A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE WOODS ROAD PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 80°08'45"W - 80°11'W
LAT.: 45°27'10"N - 45°28'10"N
NTS: 41H/8

DATE: December 31, 1993

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SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of simiiar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, and sawing and polishing specimens from many prospects. Seven sites in the Britt domain, and one in each of the Rosseau and Moon River domains have been staked and mapped by the writer resulting in the definition of a large number of potential quarry sites. The fifteen claim unit Woods Road property is one of these.

The property is underlain by the Bolger megacrystic granite pluton which comprises biotite-amphibole migmatite, tonalite and coronitic metagabbro. Thinly laminated biotite migmatite and felsic biotite migmatites are flat lying with profuse, uniform intrafolial folds having SSE plunging hinge lines on SSE dipping axial planes. Joints are widely spaced and several areas having very large resources could be developed for dimension stone on the property. Four areas on the property warrant site planning, detailed geological mapping and core drilling. Test quarrying will involve removal of 6,000 tonnes from two sites.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In July, 1992 and July, 1993, the Woods Road property was staked for its dimension stone potential. Geological mapping was carried out in 1993, and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Carling Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 150 miles (240 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°11'W on the west and 80°08'45"W on the east and latitudes 45°27'10"N on the south and 45°28'10"N on the north. The corresponding UTM co-ordinates in metres are 563,335 on the west, 566,838 on the east, 5,033,295 on the south and 5,035,210 on the north. The property is within National Topographic System area 41H/8 and is recorded on claim map M2297.

The Woods Road property is traversed by Hwy 69 some 13 km north of Parry Sound and can also be accessed by Station Road two kilometres north of its junction with old Hwy 69. The Canadian Pacific rail bed also traverses the property. Large portions of the property are essentially flat giving virtual access to 80% of the property using four wheel drive vehicles and 20% of the property in two wheel drive vehicles.

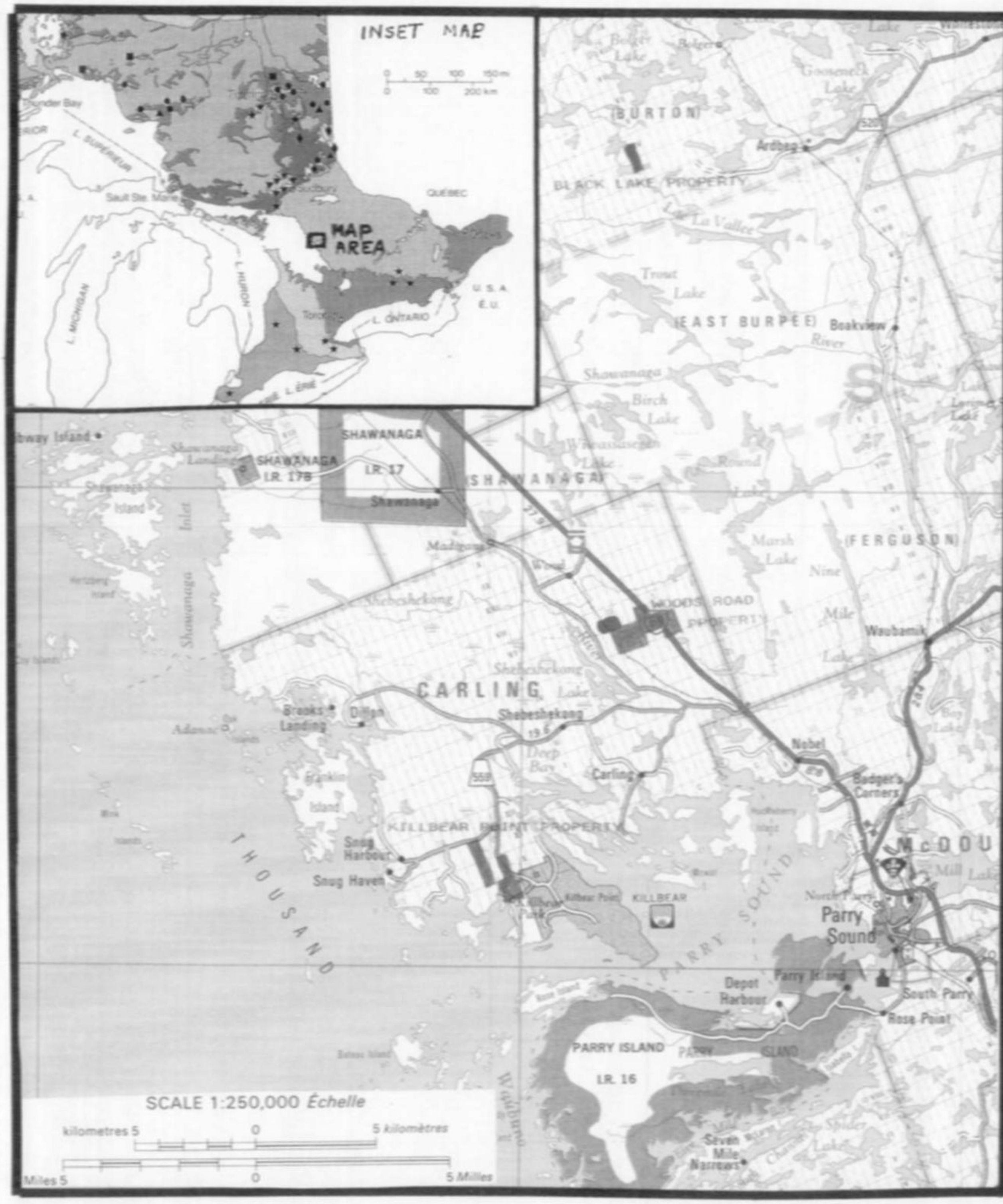


Figure 1: Location Map

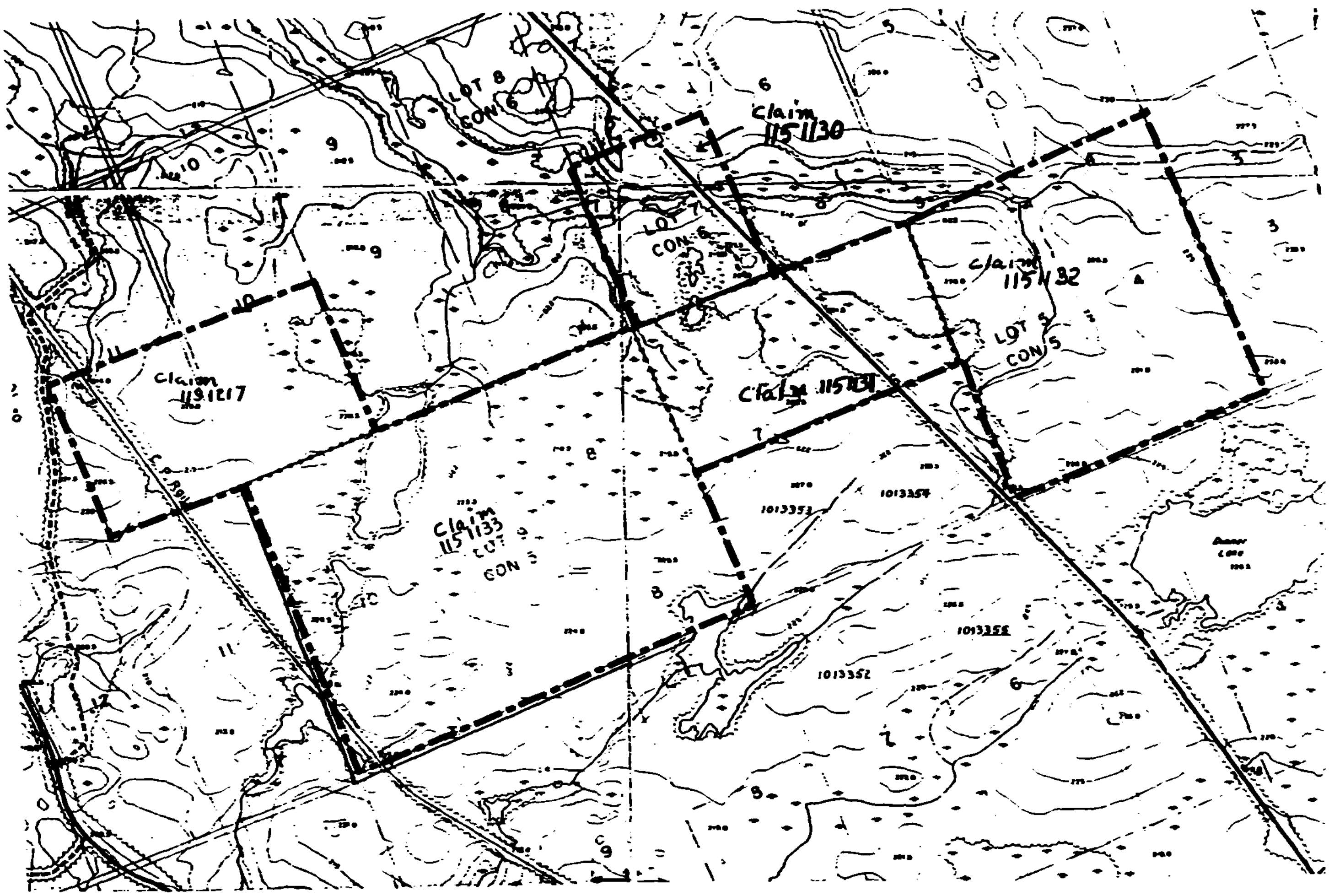
PROPERTY

The Woods Road property comprises approximately 747 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: WOODS ROAD PROPERTY

Claim No	Township	Lot	Conc.	Area	Recording Date
1151130	Carling	S/2 7	VI	50 ac	Aug. 11, 1992
1151131	Carling	N/2 6,7	V	100 ac	Aug. 11, 1992
1151132	Carling	4,5	V	200 ac	Aug. 11, 1992
1151133	Carling	8,9,10	V	300 ac	Aug. 11, 1992
1191217	Carling	S/2 10,11	VI	97 ac	July 22, 1993



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on July 3, 1993 and the map drafting and report writing was completed on December 31, 1993. Actual work days for assessment purposes break down as follows:

Woods Road Property: Claims SO1151130, 1151131, 1151132, 1151133 and 1151217.

Preparation: Apr. 4,6,9. Aug. 3,4,13, 1993 (5½ days)
Field:May 11.12. July 3.4.5,6,13. Aug. 23,24,25.26,27.28, 1993 (12½ days)
Drafting: Aug. 19.20, Sept.29,30. Oct.1.4-8,12,22, Nov. 8-13. Dec. 11,12. 1993 (12days)
Reporting:Sept. 3,10,20-24,27. Nov. 1. Dec. 16-24,26-31, 1993 (6 days)

Preparation for field work involved production of 1:5,000 enlargements of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 10°-15′ W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.

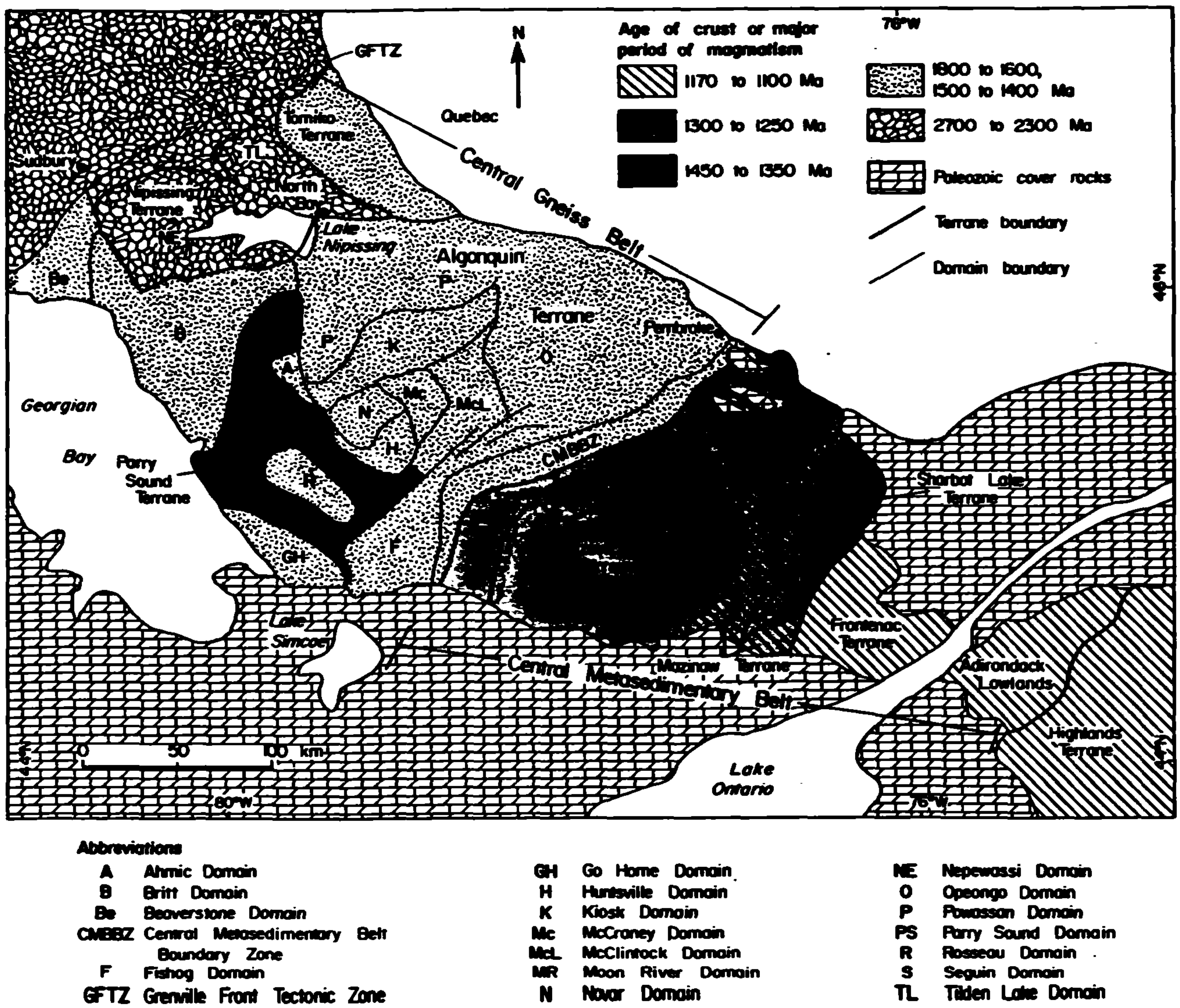


Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

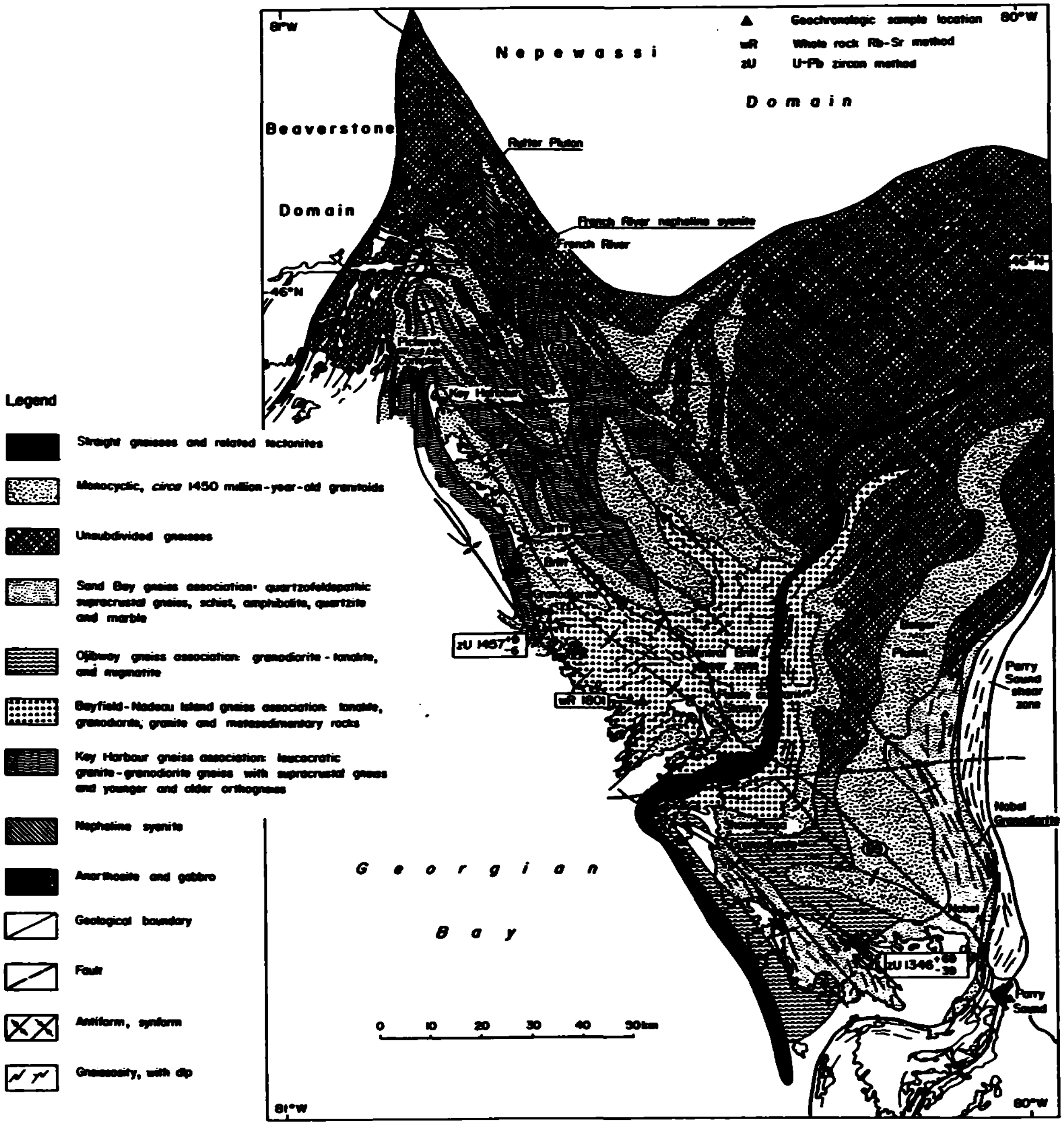


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60° to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies.

Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: biotite-hornblende migmatite, gabbro, and tonalite.

The biotite-hornblende migmatite is represented by quartzo-feldspathic rock ranging from less than 5% to greater than 40% mafic minerals and containing syntectonic and late tectonic pegmatitic material in varying proportions and thicknesses. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant. The gneissic fabric is very thinly laminated in some areas but ranges to thickly layered in other areas and is typically variegated pink and various shades of grey. However some areas are underlain by laminated gneisses variegated only in shades of grey. A pervasive feature of this rock is a 5-10% translucent red speckle caused by hematite on grain boundaries. Profuse, fine scale, intrafolial folding with a slight plunge to the southeast and shallow southeast dipping axial planes is a dominant feature of these rocks.

The tonalite is generally a gneissic, medium to coarse grained, thinly to thickly layered rock generally variegated light grey and greyish black and containing 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. Usually approximately 10%, but occasionally up to 50% of the rock unit comprises introduced or anatectic, syntectonic quartzo-feldspathic material. Pinch and swell characteristics are common especially in neosome portions of this rock.

The gabbro is represented both by a very coarse grained, greyish black, coronitic metagabbro which has an ophitic and oikocrystic texture and amphibolite gneiss which is a coarse grained amphibole-plagioclase rock which is thinly to thickly layered, variegated medium grey and dark greyish black and very rarely contains a small amount of syntectonic material.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel
__________Unconformity (possible regolith)__________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings
__________Unconformity__________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes
__________Intrusive Contact__________
High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene
__________Sheared Contact__________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.
__________Intrusive Contact__________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

_______________Intrusive Contact_______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

_______________Intrusive Contact_______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

_______________Intrusive Contact_______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

_______________Intrusive Contact_______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The main unit on the property is the biotite-hornblende migmatite. Although, the progenitor of this rock is megacrystic granite, the only macroscopic feature evidencing its origin on the property is the relative uniformity of texture and chemical composition. The rocks have been subjected to intense small scale folding, anatexis or syntexis and polyphase tectonism and metamorphism. The final stage of amphibolite facies metamorphism appears to have succeeded any penetrative tectonic influences.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The biotite-hornblende migmatite is a granular aggregate of equant to elongated grains of quartz, feldspar and biotite, averaging over 10% mafic minerals and containing syntectonic and rarely, late tectonic pegmatitic material exhibiting cataclastic textures. The pegmatites occur in varying proportions and thicknesses. Evidently, this unit has evolved through polyphase metamorphism and tectonism with a final stage of amphibolite facies metamorphism annealing the rocks. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant, but some large tracts are hornblende dominant. The gneissic fabric is very thinly laminated in some areas but ranges to thinly layered in other areas and is typically variegated pink and various shades of grey, but in several areas is variegated light grey and greyish black. Minor scattered red hematite specks occur throughout this unit. Some of the pink and grey banded varieties of this rock contain less than 5% biotite and some light grey and greyish black varieties contain less than 10% biotite. Some outstanding potential quarry sites are evident on the property having these features.

The tonalite comprises a gneissic, medium to coarse grained, thinly to thickly layered rock, variegated light grey and greyish black and containing 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. It is a medium to coarse grained, thinly to thickly layered rock containing significant variation in texture and composition of the syntectonic and late tectonic pegmatitic material. Some portions of the unit contain rich biotite segregations which weather low although amphibole is the main mafic mineral. It comprises usually approximately 10%, but occasionally up to 50% introduced or anatectic. syntectonic quartzo-feldspathic material. Pinch and swell characteristics are common especially in neosome portions of the gneissic rock. One large outcrop of this material is potentially able to be quarried for dimension stone.

The gabbro is represented by two diverse rocks. The first is a very coarse grained, greyish black, coronitic metagabbro which has an ophitic and oikocrystic texture. The coronas are produced from partial amphibole replacement of clinopyroxenes. This particular rock usually occurs as small circular intrusions up to several hundred metres in diameter. The second is an amphibolite gneiss which is a coarse grained amphibole-plagioclase rock which is thinly to thickly layered, variegated medium grey and dark greyish black and very rarely contains a small amount of syntectonic material. This rock usually occurs as large elongated sills or dikes generally spatially associated with the tonalite.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. The gneissic foliations are very strong on the property, but the attitude is predominantly flat lying to slightly southeast dipping. The biotite-hornblende migmatite, in particular, contains profuse ubiquitous, intrafolial folding which plunges at approximately 10° to the south-southeast and has gently south dipping axial planes.

The average sub-horizontal joint spacing, based on 24 data, is 2.5 metres and the average vertical joint spacing based on 395 data is four metres. The statistical plot of vertical joints was constructed using 456 data and gave a high degree of scatter. The main joint direction is 153° and 27% of the data are clustered about this direction. The remainder of the data are scattered with all five degree segments having at least 2% of the data (Map 1).

POTENTIAL DIMENSION STONE SITES

An outcrop of biotite-hornblende migmatite (Photo 1) with about 40% shallow overburden cover is exposed from the middle of lot 4, conc. 5, Carling Twp. to the south boundary and southeast corner of the lot. The favourable area is 500 metres X 250 metres approximately and has a relief of approximately 20 metres above the surrounding drainage. The joint spacing appears favourable for recovery of 30 tonne dimension stone blocks. The biotite-hornblende migmatite in this location is biotite dominant with over 20% biotite. is thinly laminated with profuse intrafolial folding, and is variegated medium greyish black and pink. A site plan is warranted for this site combined with detailed geological mapping and drilling.

Photo 3 shows the bedrock plane in the north part of lot 8, concession 5, Carling Twp. This outcrop continues to the SSE to the middle of the lot on its east boundary. The rock is a biotite dominant biotite-hornblende migmatite with over 20% biotite, similar to the material described in the preceding paragraph, on 60% of the outcrop, but becomes hornblende dominant and a biotite dominant schlieren on the southeast portion of the outcrop. This latter variation of the rock is lighter grey and more intensely pink. The outcrop covers an area about 500 metres X 150 metres

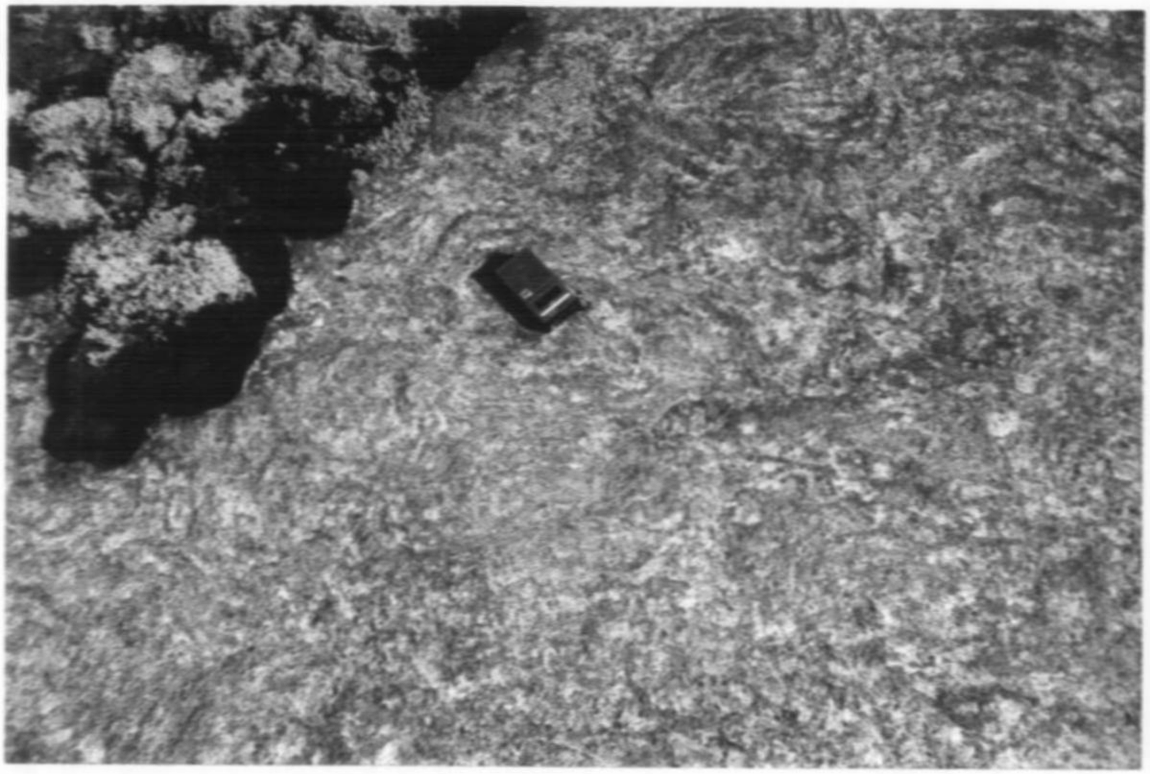


Photo 1 Thinly laminated and folded pink and dark grey biotite-hornblende migmatite on Woods Road property (above) material is similar to straight gneiss featured in Photos 2; the sites are 1500 metres apart; Photo 2 a polished slab from a crushed rock quarry (below); the sample is described in sample 2, Table 3; this material takes a good polish and is very attractive.

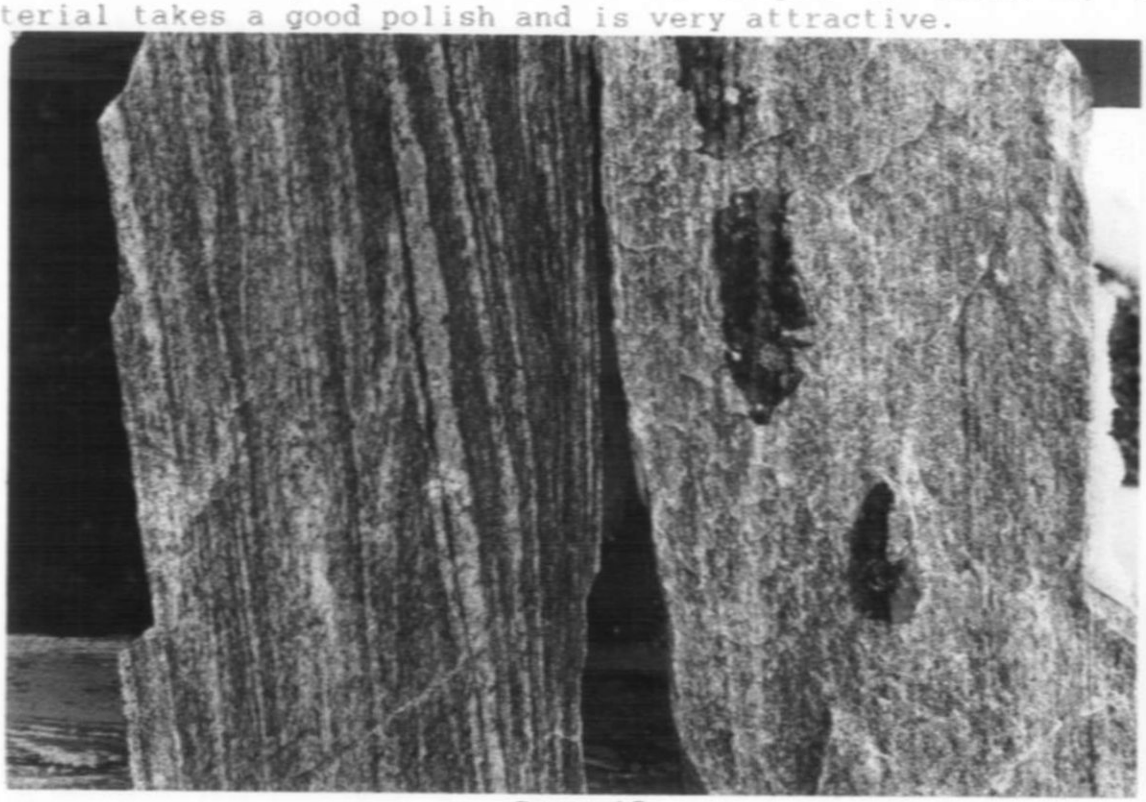


Photo 3 Bedrock plane typical of Woods Road property (above) located on the north part of lot 8 concession 5, Carling Twp. and proposed for site planning; Photo 4 polished folded migmatite Woods Road property; the sample is described as sample 1, Table 3 and is similar to the material depicted in the quarry face but cut on a different angle. This folded horizon with little or no change in character can be followed for over 2 km., is flat lying and underlies the bedrock plane above.

TABLE 3: RESULTS OF SAMPLE POLISHING

Sample No.	Type of Sample	Rock Type	Test Results
Sample 1 Claim 1151130	large block weighing 30 Kg.	Intrafolial folded pink, biotite-hornblende-quartz-feldspar migmatite.	The sample took an excellent polish appearing very durable without weathering fractures or pluck outs; the rock is a very attractive buff stringered, pink-grey migmatite containing approximately 20% biotite with quartz, feldspar with accessory magnetite and hematite speckles on grain boundaries widespread and attractive; rock is cataclastic with most pegmatite crystals recrystallized to a medium grained rock after cataclasis; alignment of biotite crystals appears to be axial planar to the folded gneissic layers giving the rock a "wood grain" appearance.
Sample 2 Claim 1151131	large block weighing 50 kg.	Straight gneissic, grey-pink, biotite-hornblende-quartz-feldspar migmatite	Red flecked pink and grey gneissic rock with ≈25% biotite and ≈20% hematite spots; pegmatitic material granulated and recrystallized; closed folds with axial planar biotite foliation; takes an excellent polish but some healed cross fractures evident which may be deleterious; also a wood grain gneiss.

average and is 10 to 15 metres above the drainage. Site planning and detailed mapping are warranted.

On the south half of lot 10, concession 6, Carling Twp., up to the boundary with lot 11 a large outcrop of felsic biotite-hornblende migmatite occurs. The rock is variegated pink and light grey with a biotite content of less than 10%. Profuse small scale intrafolial folding can be seen in outcrop. At this location the jointing is favourable for the removal of large blocks, but the outcrop covers a much larger area some of which has close spaced joints. The area of favourable outcrop is 250 metres square and 15 metres above the drainage. More favourable material could be located in the south half of lot 11. Site planning including detailed mapping and drilling are warranted.

The tonalite which outcrops in the middle of lot 9, concession 5, Carling Twp. has wide joint spacing and is a uniform thinly layered rock with light grey and medium greyish black layers. The outcrop, at the south end of the tonalite intrusion, covers an area 250 metres X 125 metres and is 15 metres above the drainage. Site planning, detailed mapping and drilling are warranted.

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects were staked in the Parry Sound area, and all have been mapped geologically. Many of the rocks underlying these properties are migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks. The Woods Road property is the largest of these claim groups.

The property is underlain by the Bolger megacrystic granite pluton which comprises biotite-amphibole migmatite, tonalite and coronitic metagabbro. Thinly laminated biotite migmatite and felsic biotite migmatites are flat lying with profuse, uniform intrafolial folds having SSE plunging hinge lines on SSE dipping axial planes. Joints are widely spaced and several areas could be developed for dimension stone on the property. Four areas on the property warrant detailed geological mapping, site planning and drilling. Two of these sites should be test quarried after the initial exercises. The dimension stone resources in each case exceed 1,000,000 tonnes.

RECOMMENDATIONS

1. Site planning including drilling and detailed geological mapping are recommended on four sites.

2. Two of the above sites are recommended for test quarrying by the removal of 3,000 tonnes in 30 tonne blocks from each.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

Dated: December 31, 1993

James R. Trusler M.S., P.Eng.

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE DILLON ROAD PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 80°13'40"W - 80°14'33"W
LAT.: 45°25'03"N - 45°25'43"N
NTS: 41H/8

DATE: December 30, 1993

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE DILLON ROAD PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of similar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, and sawing and polishing specimens from many prospects. Seven sites in the Britt domain, and one in each of the Rosseau and Moon River domains have been staked and mapped by the writer resulting in the definition of a large number of potential quarry sites. The four claim unit Dillon Road property is one of these.

The property is underlain by the southwest extremity of the Bolger megacrystic granite pluton and the rocks of the Ojibway gneiss association. The contact and gneissic foliations trend southeast and dip shallowly to the west. The derivatives of the pluton, chiefly pink biotite migmatite with lesser felsic biotite migmatite are locally hematite stained but not as attractive as on other properties. Local attractive, porphyritic tonalite intrusions are present in the pluton and warrant sampling. The gneiss association is represented by tonalite gneiss and gabbro.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In July, 1993, the Dillon Road property was staked for its dimension stone potential. Geological mapping was carried out in 1993. and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Carling Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 150 miles (240 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°14'33"W on the west and 80°13'40"W on the east and latitudes 45°25'03"N on the south and 45°25'43"N on the north. The corresponding UTM co-ordinates in metres are 559,240 on the west, 560,350 on the east, 5,029,420 on the south and 5,030,630 on the north. The property is within National Topographic System area 41H/8 and is recorded on claim map M2297.

The Dillon Road property is at the intersection of Dillon Road where it leaves Highway 559 approximately 10 km west of Highway 69.

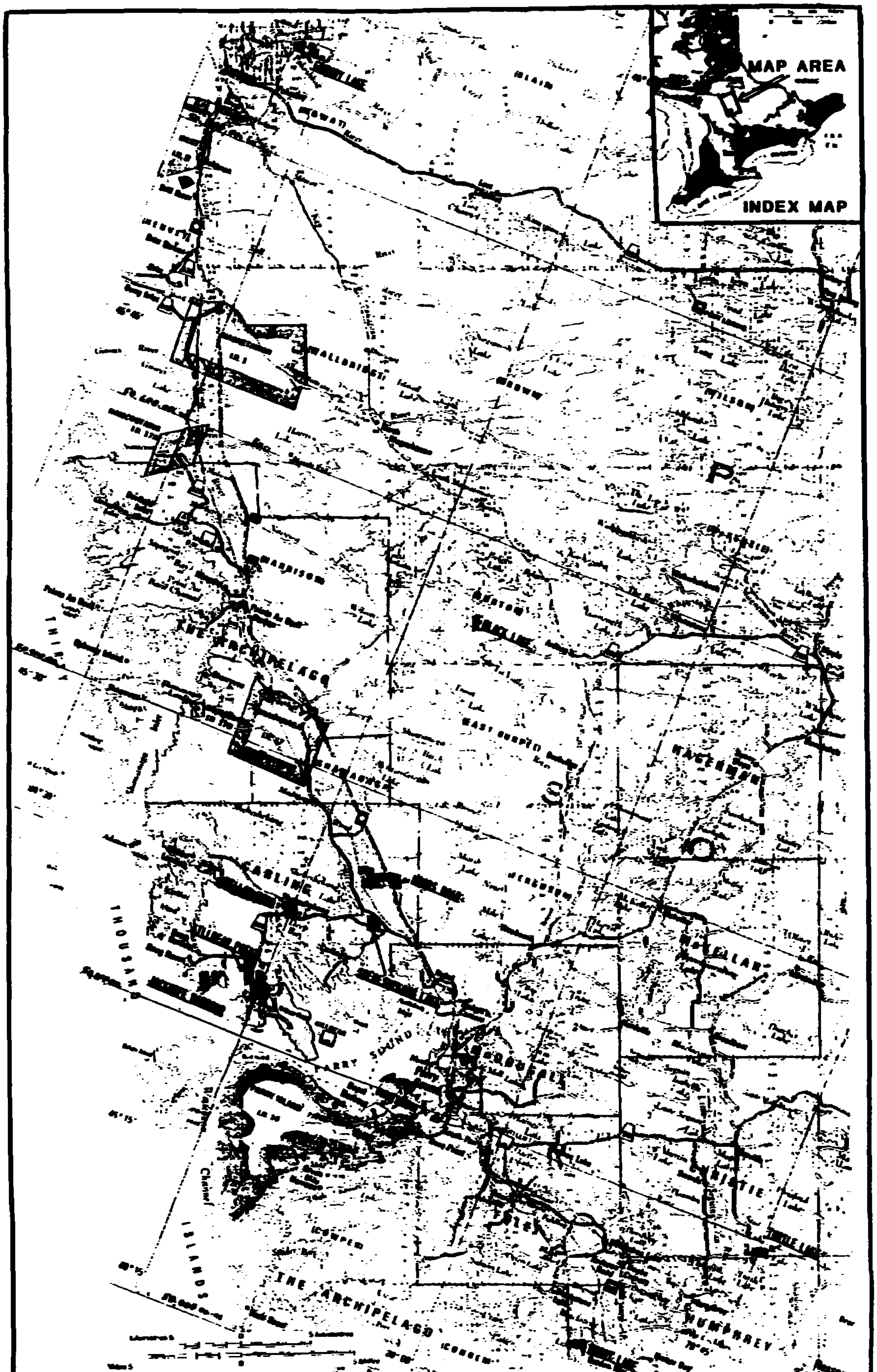


Figure 1: LOCATION MAP

PROPERTY

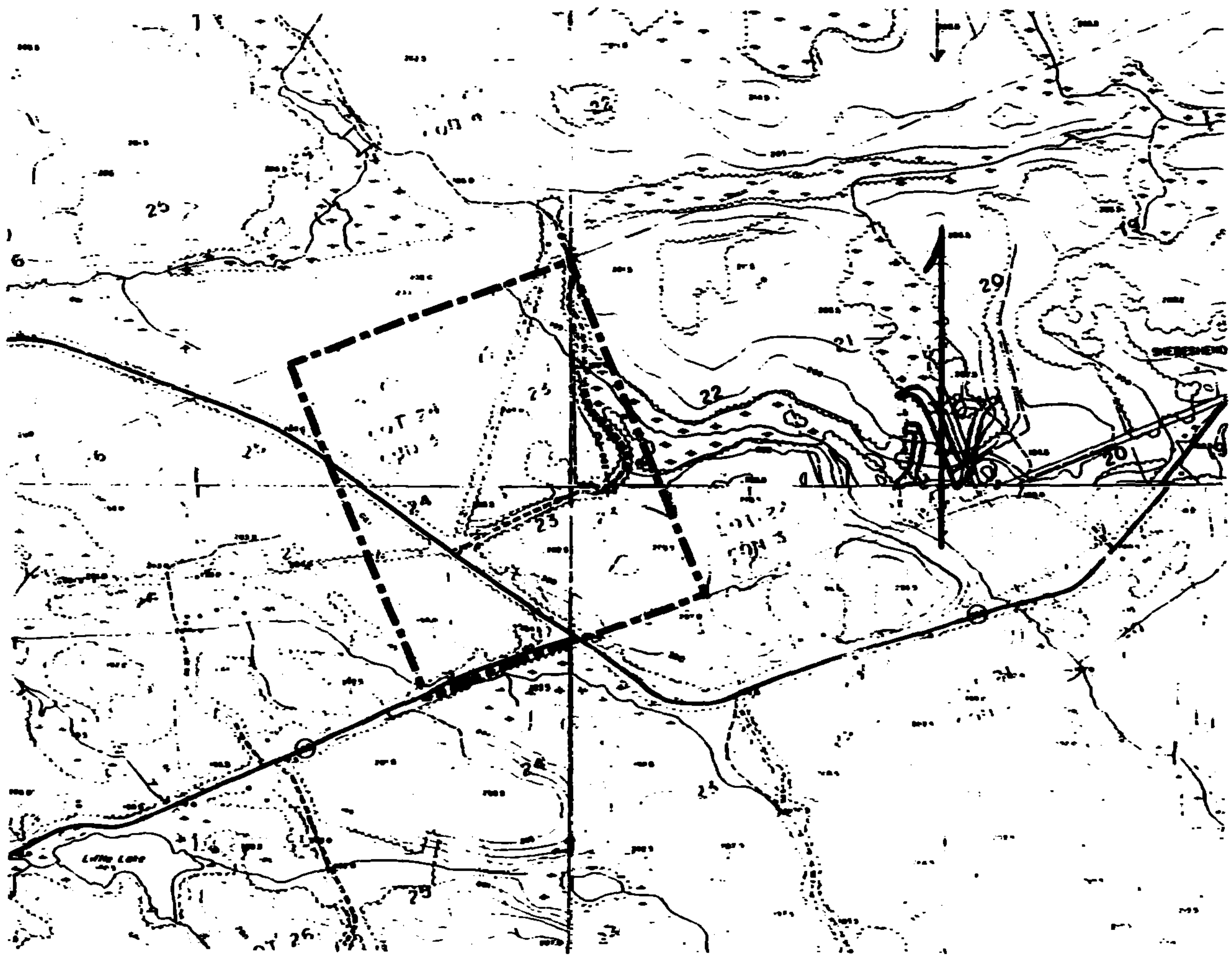
The Dillon Road property comprises approximately 193 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: DILLON ROAD PROPERTY

Dillon Road Property

Claim No	Township	Lot	Conc.	Area	Recording Date
1191216	Carling	23, 24	III	193 ac.	July 22, 1993



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on September 17, 1993 and the map drafting and report writing was completed on December 30, 1993. Actual work days for assessment purposes break down as follows:

Dillon Road Property: Claims SO1191215.

Preparation: July 28, 30, Aug. 1, 5, 1993 (3 days)
Field:Sept. 17,18, 1993 (2 days)
Drafting: Sept. 29,30, Oct. 1,4-7,22, Dec.3,4,9, 1993 (4days)
Reporting:Sept. 20-24,27, Nov. 1, Dec. 16-24,26-30, 1993 (2½ days)

Preparation for field work involved production of 1:5,000 enlargements of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 10°-11′ W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

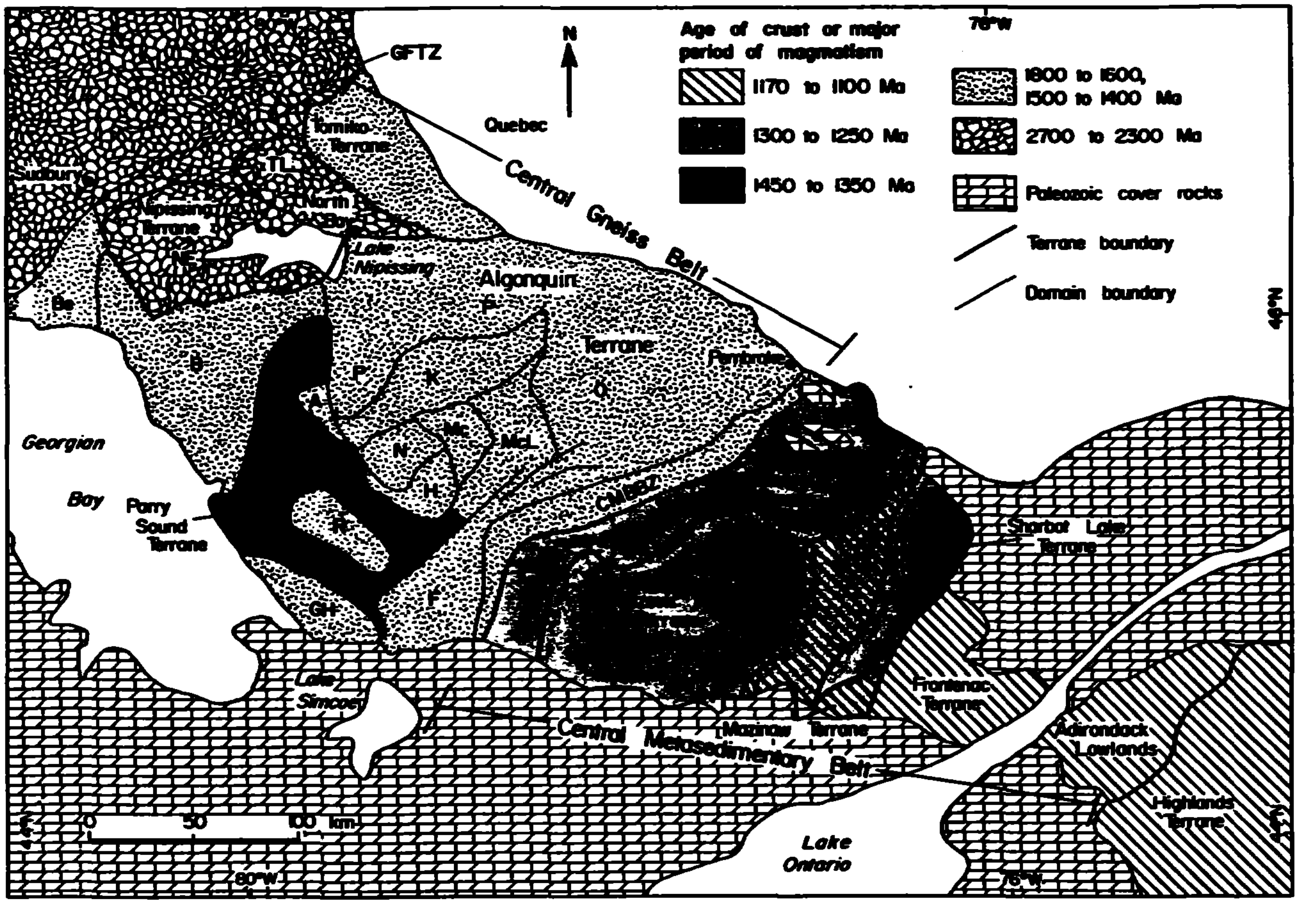
The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.



