REPORT ON McCONNELL CREEK PROPERTY
- 1990 -
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east of McConnell Creek have similar lithologies and because the relatively high degree of metamorphism and deformation has masked or destroyed their primary features.

The distribution of the amphibolites hosting the McConnell Creek property is best defined by Belik's mapping in 1981, 1982 and 1983 (Belik, 1981 and 1983), which shows the belt to extend at least 4 km southeast and 6 km northwest of Snowslide Creek (Richardson, 1987, Figure 5). Southeast of the creek, where the main showings are located, the belt is about 0.5 km wide, but northwest of the creek, where outcrops are sparse, it appears to be about 1 km wide (Figure 3).

PROPERTY GEOLOGY AND MINERALIZATION

On the McConnell Creek property gold, accompanied by minor silver, occurs in quartz veins hosted by steeply dipping carbonate-chlorite-sericite schist zones developed in a band of amphibolite that is intruded on one side by quartz monzonite and on the other side by diorite. The quartz veins, schist zones, foliation in the amphibolite and contacts between the amphibolite and plutons all trend approximately northwestward and dip steeply southwestward or northeastward. Faults trending subparallel to the general structure are common in the schist zones. The amphibolite is exposed intermittently along trend for about 10 km, and in the area of the main showings its width appears to be 300 to 500 metres.

Lithology

The following descriptions are based on drill core, except for chlorite schist type C, which is exposed in trenches but was recognized in only a few places in drill core. Trench mapping and very limited outcrop mapping showed that these rock types can be recognized on surface, although chlorite schist type E was not recognized as readily as in drill core.

The principal minerals of the schist zone rocks are carbonate, chlorite and sericite, with or without quartz and plagioclase. Chlorite is a major constituent and sericite a minor constituent of CLS1, CLS3, CLS4, CLS5 and CLS//, whereas sericite is a major constituent and chlorite a minor constituent or absent in CLS2 and altered felsite. Carbonate is generally a major constituent of all types. The carbonate in several specimens of CLS1 and CLS2 was identified as calcite by X-ray diffraction, and although this may be the dominant species of matrix carbonate in most schist zone rocks the fact that in places the rocks do not effervesce with cold dilute HCl suggests that some other species is dominant locally.

Amphibolite: Amphibolite is the host rock for the schist zones that contain the mineralization. In the vicinity of the main showings it is intruded on the east by quartz monzonite and quartz diorite. This contact lies 30 to 50 metres east of the mineralized zones. Its contact with diorite west of the main showings has not been mapped, but the width of the amphibolite band here is more than 300 metres.

The amphibolite is dark green, mainly fine-grained and is generally composed of plagioclase (± 50%), hornblende (± 30%), chlorite and/or biotite (± 20%) and variable amounts of epidote. In one common variety hornblende occurs as fine- to medium-grained "xenocrysts", as well as being a component of the matrix. Biotite is generally absent except in a friably weathering (sandy textured) variety. In thin section hornblende is seen to be partially altered to chlorite and plagioclase to be variably altered to epidote, calcite and sericite.

Most of the amphibolites observed in the 1987 drill core fall into one of four types that tend to occur in layers several metres or more thick. In drill logs these types are called banded, patchy, speckled and nondescript. Sandy textured amphibolite, which is characterized both in drill core and in outcrops by being friable, is a less common type that occurs as layers usually less than one metre thick. Bands and patches are defined by differences in colour and texture. Bands may be 1mm to 10mm thick and generally are quite regular in form, although some are lensy. In a few places in drill core and in outcrop thin bands are isoclinally folded. Patches are often diffuse in outline and elongated so that only their width is seen in drill core. This dimension varies from 2 cm to more than 10 cm. Speckled amphibolite takes its name from large dark amphibole grains that give it a speckled texture. These appear to be grain fragments rather than phenocrysts, so in the drill logs they are referred to as "xenocrysts". Nondescript amphibolite is uniform in colour, texture and grain size.

Foliation, which is moderately to strongly developed, is defined in all types by a preferred orientation of matrix hornblende, and in thinly banded types by the banding as well. In places the foliation is cut by quartz-calcite stringers 1 or 2 mm thick.

Pod-like and dike-like bodies of medium-grained diorite are present in places. These bodies have diffuse margins and appear to be gneissic segregations rather than intrusions.

Quartz Monzonite and Quartz Diorite: These are grey to pinkish-grey, medium-grained rocks that display a weak foliation due to a preferred orientation of accessory amphibole. Thin fractures healed by quartz and bounded by selvages up to a centimetre wide of strong sericitization grading outwards into less intense sericite-epidote alteration are common. Scattered inclusions of amphibolite are present.

