GEOLOGICAL REPORT ON THE MAIN ZONE

AND SURROUNDING AREA - 1:2 500 SCALE

MACLEOD LAKE PROPERTY

CHIBOUGAMAU MINING DISTRICT

N.T.S. 33A/3

For: Windy Mountain Explorations Ltd.

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1. SUMMARY

The Macleod Lake property of Windy Mountain Explorations Ltd. from L11W to L25E and from 9+00S to 2+00N was mapped at a scale of 1:2 500. A mineral inventory based on results from the phase 1 and phase 2 drill programmes indicated mineralization in the Main Zone of slightly over 30 million metric tonnes with a calculated average grade of 0.49% Cu, 0.07% Mo, 0.05 grams/t Au and 4.31 grams/t Ag (Winter, 1990a). Phase 3 drilling (drill holes ML-36-41 and 54-57) has increased the mineral inventory to 37,511,000 metric tonnes with an average grade of 0.44% Cu, 0.05% Mo, 0.04 grams/t Au and 3.68 grams/t Ag (Winter, 1990b). Drill results indicate that mineralization is open in both directions along strike, downdip and updip. The purpose of the 1:2 500 scale mapping programme of this report was to incorporate the 1:1 000 scale mapping of the Main Zone of Prior (1989) with the geology of the surrounding rocks. The map produced would indicate the geological setting of the mineralized zone in relation to the surrounding rock units and, in particular, further delineate the quartzo-feldspathic gneiss/granodiorite fels contact in the Main Zone and along strike.

The results of the programme are presented in the Geology Map. The area is composed of quartzo-feldspathic biotite gneiss and migmatitic counterparts, amphibolite, quartzo-feldspathic biotite fels, siliceous zones, schist, granodiorite fels, pegmatites, aplites, quartz stockwork breccia and milky quartz veins. Migmatitic quartzo-feldspathic biotite gneiss and granodiorite fels are, by far, the most predominant rock types. Siliceous zones are unique to the Main Zone and characteristically contain high grade copper and molybdenum mineralization. Pegmatites are common in the Main Zone and surrounding area. There may be two (2) ages of pegmatite. The pegmatites of the Main Zone are very coarse grained (feldspar to 20+ cm size) and are characterized by exsolved quartz in feldspar (graphic and myrmekitic textures). Younger (?) pegmatites are much less abundant and form narrow quartz-rich dykes in the

granodiorite fels south of the Main Zone. Aplites also are common in this area and occur as narrow folded fine grained dykes in the granodiorite fels. The aplites may be genetically related to the Main Zone pegmatite.

Late quartz stockwork breccia is located at 13+80E; 0+90S. This, possibly highly explosive event, appears to be the last lithologic unit emplaced in the map area. Milky white quartz veins on Rocky Point which have been grouped with the stockwork breccia may not be of the same age.

Small-scale folding is common in the migmatitic gneisses and produces fold lineations which trend 060°-110°. The foliation in the gneisses is 040° to 060°. Hornblende mineral lineation in the granodiorite fels trends 040°-060°. Two (2) regional fold axes have been interpreted, one across the south portion of Baseline Lake and a second west of Rocky Point.

Faults, fractures and joints have predominant 140°-170° orientation. Numerous fractures with fracture controlled to spotty epidote and hematite and lesser chlorite and calcite are common in the map area. In the granodiorite fels south of the Main Zone fracture fills with epidote and halos of epidote +/- hematite are common. Distinctive resistive ridges are present in the migmatitic gneisses of the Main Zone. These structures are generally oriented at 140°-170°.

Four (4) drill holes were drilled on Rocky Point in the winter of 1990 in order to test the possible source of an IP anomaly in the area (Prior, 1990). ML-15 intersected significant mineralization in quartzo-feldspathic gneiss at the quartzo-feldspathic gneiss/granodiorite fels contact (0.19% Cu, 0.00% Mo, 0.01 grams/t Au, 1.44 grams/t Ag over 14.63 m). A mineralized boulder also occurs on Rocky Point and consists of siliceous material with 2-3% chalcopyrite and trace molybdenite. Based on this information, a beep-mat survey was completed along the quartzo-feldspathic gneiss/granodiorite fels contact on Rocky Point and an anomaly was located 6 metres east of L3W at 5+70S which was blasted, stripped, washed and sampled. Strongly magnetic granodiorite fels with significant (to 20-30% sulphides) chalcopyrite + bornite mineralization occurs in the blasted pit. Two (2) strongly mineralized and magnetic samples of granodiorite fels assayed 9.11% and 5.72% copper (Cu). Silver (Ag) values from these samples are anomalous (22 and 26 ppm).

Further exploration is recommended in the area from Rocky Point to the Main Zone and east of the Main Zone along the granodiorite fels/migmatitic quartzo-feldspathic contact. As the contact between the migmatitic gneiss and granodiorite fels is very shallow in the Rocky Point area, this area appears to have excellent potential for economic mineralization.

2. INTRODUCTION

2.1 LOCATION

The Macleod Lake property is located in northwestern Quebec 100 km northeast of Lake Mistassini and 275 km northeast of the town of Chibougamau (Figure 1). The property is 6 km north of the Eastmain River and the two (2) largest lakes in the area are Lac Autric and Lac Lavalette, 8 km southwest and 11 km southeast, respectively. The property is located on the Lac Rossignol 1:250 000 topographic sheet (NTS 33A) within A2, A3, A6 and A7.

Access to the property year-round is by float or ski-equipped aircraft from Baie du Poste on the southeast shore of Lac Mistassini approximately 200 km southeast or from Temiscamie approximately 120 km to the east-southeast. Helicopter and fixed-wing service is also available from Chibougamau.

2.2 CLAIM DESCRIPTION

The Macleod Lake property consists of 263 claims (Figure 2). The original 54 claims were staked in 1988 (series 4620) and an additional 50 claims (series 5052) were staked in 1989. In 1990 an additional 159 claims were staked (series 5046). Windy Mountain Explorations Ltd. applied for and was granted three (3)

