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1986
NTS 21E/13 and 14
NTS 21L/13 and 4

INTERNAL REPORT

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INTRODUCTION

Location and Access

The Eastern Townships Property is located in southern Quebec and comprises both contiguous and separated special exploration permits between Thetford Mines and Asbestos (NTS 21E/13 and 14, 21L/3 and 4, (figure 1.)

Claim Information

The property consists of 399 special exploration permits covering 18,522 ha. Rental fees are $1.20 per hectare for the first two years and for each subsequent two year period. Assessment work valued at $15 is due for the first two years and rises by $20 for each subsequent two year renewal. A 5% NPI is payable to the former holder of the mineral rights or to the Quebec Government on production.

Summary of Work

1983: 1700 line kilometres of helicopter-borne EM, VLF and magnetic surveying. From 3,451 anomaly intercepts, 761 conductor systems were inferred. From the many anomalies detected, 53 were initially identified for ground follow-up.

1984: For logistical reasons it was decided that the initial work would be concentrated in the northeast sector of the project area. It was also decided that the anomalies followed up during this initial phase of work, should be situated in order to obtain as much information as possible on the geology of the region from the detailed mapping carried out on the gridded areas. As a result, nine grids were established which covered 33 Dighem conductor systems.

A total of 167km of cut lines were established on these grids and ground geophysics comprising HLEM and magnetic surveys served to delineate a total of 103 conductors.

Based on the interpreted physical characteristics of the conductors and the geology interpreted from the grid mapping, eleven targets were recommended for drilling on a first priority basis.

In November-December, 1984, additional gridding in the southwestern part of the property was undertaken in the Lac au Canard-Lac Coulombe area. This totalled about 192km of gridding and magnetic surveying and 172km of Max-Min II surveying.

1985: It was decided to drill test two anomalies located under Lac au Canard in the spring of 1985 on the frozen lake surface. These were both found to be caused by graphitic slate intercalated with mafic volcanics. The remaining eleven drill targets were left untested until further mapping was undertaken through these areas.

Mapping was conducted throughout the property at 1:20,000 scale to provide a base from which the work to date could be evaluated and to identify additional areas underlain by the volcanic part of the succession. Detailed mapping was conducted through the winter grids in the Lac au Canard-Lac Coulombe-Grid 24 area. In addition, ground truthing of the previously selected drill targets served to downgrade some of these and to upgrade others based on their geological setting with regard to proximity to volcanic portions of the ophiolite. It was found in may instances that airborne and ground EM conductors were located in areas underlain by graphitic black slate of the St. David Fm.

On completion of the reconnaissance mapping it was discovered that very few AEM conductors were located within the volcanic pile and it was also discovered that an area of previously known and partially explored mineralization in the Lac Coulombe area had only been partially covered by our grids in that area. The grids in the Lac au Canard-Lac Coulombe area were oriented with regard to a previously unknown series of slate units which occur through the middle of the volcanic pile and form long stratigraphic conductors, easily traceable for the airborne data.

Considering that the Lac Coulombe mineralization had no strong AEM response, and that a large area of the volcanic pile remained unexplored, it was decided to grid the remaining parts of the volcanic succession in the fall of 1985 and in the spring of 1986. In addition, it was decided to conduct a geophysical test program over the Lac Coulombe mineralized zone. This involved detailed IP, VLF, HLEM, gravity, and magnetic surveys on 50 meter grid line. The mineralized zones were readily detected by the VLF, IP. and HLEM surveys.

The fall 1985 drill program tested five geophysical anomalies on the 1984 grids, eight geophysical/geological targets on the Lac Coulombe test grid and one geophysical anomaly on the Lac au Canard grid for a total of 1,637 meters. The holes on the northwestern grids and at Lac au Canard returned only graphitic slate.

In the Lac Coulombe test area, holes LC85-1 and LC85-2 tested coincident VLF, HLEM, and IP responses (conductor E-6) and obtained a stratigraphic profile across the full width of the geophysical responses of L22E. Hole LC85-3 tested a coincident VLF and weak HLEM anomaly (conductor E-25) approximately 600 meters along strike from LC85-1 and 2. The results of this program are contained in a report by Lutes (1985).

1986: The 1986 exploration program included completion of the gridding of the remaining portions of the volcanic pile in the Lac au Canard - Lac Coulombe area and at Lac Nicolet and Asbestos to the southwest (222km). This was followed by 201km of HLEM surveys and 222km of magnetic surveys. All grids and grid extensions were mapped through the summer of 1986.

A geochemical test survey was conducted in soils from the Lingwick Deposit in the Weedon Belt and along several lines over the sulfide lenses in the Lac Coulombe test area and anomalies were detected in both cases, however, continued surveys in the Lac au Canard area - Lac Coulombe area were not undertaken as mapping had served to accurately locate and define the felsic horizons in these areas. Several interesting HLEM anomalies had been identified associated with those felsic horizons west of, and along strike with the Lac Coulombe sulfide zone. It was decided to survey this area with IP to further define drill targets here.

The fall drill program tested one geological target on the asbestos grid; a weak Max-Min II and VLF target on the Lac la fruite Grid; a geological target on the Lac au Canard - west grid and six geophysical targets on the Lac Coulombe - East and Lac Coulombe west area.

A series of 20 outcrop samples of mafic and felsic volcanic rocks were collected in the fall of 1986 and analysed for major and selected trace elements to enable correlation with the type section at Lac de L'Est and to determine parental magma type.

REGIONAL GEOLOGICAL SETTING (Figures 2 and 3)

Discussions of the geology and tectonics of the Thetford Mines Ophiolite and adjacent areas in southern Quebec abound in the published literature and the salient features have been summarized by Williams and St. Julien (1982).

The Baie Verte-Brompton Line (St. Julien and Hubert, 1975) describes the narrow zone of ophiolitic complexes which occur along the western margin of the Appalachian Orogen from Southern Quebec to Newfoundland, The Thetford Mines ophiolite Complex is part of the Baie Vert-Brompton Line and comprises the Black Lake, Mont Adstock and Mont Ham Massifs (Figures 2 and 3). Polydeformed and metamorphosed quartzites and phyllites of the Cambrian Caldwell Group lie to the northwest of the ophiolite complex and pass into the Cambro-Ordovician higher grade equivalent, the Sutton-Bennett Schists (Allochtons of the internal Domain) and thence into Cambro. Ordovician Allochtons of the External Domain separated by Logans Line from the Ordovician Foreland thrust belt and the Cambro-Ordovician St. Lawrence platform which overlie Precambrian Grenville Basement.

The Ophiolite Complex is bound to the southeast by Lower Ordovician olistostromes of the St. Daniel Formation which are succeeded by a Middle Ordovician turbidite sequence (Magog Group) occupying the St. Victor Synclinoruim. The Siluro-Devonian Connecticut Valley-Gaspe Synclinorium lies to the southeast of the Magog Group and is in fault contact with the Weedon Formation of Lower to Middle Ordovician age which is thrust northwest over the Siluro-Devonian rocks.

GENERAL GEOLOGY

The stratigraphic succession in the various segments of the Thetford, Mont Ham and Asbestos ophiolites is similar and is described in Lutes (1985). A basal cumulate sequence comprising pyroxenite and gabbro generally overlies a serpentinized hartzburgite (peridotite tectonite) which is host to the asbestos deposits of the Thetford Mines area. The top of the gabbroic unit is often occupied by erratically distributed trondhjemite bodies. A sheeted dyke swarm of variable thickness overlies the gabbroic rocks and passes into a sequence of pillowed basalts. These basalts are locally intercalated with pillow breccia, red argillite, chert, felsic volcanics and black slate. A distinction between a Lower Volcanic Sequence and an Upper Volcanic

Sequence is recognized by Hebert (1983) in the Lac de l'Est area of the Thetford ophiolite but does not appear to be valid elsewhere at either Ham Sud or in Asbestos.

GEOLOGICAL MAPPING 1986 (Fig. 4 and 5)

Detailed mapping of the new grids and grid extensions (222km) was conducted in the Lac Coulombe-east Grid (map 1), Lac Coulombe-West Grid (map 2), Lac au Canard-East Grid (map 3), Lac au Canard-West Grid(map 4), Lac Nicolet large Grid (map 5), Lac Nicolet Small Grid (map 6), Asbestos Large Grid (map 7) and Asbestos-Small Grid (map 8). Mapping was conducted with the assistance of J. Bernard.

LAC COULOMBE-EAST GRID (Map 1)

The Lac Coulombe-East Grid area is generally poorly exposed but appears to be largely underlain by pillowed basalts and pillow breccia. Medium-grained, isotropic gabbros are well exposed along the northern margin of the grid and toward the interpreted fault contact with volcanics, contain frequent dykes and veins of both diabase and felsite (aphanitic trondhjemite). These trend consistently to the northeast parallel to the inferred contact. Fairly thick sections of diabase dyke complex are preserved in the eastern portion of the grid, overlying the isotropic gabbros.

The mafic volcanics are best exposed from L48-55 and contain several zones of chlorite-carbonate alteration and weak pyritic mineralization but no felsic horizons appear to exist in this area. Magnetite-bearing flows are relatively common and easily traceable from the magnetic survey.

The southeast half of the grid was mapped in 1985 and contains two parallel bands of black graphitic slate marked by a moderate to strong EM response. The upper contact of the volcanic pile is in fault contact with grey to black graphitic slates and greywackes of the St. Daniel Formation.

LAC COULOMBE-WEST GRID

The original grid in this area covered the central part of the volcanic complex, including the Lac Coulombe Mineralized Zone. Grid extensions to the NW covered the lower contact of mafic volcanics and gabbro extensions to the SE covered the upper contact of the mafic volcanic sequence against St. Daniel Formation. The SW extension of the Lac Coulombe mineralized zone was also covered by the grid extensions and was found to continue along strike into the Lac au Canard-East Grid.