Skarn: The intrusive contact of quartz monzonite and quartz diorite with amphibolite is marked by a contact zone 2 m to 5 m metres wide of skarn and epidotized amphibolite. The skarn is composed of fine- to coarse-grained garnet, epidote, plagioclase, calcite and quartz.

Greenstone: This is a dark green and greyish green, fine-grained to aphanitic rock that in places is faintly laminated. It may be either massive or cleaved. It may contain minor finely disseminated pyrite and in places it effervesces with cold dilute HCl. Greenstone generally occurs as zones less than 2 m thick in or adjacent to amphibolite, although in places it is found within schist zones.

Chlorite Schist Type 1: This schist is dark green, fine-grained and thinly laminated in green and grey. It usually, but not always, effervesces with acid. It rarely contains more than 0.1% finely disseminated pyrite. In thin section the green laminae are seen to consist of chlorite and plagioclase with minor calcite and sericite and the grey laminae are seen to consist of calcite and sericite with or without quartz, plagioclase and chlorite. The laminae are discontinuous and in the one thin-section studied the green laminae appear to be flattened lapilli.

Chlorite Schist Type 2: This is a light green to grey to buff coloured, fine-grained, thinly laminated rock. It commonly effervesces with acid, but not in all cases. Sericite, carbonate and an emerald green mica are the principal constituents visible with a lens, and quartz and feldspar are seen in thin section. Chlorite is a minor constituent. The green mica was identified as fuchsite with a scanning electron microprobe. Elongated, lapilli size pods are faintly visible in some specimens. The most characteristic features of this rock are a better developed sericite foliation than the other types of schists and the presence of fuchsite. This is the second most abundant type of schist after type 1 and is the most common host rock to large quartz veins.

Chlorite Schist Type 3: This is a dark, drab green, fine-grained rock that may or may not be faintly laminated. Chlorite is the most prominent constituent. Its most distinguishing feature is the presence in the zone of weathering of lenses and coatings on cleavage surfaces of brownish black manganese oxides. This rock has been recognized most often in the trenches along the west margin of the schist zone.

Chlorite Schist Type 4: This rock is dark green, fine-grained and contains chlorite as the most visible constituent. Some specimens effervesce with acid and in a few places chloritized amphibole xenocrysts are present. The rock is variably cleaved and laminated. On one extreme the more massive examples could be called greenstone and at the other extreme the better laminated specimens are essentially the same as type 1 chlorite schist. It is not an abundant rock type.

Chlorite Schist Type 5: This is a dark green, fine-grained rock consisting of chloritic pods (about 75% of the rock) separated by white, irregularly shaped septa. The pods are elongate and vary in size from 0.5 cm x 1 cm to 2 cm x 4 cm. In one thin section examined the septa were composed 95% of carbonate, with minor quartz, sericite and chlorite, and the pods were composed approximately of 25%

chlorite, 20% sericite, 20% carbonate and 35% crystal fragments of plagioclase of varying sizes. The internal structure of the pods in this specimen indicates that they are formed from lapilli and crystal tuff. This rock occurs mainly, but not exclusively, as zones less than 50 cm thick immediately adjacent to amphibolite. In many cases it is not schistose and would more correctly be called a greenstone.

Chlorite Schist Type #: This is a bag term used for chloritic rocks in the schist zone that do not fit into one of the above categories.

Felsite: This is a medium to light grey, very fine-grained to aphanitic rock that often has a semi-porcelaneous appearance. However, it is easily scratched. It is generally massive, although it may be weakly banded. It commonly effervesces with cold dilute HCl. Often the only minerals visible with a lens are finely disseminated pyrite and magnetite, the former comprising up to 5% of some bands, and the latter being responsible for the moderate magnetism that is characteristic of the rock. The single thin section examined contained calcite, sericite, plagioclase and minor epidote. The term felsite may be a misnomer. The writer believes that this rock is an intensely altered felsite, but there is little evidence other than colour on which to base this conclusion.

Distribution Within the Schist Zones: A number of drill holes and trenches intersect two schist zones, and some drill holes intersect three or four. The zones are separated by amphibolite or greenstone units one to several metres thick. Some schist intersections are bounded by faults and are undoubtedly fault repetitions, however, some intersections are not fault bounded and represent a second or third schist zone. Although the picture is clouded by the presence of faults, it appears that the amphibolite or greenstone units separating schist zones are discontinuous, so that along strike and down dip one schist zone may merge with another. Nevertheless, the writer has found it useful to designate the westernmost zone, which outcrops along or just east of the baseline, as Zone 1 (Z1), the next zone to the east, if one is present, as Zone 2 (Z2), and so on.