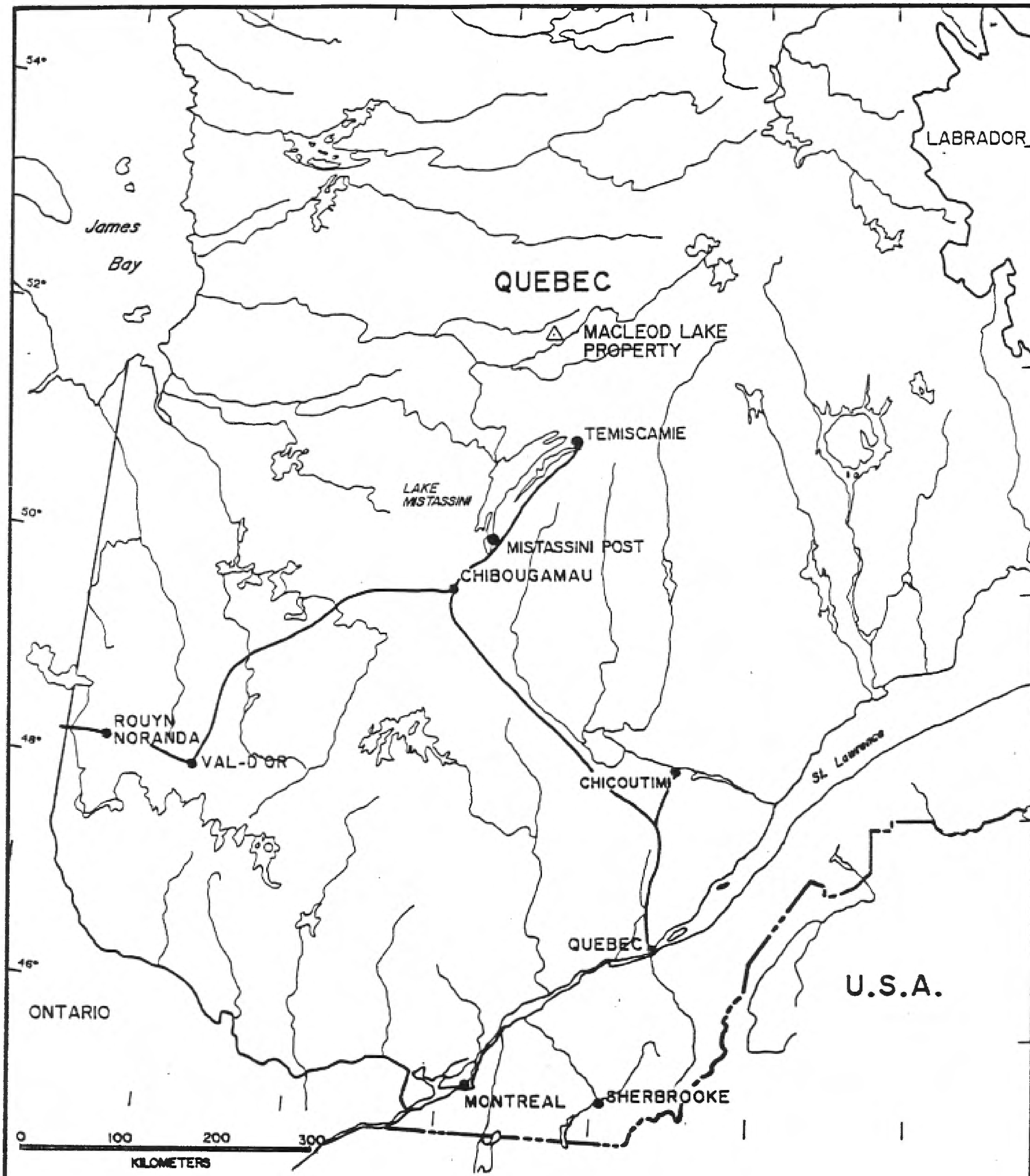

Figure 1

PROPERTY LOCATION MAP

WINDY MOUNTAIN EXPLORATIONS LTD.

MACLEOD LAKE PROPERTY

DECEMBER, 1990

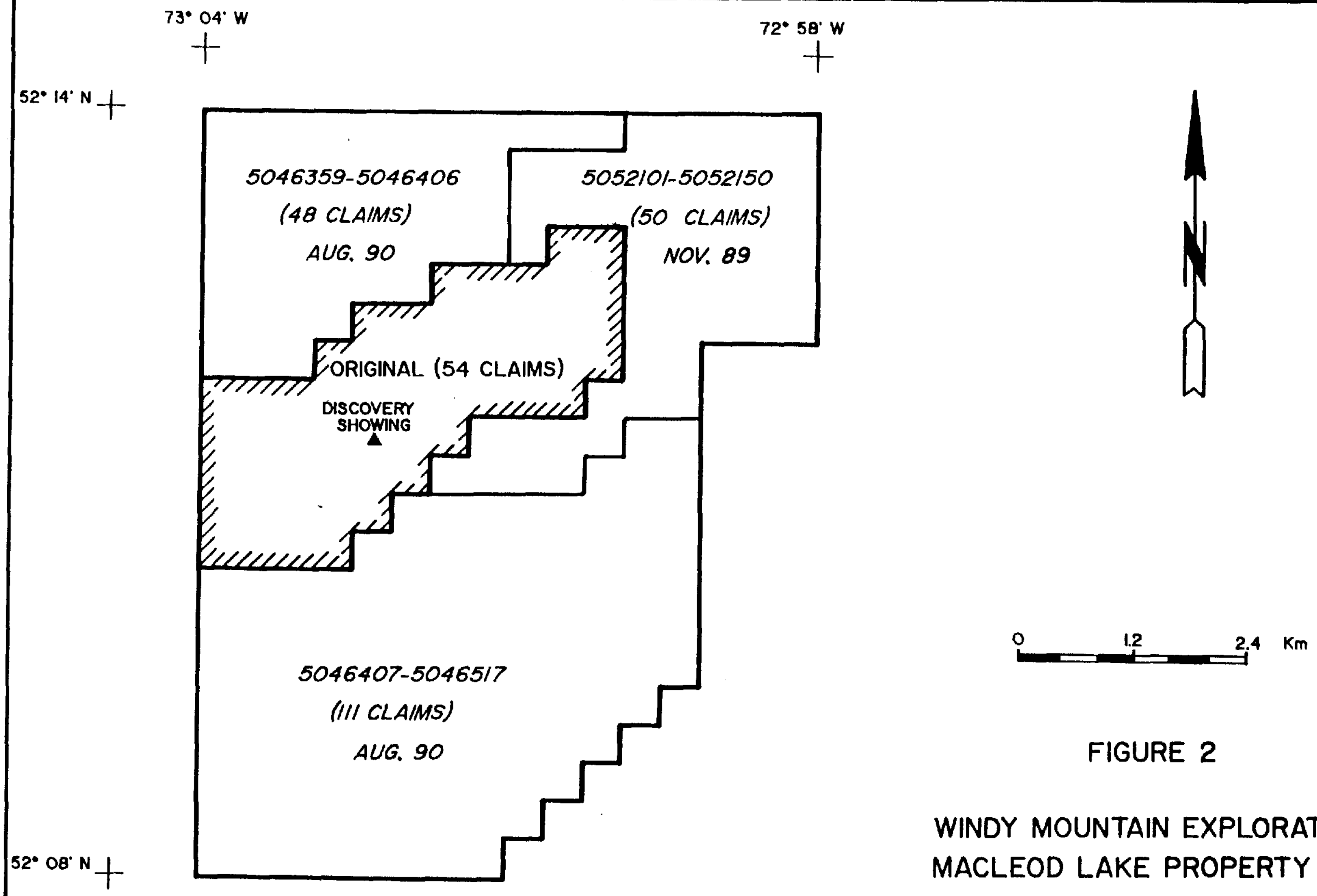

FIGURE 2

WINDY MOUNTAIN EXPLORATIONS LTD.
MACLEOD LAKE PROPERTY

CLAIM BLOCK LOCATION MAP

BY: NORWIN GEOLOGICAL LTD.

OCTOBER, 1990

contiguous Licences of Exploration surrounding the Windy Mountain property (881, 882 and 883) and Home Lake Resources Inc. staked 100 claims west of the 881 Licence of Exploration. The three (3) Licences of Exploration are under a joint venture agreement between Windy Mountain Explorations Ltd. and Cochise Resources Inc. For details of the Windy Mountain Claim Group refer to Pilkey, 1990a.