Exposures at the southern margin of the volcanic pile in the immediate vicinity of Lac Coulombe show a transitional sequence of lithologies from basalt to overlying slate (St. Daniel) of about 20-30 meters thickness. The lowermost beds are comprised of locally derived coarse angular volcanic debris which appear to be poorly sorted and directly overlie pillowed mafic volcanics. These are rapidly succeeded by progressively finer mafic volcaniclastic beds with interbedded slate. Slatey interbeds predominate toward the top of the section and where recognizable volcaniclastic beds are absent, one can confidently recognize the rock type as typical St. Daniel Fm. This transition zone appears to be no more than 20-30 meters thick at most but shows that thrust faults are not present at all contacts between the ophiolite and the St. Daniel Fm. The transitional lithologies have been traced for about 2km along strike but are structurally removed on both the Lac Coulombe-East Grid and the Lac Au Canard-East Grid.

Mapping at the south-west extension of the Lac Coulombe Sulfide Zone showed a continuation of rhyolitic horizons to at least line 2E in outcrop. These typically have associated minor pyritic mineralization and are assumed to persist SW into the Lac au Canard-East Grid through an unexposed area.

Mapping along lines cut north of the Lac Coulombe sulfide zone has shown relatively numerous chaotic sulfide-bearing boulders identical to the typical altered and mineralized rocks from this zone. The position of these boulders quite clearly indicates a latest glacial episode of northward ice advance with transport of erratic boulders up to about 2km from the sulfide deposits.

Mapping at the northern part of the grid defined the lower contact of the volcanic sequence at about 17 N and striking about NE parallel to the baseline. The intrusive underlying the volcanic complex here consists of microgabbro and diabase in dyke swarms. Rocks furthest north at the edge of the grid are generally fine to medium grained and often massive in outcrop although glacially polished exposures clearly show the dyke-like contacts locally. These rocks become increasingly fine-grained and hyaline toward the volcanic contact and are locally autobrecciated. The volcanics are also very hyaline near this contact but show vesiculated pillows or pillow breccias. A reddish Jasperoid chert (unit OIF) occurs in a single rubbly outcrop on line 8+00E at about 100 meters above the dyke complex. It is not known if this is a vein or stratiform feature. The "Disraeli Copper" vein containing a variety of base metals, occurs at about 9+50E at 20N. This epithermal vein has received much attention as an exploration target in the past but appears to be a late epithermal vein unrelated to the origin of the ophiolitic rocks and has no viable exploration potential. It lies within rocks of the dyke swarm about 300 meters below the volcanic contact.

Two horizons of oxidized pillow breccia occur along the road on line 3+00E. One at 16+00N is at approximately the same stratigraphic level as the jasperoid chert on line 8+00E.

Undeformed upper and lower contacts of the volcanic sequence are apparent on the Lac Coulombe-West Grid approximately between lines 1E and 12E in the north and along the entire contact against St. Daniel Fm. in the south. This apparent thickness is about 2.9km and assuming a subvertical dip this equates to a true thickness for the volcanic sequence.

LAC AU CANARD-EAST GRID (Map 3)

The original Lac au Canard- East Grid covered only a narrow section in the central part of the volcanic sequence and it was found that the grid extensions adequately covered both the upper and lower contacts of the volcanic succession. Results of grid mapping in the area in 1985 were reported in Lutes (1985).

The dominant type of volcanic is vesicular pillow basalt (unit 6a). Pillows are generally small and poorly formed and tops are difficult to determine. A relatively continuous zone of oxidized basalt and pillow breccia near the sheeted dyke swarm can be traced from about L58E to the edge of the grid at L68E and is also located on the Lac au Canard Grid. Interspersed throughout the mafic volcanics are a variety of massive and/or quartz and feldspar phyric rhyolite and felsic pyroclastic rocks (unit 6C, 6Cr) which appear to occur at virtually all stratigraphic levels. These vary widely in thickness but usually contain disseminated or stringer pyrite. Pyrite is most common in several of the smaller units at lower stratigraphic levels (L49-L54E Lac au Canard 5 to 7N; L53E-54E Lac au Canard 2N; L66E-67E Lac au Canard 1N).

A relatively thick section (±300m) of mixed coarse to fine felsic pyroclastic, and volcaniclastics grey slate (unit 6dg), reddish hematitic slate (unit 6d) and chert (unit 6ch) occurs on the east side of Lac au Canard at about 1S-3S. These rock types are interbedded and appear to be intimately associated in this section. Despite considerable alteration of the pyroclastic/volcanic rock types in the section, at least two distinct compositional varieties occur together, each locally included as brecciated fragments in the other, suggesting probably a very local provenance or eruptive center. A faulted extension of this section strikes NE across the grid at about 1S-2S(unit 6bxr). This unit is comprised of a mixed mafic felsic component fragmental (dominantly mafic agglomerate containing felsic clasts) and is interpreted as perhaps a distal equivalent to the pyroclastic breccias near the Lake.

Two additional thick sections of felsic rock occur higher in the volcanic sequence. The first strikes NE across the grid from about TL5S at the lake to about 10S at the NE end of the grid and is probably stratigraphically equivalent to the felsic rocks in the Lac Coulombe Sulfide Zone and its southwestward extension. This unit is thickest at the lake (±300m) and is composed of dense buff to grey massive aphanitic to quartz and feldspar phyric rhyolite (crystals 1-2mm in size) with generally less than 1% disseminated pyrite. Although easily defined in outcrop near the lake, the unit is poorly exposed at the NE end of the grid and is only partially defined at lines 61 and 62E. Abundant float in this area suggests its continuation to the NE. The thickness of the unit decreases to about 100 meters in this area

The uppermost felsic unit is in fault contact with St. Daniel Fm. from lines 43E to 59E and here obtains a maximum thickness of ±400m. It appears to continue NE across the grid to L68E at 15S and is reasonably well defined through this area although stratigraphic thickness is much reduced at about ±75 meters. The unit is composed of a buff to grey, dense quartz and feldspar phyric rhyolite. Quartz crystals are predominant and unusually large (up to about 8mm). Pyrite is least common in this unit.

Mafic volcanic rocks lying between these uppermost two felsic units are locally intensely carbonatized ankeritic and locally contain up to 5-10% coarse euhedral cubes of pyrite. The most intense alteration occurs between about L56E and L61E, coincidentally straddling an E-W trending fault. It is thought that channelling of seawater through such a structural zone might account for the "footwall alteration" under the uppermost felsic unit. Unfortunately no associated base metal mineralization is apparent.

Several features of the felsic volcanic/pyroclastic rocks seem to vary consistently according to stratigraphic position in the volcanic sequence. Those units at a lower stratigraphic level are generally aphanitic with crystals less than 1mm in size and usually contain disseminated or stringer pyrite up to 3-5%. Felsic units at a higher stratigraphic level have succeedingly larger and more abundant crystals and generally contain less pyrite (L1%). Thickness of the felsic units seems to increase with increasing stratigraphic level and also with proximity to the lake suggesting a provenance or eruptive center in this direction.

Various units of grey and black graphitic slate (unit 6dg) occur across the volcanic sequence and although these are rare in outcrop, they are generally easily traced as long stratigraphic conductors. These are probably more or less stratigraphically continuous with those in the Lac Coloumbe area.

A long continuous unit of red hematitic slate (unit 6d) is readily traced along between the five uppermost felsic units and appears to be displaced about 200 meters along an E-W trending fault between lines 57E and 58E. This distinctive slate unit makes a convenient marker horizon on both sides of this fault.

The intrusive rock series comprises a medium-to coarse-grained gabbro in the northwestern extremities of the grid which become increasingly fine-grained toward the volcanic edifice. A section of up to 1km of diabase dykes, microgabbro and associated hyaline hypabysal intrusive breccias occur below the volcanics and the contact is readily defined in most outcropping areas as at the Lac Coulombe-West Grid.

A structurally repeated section of the volcanic sequence occurs in the NW corner of the grid, bound by two thrust faults which converge as scissor faults at about L47E. The section appears to be about 600 meters thick on this grid and strikes off onto the Lac au Canard-West Grid where it is better represented in outcrop. The rocks contained in the section comprise part of the sheeted dyke swarm, overlain by pillowed basalts, a zone of oxidized pillow breccia and an aphanitic rhyolitic unit. These lithologies are fairly typical of the lower section of the volcanic sequence elsewhere on the grid and it is presumed that this section was emplaced as an imbricate thrust during obduction of the ophiolite.

A large trondhjemite intrusion occurs on the west side of Lac au Canard and appears to intrude both the sheeted dyke swarm and the lower part of the volcanic sequence. The intrusion consists of a homogeneous fine-to medium grained equigranular granitiod rock which generally contains 1-2% pyrite. Petrographic examination of a smaller trondhjemite body on the Lac au Canard-West Grid shows about 15-20% quartz and 75% plagioclase (composition An40) comprising the rock with about 2-3% clinopyroxene and 2-3% secondary chlorite.

Age relationships for four intersecting faults on the Lac au Canard-East Grid can be interpreted. The oldest fault indicated is the east-west trending cross fault between about L45E/8N and L59E/15S (F1). This is cut off by the major thrust fault at the top of the volcanic pile against St. Daniel Fm (F2). This in turn is interpreted to be offset by a second crossfault down the length of Lac au Canard (F3). Apparently the youngest of these intersecting faults is the thrust fault at the top of the repeated volcanic section in the NW part of the grid (F4). I would suggest therefore that F, and F3 are original structures related to seafloor processes whereas F2 and F4 were initiated by later obduction processes. It is possible that later movements on F3 are responsible for the interpreted offsets of F2.

LAC AU CANARD-WEST GRID (map 4)

This area is characterized by abundant outcrop throughout the grid. The hilly upland areas along the northwestern margin of the grid are typically underlain by gabbro and sheeted dyke complex with minor trondhjemitic intrusions and local felsite dykes.

The volcanic sequence overlying the intrusive complex is comprised largely of sheared and deformed pillow breccia through the central portions of the grid and probably indicates layer-parallel shear associated with thrust faulting. Relatively undeformed pillow basalt is best exposed in the northern part of the grid in the vicinity of L27E/14N and is fairly common in the southern part of the grid at or below the baseline.