The westernmost zone (Z1) is the best developed in terms of width and vein content, except on section 57+00N, where Z2 is better developed. In the area of the main showings Z1 varies from 1.1 m to 10.6 m wide. Z2 varies from 0.6 m to 5.5 m wide, and Z3, which may be a fault repetition in places, is up to 3.0 m wide.

CLS1 is both the most abundant and the most widespread rock type in the schist zones. It occurs in all the zones. CLS2 is the second most abundant type in the area of the main showings. CLS2 is most commonly found in Z1, where it may comprise half the zone. In over half the 1987 holes it was not encountered in Z2, although in some holes one or two metres were intersected. In other zones it occurs sparsely in bands less than a metre wide. CLS2 is the preferred host for quartz veins. Of the remaining rock types CLS3 is most abundant, especially in the trenches.

In general, CLS1 and CLS2 occupy the central parts of a zone. CLS2 is developed only within intervals of CLS1. Typically one or more of the other rock types occur between CLS1 and the margin of a zone, with several decimetres of either CLS5 or felsite being in immediate contact with the bounding amphibolite or greenstone.

Origin: The writer interprets the amphibolite and schist zone rocks as having formed from volcanic fragmental rocks by regional metamorphism and subsequent hydrothermal alteration and deformation. Amphibolite with patches elongated parallel to the foliation is interpreted as mafic volcanic breccia or agglomerate, and amphibolite with hornblende xenocrysts (speckled amphibolite) is interpreted as mafic tuff. CLS1 and CLS2, which in places contain ghost outlines resembling flattened lapilli, and the chlorite pods in CLS5, which in thin section appear to contain lapilli, are interpreted as having been mafic lapilli tuffs.

All the rocks underwent amphibolite grade metamorphism, but the only mineral remaining from that event is the hornblende in amphibolites. The mineralogy of the schists is a product of subsequent hydrothermal alteration, presumably related to the development of the quartz veins. CLS2 is lower in Na_2O and higher in K_2O than the other rock types, suggesting that changes in bulk composition accompanied hydrothermal alteration. There is some evidence (described under "foliation") that the schist zone fabric may also be a product of an event that post dates regional metamorphism. Certainly some pervasive strain in the schist zones after the development of some of the quartz veins (see under "veins").

Structure

Folds: East of the baseline at about 44+50N banded amphibolite contains a single isoclinal fold, 1 m in amplitude, about an axial plane 150/60W. The fold axis appears to plunge steeply northwestward, but it is not measurable. In an old trench at 55+80N a lineation in the plane of the amphibolite foliation plunges 50 degrees northwestward.

Small chevron folds are found in amphibolite foliation in a few scattered localities west of the baseline and in schist zone foliation in trenches 87-1 and 87-4. In a few drill holes schist zone foliation is folded into small isoclinal folds with amplitudes of several centimetres. In both the amphibolite and the schist zone these folds are accompanied by a very local and weakly developed fracture cleavage in which there is little if any development of chlorite, mica or other secondary minerals. The timing of the deformation that produced these small folds is unknown, and may not have been the same for both chevron and isoclinal folds. It is likely that the chevron folding is related to intrusion of the adjacent pluton. The significant point about the little folds in the schist zone is the absence of metamorphic or hydrothermal minerals in the associated fracture cleavage, which suggests that they formed after any such event, including hydrothermal alteration associated with vein formation.

Foliation: Between 55+55N and 57+50N the foliation in the schist zones exposed by trenching has a fairly uniform attitude of 150-170/70-90SW. In one spot it is cut by a fracture cleavage 140/85NE. Although foliation in the amphibolite west of the baseline appears in general to be parallel to foliation in the schist zones, it has not yet been shown that they are same, and it is an assumption that they developed at the same time. In a piece of core from DH87-15 containing a greenstone-amphibolite contact the schistosity associated with the foliation in the amphibolite cuts the contact but does not pass into the greenstone, whereas the greenstone foliation, which is part of the schist zone fabric, is parallel to the contact.

Faults: Faults are the main structural concern in attempting to correlate veins between drill holes. A number of faults observed in trench exposures are mere slips with slickensided surfaces but no gouge. Many faults, however, form gouge zones up to a metre thick. Some form breccia zones with little gouge. Faults recorded during trench mapping and drill core logging either have more than one centimetre of gouge or form a breccia zone.

The most prominent fault is a zone of gouge (sometimes mainly breccia) along the west wall of schist Zone 1. In most places the gouge is immediately adjacent to amphibolite, but in some places chlorite schist is in unfaulted contact with amphibolite and the fault lies a metre or less inside the schist zone. The attitude of this fault zone in the trenches is 145-180/60SW-85NE. Southwest dips predominate.