Abbreviations

A	Ahmic Domain	GH	Go Home Domain	NE	Nepewassi Domain
B	Britt Domain	H	Huntsville Domain	O	Opeongo Domain
Be	Beaverstone Domain	K	Kiosk Domain	P	Powassan Domain
CMBBZ	Central Metasedimentary Belt Boundary Zone	Mc	McCraney Domain	PS	Parry Sound Domain
F	Fishog Domain	McL	McClintock Domain	R	Rosseau Domain
GFTZ	Grenville Front Tectonic Zone	MR	Moon River Domain	S	Seguin Domain
		N	Novar Domain	TL	Tilden Lake Domain

Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

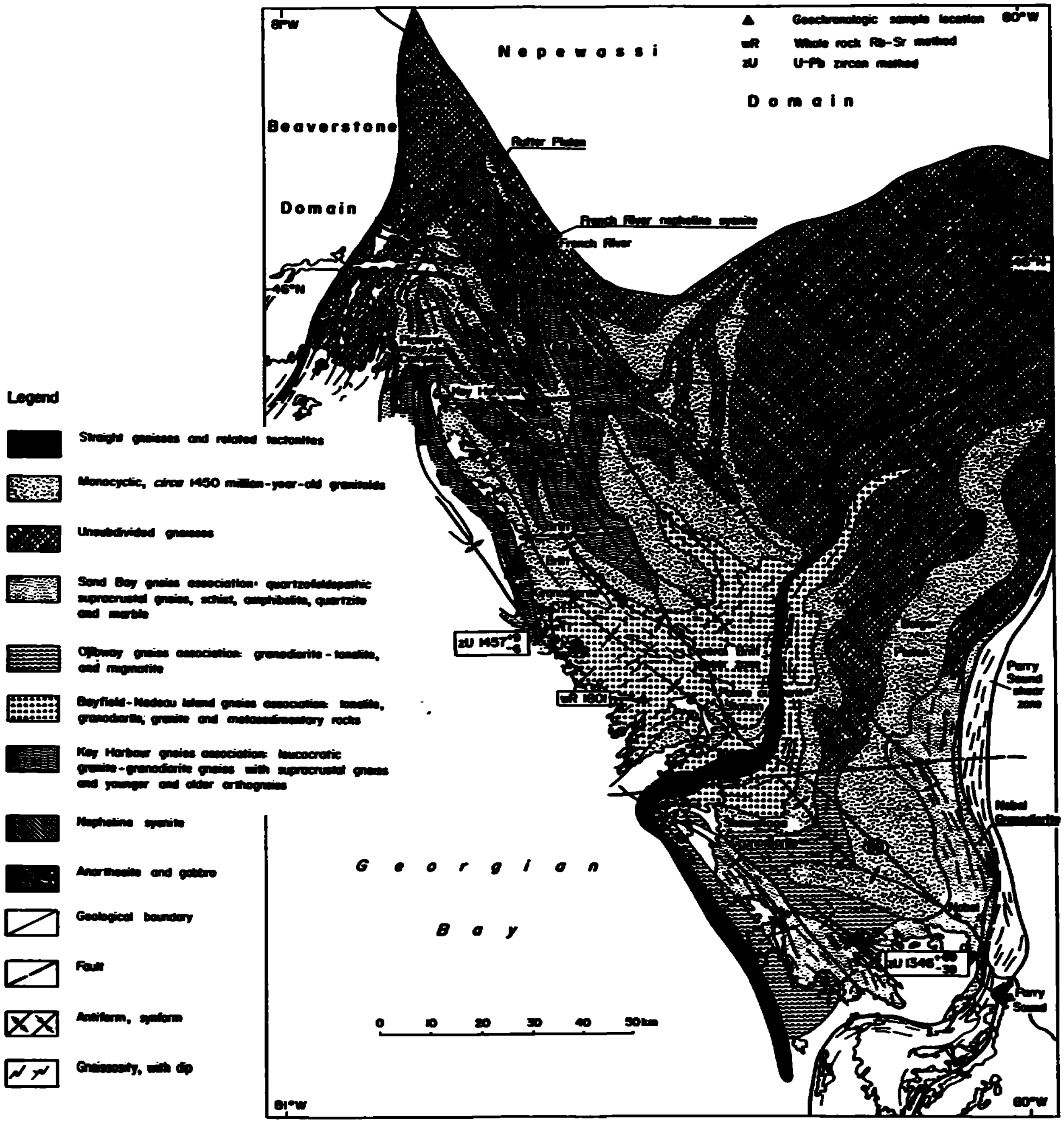


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock

largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: biotite-hornblende migmatite, gabbro, and tonalite.

The biotite-hornblende migmatite is represented by quartzo-feldspathic rock ranging from less than 5% to greater than 40% mafic minerals, averaging over 20% mafic minerals and containing syntectonic and late tectonic pegmatitic material in varying proportions and thicknesses. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant. The gneissic fabric is very thinly laminated in some areas but ranges to thickly layered in other areas and is typically variegated pink and various shades of grey. Small scale, intrafolial folding with a slight plunge to the southeast and shallow west dipping axial planes is a common feature of these rocks.

The tonalite comprises two varieties: a gneissic to slightly layered rock containing 2-3 cm pink orthoclase phenocrysts and a gneissic, medium to coarse grained, thinly to thickly layered rock. The latter is variegated light grey and greyish black and contains 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. In the gneissic variety, usually approximately 10%, but occasionally up to 50% of the rock unit comprises introduced or anatectic, syntectonic quartzo-feldspathic material. Pinch and swell characteristics are common especially in neosome portions of the gneissic rock.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel

______________Unconformity (possible regolith)______________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings

______________Unconformity______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes

______________Intrusive Contact______________

High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene

______________Sheared Contact______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.

______________Intrusive Contact______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age.
The main unit on the property is the biotite-hornblende migmatite. Although, the progenitor of this rock is megacrystic granite of the Bolger pluton, the only macroscopic feature evidencing its origin on the property is the relative uniformity of texture and chemical composition. The gneissic tonalite underlying the property belongs to the Ojibway gneiss association. The rocks have been subjected to intense small scale folding, anatexis or syntexis and polyphase tectonism and metamorphism. The final stage of amphibolite facies metamorphism appears to have succeeded any penetrative tectonic influences.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The biotite-hornblende migmatite is a granular aggregate of equant to elongated grains of quartz, feldspar and biotite, averaging over 20% mafic minerals and containing syntectonic and late tectonic pegmatitic material exhibiting cataclastic textures. The pegmatites occur in varying proportions and thicknesses. Evidently, this unit has evolved through polyphase metamorphism and tectonism with a final stage of amphibolite facies metamorphism annealing the rocks. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant. The gneissic fabric is very thinly laminated in some areas but ranges to thickly layered in other areas and is typically variegated pink and various shades of grey. Small scale, intrafolial folding with a slight plunge to the southeast and shallow west dipping axial planes is a common feature of these rocks. A minor amount of this rock attains a purple tone from addition of hematite spotting

The tonalite comprises two varieties: a gneissic to slightly layered rock containing recrystallized, 2-3 cm pink, relict orthoclase phenocrysts and a gneissic, medium to coarse grained, thinly to thickly layered rock. The latter is variegated light grey and greyish black and contains 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. In many cases the layers are gabbroic. In the gneissic variety, usually approximately 10%, but occasionally up to 50% of the rock unit comprises introduced or anatectic, syntectonic quartzo-feldspathic material. Pinch and swell characteristics are common especially in neosome portions of the gneissic rock. The tonalite with pink phenocrysts is potentially quite presentable and the joint spacings are sufficiently large to enable some quarrying. Quantities of this rock may be limited.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. In general the rocks strike southeasterly and dip to the west at angles between 20° and 45°. Lineations where seen are to the southeast at approximately 10°.

The average sub-horizontal joint spacing, based on 20 data, is between 2.5 and 3 metres. The average for vertical joints, based on 91 data, is the same, but forty per cent of the vertical joint separations exceed three metres. (Map 1) The statistical scatter of vertical joints, based on 96 data, is significant especially since there are frequently three recordable joints at many of the stations. The principal joints were at 75° (28%) and 160° (26%). If the tails of both of these statistical clusters are added in the mean direction would shift in each case about 10° clockwise and the data totals would be 28% and 42% respectively. The remainder of the joint data do not appear to cluster at all.

POTENTIAL DIMENSION STONE SITES

The porphyritic tonalite gneisses on this property may be suitable for development as dimension stone. The most favourable tonalite occurrence is a body in the central part of lot 23, concession 3, Carling Twp. which trends SSE and occupies an area approximately 300 metres X 50 metres. The tonalite is uniformly medium to dark grey and banded with approximately 25% lozenge shaped pink orthoclase phenocrysts approximately 3 cm. long. The body is sill-like and dips to the west at 25°-50°. A large sample should be removed from the site for slabbing and polishing to see if this material is suitable for dimension stone.

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects were staked in the Parry Sound area, and all have been mapped geologically. Many of the rocks underlying these properties are migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

The Dillon Road property is underlain by the southwestern extremity of the Bolger granitic pluton and to the southwest the Ojibway gneiss association. The bolger pluton comprises biotite-hornblende migmatite and tonalite gneiss on the property. The Ojibway gneiss association comprises tonalite gneisses with a gabbroic phase.

The biotite-hornblende migmatites underlying the Dillon Road property contain a higher mafic mineral content and would produce more waste on quarrying than similar rocks on other sites. The porphyritic variety of the tonalite gneiss appears to be very attractive and can be removed in large blocks. A large sample of this material should be collected for slabbing and polishing to test the suitability of this rock.

RECOMMENDATIONS

1. A sample of the porphyritic tonalite gneiss should be collected for slabbing and polishing in order to determine the suitability of this rock as a dimension stone.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

James R. Trusler M.S., P.Eng.

Dated: December 30, 1993

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE SHEBESHEKONG LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 80°09'02"W - 80°09'54"W
LAT.: 45°25'41"N - 45°26'23"N
NTS: 41H/8

DATE: December 30, 1993

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE SHEBESHEKONG LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of similar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, and sawing and polishing specimens from many prospects. Seven sites in the Britt domain, and one in each of the Rosseau and Moon River domains have been staked and mapped by the writer resulting in the definition of a large number of potential quarry sites. The four claim unit Shebeshekong Lake property is one of these.

The property is underlain by the Bolger megacrystic granite pluton which is manifested by uniform biotite-amphibole migmatite and the minor tonalite gneiss. Original textures have been obliterated. Biotite migmatite and felsic biotite migmatite dominate. These rocks trend easterly and dip shallowly to the south. Two very attractive areas of felsic biotite migmatite which might be exploited for dimension stone are situated in the northwest corner and midway along the western boundary of the property. Site planning and detailed geological mapping are warranted.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In July, 1993, the Shebeshekong Lake property was staked for its dimension stone potential. Geological mapping was carried out in 1993, and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Carling Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 150 miles (240 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°09′54"W on the west and 80°09′02"W on the east and latitudes 45°25′41"N on the south and 45°26′23"N on the north. The corresponding UTM co-ordinates in metres are 565,310 on the west, 566,420 on the east, 5,030,665 on the south and 5,031,900 on the north. The property is within National Topographic System area 41H/8 and is recorded on claim map M2297.

The Shebeshekong Lake property is northwest of the junction of Highway 559 and old Highway 69 being traversed by both roads plus a cottage access road on the north property boundary. The property is 3 km west of Highway 69.

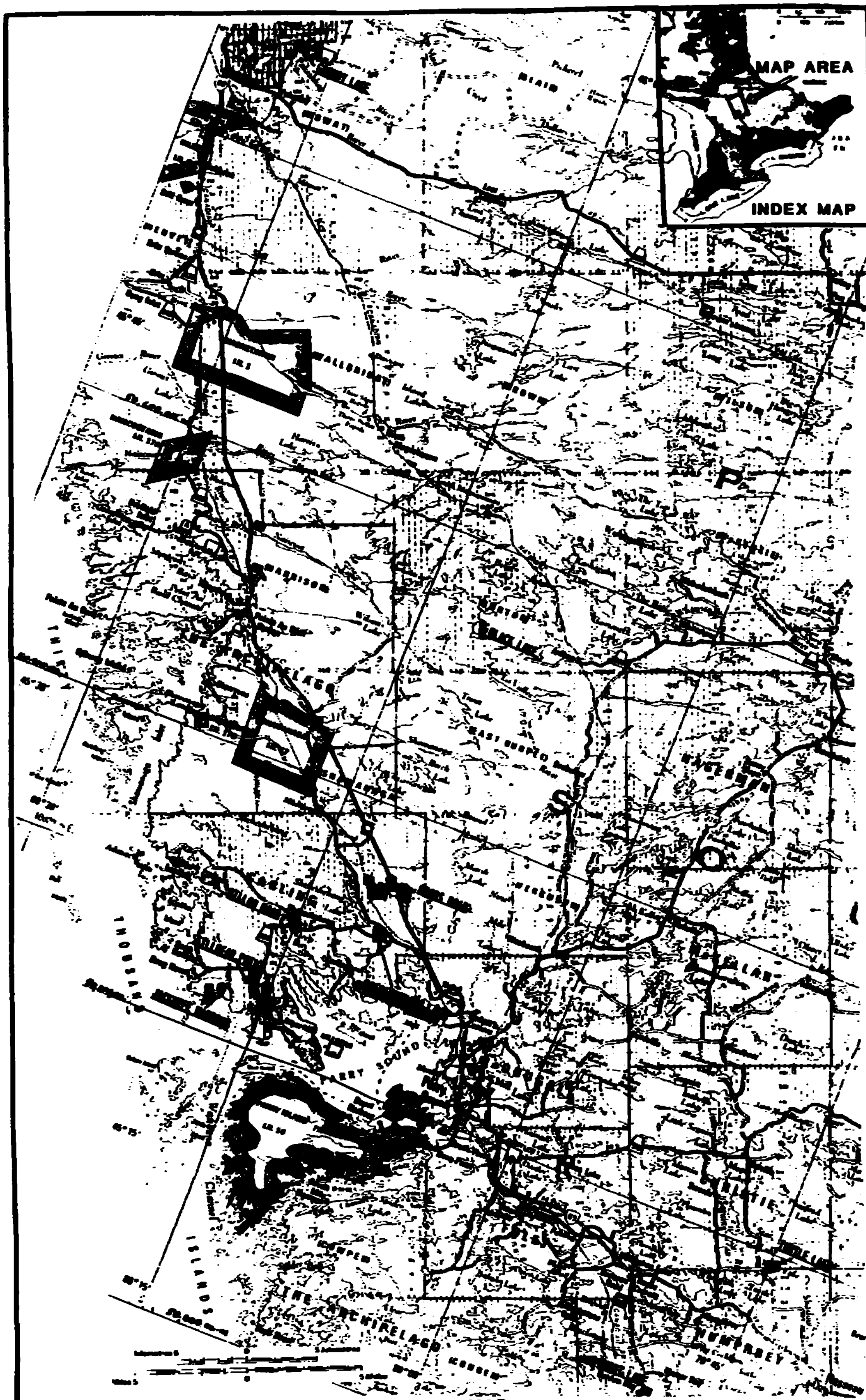


Figure 1: LOCATION MAP

PROPERTY

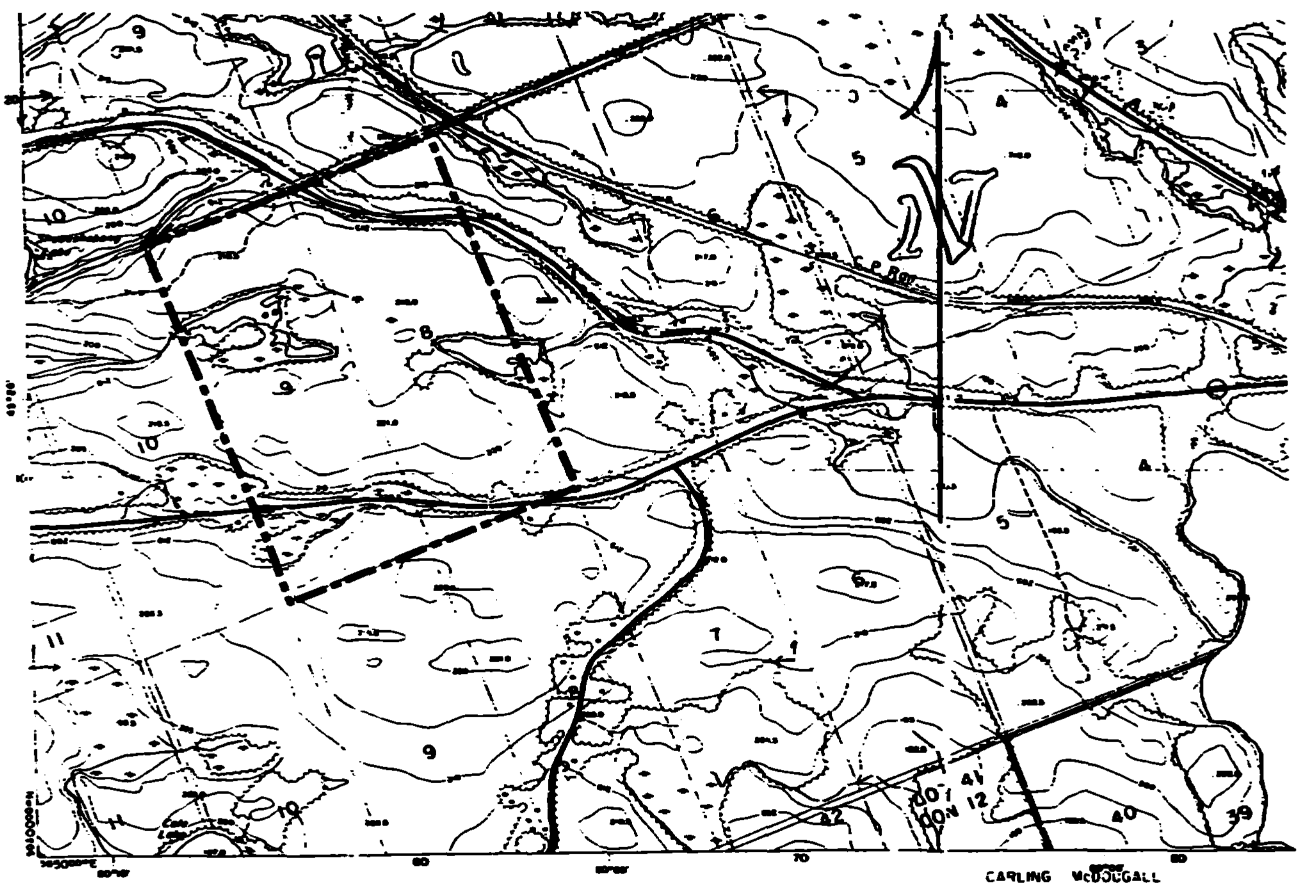
The Shebeshekong Lake property comprises approximately 199 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: SHEBESHEKONG LAKE PROPERTY

Shebeshekong Lake Property

Claim No	Township	Lot	Conc.	Area	Recording Date
1191215	Carling	8,9	II	199 ac.	July 22, 1993



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on August 29, 1993 and the map drafting and report writing was completed on December 30, 1993. Actual work days for assessment purposes break down as follows:

Shebeshekong Lake Property: Claims SO1191215.

Preparation: July 27, Aug. 2,5, 1993 (2½ days)
Field:Aug. 29, Sept. 2, 1993 (2 days)
Drafting: Sept. 29,30, Oct. 1,4-7,22, Dec. 5,6,10, 1993 (4days)
Reporting:Sept. 20-24,27, Nov. 1, Dec. 16-24,26-30, 1993 (2½ days)

Preparation for field work involved production of 1:5,000 blow ups of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 10°-15′W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

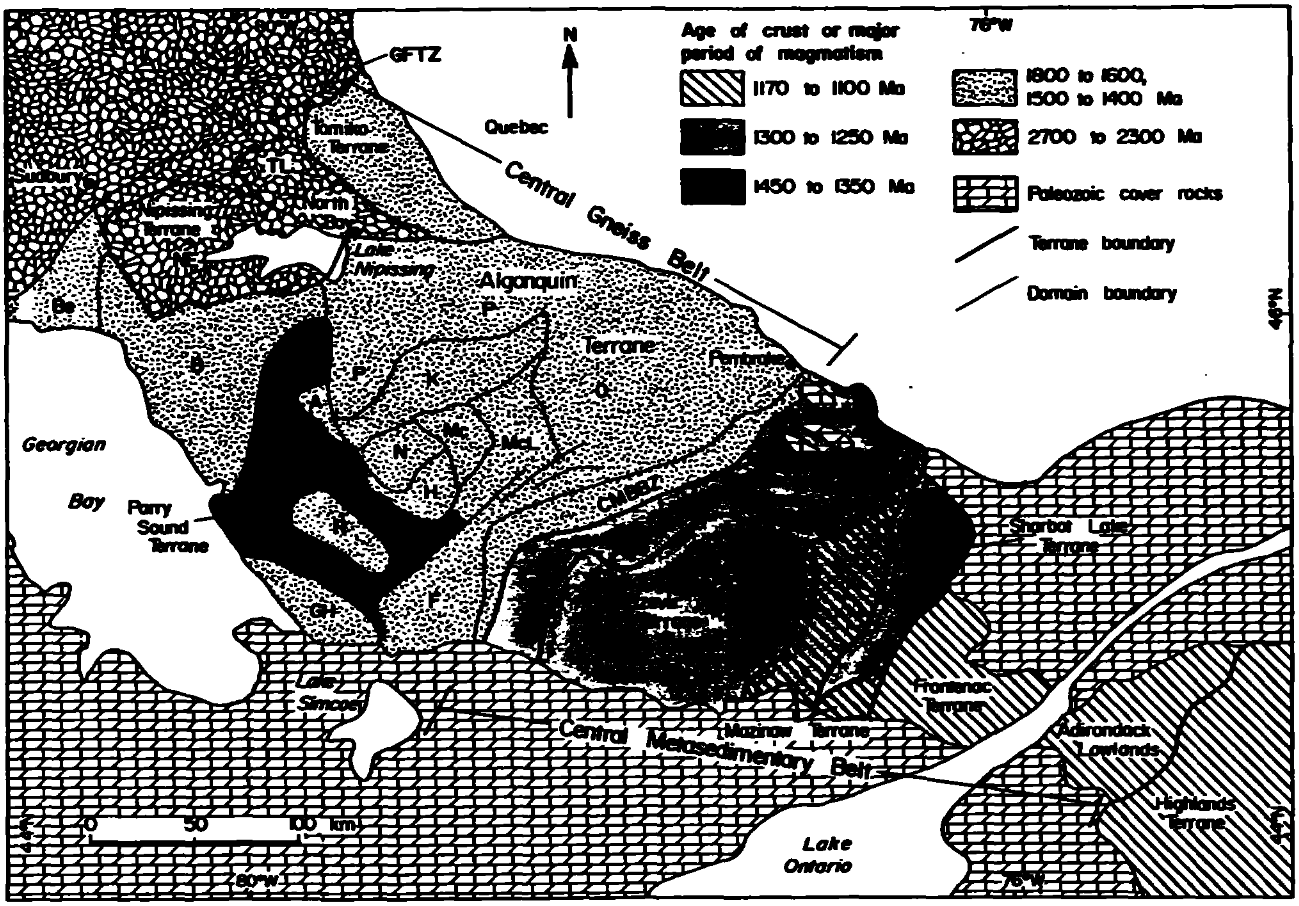
The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.



Abbreviations

A	Ahmic Domain	GH	Go Home Domain	NE	Nepewassi Domain
B	Britt Domain	H	Huntsville Domain	O	Opeongo Domain
Be	Beaverstone Domain	K	Kiosk Domain	P	Powassan Domain
CMBBZ	Central Metasedimentary Belt Boundary Zone	Mc	McCraney Domain	PS	Parry Sound Domain
		McL	McClintock Domain	R	Rosseau Domain
F	Fishog Domain	MR	Moon River Domain	S	Seguin Domain
GFTZ	Grenville Front Tectonic Zone	N	Novar Domain	TL	Tilden Lake Domain

Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

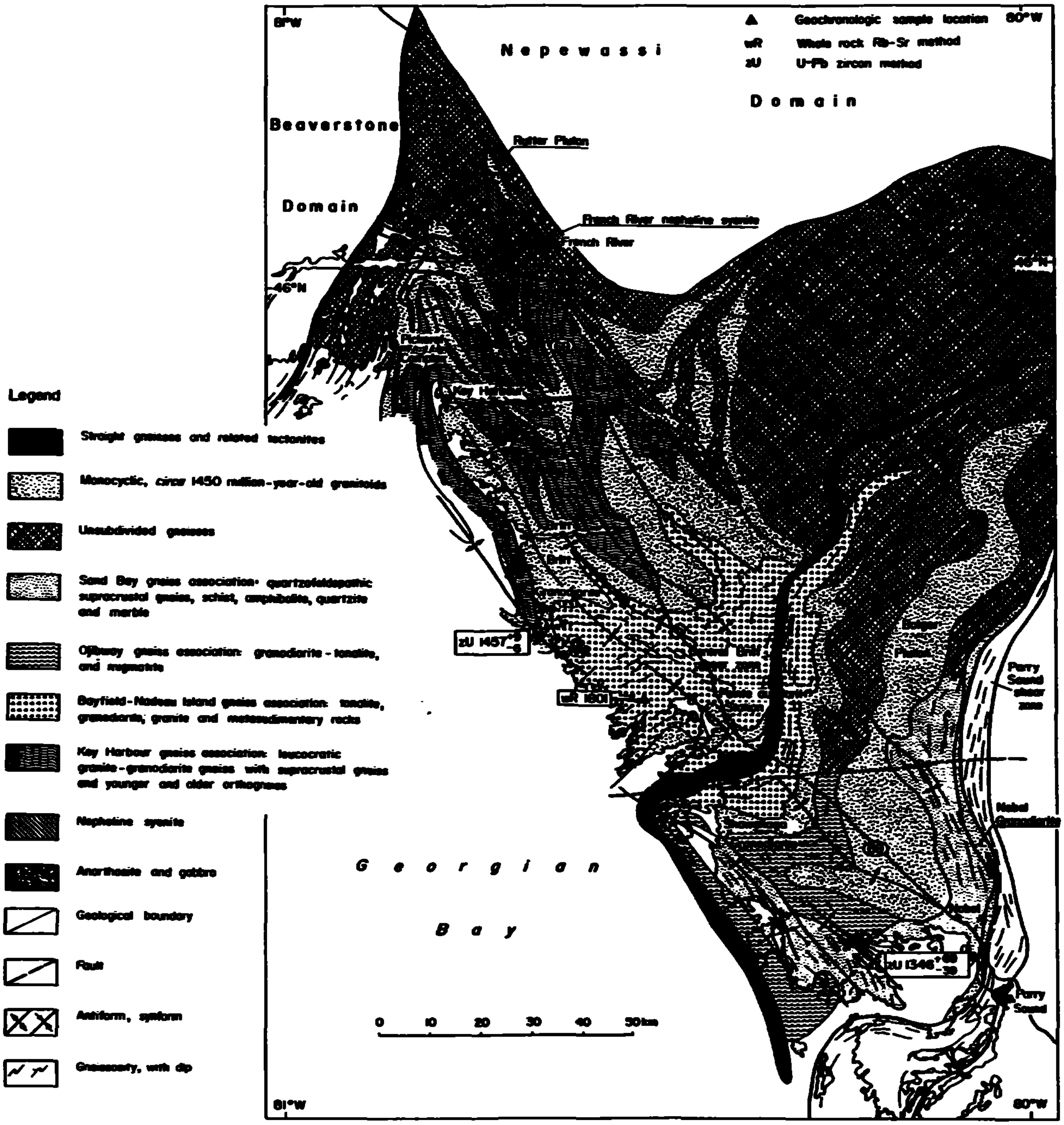


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock

largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: biotite-hornblende migmatite and tonalite.

The biotite-hornblende migmatite is represented by quartzo-feldspathic rock ranging from less than 5% to greater than 40% mafic minerals and averaging less than 20% mafics and containing syntectonic and late tectonic pegmatitic material in varying proportions and thicknesses. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant. The gneissic fabric is very thinly laminated in some areas but ranges to thickly layered in other areas and is typically variegated pink and various shades of grey. However some areas are underlain by laminated gneisses variegated only in shades of grey. Small scale, parasitic folds with a slight plunge to the southeast occur within shallow south dipping rocks.

The tonalite is a gneissic, medium to coarse grained, thinly to thickly layered rock generally variegated light grey and greyish black and containing 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. Usually approximately 10%, but occasionally up to 50% of the rock unit comprises introduced or anatectic, syntectonic quartzo-feldspathic material. All of the tonalite seen on the property occurs in fold nose segments which are presumably tectonically separated from the rest of the intrusion.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel
_______________Unconformity (possible regolith)_______________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings
_______________Unconformity_______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes
_______________Intrusive Contact_______________
High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene
_______________Sheared Contact_______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.
_______________Intrusive Contact_______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The main unit on the property is the biotite-hornblende migmatite. Although, the progenitor of this rock is megacrystic granite of the Bolger pluton, the only macroscopic feature evidencing its origin on the property is the relative uniformity of texture and chemical composition. The rocks have been subjected to intense small scale folding, anatexis or syntexis and polyphase tectonism and metamorphism. The final stage of amphibolite facies metamorphism appears to have succeeded any penetrative tectonic influences.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The biotite-hornblende migmatite is a granular aggregate of equant to elongated grains of quartz, feldspar and biotite, averaging over 10% mafic minerals and containing syntectonic and rarely, late tectonic pegmatitic material exhibiting cataclastic textures. The pegmatites occur in varying proportions and thicknesses. Evidently, this unit has evolved through polyphase metamorphism and tectonism with a final stage of amphibolite facies metamorphism annealing the rocks. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant. The gneissic fabric is very thinly laminated in some areas but ranges to thinly layered in other areas and is typically variegated pink and various shades of grey, but in rare cases is variegated light grey and greyish black. Some of the pink and grey banded varieties of this rock contain less than 5% biotite and could be quarried. Minor scattered red hematite specks occur throughout this unit.

Outcrop scale, folding with a slight plunge to the southeast and shallow west dipping axial planes is a common feature of these rocks.

The tonalite comprises a gneissic, medium to coarse grained, thinly to thickly layered rock, variegated light grey and greyish black and containing 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. The tonalite is not well represented in outcrop as it tends to weather low.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. The rocks are strongly gneissic. The gneissic foliation trends east to southeast in general with dips of 0°-30° to the south. The frequent parasitic folds appear to plunge to the southeast at 10°-15°..

The average sub-horizontal joint spacing, based on 19 data, is slightly less than 2 metres for the whole property. The average vertical joint spacing, based on 116 data, is 3 metres. The statistical plot of vertical joints, based on 138 data, exhibit significant dispersion. The following azimuths are broadly defined: twenty-seven per cent of the data cluster about 90°; thirty per cent of the data cluster about 158°, and; twenty-three per cent of the data cluster about 18°.

POTENTIAL DIMENSION STONE SITES

Two areas on the property are judged to be potentially suitable for quarry development. These sights are the large outcrop areas in the north portion of lot 9, concession 2 north of a small beaver slough, and in the middle of the same lot towards the western boundary. The two areas are underlain by felsic biotite migmatite which is thinly laminated, variegated pink and light to medium grey, frequently contains profuse intrafolial folding, and exhibit excellent joint separations. The southern site (Photo 2) has a relief of 15 metres above the highway and covers an area of at least 250 metres X 350 metres for a resource of 3,400,000 tonnes. The northern site has a relief of 25 metres, and covers an area of at least 200 metres X 350 metres for a resource of 4,700,000 tonnes. Site planning, including detailed geological mapping are warranted.

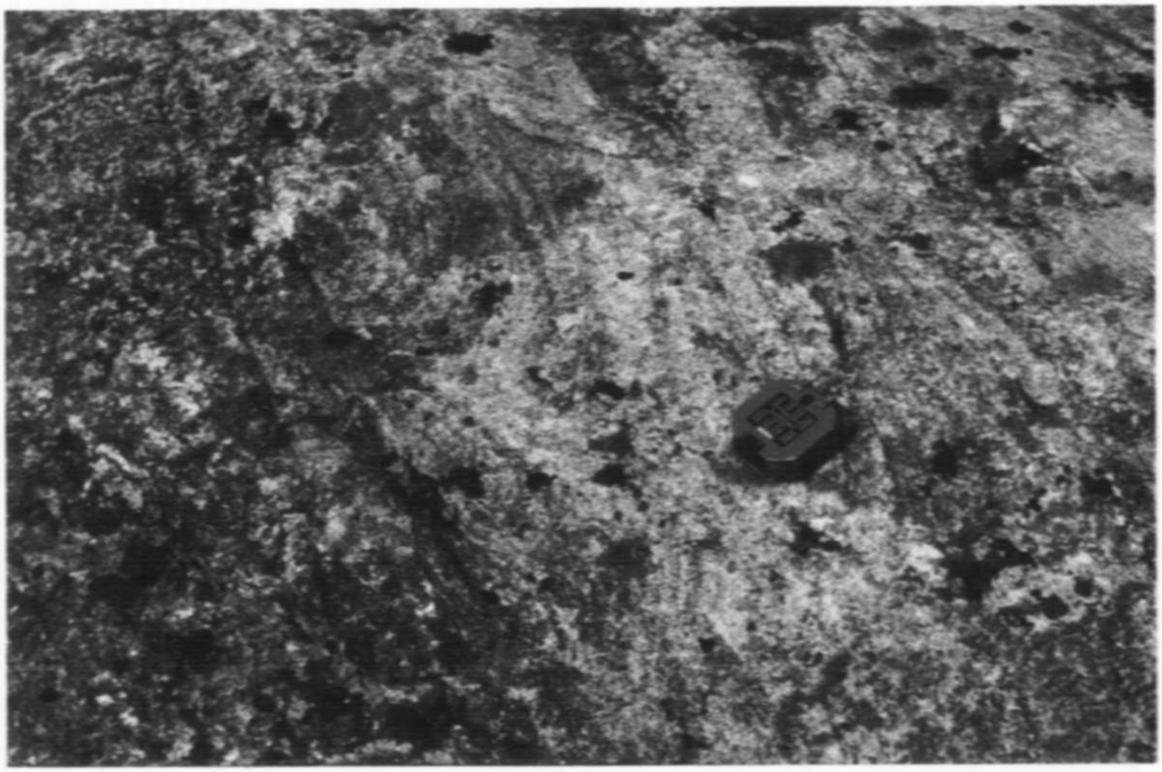


Photo 1: Felsic biotite migmatite with small scale folding; feldspathic alteration of the paleosome constituent has produced a schlieren.

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects were staked in the Parry Sound area, and all have been mapped geologically. Many of the rocks underlying these properties are migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

The property is underlain by the Bolger megacrystic granite pluton which is manifested by uniform biotite-amphibole migmatite and the minor tonalite gneiss. Original textures have been obliterated. Biotite migmatite and felsic biotite migmatite dominate. These rocks trend easterly and dip shallowly to the south. Two very attractive areas of felsic biotite migmatite which might be exploited for dimension stone are situated in the northwest corner and midway along the western boundary of the property. The combined resource just in the elevated area is 8,100,000 tonnes. Site planning and detailed geological mapping are warranted.

The northern site is crossed by a cottage access road, and care will be required to ensure that the cottagers are informed of the activities well in advance of any development. At this stage the municipal council should be informed of the intended activity.

RECOMMENDATIONS

1. Site planning and geological mapping should be conducted on the two sites underlain by felsic biotite migmatite.

2. The municipal council should be informed of the current activities and future possibilities.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

James R. Trusler M.S., P.Eng.

Dated: December 30, 1993

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE JACKNIFE HARBOUR PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 80°16'18"W - 80°17'18"W
LAT.: 45°21'24"N - 45°22'10"N
NTS: 41H/8

DATE: December 30, 1993

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PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE JACKNIFE HARBOUR PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of similar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, and sawing and polishing specimens from many prospects. Seven sites in the Britt domain, and one in each of the Rosseau and Moon River domains have been staked and mapped by the writer resulting in the definition of a large number of potential quarry sites. The three claim unit Jacknife Harbour property is one of these.

The property is segmented into a two claim unit western claim and a one claim unit eastern claim both of which are underlain by the Sand Bay gneiss association. This suite of rocks comprises pink and purple migmatite, amphibolite gneiss, biotite migmatite, and granite pegmatite. Attractive pegmatite and amphibolite-pegmatite breccias occur on both claims in large volumes and warrant development. Site plans should be prepared for the northwest portion of the western claim and the northeastern portion of the eastern claim.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In April, 1993, the Jacknife Harbour property was staked for its dimension stone potential. Geological mapping was carried out in 1993, and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Carling Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 150 miles (240 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°17′18"W on the west and 80°16′18"W on the east and latitudes 45°21′24"N on the south and 45°22′10"N on the north. The corresponding UTM co-ordinates in metres are 555,600 on the west, 556,900 on the east, 5,022,670 on the south and 5,024,020 on the north. The property is within National Topographic System area 41H/8 and is recorded on claim map M2297.

The Jacknife Harbour property can be accessed from the Snug Harbour road by first leaving Hwy 69 some ten km north of Parry Sound and travelling 19 km. west on Hwy 559. The property is south of the Snug Harbour Rd some two to three km. west of Hwy 559. It can be reached at its northwest corner via the south branch of the Snug Harbour Rd. Also the access road to Gower Bay and Jacknife Harbour from the Snug Harbour Rd traverses both property segments.

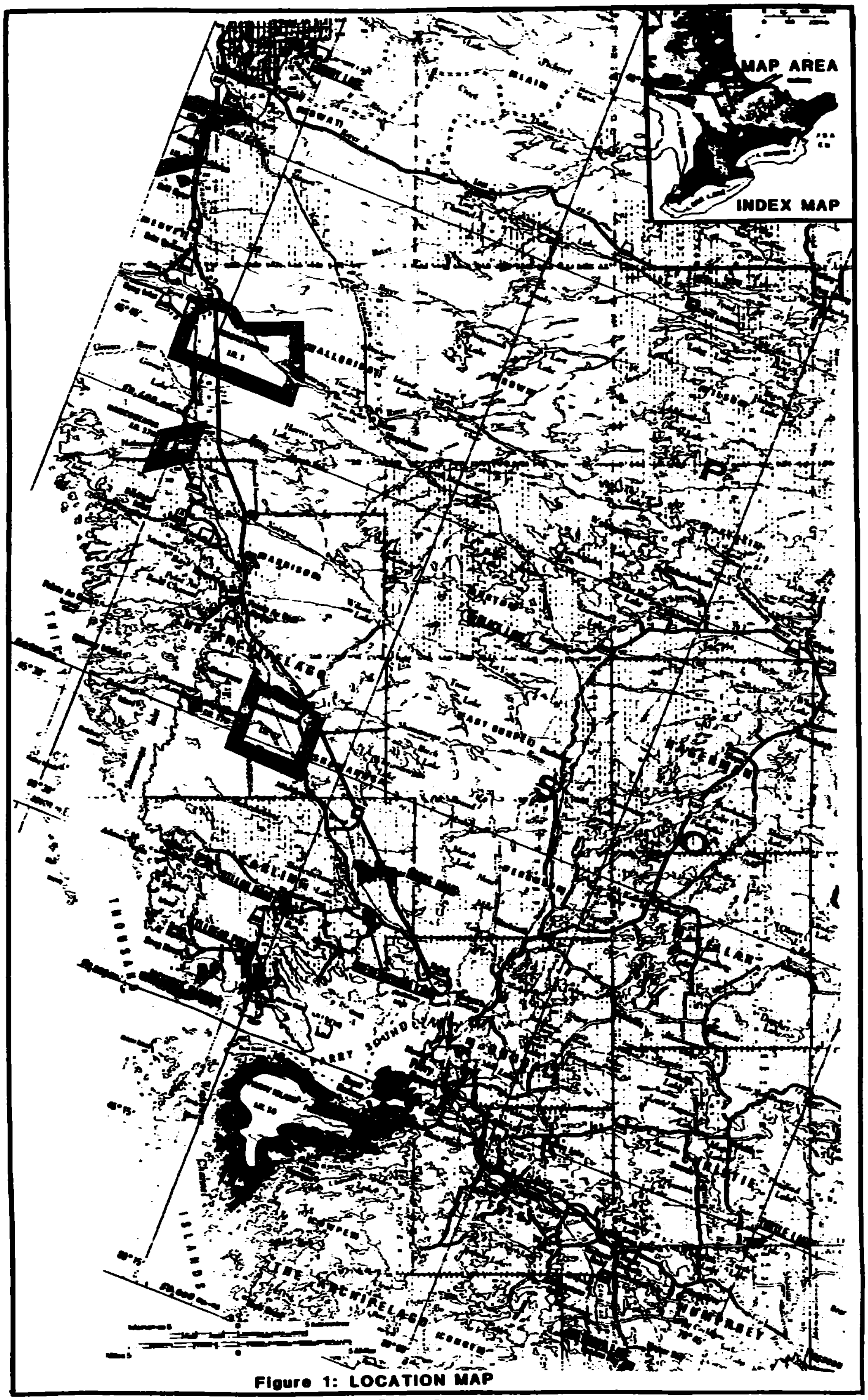


Figure 1: LOCATION MAP

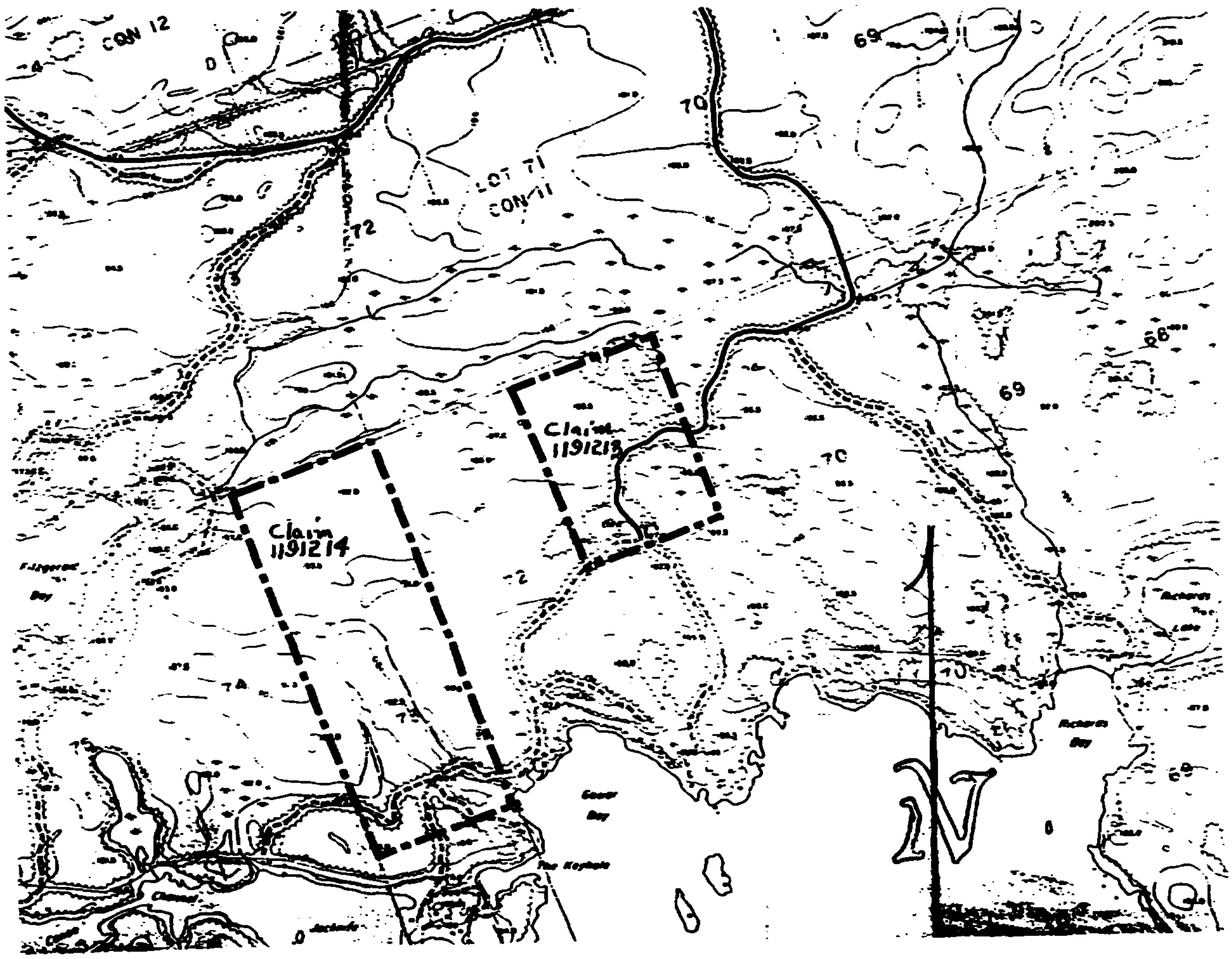
PROPERTY

The Jacknife Harbour property comprises approximately 149 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: JACKNIFE HARBOUR PROPERTY

Claim No	Township	Lot	Conc.	Area	Recording Date
1191213	Carling	N/2 71	X	49.4 ac	May 4, 1993
1191214	Carling	Pt. 73	X	100 ac.	May 4, 1993



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on June 3, 1993 and the map drafting and report writing was completed on December 30, 1993. Actual work days for assessment purposes break down as follows:

Jacknife Harbour Property: Claims SO1191213, 1191214.