A mineralized felsic horizon was discovered at a stratigraphic level of about 100-150 meters above the sheeted dyke complex in the eastern, central and western portions of the grid. It is best mineralized from L22E to about L24E, containing up to 10-20% pyrite and local visible disseminated chacopyrite. Adjacent pillowed basalts locally contain magnetite iron formation in crevices between pillows. These magnetite-rich deposits commonly contain disseminated chalcopyrite. A good example of this is at L25E/14+25N. Felsic rocks have also been identified at L25E/7N and L0+00/9N and it is suspected that strike continuation of the latter may be the mineralized provenance for a chalcopyrite-bearing float at L4E/BL.

A jasper vein (bed?) occurs within mafic volcanics on L0+00. This horizon is located about 100 meters above the sheeted dyke complex and appears to be stratifrom although it cannot be followed along strike. It should be noted that the only other known occurrence of a jasperoid rock was located on the Lac Coulombe-West Grid and also at about 100 meters above the intrusive complex. This latter jasperoid appears to strike into a stratiform zone of oxidized pillow breccia and indeed in the present case, oxidized pillow breccia occurs just 100-200 meters along strike southwest of the grid, outcropping on the Gosford Road. A variety of depositional and tectonic structures were noted here from the 1985 reconnaissance mapping, including rare clasts of jasper. This combined evidence suggests that the jasperoid cherts are strata bound sedimentary rocks.

Several mappable zones of hematitic alteration (oxidized zones) and chlorite±pyrite alteration occur on the mafic volcanics. These can generally be followed across several lines but are often irregular in outline and trend. No chalcopyrite or sphalerite is associated with these zones and they do not appear to be of economic significance.

A unit of grey and black graphitic slate up to 400-500 meters thick occurs south of the baseline and can be traced both in outcrop and by a marked conductive response though this area. It is succeeded by a 300m thick succession of mafic volcanics which contain a carbonate-rich alteration zone similar to that described on the Lac au Canard-East Grid. This is likewise overlain by a quartz phyric pyroclastic unit which correlates along strike with those rocks described for the East Grid. No mineralization occurs associated with these rocks on the West Grid.

A fault bound block of gabbro-dkye complex occurs at the eastern margin of the grid along L34E. This has been described on the East Grid. The curved form of the bounding fault which straddles these two map sheets strongly suggests overthrusting from the east.

Several isolated gabbroic bodies have been mapped through the central portion of the grid. These appear to be high level intrusions rather than fault slivers and show that magmatism in the rocks of this complex must have been unusually long-lived as these have not been distinguished elsewhere. Several trondhjemitic intrusions also occur within the volcanic sequence. These appear to have intruded to even higher levels than the gabbros.

The major bounding fault between the volcanics and the St. Daniel Fm. truncates much of the ophiolitic sequence and the apparent thickness of the volcanic succession is reduced from about 2.6km at the NE margin of the grid to about 0.6km at the SW margin. A cross fault disrupts this major fault between lines 8E and 9E although it cannot be traced through the volcanics.

LAC NICOLET-LARGE GRID (map 5)

Outcrop on the property is generally sparse, the best exposures being generally in the center portion from lines L15 to 24E (approx.). Strongly deformed rocks of the Caldwell Group outcrop at the northern margin of the grid on Lines 18-20. An outcrop at about 5+25N on L20E comprises a melange of sedimentary and minor volcanic rock-types which is considered to mark the fault contact between Caldwell Group and the ophiolite rock-types. Both rock series are extremely deformed and altered along this contact, but the Caldwell rocks comprise largely greywacke and phyllitic schists. The trend of the fault contact appears to coincide with conductor E-13 which extends from L25E/4+50N to L36E/4+50N and is probably caused by a graphitic component in the sediments along the fault.

Gabbro (unit 4c) occurs in E-W trending belts both in the north and south portions of the grid and in both areas appears to be in proper stratigraphic context to the adjacent mafic volcanic rocks, implying a folded sequence with younger rocks cored in a syncline through the center of the grid (this is borne out by the symmetry of unit 6bx). Ankerite spotting and minor pyritic mineralization (coarse euhedral variety) are common in both the gabbro and the mafic volcanics in the northern part of the grid adjacent to the faulted contact against the Caldwell Group. At the northeastern corner of the grid, extensive gabbroic rocks are little deformed, but many cross-faults complicate the stratigraphic succession into the volcanic sequence. The gabbro along the southern margin of the grid is likewise little deformed and there is sufficient outcrop across the grid to confirm the presence of gabbro over a large area (LI5E-L43E) and to reasonably delineate the gabbro-volcanic contact. This contact is well exposed from L20E-L28E and appears to have a generally E-W trend. Cleavage (S_1) throughout this contact zone is at 30-40° variance to the mapped trend of the contact. This variance is even greater in the NE corner of the grid and suggests that folding is pre-cleavage and that the two events are the product of different deformational episodes.

The mafic volcanics (unit 6a) comprise both pillowed mafic volcanics and pillow breccia. Two parallel belts of hematitic pillow breccia (unit 6bx) are well exposed in the central grid area. This breccia locally contains clasts of jasper and rhyolite and distinct layers of hematitic slate can be distinguished. Local boulders of rusty rhyolite through this area seem to indicate that mineralized rhyolites may be present although unexposed. Several outcrops of hematitic pillow breccia and hematitic slate occur at L35E/4S and are correlated with the former occurrences. Conductor E-12 is on strike with this unit and may indicate some graphitic bands in the slate unit.

A peculiar mafic breccia with rhyolite clasts occurs in the NE corner of the grid near a small outcrop of pyritic and silicified felsic tuff at L41E/1+00N. The apparent short strike length of this pyritic unit and the lack of associate conductive response suggest little mineral potential in this area.

A single outcrop of an ankerite-magnetite rock occurs at L8+00E/2+50S and has no easily defined geologic context. The lithology appears to be an altered form of ultramafic rock. Its magnetic signature suggests that it strikes NE across the area and appears to cross the Caldwell Group Fault boundary. It might be an altered ultramafic dyke rock.

<u>LAC NICOLET-SMALL GRID</u> (map 6)

This grid was cut to cover an AEM conductor (E-1). Mafic volcanics are relatively well exposed throughout much of the grid and are relatively unaltered. Cleavage in the volcanics is vertical and strikes NE across the area. The volcanics are separated by a fault from graphitic slate of the St. Daniel Formation in the northwest part of the grid. Conductor E-1 coincides with this contact.

<u>ASBESTOS-LARGE GRID</u> (map 7)

This grid contains a reasonably well exposed section of mafic volcanics containing several horizons of aphanitic to locally quartz phyric felsic volcanics. The volcanic sequence is about 400-600 meters thick, overlies a diabase dyke complex to the northwest and is in fault contact with greywacke, quartzwacke and slate of the St. Daniel Fm. to the southeast.

The Gabbro-volcanic contact is reasonably well defined in outcrop from about L6E-L10E but is elsewhere interpreted from the magnetic signature of the diabases.

The felsic horizons appear to number about six. These are all lithologically similar and usually vary from about 1-15 meters in thickness. Minor associated pyrite is common to all but is usually less than 2-3%. Chalcopyrite was recognized only at L11E/2S and is not of economic importance. Some associated footwall and hanging wall chloritic-pyritic alteration can be recognized in most outcropping areas of surrounding mafic volcanics. The thickest section of felsic rocks is on L7E which is about 75-100 meters thick.

The best exposed section of the volcanics is along L14E where three successive felsic horizons are exposed across strike. A grey to reddish hematitic slate occurs here about 50 meters above the uppermost felsic horizon. This felsic horizon can be traced discontinuously from L8E to L25E and appears to be the most persistent of the felsic units. Hematitic slate occurs only on lines 11E, 14E, 26E and 27E and appears to be at increasing distances above the felsic unit from west to east. It is probable that the slatey rocks represent a single lithologic unit across the area.

The volcanics trend consistently NE and do not appear to be folded. A cleavage is generally present in these rocks with a consistent NE strike and a steep SE dip. The intensity of deformation increases rapidly toward the fault contact with St. Daniel Fm. and extreme shearing and carbonate alteration is characteristic of mafic volcanic rocks near this boundary. The fault contact is nowhere exposed on the grid but is easily discerned from the EM data. The river valley is occupied by extensive thicknesses (40-50M) of compact clay-rich glacial till with local overlying sand and gravel outwash.

ASBESTOS-SMALL GRID (map 8)

This grid was emplaced in order to cover an AEM conductor in an unknown geological context. The northern portion of the grid is underlain by mafic volcanics in fault contact with graphitic slates of the St. Daniel Fm. to the south. Ground conductors E1, E2 and E3 are located along the southern margin of the grid and coincide with the mapped distribution of the St. Daniel Fm. slates and greywackes which strike about E-W across this area. A narrow zone of weak chloritic alteration with a trace of pyrite was located on L2E but no other evidence of mineralization was found.

DIAMOND DRILLING (1986)

The fall drill program tested one geological target on the asbestos grid, a weak max-min II and VLF target on the Lac la Truite grid, a geological target in the Lac au Canard-West Grid and six geophysical targets on the Lac au Canard-East and Lac Coulombe grids along strike west of the Lac Coulombe test area. A total of nine "BQ" diamond drill holes (726 meters) were drilled from October 3 to Oct 21, 1986 by St Lambert Drilling Co. Ltd. of Valleyfield, Quebec. Drill logs and assay reports are contained in appendix I.

ET86-1 (fig. 6, 7, 8)

This hole tested a geologically interesting section of felsic volcanics on the Asbestos-Large Grid which contain disseminated and stringer pyrite with a trace of chalopyrite.

Light grey-green felsic tuff (ash tuff) was intersected in the drill hole from the collar to 93 meters depth. Some variation in grain size was noted (e.g. the presence of locally interbedded crystal tuffs). Stringer and disseminated pyrite was present throughout the felsic unit with local traces of chalcopyrite but no improvement in alteration or mineralization was recognizable across the section relative to that observed at surface.