Most faults within the schist zones strike between 140 and 160 and dip 60SW to 80NE, with southwest dips more common. There appears to be another set of faults striking 05 to 50 and dipping 60SW to 70NE. In reality, however, too few faults have been observed to conclude that there are two sets. An important aspect of the faults is that nine instances of slickensides, scattered throughout the trenches between 55+50N and 57+50N, in both the west wall fault zone and within the schist zones, showed plunges between horizontal and 20 degrees. southeastward. No steeply plunging slickensides were observed. The most recent movement, and likely the main movement, on the faults cutting the quartz veins was approximately horizontal to plunging gently southeast.

Contacts: Lithological contacts exposed in trenches strike between 135 and 175 and dip 70SW to 75NE. Southwest dips are more common. In three instances where the west wall of the schist zone is not a fault the attitude of the contact is 145/90, 160/85SW and 172/70SW. The overall trend of the surface trace of the schist zone between 55+50N and 61+00N is 142 degrees.

An unexplained aspect of the structure of the schist zone is that although in the trenches most boundary contacts and faults, as well as most internal contacts and faults, dip steeply southwestward, the apparent dip of the schist zone as indicated by drilling is vertical to steep northeastward.

Mineralization

Native gold occurs with minor pyrite and chalcopyrite and almost negligible silver in quartz-carbonate veins within the schist zones.

Form and Distribution of Veins: The quartz-carbonate veins are steeply dipping structures with contacts that, in a general sense, are parallel to the foliation and trend of the schist zones. The veins vary in thickness from a few millimetres to over a metre, and any one vein may pinch or swell abruptly. Their continuity is affected by faults and numerous slips.

In places small veins are deformed into tight, irregular folds by the foliation in the schist zones. This was observed in core from several drill holes. On the other hand, large veins contain inclusions of foliated wall rock. Vein formation and the deformation that produced the schist zone foliation overlapped.

Veins occur in all rock types within the schist zones and an occasional vein is found in adjacent amphibolite. In fact an assay of 0.432 oz/t Au is reported from a 45 cm thick massive quartz vein carrying 1% cubic pyrite cutting amphibolite some 10 or 20 metres from the schist zone in DH85M16 (Serack, 1985). However, vein development, in terms of number and size, is decidedly greatest in CLS2. CLS1 also contains veins but is clearly a less preferred host.

Thin quartz-calcite veinlets are common in greenstone members, and to a lesser extent in adjacent amphibolite. They sometimes contain minor pyrite. They may be up to 5 mm wide and comprise several percent of a sample interval, but there is no correlation between the abundance of these veins and assay value. In some drill intersections of CLS1 and CLS2 there is a physical transition between grey carbonate rich lamellae in the foliation and lensy quartz-calcite veinlets several millimetres thick sub-paralleling but cross-cutting the foliation. The latter appears to have developed in part from the former.

Vein Mineralogy: The vein mineralogy is simple. Quartz and carbonate form more than 99% of most veins. Pyrite and lesser chalcopyrite occur as unevenly distributed grains and fine- to coarse-grained blebs or patches that range in size from several millimetres to several centimetres. Native gold has been observed in polished section in cracks within pyrite and occasionally gold has been seen with a hand lens. Fine gold can be panned from iron oxide rich mud in some trenches. Galena has also been reported (Belik, 1981). In two instances small grains of a soft, lustrous, grey metallic unknown were observed in drill core. It may have been graphite or a sulfosalt. In small veins pyrite may comprise up to 50% of the vein over several centimetres, but the sulphide content over a metre, as exposed in a trench, is seldom more than several percent, and is normally less than 1%. Concentrations of heavily disseminated pyrite may occur in wall rocks immediately adjacent to a vein or in wall rock inclusions within a vein. It has not been determined if this pyrite carries gold. High gold assays are not necessarily associated with large veins, or with intervals in which numerous veins are developed, or even with a high sulphide content, although there is a general correlation with these factors. The strongest association is with sulphides occurring as blebs rather than individual grains.

The veins normally contain between zero and 20% carbonate. In places carbonates form bands along vein margins or along microfractures in the quartz. This is the only form of banding visible in the veins. Most of the carbonate is milky white, fine- to medium-grained, and does not effervesce with cold dilute HCl. X-ray diffraction analysis of five specimens indicated that this is an Fe-dolomite. In places a buff coloured, coarse-grained carbonate, assumed to be ankerite, is present, with or without Fe-dolomite. In thin section both quartz and Fe-dolomite show strain features. Tourmaline is a sparse and irregularly distributed vein constituent.