2.3 TOPOGRAPHY AND LANDFORMS

The topography of the Macleod Lake property is generally subdued and the moraine on the baseline west of Macleod Lake produces the maximum relief (16 metres). Glacial deposits consist of sand, gravel and boulders which produce a veneer of cover over the bedrock and expose only a limited amount of outcrop (generally 1-3%). Diamond drilling indicates that overburden generally is less than 15 metres deep.

Landforms consist of boulder moraines, eskers, swamps and muskegs. The most notable feature is a 030° trending esker which extends from the north side of Baseline Lake across the northern portion of the main mineralized zone crossing Macleod Lake north of Rocky Point (forming a narrows) and extending beyond the southwestern limits of the grid at the south end of L27+00W. Several other small, discontinuous esker or esker-like features occur in the map area. Steep-sided boulder moraines are common. Boulders of gneiss and pegmatite are extremely abundant in the moraines. Numerous small steep-sided, elliptically shaped moraines (kames) west of Macleod Lake produce a kame field. Some kames are also present east of the campsite.

Boulders predominantly consist of quartzo-feldspathic biotite gneiss and migmatitic quartzo-feldspathic gneiss with lesser granitoid and pegmatite. Many of the gneiss boulders have rusty weathering, however, only a few have trace amounts of chalcopyrite and rare molybdenite. A boulder of siliceous material with 2-3% chalcopyrite and trace molybdenite at 0+70W; 5+35S assayed 8,800 ppm Cu, 1,500 ppm Mo, 112 ppb Au and 6 ppm

Ag.

3. PREVIOUS WORK

Until recently, very little exploration work was completed on the Macleod Lake area. No work is recorded in the assessment files of the Ministere de l'Energie et des Ressources (MER) prior to 1988 (Winter, 1989). In 1982 a geologist working for Uranerz discovered the initial Macleod Lake showing (on what is now L14E, 1+00S). No further work was completed at that time.

Work by Norwin Geological Ltd. for Windy Mountain Explorations Ltd. was initiated in 1988. Details of the exploration work completed on the property, up to and including the spring of 1990, are presented by Prior (1990) and will not be outlined here. The original 54 claims were mapped at a scale of 1:5 000 in 1989 (Brack, 1989). In the same year Prior (1989) mapped the area hosting the main chalcopyrite-molybdenum mineralization at a scale of 1:1 000. In the summer of 1990 a mapping programme at a scale of 1:5 000 was completed on grid lines cut in the winter and summer of 1990 which extended the Macleod Lake grid (Pilkey, 1990a). Also, during the summer, the area around and including the main showing from L11+00E to L25+00E and approximately from L2+00N to L9+00S was mapped at a scale of 1:2 500. This report describes the results of the 1:2 500 scale mapping programme.

3.1 REGIONAL GEOLOGY

The geology of the region has been summarized by Winter, 1989. Other workers, in particular from the Ministere de l'Energie et des Ressources, Quebec have reconnaissance mapped throughout the area. Winter (1989) notes that Eade (1966), Chown (1971) and Hocq (1976 and 1985) have mapped broad regions throughout the area and that Avramtchev (1983) has synthesized much of this information. The reader is referred to these reports for details of the geology (refer to Winter, 1989 for these references).

The predominant feature in the area of the Macleod Lake property is an east-northeast opening and plunging synform south of the property. Mafic and felsic metavolcanic rocks occur within the core of the synform and are underlain by granite and granodioritic rocks with biotite and/or hornblende gneiss and migmatites. Pegmatites occur within the above units (Winter, 1989).

These units have been folded about east-northeast trending and plunging fold axes. East-northeast and northwest-southeast topographic features probably represent bedrock structures and northwest-southeast trending (Mistassini swarm) and later northeast trending Abitibi dykes crosscut all other rock units in the area.

3.2 PROPERTY GEOLOGY

Quartzo-feldspathic biotite gneiss and hornblende +/- biotite granodiorite fels are the predominant rock units on the Macleod Lake property. Other lithologies include quartzo-feldspathic biotite fels, chlorite-biotite schist, pegmatites, aplite and granitoid. Prior (1989) identified four (4) significant chalcopyrite-molybdenite occurrences within siliceous zones hosted by mineralized quartzo-feldspathic biotite gneiss. The foliation in the gneiss generally strikes from 040° to 070° and dips moderately (30° to 60°) to the southeast.

The legend used for the 1:2 500 mapping programme is the same as the one used for the 1:5 000 mapping programme (Pilkey, 1990a). Some units such as the biotite granite, volcanic breccia and diabase do not occur on the 1:2 500 map sheet.

4. LITHOLOGIES

The lithologic units are described from the oldest to the youngest. Age relationships are inferred based on the field relationships of various units throughout the Windy Mountain claim group as identified in the 1989 (1:5 000 and 1:1 000) and 1990 (1:5 000 and 1:2 500) mapping programmes. Descriptions of the units follow in chronological order from the oldest to the youngest (refer to the Geology Map in the backpocket).

4.1 QUARTZO-FELDSPATHIC GNEISS

The quartzo-feldspathic gneiss sequence is subdivided into four (4) sub-units:

a) quartzo-feldspathic biotite gneiss
b) quartzo-feldspathic hornblende +/- biotite gneiss
c) migmatitic quartzo-feldspathic biotite gneiss and,
d) migmatite.

All four (4) units appear to be of similar age.

4.1.1 QUARTZO-FELDSPATHIC BIOTITE GNEISS

The quartzo-feldspathic biotite gneiss is a well-foliated fine to medium-grained unit consisting of approximately equal proportions of medium-grained well-foliated biotite and quartzo-feldspathic material (fine subequigranular quartz and whitish feldspar). Less than 5% of this unit consists of light coloured quartz-feldspar bands (leucosomes/neosomes) which tend to parallel the foliation. On weathered surfaces the quartzo-feldspathic biotite gneiss typically has a rusty appearance. The tendency of the gneiss to oxidize makes it difficult to visually differentiate between mineralized and unmineralized gneiss. Outside of the main mineralized zone (from L9 to L14E) trace to 1% chalcopyrite and molybdenite are noted locally within the gneiss. Leucosome bands where present are narrow, in the order of 1-2 centimetres wide, and tend to parallel the foliation. Locally the leucosome bands are weakly small scale folded.

4.1.2 QUARTZO-FELDSPATHIC HORNBLENDE +/- BIOTITE GNEISS

Locally the quartzo-feldspathic biotite gneiss appears to have variable but minor amounts of hornblende.

A band of hornblende-plagioclase +/- quartz gneiss occurs in outcrop at 9+25E; 1+00S, 13+40E; 1+00S and 13+70E; 1+00S (Geology Map). The hornblende-plagioclase +/- quartz gneiss consists of 50% to 70% medium grained weakly to moderately foliated/lineated hornblende and 30%-50% subequigranular plagioclase with minor (0%-5%) quartz. At 9+25E hornblende-plagioclase +/- quartz gneiss forms a more or less continuous, less than 20 cm band within the quartzo-feldspathic biotite gneiss. At 13+40E an outcrop of contorted, folded migmatitic quartzo-feldspathic biotite gneiss has four (4) ellipsoidally shaped zones of hornblende-plagioclase gneiss. At 13+70E the hornblende-plagioclase +/- quartz gneiss occurs as a 2 metre band along the lower portion of steep sloped outcrop. The unit is medium grained and quite massive. It is not known if the hornblende-plagioclase +/- quartz gneiss is related to the amphibolite unit, however, mineralogically the units are similar. Spatially, the hornblende-plagioclase +/- quartz gneiss occurs in close proximity to the 9+25E and 14+00E showings.