<u>ET86-2</u> (fig. 9, 10, 11)

This hole tested a section of exposed felsic volcanics on the Lac au Canard-West Grid that locally contain heavy stringers of pyrite. Some chlorite-magnetite iron formation with associated chalcopyrite also occurs in the area surrounding selvages in pillow basalt.

The hole was collared near the southeastern contact of the felsic volcanic against pillow basalt. The upper part of the hole intersected a barren crystallithic tuff overlying a silicified rhyolite with pyrite stringers and disseminations. These felsic units appear to be only about 10-15 meters in combined thickness and are underlain by mafic volcanics down the hole.

The felsic units are only about 200-300 meters stratigraphically above the sheeted dyke complex. Two quartz-feldspar porphyry dykes occur in the lower part of the hole. These may be feeders to the felsic units and if so, may have a similar chemical composition.

Six sections of 0.6-1.0 meters length were split and analysed for Co, Pb, Zn, Ag and Au. The best result was 2870ppm Cu+12ppm Pb+12,860ppmZn+2.1ppm Ag+59ppm Au from 15.1-15.7 meters. The results show generally increasing Cu+Zn values from the uphole contact to the downhole contact of the rhyolitic unit (fig. 11).

<u>ET86-3</u> (fig. 12, 13)

This hole tested a VLF and weak IP chargeability target on the Lac au Canard-East Grid. A mixed section of mottled felsic tuff with chloritic fragments and mafic volcanics was encountered. No noticeable conductive minerals were identified in the hole (pyrite is generally sparse) however, some graphite along fractures has been recognized in felsic volcanics intersected elsewhere on the grid and may also be present here.

<u>ET86-4</u> (Ag.14)

This hole tested a weak max-min II and VLF anomaly on the Lac au Canard-East grid. A mixed assemblage of rhyolite, felsic tuff and mottled chloritic tuff were encountered in the hole but with little sulfide content. A section of rhyolite at 15-20 meters depth was found to contain abundant fractures infilled with graphite. This section is distinctive and is undoubtedly the conductive source.

<u>ET86-5</u> (fig. 15)

This hole tested a weak max-min II/VLF conductor on the Lac Coloumbe Grid. A section of rhyolite breccia and felsic tuff was encountered with variable abundance of stringer and disseminated pyrite-chalcopyrite throughout. A semi-massive pyrite unit was intersected from 39.3-39.9 and may be the conductive source.

Twenty samples of core were split from 24.0-43.6 meters and all returned relatively high values for Cu. These can be averaged over various intervals as follows:

24-27m = .26%Cu/3m
28-34m = .29%Cu/6m
24-34m = .27%Cu/10m
38-42m = .46%Cu/4m
24-42m = .26%Cu/18m

Stringers and disseminated pyrite and chalcopyrite persist to the bottom of the hole and suggest that mineralization here, although very low grade, is very widespread.

<u>ET86-6</u> (fig. 16)

This hole was collared to test a weak max-min II anomaly on the Lac Coulombe-West Grid. A variety of felsic volcanics and tuffs were encountered throughout the hole containing disseminated and stringer pyrite and locally chalcopyrite. Two thin, semi-massive bedded pyritic tuffs occur at the bottom of the hole (67.0-67.2 and 72.1-72.3), but do not contain chalcopyrite. These are probably the conductive source. Metasomatic carbonate blasts are present through the lower half of the hole (siderite?) marking the presence of a footwall alteration zone. Twelve sections of core were split and analysed for Cu, Pb, Zn, Ag and Au. The samples returned consistently high background values of Zn throughout the hole in contrast to the high Cu encountered in hole ET86-5.

ET86-7 (fig. 17)

This hole tested a weak max-min II and VLF anomaly on the Lac Coulombe Grid. Intercalated rhyolites and felsic tuffs were encountered through the hole to 70.5 meters depth, succeeded by silicified mafic volcanics. Disseminated and stringer pyrite are most common in the upper part of the hole and are probably the conductive source. Twenty two core samples were split and analysed for Cu, Pb, Zn, Ag and Au. Slightly more elevated values for Cu and Zn occur in the lower parts of the hole.

ET86-8 (fig. 18, 19)

This hole tested a weak max-min II and VLF anomaly on the Lac Nicolet Grid. A unit of felsic volcanics is followed by volcaniclastic siltstones and graphitic, calcareous conglomerate typical of the St. Daniel Fm. Graded silty units in the sedimentary rocks suggests tops down-the-hole (south facing). As outcrops of a north facing sequence of gabbro and mafic volcanics occurs at surface, it must be presumed that the succession drilled lies within a tectonic (thrust) slice. It is quite probable that this is the tectonic style across much of the Lac La Truite Grid. The graphite rich slates and conglomerates in the lower part of the hole are undoubtedly the conductive source in this area.

ET86-9 (fig 20)

This hole tested an IP target on the Lac au Canard-East Grid. A light grey-green quartz crystal tuff was encountered throughout with locally abundant fractures infilled with a slightly conductive dark coloured assemblage of possibly Mn-Fe oxides and locally graphite. Only sparse scattered cubes of pyrite were present.

LITHOGEOCHEMISTRY

The geochemistry and petrogenesis of the ophiolitic volcanic rocks from the Lac de l' Est section near Coleraine has recently been interpreted by Oshin and Crocket (1986). This is a fairly well preserved section where the basaltic volcanics consist of a lower unit which includes both high and low Ti-basalts and an upper unit of low-Ti basalt. The upper and lower units are separated by a 50 meter layer of cherty, argillaceous sediment. The upper unit contains a variety of rock types varying from basalt, andesite and pyroclastic agglomerates to felsic tuffs. The total section at Lac de'Est is about 350 meters thick (fig. 21).

The geochemistry of the volcanics and the argillaceous sediments and the absence of a sheeted dyke facies led the authors to conclude that the Lac de l'Est volcanics and the ophiolites of the Thetford Mines Complex in general were formed in a back-arc or marginal basin environment.

As FinNeth has a vested interest in the Economic Geology of the Thetford Mines Ophiolite, a series of 14 samples of mafic volcanic rocks and six samples of felsic volcanic rocks were collected in three traverses across the better exposed sections of the Ham-Sud ophiolite in the Lac au Canard-Lac Coulombe area. These were analysed for major elements + Ni, Cr, Zr, Y, and Nb. The results are compared to the geochemistry of the mafic volcanic rocks from Lac de L'Est and to mafic volcanic rocks from known modern tectonic settings.

There is quite a significant loss on ignition for all the mafic rocks and these have all been recalculated to 100% before plotting (table 1).

CHEMICAL VARIATION DIAGRAMS:

Na_2-CaO/Na_2O+K_2O-(K_2O-100)÷Na_2O+K_2O/Ti-Cr (fig. 22)

The rectangular and oval fields on the Na_2O-CaO diagram contain the mean values of several suites of unaltered mafic and felsic rocks. The field of normal igneous compositions is taken from Hughes (1973) and the line on the Ti-Cr diagram was employed by Pearce (1982) to discriminate between mid-ocean ridge tholeiites (upper field) and island arc tholeiites (lower field). These variation diagrams are from Stephens (1984).

All mafic rocks from the Ham-Sud area plot outside of the field of unaltered mafic rocks on the Na_2O-CaOdiagram which is not surprising considering the relatively common secondary chlorite and calcium carbonate which affects all mafic rocks on the property. It would appear from the spread of values that Ca is generally quite mobile in these rocks being either depleted or enriched relative to the mean unaltered composition and Na values appear to be generally enriched relative to this field.

On the Na_2O+K_2O vs (K_2O-100)/Na_2O+K_2O diagram, many rocks fall in the spilitic field, but these are generally spread across the field of normal igneous composition as well.

On the Ti-Cr diagram most points fall within the field of island arc tholeiites except for five points at high Cr- contents.

The felsic rocks are generally Ca- poor relative to mean felsic rock compositions and generally somewhat richer in Na as were the mafic rocks.

SiO_2 - FeO^+/MgO (fig 23)

All mafic compositions are plotted on this diagram from Miyashiro (1973). All but one rock composition falls in a calc-alkaline field. It is probable that spilitization would decrease the Fe/Mg ratio, but even so, the indication here is that these are probably calc-alkaline rocks.

Ti-Zr (fig 24)

If we use the relatively immobile trace elements Ti and Zr in a Pearce and Cann (1973) diagram, all but two points fall neatly within the field of low-K tholeiites and these compositions are a long way from those of ocean floor basalts.

Ti/100 - Zr - Y·3 (fig 25)

On this diagram (also after Pearce and Cann) we see a lot more spread in the rock compositions but the center of gravity here is still in the field of Lo-K tholeiites.

TiO_2 - MnO·10 - P_2O_5.10 (fig 26)

This diagram is from Mullen (1983) and was created from 507 analyses from well-defined environments using Ti-Mn-P. All of the mafic volcanic composition from the Mont Ham ophiolite plot in the field of calc-alkali basalts.

COMPARISON OF TRACE ELEMENT DATA - VARIOUS ENVIRONMENTS

A summary of the analyses used by Pearce and Cann (1973) is presented in table 2. Averages for the trace elements we analysed from the Mont Ham mafic volcanics and also those from Oshin and Crockett (1986) are included at the bottom of the table for comparison.

Cr and Ni values are available only from Oshin and Crockett (1986) for comparison with our data. There is quite a marked variation in these elements of the Lac de l'Est area between each of the three compositional groups (an order of magnitude difference approximately). In comparing this data with the average analyses from Mont Ham it is readily apparent that the lower type II volcanics are compositionally very similar.

Ti, Zr and Y values are very similar between the Mont Ham rocks and both of the lower type II and upper units of the Lac de l'Est area. Taken together with the Cr and Ni averages it would seem that the very close compositional similarities between the Mont Ham rocks and the lower type II rocks from Lac de l'Est suggest a common parental magma.

It was the conclusion of Oshin and Crockett (1986) that the upper unit lo-Ti basalts were similar in chemical composition to the lo-Ti basalts of the lower unit and that those compositional differences that distinguish the two rock types would be best explained if "the lower unit - low Ti volcanics were subject to minor pre-eruptive olivine and spinel fractionation followed by eruptive fractional crystallization of small amounts of clinopyroxene and plagioclose".