The quartz-carbonate veins are cut by microfractures healed by quartz and calcite and along which scattered filaments of dark green to black chlorite, minor fine-grained euhedral pyrite and occasional smears of serpentine(?) and the grey metallic unknown described above occur.

Oxidation is not a pervasive feature in the veins and schist zones, even at the surface. It is absent in some drill holes, while in a few it occurs adjacent to fractures up to 100 m beneath the surface. It has developed erratically. In the veins sulfides are oxidized and Fe-dolomite is typically replaced by box-work limonite, with fine-grained calcite as a by-product of the process. An indicator of good mineralization (although not infallible) is a rich, reddish-brown iron oxide staining in oxidized veins.

SCOPE FOR FURTHER EXPLORATION

Area of the Main Showings

Chlorite schists containing quartz-carbonate veins and yielding assays more than 0.01 oz/ton Au have been encountered in all but a few of the 1984, 1985 and 1987 drill holes between 53+50N and 62+00N. Thus the extent of the mineralized structure in the vicinity of the main showings is at least 850 m along strike and 220 m down dip. There is scope within this area for the presence of undetected mineralization. The best mineralization found so far appears to have the form of a shoot 30 m in strike length plunging steeply to the northwest. Furthermore, veins appear to be offset by strike slip faults. Between 53+00N and 54+25N and between 58+00N and 60+50N, where drill hole spacing is 50 m or more and there are few trenches, there is ample room for shoots this size to be sitting unrecognized by the work to date.

Beyond the Main Showings

Drilling in 1984 indicated a potential for mineralization in several places beyond the area of the main showings.

1. DH84M17 at 69+00N, 0+50W: This hole, on the north side of Snowslide Creek, was drilled to test a VLF anomaly. It encountered 7 m of chlorite schist carrying a trace of quartz-carbonate material that assayed 0.016 oz/t Au over 0.9 m. The intersection was described as containing "poorly consolidated muddy sections" (Serack, 1984), a strong indication that faulting may have broken up the vein structure here. Another hole should be drilled to test the vein structure in this vicinity.

EXPLORATION TARGETS

Targets are numbered and labeled "T" for target and "S", "C" or "N" for south grid, central grid or north grid. They are shown on Figures 89-10A, B and C.

SOUTH GRID - High Priority

T-S1: 6250N to 6700N, 9950E to 10050E

This target is the northwestward extension of the main vein system. The vein in trench 88-29, the most northerly exposure of the main vein system, assayed 0.232 oz/t Au over 1.8 m. The VLF conductor that coincides with the main vein system continues uninterrupted to L6300N. North of L6300N the conductor splits into four moderately strong to weak conductors that lie within 70 m east and west of the baseline.

The bouldery kame deposit that blankets this area deters exploration by soil sampling or trenching. A 1983 hammer seismic survey along L6600N northeast of the baseline indicated 7 m of overburden.

Four diamond drill holes are recommended for the purpose of tracing the main vein system through this area.

TS-1.

Drill Hole	Collar Location	Direction	Inclination	Length
90-1	6275N 10040E	236	-45	50 m
90-2	6400N 10060E	236	-45	120 m
90-3	6650N 10070E	236	-45	120 m
90-4	6700N 10030E	236	-45	50 m

& TS 2   2-3 holes

plus IP anomaly.

T-S2: 5100N to 5400N, 9920E to 9970E
The southward projection of the main vein system through trench 87-1, DH84-M6 and the outcrops at 5295N, 9953E and 5283N, 9950E passes southwest of drill holes 84-M4, M3 and M1. These holes were collared in quartz monzonite or on the gneiss-quartz monzonite contact. Holes 84-M3 and M4 intersect thin, poorly developed chlorite schist zones only, nothing that resembles the main zone.

The projection of the main vein system intersects the 5000N cross-fault at 5100N, 9920E. The 300 m between trench 87-1 and this point should be investigated by trenching.

T-S3: 5950, 9940E
The veins exposed in trench 88-42 in the vicinity of L5959N, 9940E should be traced by trenching. Two moderate to weak VLF conductors, one trending 300° and the other trending 330° merge at this point. Each should be investigated.

T-S4: 5700N to 6150N, 9675E to 9850E
The "west zone" is exposed intermittently. The zone and its extensions should be better exposed by trenching. Several trenches should be placed over the two VLF conductors west of the zone and also over the conductor that runs up the gulley about 70 m east of the zone.

T-S8: The 3650N cross-fault between L3800N and L4050N
The 300 m long portion of the 3650N cross-fault between lines 3850n and 4050N is the most likely source of anomaly Soil S4. It should be investigated by trenching.

Mineralization in a cross-fault would represent an episode of mineralization younger than the quartz veins in schist zones.