4.1.3 MIGMATITIC QUARTZO-FELDSPATHIC BIOTITE GNEISS

The migmatitic quartzo-feldspathic biotite gneiss is medium and locally coarse grained with 5%-30% leucosome material. Leucosomes tend to form less than 10 cm wide foliation parallel bands that typically exhibit some small scale folding. As the grade of metamorphism increases the amount of leucosome material increases, the grain size (especially biotite) generally appears to increase and the amount of tight to isoclinal small scale folding increases. Much of the quartzo-feldspathic gneiss within the map area appears to be typical of this sub-unit.

4.1.4 MIGMATITE

Migmatite (quartzo-feldspathic gneiss) is medium to coarse grained and consists of greater than 30% leucosome material. This unit tends to be highly convoluted with intense isoclinal folding of the banding. As migmatization increases the amount of leucosome material increases. Banding becomes increasingly convoluted in these migmatites to the point where quartzo-feldspar bands give way to pervasive leucocratic granitoid material and the gneiss becomes assimilated by anatectic granitoid material. Several zones of intensely folded gneiss occur from L15E to L18E (Geology Map).

4.2 AMPHIBOLITE

Amphibolite has only been mapped on the peninsula along the north shore of Baseline Lake (Geology Map). In these outcrops two (2) main bands of medium grained, very strongly lineated amphibolite (90% + hornblende) are present in migmatitic quartzo-feldspathic biotite gneiss. Contacts between the gneiss and amphibolite strike 065° and dip 30° NW. The amphibolite bands are finer grained (chilled?) near the contact and narrow contact/foliation parallel quartz veinlets occur in the gneiss parallel to the contact. These features suggest that the amphibolite here may represent mafic dykes. In another outcrop immediately to the east, very thin mafic bands of <1 cm to 2 cm width strike at 100° in quartzo-feldspathic gneiss. These may be mafic dyklets related to the main amphibolite bands. Small, elongate, rod-shaped quartz lenses form linear features at 110°/15° along strike from the thin dyklets.

4.3 QUARTZO-FELDSPATHIC BIOTITE FELS (DIORITE FELS)

The quartzo-feldspathic biotite fels (previously referred to as dioritic fels) is a fine to medium grained, equigranular and weakly foliated unit. Fine grained and saccharoidally (sugary, equigranular) textured quartz and feldspar predominate over biotite (60%-70% quartzo-feldspathic component and 30%-40% biotite). Biotite tends to be fine grained and weakly foliated. Within the area of the map-sheet quartzo-feldspathic biotite fels is not very common in outcrop; however, within drill holes in the main zone quartzo-feldspathic fels is much more abundant (Pilkey, 1990b and Prior, 1990). In outcrop (and also in drill holes) the quartzo-feldspathic biotite fels appears to have a close spatial association to the alkali feldspar-plagioclase-quartz pegmatite. Quartzo-feldspathic biotite fels is noted in several outcrops north, south and east of Baseline Lake. In two (2) outcrops on the peninsula on the north shore of Baseline Lake, excellent exposures of quartzo-feldspathic biotite fels in contact with pegmatite occur (refer to the Geology Map). Vague relicts of migmatitic folding are locally evident in the fels unit and the fels tends to form a 1-2 m wide band separating pegmatite from migmatitic quartzo-feldspathic biotite gneiss.

The quartzo-feldspathic biotite fels appears to be compositionally and probably genetically related to the quartzo-feldspathic gneiss sequence (ie, part of a paragneiss sequence). In areas, such as on the north shore of Baseline Lake, the fels has a particularly gritty, saccharoidal, recrystallized appearance with vague gneissic banding and occurs at the contact with pegmatite. At these areas the fels texture may be due to contact metamorphism (hornfels).

4.4 SILICEOUS ZONES

Siliceous zones outcrop at the 9+25E, 12+25E and 14+00E showings on the Main Zone (Geology Map); however, siliceous zones have not been noted elsewhere on the map sheet. Siliceous zones typically host the highest grades of mineralization on the property and are composed of 90%-95% medium to coarse grained, equigranular glassy to smokey grey quartz, up to 10% chalcopyrite + molybdenite (chalcopyrite predominates) with lesser to accessory pyrite, bornite, malachite, magnetite, ferrimolybdite and actinolite (Prior, 1989, 1990 and Pilkey, 1990b). Locally abundant pyrrhotite occurs in the siliceous zones (Prior, 1989).

Contacts between the siliceous zones and quartzo-feldspathic biotite gneiss and pegmatite appear sharp but typically have irregular, sutured or interpenetrating relationships.

4.5 CHLORITE-BIOTITE SCHIST

The chlorite-biotite schist as noted in the 1989 and 1990 drill programmes (Pilkey, 1990b and Prior, 1990) is an extremely consistent unit which has a spatial association with the Cu-Mo mineralization and occurs within the quartzo-feldspathic biotite gneiss unit. Outcrop exposures of the schist are non-existent possibly due to its softness. Subcrop uncovered and blasted at 18+30E; 9+40S appears to have chlorite-biotite schist with locally 1-2% coarse blebby chalcopyrite and trace molybdenite (Geology Map). A pit blasted in a sandy esker-like hummock at 11+00E; 1+00S produced boulders of strongly chloritized and sericitized quartzo-feldspathic biotite fels with trace chalcopyrite and small boulders of chlorite-biotite schist (unmineralized).

4.6 GRANODIORITE FELS

The granodiorite fels occurs in the south portion of the Main mineralized Zone and its interpreted northern most limited is 150 metres south of the baseline. Granodiorite fels also occurs on Rocky Point located along the southwestern shore of Macleod Lake (Geology Map). A description of the granodiorite fels/quartzo-feldspathic gneiss contact is outlined in Section 4.9.

The granodiorite fels is whitish to light green to light pinkish in colour and consists of quartz (10%-20%), feldspar (K-feldspar + plagioclase 60%-75%) and hornblende (10%-20%). Biotite is locally present especially in close proximity to the granodiorite fels/quartzo-feldspathic gneiss contact (0%-10%). The granodiorite fels is a holocrystalline, subequigranular, medium to coarse grained rock which is predominantly characterized by a well developed lineation produced by the alignment of elongate, prismatic grains of hornblende. In general the granodiorite fels is unmineralized, however, trace chalcopyrite has been noted in the granodiorite fels at the contact with migmatitic quartzo-feldspathic gneiss at 3+50E; 1+90S and extremely strongly mineralized granodiorite with up to 20%-30% sulphides (10%-15% chalcopyrite, to 7% bornite and trace molybdenite) and abundant magnetite occurs at 1+94W; 5+70S (refer to Section 5.3 and the Geology Map).

Elongate mafic inclusions, composed of hornblende-plagioclase +/- quartz and hornblende (only), occur in the granodiorite fels especially in close proximity to the granodiorite fels/quartzo-feldspathic gneiss contact. Inclusions have a preferred elongation parallel to the lineation produced by the alignment of hornblende. The mafic (amphibolitic??) inclusions vary from 1-2 cm to >10 m length and up to 1-2 metres in width. Accessory magnetite and specular hematite have locally been noted in drilling.