As apparently no high-Ti volcanics of the lower type I or low Ti-volcanics of the upper unit occur in the Ham-Sud ophiolite, it may be suggested that the magmatic source for these mafic volcanics is the same as the source of the lower unit type II-low-Ti volcanics and is volumetrically more significant in the Ham-Sud area.

In comparing these low-Ti volcanics to well known environments in table 2, it is apparent that the very low Ti values are only typical of some low-K tholeiites or perhaps calc-alkali basalts in volcanic arc environments. The same conclusion can be drawn by inspection of the Zr, Y, and Nb values as well.

DISCUSSION

Considering that felsic volcanic and pyroclastic rocks are volumetrically significant in the Ham-Sud ophiolite, this section of ophiolite is not typical of ocean floor basalts formed at modern spreading ridges. The trace element geochemistry reflects this bimodal volcanism and alludes to a volcanic arc environment. Oshin and Crockett (1986) describe three petrochemically distinct magma types from the Lac de l'Est area of the Thetford Mines Ophiolite and infer that the parental magmas of the high-TiO_2 lower unit basalts were partial melts of undepleted mantle whereas the low-TiO_2 volcanics were partial melts of residual, depleted mantle. It was their conclusion that the close spatial association of chemically diverse magma types was best accounted for by generation in a back-arc or marginal basin environment. They drew their support for this conclusion from the geochemistry of the argillaceous sediments in the Lac de l'Est section and from the perceived absence of a sheeted dyke complex in that area. They found that the Lac de l'Est sediments were metal-poor relative to those found at modern spreading ridges and had high AL contents, suggesting a "significant input from an AL-rich source such as a continent or an island-arc or marginal basin". Our work provides some additional criteria for discriminating the tectonic environment. A well developed sheeted dyke complex underlies the Ham-Sud ophiolite and it is therefore probable that a similar complex underlies the Lac de l'Est section. The failure to recognize such a complex at Lac de l'Est is probably due to structural removal as the pile does rest in fault contact on the underlying plutonic plate as noted by Oshin and Crockett (1986). This indicates that these ophiolites were formed in a rift environment. Accepting that the Ham-Sud ophiolite consists primarily (if not entirely) of a magma type which is petrochemically similar to one of three types found at Lac de l'Est, then it can be concluded that magmatism is of at least two types (partial melts of undepleted mantle; partial melts of residual, depleted mantle) occurs along the rift axis. As the volcanics in the Ham-Sud ophiolite were apparently derived from partial melts of residual, depleted mantle and are far more voluminous than those to the NE at Lac de l'Est, it might be suggested that two separate magmatic-volcanic centers existed - one in the Ham-Sud area, and another in the Thetford Mines area. Considering that the earliest melts generated would be expected to be derived from undepleted mantle (Hi-Ti volcanics of the lower-type I at Lac de l'Est) and these only occur at Lac de l'Est, then the volcanics at Ham-Sud might be considered to be generally younger than those at Lac de l'Est. In a dynamic model of rift propagation it might be suggested that the Ham-Sud is a more mature segment of a NE propagating ridge axis.

The presence of significant quantities of felsic volcanics not only in the Ham-Sud ophiolite but throughout the Ham-Sud-Thetford segments of ophiolite is indicated from both our detailed and reconnaissance surveys in 1985 and 1986. This suggests that a propagating rift axis has interacted with sialic crust and could indicate that the ophiolites obducted westward onto the continental margin represent relics of earliest formed oceanic crust (basin margin) or perhaps interaction of a propagating rift with an island arc terrane (Ascot-Weedon belt?). It is worth noting that the associated graphitic siltstones throughout the ophiolite belt (St. Daniel Fm.) is very similar to graphitic siltstones intercalated with the mafic and felsic volcanics of the Weedon Belt. As Oshin and Crockett (1986) noted that the sediments at Lac de l'Est contained a significant continent or island arc component, it might be that these sediments were derived from the Weedon terrane to the east rather than the continent to the west.

RECOMMENDATIONS

A series of 144 samples of surface outcrop and drill core were collected by R. Beeson of Billiton Research largely from the Lac Coloumbe area but also from the Asbestos and Ives/Huntingdon areas. These will be analysed for selected trace elements as part of an orientation rock geochemistry project which will compare the geochemistry of the separate ophiolite segments and attempt to reconstruct their original tectonic setting by using immobile element diagrams. It is also hoped that by completing a geochemical traverse of the Lac Coulombe section (mineralized zone) any geochemical changes that might exist within the mafic volcanics might be related to known mineralization. An assessment of the geochemical variations of alteration in the mafic volcanics will be made and this will be related to the known mineralization and its metal associations. The felsic volcanics associated with the Lac Coulombe-Sulfide Zone have also been sampled to determine whether these can be contrasted with non-mineralized felsic rocks.

The work to date has concentrated on the Lac Coulombe-Sulfide Zone and its SW extension onto Lac au Canard Grid. Drilling has concentrated on geophysical targets through this area (both EM and IP) and has successfully tested the known sulfide lenses at Lac Coulombe in 1985 and all geophysical targets on the SW extension in 1986. It has been shown from the drill results to date, that all of the geophysical anomalies are due to either graphitic sediment or disseminated and massive sulfides through these areas. It would seem reasonable to conclude from the character of the mineralization discovered to date that the geophysical methods used are effective and have accurately located the mineralization which exists on the property. There is no evidence to suggest that mineralization might be present which would be blind to the methods used. Assuming that economic mineralization is present within the Lac au Canard-Lac Coulombe Zone it must be located at some depth beyond the detection limits of the EM-IP methods used to date, probably ±200 meters.

A review of the assessment work in the Lac Coulombe area shows extensive drilling in the vicinity of the sulfide lenses at lines 21E to 24E (Lutes, 1985). The deepest recorded hole in this area reached a vertical depth of about 300 meters. This hole (G-17) intersected several long sections of low grade Cu mineralization which might be interpreted as a stringer zone material (0.27% Cu/35' and 0.26% Cu.79' respectively) underlying the two massive sulfide lenses which were confirmed by our own drill holes in this area (LC85-1, LC85-2). It is reasonable to conclude that this zone has been well tested to depth and warrants no further investigation.

One other massive sulfide lense occurs in the Lac Coulombe area approximately between lines 16E and 17+50E at 1+50 S and was discovered by ddh LC85-3. As no previous work has apparently been done on this zone, some deeper drilling may be warranted in this area.

In the SW extension, the best results were returned from hole ET86-5 (fig 27) which contained an average of 0.26% Cu over 18 meters split from the upper part of the hole. Py-Cp stringers are persistent throughout the hole and similar averages could be expected over even longer sections. Despite the improbability of any near surface massive sulfide lenses (no appropriate geophysical expression present in this area) the long section of Py-Cp stringers is very similar in Cu-content to those noted in hole G-17 in the Lac Coulombe area and the latter are confirmed to be in association with massive sulfide mineralization. Room for additional drill testing of this zone should be bracketed somewhere between ET86-4 (barren) and ET86-6 (weakly mineralized) as these holes appear to cut off the possible extensions of mineralization 400 meters both to the SW and NE of hole 86-5.

As work to date has discovered only uneconomic concentrations of base metals through the Lac Coulombe-Lac au Canard sulfide zone and all ground geophysical anomalies have been tested, it is recommended that two zones characterized by the greatest tenor of metal values and the least amount of drill testing be subjected to further drilling to a depth exceeding the limits of ground geophysical penetration in an effort to detect indications of economic mineralization. As such drilling would be extremely fortuitous in directly detecting economic sulfide mineralization it is proposed that down-the-hole geophysics be employed to thoroughly test each of these two zones for nearby anomalies which might require additional drill testing.

It is therefore recommended that one hole of length ±400 meters be drilled in the vicinity of ET86-5 and that one hole of length ±400 meters be drilled in the vicinity of LC85-3 to be followed up by down-the-hole geophysics.

Work to date on all other portions of the Eastern Townships Property has failed to locate any additional mineralized zones of merit. It is therefore recommended that only the Lac Coulombe-Lac au Canard area be retained upon renewal of claims in 1987. This area is outlined in Figure 28 and a list of these special exploration permits is contained in table III. The total area covered by these exploration permits is 1742 ha. The work commitments necessary to maintain these in good standing on renewal in February, 1988 is 1742x$35 = $60,970 which would be covered by work done in 1986 plus additional work recommended for 1987.

WORK PLAN AND BUDGET - 1987 EASTERN TOWNSHIPS

In addition to two deep (±400m) drill holes in the areas specified in the Lac au Canard area, a compilation map should be erected at about 1:2000 scale on which all geological - geophysical - lithogeochemical data can be plotted for the sulfide zone. This will require some remapping for the area to distinguish separate felsic units which have been shown to be closely associated with the mineralization discovered to date. Accurately locating these with respect to the present drill-hole data is necessary for stratigraphic control and interpretation of the lithogeochemical results presently being undertaken by R. Beeson. The area to be mapped in detail is attached. This mapping will take about one week and should be completed prior to diamond drilling. The recommended budget is attached. The lithogeochemical interpretations should be complete by spring; the detailed mapping will be conducted through June and drilling should be completed prior to the fall of 1987.

Cost Code 01

BUDGET YEAR:
1987

PROJECT:
Eastern Twp.