Preparation: Apr. 8, July 12, 23, 1993 (2½ days)
Field:June 3, Oct. 28,29, 1993 (3 days)
Drafting: Sept. 29,30, Oct. 1,4-7,22,30, Nov. 2, 1993 (4½days)
Reporting:Sept. 20-24,27, Oct. 30,31, Nov. 1, Dec. 16-24,26-30, 1993 (4 days)

Preparation for field work involved production of 1:5,000 enlargements of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 10°-4′W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

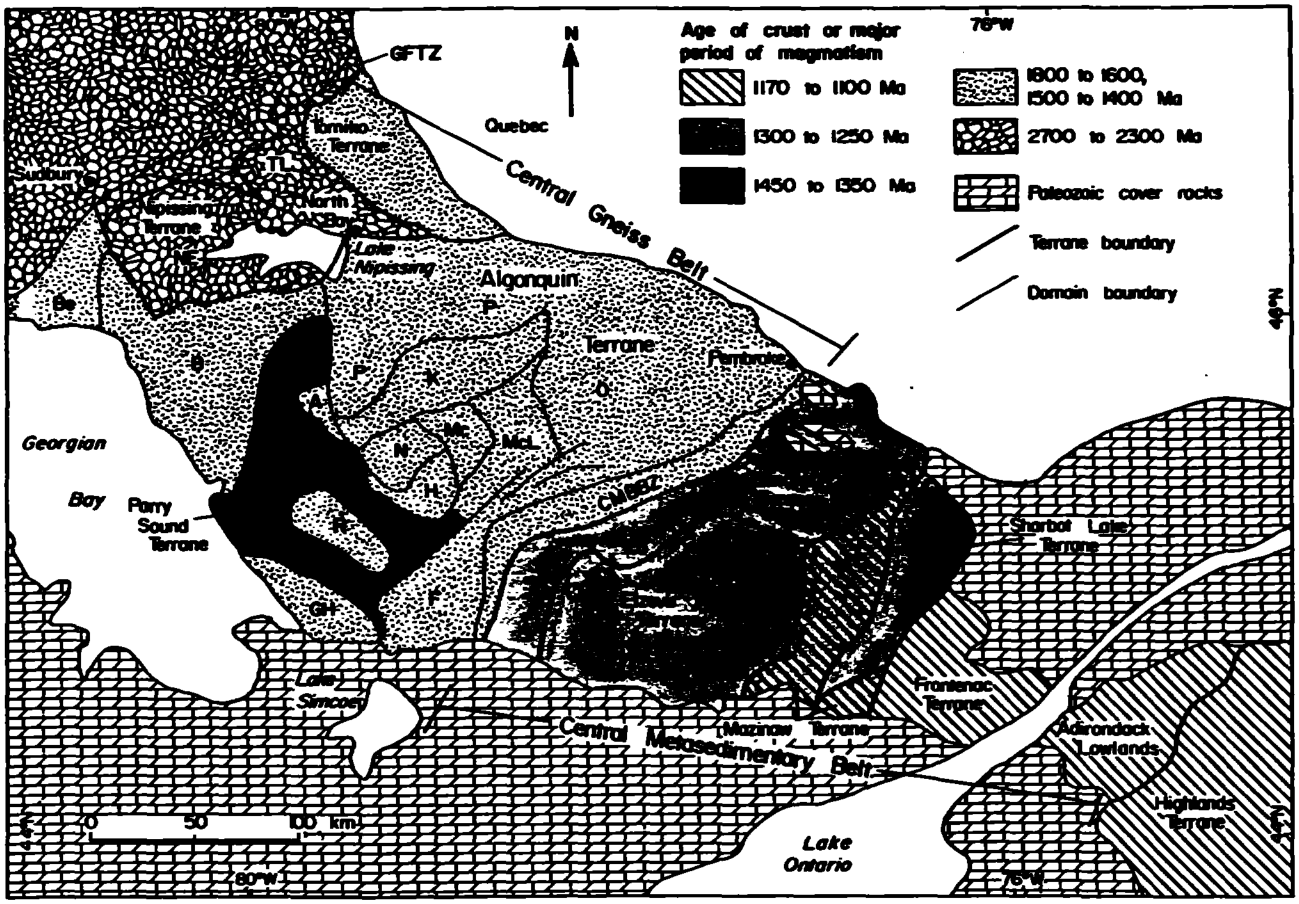
The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.



Abbreviations

A	Ahmic Domain	GH	Go Home Domain	NE	Nepewassi Domain
B	Britt Domain	H	Huntsville Domain	O	Opeongo Domain
Be	Beaverstone Domain	K	Kiosk Domain	P	Powassan Domain
CMBBZ	Central Metasedimentary Belt Boundary Zone	Mc	McCraney Domain	PS	Parry Sound Domain
F	Fishog Domain	McL	McClintock Domain	R	Rosseau Domain
GFTZ	Grenville Front Tectonic Zone	MR	Moon River Domain	S	Seguin Domain
		N	Novar Domain	TL	Tilden Lake Domain

Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

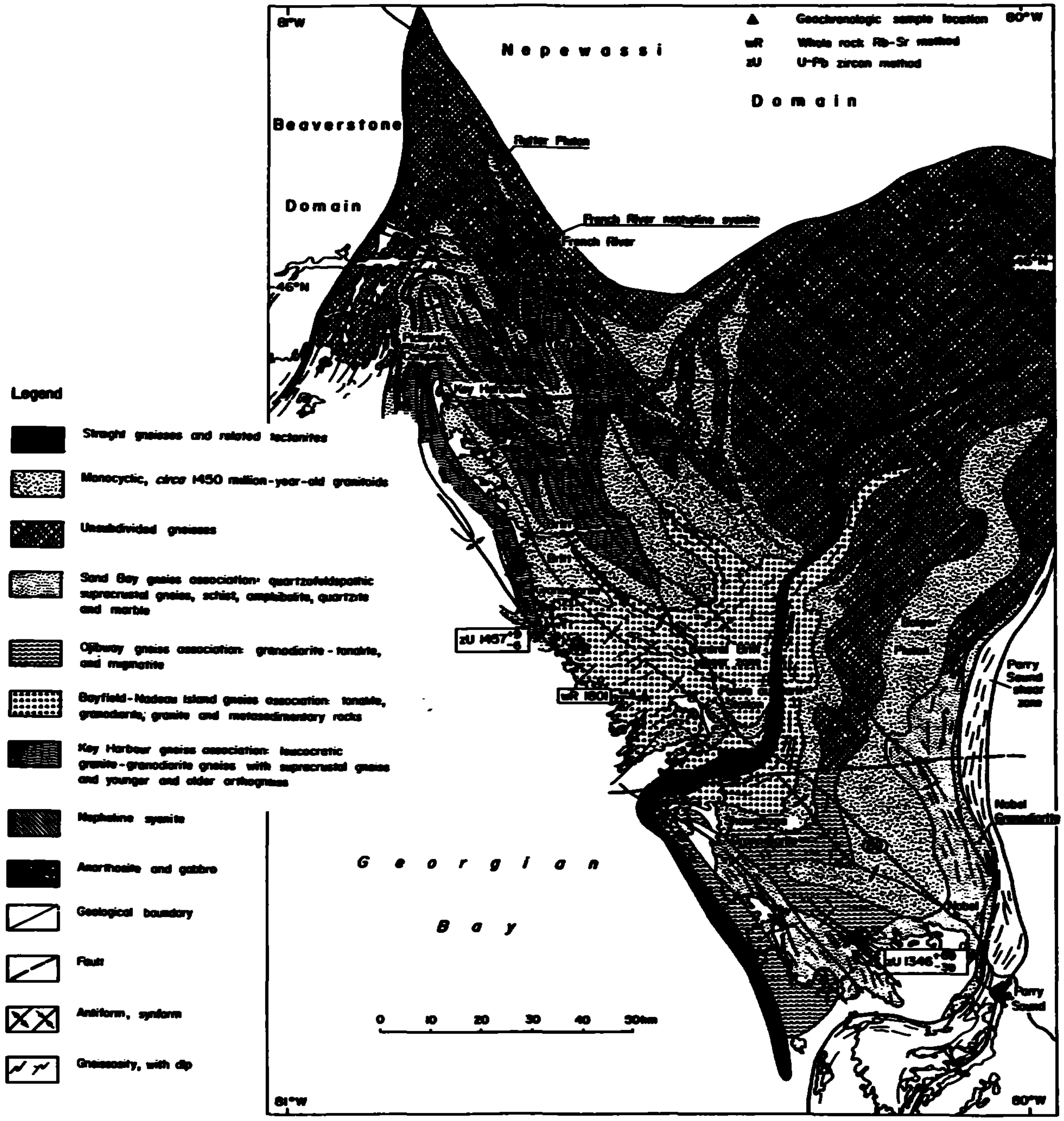


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock

largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: biotite-hornblende migmatite, amphibolite gneiss, purple and pink migmatite, and granite pegmatite.

The biotite-hornblende migmatite is represented by quartzo-feldspathic rock ranging from less than 5% to greater than 40% but averaging over 25% mafic minerals and containing syntectonic and late tectonic pegmatitic material in varying proportions and thicknesses. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant. The gneissic fabric is thinly to thickly layered and exhibits substantial differential weathering. Profuse, small scale, intrafolial folding with a slight plunge to the southeast is a dominant feature of these rocks.

The purple and pink migmatite is a composite layered rock generally containing medium to coarse grained layers of the felsic gneiss and a regular fine to medium grained purple or mauve layer comprising quartz, feldspar, biotite, almandine and hematite. Frequently a milky to buff rock of medium to coarse grained granulated late tectonic pegmatite forms layers within the purple and pink migmatite. Biotite content seldom exceeds 10%. Chevron folds on a small scale are profuse and widespread in occurrence.

The amphibolite gneiss is a medium greyish black, medium to coarse grained, thinly to thickly layered rock. The amphibolite flanks a thick continuous granite pegmatite dike and the various textures in evidence reflect the gradational and tectonic boundary relationships between the two units. From the massive homogeneous amphibolite gneiss, towards the pegmatite the following distinctive textures occur consistently as zones along the length of the pegmatite: gabbro gneiss with 20% pink to rose, coarse grained 2-3 cm lozenge-shaped porphyroclasts; lit par lit gabbro gneiss with between 20% and 80% 2-6 cm continuous layers of granite pegmatite; and granite pegmatite breccia.

The granite pegmatite breccia occurs as matrix supported mono-mineralic and poly-mineralic clasts from 2- 10 cm in diameter in both clast-supported and matrix-supported configurations. The clasts comprise unstrained crystals of quartz and microcline which are apparently very well cemented by a medium to coarse grained cataclastic matrix. In one identifiable dike with offsets the breccia which is clast-supported averages a width of 15 metres for some 300 metre length. Vertical joint separation averages in excess of 15 metres. In another occurrence the dike of matrix-supported breccia is 130 metres wide.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel

______________Unconformity (possible regolith)______________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings

______________Unconformity______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes

______________Intrusive Contact______________
High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene

______________Sheared Contact______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.

______________Intrusive Contact______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The property is underlain by biotite-hornblende migmatite, amphibolite gneiss, purple and pink migmatite and granite pegmatite breccia. All of these rocks are included in the Sand Bay gneiss association of Culshaw (1991). The pre-metamorphic origin of these rocks is somewhat obscure. In fact the evolution of these rocks was largely shaped through metamorphic replacement and brecciation.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. In the purple and pink migmatite, the felsic gneiss appears to be the introduced neosome constituent which appears to have been reduced in grain size by cataclasis (many examples of syntectonic pegmatites reduced to fine grained neosome constituents are evident in the region within both the Britt domain and the Moon River domain). The paleosome layer in a few places still contains over 10% biotite and exhibits a relict foliation; however, this material appears to be a schlieren produced by the process of granitization. The hematite which macroscopically appears to follow the biotite foliation or occur in streaks parallel to the gneissic foliation, microscopically coats the grain boundaries of all the other minerals and is translucent in character. The hematite spotting which is very strong in this unit is a regional feature of the area and is frequently erroneously attributed to almandite.

In a variety of the purple and pink migmatite a pale to buff medium to coarse grained pegmatite forms lit par lit stringers parallel to the gneissic foliation. This material is of late tectonic origin and forms some very attractive textures. Frequently the late tectonic pegmatite exhibits pinch and swell textures over very large areas. This might provide a target material for quarrying. A very attractive, voluminous, and somewhat unique variety of the pink and purple migmatite is a chevron folded polyphase unit of the purple and pink migmatite with the buff pegmatite (Photo 1).

The various rock units trend SSE and are situated in parallel bands up to 200 metres wide on the two sections of the property. The biotite-hornblende migmatite underlies the eastern half of the western claim and a separate unit underlies the mid central portion of the eastern claim. Separate units of the purple and pink migmatite underlie the western boundary of each claim in contact with the biotite-hornblende migmatite and the pegmatite breccia in the eastern claim and the amphibolite gneiss in the western claim. Amphibolite gneiss underlies the central portion of the western claim and the eastern portion of the eastern claim. Granite pegmatite breccia occurs generally in contact with the amphibolite gneiss. On the eastern claim the pegmatite breccia is generally the matrix supported variety (Photo 2) and occurs in 200

Photo 3 Profuse chevron folding in pink and purple migmatite (above) typical of this rock unit. Photo 4 Matrix-supported granite pegmatite breccia.(below) typical of large exposed areas of outcrop..

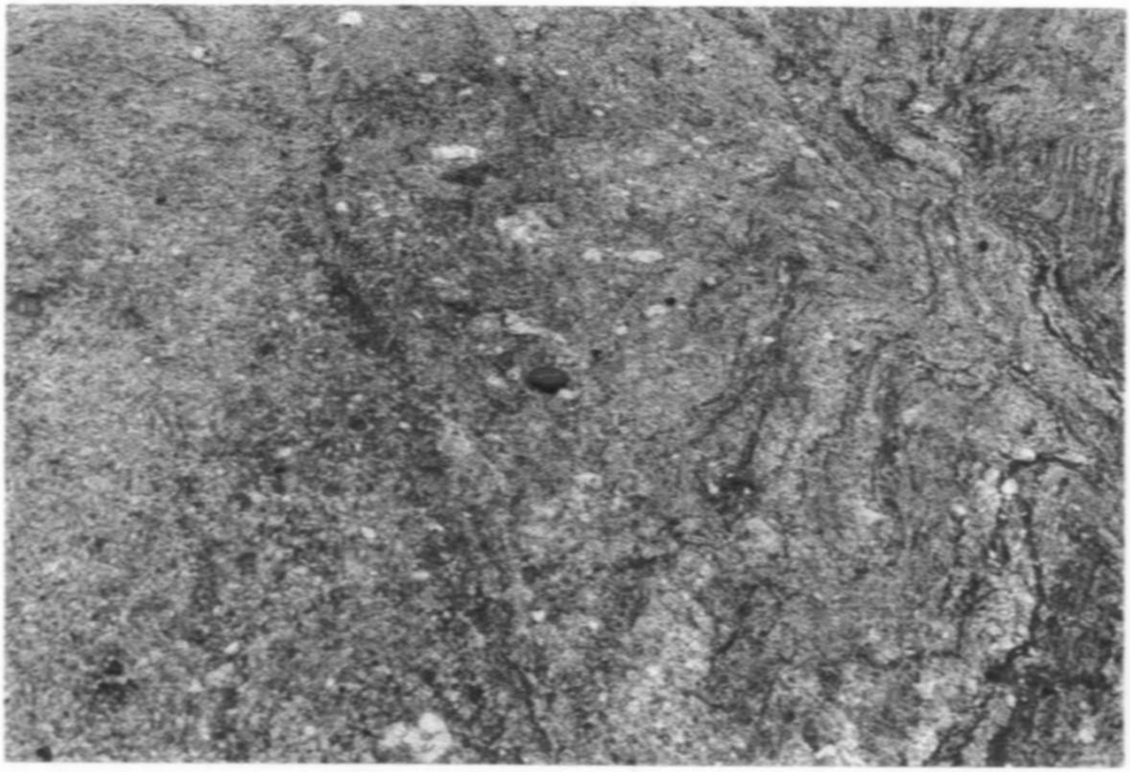


Photo 3: Clast-supported granite pegmatite breccia outcrop. Note the continuous mineral proportions along strike and the regular 30 metre joint separation on this outcrop. The large pink microcline clasts are evident in the foreground left of the picture. The outcrop ridge is 300 metres long.

metre X 150 metre pods flanked by amphibolite gneiss and believed to plunge at a shallow rake to the SSE. This is generally a very attractive material. On the western claim the pegmatite breccia forms dikes 300 metres long and 25 metres wide (Photo 3) which are contained within the amphibolite gneiss and exhibit tectonic gradational relationships laterally on the contacts, but are quite continuous along strike.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. The foliation on the property is strongly gneissic trending south to south-southeast and steeply dipping either east or west or vertical. Many of the units are folded along hinge lines which rake at 10°-20° to the south.

The sub-horizontal joint spacing, based on 24 data, averages 2.5 metres and the vertical joint spacing, based on 108 data, averages in excess of 5 metres. The statistical plot of vertical joint data, based on 137 data, exhibits considerable scatter, but the significant joints are well defined. Twenty-six per cent of the data cluster about 155°. Twenty-five per cent of the data cluster about 83°. Seventeen per cent of the data cluster about 53°.

POTENTIAL DIMENSION STONE SITES

Each of the pegmatite breccia outcrop areas is a potential quarry site. The clast supported examples on lot 73,concession 10, Carling Twp. both require detailed mapping and site planning prior to permitting one of these for a quarry test. Since the chevron style purple and pink migmatite and amphibolite gneiss are on the same outcrop as the southern pegmatite breccia, this site plan should include these rocks. At the same time a sample or samples of amphibolite gneiss and the purple and pink migmatite should be collected for slabbing and polishing. Between the two sites the resource of this pegmatite breccia approximates 200,000 tonnes to a depth of 6 metres.

Site planning should also be conducted on all of the matrix supported pegmatite breccias which underlies the north half of lot 71, concession 10. All of these sites could be quarried for dimension stone. In total to a depth of 6 metres, there exists a resource of 500,000 tonnes of matrix supported pegmatite breccia in areas up to 100 metres X 400 metres.

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects were staked in the Parry Sound area, and all have been mapped geologically. Many of the rocks underlying these properties are migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

The property is segmented into a two claim unit western claim and a one claim unit eastern claim both of which are underlain by the Sand Bay gneiss association. This suite of rocks comprises pink and purple migmatite, amphibolite gneiss, biotite migmatite, and granite pegmatite. Attractive pegmatite and amphibolite-pegmatite breccias occur on both claims in large volumes and warrant development. Site plans should be prepared for all of the areas of pegmatite breccia stating with the northwest portion of the western claim and the northeastern portion of the eastern claim. Samples of the amphibolite gneiss and the pink and purple breccia should also be collected for slabbing and polishing.

Due to the proximity of the property to cottages and the fact that the access roads would be shared, the project should be carefully run to ensure that the local community knows what is happening, becomes informed as to the real environment to be created by a proposed development, and has an opportunity to have real concerns implemented. Deer yards are partly coincident with the property and efforts will have to be made to ensure that any openings planned are compatible with the deer habitat.

RECOMMENDATIONS

1. Site plans of all areas underlain by pegmatite breccia on the two claims should be conducted and the area of site planning should be extended to cover amphibolite gneiss and purple and pink migmatite on the same outcrop as the pegmatite breccia in the south half of lot 73, concession 10, Carling Twp. Priority should be given to initial evaluation of the northeastern part of the eastern claim and the northwestern part of the western claim.

2. Large samples of the amphibolite gneiss and the purple and pink migmatite with the profuse chevron folding should be collected for slabbing and polishing.

3. Meetings should be held with the municipal council and the Ministry of Natural Resources to explain the purpose of the site planning and the possible developments that may ensue and to obtain some feedback.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

Dated: December 30, 1993

James R. Trusler M.S., P.Eng.

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE KILLBEAR POINT PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 80°13'44"W - 80°15'30"W
LAT.: 45°21'33"N - 45°23'31"N
NTS: 41H/8

DATE: October 18, 1993

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE KILLBEAR POINT PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been hypothesized by Davidson et al (1982).

Although Davidson's model is being modified and no reasonably detailed geological map has yet been made available for the area, it has become evident that several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains. Moreover the fact that two very similar and intrinsically unique lineated pink flagstones occurred 90 km apart (at Mill Lake and Magnetawan) along a particular ductile thrust encouraged the view that a large flagstone deposit might be located between the two sites. In addition, the high temperature environment of the metamorphism within these tectonic domains leads one to anticipate that competent, annealed gneisses and migmatites physically suitable for dimension stone can be located.

As a result of mapping dimension stone potential, nine sites exposing migmatitic orthogneisses in the Britt domain were sampled producing encouraging results on sawing and polishing. Subsequently six of the properties examined and three properties identified in government research have been staked. One of these properties is the ten claim unit, 500 acre, Killbear Point property.

The property is underlain by massive to gneissic pink granite gneiss, migmatite and a purple and pink migmatite all of which are flat lying or gently dipping to the southeast. A study of the joint spacings indicates average spacings of 2 metres for horizontal joints and over 5 metres for vertical joints. Four prospective products , two of which are unique, attractive, red, textured granites have been identified in five potential quarry locations. A high yield rate of 30 tonne blocks is inferred.

Detailed mapping, drilling, and site planning for the five sites is recommended. Material testing will be required. It is recommended that permitting be sought to licence 3,000 tonne tests on two sites.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by government geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 is being conducted. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In October 1991, the first portion of the Killbear Point property was acquired for its dimension stone potential. Additions to the property were made in 1992. Geological mapping was carried out initially in 1992 and a Preliminary map was prepared and submitted with the final report for the OPAP grant in 1992. This work was supplemented in 1993 with additional mapping on the property resulting in a more detailed interpretation of the northeast corner of the claim group and a revision of the Legend.

The format of the report is in compliance with requirements for submission of a regional geological report for assessment purposes.

LOCATION AND ACCESS

The property is located in Carling Township, Parry Sound District, Southern Ontario Mining District, and Algonquin District Regional Geologist's area approximately 150 miles (240 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°-15'-30"W on the west and 80°-13'-44"W on the east and latitudes 45°-21'-33"N on the south and 45°-23'-31" on the north. The corresponding UTM co-ordinates in metres are 558,100 on the west, 560,370 on the east, 5,022,840 on the south and 5,027,320 on the north. The property is within National Topographic System area 41H/8 and is recorded on claim map M2297.

The property can be accessed from Hwy 559, the Pengallie Bay Rd. and the Snug Harbour Rd by first leaving Hwy 69 some 10 km north of Parry Sound and travelling 19 km west on Hwy 559. Due to an old road and relatively flat outcrop the bulk of the property is currently accessible to 4-wheel drive vehicles.

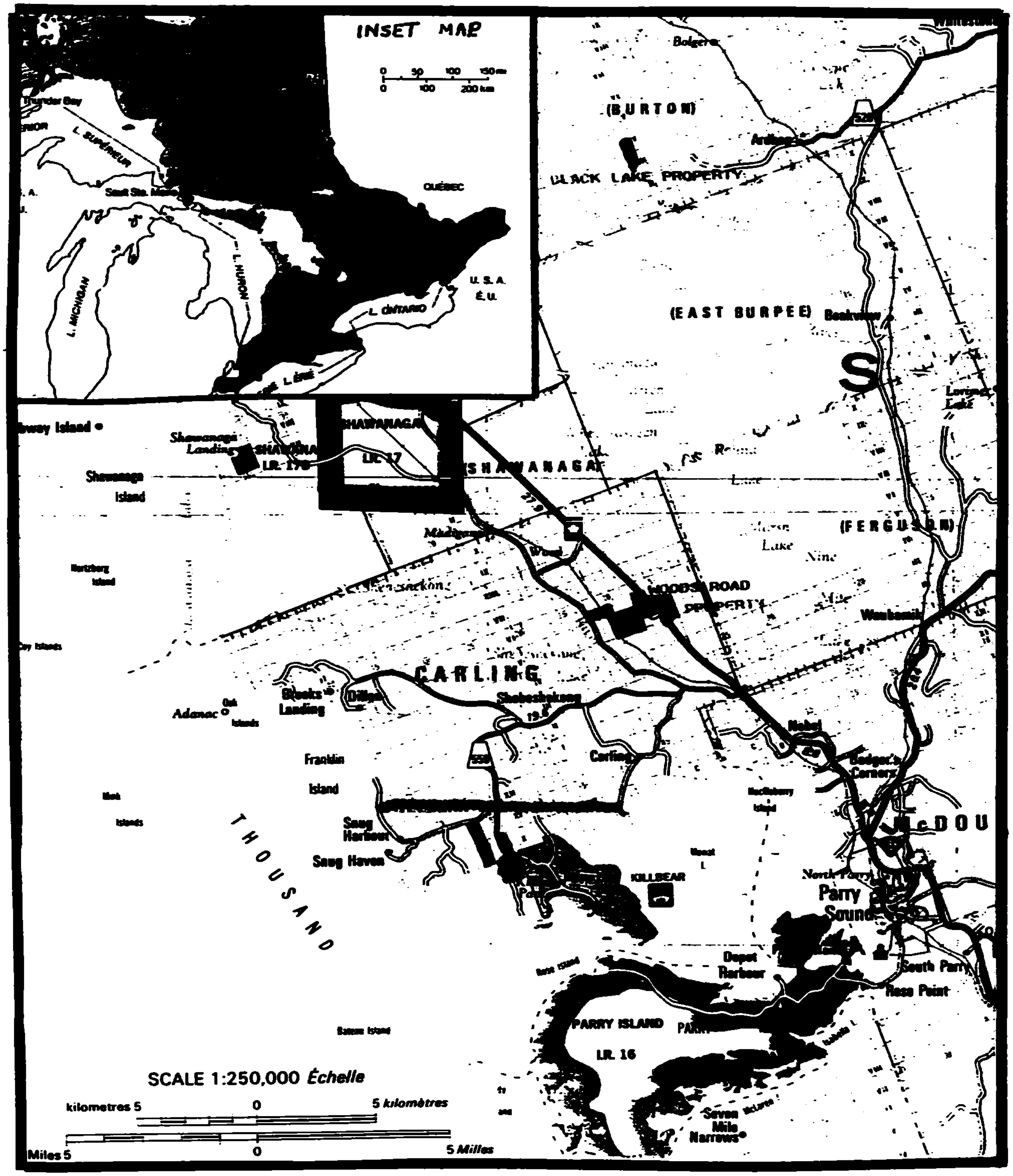


Figure 1: Location Map

PROPERTY

The Killbear Point property comprises approximately 500 acres and is more particularly described in TABLE 1 (Figure 2). Assessment was applied to the claims recorded in 1992 on July 24 of this year, and this report will be filed for assessment prior to Oct. 23. As a result sufficient credits should be available to keep the entire claim group in good standing for some five years from date of staking.

TABLE 1: KILLBEAR POINT PROPERTY

Claim No	Township	Lot	Conc.	Area	Recording Date
1151129	Carling	66	XI		
		66	X	200 ac	Oct.23, 1991
1151135	Carling	64	X	100 ac	Nov. 5, 1992
1151136	Carling	64,65	IX	200 ac	Nov. 5, 1992

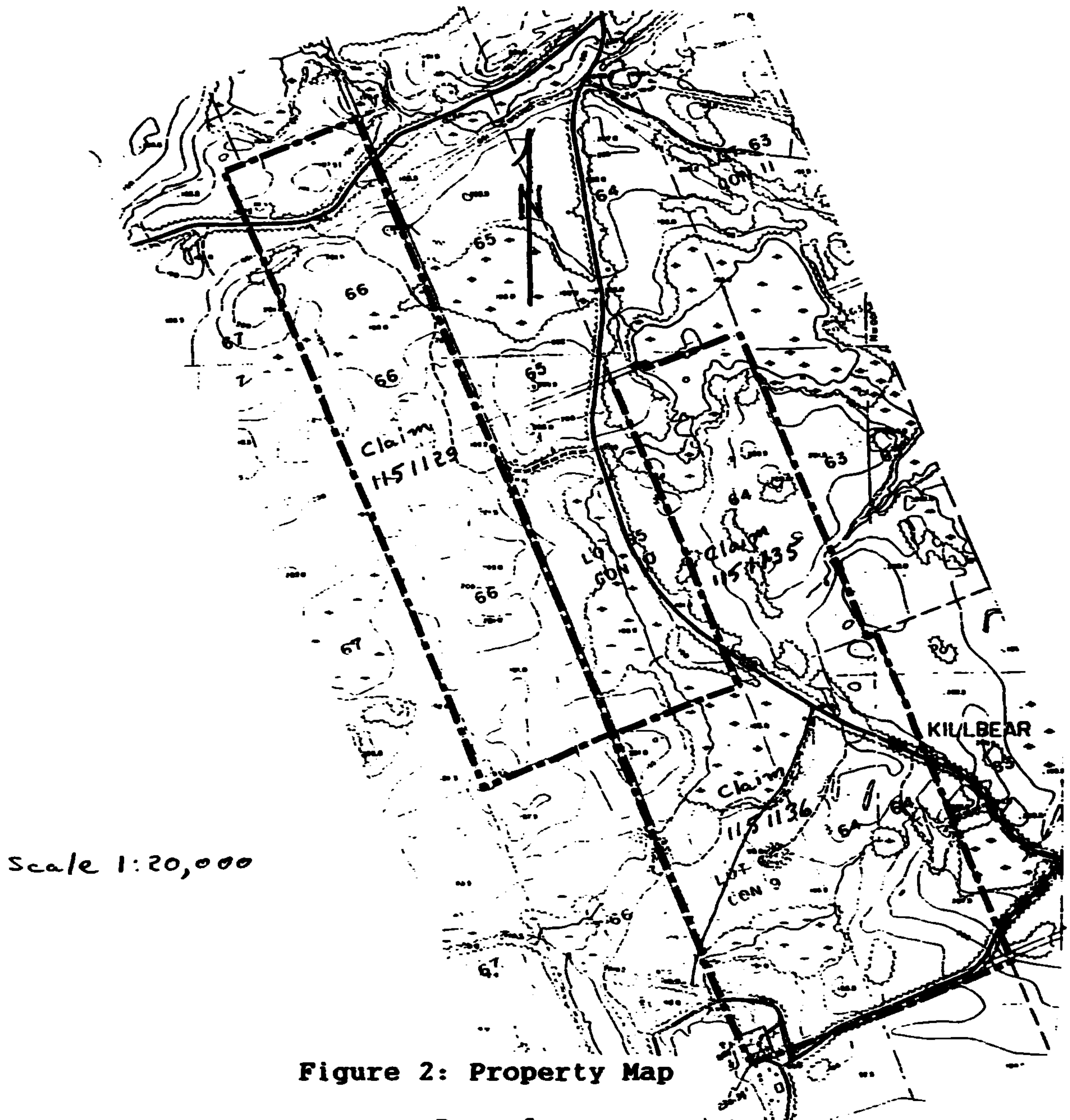


Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced on June 18, 1992, the field work commenced on Nov. 23, 1992 and the map drafting and report writing was completed on Oct 18, 1993. Actual work days for assessment purposes break down as follows:

Killbear Point Property: Claims SO1151129, 1151135, 1151136
- Preparation: Nov. 7, 1992, Apr. 5&8, 1993 (2½ days)
- Field:Nov. 23,24,25& 26, 1992; Apr. 29, May 10, June 4,5, July 14,15 & 16, 1993 (11 days)
- Drafting: Dec.1,2,3,4,6,10& 12,1992; Oct.13,14&15,1993(9½days)
- Reporting:Nov.29,30, Dec.13,14,1992; Oct. 16, 17, 18,1993 (7 days)

Preparation for field work involved production of 1:5,000 blow ups of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop (approximately 70%), visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 10°-5′W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes. Statistical analysis of joints was done to demonstrate the generally favourable joint spacing and orient future development.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terrains in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has provided a coherent review, but the tectonic terrains and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.

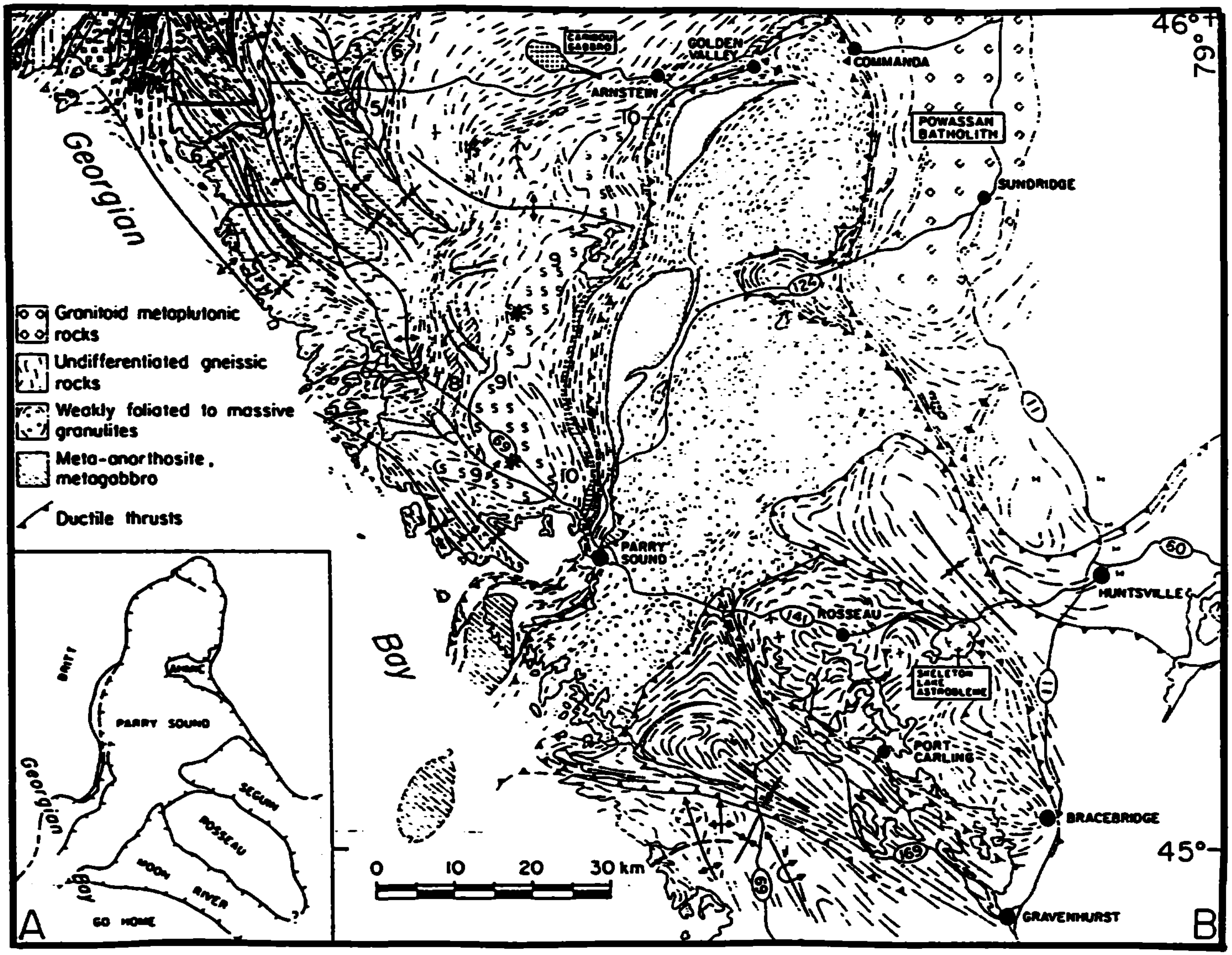


Figure 3: Tectonic map of Parry Sound - Muskoka region (Davidson et al. 1982)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) in sythesizing previous works indicates that the stacked model applies, but that the Algonquin terrain is parautochthonous and includes the Britt and Rosseau Domains which are dominantly underlain by 1450-1420 Ma and 1350-1320 Ma intrusions within a subordinate 1800-1700 Ma juvenile crust. He further states that the Parry Sound and Moon River domains are allocthonous and consist chiefly of juvenile mantle derived crust dated at 1450-1350 Ma. Metamorphism in the Britt domain is granulite facies dated at 1450 Ma. and overprinted by amphibolite facies metamorphism(s) of Grenville age (1100-1030) (Culshaw et al. (1991)). Easton (1992) suggests that this last metamorphism occurred in pulses which culminated with a final continental collision with a land mass to the southeast.

Despite the rapid evolution of diverse geological frameworks, the project area is known to be underlain by Mesoproterozoic rocks which have been metamorphosed during the Grenville orogeny. The bedrock largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting).

The Britt Domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

The Ahmic sub-domain is underlain by similar rocks to the Parry Sound domain but contains some of the charnokitic gneisses more typical of the Britt domain and is dominated by an east-west trending fold.

According to the Davidson model the boundary of the Parry Sound domain with both the Ahmic sub-domain to the east and the Britt domain to the northwest is a zone or zones displaying varying degrees of ductile deformation or mylonitization produced by thrusting. This model did not entirely stand up to detailed scrutiny during the investigations for flagstone carried out by Trusler (1992,1993).

Flagstone which is strongly lineated, felsic, siliceous and fine grained (mylonitite to ultramylonite) occurs at the Mill Lake Quarry in Mc Dougall Twp. and in lot 28, Conc. 5 Chapman Twp within the zone of ductile deformation. This is the type of material which was being sought as part of a study carried out by the writer in 1992. In general, however, the deformation is characterized by a tectonic breccia notably where the faulting is dominated by strike slip motion rather than thrusting postulated by Davidson.

DESCRIPTION OF ROCK UNITS

Since no detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. Since each domain postulated by Davidson has been transposed over a large distance none of the rock units are correlative across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping. However, the property is principally underlain by rocks that correlate with the Killbear Point Formation and to a lesser extent with rocks of the Bateau Island Formation. Culshaw et al. (1991) correlate these rocks with the Sand Bay Gneiss Association.

The rocks on the property have been subdivided into mappable units as follows: granite gneiss, purple and pink migmatite, migmatite and coronitic metagabbro. The granite gneiss is a pink, layered to massive rock, varying from fine grained to coarse grained from one area to another and comprising quartz, plagioclase and microcline with minor biotite and variable accessory magnetite, hematite and almandine. A significant portion of this rock unit is demonstrably composed of breccias cataclastically derived from granite pegmatites.

The purple and pink migmatite is a composite layered rock generally containing medium to coarse grained layers of the granite gneiss and a regular fine to medium grained purple or mauve layer comprising quartz, feldspar, biotite, almandine and hematite. Frequently a milky to buff rock of medium to coarse grained granulated late tectonic pegmatite forms layers within the purple and pink migmatite. Pinch and swell of the late tectonic pegmatite and brecciation or crenulation of the purple constituent are common variations of this rock unit.

The migmatite is a generally coarse grained composite layered rock comprising a generally mafic paleosome biotite or hornblende dominant material and a neosome late tectonic pegmatite.

Coronitic metagabbro has been found in two isolated segments on the property. The rock is commonly mafic to ultramafic and coarse grained. In many cases, especially towards the core of an intrusion, relict clinopyroxenes have been preserved generally rimmed by amphiboles.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel
______________Unconformity (possible regolith)_____________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings
______________Unconformity______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes
______________Intrusive Contact______________
High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene
______________Sheared Contact______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.
______________Intrusive Contact______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The pre-metamorphic origin of these rocks is obscure. In addition, the degree of thermal and dynamic metamorphism to which these rocks were subjected through multiple stage or polyphase deformation is difficult to determine in the field.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The granite gneiss is generally hypidiomorphic granular. Several features of this rock unit infer at least a partial metamorphic origin: cataclastic textures including tectonic grain gradation characterize the fine grained portions of the unit and frequently occur with regularly spaced biotite and amphibole rich partings; the cataclastic grain classification forms a strong gneissic foliation in portions of the unit; significant portions of the unit comprise a matrix supported, pegmatite breccia which consists of apparently unstrained microcline porphyroclasts in a gneissic, fine to coarse grained, granitic ground mass. The genesis of this material would also be obscured except for some textbook quality examples in road cuts near the property on Hwy 559 where a well constituted coarse grained granite pegmatite grades laterally into a pegmatite breccia. A portion of both the fine and coarse grained varieties have purple to dark red speckles of hematite.

Despite the apparent role of dynamic metamorphism in the genesis of this rock unit several large outcrops expose uniform occurrences of massive, equigranular granite possibly suitable for monument stone.

In the purple and pink migmatite, the granite gneiss appears to form the introduced neosome constituent which appears to have been reduced in grain size by cataclasis (many examples of syntectonic pegmatites reduced to fine grained neosome constituents are evident in the region within both the Britt domain and the Moon River domain). The paleosome layer in a few places still contains over 10% biotite and exhibits a relict foliation; however, this material appears to be a schlieren produced by the process of granitization. The hematite which macroscopically appears to follow the biotite foliation or occur in streaks parallel to the gneissic foliation, microscopically coats the grain boundaries of all the other minerals and is translucent in character. The hematite spotting which is very strong in this unit is a regional feature of the area and is frequently erroneously attributed to almandite.

In a variety of the pink and purple migmatite a pale to buff medium to coarse grained pegmatite forms lit par lit stringers parallel to the gneissic foliation. This material is of late tectonic origin and forms some very attractive textures. Frequently the late tectonic pegmatite exhibits pinch and swell textures over very large areas. This might provide a target material for quarrying. A very attractive, voluminous, and somewhat unique variety of the pink and purple migmatite is a breccia or crenulation of the purple material in the pink granitic or the buff pegmatitic materials.

The more common migmatite contains thick paleosome sections from 2 cm thick to 2 metres thick in a lit par lit arrangement with late tectonic, quartz-rich, pink to grey granite pegmatite. The paleosome is generally over 50% mafics with biotite being more frequently the mafic mineral than amphibole. The migmatite is frequently flanked by the purple and pink migmatite giving the impression that the varieties of rock evidence gradational granitization.

Gneissic foliations were measured at each station where possible. Despite some exceptions which may be caused by outcrop scale folding, the general pattern displayed is of a relatively structurally uniform sequence which is flat lying to gently southeast dipping.

A concerted investigation of the joints was made on the property which is presented on the geological map as individual plots, a frequency analysis of the vertical joints and histograms of joint spacing for both vertical and horizontal jointing. Vertical joint data total 280 and horizontal and sub-horizontal joint data total 55. The major vertical joint is at 150° with a cluster of over 50% of the data. The two minor vertical joints each having a data cluster of approximately 11 to 18% depending on interpretation are centred at 75° and 25°. With total outcrop exposure approaching 70% over the whole property it is very encouraging to note that the average horizontal and sub-horizontal joint spacing on the property is 2 metres from observable surfaces and the vertical joint spacing averages over 5 metres. Indeed many areas were seen with joint spacings in excess of thirty metres.

POTENTIAL DIMENSION STONE SITES

At least four distinctive potential dimension stone products may be found in various locations on the property. Although there are a large number of potential quarry sites, five appear to be more outstanding due to existing vertical faces or the presence of a steep hill.

The first site is located at the west side of lot 66, Concession 11, 100 metres south of the Snug Harbour Road. A north facing hill rises 10 to 15 metres above the valley and exposes a brecciated or crenulated variety of purple and pink migmatite with a minor amount of coarse granitic gneiss and some lit par lit purple and pink migmatite. A sample of this latter material (Sample 3) is described in TABLE 3 (Page 18) and illustrated in outcrop and polished specimen in Photos 1, 2 (Page 15)and 3 (Page 16). Photo 1 is of a road cut on Hwy 559 approximately 150 metres south of the junction with the Snug Harbour Rd. and is not on the Killbear Point property. The fracturing in the outcrop is induced by blasting and tends to understate the very large joint spacing that exists on the property.

This particular rock type occurs to the south in the same lot in both concessions 10 and 11 and should be provide large quarry blocks along most of this distance. Another very good potential quarry site for the brecciated purple and pink migmatite is in the middle of concession 10 on the west side of lot 66. Here again a north facing steep slope rises between 5 and 10 metres above the swamp and exhibits large joint spacings. Sub-horizontal joint spacings exceed 2 metres and vertical joint spacings are from 10 to 30 metres. Many 20 to 30 tonne frost heaved or glacial lag blocks are recoverable from this area.

A more regularly layered variant of the purple and pink migmatite occurs with pegmatite breccia on a steep hill which faces west and rises 10 metres above a treed area in the north-central portion of lot 64, concession 10. This site is less accessible than the others, but a trail to it could be constructed inexpensively.

The best area noted for extraction of pegmatite breccia is located in the middle of concession 9 at the junction of lots 64 and 65. A north facing cliff rises 5 metres above a winter road on the southern fringe of a swamp. All joint spacings exceed three metres. A polished sample of the pegmatite breccia is described in Sample 4 in TABLE 3 (Page 18) and is depicted in Photo 4 (Page 16).

In the northwest corner of lot 65 concession 9 a 200 metre X 300 metre outcrop rises over 10 metres above the swamp. The outcrop exposes a uniform, massive to slightly gneissic granite which is modestly speckled with hematite. Horizontal joint spacing exceeds 2 metres and vertical joint spacing exceeds 3 metres. The rock is depicted in Photos 5 and 6 (Page 17) and Sample 9 in TABLE 3 (Page 19) is a description of the polished sample.

Photo 1 (above) and Photo 2 (Killbear Point Property) showing a roadcut and polished slab of mauve-pink and cream-buff variegated "veined-gneiss": the mauve-pink portion is the older portion of rock which comprises a medium to coarse grained mixture of quartz, plagioclase and microcline with minor biotite and rare magnetite; the intense red spots are actually formed by translucent hematite-stained grain boundaries- which impart the apparent mauve-pink appearance in much of the rock; the cream-buff portion is a coarse grained recrystallized pegmatite which forms parallel laminae or veins in the mauve pink material; the pegmatite contains plagioclase, quartz, microcline, biotite and magnetite; an attractive polish is achieved with minimal plucking.
A rock material not shown is a breccia of mauve-pink fragments in the cream-buff pegmatite.