Numerous granodiorite fels outcrops at Rocky Point produced a prominent hill in the area (note L2W does not exist). Along the west flank of the hill outcrops of granodiorite fels produce a distinctly stepped slope with steep to vertical west slopes (rises) and gentle east to northeast slopes (runs).

4.7 GRANITOID ROCKS

4.7.1 PEGMATITE

Pegmatite is common in the area of the Main Zone of mineralization and numerous excellent exposures occur from L9E to L20E. Outcrops of pegmatite also are common along the north shore of Rocky Point on the southwest shore of Macleod Lake. At L0+00; 3+20S 30 cm to 1 metre wide bands of pegmatite are lit-par-lit interbanded with granodiorite. Exposures of pegmatite are also noted in outcrops of migmatitic quartzo-feldspathic biotite gneiss from L7W to L10W from 4+00S to 6+50S (refer to the Geology Map).

Pegmatite spatially associated with the 9+25E, 12+25E and 14+00E showings is the coarsest grained with whitish alkali feldspar to 20+ cm size. Pegmatite in quartzo-feldspathic gneiss is typically buff-white and is composed of 70-80% alkali feldspar, 20-30% smokey grey quartz and nil to 10% biotite/chlorite. Although not readily evident in outcrop, drilling indicates accessory coarse muscovite (especially in strongly pegmatitic sections), tourmaline (clusters of fine needles) and spotty equant garnets. In outcrop accessory garnet is only noted in pegmatite east of L18E. Chalcopyrite and molybdenite are rare in the pegmatite and where present occur at the margin with mineralized quartzo-feldspathic gneiss and/or siliceous zones. One of the most notable characteristics of the pegmatite other than its very coarse nature, is the relationship of quartz and alkali feldspar. Smokey grey quartz is exsolved in the alkali feldspar as vermicular, blob-like and cuneiform inclusions producing graphic and myrmekitic textures. Most of the quartz in these pegmatites appears to be present as exsolved inclusions in feldspar and very little appears to form interstitial aggregates.

Contacts between the pegmatites and surrounding gneiss and siliceous zones in many places are highly contorted with sutured, interpenetrating contacts which tend to parallel the foliation. Evidence of chilled contacts is lacking; however, margins with coarse well foliated biotite are common (restite?).

A second group of pegmatites form up to 1 metre wide dykes in the granodiorite fels outcrops south of the Main Zone. These dykes are light to medium pink in colour and are composed of 20-80% glassy grey to milky white quartz and 20-80% pink alkali feldspar. Accessory minerals appear to be absent and the dykes are characterized by their very quartz-rich nature. Quartz exclusively occurs interstitially with respect to the feldspars and is not exsolved within the feldspars. Also, feldspar grains are not nearly as coarse as in the Main Zone pegmatite. A number of the pegmatite dykes occur from L8+50E; 2+50S to 3+00S to immediately south of the 12+25E showing (1+50S to 3+00S). The dykes strike 040° to 050° and are orientated at a very slightly angle 0°-10° with respect to the hornblende lineation in the granodiorite fels (045° to 060°). Centimetre scale sinistral displacements of aplites and epidote fractures by the pegmatite dykes suggests that these dykes are relatively late and may not be related to the pegmatites within the Main Zone.

4.7.2 GRANITOID

Bands of granitoid occur throughout the map sheet as foliation parallel bands in the quartzo-feldspathic gneiss unit. Granitoid bands appear to be compositionally similar to pegmatite, the primary difference being the lack of pegmatitic texture.

4.7.3 APLITE

Numerous generally less than 15 cm wide, fine to medium grained saccharoidally (sugary) textured felsic aplites occur in the granodiorite fels south of the Main Zone and on Rocky Point between L0+00 to L2+00E from 4+00S to 6+00S (Geology Map). Rare aplite dykes are noted in the quartzo-feldspathic biotite gneiss unit, however, aplites appear to primarily occur in the granodiorite fels. The aplites are composed of fine saccharoidal quartz and pink feldspar with rare pyrite. The equigranular, saccharoidal texture is quite evident under hand lens and glassy quartz and feldspar grains appear to be reddish due to a slight coating of hematite.

Several outcrops, in particular one at 8+90E; 2+70S, help to clarify the relative age relationship of the aplite dykes. In that particular outcrop and in outcrops on L10E; 2+00S to 2+25S aplite dykes are very common and highly folded. The dykes tend to strike from 085° - 120° and where folded produce fold noses trending from 050° to 060° parallel to the lineation produced by hornblende in the surrounding granodiorite fels. In these outcrops aplites form a series of parallel folded dykes which are cut by quartz-rich pegmatites dykes. The pegmatite dykes also cut epidote fracture fills which in turn cut the aplites. These relationships suggest that the aplites are younger than the granodiorite fels but pre-date the development of the hornblende lineation. The aplites appear to be older than the epidote fracture fills and younger than the quartz-rich pegmatites.

4.7.4 COMMENTS ON PEGMATITE, GRANITOID, APLITE GENESIS

Jahns and Burnham (1969) note in the generation of granitic pegmatites of igneous or metamorphic origin that a three-fold sequence of consolidation is involved. Initial crystallization of hydrous silicate melt produces hydrous solid phases with normal phaneritic granitic textures (Phase 1). Phase 2 involves "Crystallization concomitantly from silicate melt and from a coexisting exsolved aqueous fluid of considerably lower viscosity, yielding giant-textured pegmatite along with much finer-grained even aplitic mineral aggregates" according to Jahns and Burnham (1969). Partitioning of the constituents between the melt and aqueous fluid, the rapid diffusion within the aqueous phase and also gravitational rising of the less viscous aqueous phase results in pods and zones of unusual composition and texture. Phase 3 involves the production of late stage mineral products and the formation of "pocket minerals" and mineral aggregates as late stage fluid-rock reaction products (Jahns and Burnham, 1969).

Based on these studies, it would appear that the aplites may be genetically related to the Main Zone pegmatites and that their formation may be related to the development of a coexisting aqueous fluid (which produced the very coarse pegmatite). Other features of this model which may be relevant to the granitoids, pegmatites and aplites of the Main Zone include:

1) The presence of granitoids of similar mineralogy but lacking pegmatitic texture (Phase 1 crystallization products).

2) The presence of coarse to very coarse pegmatites with exsolved quartz and volatile-rich and other accessory minerals including coarse muscovite, biotite, tourmaline and garnet (Phase 2).

3) The presence of aplites (Phase 2).

4) The presence of pods and zones of very coarse pegmatite (Phase 2).

5) The spatial association of pegmatite zones with an interpreted area of antiformal folding (refer to Section 5.1 - Folding) - Phase 2.

6) The presence of highly vuggy zones and drusy textures in some sections of pegmatite intersected in drill holes (Phase 3).