PROJECT #
941

Fig.30
Proposed Budget, 1987

01	Personnel	Total	14,500
1x	Staff and Temporary Personnel		
0	Research/Reconnaissance		
1	Prop. Acquisition and Maintenance		500
2	Travel		500
3	Geology		2,500
4	Geophysics		2,000
5	Geochemistry		
6	Trenching/Drilling		5,000
7	Project Supervision		
8	In-house Drafting		1,000
9	Report Writing		3,000
02	Support Cost	Total	5,800
01	Accommodation/Food		4,000
02	Communication		400
03	Vehicle Costs		500
04	Air Charter		
05	Scheduled Transport		500
06	Field Supplies		300
07	Publications		100
08	Contract Drilling		
09	Miscellaneous		
03	Concession Cost	Total	4,100
01	Contract Staking		
02	Property Maintenance (assessment, rent, taxes, reports)		2,100
03	Option Payments/Royalties (to vendor)		
04			
05	Legal		
06	Property Damage/Rights of Entry		2,000
07	Fees - acquisition and transfers		
04	Geochemical	Total	
01	Contract Surveys		
02	Geochemical Analyses		
03	Consultants		
04	Miscellaneous		
05	Geophysical	Total	20,000
01	Contract Surveys Downhole EM @ $200/dayx8 days		16,000
02	Data Processing		1,000
03	Consultants		
04	Miscellaneous mob-demob		3,000
06	Grid Preparation	Total	
01	Contract Cutting		
02	Miscellaneous		
07	Drilling	Total	62,500
01	Meterage Cost $75/m x 800		60,000
02	Mob./Demob.		2,000
03	Drill Core Analyses		500
04	Miscellaneous		
		Total	$106,900

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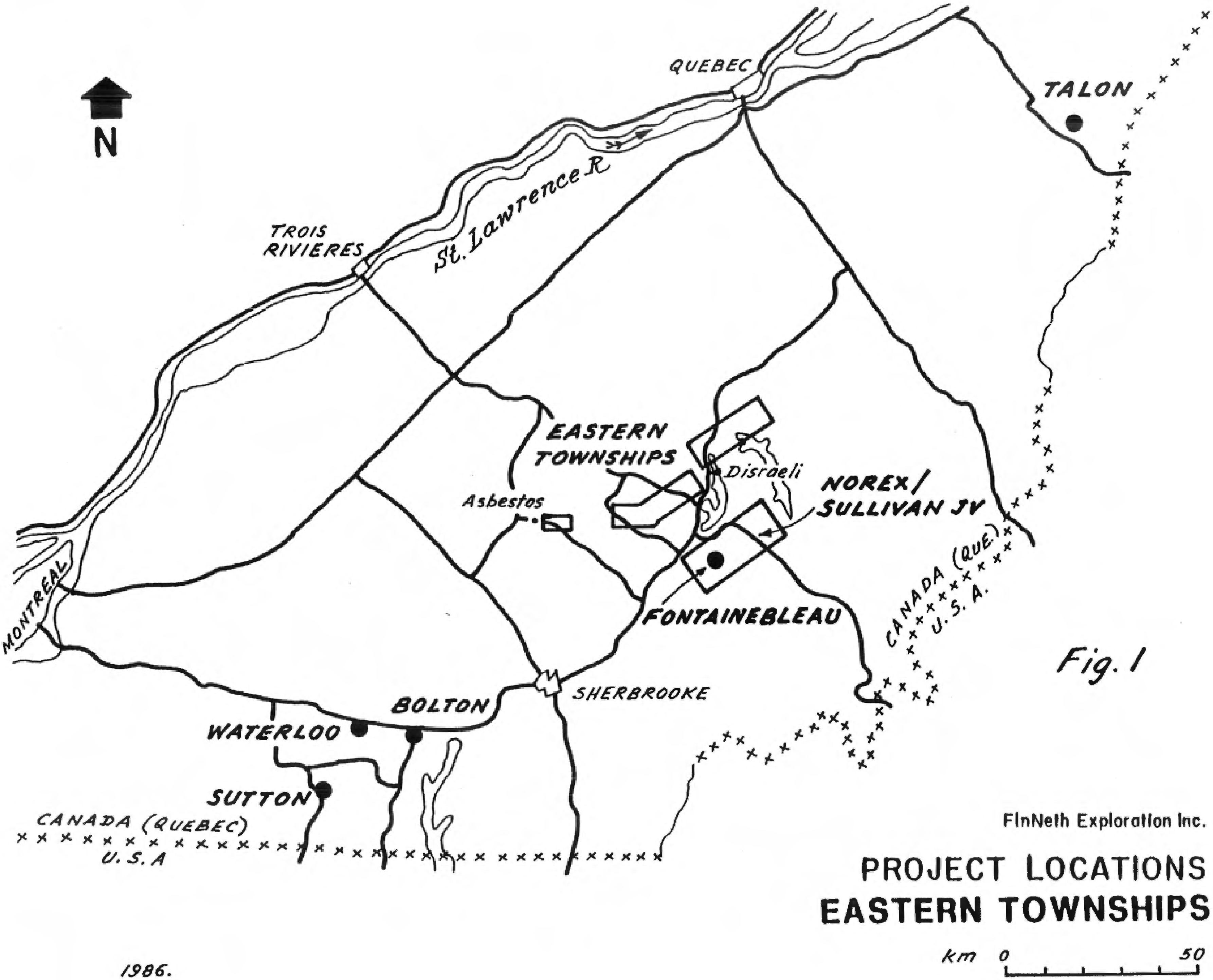

N
QUEBEC
TALON
St. Lawrence R
TROIS RIVIERES
EASTERN TOWNSHIPS
Disraeli
NOREX/ SULLIVAN JV
Asbestos
MONTREAL
FONTAINEBLEAU
CANADA (QUE.)
U.S.A.
Fig. 1
SHERBROOKE
BOLTON
WATERLOO
SUTTON
CANADA (QUEBEC)
U.S.A
FinNeth Exploration Inc.
PROJECT LOCATIONS
EASTERN TOWNSHIPS
km 0 50
1986.

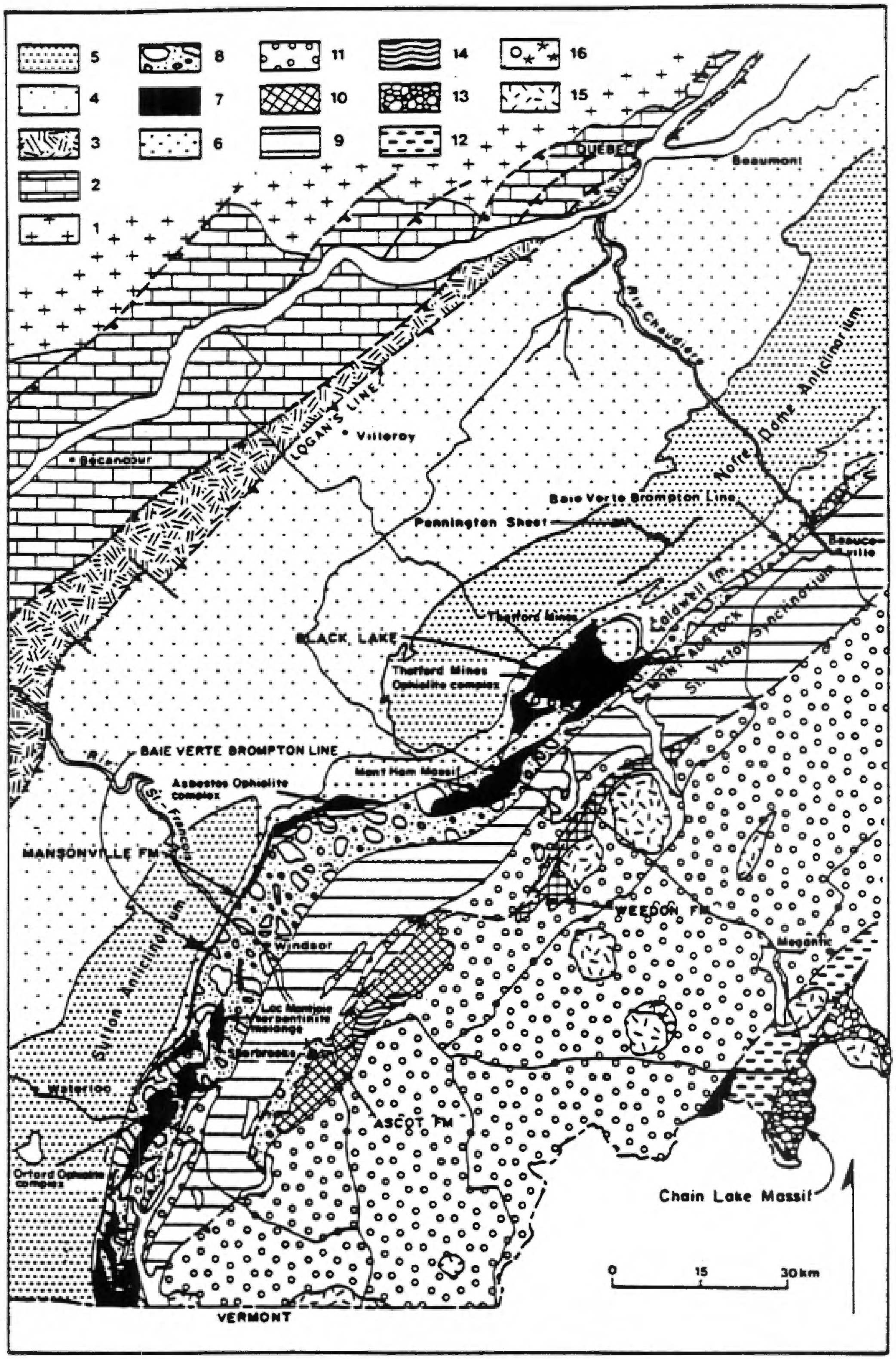


Figure 2. The Baie Verte-Brompton Line and major rock units of the Quebec Eastern Townships: 1) Grenville basement (P€); 2) St. Lawrence platform (€-0); 3) Foreland thrust belt (0); 4) Allochthones of the external domain (€-0); 5) Allochthones of the internal domain (mainly Sutton-Bennett schists) (€-0); 6) Caldwell Gr. and Mansonville Fm. (€); 7) ophiolites (€); 8) St. Daniel and Brompton Fms. (Mélange) (L.0); 9) St. Victor synclinorium (Magog Gr.) (M.0); 10) Ascot-Weedon Fms (L 0-M.0); 11) Connecticut Valley-Gaspé synclinorium (S-D); 12) Frontenac Fm. (0?); 13) Chain Lakes Massif (Helikian); 14) Ordovician granites; 15) Devonian granites; 16) Mesozoïc alkaline intrusive rocks.