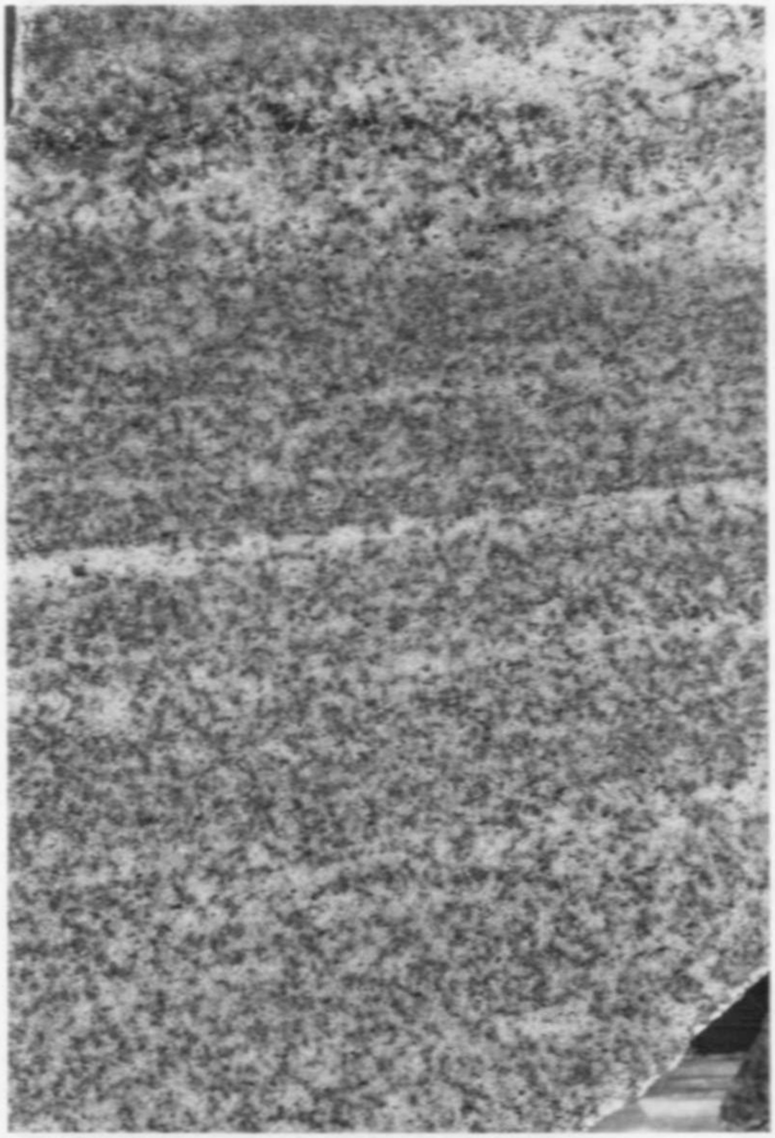
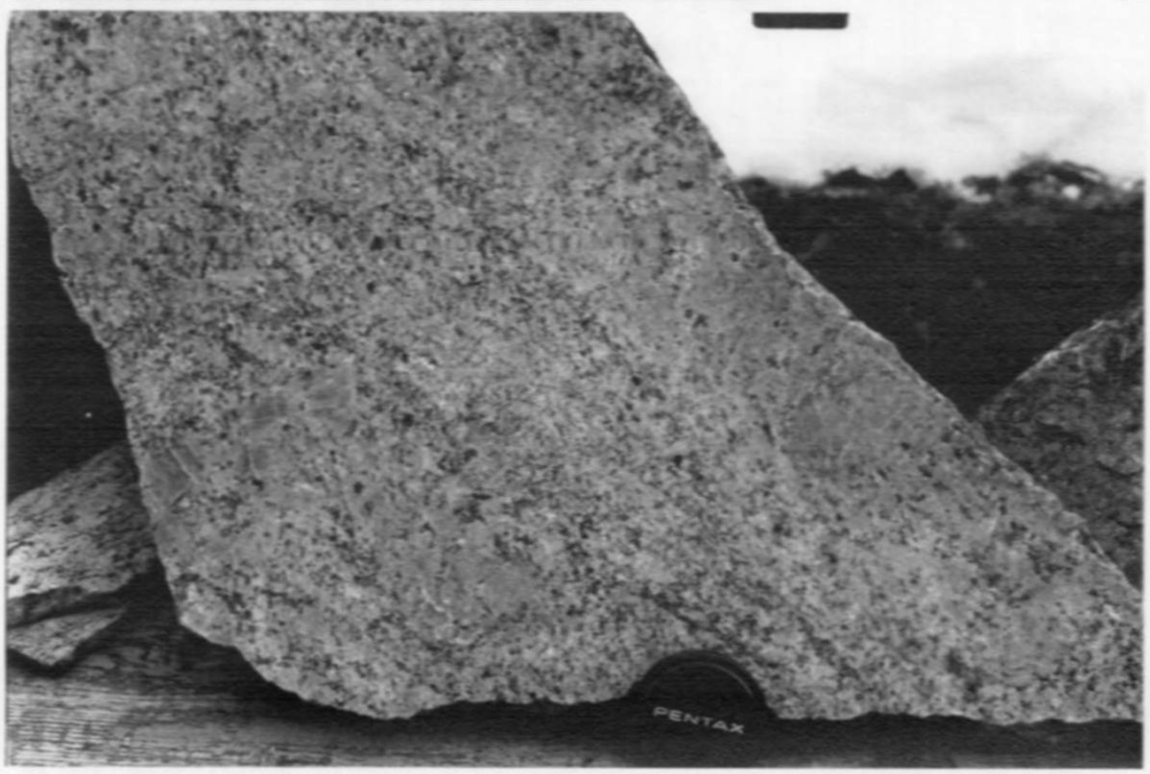


Photo 3(top) (Killbear Point Property) depicts a closeup picture of the polished surface of the purple and pink gneiss shown in Photo 2; note the intense red glassy or translucent quality of the speckles; the similarity in appearance to a red garnet has lead many to the erroneous assumption that this colour is imparted by almandite; in fact an excellent polish is obtained on the surface with no apparent pluck outs.

Photo 4(bottom) (Killbear Point Property) depicts a granite pegmatite breccia: rose-pink microcline crystals with sharp grain boundaries are semi-randomly oriented within a quartz, plagioclase (some peristerite), microcline, and biotite matrix which has graded grain sizes. This rock is very attractive and has been found in several locations. The rock is similar to that marketed under tradename agate.



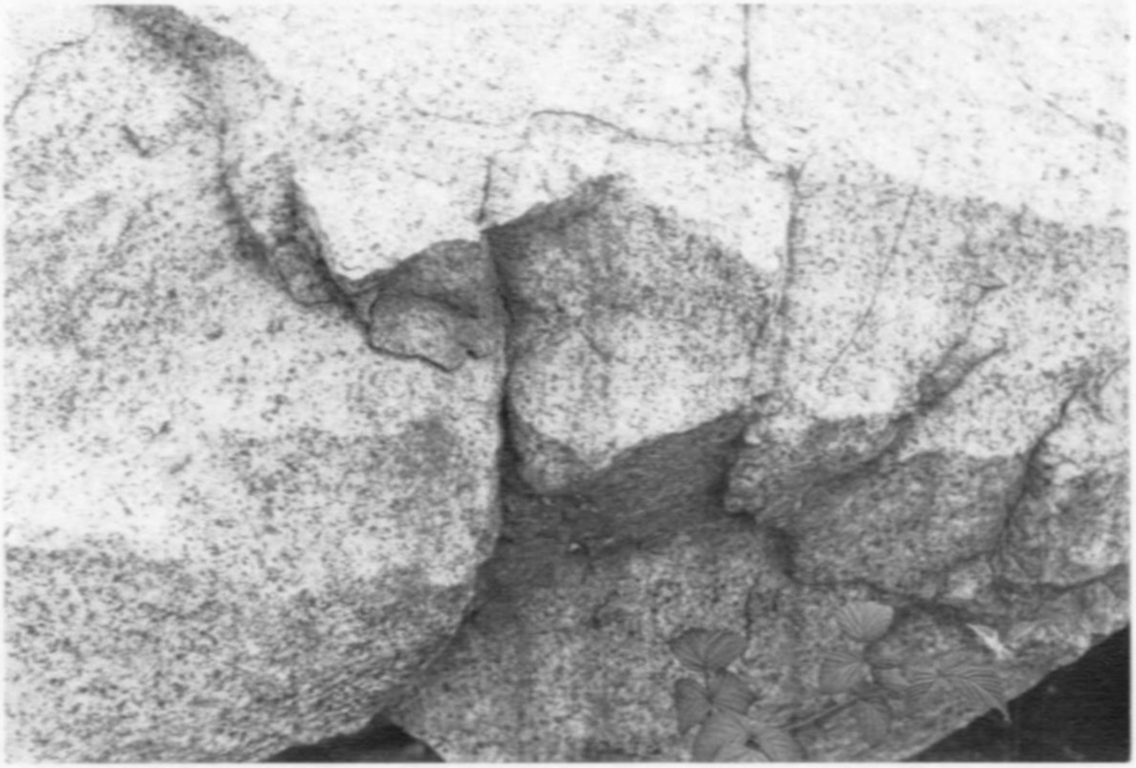


Photo 5(above) and Photo 6(below) (Killbear Point Property) depict a slightly foliated medium grained granite which is characterized by an equigranular matrix and intense red hematite spotting of grain boundaries. The rock is intensely pink when viewed from a distance. The mineral constituents are the same as in photos 1 and 2, however the hematite spotting is consistent, but less intense in this example. This rock is well exposed and could be removed from one outcrop covering an area 600 feet X 900 feet. The rock is similar to Laurentian Pink.

TABLE 3: RESULTS OF SAMPLE POLISHING

Sample No.	Type of Sample	Rock Type	Test Results
Sample 3 Claim 1151129	large block weighing 55 kg.	Purple and pink medium grained variegated migmatite with hematite stain and possibly fine grained garnets	Buff to pink laminae with elongated biotite clusters; mineral foliation at acute angle to the tightly folded compositional layering; the buff to pink material is a medium to coarse grained cataclastic relict of pegmatite containing minor peristerite; red spotted material with pink buff ground mass composes ≈70% of the sample; the red spots are hematite stain on grain boundaries proximal to biotite and accessory magnetite; 50% of this layer is stained and the unit is medium grained; the rock takes an excellent polish with minor biotite plucking; the rock is unique and very attractive.
Sample 4 Claim 1151136	Large block weighing ≈60 kg.	Pink, coarse grained cataclastic, pegmatitic granitic breccia with minor hematite spotting.	Pink and grey, medium to coarse grained to megacrystic pegmatite breccia with sharply defined, cemented grain boundaries between the large clasts and the ground mass; the clasts are slightly deformed and rounded but the individual crystals in the clasts are fresh and unstrained; the rock takes an excellent polish with some plucking of biotite and quartz in the pegmatite and cracks within feldspar crystals; biotite foliation does not penetrate the pegmatitic fragments; magnetite ≈3% with slight hematite stain.

Sample 5 Claim 1151136	10 kg sample.	Coronitic metagabbro which is a dark grey, coarse grained amphibole-pyroxene-feldspar bearing rock.	The polish did not come up on this rock; an anastamosing network of profuse cracks on grain boundaries and within individual crystals appears to weather low and on close examination appears to comprise largely carbonate replacement; approximately 10% magnetite in the rock.
Sample 8 NW corner of Claim 1151135	15 kg sample	Granitic mylonite, or pink gneiss in contact with granitic pegmatite.	Rich, pink coloured, fine grained, mylonitic, quartzo-feldspathic rock with minor biotite, magnetite and hematite (the latter in laminae or streaks); a parallel stretched granitic pegmatite with well healed boundaries; excellent polish with only minor plucking of smoky quartz in pegmatite.
Sample 9 NW corner of Claim 1151136	15 kg. sample	A medium to coarse grained, equigranular rock with hematite speckles.	Under microscopic examination this rock presents as a formerly megacrystic, granitic intrusion which has been stretched into faint layers and recrystallized into an equigranular medium grained rock; cataclasis is very evident; medium grained hematite spots comprise 15% by volume over a pink to slightly grey background; minor biotite and magnetite and a small percentage of plagioclase compared to microcline; Smith's Monument Co. staff was very complimentary about this specimen which they state to be similar to a Laurentian Pink Granite which is used as a high quality monument stone.

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Seven dimension stone prospects were staked in the Britt domain and have since been mapped geologically. Most of these rocks are deformed plutons or migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

The Killbear Point property comprises 500 acres, and is underlain by complex migmatites of Middle to Late Precambrian age. A study of the joints and joint spacings suggest that most of the property would yield a high percentage of 30 tonne blocks of dimension stone. Four potential product lines have been identified in five potential quarry sites. Two of the potential product lines are unique and the other two are similar to other stone already being marketed. All of the stone appears to be of good quality and very attractive.

In addition to the stone in place, a large number of very large loose blocks occur on the property. Due to the extreme durability of this rock (some of the exposed rock still retains a glacial polish) it is anticipated that some of these blocks would be suitable for direct shipping dimension stone or landscaping purposes.

RECOMMENDATIONS

It is recommended that efforts be concentrated on further inventory and development of the purple and pink migmatite and the pegmatite breccia:

1. Inventory work would consist of detailed mapping of the proposed quarry sites including a few drill holes for definition of sub-horizontal joints, continuity and material tests plus preparation of site plans.
2. Initial licencing should proceed with the Minister of Northern Development and Mines to licence two sites for removal of a 3000 tonne test sample at each site; public information meetings will be required.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1992. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Dated:October 18, 1993

Signed

James R. Trusler M.S., P.Eng.

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE GRUNDY LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 80°30' 6"W - 80°31' 18"W
LAT.: 45°56' 39"N - 45°57' 11"N
NTS: 41H/15

DATE: December 30, 1993

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE GRUNDY LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of similar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, nine sites in the Britt domain were sampled producing encouraging results. Subsequently six of these properties examined and three properties identified in government research have been staked. One of these sites is in the Moon River domain and one is in the Rosseau domain. All nine properties have been mapped resulting in the definition of a large number of potential quarry sites. The three claim unit Grundy Lake property is one of these.

The property is segmented into a western two claim units and a single eastern claim unit. An attractive, pink, porphyritic, strained, megacrystic granite underlies both property segments, but encloses a tonalite gneiss and porphyritic tonalite on the eastern claim. The rock trends to the southeast with steep dips and a shallow plunge to the southeast. The rock is very uniform with consistent large joint spacing suitable for development. A site plan should be prepared of the main outcrop on the western claim.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In March and May, 1993, the Grundy Lake property was staked for its dimension stone potential. Geological mapping was carried out in 1993, and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Mowat Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 190 (304 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°31′18"W on the west and 80°30′6"W on the east and latitudes 45°56′39"N on the south and 45°57′11"N on the north. The corresponding UTM co-ordinates in metres are 538,620 on the west, 537,000 on the east, 5,087,780 on the south and 5,088,665 on the north. The property is within National Topographic System area 41H/15 and is recorded on claim map M191.

The Grundy Lake property is crossed by a forest access road 4.5 km north of Hwy 522, 1.1 km east of the Canadian Pacific rail crossing at Pakesley. Although a competent road bed exists for the forest access road, a bridge over a creek is washed out approximately 1.5 km short of the property and two other areas have been flooded by beaver ponds.

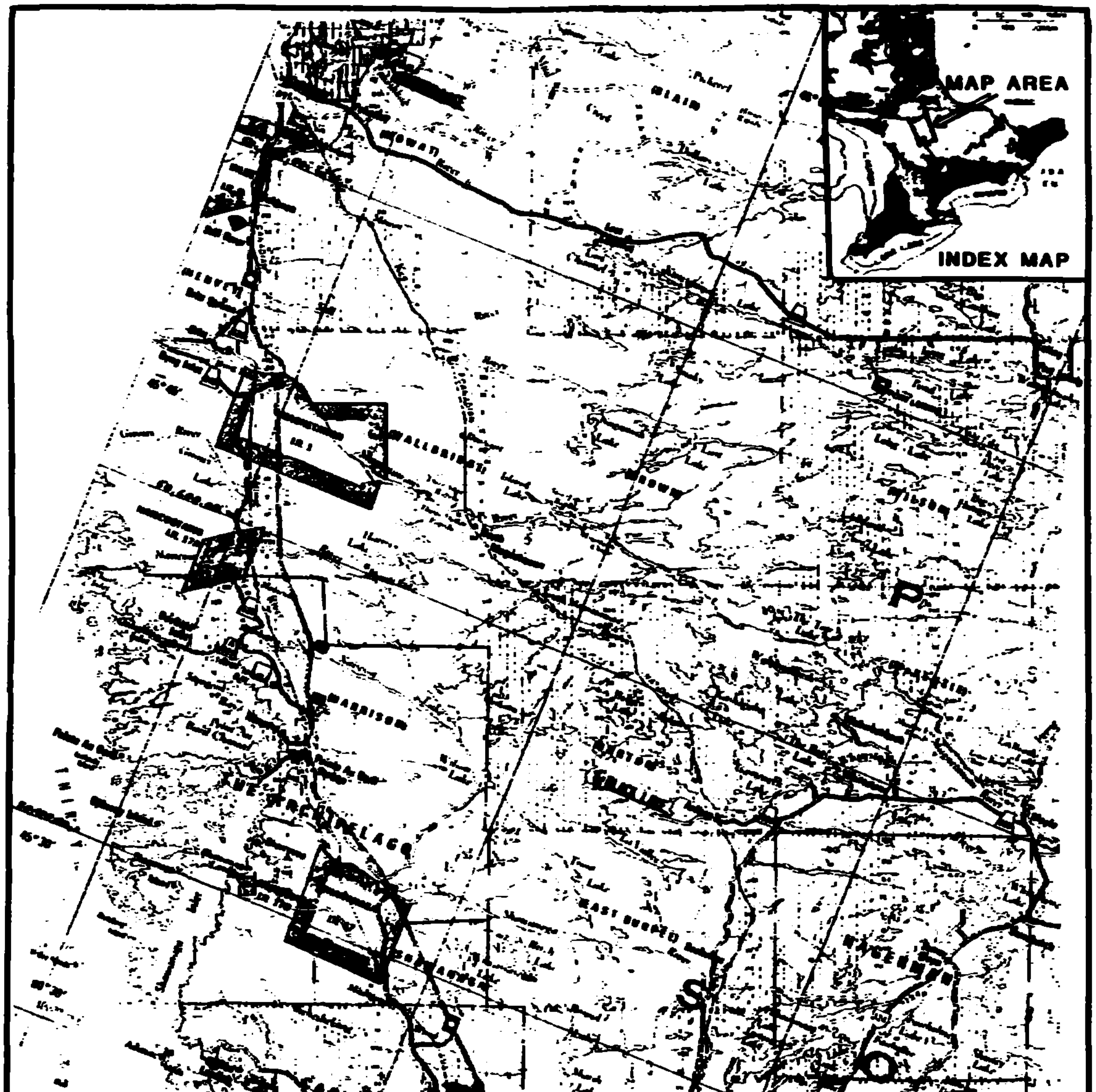


Figure 1: LOCATION MAP

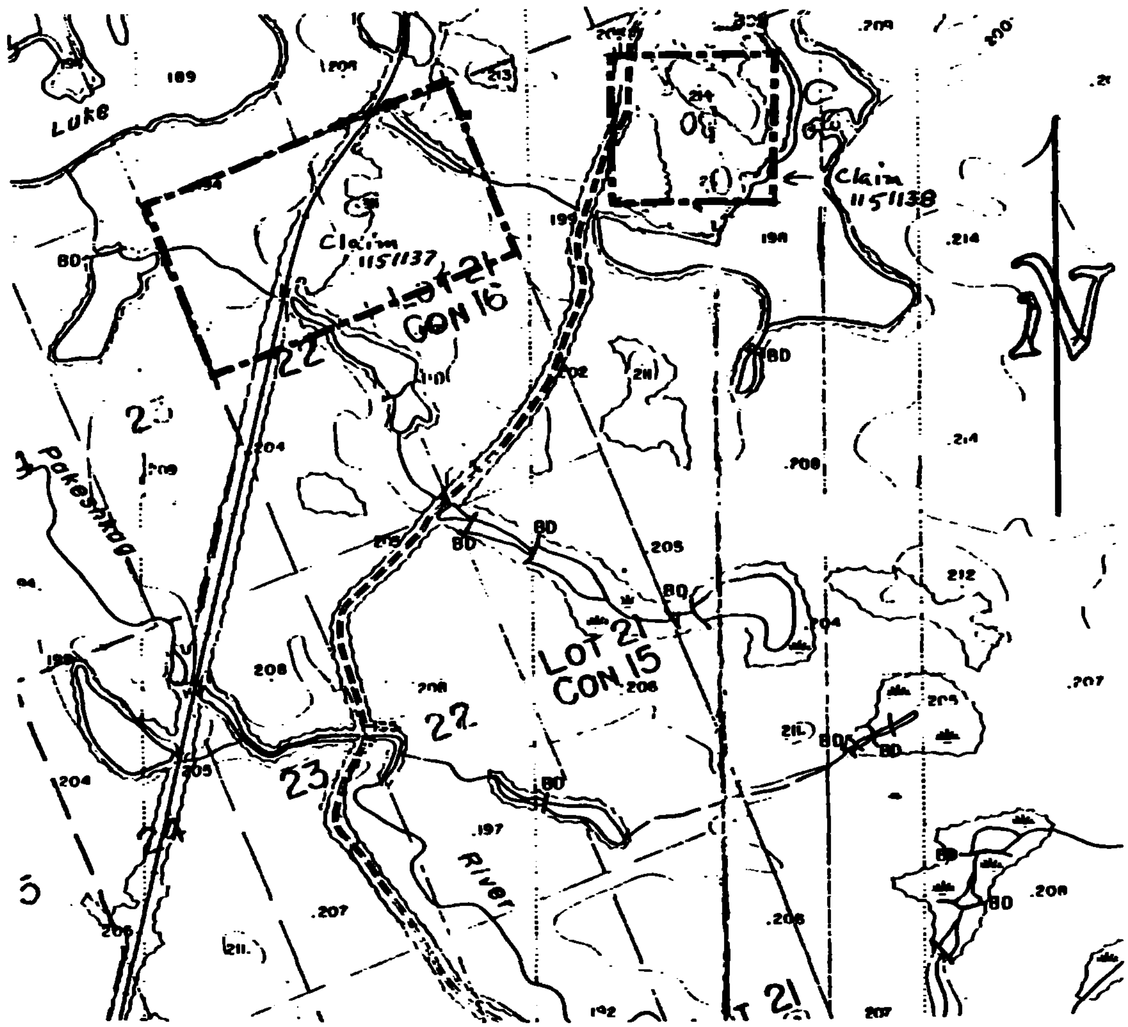
PROPERTY

The Grundy Lake property comprises approximately 140 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: GRUNDY LAKE PROPERTY

Claim No	Township	Lot	Conc.	Area	Recording Date
1151138	Mowat	19 &20	XVI	40 ac	Mar. 29, 1993
1151137	Mowat	N/2 21 & 22	XVI	100 ac	May 4,1993



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on July 17, 1993 and the map drafting and report writing was completed on December 30, 1993. Actual work days for assessment purposes break down as follows:

Grundy Lake Property: Claims SO1151137, 1151138.

Preparation: July 18,19,24, 1993 (3 days)
Field:July 17,20, Sept. 14,15, 1993 (3½ days)
Drafting: Sept. 29,30, Oct. 1,4-7,19,22,24,27, 1993 (4days)
Reporting:Sept. 20-24,27, Oct. 26, Nov. 1, Dec. 16-24,26-30, 1993 (4 days)

Preparation for field work involved production of 1:5,000 blow ups of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 9°-30′W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

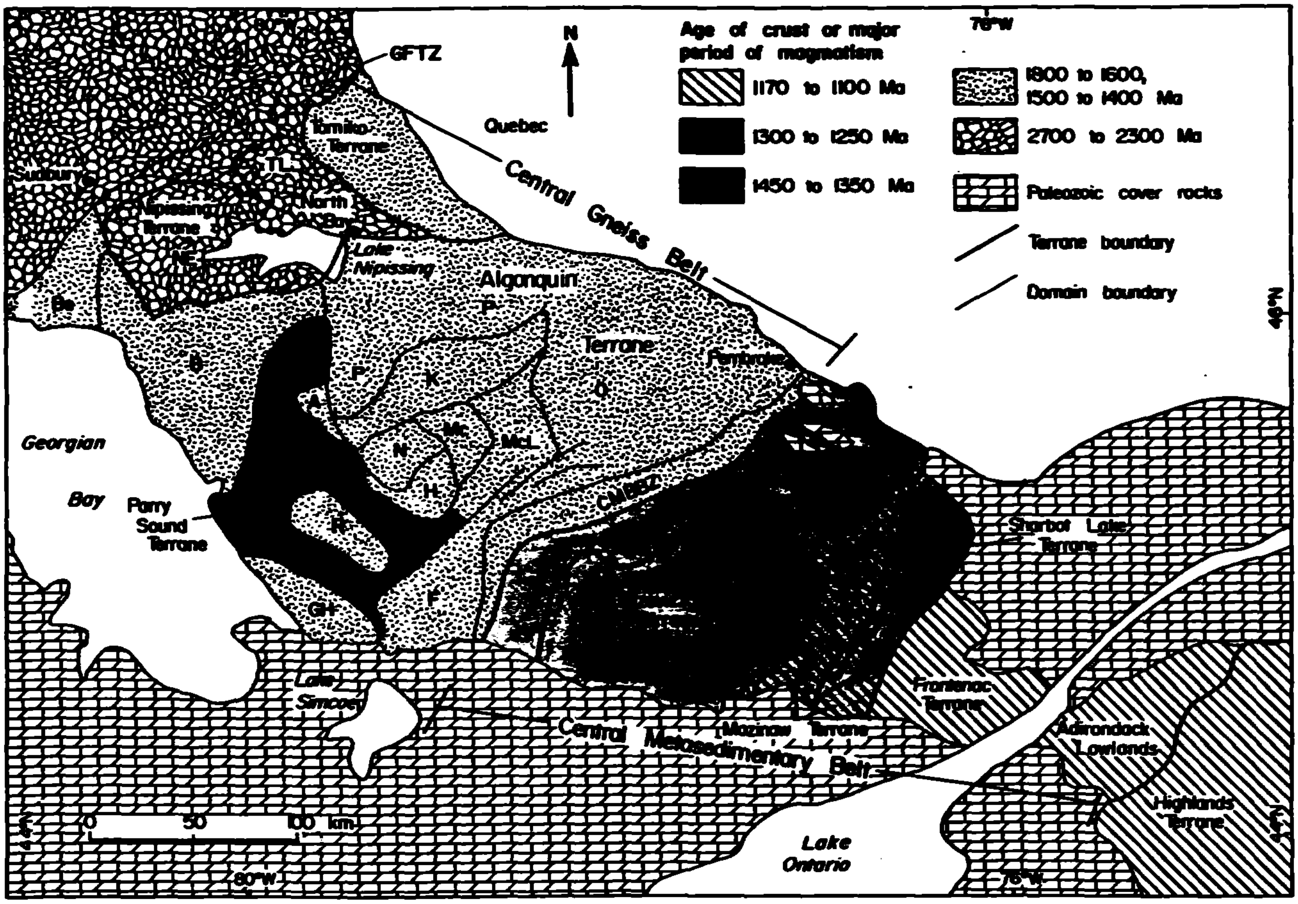
The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.



Abbreviations

A	Ahmic Domain	GH	Go Home Domain	NE	Nepewassi Domain
B	Britt Domain	H	Huntsville Domain	O	Opeongo Domain
Be	Beaverstone Domain	K	Kiosk Domain	P	Powassan Domain
CMBBZ	Central Metasedimentary Belt Boundary Zone	Mc	McCraney Domain	PS	Parry Sound Domain
F	Fishog Domain	McL	McClintock Domain	R	Rosseau Domain
GFTZ	Grenville Front Tectonic Zone	MR	Moon River Domain	S	Seguin Domain
		N	Novar Domain	TL	Tilden Lake Domain

Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

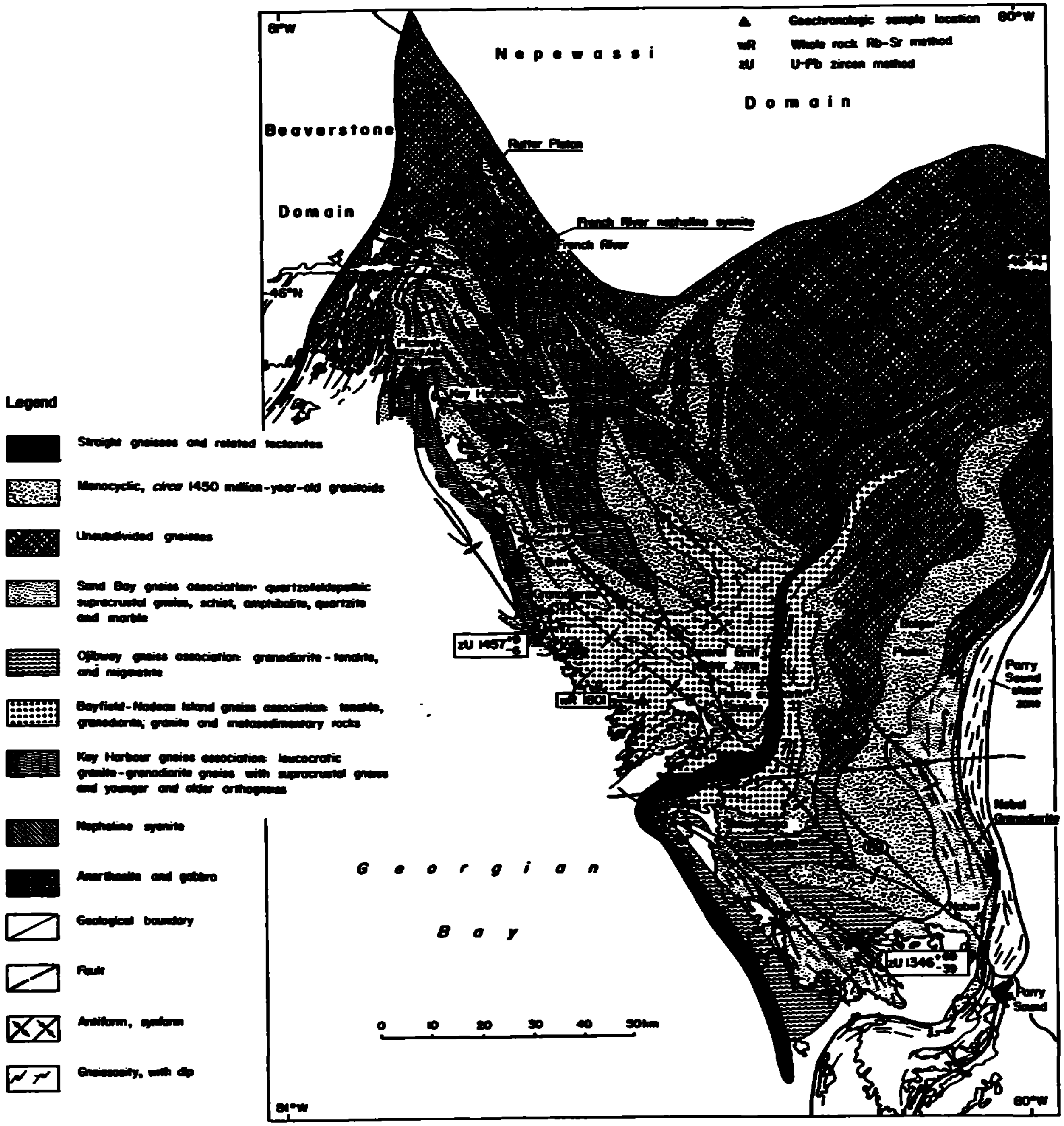


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock

largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: megacrystic granite, and tonalite.

The megacrystic granite is a highly strained to gneissic pink and grey rock containing relict pink orthoclase phenocrysts from 2 to 5 cm in original diameter which have been stretched to form a prominent lineation. Rarely this lineation is also crenulated. The orthoclase comprises 20-50% of the rock. Hornblende at between 10 and 15%, quartz at 10-20% and plagioclase are also present. The lineation rakes SSE at a gentle angle.

The tonalite is generally a gneissic, medium to coarse grained, thinly to thickly layered rock uniformly variegated light grey and greyish black and containing 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. Usually approximately 10%, but occasionally up to 20% of the rock unit comprises introduced or anatectic, syntectonic quartzo-feldspathic material. Pinch and swell characteristics are common especially in neosome portions of this rock.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel
______________Unconformity (possible regolith)_____________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings
______________Unconformity______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes
______________Intrusive Contact______________
High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene
______________Sheared Contact______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.
______________Intrusive Contact______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The property is underlain by a portion of a large megacrystic granite pluton which has undergone relatively uniform simple strain resulting in stretched phenocrysts and amphibolite facies metamorphism.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The megacrystic granite has a medium grained, hypidiomorphic granular matrix of quartz, plagioclase, orthoclase and hornblende. The phenocrysts vary from very rare, original, relict orthoclase eyes with sugary grained rims in the least strained rocks to pink sugary aggregates preserving the identity of the original orthoclase.

Although the tonalite also has a cataclastic texture some of the original compositional banding or layering appears to be relict. Some of this rock may also be suitable for quarrying although limited in outcrop extent underlying the eastern claim.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. Within the megacrystic granite the metamorphic texture is transitional between a lineation, a combination of lineation and gneissic foliation and a gneissic foliation alone. Within the tonalite the gneissic foliation is prominent. The rocks strike east to southeast and dip steeply between 75° east and 75° west.

The sub-horizontal joint spacing, based on 11 data, on the property averages at least 2.5 metres and the vertical joint spacing, based on 76 data, averages 5 metres. Thirty-six per cent of the vertical joint data, based on 75 data, cluster about an azimuth of 55° and a further thirty per cent cluster about an azimuth of 132°. The remaining data are scattered. In locations favourable for quarrying the joints tend to be more orthogonal and consistent.

POTENTIAL DIMENSION STONE SITES

Both main outcrops with megacrystic granite are underlain by similar material which should consistently produce 30 tonne blocks. The main texture is a simple stretched phenocryst, although significant areas have stretched and folded phenocrysts which are extremely attractive. The main outcrop on the western claim covers an area 450 metres square with a relief of 6 metres and the main granitic portion of the outcrop on the eastern claim covers an area 400 metres X 200 metres with a similar relief for a resource above the water table of approximately 4,000,000 tonnes.

Photo 1 Outcrop of Megacrystic Granite, Grundy Lake West(above) displays the relative homogeneity, absence of vertical joints and durability of the rock.Trough-like areas are due to glacial fluting; Photo 2 Close-up of Outcrop of Megacrystic Granite, Grundy Lake West (below) depicting the end on and side views of folded rapakivi-textured, pink, orthoclase phenocrysts.

On both sites the initial quarrying would start on the northeast side where cliff faces are exposed. Site plans should be prepared for both properties with detailed mapping if necessary to isolate zones with the folded phenocrysts. Photo 2 shows a rock exposure with the folded phenocrysts and a sample of granite containing regularly stretched phenocrysts which has been slabbed and polished is described in Table 3.

A sample should be taken of the banded tonalite for slabbing and polishing.

TABLE 3: RESULTS OF SAMPLE POLISHING

Sample No.	Type of Sample	Rock Type	Test Results
1993-2	polished samples provided by Chris Marmont and Dave Villard, formerly of the Ministry of Northern Development and Mines, from the their sampling program.	Megacrystic Granite displaying rapakivi textures.	Samples taken were cut to obtain an end on and section view of the stretched phenocrysts. Transitional between lineated and combined lineation and gneissic textures, granoblastic; grain size 0.1-2.0 mm and hornblende poikiloblasts up to 6.0 mm. Orthoclase(30%), plagioclase (35%), quartz(20%), hornblende(10%), biotite(5%), sphene, apatite, clinopyroxene, zircon. The polished specimens are very attractive with no defects.(Marmont, 1993)

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects were staked in the Parry Sound area, and all have been mapped geologically. Many of the rocks underlying these properties are migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

Large outcrops with wide joint spacing on both the east and west claims at Grundy Lake expose megacrystic granites displaying stretched rapakivi and folded, stretched rapakivi textures which are very attractive. The outcrops individually cover a significant area, and the total resource to a depth of 6 metres is estimated to be 4,000,000 tonnes. Production of two separate site plans is recommended followed by an initial quarry test on one of the sites.

A portion of the tonalite outcrop is uniform and attractively laminated. A large sample of this material should be recovered for slabbing and polishing.

RECOMMENDATIONS

1. Two site plans should be prepared in order to licence the initial quarry development of one of the outcrops on the property.
2. One of the outcrops should be developed by initial quarrying of a 3,000 tonne sample.
3. A sample of banded tonalite should be taken for slabbing and polishing.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

James R. Trusler M.S., P.Eng.

Dated: December 30, 1993

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE BLACK LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 80°10'08"W - 80°10'41"W
LAT.: 45°38'06"N - 45°38'40"N
NTS: 41H/9

DATE: December 29, 1993

A GEOLOGICAL SURVEY OF THE
DIMENSION STONE RESOURCES ON THE
BLACK LAKE PROPERTY
THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of similar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, and sawing and polishing specimens from many prospects. Seven sites in the Britt domain, and one in each of the Rosseau and Moon River domains have been staked and mapped by the writer resulting in the definition of a large number of potential quarry sites. The two claim unit Black Lake property is one of these.

The property is underlain by the Bolger pluton which is a circum 1450 Ma megacrystic granite intrusion. A highly strained megacrystic unit trends northeasterly across the southern portion of the property bounded on the south by derived complex migmatites and on the north by tonalite gneiss, porphyritic tonalite and coronitic metagabbro. The migmatite in the southeast corner of the property warrants a detailed site plan and the metagabbro should be mapped in detail and sampled to see if the favourable joint separations are continuous and unweathered material is available.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In October, 1992, the Black Lake property was staked for its dimension stone potential. Geological mapping was carried out in 1993, and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Burton Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 165 miles (264 km) north of Toronto (Figure 1). The property is bounded by longitudes 80°10′41"W on the west and 80°10′08"W on the east and latitudes 45°38′06"N on the south and 45°38′40"N on the north. The corresponding UTM co-ordinates in metres are 564,031 on the west, 564,403 on the east, 5,053,309 on the south and 5,054,342 on the north. The property is within National Topographic System area 41H/9 and is recorded on claim map G3884.

The Black Lake property is in Burton Township, and can be accessed by a hydro access road which leads one some seven kilometres west of the town of Ardbeg. Ardbeg is at the western terminus of Highway 520 which can be reached by exiting Highway 124 at Waubamik, 11 kilometres northeast of Parry Sound and following a secondary road for twenty five kilometres to the north.

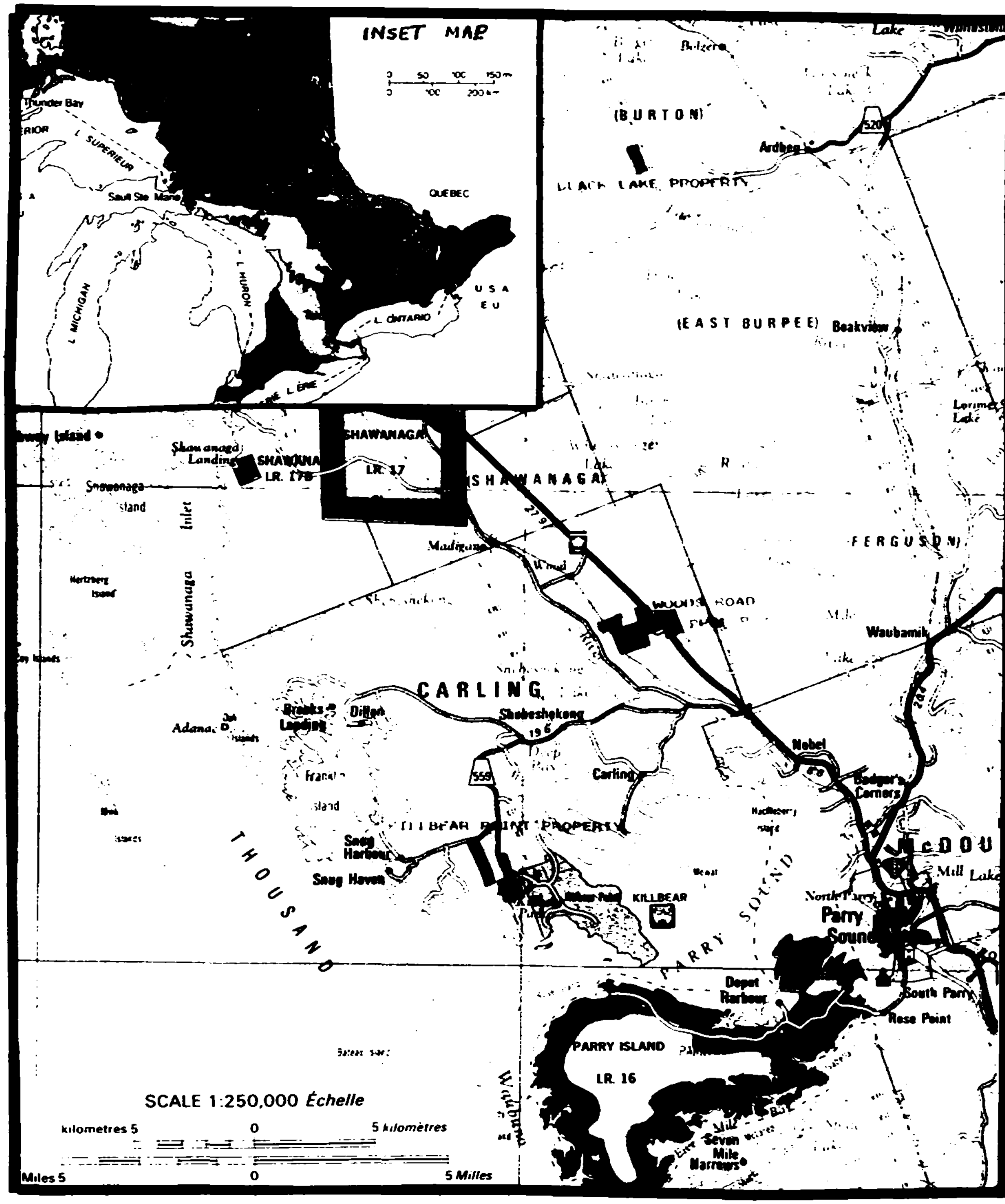


Figure 1: Location Map

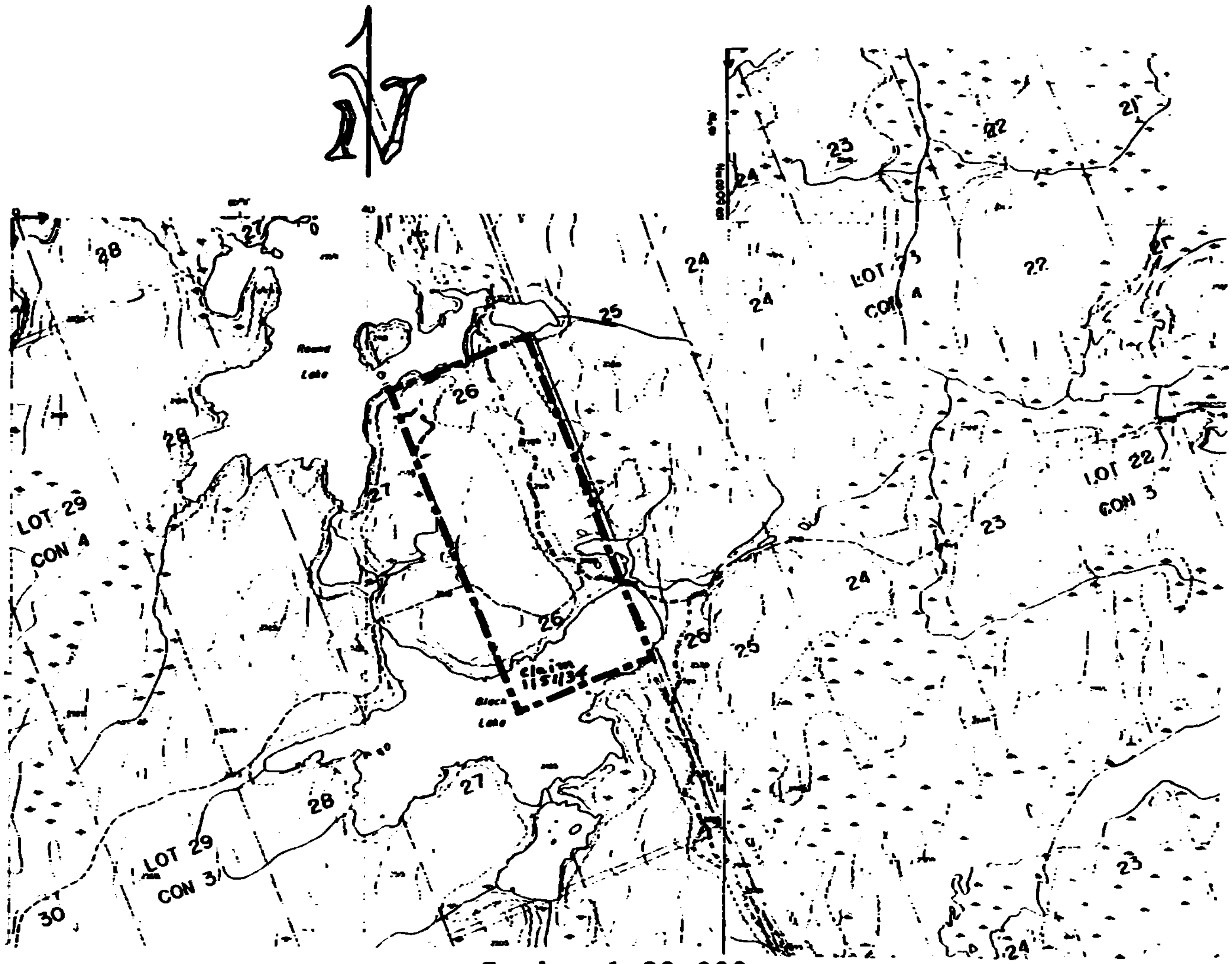
PROPERTY

The Black Lake property comprises approximately 100 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: BLACK LAKE PROPERTY

Claim No	Township		Lot	Conc.	Area	Recording Date
1151134	Burton	S/2	26	IV		
		N/2	26	III	100 ac	Oct. 8, 1992



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on September 1, 1993 and the map drafting and report writing was completed on December 29, 1993. Actual work days for assessment purposes break down as follows:

Black Lake Property: Claims SO1151134

Preparation: July 22, 29, 1993 (2 days)
Field:Sept. 1,9, 1993 (2 days)
Drafting: Sept. 29,30, Oct. 1, 4-7,22, Nov. 26-29, Dec. 7,8, 1993 (6½days)
Reporting:Sept. 20-24,27, Nov. 1, Dec. 16-24,26-29, 1993 (2 days)

Preparation for field work involved production of 1:5,000 blow ups of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 10°-15′W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

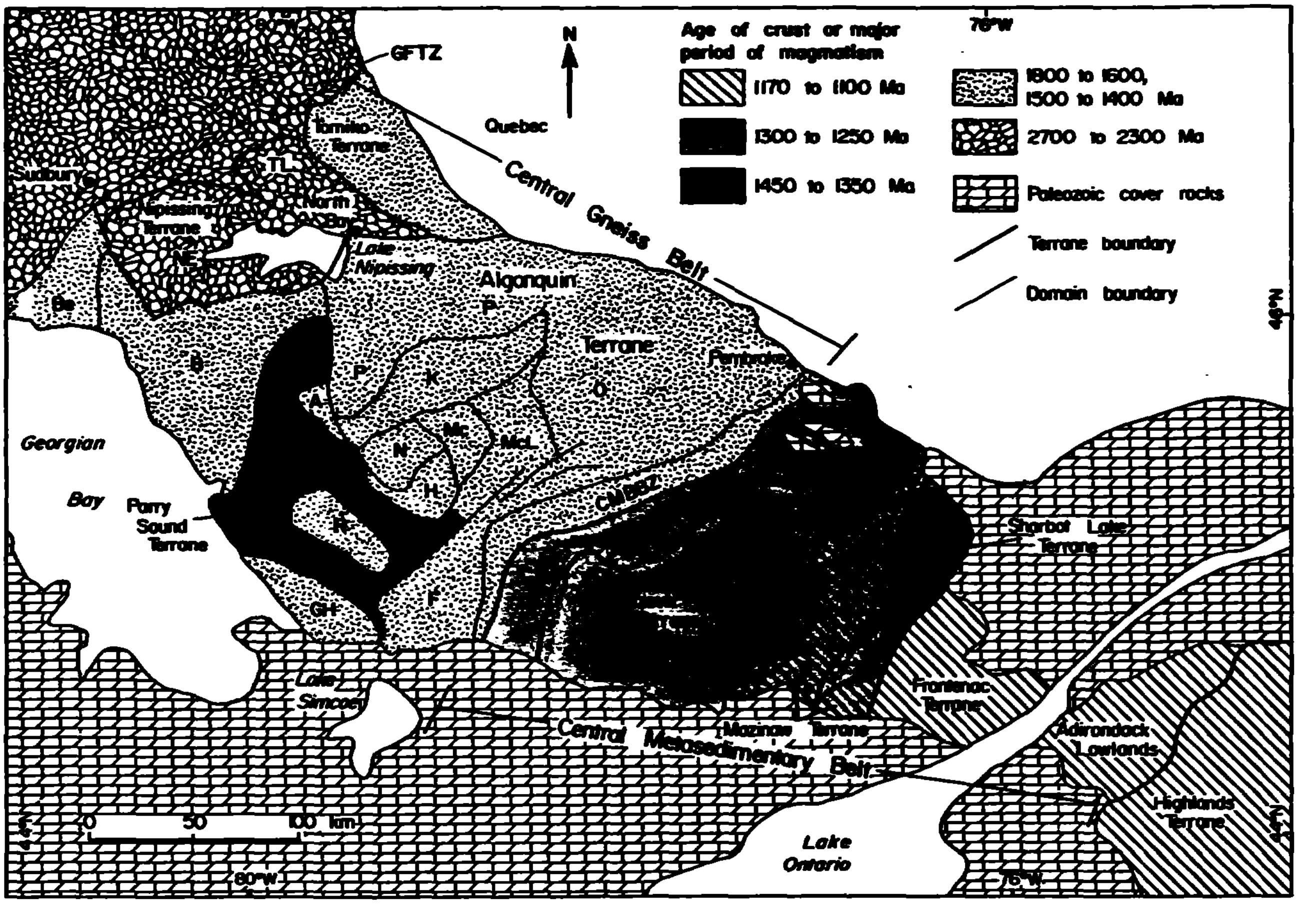
The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.