4.8 QUARTZ STOCKWORK BRECCIA

At L13+50E; 0+80S is a milky quartz and breccia zone (refer to the Geology Map). Fragments in the breccia are very angular and include migmatitic quartzo-feldspathic, pegmatite, granitoid and siliceous zone material. Some sections of the breccia zone are composed of very fine grained and angular felsic (pegmatite and granitoid) fragments surrounded by a very fine green material which may be rock flour and actinolitic amphibole. The largest majority of the breccia zone is composed of massive, barren, coarse grained, milky white quartz. Quartz surrounds all the above fragments and has very sharp contacts with the fragments and surrounding rocks. Locally the quartz appears to form a foliation parallel vein that extends east of the main breccia body. Angular fragments are also noted in the quartz vein. Epidote fracture fills which strike 150° to 160° are cut by the breccia zone.

The very angular nature of the fragments suggests that the quartz stockwork breccia post-dates migmatization.

4.8.1 QUARTZ VEINS

A number of coarse grained, bull-white quartz veins occur in the granodiorite fels on Rocky Point from L1W to L1E; 3+00S to 5+50S (Geology Map). Several quartz veins are also present in magmatic quartzo-feldspathic gneiss from L7W to L10W north of TL 6S. These veins are from 20 cm to >1 metre in width and consistently strike 000° to 010° and dip 35°W to vertical. The quartz veins appear barren and contain no sulphides. Several pegmatite and granitoid dykes are also present on Rocky Point. These dykes strike 010° - 020° and trace calcite is locally noted in the granitoid dykes.

4.9 GRANODIORITE FELS/QUARTZ-FELDSPATHIC GNEISS CONTACT

The contact between the granodiorite fels and quartzo-feldspathic gneiss is exposed at three (3) locations on the 1:2 500 map (Map 1). At 3+60E; 1+90S and at 1+90W; 5+00S (10 metres east of L3W) granodiorite fels is in direct contact with migmatitic quartzo-feldspathic biotite gneiss. At 12+25E to 13+00E; 1+30S to 1+60S pegmatite with elongate inclusions of gneiss and granodiorite fels separates migmatitic quartzo-feldspathic gneiss to the north and granodiorite fels to the south.

The best exposure of the contact occurs at 1+90W; 5+00S, where granodiorite fels occurs in contact with migmatitic quartzo-feldspathic biotite gneiss in an outcrop at the northwest base of a hill of granodiorite fels (refer to the Geology Map). Several outcrops of flat lying quartzo-feldspathic biotite gneiss occur at the base of the hill. The contact between the quartzo-feldspathic biotite gneiss and granodiorite fels is very flat producing a 'layer-cake' type stratigraphy. The contact is exposed on the steep west-face of the outcrop and appears to be very gently dipping to the north (5°-15°). Because of the very flat nature of the contact, determination of an accurate strike is very difficult. It appears that the contact dips northeast at 15° and strikes at approximately 125°. In the quartzo-feldspathic gneiss immediately below the contact are 2 less than 15 cm amphibolitic inclusions, one is ellipsoidally shaped and the other is very round and protrudes out of the outcrop. In particular, the round one has the appearance of a conglomeratic pebble. No evidence of faulting or shearing has been noted at the contact. Further stripping and washing could increase and improve this exposure.

At 3+60E; 1+90S the contact separating migmatitic quartzo-feldspathic biotite gneiss and granodiorite strikes at 055° and dips 60° SE. This contact is approximately parallel to the foliation in the migmatitic gneiss which strikes 045° and dips 30°-40° SE. The granodiorite fels is fine to medium grained and is composed of quartz, feldspar, biotite and hornblende. Elongate mafic inclusions composed of hornblende and plagioclase parallel the foliation and are 10's of centimetres in length. Granodiorite fels because of its fine grained nature and the presence of biotite is not characteristic of the typical medium to coarse grained, hornblende lineated granodiorite fels. Trace chalcopyrite has been noted in both the migmatitic quartzo-feldspathic biotite gneiss and the granodiorite fels at this locality.

At 12+25E to 13+00E; 1+30S to 1+60S (Geology Map) numerous outcrops of pegmatite occur at the quartzo-feldspathic gneiss/granodiorite fels contact. Coarse aggregates of specular hematite locally are noted in the pegmatite. Elongate inclusions of migmatitic quartzo-feldspathic gneiss and granodiorite fels occur within the pegmatite and parallel the regional foliation. Drilling in the Main Zone indicates the contact between the granodiorite fels and the quartzo-feldspathic biotite gneiss is of this type.

5. STRUCTURES, ALTERATION AND MINERALIZATION

5.1 FOLDING

In the area of the Main Mineralized Zone, the foliation in the migmatitic gneisses strikes generally from 040° to 060° and dips predominantly moderately to vertically to the southeast. In the west portion of the map sheet from L11W to L3W; 4+00S to 7+00S the foliation is very flat and because of this the strike shows quite a degree of variance and is difficult to measure. Several outcrops of migmatitic quartzo-feldspathic biotite gneiss from L3W; 4+30S, to 6+30W; 1+60S have foliations that dip shallowly to moderately to the north and northwest.

The migmatitic quartzo-feldspathic gneiss typically exhibits small scale folding which is characterized by folding of leucocratic bands and melanocratic bands in the gneiss. The greatest abundance and intensity of small scale folding occurs in outcrops of migmatitic gneiss along the north shore of Baseline Lake and from L14E to L19E south of Baseline Lake. Folds are very tight to isoclinal with amplitudes from centimetres to 10's of centimetres (Prior, 1989). The isoclinally folded gneiss is migmatitic to migmatite and significant amounts of pegmatite usually occur in close proximity to these folded zones. Small scale folds in these and other less intensely folded exposures of gneiss produce fold noses which trend from 060° to 110° and plunge shallowly (10°-20°) and rarely steeply east. The plunge of folds is difficult to determine in outcrop. Prior (1989) has noted that the trend of fold axes in the gneiss, when compared with the foliation, is slightly more eastward. Based on Phase 1, Phase 2 and Phase 3 drill results, the location of outcrops with isoclinal folding and the preponderance of pegmatite whose contact with migmatitic gneiss and fels locally also produce fold noses, an antiformal fold axis has been plotted in the Main Zone (refer to the Geology Map). This fold axis is interpreted to trend 065-070°.

Another antiformal fold axis may occur from L10W to L7W; 4+50S to 6+50S (Geology Map). The approximate location of this feature has been interpreted based on the disposition of outcrops, the orientation of small scale fold axes and foliations. Extrapolation of this feature further eastward intersects an outcrop at 4+30W; 7+70S. This outcrop of highly gossanous quartzo-feldspathic biotite gneiss is extremely pyritized and friable with abundant granular pyrite. Regionally, the Aerodat 1:20 000 scale contoured total field response airborne magnetometer map (Podolsky, 1990) indicates two (2) magnetic highs approximately 2.4 and 4.3 km to the west-southwest. These oblate-shaped highs have flattened contours which align producing a linear east-northeast/west-southwest feature which appears to project into the area of the interpreted fold axis. Two (2) mag highs occur to the east and flank the projection of the linear feature. One (1) of these mag highs occurs approximately at L3E; 10+00S to 12+00S and the other at about L20 to 22E; 10+00S to 12+00S.