T-S10: 2900N to 3200N, 10250E to 10300E
The source of anomalous values in Soil S5 is doubtless the quartz veins associated with VLF conductor S1 south of the 3650N cross-fault. One such vein at 3025N, 10280E carries 44,200 ppb Au. Although this vein is thin, like the others exposed in

this part of the property, it should be traced by trenching, if only to disprove the possibility that it widens along strike.

SOUTH GRID - Low Priority

T-S5: 5650N to 5900N, 9500E to 9650E
This small cluster of anomalous Au, Cu and Pb soil values lies just southwest of the gneiss-quartz diorite contact. The presence of mineralized shear zones within the quartz diorite cannot be ruled out at this stage, therefore this soil anomaly should be investigated by trenching. Basal till profile samples should be collected from the trenches for geochemical analysis if the overburden is more than a metre thick in an effort to identify and follow a dispersion fan.

T-S6: L5300N to L5500N, 9550E to 9700E
This area contains three spot soil anomalies of Au and one of Pb located on and south of the 5000N cross-fault. The VLF pattern here suggests the presence of a short conductor with a more northerly trend than the 5000N fault. Both the 5000N fault and the more northerly trending conductor should be trenched.

T-S7: 5000N to 5100N, 9500E to 9700E
Two spot Au anomalies occur down slope from a thin quartz vein exposed at 4975N, 9690E. A westerly trending VLF conductor passes close to the vein exposure. This conductor should be trenched on the possibility that a hidden vein along it is the real source of the Au anomalies.

T-S9: VLF anomaly S1 from L3700N to L4750N
A number of thin quartz veins in narrow chlorite schist zones are exposed between the twin conductors that comprise VLF anomaly S1 between the 3750N and 5000N cross-faults. Coarse-grained pyrite is present in some of these veins and in several places minor chalcopyrite and galena are present. Most grab and character samples from these veins returned low gold values. Drill holes 84-M24 to M28, between 3875N and 4175N (Figure 89-4), encountered chlorite schist and non-schistose chlorite-carbonate alteration zones containing quartz-carbonate veins up

to 15 cm thick carrying spotty pyrite, chalcopyrite and galena. One core sample ran 0.188 oz/t Au, but most samples assayed <0.05 oz/t Au. Soil region S3 owes its origin to these veins.

There is little indication of the presence of economically significant quartz veins in this area. However, there is no doubt that the processes leading to vein development were active here, and the possibility that these thin separated veins could coalesce into thicker veins at depth cannot be ignored. This possibility could be tested by three 180 m long diamond drill holes inclined at -60° and placed to intersect the zone about 150 m beneath the surface on sections 4700N, 4450N and 3900N.

T-S11: 2100N to 2650N, 10250E to 10350E
This area is on the southeastward trend of target S10, and lies in the middle of the Pb anomaly at the south end of Soil S5. Several short, weak VLF conductors are present.

The source of the anomalous Pb values lying downslope from this area may well be the veins 150 m southwest in target area S12. However, the fact that this area is on the structural trend from T-S10 and lies near the eastern margin of the gneiss, as do the main showings, suggests the possibility of a vein structure being present here.

T-S12: 2000N to 2600N, 10120E to 10200E
The thin quartz veins contained in narrow chlorite schist zones that are exposed between L2100N and L2400N at approximately 10150E were explored by diamond drill holes 84-M30, M31 and M32. These holes intersected chlorite schist zones less than 2 m thick containing 1 cm to 5 cm thick quartz veins carrying low gold values. A heavy concentration of vein quartz float between 2060N and 2100N at 10200E includes large pieces that indicate their origin was a vein at least 20 cm thick.

The source of the large blocks of quartz float, which is most likely the southward extension of the zone containing the thin veins described above, should be investigated. The steepness of the hillside here prevents the use of a backhoe for trenching, but a bench at 2075N, 10200E provides a suitable site for a drill pad.

The small size of the veins and schist zones exposed between L2100N and L2400N suggest that there is little to be gained from tracing these veins northward. However, since veins in the main showing pinch and swell, a few trenches would not be amiss.

CENTRAL AND NORTH GRIDS

These target areas, except the IP anomaly, were identified by soil geochemistry, all have VLF conductors passing through them and most are either in the gneiss terrane close to its western contact or straddle the gneiss-quartz diorite contact. They are presented in tabular form below, and comments where required, follow the table.