Abbreviations

A	Ahmic Domain	GH	Go Home Domain	NE	Nepewassi Domain
B	Britt Domain	H	Huntsville Domain	O	Opeongo Domain
Be	Beaverstone Domain	K	Kiosk Domain	P	Powassan Domain
CMBBZ	Central Metasedimentary Belt Boundary Zone	Mc	McCraney Domain	PS	Parry Sound Domain
		McL	McClintock Domain	R	Rosseau Domain
F	Fishog Domain	MR	Moon River Domain	S	Seguin Domain
GFTZ	Grenville Front Tectonic Zone	N	Novar Domain	TL	Tilden Lake Domain

Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

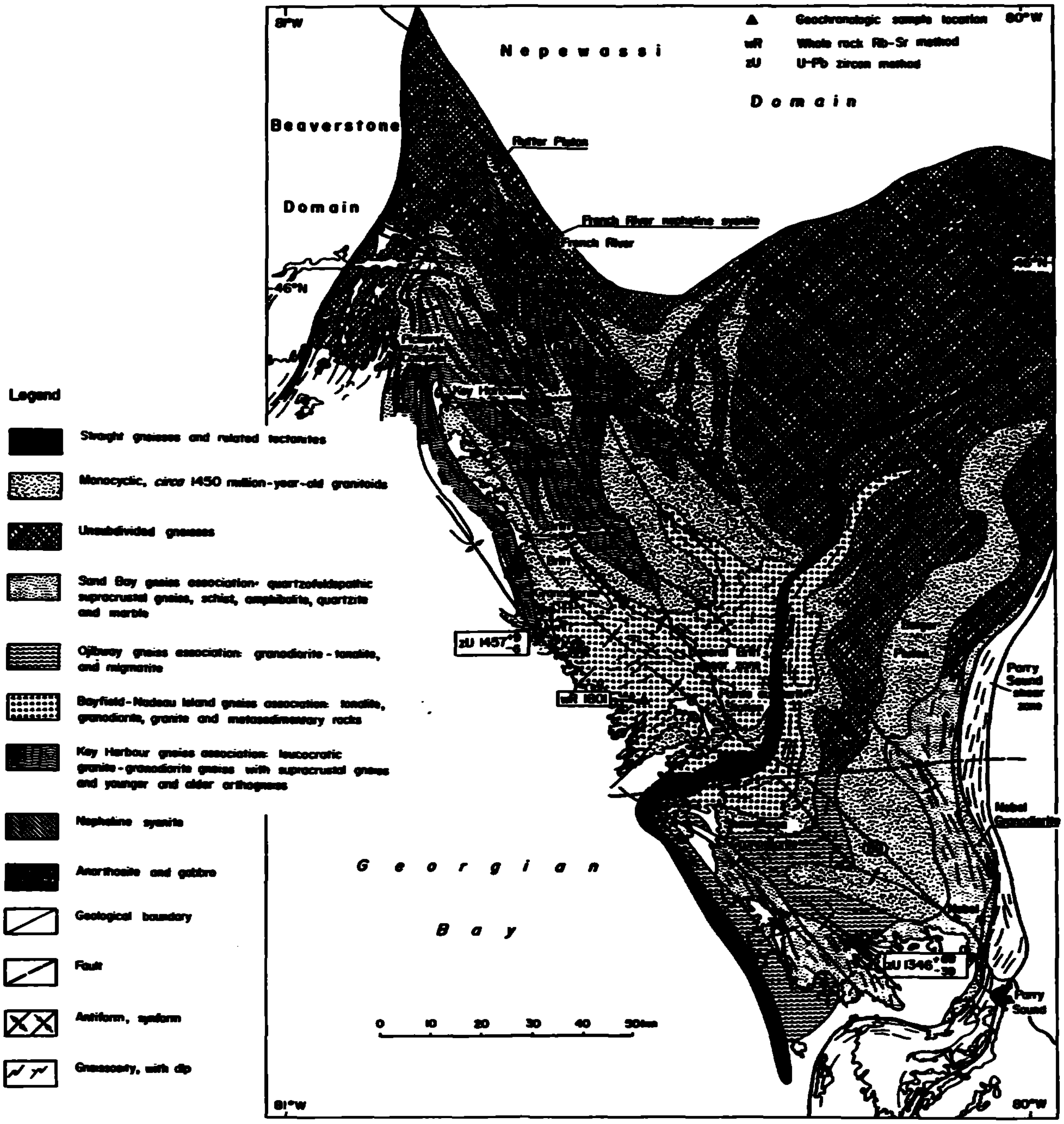


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock

largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: biotite-hornblende migmatite, megacrystic granite, gabbro, and tonalite.

The biotite-hornblende migmatite is represented by quartzo-feldspathic rock ranging from less than 5% to greater than 40% mafic minerals and containing syntectonic and late tectonic pegmatitic material in varying proportions and thicknesses. The grain size ranges from fine to coarse with the more neosome phases generally being coarser. In any one area and especially in individual layers the mineralogy and textures are uniform. The mafic mineral tends to be biotite dominant although hornblende dominant sections are present and frequently alternate layers switch dominance of the mafics. The gneissic fabric is very thinly laminated in some areas but ranges to thickly layered in other areas and is typically variegated pink and various shades of grey. A prominent mineral foliation is frequently superimposed on the gneissic fabric. Hematite staining frequently contributes a dark red fleck to the rock.

The megacrystic granite is a highly strained to gneissic pink and grey rock containing relict pink orthoclase phenocrysts from 2 to 5 cm in original diameter which have been stretched to form a prominent lineation. Rarely this lineation is also folded. The orthoclase comprises 20-50% of the rock. Biotite or hornblende at between 10 and 20%, quartz at 10-20% and plagioclase are also present. The granite grades into the migmatite, and in reality the granite forms the paleosome constituent or progenitor of the migmatite.

The tonalite comprises two varieties: a gneissic to slightly layered rock containing 2-3 cm pink orthoclase phenocrysts and a gneissic, medium to coarse grained, thinly to thickly layered rock. The latter is variegated light grey and greyish black and contains 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. In the gneissic variety, usually approximately 10%, but occasionally up to 50% of the rock unit comprises introduced or anatectic, syntectonic quartzo-feldspathic material. Pinch and swell characteristics are common especially in neosome portions of the gneissic rock.

The gabbro is represented by a very coarse grained, greyish black, coronitic metagabbro which has an ophitic and oikocrystic texture. The joints where seen on this particular outcrop are three metres apart.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel
______________Unconformity (possible regolith)______________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings
______________Unconformity______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes
______________Intrusive Contact______________
High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene
______________Sheared Contact______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.
______________Intrusive Contact______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The property is underlain by the Bolger pluton, and relict portions of megacrystic granite, tonalite and gabbro give evidence to this. However, polyphase metamorphism and tectonic deformation are evident in migmatites generated from the megacrystic granites.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The megacystic granite exhibits cataclastic textures in all outcrops. In the areas of greater preservation the orthoclase phenocrysts are elongated exhibiting uniaxial strain and recrystallized to a sugary grained aggregate of pink crystals. The stretching ratios vary from five to one to twenty five to one. Where the cataclasis becomes more pronounced, a gneissic foliation is induced both by the apparent banding from stretched phenocrysts and also by differential cataclasis yielding layers having different grain sizes.

The megacrystic granite is still recognizable within the migmatite although the stretched phenocrysts are not preserved or recognizable. In the migmatite the biotite composition of the paleosome constituent is enhanced to approximately 20% (10% overall) and forms a prominent foliation frequently with minor aligned red hematite spots which is at an acute angle to the gneissic foliation imparted from interlayering of the neosome constituent with the paleosome material. The neosome constituent is relatively uniform in composition, pink to red, fine to rarely medium grained, and a hypidiomorphic granular quartzo-feldspathic aggregate. This material is extremely attractive, and the textures are uniform over a large area despite the fact that at least two and possibly more phases are involved in the genesis of the rock. This is the principal target material on the property.

Neither variety of tonalite exhibits consistency in texture over a large area. The gneissic to slightly layered tonalite containing 2-3 cm pink orthoclase phenocrysts is very restricted in extent although the rock is potentially quite presentable and the joint spacings are sufficiently large to enable some quarrying. The gneissic tonalite is a medium to coarse grained, thinly to thickly layered rock contains significant variation in texture and composition of the syntectonic and late tectonic pegmatitic material. Some portions of the unit contain rich biotite segregations which weather low although amphibole is the main mafic mineral. The gneissic variety comprises usually approximately 10%, but occasionally up to 50% introduced or anatectic, syntectonic quartzo-feldspathic material. Pinch and swell characteristics are common especially in neosome portions of the gneissic rock.

The gabbro is represented by a very coarse grained, greyish black, coronitic metagabbro which has an ophitic and oikocrystic texture. The joints where seen on this particular outcrop are three metres apart. The coronas are produced from partial amphibole replacement of clinopyroxenes. This also is a candidate rock unit for quarrying as a dimension stone.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. The gneissic foliation is prominent on all parts of the property and generally strikes northeast and dips to the south. However substantial dip variation occurs and it is suspected that a large recumbent fold is situated on the property. The lineation where measured trends to the south or southeast at a 10-20°plunge.

In general the joint spacing in the rocks throughout the property is widespread. The vertical joints have an average separation, based on 59 data, of four metres and the average sub-horizontal joint separation, based on 9 data, is 2.5 metres. Twenty-four per cent of the vertical joint data, based on 66 data, are clustered about 155° and 37% of the data are clustered about 60°.

POTENTIAL DIMENSION STONE SITES

A potential dimension stone site is located to the west of the hydro line road in the north half of lot 26, Concession 3, Burton Twp. A picture of the outcrop and polished specimen are depicted in pictures 1 and 2. The polished specimen is described in Table 3. The area is bounded by Black Lake, is 300 metres X 130 metres and rises up to 10 metres above the lake level. The site has 50% outcrop, and the remainder of the area is covered by brush and low trees. A site plan with detailed mapping will be needed to orient the next phase of work.

An outcrop of coronitic metagabbro was located near the northwest corner of the claim. Before this is considered as a potential test site, more prospecting is required and a large sample should be taken for polishing.

Photo 1 Migmatite Outcrop(above) and Photo 2 Polished Migmatite (below) Black Lake depicting the pink-mauve and buff and grey variegated, veined migmatite in outcrop and polished slab respectively. The rock takes a very attractive polish. The intense red is caused by extremely fine hematite staining. The basic colours are amazingly similar to those existing on the other properties which are 20 miles to the south.

TABLE 3: RESULTS OF SAMPLE POLISHING

Sample No.	Type of Sample	Rock Type	Test Results
Sample 7 Black Lake, Burton Twp. Claim 1151134	50 kg block	Originally a megacrystic quartz monzonite injected by an equigranular, medium grained granitic phase and subsequently deformed.	Granitic phase is folded and its attitude is at acute angle to the megacryst extension direction; late foliation in the biotite crosses these other planar elements; the granitic phase comprises about 35% hematite spots which are quite fine; the rock takes a superb polish with only slight plucking of accessory magnetite.

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects were staked in the Parry Sound area, and all have been mapped geologically. Many of the rocks underlying these properties are migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

Two sites on the Black Lake property warrant further attention. One site, underlain by a variegated migmatitic derivative of megacrystic granite, covers an area 100 metres X 1000 metres and might supply up to 10,000 30-tonne blocks. Site planning, detailed mapping, and a quarry test are required on this site. The other site is underlain by a coronitic metagabbro which appears to have very large joint spacings. Prospecting and the recovery of a large sample are required to further define this prospect.

RECOMMENDATIONS

1. It is recommended that the site underlain by migmatite on lot 26, Concession 3, Burton Twp. be mapped in detail and that a site plan be prepared which would enable licensing of a quarry site.

2. Further prospecting of the coronitic metagabbro on lot 26, concession 4 should be conducted to better define the extent of good quality material. A large sample should be taken for testing.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

James R. Trusler M.S., P.Eng.

Dated: December 29, 1993

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE BURNT LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 79°50'21"W - 79°51'03"W
LAT.: 45°13'21"N - 45°13'47"N
NTS: 31E/4

DATE: December 29, 1993

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE BURNT LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of similar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, and sawing and polishing specimens from many prospects. Seven sites in the Britt domain, and one in each of the Rosseau and Moon River domains have been staked and mapped by the writer resulting in the definition of a large number of potential quarry sites. The two claim unit Burnt Lake property is one of these.

The property is underlain by a folded, steeply dipping, south trending, cataclastic, weakly foliated, medium to coarse grained, bright salmon pink, felsic gneiss. The northern portion of the western edge of the large outcrop in the middle of the property has a relief of 30 metres, and a quarry could be developed here capable of producing a high volume of large attractive blocks at low cost and minimal waste factors. Unfortunately, the local cottagers association is opposed to exploration and mineral development which renders this a low priority dimension stone site. Further research into the potential for uranium is warranted.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In March, 1993, the Burnt Lake property was staked for its dimension stone potential. Geological mapping was carried out in 1993, and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Humphrey (formerly Conger) Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 135 miles (214 km) north of Toronto (Figure 1). The property is bounded by longitudes 79°51′03"W on the west and 79°50′21"W on the east and latitudes 45°13′21"N on the south and 45°13′47"N on the north. The corresponding UTM co-ordinates in metres are 590,195 on the west, 591,120 on the east, 5,008,085 on the south and 5,008,840 on the north. The property is within National Topographic System area 31E/4 and is recorded on claim map M170.

The property can be accessed by a secondary road which leads west from Hwy 69 at the north end of McTaggart Lake (3.5 Km. north of the Gordon Bay Marina). The road passes within 500 m of the property 3 km west of the highway. A small portion of the access crosses private land for a direct walk to the property, but several more circuitous routes are possible which involve using right of ways on private land and crown land access.

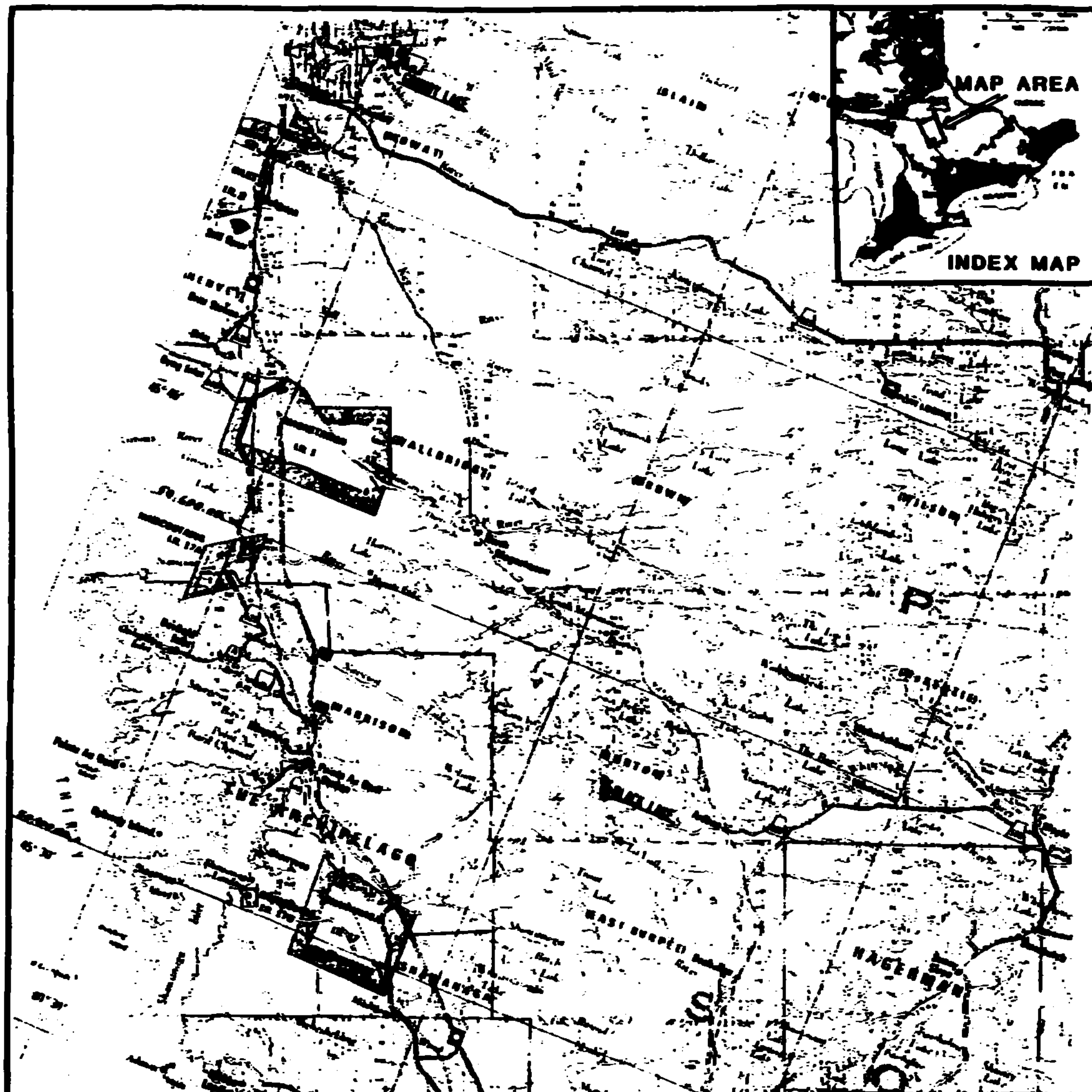


Figure 1: LOCATION MAP

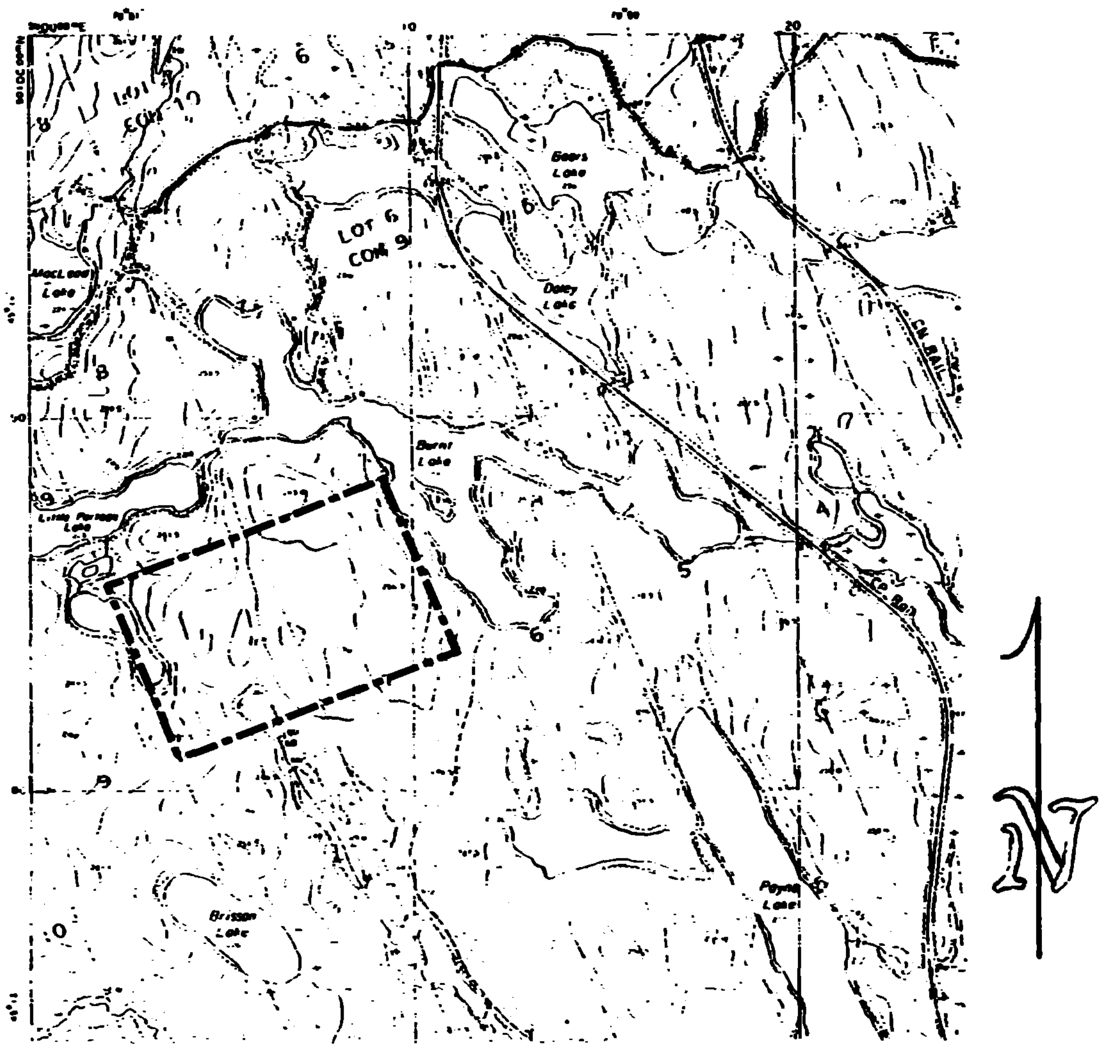
PROPERTY

The Burnt Lake property comprises approximately 100 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: BURNT LAKE PROPERTY

Claim No	Township	Lot	Conc.	Area	Recording Date
1191211	Conger	N/2 7&8	VIII	100 ac	Mar. 29,1993



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on September 8, 1993 and the map drafting and report writing was completed on December 29, 1993. Actual work days for assessment purposes break down as follows:

Burnt Lake Property: Claims SO1191211

Preparation: Apr. 4, July 9, 10, 1993 (2½ days)
Field:Sept. 8, 1993 (1 days)
Drafting: Sept. 29,30, Oct. 1,4-7,22, Nov. 30, Dec. 1,2,8, 1993 (4½days)
Reporting:Sept. 20-24,27, Nov. 1, Dec. 16-24,26-29, 1993 (3½ days)

Preparation for field work involved production of 1:5,000 enlargements of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 11°-12′W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

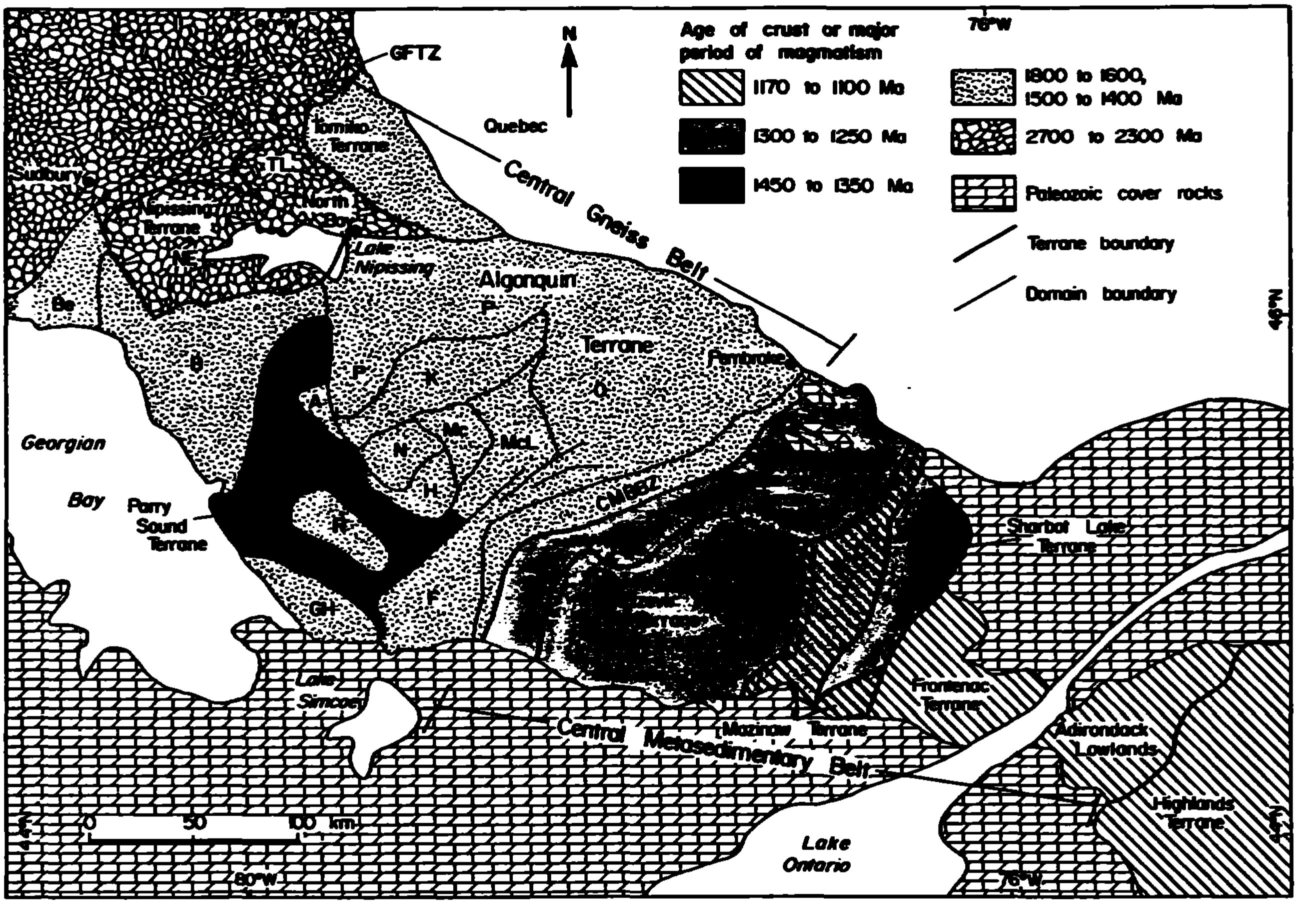
The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.



Abbreviations

A	Ahmic Domain	GH	Go Home Domain	NE	Nepewassi Domain
B	Britt Domain	H	Huntsville Domain	O	Opeongo Domain
Be	Beaverstone Domain	K	Kiosk Domain	P	Powassan Domain
CMBBZ	Central Metasedimentary Belt Boundary Zone	Mc	McCraney Domain	PS	Parry Sound Domain
F	Fishog Domain	McL	McClintock Domain	R	Rosseau Domain
GFTZ	Grenville Front Tectonic Zone	MR	Moon River Domain	S	Seguin Domain
		N	Novar Domain	TL	Tilden Lake Domain

Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

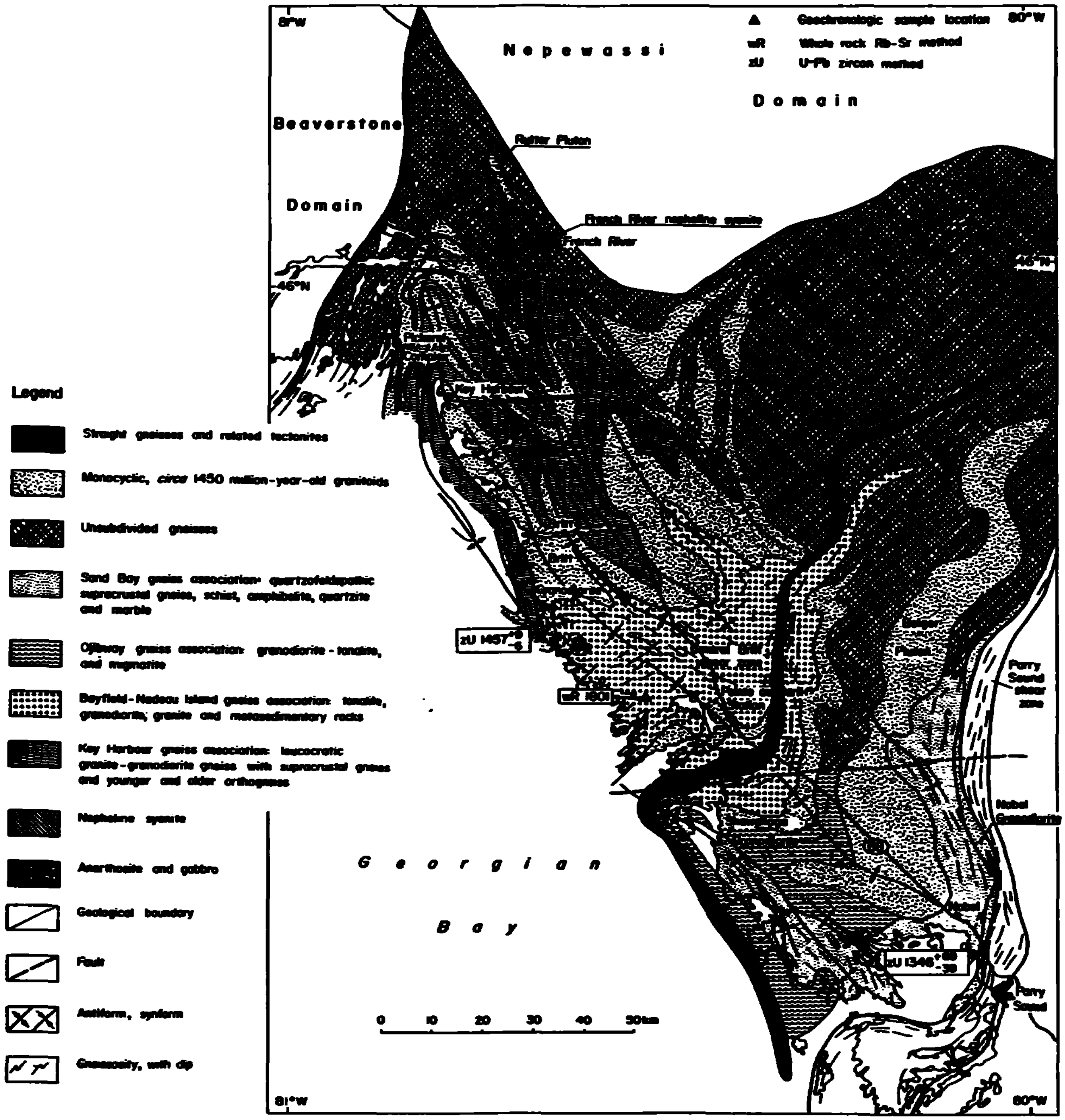


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock

largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: felsic gneiss.

The felsic gneiss is an intense pink, weakly layered to massive rock, varying from fine grained to coarse grained from one area to another and comprising quartz, plagioclase and microcline with minor biotite and variable accessory magnetite, hematite and almandine. A significant portion of this rock unit is demonstrably composed of breccias cataclastically derived from granite pegmatites. Tectonic grain gradation from coarse to fine grained across thicknesses of up to 0.5 metres are common on the outcrops. The textures and colour are very uniform. However, a brown pigment is apparent on the broken surface. This is suspected to be a weathering feature.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel

______________Unconformity (possible regolith)_____________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings

______________Unconformity______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes

______________Intrusive Contact______________

High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene

______________Sheared Contact______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.

______________Intrusive Contact______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The felsic gneiss which underlies the entire property appears in large part to be generated by tectonic deformation of syntectonic pegmatites. No progenitors were identified on the property, and this part of the Moon River Domain has not been mapped.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The felsic gneiss is generally a granular aggregate of equant to elongated interlocking grains. Several features of this rock unit infer at least a partial metamorphic origin: cataclastic textures including tectonic grain gradation characterize the fine grained portions of the unit and rarely occur with regularly spaced biotite and amphibole rich partings; the cataclastic grain classification forms a strong gneissic foliation in portions of the unit; significant portions of the unit comprise up to 5% pegmatite porphyroclasts which consist of partially strained microcline. The matrix is a gneissic, fine to coarse grained, quartzo-feldspathic mixture. The genesis of this material would also be obscured except for some textbook quality examples in road cuts near the property on Hwy 559 near the Killbear property in Carling Twp. where a well constituted coarse grained granite pegmatite grades laterally into a pegmatite breccia.

A brown weathering colour appears on freshly exposed surfaces and polished specimens. Apparently this is a weathering feature which may disappear at depth.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. In general a weak steeply dipping northerly trending gneissic foliation is imparted on the rocks, but on the western edge of the main outcrop the foliations dip steeply to the west.

Joint spacings are widespread. Vertical joints have an average separation of five metres, based on 39 data, and sub-horizontal joints have an average spacing, based on 6 data, of over three metres. A scatter of the vertical joint data is apparent on a statistical plot, based on 42 data. However, in the field, there tends to be only two orthogonal joints at any station. A variation in the azimuth of the joints appears to correlate with variation in the strike and dip of the gneissic foliation. Despite the large spread of data the median in each data cluster appears to have a complementary median direction which is orthogonal. Twenty-five per cent of the data are centred about an azimuth of 80° and 16% of the data are centred about the orthogonal direction at 170°.Twenty-seven per cent of the data are centred about the azimuth of 25° and 22% are centred about the complementary set at 115°.

POTENTIAL DIMENSION STONE SITES

The entire outcrop area on the property covers an area approximately 300 metre X 500 metres on a 30 metre high promontory. The entire outcrop exposes a relatively homogeneous rock with uniform colour which is suitable for dimension stone. The resource totals approximately 12,000,000 tonnes. The west side of the outcrop along the north claim boundary provides a steep access for quarrying purposes. A site plan should be prepared commencing in this area of the property when this activity can be justified.

TABLE 3: RESULTS OF SAMPLE POLISHING

Sample No.	Type of Sample	Rock Type	Test Results
1993-1	polished slab provided by Chris Marmont and Dave Villard, formerly of Ministry of Northern Development and Mines from their sampling program.	Felsic gneiss or migmatite	The specimen takes a very high polish with practically no imperfections. One fracture crosses this particular sample. The colour is salmon pink with a cloudy brown colouration attributed to weathering. Also some poorly defined aggregates of black substance. Plagioclase(40%), quartz(30%), microcline(25%), magnetite(1%), fluorite(1%), Biotite(<1%), metamict brown mineral(tr), Hematite(tr), muscovite(tr). Hematite occurs on grain boundaries and along albite twin lamellae, and probably accounts for the colour of the stone. (Marmont, 1993)

Photo 1 Outcrop(above) and Photo 2 Tectonic Grain Gradation (Close-up view)(below) Burnt Lake depicting the pink felsic gneiss or migmatite in outcrop. The rock takes a very attractive polish. The intense red is caused by extremely fine hematite staining.

CONCLUSIONS

The Moon River domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects in the Parry Sound area were staked and have since been geologically mapped. All of these rocks are migmatitic or gneissic derivatives of quartzo-feldspathic metasedimentary rocks or granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

The outcrop area on the property covers an area approximately 300 metre X 500 metres on a 30 metre high promontory. The entire outcrop exposes a relatively homogeneous rock with uniform colour which is suitable for dimension stone. The resource totals approximately 12,000,000 tonnes. The west side of the outcrop along the north claim boundary provides a steep access for quarrying purposes. A site plan should be prepared commencing in this area of the property when this activity can be justified.

It was noted during the mapping exercise that systematic pitting and sampling of the outcrop had been conducted probably about 15 to 20 years ago. It was surmised that the purpose of this sampling would have been for uranium since the rocks underlying the property have an origin similar to those of the Rossing uranium deposit in South Africa. Marmont (personal communication) said that he had met the person who had conducted the work, and that that person had verbally reported low values. More research of this possibility is warranted.

The most direct access to the property is across a small stretch of private land. Access has been denied by the landowner and the Joselin-Mogridge-McLeod Cottagers Association has stated that they will oppose exploration and development activities on this property through any legal means at their disposal which they deem necessary. Since such legal action could be extremely costly, it is proposed to forgo further activity on the property at this time and continue prospecting in the vicinity for similar prospective dimension stone.

RECOMMENDATIONS

1. Further work developing the dimension stone potential on the property should be deferred until the impass with the cottagers is resolved.

2. Research should be conducted into the suspected radioactive mineralization on the property.

3. Prospecting should be conducted in the surrounding area to acquire a similar site to this one which is free of conflict with local cottagers.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

Dated: December 29, 1993

James R. Trusler M.S., P.Eng.

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE TURTLE LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

by

JAMES R. TRUSLER

LONG.: 79°43'01"W - 79°43'38"W
LAT.: 45°19'12"N - 45°19'40"N
NTS: 31E/5

DATE: December 30, 1993

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

A GEOLOGICAL SURVEY OF THE DIMENSION STONE RESOURCES ON THE TURTLE LAKE PROPERTY THE PARRY SOUND DISTRICT OF ONTARIO

SUMMARY

The Parry Sound area of Ontario is underlain by complex gneisses and migmatites of Middle to Late Proterozoic age which are part of the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. A working model of thrust plates (called domains and sub-domains) which are separated by ductile thrust faults and moved in a northwesterly direction upon each other has been postulated by Davidson et al (1982). Easton (1992) has improved this model in his synopsis using a hierarchy of terranes and domains wherein the terranes include domains of similar age which are autochthonous with respect to each other. Age dating has indicated that four of these large scale terranes or plates are stacked on each other with the base being near Sudbury at the Grenville Front and the top being near Kingston.

Despite the recent wealth of scholarly publications a comprehensive geological map has not yet been made available for the area. However, the limited information available has enabled the clear identification of potentially favourable conditions for both flagstone and dimension stone. Several flagstone occurrences cluster along Davidson's thrusts and several potential dimension stone prospects have been identified within the interior of particular domains.

Although one may ordinarily not expect to find dimension stone within tectonite terranes, it is evident that the autochthonous nature of some of the domains combined with annealing effect of later superimposed amphibolite facies metamorphism preserved large competent blocks of migmatites and gneisses.

As a result of mapping dimension stone potential, and sawing and polishing specimens from many prospects. Seven sites in the Britt domain, and one in each of the Rosseau and Moon River domains have been staked and mapped by the writer resulting in the definition of a large number of potential quarry sites. The two claim unit Turtle Lake property is one of these.

The property is underlain by an unidentified circum 1450 Ma megacrystic granite pluton within the Rosseau domain. A strained megacrystic granite underlies the southern two thirds of the property and a tonalite gneiss underlies the northern portion. The rocks strike ENE and dip very gently to the north. The megacrystic granite contains approximately 20% amphiboles and is attractive. Site planning, geological mapping, and drilling of the large megacrystic granite outcrop in the centre of the property are warranted. Dimension stone resources exceed 10,000,000 tonnes.

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INTRODUCTION

In 1991, the writer commenced a project to evaluate the flagstone and dimension stone resources of the Parry Sound area. At the same time efforts by former Ministry of Northern Development and Mines geologists, principally Chris Marmont and Dave Villard, were being made to outline the substantial potential for these stone resources and make the public aware of the opportunity. In 1992, the regional investigation of flagstone resources by the writer proved discouraging. It was decided late in the field season to focus solely on the dimension stone potential.

By the end of 1992, many prospective dimension stone sites had been identified by either government publications or by the writer's prospecting. Nine of these dimension stone properties have now been staked by the writer, and an initial evaluation of each property involving geological mapping of the outcrops at a scale of 1:5,000 has been completed. The work provides an initial evaluation of potential quarry sites on each property. The project has been supported by the Ontario Prospector's Assistance Program in both 1992 and 1993.

In May and September, 1993, the Turtle Lake property was staked for its dimension stone potential. Geological mapping was carried out in 1993, and the map in the back pocket was prepared and is being submitted with the final report for the OPAP grant in 1993.

The format of the geological report is formulated in compliance with assessment submission requirements.

LOCATION AND ACCESS

The property is located in Christie Township, Parry Sound District, Southern Ontario Mining District, and Sudbury District Regional Geologist's area approximately 135 miles (216 km) north of Toronto (Figure 1). The property is bounded by longitudes 79°43'38"W on the west and 79°43'01"W on the east and latitudes 45°19'12"N on the south and 45°19'40"N on the north. The corresponding UTM co-ordinates in metres are 599,740 on the west, 600,520 on the east, 5,019,140 on the south and 5,019,900 on the north. The property is within National Topographic System area 31E/5 and is recorded on claim map M67.

The Turtle Lake property is 0.5 kilometre east of the Turtle Lake access road at a point 6 km. north of Hwy 141. The Turtle Lake Rd meets Hwy 141 five km west of Rosseau.

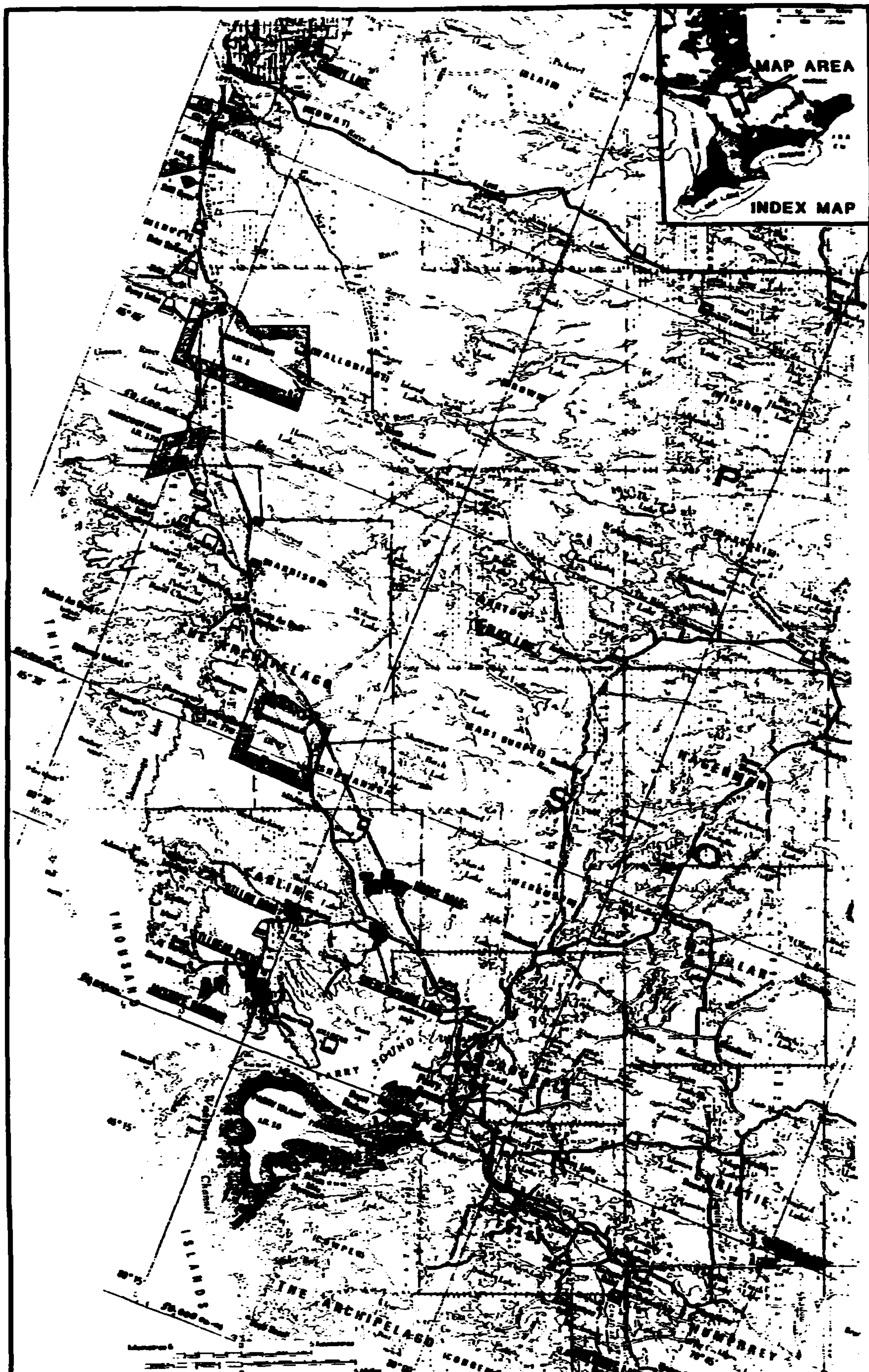


Figure 1: LOCATION MAP

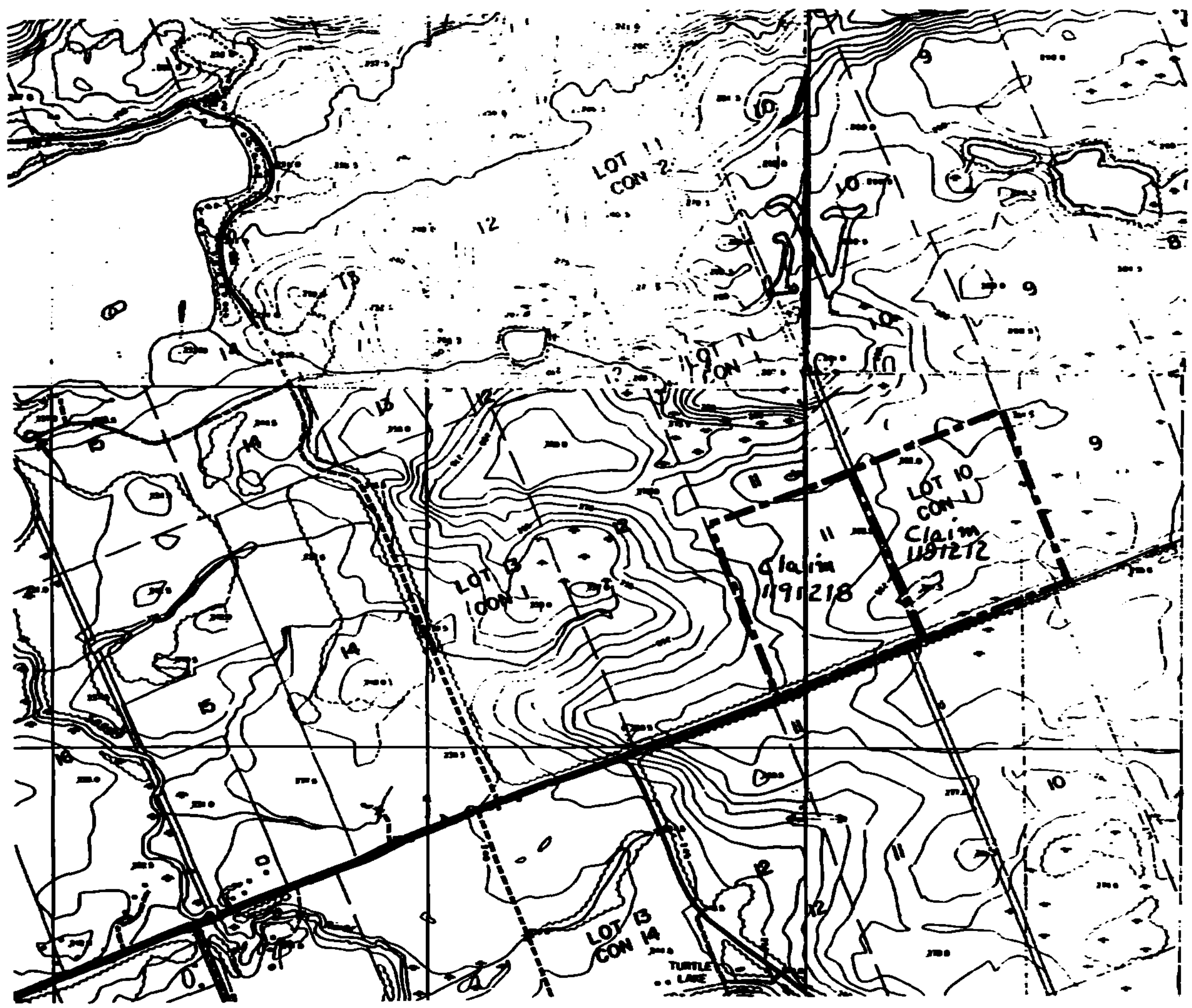
PROPERTY

The Turtle Lake property comprises approximately 100 acres and is more particularly described in TABLE 1 (Figure 2).