(after Williams & St. Julien, 1982)

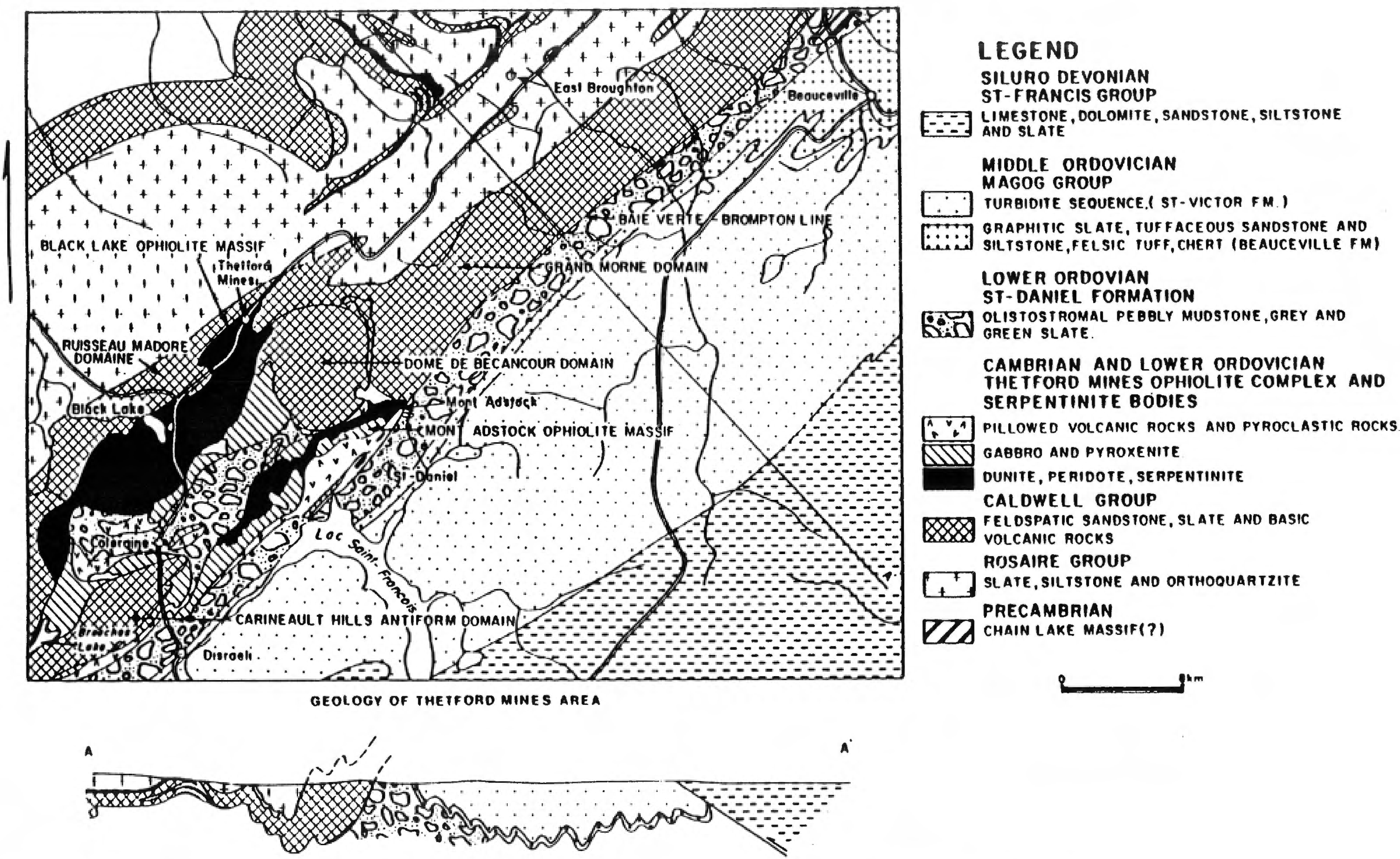
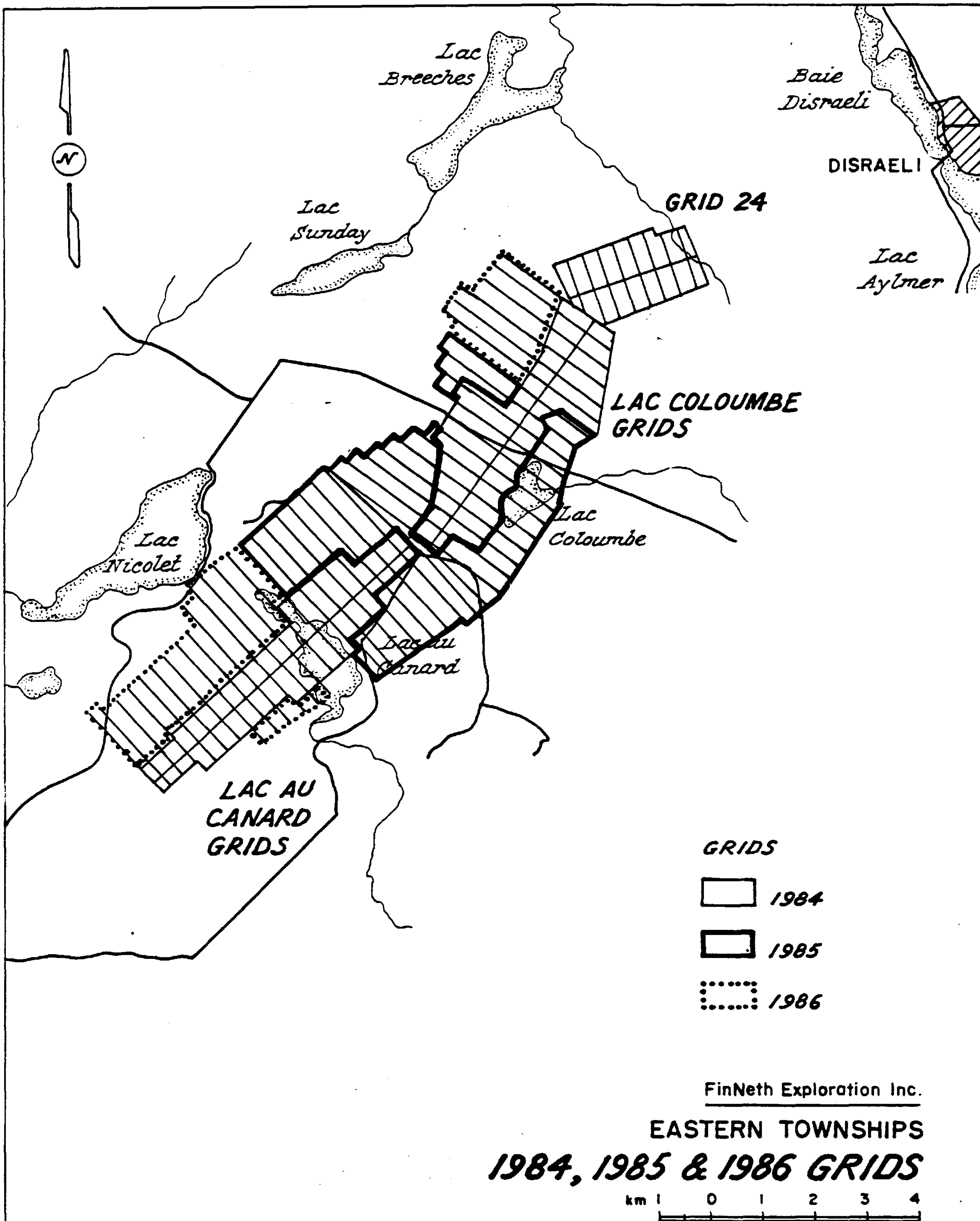


Figure 3 Relationships between rock groups and structures at the Baie Verte-Brompton Line, Thetford Mines, Quebec.

(after Williams & St. Julien, 1982)



FinNeth Exploration Inc.