TABLE 6
CENTRAL AND NORTH GRID TARGET AREAS

Target Area, Name and Location

Priority	Geological Location	Geochemical Response	VLF Response	Quartz Veins	Length of Trenching
T-C1: 7100N to 7500N, 10050E to 10200E					
high	contact	Au	strong	yes	grid pit ✓
T-C2: 7200N to 7400N, 9575E to 9750E (IP anomaly)					
high	gneiss	Cu	medium	no	drill
T-C3: 7650N to 8050N, 9300E to 9500E					
low	contact	Au, Cu	medium	no	150 m and grid pit
T-C4: 8750N to 9050N, 9300E to 9475E					
low	contact	Au, Cu, Pb	medium	no	180 m and grid pit
T-C5: 9250N to 9575N, 9200E to 9425E					
low	contact	Au, Cu	medium	no	120 m
T-C6: 9900N to 10050N, 9250E to 9325E					
low	qtz. dio.	Au, Cu	weak	no	110 m

TABLE 6, CONTINUED
CENTRAL AND NORTH GRID TARGET AREAS

Target Area, Name and Location

Priority	Geological Location	Geochemical Response	VLF Response	Quartz Veins	Length of Trenching
T-C7: 10100N to ~~11050~~ 10500N, 9200E to 9500E					
low	contact	Au, Cu	strong	no	200 m
T-C8: 10500N to 10950N, 9650E to 9800E					
high	gneiss	Au, Pb	medium	yes	230 m ✓
T-C9: 10900N to ~~11750N~~ [illegible], 9550E to 9650E					
high	contact	Cu	medium	yes	80 m ✓
T-C10: 11200N to 11350N, 9650E to 9800E					
high	gneiss	Au, Cu, Pb	medium	yes	180 m ✓
T-C11: 11350N to 11550N, 9300E to 9400E					
low	qtz. dio.	Au	strong	no	40 m - [illegible]
T-C12: 11450N to 11550N, 9475E to 9550E					
low	qtz. dio.	Au, Pb	medium	no	50 m [illegible]
T-C13: 11575N to 11825N, 9575E to 9700E					
high	contact	Au, Cu	medium	yes	100 m [illegible]
T-N1: 11650N to 11950N, 10000E to 10150E					
low	gneiss	Au	strong	no	70 m
T-N2: 12350N to 12800N, 10250E to 10400E					
low	gneiss	Au	strong	no	90 m

T-C1: This is a high priority area because it lies on VLF-C1, because there are scattered anomalous Au values in soil and silt samples present and because fragments of vein quartz were found in a backhoe pit. Trenching in the area in 1983 revealed 2 m to 3 m of clay overlying till. The source of the anomalous geochemical values therefore is probably not local. Three samples of pyritic quartz fragments from boulder till underlying the clay ran 405, 585 and 680 ppb Au.

The core from drill holes M17, M19 and M20 indicate that VLF-C1 is probably due to faulting and brecciation in altered quartz monzonite. Quartz stringers are present in the quartz monzonite. It is most probable, however, that the quartz fragments in the till originated in gneiss at a point between west and northwest of this target area.

Since the water table in this area is above bedrock, the only way to pinpoint drill targets is to collect till samples for analysis from below the clay layer from backhoe pits in an effort to identify and follow a glacial dispersion fan.

T-C2: This target is defined by the IP anomaly, by partly coincident VLF conductors and by a Cu anomaly that lies down slope from the IP anomaly. The IP anomaly is strong and is shallow, yet the scattered outcrop in the area gives no indication of the reason for the anomaly other than possibly that some bands of gneiss contain more disseminated pyrite than is normal.

Trenching would not be effective in this area because the water table is shallow. It is recommended that a 200 m diamond drill hole be drilled from the southwest edge of the IP anomaly at L7300N, 9575E inclined at -40° in a direction 040°. This hole will intersect the axis of the IP anomaly at 20 m, the main VLF conductor at 95 m and the weaker VLF at 120 m vertically below the surface.

If nothing of interest is encountered when drilling through the IP anomaly, the site should not be abandoned without drilling the VLF conductors either by continuing the hole or collaring a new hole closer to the conductors. The local topography, which consists of a hogsback of gneiss rising abruptly from the southwest side of the swamp, suggests to the writer that a difference in competency exists between the gneiss and the rock underlying the edge of the swamp, and that consequently the VLF conductors may represent faulting within a schist zone.

T-C4: This is a good area in which to do a till geochemistry orientation study. It contains anomalous Au, Cu and Pb values in a relatively small area and also moderately strong twin VLF conductors. It lies mostly over gneiss, but partly over quartz diorite. Areas T-C3 and T-C5 are alternative choices for an orientation study if the till in T-C4 is thin.

T-C8, C9, C10 and C13: These areas are designated high priority because they contain exposures of quartz veins in chlorite schist. The old prospect trench at 11300N, 9700E in T-C10 exposes a quartz vein up to 15 cm thick in a chlorite schist zone at least 3 m thick. However, most of the exposed veins are only a few centimetres thick. All of the exposures are poor and require trenching.