Assessment will be filed for the current work on the claims, and it is anticipated, as a result, that sufficient credits should be available to keep the entire claim group in good standing for some five years from the date of submission.

TABLE 1: TURTLE LAKE PROPERTY

Claim No	Township	Lot	Conc.	Area	Recording Date
1191212	Christie	S/2 10	I	50 ac	May 4, 1993
1191218	Christie	S/2 11	I	50 ac	Sept. 7+,1993



Scale: 1:20,000
Figure 2: Property Map

DATES WORKED METHODS USED ON CURRENT PROJECT

Preparation work on the project commenced in March, 1993, the field work commenced on September 13, 1993 and the map drafting and report writing was completed on December 30, 1993. Actual work days for assessment purposes break down as follows:

Turtle Lake Property: Claims SO1191212, 1191218.

Preparation: Sept.12, 13, 1993 (2 days)
Field:Sept. 13,14,16, 1993 (2½ days)
Drafting: Sept. 29,30, Oct. 1,4-7,20-23, 1993 (3½days)
Reporting:Sept. 20-24,27, Oct. 25, Nov. 1, Dec. 16-24,26-30, 1993 (2½ days)

Preparation for field work involved production of 1:5,000 blow ups of data from Ontario Base Maps and 1:30,000 air photographs. A grid was overlain on the maps, and stations for recording observations at approximately 100 metre centres were plotted and coded. Due to the high percentage of outcrop, visual control was feasible in almost all cases, but traversing by pace and compass from known sites was sometimes supplemented by the use of a rangefinder. The magnetic declination used in the field work is 11°-23'W.

At each station rock types with variations were noted generally with a visual description of colour and textures. Foliations were described and measured where possible. The main emphasis was in measurement of joints and their separations. In this respect at each station joints were observed within a 50 to 100 foot radius of the station. The attitude of each joint was recorded with the minimum and maximum spacing observed and the average spacing estimated.

Observations were directly recorded on a dictaphone in the field. The verbal record was later transcribed to paper notes. Drafting of the data onto maps was later done from the paper notes.

PREVIOUS GEOLOGICAL WORK

A traverse of the shore of Georgian Bay was made by Alexander Murray in 1848, and he gives a brief account of the geology of the shoreline (Murray 1848, p.45,46). The shoreline of Georgian Bay was again examined by Robert Bell in 1876 (Bell 1876, p.198-207). The Huntsville -Bracebridge area was investigated by W.A. Parks (1900, p.121-126), and brief notes on the geology are given. Further field work was done in the area in 1905 by T.L. Walker (1905, p. 84-86). The International Geological Congress had a field excursion in Parry Sound area in 1913. Some local geological features are described by T.L. Walker (1913, p. 98-100).

The first comprehensive reconnaissance mapping in the area was done by Satterly (1942) who visited all the local known mineral deposits. Satterly (1955) also mapped Lount Twp. in detail showing for the first time the existence of mappable units in the Parry Sound area. Hewitt (1967) was able to accurately identify the complexity of petrographic units and correlate some of these in a reconnaissance mapping program.

Greater interest in resolving the geological complexity of the area was kindled by Lumbers who was progressively mapping Grenville terranes in Ontario from the Grenville Front to the south Lumbers (1975) and by Wynne-Edwards (1972). Wynne-Edwards suggested the first interpretive framework for the Central Gneiss Belt of the Grenville Structural Province. The controversy which arose from Wynne-Edwards "Sea of Gneisses" lead a profusion of other researchers into the area who have conducted specific detailed and reconnaissance mapping and synoptic studies. Since 1972 M. W. Schwerdtner and students have concentrated on resolving many of the structural geology problems of the area contributing a great amount to the understanding of the geology of the Central Gneiss Belt.

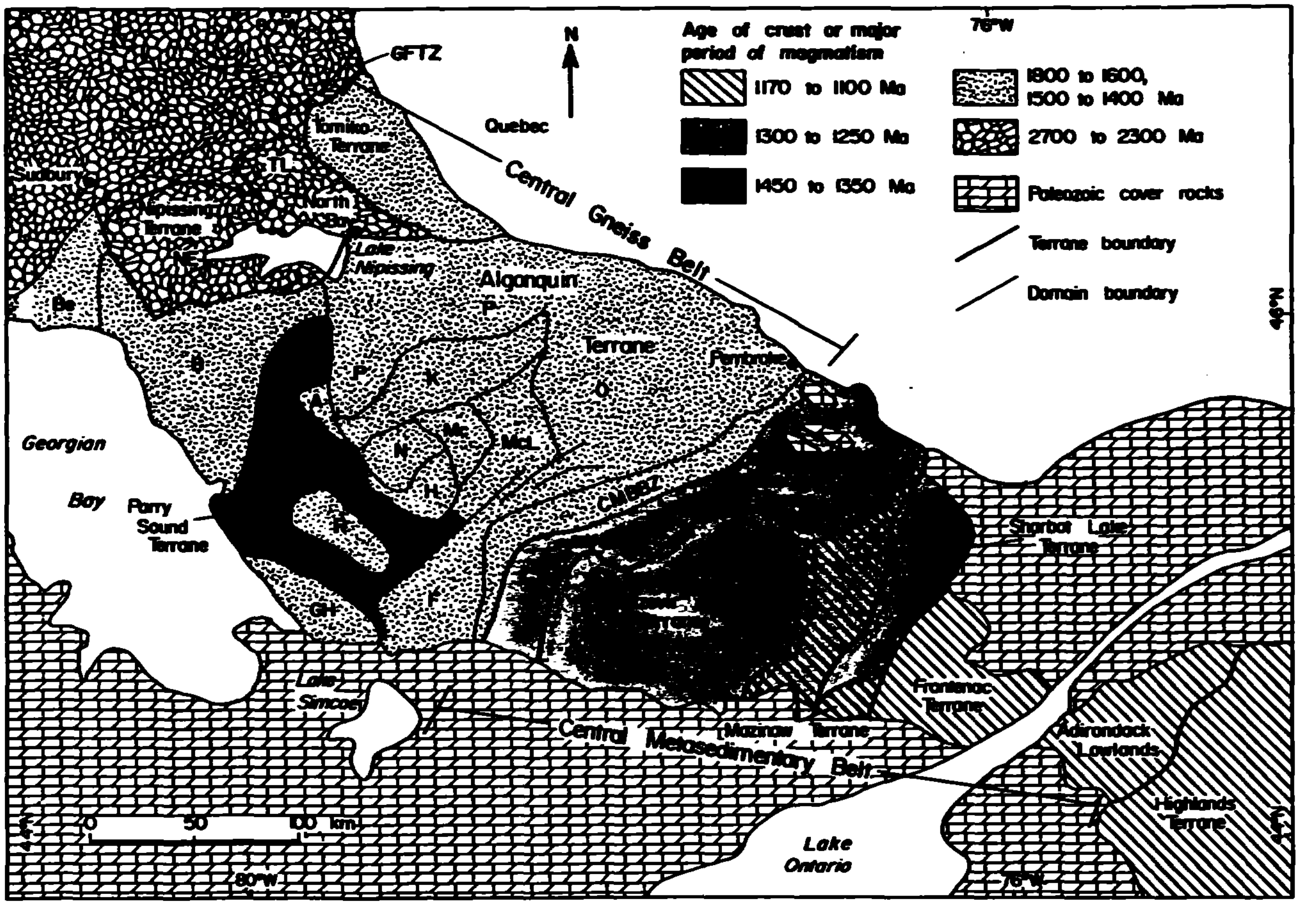
The framework for all current work in the area was provided by Davidson et al. (1982). This has been modified subsequently by Davidson and other workers, and Easton (1992) has synthesized this work eloquently. The tectonic terranes and domains separated by shear zones have become imbedded in the literature.

REGIONAL GEOLOGY

The Muskoka-Parry Sound region is part of the Ontario segment of the Central Gneiss Belt in the Grenville Structural Province (Wynne-Edwards 1972). No detailed geological map of the whole region, which was included in a recent major project on the Ontario Gneiss Segment by the Geological Survey of Canada, has been published to date.

Recent mapping by Davidson et al. (1982) has led to a tectonic model in which the thickening of Proterozoic crust is accomplished by deep-level thrusting and associated reverse ductile

shearing (Davidson 1984a, 1984b). According to this model, major crustal slices (called domains and sub-domains, see Fig.3) have been translated over large distances toward the margin of the Superior Structural Province.



Abbreviations

A	Ahmic Domain	GH	Go Home Domain	NE	Nepewassi Domain
B	Britt Domain	H	Huntsville Domain	O	Opeongo Domain
Be	Beaverstone Domain	K	Kiosk Domain	P	Powassan Domain
CMBBZ	Central Metasedimentary Belt Boundary Zone	Mc	McCraney Domain	PS	Parry Sound Domain
		McL	McClintock Domain	R	Rosseau Domain
F	Fishog Domain	MR	Moon River Domain	S	Seguin Domain
GFTZ	Grenville Front Tectonic Zone	N	Novar Domain	TL	Tilden Lake Domain

Figure 3: Lithotectonic terranes,domains Central Gneiss Belt (Easton, 1992)

This view has been further modified by some more local studies by Hanmer (1988) and Schwerdtner (1987). According to Hanmer the southeast to northwest thrusting was initiated at approximately 1160 Ma and continued for 100 Ma. However he claims that subordinate northeastward thrusting was coeval and that late synmetamorphic extensional shears cut these major thrusts and thrust sheets but are in turn cut by late movement on the thrusts. He further alludes to the comparison to the structural style of the

Central Gneiss Belt and the Himalayas suggesting that the Grenville exposes the architecture and processes presently active in the roots of younger mountain belts. Schwerdtner's observations agree with Hanmer's respecting a northeasterly component to deformation which he invokes to explain north-south buckle folds. However, Schwerdtner observed that not all foliations can be explained by the thrust model and that three sets of folding are superimposed and cross the domain boundaries. He claims that all the structural facts can be explained without large differential translations of crustal slices and most discordances in the regional gneissocity could have been created by décollement and repeated buckling.

Easton (1992) synthesized all previous studies stating that, "Recorded within the Grenville Province is the tectonic evolution of the southeast margin of Laurentia during the Mesoproterozoic. The Grenville Orogeny has overprinted the structural trends and metamorphic effects of the Archean and Paleoproterozoic geological province of Laurentia. It is now generally accepted that this orogenic event or events involved northwest directed thrusting and imbrication of the entire crust, presumably as a result of a terminal collision at about 1100 Ma. with a continental landmass somewhere to the southeast.

The Central Gneiss Belt consists mainly of upper amphibolite and local granulite facies, quartzo-feldspathic gneisses, chiefly of igneous origin with subordinate paragneiss. Distinctive lithotectonic terranes, some further subdivided into domains, have been identified within the Central Gneiss Belt. The terranes and domains are distinguished by differences in rock types, internal structure, metamorphic grade, geological history, and geophysical signature and are bounded by zones of intensely deformed rocks traceable for tens of kilometres."

The Algonquin terrane consists of 1800 to 1600 Ma gneisses intruded by 1500 to 1400 Ma granitic and monzonitic plutons that may represent an extension of the Eastern Granite-Rhyolite Province. Although imbricated by later thrusting the Algonquin terrane is probably parautochthonous. The Britt and Rosseau domains are part of the Algonquin terrane.

The Britt Domain (Figure 4) comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features. Dips of these rocks are generally flat to 10°to the southeast. Some units are entirely composed of isoclinal sheath folds whereas other units are evidently deformed megacrystic granitic plutons.

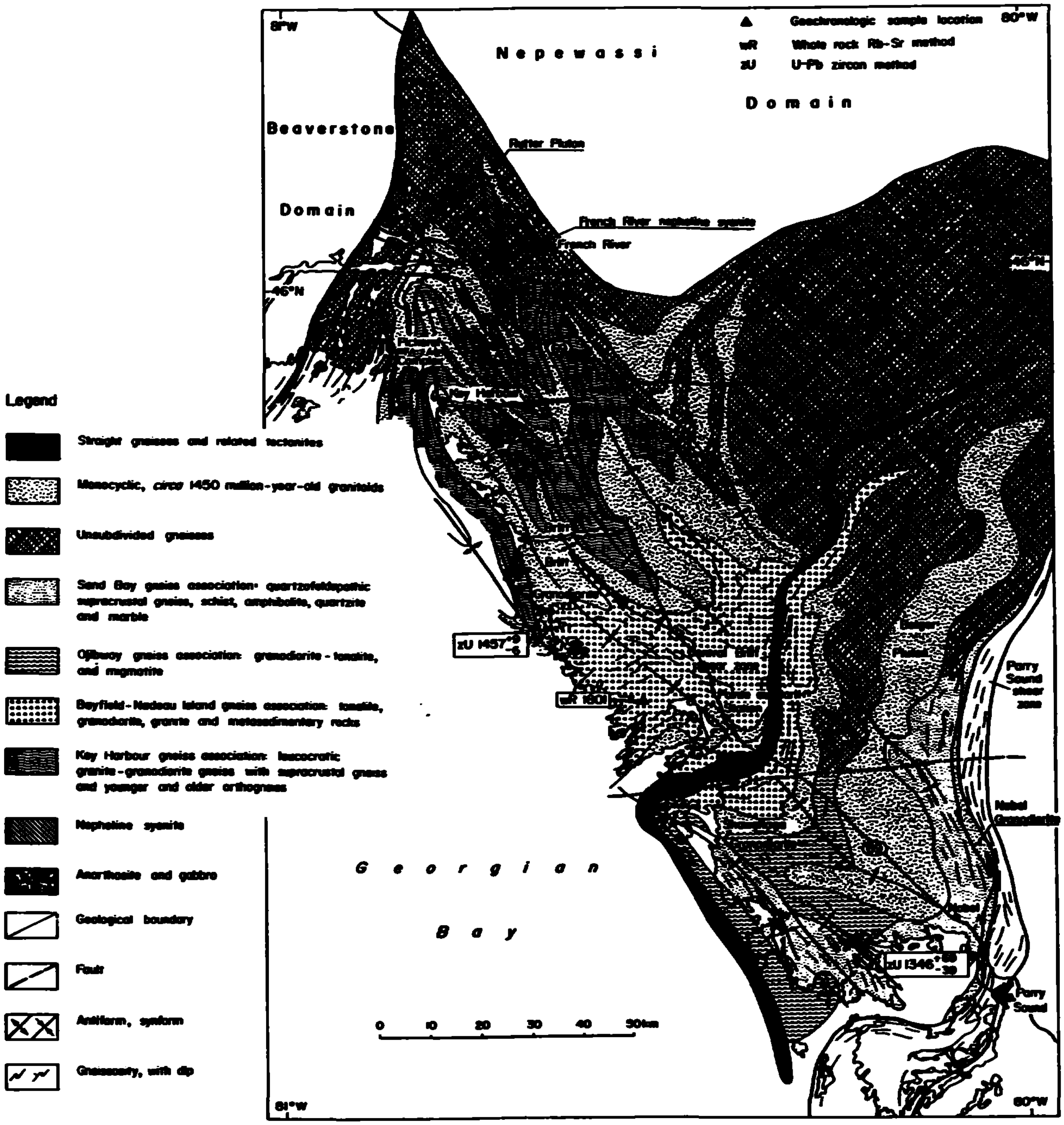


Figure 4: Geology of the Britt Domain (Easton (1992))

The Parry Sound and Moon River domains consist chiefly of juvenile crust 1450 to 1350 Ma in age and are parallochthonous. The Parry Sound domain rocks comprise dense high metamorphic facies rocks (amphibolite and granulite facies) which are emergent on the other domains. The rocks in the Parry Sound domain are dominantly amphibolite and pyroxenite gneisses which strike to the north east and dip 20°-60°to the southeast (at a much steeper angle than the postulated shear couple accompanying thrusting). The bedrock

largely comprises veined, banded and homogeneous pink and grey migmatitic gneisses produced by injection and granitization of metamorphic gneisses of various types. The rocks are mainly of upper amphibolite and granulite metamorphic facies. Hypersthene-bearing charnokitic gneisses are present in the area. The origin of much of the amphibolite gneiss is obscure. Some which is associated with bands of marble is thought to be paragneiss whereas some is proximal to large bodies of gabbro and anorthosite and thought to be orthogneiss. Trusler and Villard (1980) found evidence that some of the mafic and felsic rocks are of volcanic origin. The high metamorphic grade of the rocks is attributed to a deep seated origin possibly involving underplating at an early stage.

The Bolger pluton in the Britt domain is dated at circa 1450 Ma and underlies the Black Lake, Woods Road and Shebeshekong Lake properties (Figure 4). The Dillon Road property is underlain by both the Bolger pluton and the Ojibway gneiss association. The Killbear Point and Jacknife Harbour properties are underlain by the Sand Bay gneiss association. The Grundy Lake property is underlain by an unnamed V-shaped pluton believed to be circa 1450 Ma.

Comparable regional maps do not cover areas about the Turtle Lake property and the Burnt Lake property which are situated in the Rosseau and the Moon River domains respectively.

DESCRIPTION OF ROCK UNITS

Since no comprehensive, detailed geological maps have been produced for the Parry Sound area, none of the previous workers have made an attempt to construct a table of rock units. None of the rock units have been correlated across domain boundaries. Trusler and Villard made an attempt to derive a Table of Rock units for the Parry Sound -Sans Souci area in 1980 and some of that information is used here to produce Table 2. These Formation names are not used in the mapping since these have been inadequately defined for inclusion in the literature. However, the area mapped by Trusler and Villard covers parts of the Britt, Parry Sound and Moon River domains and the lithologic variety is well represented.

The Sans Souci-Killbear Point Group correlates well with the Sand Bay gneiss association of Figure 4 which underlies the Killbear Point and Jacknife Harbour properties. Similar rocks which are younger underlie the Burnt Lake property. The Ojibway gneiss association which underlies part of the Dillon Road property correlates with the tonalite in Table 2. The remaining sites are megacrystic granites or migmatitic derivatives of megacrystic granites classified under quartz monzonite in Table 2.

The rocks on the property have been subdivided into mappable units as follows: megacrystic granite and tonalite.

The megacrystic granite is a moderately strained to gneissic pink and grey rock containing relict pink orthoclase phenocrysts from 2 to 5 cm in original diameter which have been stretched to form a prominent lineation. Rarely this lineation is also crenulated. The orthoclase comprises 20-50% of the rock. Hornblende at between 15 and 20%, quartz at 10-20% and plagioclase are also present. The lineation rakes SSE at a gentle angle. Small bolts of fine grained syntectonic or pretectonic felsite are also present and lineated similar to the phenocrysts.

The tonalite is generally a gneissic, medium to coarse grained, thinly to thickly layered rock generally variegated light grey and greyish black and containing 20 to 40% mafic minerals overall with amphibole being the dominant mafic mineral. Usually approximately 10%, but occasionally up to 25% of the rock unit comprises introduced or anatectic, syntectonic quartzo-feldspathic material.

TABLE 2: TABLE OF ROCK UNITS FOR THE PARRY SOUND AREA

PHANEROZOIC

CENOZOIC
Quaternary
Recent
swamp, lake, and stream deposits

Pleistocene
bouldery, cobbly and silty sand till, silt, sand, pebble gravel, and cobble gravel

______________Unconformity (possible regolith)______________

PALAEOZOIC

Cambro - Ordovician
Calcareous fracture fillings

______________Unconformity______________

PRECAMBRIAN

Late Precambrian
Late Breccias- thin mylonites; quartz veined dilatant breccias of unknown origin

Late Pegmatite
massive granite pegmatite dikes

______________Intrusive Contact______________

High Rank Regional Metamorphism

Middle to Late Precambrian

Tectonites
Mylonite: very fine grained massive to thinly to thickly laminated rock frequently exhibiting compositional and graded layering and containing rotated porphyroclasts; generally marginal to schistose and gneissic rocks; matrix minerals generally are siliceous and comprise quartz, microperthite, biotite and/or amphibole and/or pyroxene

Tectonic Breccia: brecciated rock comprising lithic clasts within a fine to coarse grained schistose to gneissic cataclastic matrix with quartz, perthitic microcline, biotite and/or amphibole and/or pyroxene

______________Sheared Contact______________

Syenite and Monzonite Suite Intrusive Rocks
pink to grey and green, massive to porphyritic to lineated and gneissic biotite, hornblende-biotite and hornblende syenite and monzonite, charnokite and mangerite.

______________Intrusive Contact______________

Anorthosite Suite Intrusive Rocks

Anorthosite- massive to gneissic labradorite anorthosite, andesine anorthosite with up to 10% pyroxene, and gabbroic anorthosite

______________Intrusive Contact______________

Gabbro- massive to gneissic fine to coarse grained, black pyroxenite, anorthositic gabbro and gabbro

______________Intrusive Contact______________

Tonalite- massive to strongly lineated and gneissic light to dark grey pyroxene tonalite and diorite with minor gabbro

______________Intrusive Contact______________

Quartz Monzonite - Syenite Suite Intrusive Rocks

massive to gneissic medium to coarse grained biotite quartz monzonite, pyroxene quartz monzonite and foliated granite pegmatite, pyroxene syenite and foliated syenite pegmatite; megacrystic granite and derivatives.

______________Intrusive Contact______________

Parry Sound Group Metavolcanic Rocks[1]

Spider Lake Formation[1]: intermediate to felsic rocks, medium to coarse grained generally porphyritic, massive to gneissic rocks containing quartz, feldspar, almandite, amphibole and pyroxene; some fragmental units present.

Parry Sound Formation[1]: mafic, medium to coarse grained, schistose to gneissic, pyroxene-feldspar and amphibole-feldspar bearing massive and fragmental rock

Sans Souci - Killbear Point Group Metasedimentary Rocks[1]

Unsubdivided: thinly laminated to extremely thickly layered; interlayered medium to coarse grained schists and gneisses; lower amphibolite to granulite facies; intercalated with metavolcanics above

Killbear Point Formation[1]: thinly to extremely thickly layered, schistose and gneissic medium to coarse grained biotite, quartz, feldspar rocks

Bateau Island Formation[1]: very thickly layered, medium to coarse grained felsic gneiss with mafic biotite and amphibole rich parting planes; variously interpreted as an arkose or granite; cataclastic textures.

[1] The formation names have not been accepted and criteria for introduction of these names into the literature have not been fulfilled. Identification as to origin is tentative

PROPERTY GEOLOGY

The property principally is underlain by felsic rocks of unusual character of Middle to Late Precambrian age. The property is underlain by a portion of a large megacrystic granite pluton which has undergone relatively uniform simple strain resulting in stretched phenocrysts and amphibolite facies metamorphism. The property is situated in the Rosseau domain for which no reasonably detailed geological map defining the unit which underlies the property has been published.

The individual rock units were described under the heading DESCRIPTION OF ROCK UNITS on Page 9 of this report. The megacrystic granite has a medium to coarse grained, hypidiomorphic granular matrix of quartz, plagioclase, orthoclase and hornblende. The phenocrysts vary from very rare, original, relict orthoclase eyes with sugary grained rims in the least strained rocks to pink sugary aggregates preserving the identity of the original orthoclase.

Although the tonalite also has a cataclastic texture some of the original compositional banding or layering appears to be relict.

Both rock units may be suitable for quarrying although limited in outcrop extent having suitable joint spacing.

Gneissic foliations were measured at each station where possible. Despite some exceptions, the general pattern displayed is of a relatively structurally uniform sequence. The rock units both have a strong gneissic foliation. In the tonalite the foliation is largely imparted by compositional layering, but in the megacrystic granite the gneissic layering is manifested by bands of stretched phenocrysts and to some extent differential cataclasis. Lineations are well developed in the megacrystic granite exhibited by both rolling and stretching of syntectonic felsic stringers and stretching of orthoclase phenocrysts. The foliations trend east to east-northeast and dip 10°-20° to the north. The lineations plunge to the north-northwest at 10°-20°..

The sub-horizontal joint spacing, based on 23 data, averages less than two metres and the vertical joint spacing, based on 79 data, averages approximately five metres. The statistical plot of vertical joints, based on 85 data, exhibits strong polarity about the main joints. thirty-six per cent of the data cluster about an azimuth of 145° and twenty-nine per cent of the data cluster about an azimuth of 80°.

POTENTIAL DIMENSION STONE SITES

The large outcrop centred on the common boundary of the southern portions of lots 10 and 11, concession 1, Christie Twp. is a megacrystic granite exhibiting stretched and recrystallized rapakivi textures. Vertical joints average over 5 metres in separation, and the sub-horizontal joint exceeds 2 metres. The hill that this outcrop is on rises 55 metres above the surrounding area (Photo 1). A cliff face on the south side of the hill provides access for the purpose of initial quarry development. The favourable area of the outcrop is over 500 metres long and 300 metres wide so that the resource initially identified exceeds 10 millions of tonnes. Site planning and detailed geological mapping are warranted, and drilling will be required to confirm reserves.

Some attractive laminated tonalite was noted during the mapping program. This material should be sampled, slabbed and polished for initial evaluation.

Photo 1: Megacrystic granite outcrop on Turtle Lake property showing the relative absence of vertical joints and the homogeneity of the rock; also note that this hill stands 55 metres above surrounding area.

TABLE 3: RESULTS OF SAMPLE POLISHING

Sample No.	Type of Sample	Rock Type	Test Results
1993-3	Polished sample supplied by Chris Marmont and Dave Villard, both formerly of the Ministry of Northern Development and Mines, collected as part of their dimension stone project.	Megacrystic granite with stretched rapakivi texture	Granoblastic, polygonal-interlobate; Groundmass seriate: 0.1-2.0 mm. Garnet poikiloblasts range up to 4 mm; hornblende porphyroblasts up to 5 mm, feldspar porphyroclasts up to 1 cm.; plagioclase(35%), microcline(25%), quartz(20%), hornblende(15%), biotite(3%), garnet(3%), magnetite, apatite, sphene, zircon. The rock produces an excellent polish with minor plucking. (Marmont, 1993)

CONCLUSIONS

The Britt domain comprises a complexly deformed and metamorphosed series of rocks. Although some of the rocks are metasedimentary in origin the preponderance of the rocks were originally plutonic, but have been changed by dynamic and thermal metamorphism. The final stages of this metamorphism appear to have annealed the rock into a compact and durable material having some relict textures and many overlapping and lively features.

Nine dimension stone prospects were staked in the Parry Sound area, and all have been mapped geologically. Many of the rocks underlying these properties are migmatitic derivatives of granitic intrusions and present a great variety of textures. In some cases it is evident that the paleosome constituent was megacrystic and subsequent neosome phases have distinct compositions and fabrics. The sites were chosen for their attractiveness and the apparent availability of accessible large blocks.

The property is underlain by an unidentified circum 1450 Ma megacrystic granite pluton within the Rosseau domain. A strained megacrystic granite underlies the southern two thirds of the property and a tonalite gneiss underlies the northern portion. The rocks strike ENE and dip very gently to the north. The megacrystic granite contains approximately 20% amphiboles and is attractive. Site planning, geological mapping, and drilling of the large megacrystic granite outcrop in the centre of the property are warranted. Dimension stone resources exceed 10,000,000 tonnes.

RECOMMENDATIONS

1. It is recommended that a site plan be devised for the large outcrop in the middle of the Turtle Lake property involving detailed mapping and limited core drilling.

2. The laminated tonalite should be sampled slabbed and polished in order to evaluate its suitability as a dimension stone.

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AUTHOR'S CERTIFICATE

a. This report was prepared by:

James R. Trusler P.Eng.

Principal,
J R Trusler and Associates
143 Temperance St.
Aurora, Ontario L4G 2R5
(416) 727-5084

GEOLOGICAL ENGINEER.

b. Qualifications:

B A Sc - Geological Engineering, University of Toronto, 1967
M S - Geology, Michigan Technological University, 1972
Professional Engineer - Ontario
Fellow - Geological Association of Canada
Member - Canadian Institute of Mining, Metallurgy and Petroleum

c. This report is based on a review of all available relevant data; historical, and geological, on personal involvement as Regional Geologist, Algonquin Region, Ministry of Natural Resources from 1974 to 1980, and on a program of field mapping conducted within the area of this report in 1993. I have personally examined the properties and the surrounding area in the field.

d. I have used my experience gained in geological mapping, the exploration for minerals, visits to most dimension stone quarries in North America, the definition of mineral deposits and the evaluation of properties (over 30 years) in preparation of this report.

e. I hold an undivided 100% interest in the claims mentioned in this report, but do not expect to receive any remuneration for the report or as a result of statements made in this report.

Signed

Dated: December 30, 1993

James R. Trusler M.S., P.Eng.

KILLBEAR POINT PROPERTY

LEGEND

- Swamp, marsh, slough or beaver pond
- Sand and gravel pit
- Forested area with 0.3-2 metres of overburden pine, maple, poplar, birch
- 1 Granite gneiss (see notes)
- 2 Purple and pink migmatite (see notes)
- 3 Migmatite (see notes)
- 4 Coronitic metagabbro

SYMBOL LIST

- Gneissic foliation
- Joints
- Property boundary
- Highway, road
- Secondary road
- Abandoned road or trail
- Road allowance
- Concession line
- Lot line
- Electric power line
- Topographic contour (5 metre interval ASL)
- Edge of swamp
- Edge of forested area
- Beaver dam
- Edge of quarry (now municipal garbage dump)
- Buildings
- Geological contact inferred

NOTES TO LEGEND AND SYMBOL LIST

1 Granite gneiss - layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite, hematite and almandine.

a) coarse grained equigranular rock, very weakly layered;

b) unit 1a with coarse reddish-mauve speckles imparted by a combination of almandine and hematite,

c) strongly layered fine to coarse grained cataclastic rock;

d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain;

e) fine to medium grained massive pink to rose coloured rock with thin biotite-rich partings;

f) unit 1e more thinly layered and containing mauve almandine-hematite laminae

2 Purple and pink migmatite generally a layered rock containing medium to coarse grained layers of unit 1a as a principal constituent and a regular fine to medium grained purple or mauve layer comprising quartz, feldspar, biotite, almandine and hematite; often a third regular milky to buff layer of late tectonic granulated quartzo-feldspathic pegmatitic material forms parallel conformable layers which generally exhibit pinch and swell textures·

a) thinly laminated or layered pink and mauve or pink, mauve and buff rock;

b) 2a with brecciated mauve fragments in pink layers or crenulations of mauve layers in the pink layers,

c) 2a or 2b with >5% biotite or hornblende-rich mafic layers

3 Biotite hornblende migmatite - a rock comprising mixed components in which >25% is introduced or neosome material

a) unit 2a with >25% post or late tectonic lit par lit granitic pegmatitic material;

b) mafic gneiss with >25% post or late tectonic lit par lit granitic pegmatitic material

4 Coronitic metagabbro - coarse grained mafic to ultramafic rock with relict outlines of original pyroxene phenocrysts or oikocrysts

Gneissic foliation - in order of occurrence the symbols depict an inclined surface with dip angle recorded and the azimuth indicated by the line, a vertical gneissic foliation again with the azimuth indicated by the line, and, a horizontal gneissic foliation

Joints - in order of occurrence the joints (fractures) are horizontal, vertical, and inclined with the dip indicated. The spacing or separation between a set of regular parallel joints is recorded in metres close to the plotted location of the joint as follows the numbers above the horizontal line represent the minimum and maximum spacing in metres between fractures and the number below the line (or where a single number is displayed) represents the average joint separation in metres

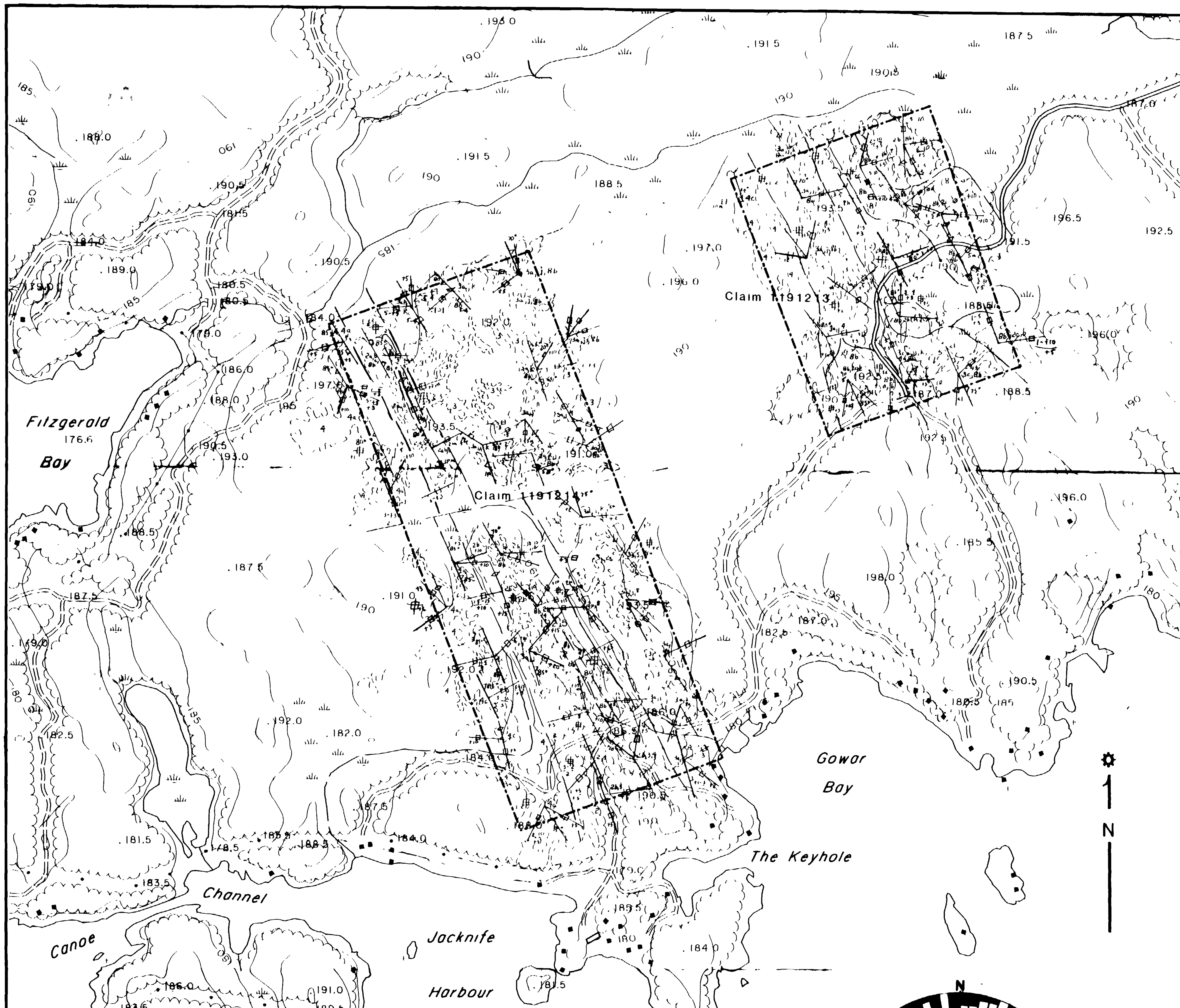
SCALE
1:5,000
feet
metres

JAMES R TRUSLER
CONSULTING GEOLOGIST &ENGINEER

KILLBEAR POINT PROPERTY

GEOLOGICAL MAP

Date: Oct.13, 1993 Drawn by: JR Trusler



LEGEND

1 — FELSIC GNEISS[1] – layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite, hematite and almandine a) coarse grained equigranular rock very weakly layered, b) unit 1a with coarse reddish-mauve speckles of hematite, c) strongly layered fine to coarse grained cataclastic rock, d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain, e) fine to medium grained massive pink to rose coloured rock with thin biotite-rich partings, f) unit 1e more thinly layered and containing mauve hematite-bearing laminae

2 — AMPHIBOLITE GNEISS – layered to massive, fine to coarse grained, greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state a) fine to coarse grained, thinly to thickly layered uniform gneiss occasionally with some biotite rich partings, b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite, c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a

3 — BIOTITE HORNBLENDE MIGMATITE – a fine to coarse grained, highly variable rock of multicomponent origin generally lit par lit layered and frequently comprising similar intrafolial folds, the paleosome constituent comprises biotite, hornblende, feldspar and quartz and frequently has a relict foliated or thinly laminated texture, the neosome constituent is generally coarser and comprises a syntectonic, cataclastic, originally pegmatitic aggregate of quartz, feldspar and minor hornblende and/or biotite a) variegated pale and dark grey with mafic content ≥20%, b) variegated pale and medium grey with mafic content ≥10% ≤20%, c) variegated pink and medium grey with mafic content ≥10% <20%, d) variegated pale and light grey with biotite content ≤10%, e) variegated pink and light grey with biotite content ≤10%, f) intense pink schlieren with biotite content ≤5%, g) minor purple hematite spotting, h) late tectonic pegmatite ≥10%, i) late tectonic pegmatite ≤10%; j) hornblende dominant mafic mineral, k) biotite dominant mafic mineral

4 — PURPLE AND PINK MIGMATITE – variegated rock with laminations of medium to coarse grained unit 1a or 3f and a fine to medium grained reddish mauve layer comprising quartz, feldspar, biotite, almandine and hematite, often a milky to buff late tectonic granulated quartzo-feldspathic pegmatitic material forms conformable layers which generally exhibit pinch and swell textures: a) thinly laminated or layered pink and mauve or pink mauve and buff rock, b) 4a with brecciated mauve fragments in pink or buff layers or crenulations of mauve layers in the pink or buff layers, c) 4a or 4b with <5% biotite or hornblende rich mafic layers

5 — GABBRO – coarse grained mafic to ultramafic rock a) coronitic metagabbro having relict outlines of original pyroxene phenocrysts or oikocrysts and a massive to slightly foliated texture, b) amphibolite gneiss foliated and generally layered rock with ≥40% amphiboles

6 — TONALITE – coarse grained intermediate rock with ≥20% <50% mafic minerals generally with some relict plagioclase phenocrysts and a strained to uniform gneissic fabric a) variegated medium to dark grey and pale grey, regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts, b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole, feldspar and quartz

7 — MEGACRYSTIC GRANITE – Porphyritic rock with relict, strained, orthoclase phenocrysts within a medium to coarse grained matrix of quartz plagioclase, orthoclase and biotite and/or hornblende a) pink phenocrysts with prestrained diameters of ≤ 2cm, b) pink phenocrysts with prestrained diameters of ≤ 5cm, c) > 5% ≤ 20% pink, fine to medium grained syntectonic pegmatite, d) folding, stretching, rolling and rodding of preexisting phenocrysts and pegmatite stringers

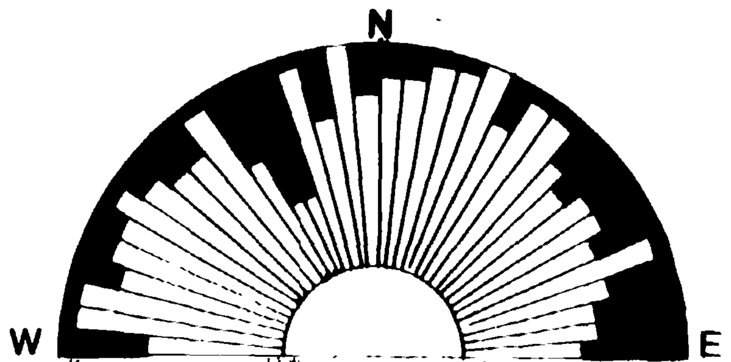
8 — GRANITE PEGMATITE – fine to coarse grained quartz, microcline, plagioclase, and biotite-bearing rock varying in texture in response to its tectonic history a) very coarsely crystalline, unstrained, post-tectonic rock, b) very coarse crystalline tectonic breccia, c) medium to coarse grained cataclastic rock with occasional large clasts, identical to unit 1d in appearance

[1] No origin is inferred by this name

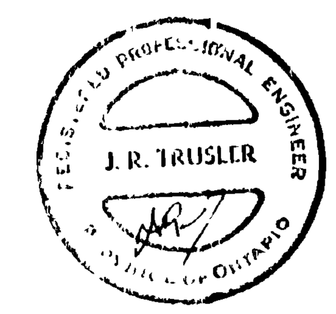
[1] No relative ages are inferred by this order of the legend

SYMBOL LIST

- Gneissic foliation: with dip; vertical, horizontal
- Joints: horizontal, vertical with average spacing, with dip, minimum and maximum spacing and average separation
- Schistocity or foliation
- Lineation: with plunge
- Property boundary
- Highway, road
- Secondary road
- Abandoned road or trail
- Road allowance
- Railroad
- Concession line
- Lot line
- Electric power line
- Topographic contour (5 metre interval ASL)
- Swamp
- Clearing
- Outcrop
- Quarry
- Buildings
- Geological contact inferred



STRIKE FREQUENCY DIAGRAM OF JOINTS
137 data



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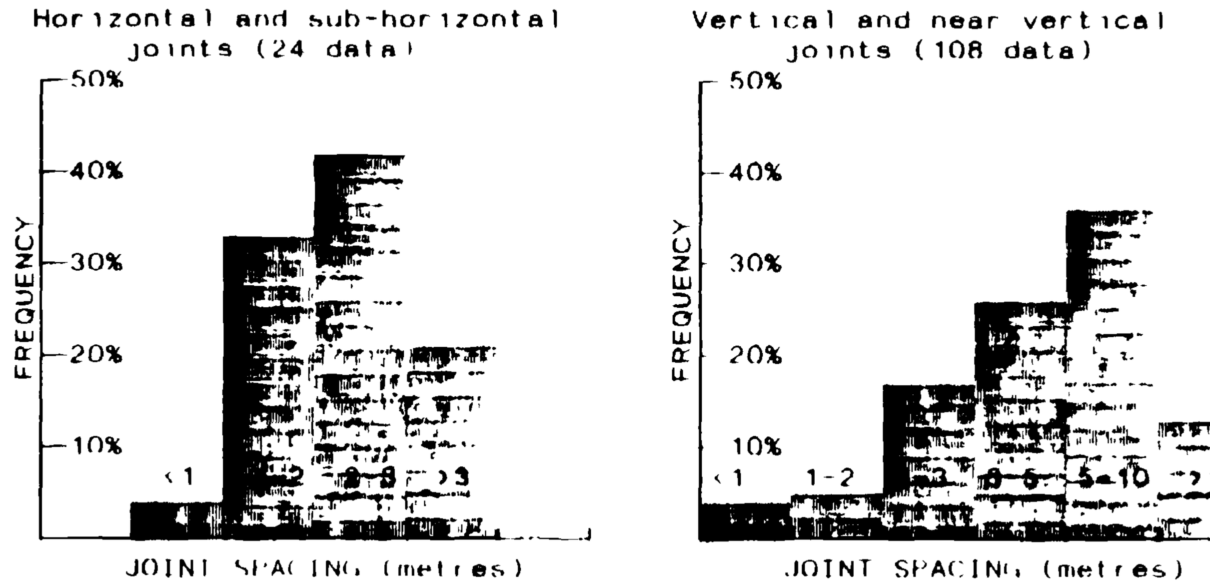
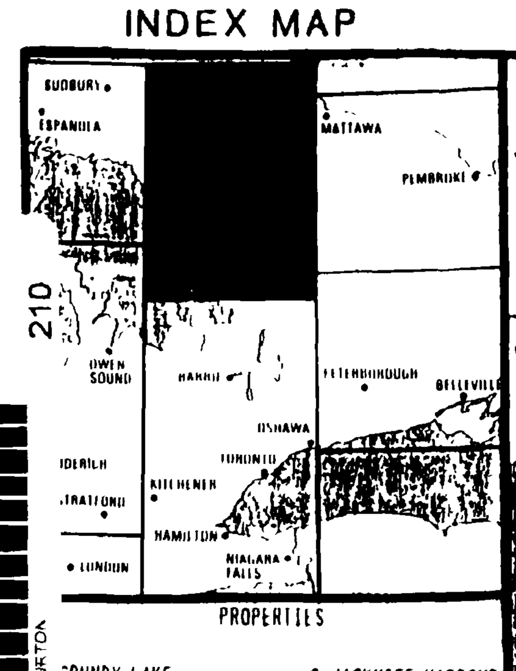
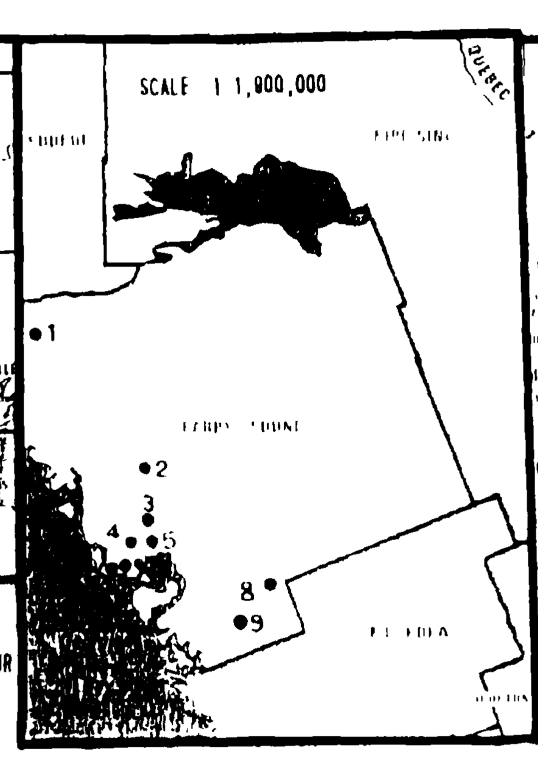
JOINT SPACING HISTOGRAMS