The alignment of elongate, prismatic hornblende in the granodiorite fels produces a lineation which trends from 040°-060° and plunges shallowly (10°-20°) to the northeast. Plunges of the mineral lineations in the field are very difficult to determine. Minor small scale folds produced by aplite dykes appear to form fold axes which are parallel to the hornblende lineation. Comparison of the mineral lineation produced by hornblende with small scale folding in the gneisses shows a small but consistent difference. Mineral lineations in the granodiorite fels rarely exceed 060°, while small scale folds in the gneiss range from 060°-110°. The mineral lineation trend appears to more closely parallel the foliation in the migmatitic gneisses.

5.2 FAULTING/FRACTURING

Fractures and joints are very common and show a distinct preferred orientation of from 140° to 170°. Dips vary from 70° SW to 70°NE. Some of these show no apparent evidence of movement (joints), some have slickensides and some south of the Main Zone have displaced units (eg aplites) up to 1-2 metres most commonly in a sinistral (left lateral) sense. Where movement is apparent faulting has been marked on the map. Any of the alteration minerals epidote, hematite, chlorite, quartz and calcite are found within or marginal to the fractures as fracture fills and spotty to pervasive alteration halos. Epidote and hematite are by far the most common alteration minerals.

Very prevalent and very distinctive ridges (resistive ridges) of 1-2 cm height are common in outcrops of migmatitic gneiss throughout the Main Zone. These ridges distinctly stand out above the relief of the rest of the gneiss and tend to strike parallel to the 140°-170° structures. Such structures have not been noted in gneisses outside of the Main Zone.

Other fractures noted include some steep 125°-135° fractures and 050°-060° fractures and joints which occur in the granodiorite fels.

5.3 ALTERATION

Prior (1989) has discussed the role of alteration and in particular the role of the siliceous zones in the Main Zone. Alteration minerals noted in field mapping include epidote, hematite, chlorite, calcite, quartz, pyrite and actinolite. Alteration minerals associated with weathering of zones of high grade mineralization include malachite and ferrimolybdite (Prior, 1989). Magnetite also occurs around zones of high grade mineralization closely associated with bornite. Rusty limonite is common in areas of mineralization, but, also occurs in unmineralized quartzo-feldspathic biotite gneiss.

Epidote and hematite are very closely associated and occur in 140°-170° fractures, faults and joints. In these structures epidote occurs as fracture fills and spotty alteration halos around fracture fills. Hematite appears to be more common as spotty to pervasive alteration halos and zones around epidote +/- hematite fracture fills, however, brick-red fracture fills of hematite also occur particularly in the granodiorite fels.

In wider faults and fractures quartz is associated with epidote and tends to occur in the central portion of the fractures. Epidote is marginal to the quartz core. Alteration halos around the fractures are up to 1-2 m wide and composed of spotty to pervasive hematite and more restricted spotty epidote.

Chlorite locally occurs with or without epidote as fracture controlled to pervasive alteration zones. Chlorite occurs on fracture surfaces locally with slickensides. Fracture controlled and spotty to pervasive chlorite frequently has finely disseminated calcite locally. Pyrite as fine, granular, subhedral cubes is also typically associated with fracture controlled to pervasive chlorite. Smears of pyrite are typically noted on chloritic fracture surfaces and slips. At 4+30W; 7+70S migmatitic gneiss is intensely pyritized with very abundant granular pyrite. No mineralization has been noted in samples taken from this outcrop.

Actinolite occurs in zones of high grade mineralization and is noted at the 9+25E, 12+25E and 14+00E showing. At these showings actinolite is associated with high grade chalcopyrite, bornite, molybdenite mineralization. Also associated with actinolite and bornite is significant amounts of euhedral magnetite. Magnetite and bornite typically occur in high-grade cores of copper mineralization (ie. porphyry copper deposits and some stratiform copper deposits).

5.4 MINERALIZATION

The mineralization of the Main Zone has been described by Prior (1989).

Samples from this mapping programme were collected from outcrops outside of the Main Zone and analyzed for Cu, Mo, Au and Ag and are presented in Table 1. Four (4) fresh samples were collected in the 1:2 500 map area for whole rock analysis (Table 1). Beep-mat surveys were completed over the Main Zone and Rocky Point. Areas identified by the survey to have sub-surface mineralization were blasted and sampled. The beep-mat identified a zone 6 metres east of L3W at 5+70S. This site was blasted, and, at a later date, followed-up with stripping, washing and sampling.

Table 1

Geochemical Results of Outcrop and Boulder Samples

Sample	Outcrop Boulder	Location	Cu (ppm)	Mo (ppm)	Au (ppb)	Ag (ppm)
190601	boulder	0+70W;5+35S	8800	1500	112	6
190706	outcrop pit	18+30E;0+40S	1.93%	9	75	12
190801	outcrop	19+00E;0+10S	91	38	18	1
190802	outcrop	2+30E;5+35S	4	11	17	<0.2
190803	outcrop	3+00W;4+25S	179	21	22	2
190804	outcrop	3+50W;6+00S	2100	140	22	9
190805	outcrop	4+25W;7+60S	57	18	24	4
190806	outcrop	4+25W;7+60S	79	32	6	4
190807	outcrop	8+25W;5+25S	16	4	8	1
190808	outcrop	8+30W;4+25S	34	11	15	1
190809	outcrop	8+30W;4+25S	17	7	11	0.4
190810	outcrop	5+50W;2+25S	24	6	15	1
190811	outcrop	3+60E;1+90S	63	82	17	1
190960	outcrop pit	14+80E;0+83S	2.32%	1700	151	13
190961	outcrop pit	14+62E;0+80S	4.52%	5000	188	5
191820	outcrop pit	1+94W;5+70S	9.11%	34	70	22
191821	outcrop pit	1+94W;5+70S	2000	18	33	6
191822	outcrop pit	1+94W;5+70S	71	57	<5	0.8
191823	outcrop pit	1+94W;5+70S	5.72%	1000	226	26
190733*	outcrop	9+10W;6+50S	62	12	14	<0.5
190734*	outcrop	8+90W;5+25S	67	15	6	0.8
190768*	outcrop	6+90W;6+75S	2	2	8	0.6
191007*	outcrop	11+75E;0+85S	8	3	6	<0.5

* samples collected for whole rock analysis.

A 0.5 m sized, subangular mineralized boulder of siliceous material was discovered by Yves Clement at 0+70W; 5+35S. A sample (190601) taken from the boulder with 2-3% chalcopyrite and trace molybdenite yielded 8800 pm Cu, 1500 ppm Mo, 112 ppb Au and 6 ppm Ag. The mineralized boulder is in fairly close proximity to the granodiorite fels/migmatitic gneiss contact, however, projecting a possible transport direction parallel to the esker north of Rocky Point indicates a possible source in a glacially trending pond and swamp south of the 9+25E showing (L9E; 1+50S to L12E; BL). Given the nature of the boulder (siliceous material) and the abundance of outcrops of siliceous zones within the projected source area it seems most likely that the boulder came from the Main Zone, a transport distance of about 1,200 metres. (A round, 0.5 m size mineralized boulder a similar distance south of the same esker at 25+60W; 12+90S if from the Main Zone may have been transported 4 km).