T-C8 is an excellent area in which to do a till geochemistry orientation study because it contains a strong soil anomaly about 150 m from a quartz vein exposure in what is assumed to be the down-ice direction.

T-N1 and N2: Soil sampling in 1989 extended only to L12000 in the north grid. However, most of the grid was covered in 1983 by a soil survey with a 100 m x 50 m station spacing (Belik, 1983). Target areas N1 and N2 are defined by the coincidence of spot anomalous Au values from the 1983 survey and strong VLF conductors.

CONCLUSIONS

1. The 1989 exploration on the McConnell Creek property highlighted a number of target areas on the south, central and north grids. Several of these are defined drill targets, but most require follow-up trenching to define drill targets.

2. Geochemistry is the most useful method for locating target areas on the central and north grids.

3. A large portion of the central and north grids that was not explored in 1989 is unsuitable for soil sampling and will have to be explored using till geochemistry.

4. A prominent VLF-EM conductor is associated with the main showings on the south grid. It continues beyond the north end of the main showings and is in line with a similarly prominent VLF conductor in the central grid. The north portion of this conductor in the south grid constitutes a drill target and the conductor in the central grid is an important target area.

5. VLF-EM conductors are related to faulting and strong joint sets. The association between VLF conductors and chlorite schist zones is an indirect relationship. It is dependent on post vein faults in the schist and not on the conductivity of the veins or the schist.

6. Induced potential surveys do not detect the low sulfide type of vein that forms the main showing.

7. The source of the strong IP anomaly between lines 6900N and 7500N at about 9700E is unknown and may be a type of mineralization not yet recognized on the property.

8. The location of some soil geochemistry anomalies suggests a source within the quartz diorite. Such anomalies should not be ignored because the possibility of mineralized shear zones in the quartz diorite has not yet been disproven.

9. The southeastern end of the amphibolite gneiss unit has been displaced east of the property by the 2175 cross-fault.

10. The sense of shearing across schist zones in the south grid is left lateral. If rock pressure inequalities played a role in the localization of veins, this information might prove useful in exploring for veins in or near bent portions of schist zones.

11. The McConnell Creek property veins are similar to many Archean type gold veins in their mineralogy, form and structural development.

12. Thin quartz veins in chlorite schist are exposed on the access road 3.3 km south of camp. They are identical in mineralogy to the veins on the property.

13. The John B showing, which is located 17 km southeast of camp, consists of thin gold-quartz veins in chlorite schist developed in slates. These veins probably formed in a similar manner to the McConnell Creek veins except

that their host schist formed in greenschist rather than amphibolite facies rocks.

14. The Fredrikson Lake - Fleet Peak region and east may be geologically favourable for the occurrence of gold-quartz veins in schist zones.

RECOMMENDATIONS

1. The target areas described under "Exploration Targets" should be explored in the manner detailed in their descriptions.

2. The area underlain by amphibolite gneiss in the central and north grids not covered by the 1989 soil survey should be covered by either soil or till geochemistry surveys.

3. The source of geochemical anomalies in the quartz diorite terrane should be accounted for.

4. It is recommended that the 1990 program on the McConnell Creek property consist of the following:

		Estimated Cost
Diamond drilling in T-S1, T-S2 and T-C2	690 m	
follow-up to trenching in priority target areas	680 m	
	1,370 m	$ 171,000
analytical (coarse gold assay)		6,700
Overburden trenching and pitting in priority areas T-S2, T-S3, T-S4, T-S8, T-S10, T-C3, T-C4, T-C8, T-C9, T-C10 and T-C13		
backhoe - 16 days		23,000
analytical		5,500
Rock trenching in priority areas		
25 trenches		15,000
analytical		3,600
Road construction - 8 km		30,000

Camp mobilization and demobilization	$ 10,000
Groceries and supplies	9,000
Fuel	5,000
Freight	2,500
Vehicle rent	4,500
Wages	40,000
Consulting fees and report	45,000
Travel	4,000
Miscellaneous	10,000
	$ 384,800

5. A till geochemistry orientation study should be conducted early in the 1990 program.

6. If the 1990 and 1991 programs on the McConnell Creek property are encouraging it is recommended that regional exploration be conducted for this type of deposit in the Fredrikson Lake - Fleet Peak area and in the area east of it underlain by rocks of the Lay Creek Assemblage. Also, a search should be conducted for the faulted off southeastern extension of the amphibolite gneiss. The quartz vein in chlorite schist exposed on the access road 3.3 km south of camp should be investigated and consideration should be given to optioning the John B gold vein property.

Respectfully submitted
April 30, 1990

W.G. Smitheringale