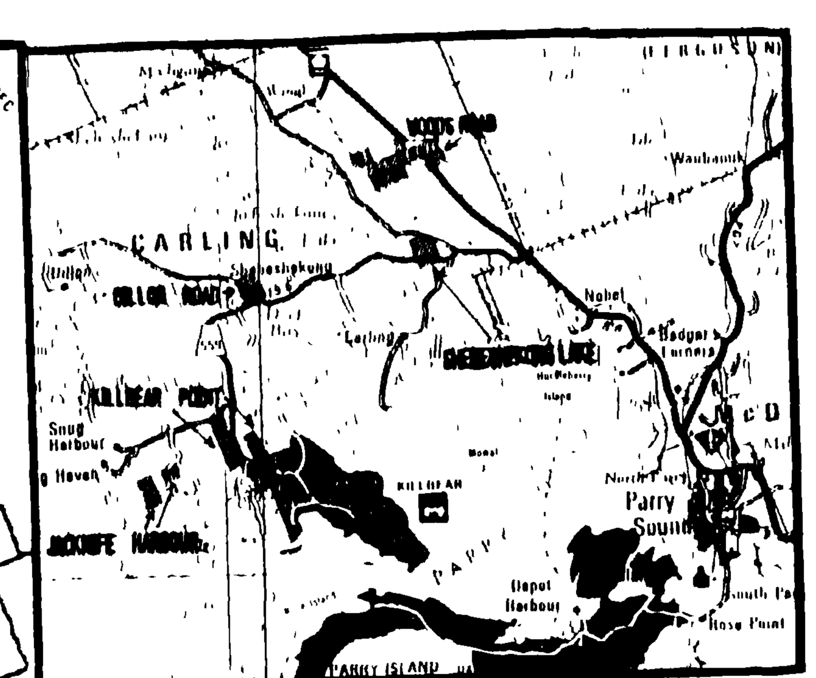


INDEX MAP





PROJECT AREA



LOCATION MAP
SCALE: 1:250,000

JR TRUSLER & ASSOCIATES MINERAL CONSULTANTS		
JACKNIFE HARBOUR PROPERTY		
GEOLOGICAL MAP		
DATE OCT 18, 1993	SCALE 1:5,000	DRAWN BY JR TRUSLER

LEGEND
1 FELSIC GNEISS[1] layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite, hematite and amphibole
a) coarse grained equigranular rock, very weakly layered
b) unit 1a with coarse reddish mauve speckles of hematite
c) strongly layered fine to coarse grained cataclastic rock,
d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain,
e) fine to medium grained massive pink to rose coloured rock with thin biotite rich partings,
f) unit 1a more thinly layered and containing mauve hematite-bearing laminae
2 AMPHIBOLITE GNEISS layered to massive fine to coarse grained greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state
a) fine to coarse grained thinly to thickly layered uniform gneiss occasionally with some biotite rich partings,
b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite,
c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a
3 BIOTITE HORNBLENDE MIGMATITE a fine to coarse grained highly variable rock of multicomponent origin generally lit par lit layered and frequently comprising similar intrafolial folds, the paleosome constituent comprises biotite, hornblende feldspar and quartz and frequently has a relict foliated or thinly laminated texture, the neosome constituent is generally coarser and comprises a syntectonic, cataclastic originally pegmatitic aggregate of quartz feldspar and minor hornblende and/or biotite
a) variegated pale and dark grey with mafic content >20%
b) variegated pale and medium grey with mafic content >10% ≤20%,
c) variegated pink and medium grey with mafic content >10% <20%
d) variegated pale and light grey with biotite content <10%,
g) minor purple hematite spotting,
h) late tectonic pegmatite >10%,
i) late tectonic pegmatite <10%
j) hornblende dominant mafic mineral,
k) biotite dominant mafic mineral
4 PURPLE AND PINK MIGMATITE variegated rock with laminations of medium to coarse grained unit 1a or 3f and a fine to medium grained reddish mauve layer comprising quartz feldspar, biotite, almandine and hematite, often a milky to buff late tectonic granulated quartzo feldspathic pegmatitic material forms conformable layers which generally exhibit pinch and swell textures
a) thinly laminated or layered pink and mauve or pink mauve and buff rock,
b) 4a with brecciated mauve fragments in pink or buff layers or crenulations of mauve layers in the pink or buff layers,
c) 4a or 4b with >5% biotite or hornblende rich mafic layers
5 GABBRO coarse grained mafic to ultramafic rock
a) Coronitic metagabbro having relict outlines of original pyroxene phenocrysts or oikocrysts and a massive to slightly foliated texture,
b) amphibolite gneiss foliated and generally layered rock with >40% amphiboles
6 TONALITE coarse grained intermediate rock with >20% <50% mafic minerals generally with some relict plagioclase phenocrysts and a strained to uniform gneissic fabric
a) variegated medium to dark grey and pale grey, regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts,
b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole, feldspar and quartz
7 MEGACRYSTIC GRANITE Porphyritic rock with relict, strained orthoclase phenocrysts within a medium to coarse grained matrix of quartz plagioclase, orthoclase and biotite and/or hornblende
a) pink phenocrysts with prestrained diameters of ~2cm,
b) pink phenocrysts with prestrained diameters of ~5cm,
c) >5% <20% pink fine to medium grained syntectonic pegmatite,
d) folding stretching rolling and rodding of preexisting phenocrysts and pegmatite stringers
8 GRANITE PEGMATITE fine to coarse grained quartz, microcline plagioclase and biotite bearing rock varying in texture in response to its tectonic history
a) very coarsely crystalline, unstrained post tectonic rock
b) very coarse crystalline tectonic breccia,
c) medium to coarse grained cataclastic rock with occasional large clasts identical to unit 1d in appearance
SYMBOL LIST
Gneissic foliation: with dip; vertical, horizontal
Joints: horizontal, vertical with average spacing, with dip, minimum and maximum spacing and average separation
Schistocity or foliation
Lineation: with plunge
Property boundary
Highway, road
Secondary road
Abandoned road or trail
Road allowance
Railroad
Concession line
Lot line
Electric power line
Topographic contour (5 metre interval ASL)
Swamp
Clearing
Outcrop
Quarry
Buildings
Geological contact inferred
Claim 1191217
Claim 1151133
Claim 1151131
Claim 1151132
Dinner Lake
Carling Twp
N
INDEX MAP
PROJECT AREA
LOCATION MAP
SCALE 1:250,000
JOINT SPACING HISTOGRAMS
STRIKE FREQUENCY DIAGRAM OF JOINTS
456 data
SCALE
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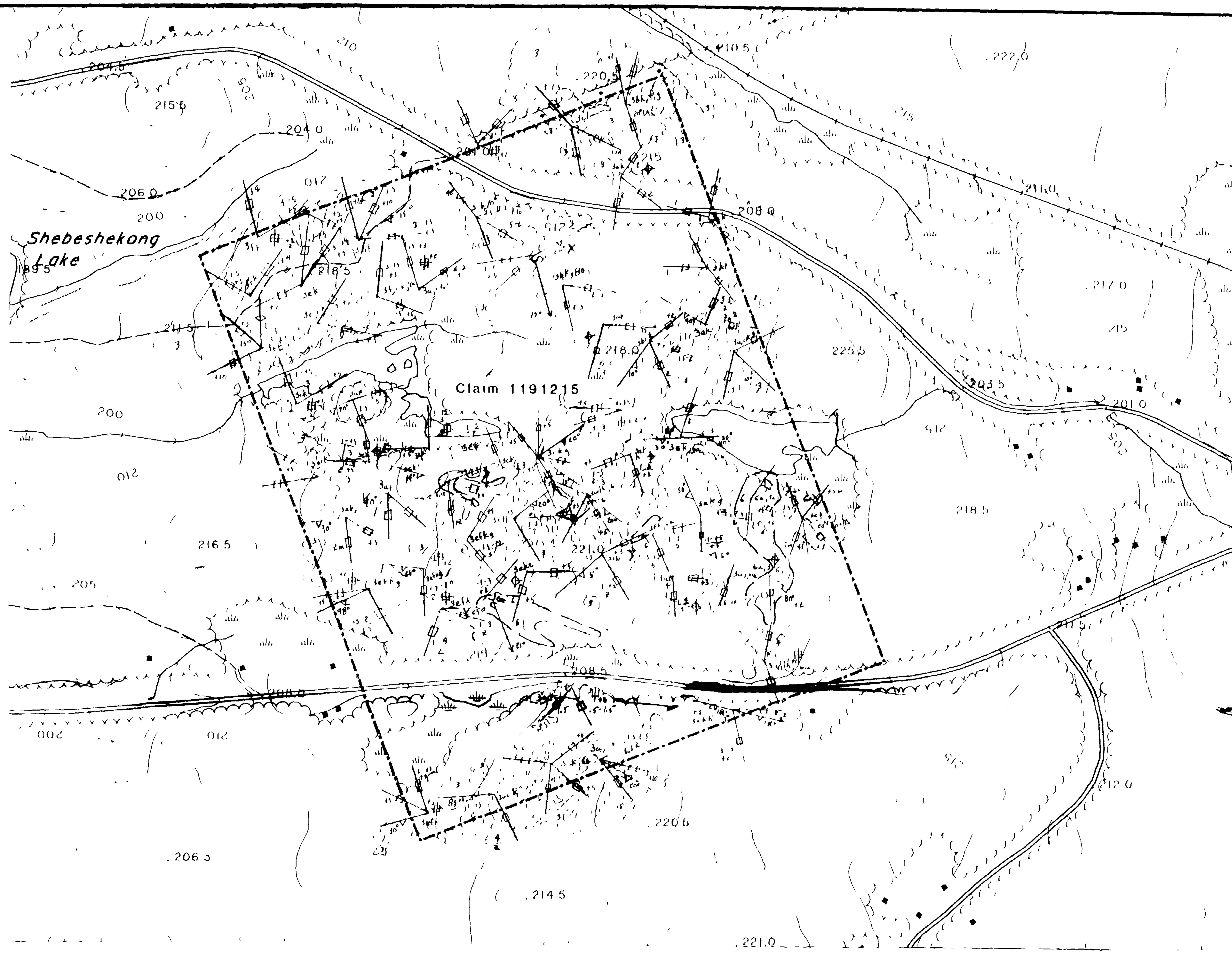
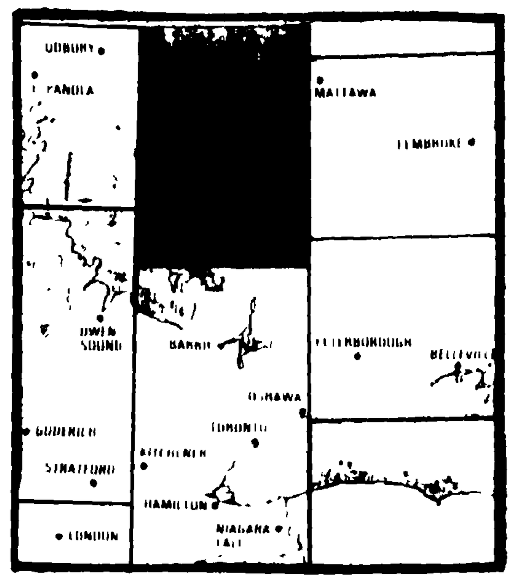
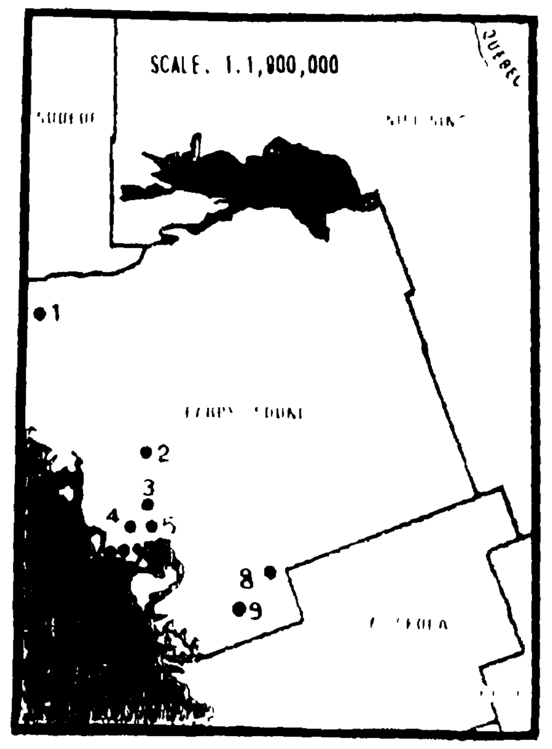
J.R. TRUSLER
JR TRUSLER & ASSOCIATES
MINERAL CONSULTANTS
WOODS ROAD PROPERTY
GEOLOGICAL MAP



INDEX MAP

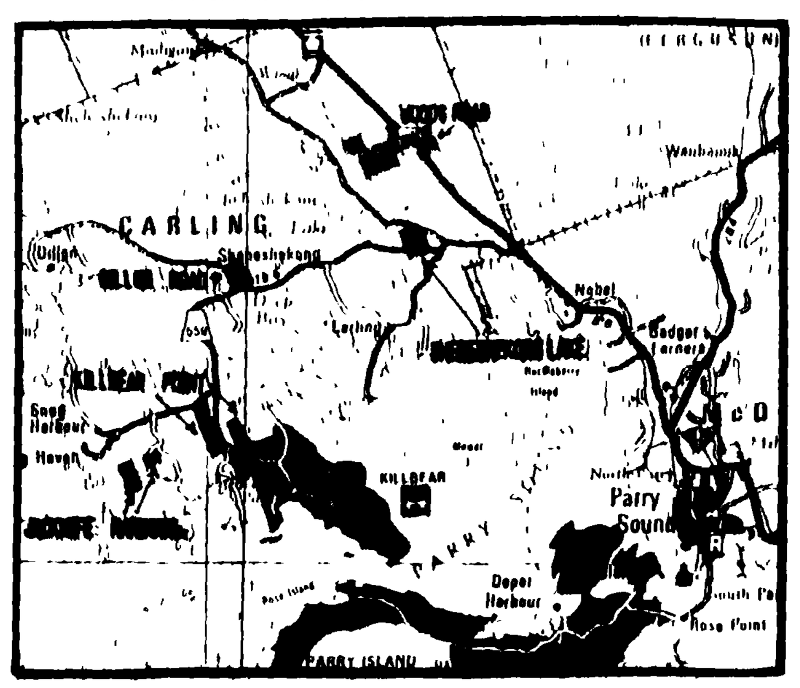




PROJECT AREA

PROPERTIES

1 GRUNDY LAKE
2 BLACK LAKE
3 WOODS ROAD
4 DILLON ROAD
5 SHEBESHEKONG LAKE
6 JACKNIFE HARBOUR
7 KILLBEAR POINT
8 TURTLE LAKE
9 BURNT LAKE

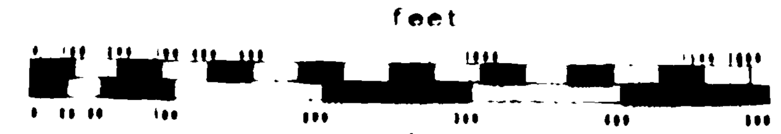


LOCATION MAP

SCALE. 1:250,000

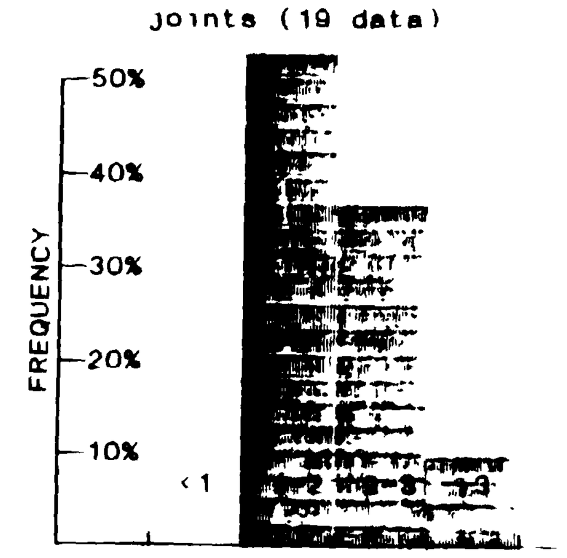
SCALE

1:5,000

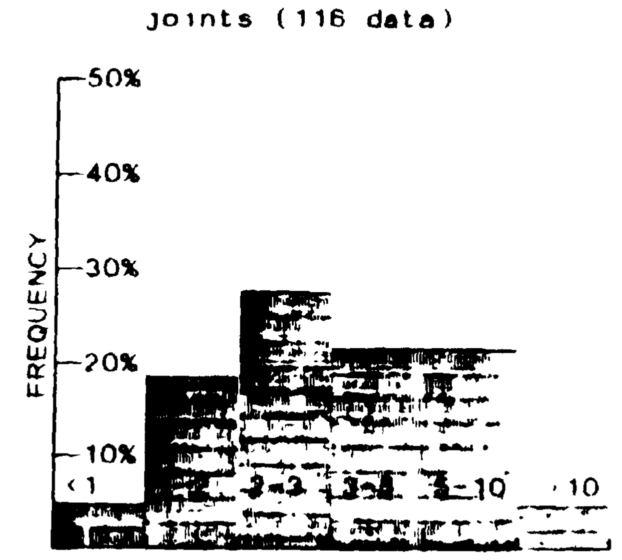


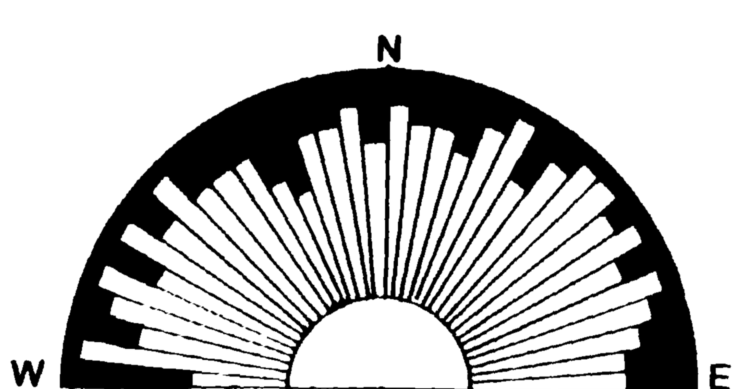
JOINT SPACING HISTOGRAMS

Horizontal and sub-horizontal joints (19 data)



Vertical and near vertical joints (116 data)





STRIKE FREQUENCY DIAGRAM OF JOINTS

138 data

SYMBOL LIST

Gneissic foliation: with dip, vertical , horizontal
Joints horizontal, vertical with average spacing, with dip minimum and maximum spacing and average separation
Schistocity or foliation
Lineation: with plunge
Property boundary
Highway, road
Secondary road
Abandoned road or trail
Road allowance
Railroad
Concession line
lot line
Electric power line
Topographic contour (5 metre interval ASL)
Swamp
Clearing
Outcrop
Quarry
Buildings
Geological contact inferred

LEGEND

1 FELSIC GNEISS[1] - layered to massive rock mainly composed of quartz plagioclase and microcline with minor matrix biotite and variable accessory magnetite hematite and almandine
a) coarse grained equigranular rock, very weakly layered
b) unit 1a with coarse reddish mauve speckles of hematite
c) strongly layered fine to coarse grained cataclastic rock
d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain
e) fine to medium grained massive pink to rose coloured rock with thin biotite rich partings
f) unit 1e more thinly layered and containing mauve hematite bearing laminae

2 AMPHIBOLITE GNEISS layered to massive fine to coarse grained greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state
a) fine to coarse grained thinly to thickly layered uniform gneiss occasionally with some biotite rich partings,
b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite
c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a

3 BIOTITE HORNBLENDE MIGMATITE a fine to coarse grained, highly variable rock of multicomponent origin generally lit par lit layered and frequently comprising similar intrafolial folds, the paleosome constituent comprises biotite hornblende feldspar and quartz and frequently has a relict foliated or thinly laminated texture, the neosome constituent is generally coarser and comprises a syntectonic cataclastic or originally pegmatitic aggregate of quartz, feldspar and minor hornblende and/or biotite
a) variegated pale and dark grey with mafic content >20%
b) variegated pale and medium grey with mafic content >10% <20%
c) variegated pink and medium grey with mafic content >10% <20%,
d) variegated pale and light grey with biotite content <10%,
e) variegated pink and light grey with biotite content <10%
f) intense pink schlieren with biotite content <5%
g) minor purple hematite spotting
h) late tectonic pegmatite >10%
i) late tectonic pegmatite <10%,
j) hornblende dominant mafic mineral
k) biotite dominant mafic mineral

4 PURPLE AND PINK MIGMATITE - variegated rock with laminations of medium to coarse grained unit 1a or 3f and a fine to medium grained reddish mauve layer comprising quartz, feldspar biotite almandine and hematite often a milky to buff late tectonic granulated [illegible] pegmatitic material forms conformable layer which [illegible] textures
a) thinly laminated or layered pink and mauve or pink, mauve and buff rock,
b) 4a with brecciated mauve fragments in pink or buff layers or crenulations of mauve layers in the pink or buff layers,
c) 4a or 4b with <5% biotite or hornblende rich mafic layers

5 GABBRO coarse grained mafic to ultramafic rock
a) Coronitic metagabbro having relict outlines of original pyroxene phenocrysts or [illegible] and a massive to slightly foliated texture
b) amphibolite gneiss foliated and generally layered rock with >40% amphiboles

6 TONALITE coarse grained intermediate rock with ≥20% <50% mafic minerals generally with some relict plagioclase phenocrysts and a strained to uniform gneissic fabric
a) variegated medium to dark grey and pale grey regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts,
b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole, feldspar and quartz

7 MEGACRYSTIC GRANITE - Porphyritic rock with relict, strained orthoclase phenocrysts within a medium to coarse grained matrix of quartz plagioclase orthoclase and biotite and/or hornblende
a) pink phenocrysts with prestrained diameters of ≤ 2cm
b) pink phenocrysts with prestrained diameters of ≤ 5cm,
c) > 5% ≤ 20% pink fine to medium grained syntectonic pegmatite,
d) folding stretching rolling and rodding of preexisting phenocrysts and pegmatite stringers

8 GRANITE PEGMATITE - fine to coarse grained quartz microcline, plagioclase and biotite bearing rock varying in texture in response to its tectonic history
a) very coarsely crystalline unstrained post tectonic rock,
b) very coarse crystalline tectonic breccia
c) medium to coarse grained cataclastic rock with occasional large clasts, identical to unit 1d in appearance

[1]No origin is inferred by this name
[1]No relative ages are inferred by this order of the legend

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

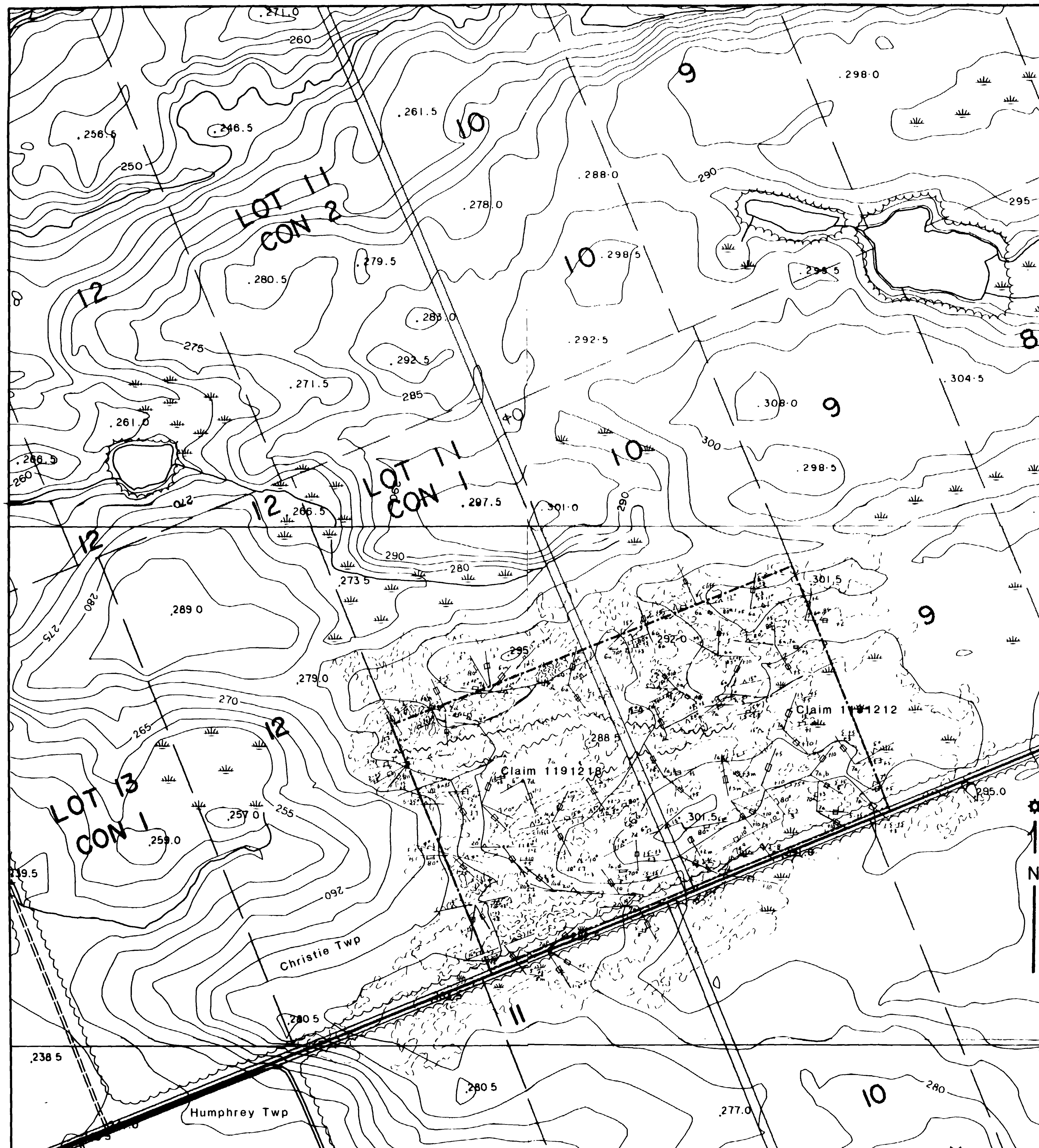
JR TRUSLER & ASSOCIATES
MINERAL CONSULTANTS

SHEBESHEKONG LAKE PROPERTY

GEOLOGICAL MAP

DATE OCT 16 1991 | SCALE 1:5 000 | DRAWN BY JR TRUSLER

230



LEGEND

1 FELSIC GNEISS[1] – layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite, hematite and almandine a) coarse grained equigranular rock, very weakly layered, b) unit 1a with coarse reddish-mauve speckles of hematite, c) strongly layered fine to coarse grained cataclastic rock, d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain, e) fine to medium grained massive pink to rose coloured rock with thin biotite-rich partings, f) unit 1e more thinly layered and containing mauve hematite-bearing laminae

2 AMPHIBOLITE GNEISS – layered to massive, fine to coarse grained, greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state a) fine to coarse grained, thinly to thickly layered uniform gneiss occasionally with some biotite rich partings, b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite, c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a

3 BIOTITE HORNBLENDE MIGMATITE – a fine to coarse grained, highly variable rock of multicomponent origin generally lit par lit layered and frequently comprising similar intrafolial folds, the paleosome constituent comprises biotite, hornblende, feldspar and quartz and frequently has a relict foliated or thinly laminated texture, the neosome constituent is generally coarser and comprises a syntectonic, cataclastic, originally pegmatitic aggregate of quartz, feldspar and minor hornblende and/or biotite a) variegated pale and dark grey with mafic content ≥20%, b) variegated pale and medium grey with mafic content >10% ≤20%, c) variegated pink and medium grey with mafic content ≥10% <20%, d) variegated pale and light grey with biotite content <10%, e) variegated pink and light grey with biotite content <10%, f) intense pink schlieren with biotite content <5%, g) minor purple hematite spotting, h) late tectonic pegmatite ≥10%, i) late tectonic pegmatite <10%, j) hornblende dominant mafic mineral, k) biotite dominant mafic mineral

4 PURPLE AND PINK MIGMATITE - variegated rock with laminations of medium to coarse grained unit 1a or 3f and a fine to medium grained reddish mauve layer comprising quartz, feldspar, biotite, almandine and hematite; often a milky to buff late tectonic granulated quartzo-feldspathic pegmatitic material forms conformable layers which generally exhibit pinch and swell textures: a) thinly laminated or layered pink and mauve or pink, mauve and buff rock, b) 4a with brecciated mauve fragments in pink or buff layers or crenulations of mauve layers in the pink or buff layers, c) 4a or 4b with >5% biotite or hornblende-rich mafic layers

5 GABBRO – coarse grained mafic to ultramafic rock a) Coronitic metagabbro having relict outlines of original pyroxene phenocrysts or oikocrysts and a massive to slightly foliated texture, b) amphibolite gneiss foliated and generally layered rock with ≥40% amphiboles

6 TONALITE – coarse grained intermediate rock with ≥20% <50% mafic minerals generally with some relict plagioclase phenocrysts and a strained to uniform gneissic fabric a) variegated medium to dark grey and pale grey regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts, b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole, feldspar and quartz

7 MEGACRYSTIC GRANITE – Porphyritic rock with relict strained, orthoclase phenocrysts within a medium to coarse grained matrix of quartz, plagioclase orthoclase and biotite and/or hornblende a) pink phenocrysts with prestrained diameters of ≤ 2cm, b) pink phenocrysts with prestrained diameters of ≤ 5cm, c) > 5% < 20% pink fine to medium grained, syntectonic pegmatite, d) folding, stretching, rolling and rodding of preexisting phenocrysts and pegmatite stringers

8 GRANITE PEGMATITE – fine to coarse grained quartz, microcline plagioclase, and biotite-bearing rock varying in texture in response to its tectonic history a) very coarsely crystalline, unstrained, post-tectonic rock, b) very coarse crystalline tectonic breccia, c) medium to coarse grained cataclastic rock with occasional large clasts, identical to unit 1d in appearance

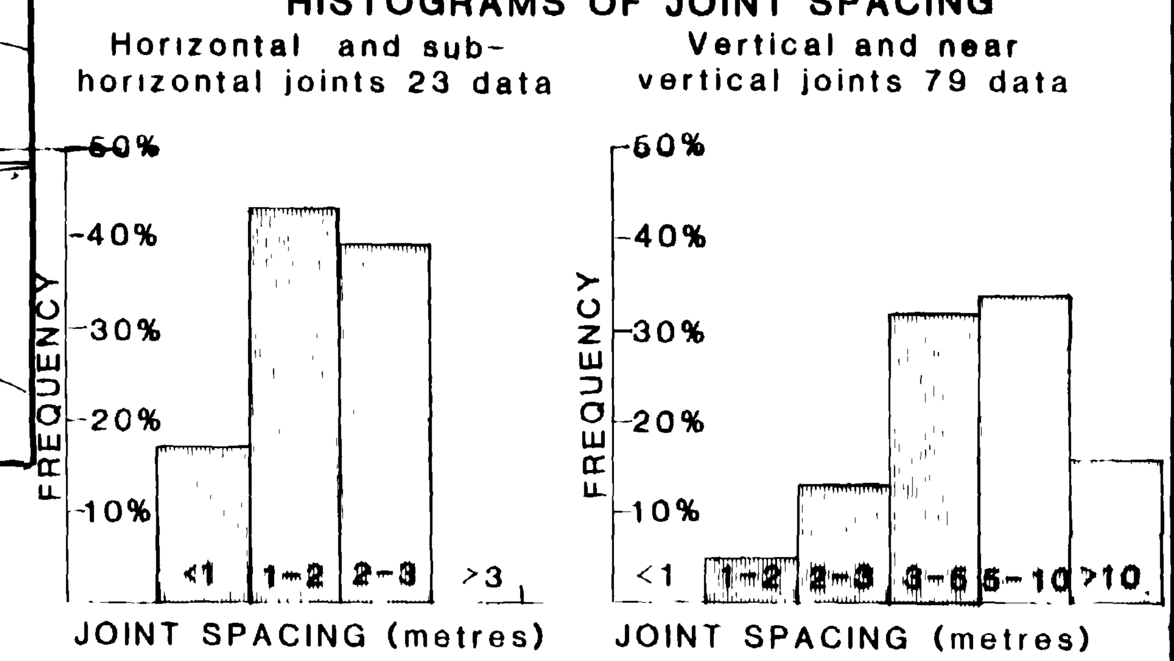
[1]No origin is inferred by this name

[2]No relative ages are inferred by this order of the legend

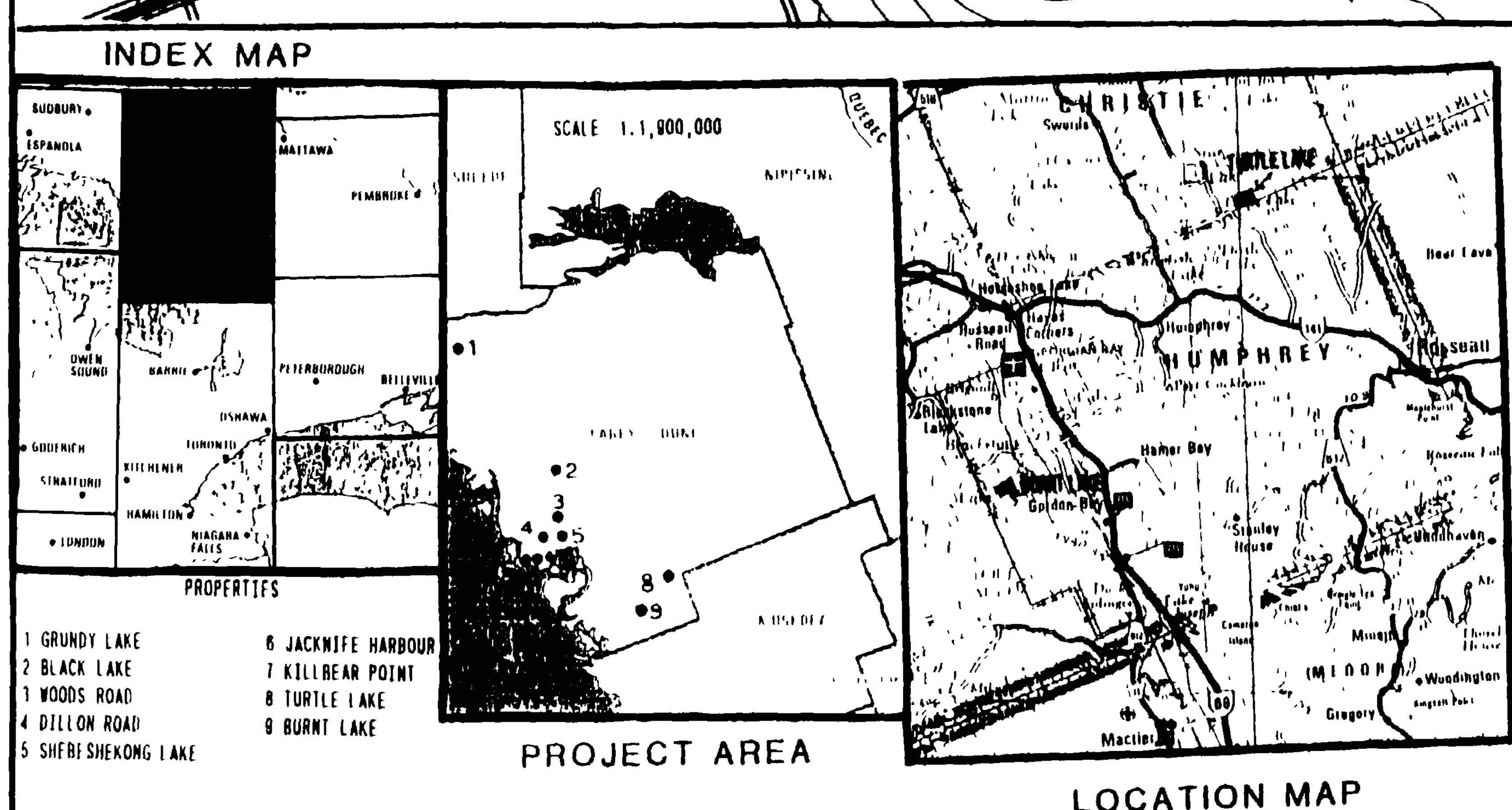
SYMBOL LIST

- Gneissic foliation: with dip; vertical ; horizontal
- Joints: horizontal; vertical with average spacing, with dip, minimum and maximum spacing and average separation
- Schistocity or foliation
- Lineation: with plunge
- Property boundary
- Highway, road
- Secondary road
- Abandoned road or trail
- Road allowance
- Railroad
- Concession line
- Lot line
- Electric power line
- Topographic contour (5 metre interval ASL)
- Swamp
- Clearing
- Outcrop
- Quarry
- Buildings
- Geological contact inferred
- Fault

HISTOGRAMS OF JOINT SPACING

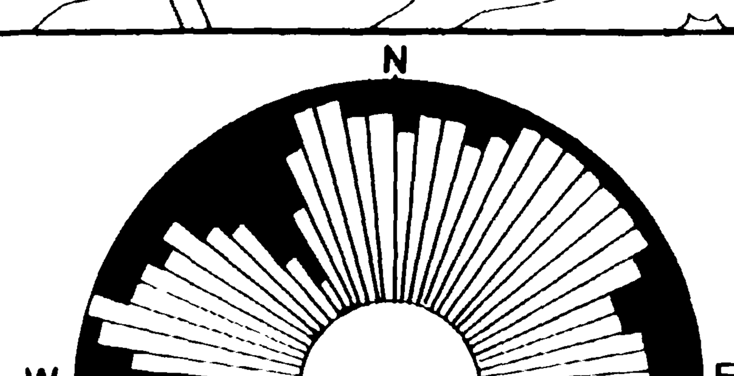


INDEX MAP



LOCATION MAP

SCALE. 1:250,000



STRIKE FREQUENCY DIAGRAM OF JOINTS

85 Vertical and near vertical joints

SCALE

1:5,000

feet

metres

JR TRUSLER & ASSOCIATES

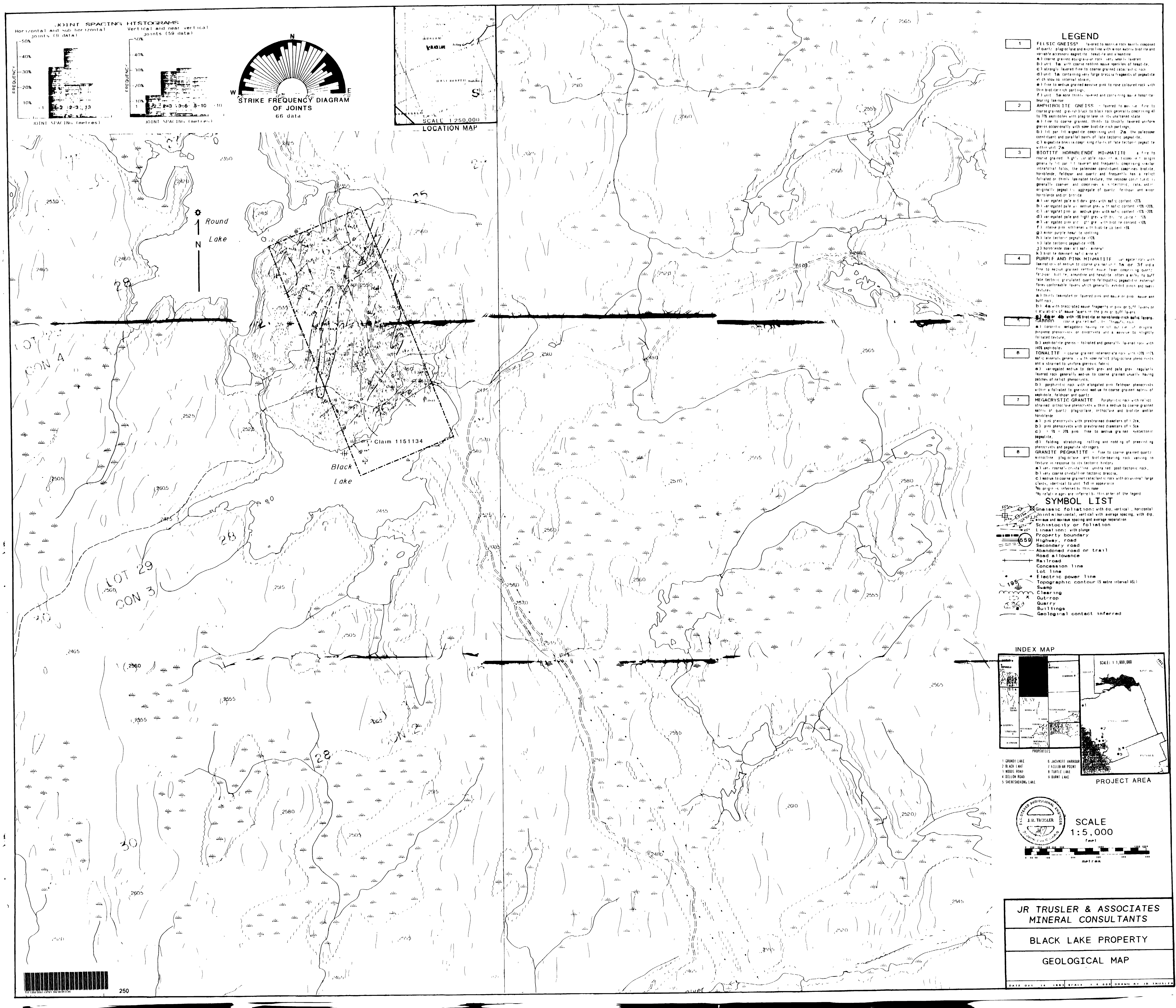
MINERAL CONSULTANTS

TURTLE LAKE PROPERTY

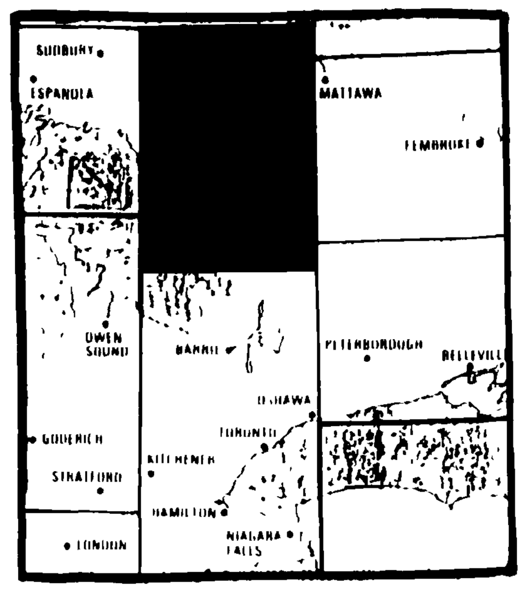
GEOLOGICAL MAP

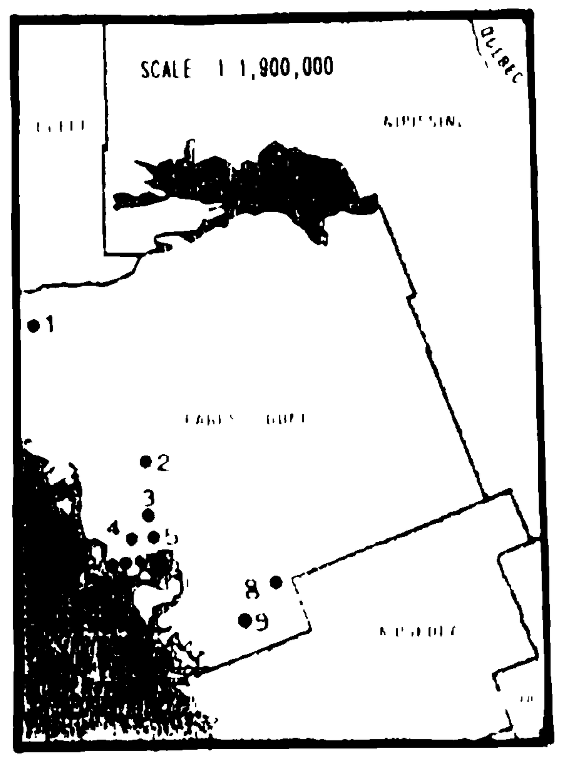
DATE Oct 18 1983	SCALE 1 5 000	DRAWN BY JR TRUSLER

240


JOINT SPACING HISTOGRAMS
Horizontal and sub horizontal joints (9 data)
Vertical and near vertical joints (59 data)
FREQUENCY
JOINT SPACING (metres)
STRIKE FREQUENCY DIAGRAM OF JOINTS
66 data
N
W
E
LOCATION MAP
SCALE 1:250,000
Round Lake
N
Claim 1151134
Black Lake
LOT 29
CON 3
CON 4
LEGEND
1
FELSIC GNEISS[1] layered to massive rock mainly composed of quartz plagioclase and microcline with minor matrix biotite and variable accessory magnetite hematite and almandine
a) coarse grained equigranular rock very weakly layered
b) unit 1a with coarse reddish mauve speckles of hematite,
c) strongly layered fine to coarse grained cataclastic rock
d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain,
e) fine to medium grained massive pink to rose coloured rock with thin biotite-rich partings,
f) unit 1e more thinly layered and containing mauve hematite-bearing laminae
2
AMPHIBOLITE GNEISS - layered to massive fine to coarse grained greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state
a) fine to coarse grained, thinly to thickly layered uniform gneiss occasionally with some biotite rich partings,
b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite,
c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a
3
BIOTITE HORNBLENDE MIGMATITE
a) variegated pale and dark grey with mafic content >20%
b) variegated pale and medium grey with mafic content >10% <20%,
c) variegated pink and medium grey with mafic content >10% <20%
g) minor purple hematite spotting
h) late tectonic pegmatite >10%
i) late tectonic pegmatite <10%
4
PURPLE AND PINK MIGMATITE
a) thinly laminated or layered pink and mauve or pink mauve and buff rock,
c) 4a or 4b with >5% biotite or hornblende-rich mafic layers.
5
GABBRO
b) amphibolite gneiss - foliated and generally layered rock with ≥40% amphiboles
6
TONALITE
a) variegated medium to dark grey and pale grey regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts,
b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole, feldspar and quartz
7
MEGACRYSTIC GRANITE Porphyritic rock with relict strained orthoclase phenocrysts in a medium to coarse grained matrix of quartz plagioclase, orthoclase and biotite and/or hornblende
a) pink phenocrysts with prestrained diameters of ≤ 2cm,
b) pink phenocrysts with prestrained diameters of ≤ 5cm
c) > 5% < 20% pink fine to medium grained syntectonic pegmatite,
d) folding stretching rolling and rodding of preexisting phenocrysts and pegmatite stringers
8
GRANITE PEGMATITE - fine to coarse grained quartz microcline plagioclase and biotite-bearing rock varying in texture in response to its tectonic history
a) very coarsely crystalline unstrained post-tectonic rock,
b) very coarse crystalline tectonic breccia,
c) medium to coarse grained cataclastic rock with occasional large clasts, identical to unit 1d in appearance
[1]No origin is inferred by this name
[2]No relative ages are inferred by this order of the legend
SYMBOL LIST
Gneissic foliation: with dip, vertical, horizontal
Joints: horizontal, vertical with average spacing, with dip, minimum and maximum spacing and average separation
Schistocity or foliation
Lineation: with plunge
Property boundary
Highway, road
Secondary road
Abandoned road or trail
Road allowance
Railroad
Concession line
Lot line
Electric power line
Topographic contour (5 metre interval ASL)
Swamp
Clearing
Outcrop
Quarry
Buildings
Geological contact inferred
INDEX MAP
SCALE: 1:1,900,000
PROPERTIES
1 GRUNDY LAKE
2 BLACK LAKE
3 WOODS ROAD
4 DILLON ROAD
5 SHEBESHEKONG LAKE
6 JACKNIFE HARBOUR
7 KILLBEAR POINT
8 TURTLE LAKE
9 BURNT LAKE
PROJECT AREA
REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
SCALE
1:5,000
feet
metres
JR TRUSLER & ASSOCIATES
MINERAL CONSULTANTS
BLACK LAKE PROPERTY
GEOLOGICAL MAP
DATE Oct 14 1993
DRAWN BY JR TRUSLER