Ten (10) of eleven (11) samples (190801 to 189811) produced negligible mineralization (Table 1). One (1) sample (190804) of gossanous, coarse grained quartzo-feldspathic biotite gneiss (biotite schist?) with 2% to 3% coarse pyrite + chalcopyrite produced 2100 ppm Cu, 140 ppm Mo, 22 ppb Au and 9 ppm Ag. Two (2) samples (190805 and 190806) were taken from an extremely pyritized, gossanous, friable limonitized (earthy yellow) and hematitized (red-brown) outcrop of quartzo-feldspathic gneiss. Both samples produced negligible results in Cu (57 and 79 ppm), Mo (18 and 32 ppm) and Au (24 and 6 ppb), but produced anomalously high Ag (both 4 ppm). Similarly, two (2) samples collected by Dave Pilkey in 1989 (Brack, 1989) from the same outcrop (samples 6506 and 6507) produced negligible Cu, Mo and Au results, however, anomalously high Ag (12 and 7 ppm, respectively). Three (3) of four (4) samples from the pit 6 metres east of L3W at 5+70S in the mineralized granodiorite produced anomalously high Ag. Two (2) strongly mineralized samples (190820 and 190823) with 10% to 15% chalcopyrite, up to 7% bornite and trace molybdenite produced 22 and 26 ppm Ag, respectively. These samples also produced 9.11% and 5.72% Cu, 34 and 1000 ppm Mo, 70 and 226 ppb Au. Other features of the strongly mineralized granodiorite fels include:

a) the mineralized granodiorite fels is strongly magnetic with abundant euhedral magnetite;

b) the mineralization surrounds pink feldspars forming an interconnected to blebby network and giving the rock a granular appearance;

c) abundant granular epidote is spatially associated with the chalcopyrite and bornite;

d) rare bluish-green mica(?) is locally noted; and

e) brick-red hematite fracture fills are locally present.

Evidence for structural controls to the mineralization, based on the limited exposure, is lacking.

Respectfully submitted,

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Norwin Geological Ltd.
November, 1990

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STATEMENT OF QUALIFICATION

I, James Bernard McAuley do hereby certify:

1. that I am a geologist and reside at 1112 Mederic Street, Hanmer, Ontario P0M 1Y1,

2. that I graduated from Laurentian University, Sudbury, Ontario in 1976 with an Honours Bachelors of Science Degree in Geology and received a Master of Science Degree in Geology from the same institution in 1983,

3. that I have practiced my profession for ten years,

4. that my report on the Macleod Lake Property, Eastmain River Area, Quebec for Windy Mountain Explorations Ltd. is based on my personal knowledge of the area and on a review of published and unpublished information on the property and surrounding area.

James B. McAuley

James B. McAuley, M.Sc.,
Norwin Geological Ltd.
November, 1990

APPENDIX 1

SAMPLE DESCRIPTIONS

SAMPLE DESCRIPTIONS

Sample No.	Location	Description
190601	0+70W; 5+35S	Subangular boulder of siliceous material with 2-3% chalcopyrite and trace molybdenite.
190706	18+30E; 0+40S	Pit sample. Strongly mineralized coarse grained migmatitic quartzo-feldspathic gneiss (with biotite-chlorite schist?) with 1-3% coarse blebby chalcopyrite.
190733	9+10W; 6+50S	Outcrop whole rock sample. Intermediate to mafic hornblende fels (dioritic fels) with 30% hornblende, 70% quartz and feldspar - very finely banded gneiss.
190734	8+90W; 5+25S	Outcrop whole rock sample. Biotite +/- hornblende intermediate to mafic fels to gneiss with 10% granitoid material. Biotite is weakly pervasively chloritized.
190768	6+90W; 6+25S	Outcrop whole rock sample. Medium grained intermediate to mafic biotite fels with 2-5% leucocratic bands to 3 mm width.
190801	19+00E; 0+10S	Outcrop grab sample. Fine to medium grained biotite gneiss with trace to 0.5% very fine disseminated chalcopyrite (?) - some rusty iron oxidation.
190802	2+30E; 5+35S	Outcrop grab sample. Massive granodiorite fels with 1% mafic inclusions and only a very weak hornblende lineation - no visible sulphides.

Sample No.	Location	Description
190803	3+00W; 4+25S	Outcrop grab sample. Quartzo-feldspathic biotite gneiss with rusty oxidation and trace to 0.5% fine disseminated specks of chalcopyrite.
190804	3+50; 6+00S	Outcrop (?) grab sample. Highly gossanous outcrop (sample) of quartzo-feldspathic biotite gneiss with 2-3% coarse sulphides (chalcopyrite + pyrite) and coarse biotite (biotite schist?).
190805	4+25W; 7+60S	Outcrop grab sample. Extremely rusty and friable quartzo-feldspathic biotite gneiss with abundant earthy yellow limonite with 1-2% pyrite but no chalcopyrite or molybdenite.
190806	4+25W; 7+60S	Outcrop grab sample. Similar to 190805 - pyritized quartzo-feldspathic biotite gneiss with abundant red-brown hematite and lesser limonite. No visible chalcopyrite or molybdenite.
190807	8+25W; 5+25S	Outcrop grab sample. Weakly foliated intermediate to mafic fels in quartzo-feldspathic biotite gneiss - a granitoid veinlet has 0.5% sulphides (chalcopyrite + molybdenite).
190808	8+30W; 4+25S	Outcrop grab sample. Rusty oxidized quartzo-feldspathic biotite gneiss near the pegmatite with no visible sulphides.

Sample No.	Location	Description
190809	8+30W; 4+25S	Outcrop grab sample. Rusty oxidized pegmatite with no visible sulphides.
190810	5+50W; 2+25S	Outcrop grab sample. Migmatitic quartzo-feldspathic biotite gneiss with fine trace to 0.5% sulphides (chalcopyrite) and rare trace molybdenite.
190811	3+60E; 1+90S	Outcrop chip sample. Migmatitic quartzo-feldspathic biotite gneiss with spotty oxidation suggesting trace-0.5% chalcopyrite - no visible molybdenite.
190820	1+94W; 5+70S	Pit sample. Strongly mineralized and strongly magnetic granodiorite fels with 20-30% total sulphides. 10-15% chalcopyrite and up to 5-7% bornite occur as interstitial matrix material surrounding granular appearing pink feldspar. Abundant euhedral crystals of magnetite are present throughout. Green malachite occurs on the weathered surface.
190821	1+94W; 5+70S	Pit sample. Weakly mineralized non-magnetic granodiorite fels with fracture controlled chalcopyrite mineralization (1-2% locally) - no bornite or molybdenite. Fracture, controlled hematite is also present.
190822	1+94W; 5+70S	Pit sample. Unmineralized granodiorite fels - non magnetic.

Sample No.	Location	Description
190823	1+94W; 5+70S	Pit sample. Very strongly mineralized and strongly magnetic granodiorite fels with 10-15% chalcopyrite, trace to 3% bornite and trace molybdenite. Abundant green malachite on the weathered surface.
190960	14+80E; 0+83S	Pit sample. Moderately silicified biotite gneiss (+/- chlorite and amphibole) with up to 10% chalcopyrite and 1-2% molybdenite locally.
190961	14+62E; 0+80S	Pit sample. Moderately to intensely pervasively silicified quartzo-feldspathic biotite gneiss with 5-7% chalcopyrite, trace to 1% molybdenite and 1-2% bornite along fractures and rimming chalcopyrite.
191007	11+75E; 0+85S	Whole rock sample. Fresh porphyritic pegmatite with 75-80% feldspar, 15-20% quartz and 3-5% biotite.