INDEX MAP

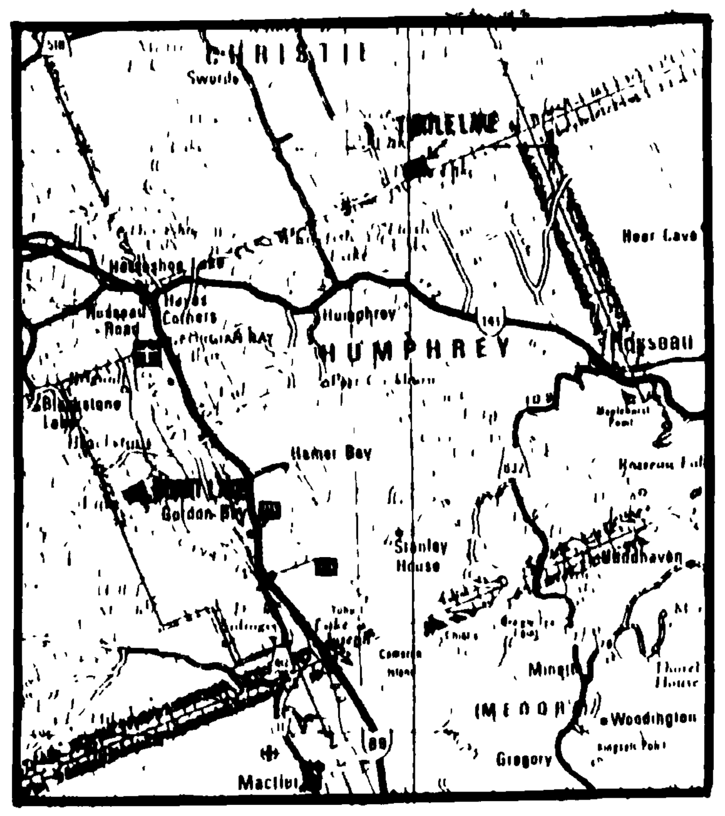




PROJECT AREA

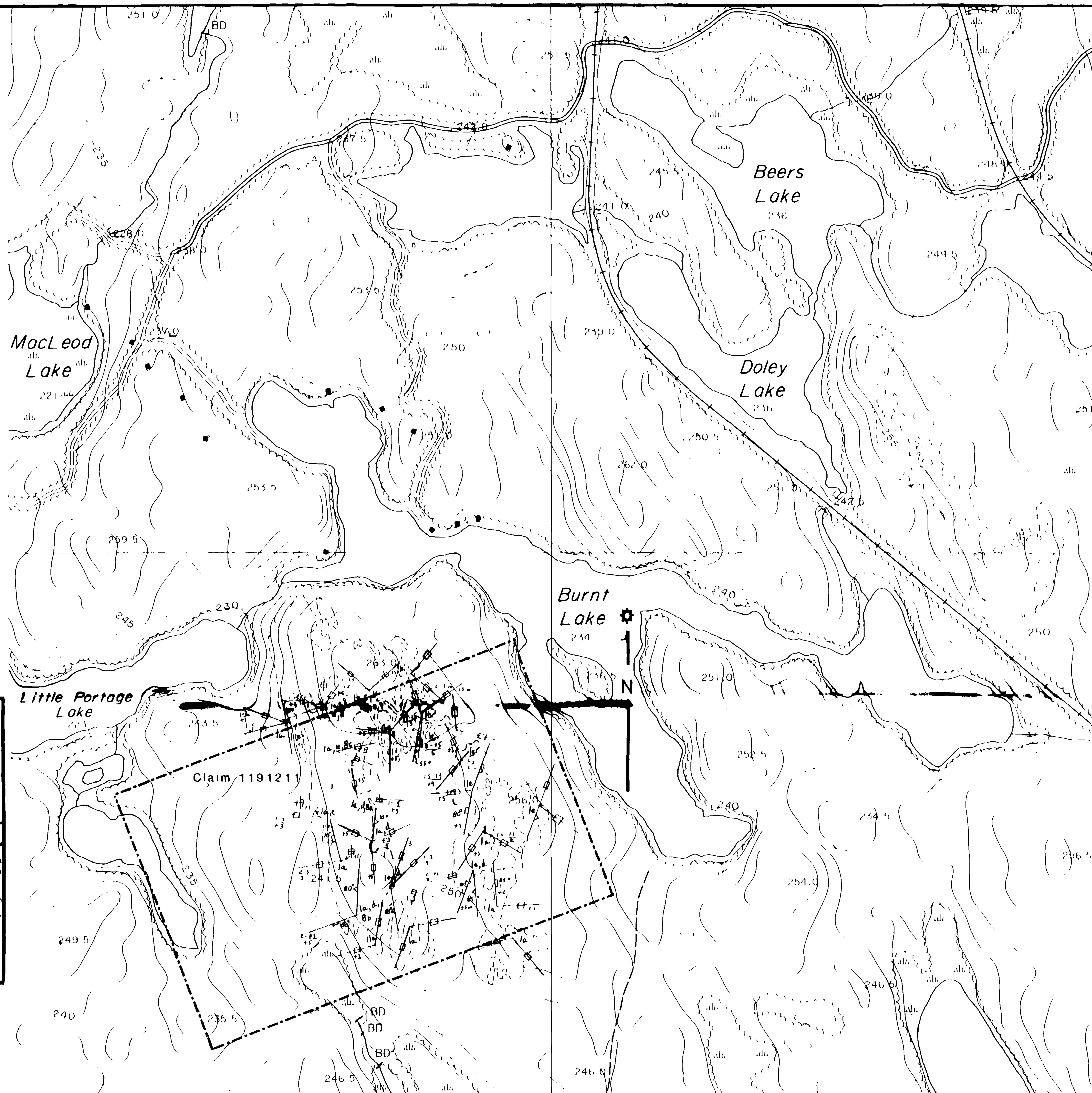
PROPERTIES

1 GRUNDY LAKE	6 JACKNIFE HARBOUR
2 BLACK LAKE	7 KILLBEAR POINT
3 WOODS ROAD	8 TURTLE LAKE
4 DILLON ROAD	9 BURNT LAKE
5 SHEBESHEKONG LAKE	



LOCATION MAP

SCALE: 1:250,000



LEGEND

1 FELSIC GNEISS[1] layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite hematite and almandine
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2 AMPHIBOLITE GNEISS - layered to massive fine to coarse grained greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state
a) fine to coarse grained thinly to thickly layered uniform gneiss occasionally with some biotite rich partings,
b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite
c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a

3 BIOTITE HORNBLENDE MIGMATITE - a fine to coarse grained highly variable rock of multicomponent origin generally lit par lit layered and frequently comprising similar intrafolial folds, the paleosome constituent comprises biotite, hornblende, feldspar and quartz and frequently has a relict foliated or thinly laminated texture, the neosome constituent is generally coarser and comprises a syntectonic cataclastic originally pegmatitic aggregate of quartz feldspar and minor hornblende and or biotite
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d) variegated pale and light grey with biotite content <10%,
e) variegated pink and light grey with biotite content <10%,
f) intense pink schlieren with biotite content <5%,
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i) late tectonic pegmatite <10%,
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k) biotite dominant mafic mineral

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c) 4a or 4b with <5% biotite or hornblende-rich mafic layers

5 GABBRO coarse grained mafic to ultramafic rock
a) coronitic metagabbro having relict outlines of original pyroxene phenocrysts ... foliated texture
b) amphibolite gneiss foliated and generally layered rock with ≥40% amphiboles

6 TONALITE - coarse grained intermediate rock with ≥20% <50% mafic minerals generally with some relict plagioclase phenocrysts and a strained to uniform gneissic fabric
a) variegated medium to dark grey and pale grey regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts
b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole feldspar and quartz

7 MEGACRYSTIC GRANITE - Porphyritic rock with relict strained orthoclase phenocrysts within a medium to coarse grained matrix of quartz plagioclase orthoclase and biotite and/or hornblende
a) pink phenocrysts with prestrained diameters of ≤ 2cm
b) pink phenocrysts with prestrained diameters of ≥ 5cm
c) > 5% < 20% pink fine to medium grained, syntectonic pegmatite
d) folding stretching rolling and rodding of preexisting phenocrysts and pegmatite stringers

8 GRANITE PEGMATITE - fine to coarse grained quartz microcline plagioclase and biotite bearing rock varying in texture in response to its tectonic history
a) very coarsely crystalline unstrained post tectonic rock
b) very coarse crystalline tectonic breccia
c) medium to coarse grained cataclastic rock with occasional large clasts, identical to unit 1d in appearance

[1]No origin is inferred by this name
[2]No relative ages are inferred by this order of the legend

SCALE
1:5,000
feet
metres

SYMBOL LIST

Gneissic foliation: with dip; vertical, horizontal
Joints: horizontal, vertical with average spacing, with dip, minimum and maximum spacing and average separation
Schistocity or foliation
Lineation: with plunge
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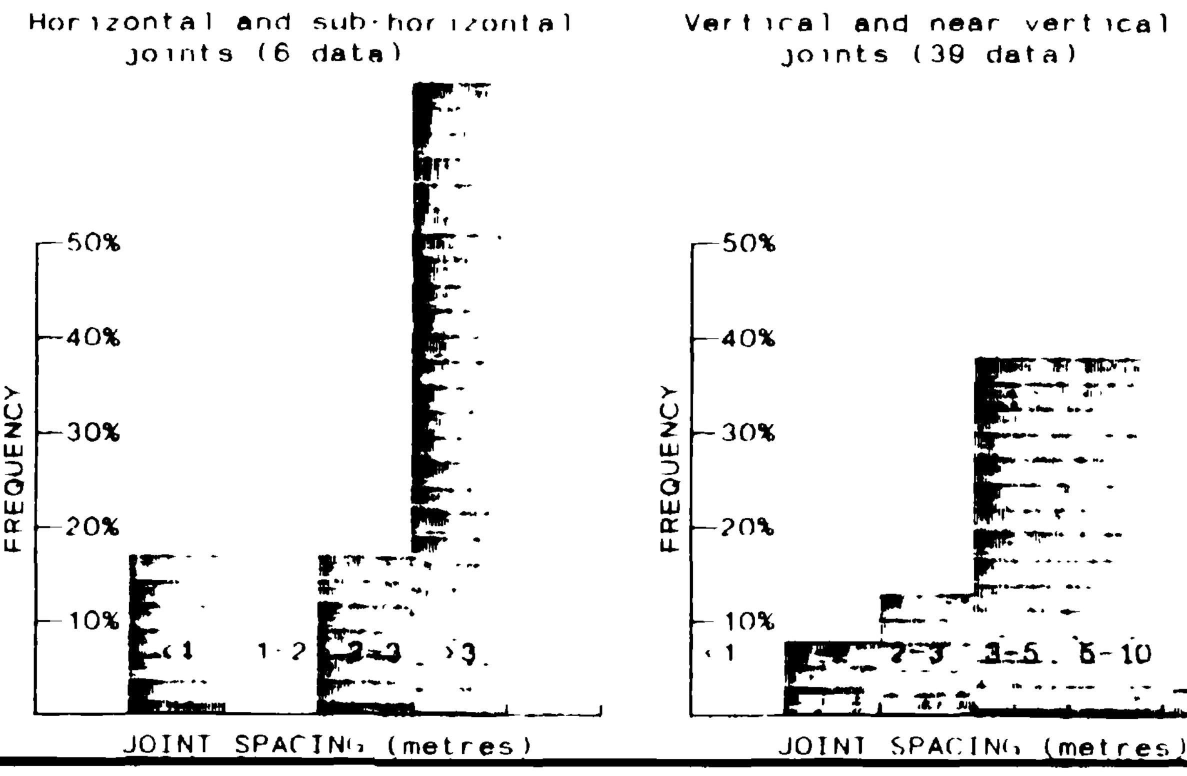
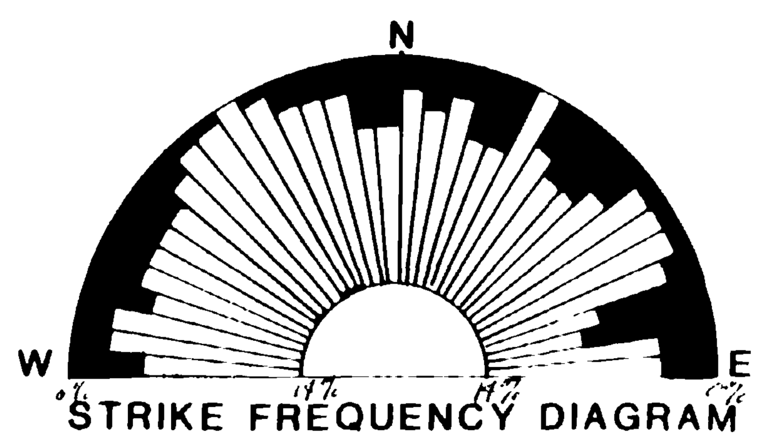
Highway, road
Secondary road
Abandoned road or trail
Road allowance
Railroad
Concession line
Lot line
Electric power line
Topographic contour (5 metre interval ASL)
Swamp
Clearing
Outcrop
Quarry
Buildings
inferred

JOINT SPACING HISTOGRAMS





STRIKE FREQUENCY DIAGRAM OF JOINTS
42 data

JR TRUSLER & ASSOCIATES
MINERAL CONSULTANTS

BURNT LAKE PROPERTY

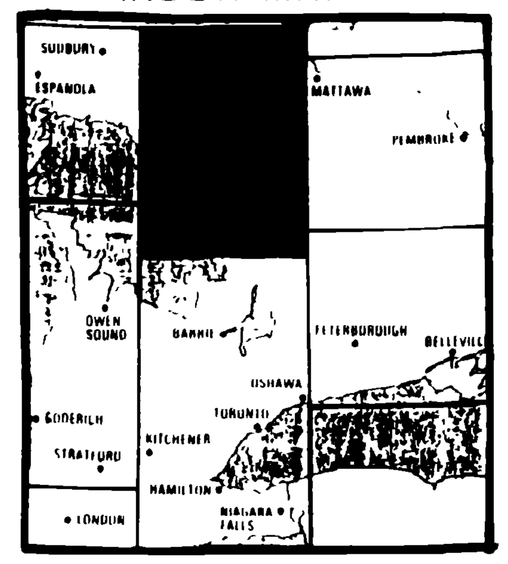
GEOLOGICAL MAP

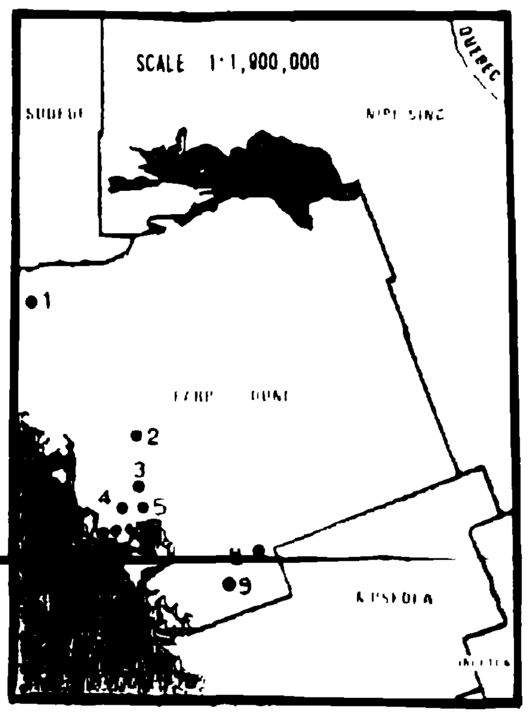
DATE OCT 11 1993 | SCALE 1:5 000 | DRAWN BY JR TRUSLER

31E13NE0001 OP93 182 BURTON

260

INDEX MAP

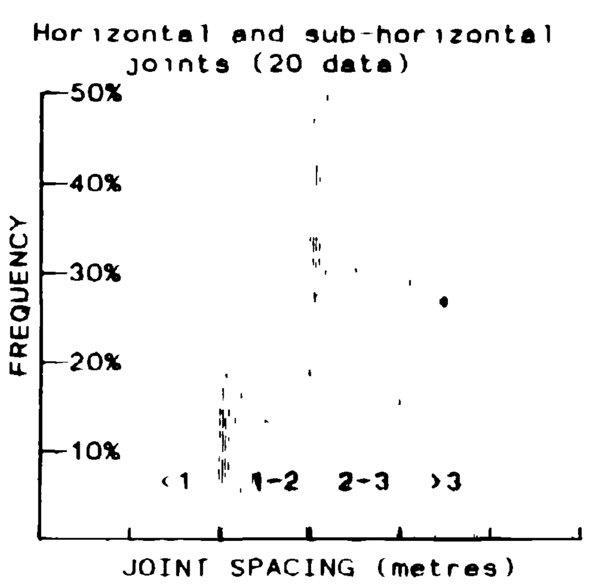


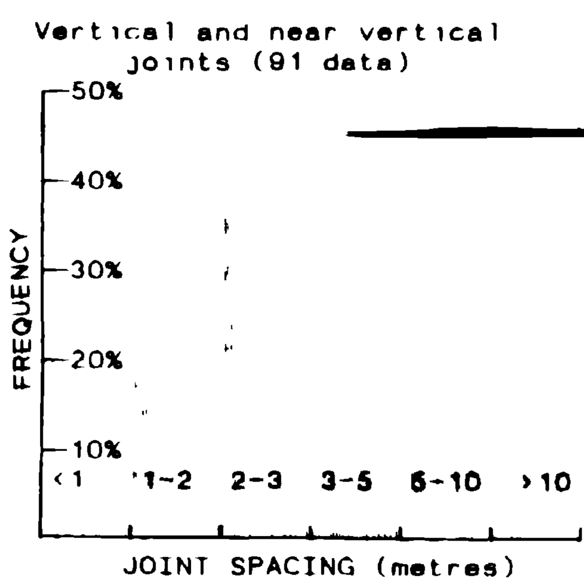


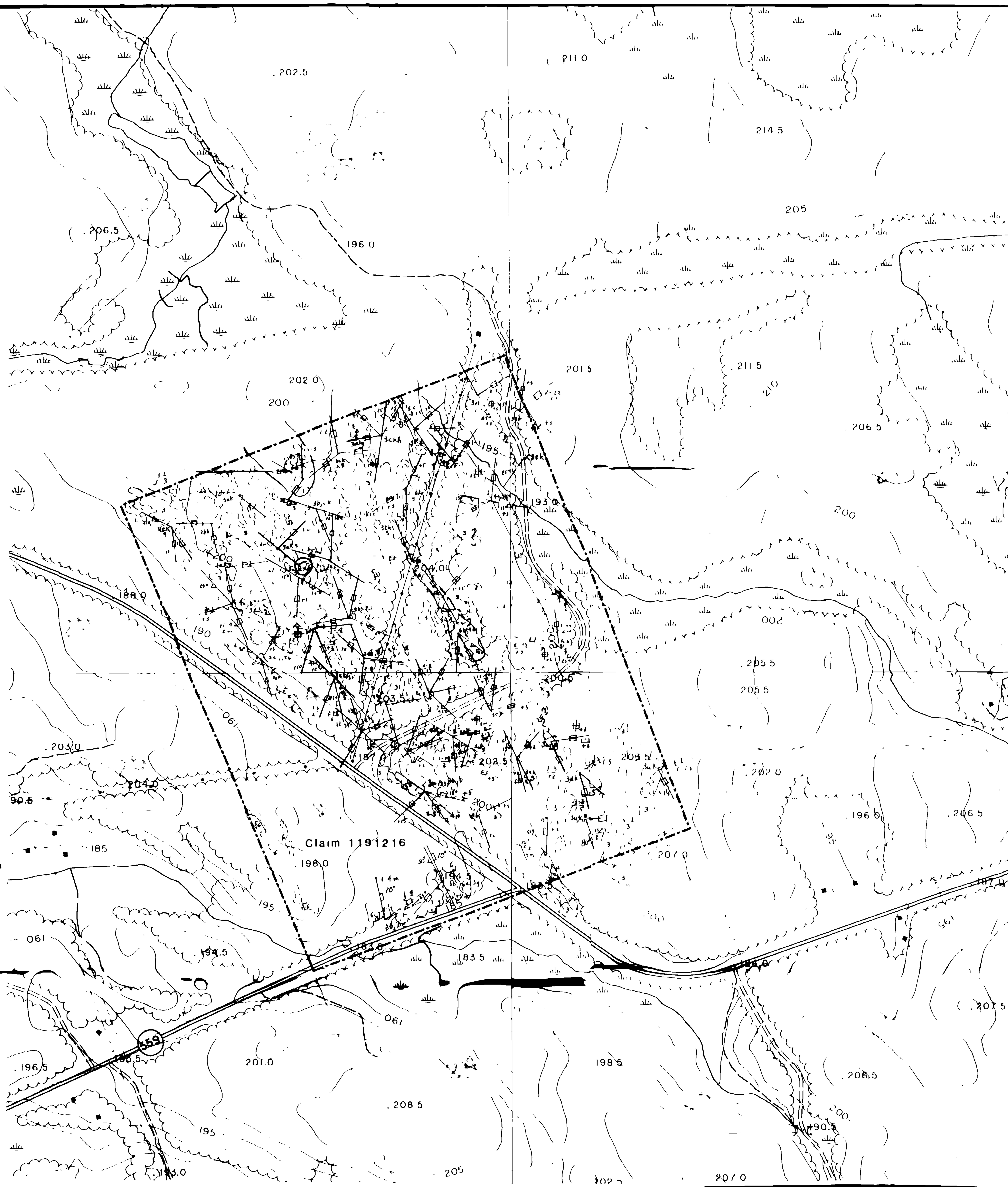
PROJECT AREA

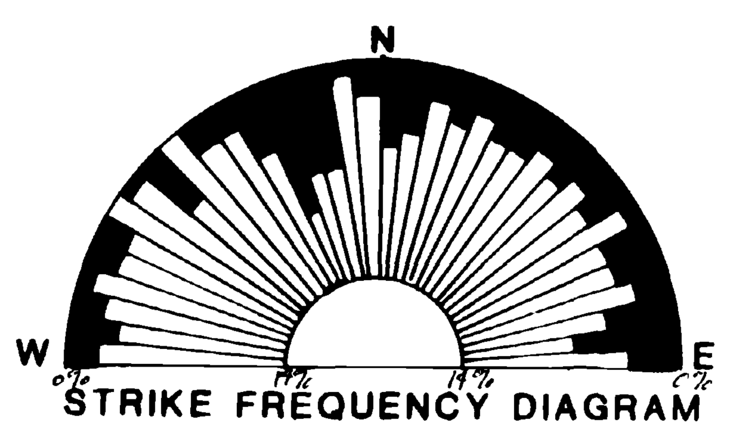
PROPERTIES

1 GRUNDY LAKE
2 BLACK LAKE
3 WOODS ROAD
4 DILLON ROAD
5 SHEBESHEKONG LAKE
6 JACKNIFE HARBOUR
7 KILLBEAR POINT
8 TURTLE LAKE
9 BURNT LAKE









STRIKE FREQUENCY DIAGRAM OF JOINTS

96 data

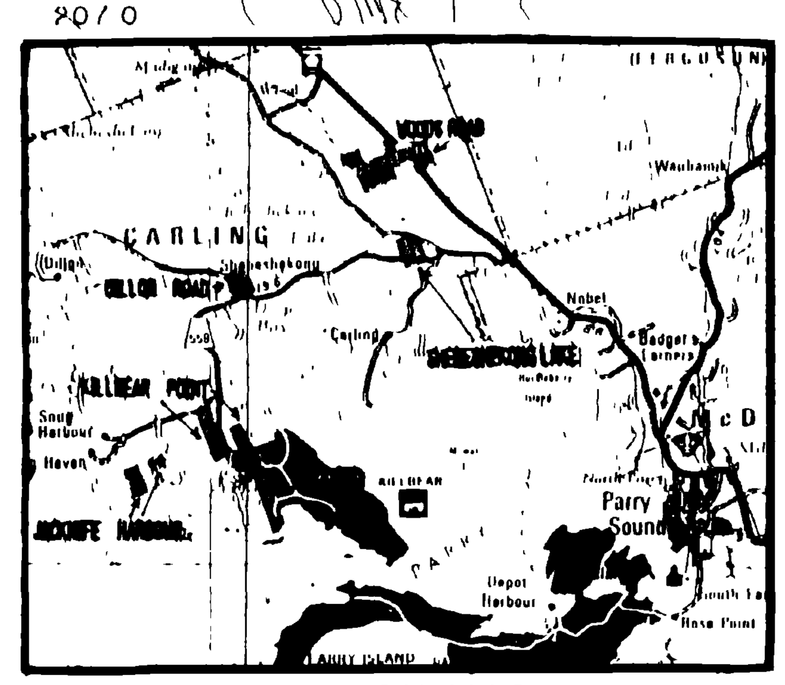
SCALE

1:5,000

feet

metres

N



LOCATION MAP

SCALE 1:250,000

LEGEND

1 FELSIC GNEISS[1] layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite, hematite and almandine

a) coarse grained equigranular rock, very weakly layered
b) unit 1a with coarse reddish-mauve speckles of hematite
c) strongly layered fine to coarse grained cataclastic rock
d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain,
e) fine to medium grained massive pink to rose coloured rock with thin biotite-rich partings
f) unit 1e more thinly layered and containing mauve hematite bearing laminae

2 AMPHIBOLITE GNEISS layered to massive fine to coarse grained greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state

a) fine to coarse grained thinly to thickly layered uniform gneiss occasionally with some biotite rich partings,
b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite
c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a

3 BIOTITE HORNBLENDE MIGMATITE a fine to coarse grained highly variable rock of multicomponent origin generally lit par lit layered and frequently comprising similar ptygmatic folds. the paleosome constituent comprises biotite hornblende feldspar and quartz and frequently has a relict foliated or thinly laminated texture, the neosome constituent is generally coarser and comprises a syntectonic cataclastic or granitic pegmatitic aggregate of quartz, feldspar and minor hornblende and or biotite

a) variegated pale and dark grey with mafic content <20%
b) variegated pale and medium grey with mafic content >10% <20%,
c) variegated pink and medium grey with mafic content >10% <20%
d) variegated pale and light grey with biotite content <10%
e) variegated pink and light grey with biotite content <10%
f) intense pink schlieren with biotite content <5%
g) minor purple hematite spotting,
h) late tectonic pegmatite >10%,
i) late tectonic pegmatite <10%,
j) hornblende dominant mafic mineral
k) biotite dominant mafic mineral

4 PURPLE AND PINK MIGMATITE variegated rock with laminations of medium to coarse grained unit 1a or 3f and a fine to medium grained reddish mauve layer comprising quartz feldspar biotite almandine and hematite often a milky to buff late tectonic granulated quartzo feldspathic pegmatitic material forms conformable layers which generally exhibit pinch and swell textures

a) thinly laminated or layered pink and mauve or pink mauve and buff rock
b) 4a with brecciated mauve fragments in pink or buff layers or crenulations of mauve layers in the pink or buff layers
c) 4a or 4b with 5% biotite or hornblende rich mafic layers

5 GABBRO – coarse grained mafic to ultramafic rock

a) Coronitic metagabbro having relict outlines of original pyroxene phenocrysts or oikocrysts and a massive to slightly foliated texture,
b) amphibolite gneiss – foliated and generally layered rock with >40% amphiboles

6 TONALITE – coarse grained intermediate rock with >20% <50% mafic minerals generally with some relict plagioclase phenocrysts and a strained to uniform gneissic fabric

a) variegated medium to dark grey and pale grey regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts,
b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole, feldspar and quartz.

7 MEGACRYSTIC GRANITE – Porphyritic rock with relict strained orthoclase phenocrysts within a medium to coarse grained matrix of quartz plagioclase orthoclase and biotite and/or hornblende

a) pink phenocrysts with prestrained diameters of < 2cm,
b) pink phenocrysts with prestrained diameters of > 5cm
c) > 5% < 20% pink fine to medium grained syntectonic pegmatite,
d) folding stretching rolling and rodding of preexisting phenocrysts and pegmatite stringers

8 GRANITE PEGMATITE – fine to coarse grained quartz microcline plagioclase and biotite bearing rock varying in texture in response to its tectonic history

a) very coarse crystalline unstrained post tectonic rock
b) very coarse crystalline tectonic breccia,
c) medium to coarse grained cataclastic rock with occasional large clasts identical to unit 1d in appearance

[1] No order [illegible]
[illegible] inferred by this order of the legend

SYMBOL LIST

Gneissic foliation: with dip, vertical, horizontal
Joints: horizontal, vertical with average spacing, with dip, minimum and maximum spacing and average separation
Schistocity or foliation
Lineation: with plunge
Property boundary
Highway, road
Secondary road
Abandoned road or trail
Road allowance
Railroad
Concession line
Lot line
Electric power line
Topographic contour (5 metre interval)
Swamp
Clearing
Outcrop
Quarry
Buildings
Geological contact inferred

REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
ONTARIO

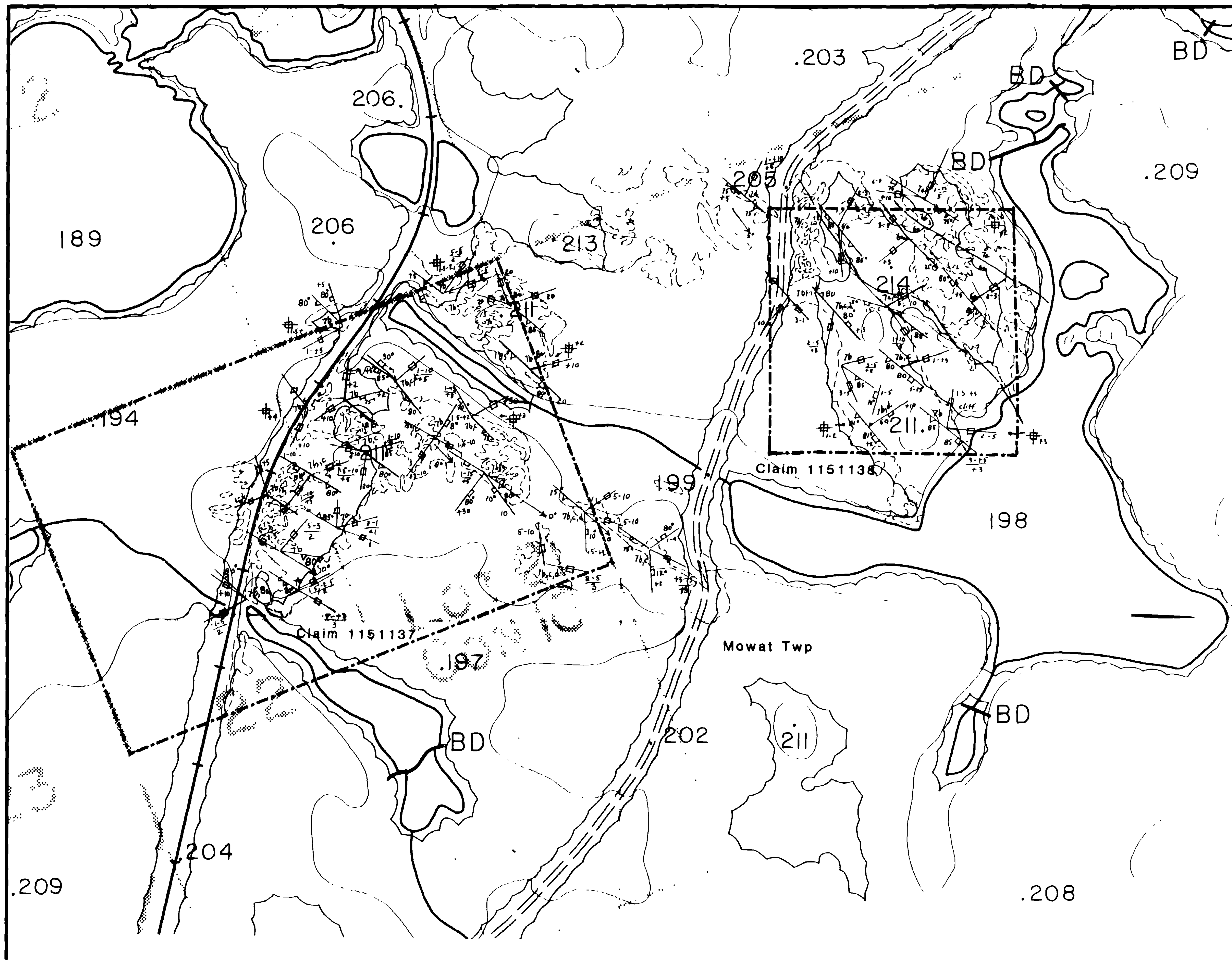
JR TRUSLER & ASSOCIATES
MINERAL CONSULTANTS

DILLON ROAD PROPERTY

GEOLOGICAL MAP

DATE OCT 17, 1983	SCALE 1:5,000	DRAWN BY JR TRUSLER

270



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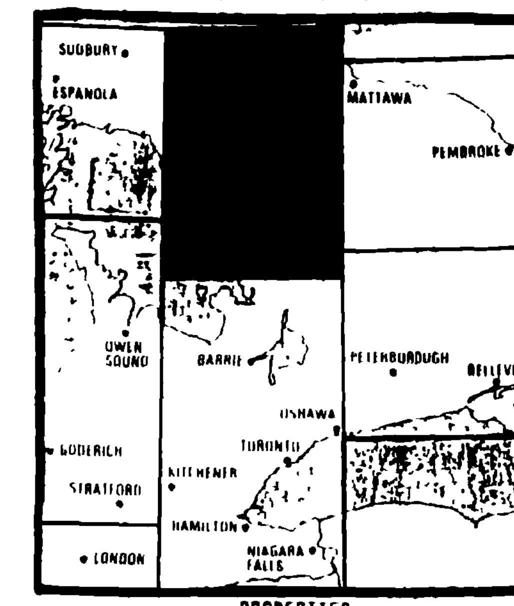
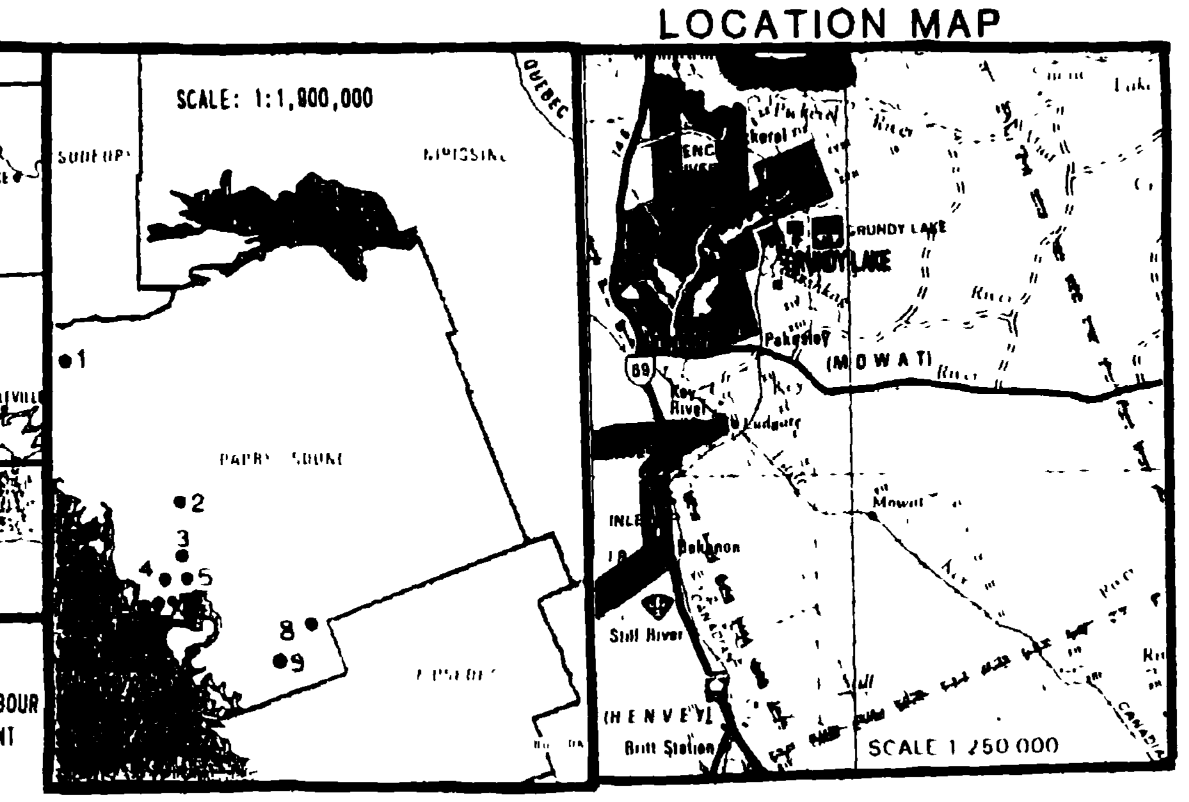
INDEX MAP



PROPERTIES

1 GRUNDY LAKE
2 BLACK LAKE
3 WOODS ROAD
4 DILLON ROAD
5 SHEBESHEKONG LAKE
6 JACKNIFE HARBOUR
7 KILLBEAR POINT
8 TURTLE LAKE
9 BURNT LAKE

LOCATION MAP



PROJECT AREA

LEGEND

1 FELSIC GNEISS[1] - layered to massive rock mainly composed of quartz, plagioclase and microcline with minor matrix biotite and variable accessory magnetite, hematite and almandine a) coarse grained equigranular rock, very weakly layered, b) unit 1a with coarse reddish-mauve speckles of hematite, c) strongly layered fine to coarse grained cataclastic rock, d) unit 1a containing very large breccia fragments of pegmatite which show no internal strain, e) fine to medium grained massive pink to rose coloured rock with thin biotite-rich partings, f) unit 1e more thinly layered and containing mauve hematite-bearing laminae

2 AMPHIBOLITE GNEISS - layered to massive, fine to coarse grained, greyish black to black rock generally comprising 40 to 70% amphiboles with plagioclase in its unaltered state a) fine to coarse grained, thinly to thickly layered uniform gneiss occasionally with some biotite rich partings, b) lit par lit migmatite comprising unit 2a the paleosome constituent and parallel bands of late tectonic pegmatite, c) migmatite breccia comprising clasts of late tectonic pegmatite within unit 2a.

3 BIOTITE HORNBLENDE MIGMATITE - a fine to coarse grained, highly variable rock of multicomponent origin generally lit par lit layered and f[redacted] comprising similar intrafolial folds, the paleosome constituent comprises biotite, hornblende, feldspar and quartz and frequently has a relict foliated or thinly laminated texture, the neosome constituent is generally coarser and comprises a syntectonic, cataclastic, originally pegmatitic aggregate of quartz, feldspar and minor hornblende and/or biotite a) variegated pale and dark grey with mafic content ≥20%, b) variegated pale and medium grey with mafic content ≥10% ≤20%, c) variegated pink and medium grey with mafic content ≥10% ≤20%, d) variegated pale and light grey with biotite content ≤10%, e) variegated pink and light grey with biotite content <10%, f) intense pink schlieren with biotite content ≤5%, g) minor purple hematite spotting, h) late tectonic pegmatite ≥10%, i) late tectonic pegmatite ≤10%; j) hornblende dominant mafic mineral, k) biotite dominant mafic mineral

4 PURPLE AND PINK MIGMATITE - variegated rock with laminations of medium to coarse grained unit 1a or 3f and a fine to medium grained reddish mauve layer comprising quartz, feldspar, biotite, almandine and hematite, often a milky to buff late tectonic granulated quartzo-feldspathic pegmatitic material forms conformable layers which generally exhibit pinch and swell textures a) thinly laminated or layered pink and mauve or pink, mauve and buff rock, b) 4a with brecciated mauve fragments in pink or buff layers or crenulations of mauve layers in the pink or buff layers, c) 4a or 4b with >5% biotite or hornblende-rich mafic layers

5 GABBRO - coarse grained mafic to ultramafic rock a) Coronitic metagabbro having relict outlines of original pyroxene phenocrysts or oikocrysts and a massive to slightly foliated texture, b) amphibolite gneiss - foliated and generally layered rock with ≥40% amphiboles

6 TONALITE - coarse grained intermediate rock with ≥20% ≤50% mafic minerals generally with some relict plagioclase phenocrysts and a strained to uniform gneissic fabric a) variegated medium to dark grey and pale grey, regularly layered rock generally medium to coarse grained usually having patches of relict phenocrysts, b) porphyritic rock with elongated pink feldspar phenocrysts within a foliated to gneissic medium to coarse grained matrix of amphibole, feldspar and quartz

7 MEGACRYSTIC GRANITE - Porphyritic rock with relict, strained, orthoclase phenocrysts within a medium to coarse grained matrix of quartz, plagioclase, orthoclase and biotite and/or hornblende a) pink phenocrysts with prestrained diameters of ≈ 2cm, b) pink phenocrysts with prestrained diameters of ≈ 5cm; c) ≥ 5% ≤ 20% pink, fine to medium grained, syntectonic pegmatite, d) folding, stretching, rolling and rodding of preexisting phenocrysts and pegmatite stringers

8 GRANITE PEGMATITE - fine to coarse grained quartz, microcline, plagioclase, and biotite-bearing rock varying in texture in response to its tectonic history a) very coarsely crystalline, unstrained, post-tectonic rock; b) very [redacted] crystalline tectonic breccia; c) medium to coarse grained cataclastic rock with occasional large clasts; identical to unit 1d in appearance

[1]No origin is inferred by this name

[2]No relative ages are inferred by this order of the legend

SYMBOL LIST

- Gneissic foliation: with dip, vertical ; horizontal
- Joints: horizontal, vertical with average spacing, with dip, minimum and maximum spacing and average separation
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- Lineation: with plunge
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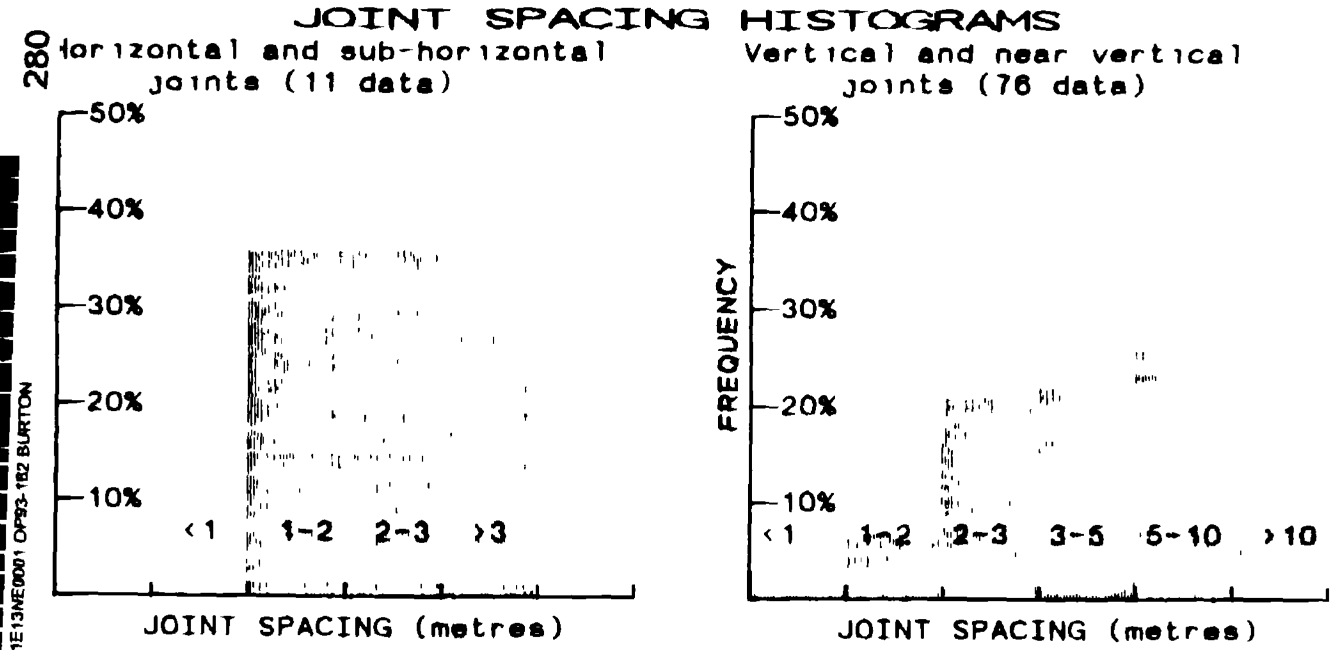
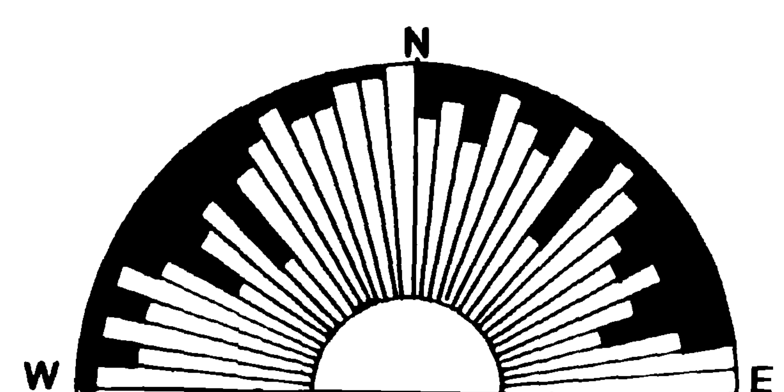
- Secondary road
- Abandoned road or trail
- Road allowance
- Railroad
- Concession line
- Lot line
- Electric power line
- Topographic contour (5 metre interval ASL)
- Swamp
- Clearing
- Outcrop
- Quarry
- Buildings
- Geological contact inferred

JOINT SPACING HISTOGRAMS



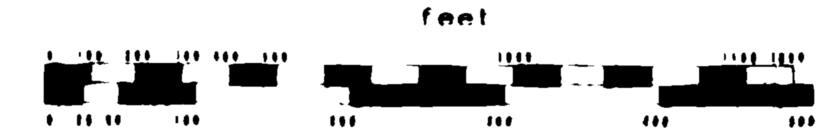


STRIKE FREQUENCY DIAGRAM OF JOINTS

75 Vertical and near vertical joints

SCALE

1:5,000



REGISTERED PROFESSIONAL ENGINEER
J. R. TRUSLER
PROVINCE OF ONTARIO

JR TRUSLER & ASSOCIATES
MINERAL CONSULTANTS

GRUNDY LAKE PROPERTY

GEOLOGICAL MAP

DATE Oct 16 1993	SCALE 1:5 000	DRAWN BY JR TRUSLER