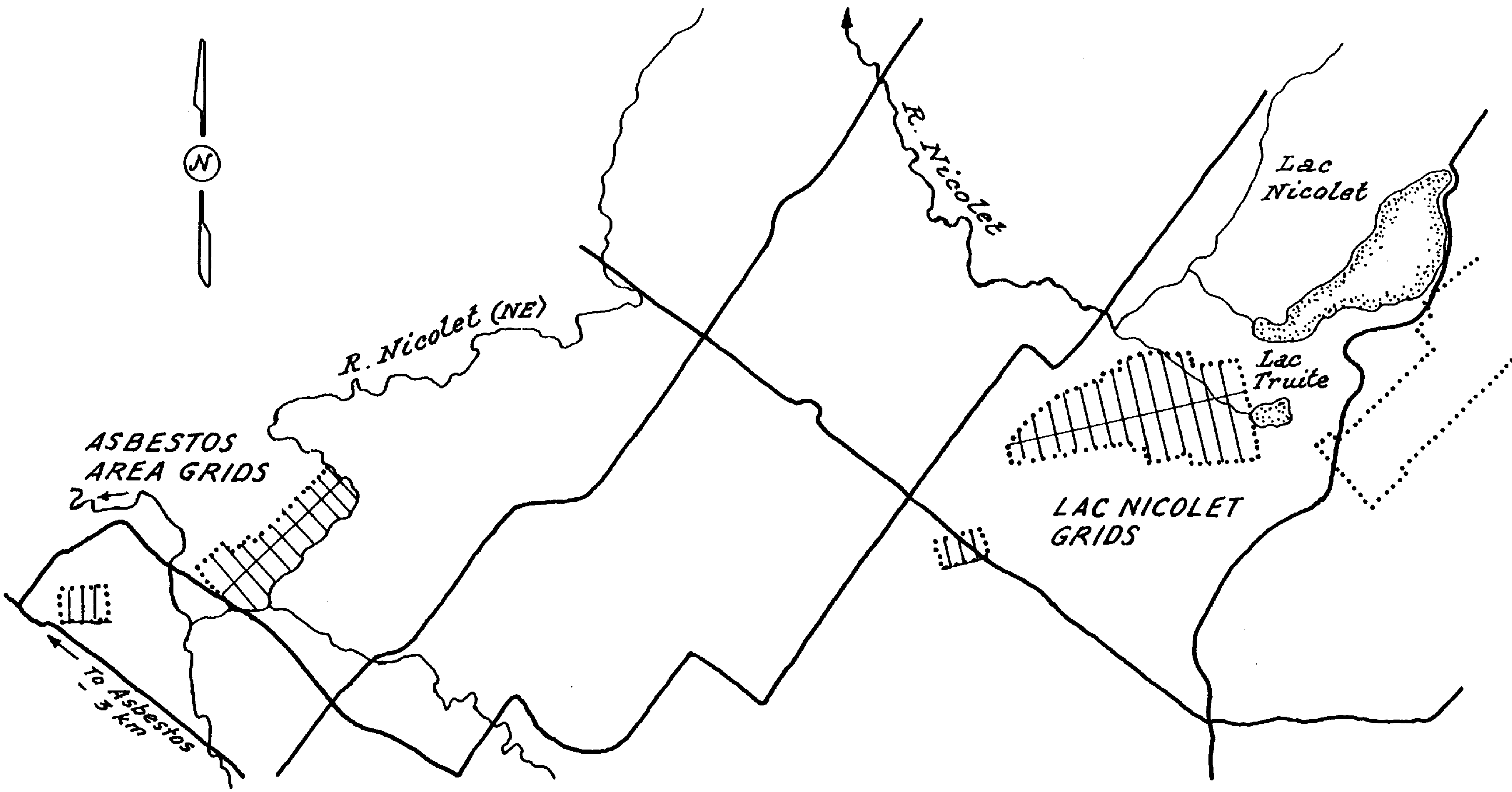
EASTERN TOWNSHIPS

1984, 1985 & 1986 GRIDS

NTS: 21E/14

Fig. 4.

Aug. 1986.



FinNeth Exploration Inc.

EASTERN TOWNSHIPS

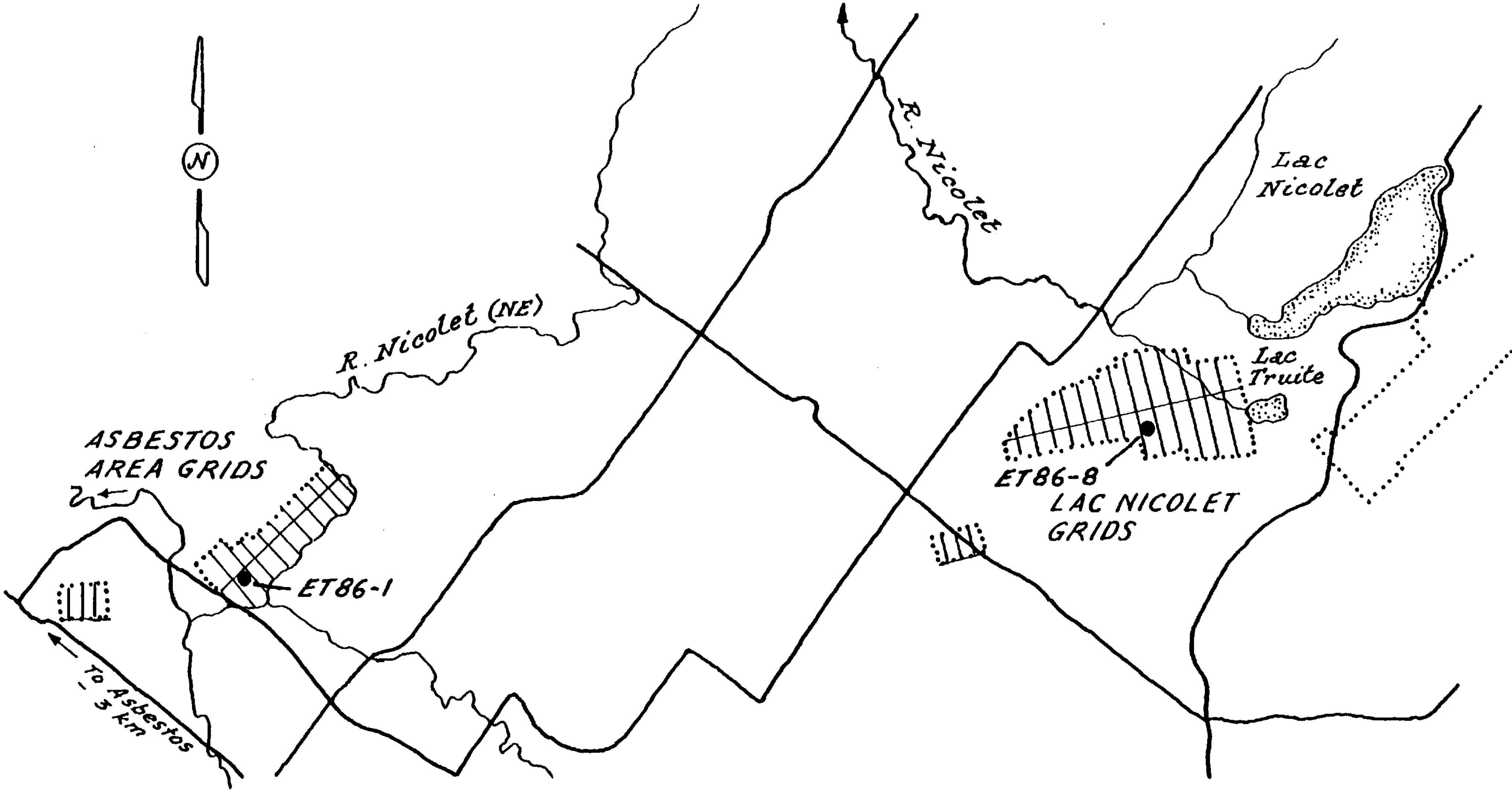
1986 GRIDS

km 1 0 1 2 3 4

NTS : 21E/13

Fig. 5.

Aug. 1986.



FinNeth Exploration Inc.

EASTERN TOWNSHIPS

LOCATION OF DRILL HOLES

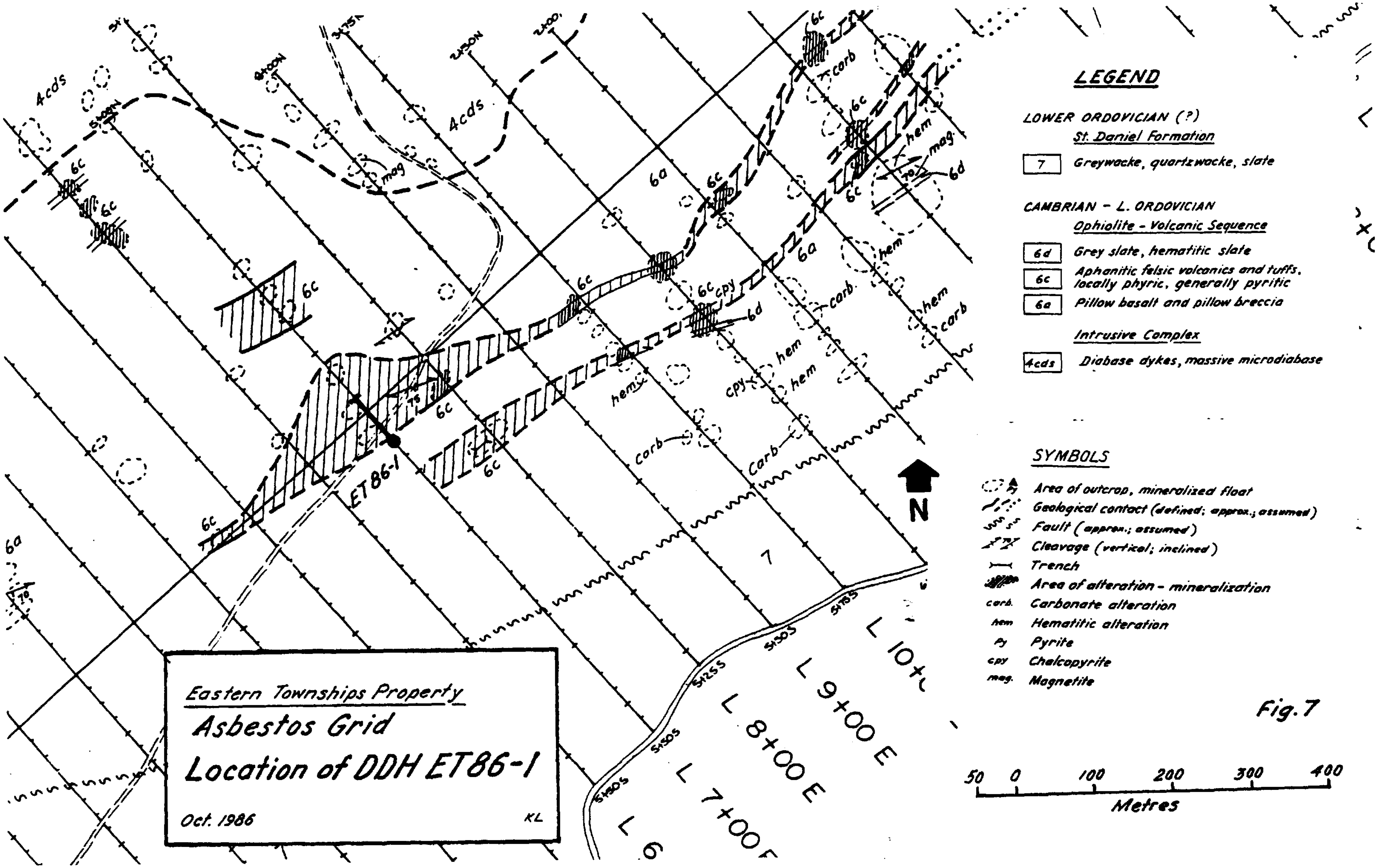
km 1 0 1 2 3 4

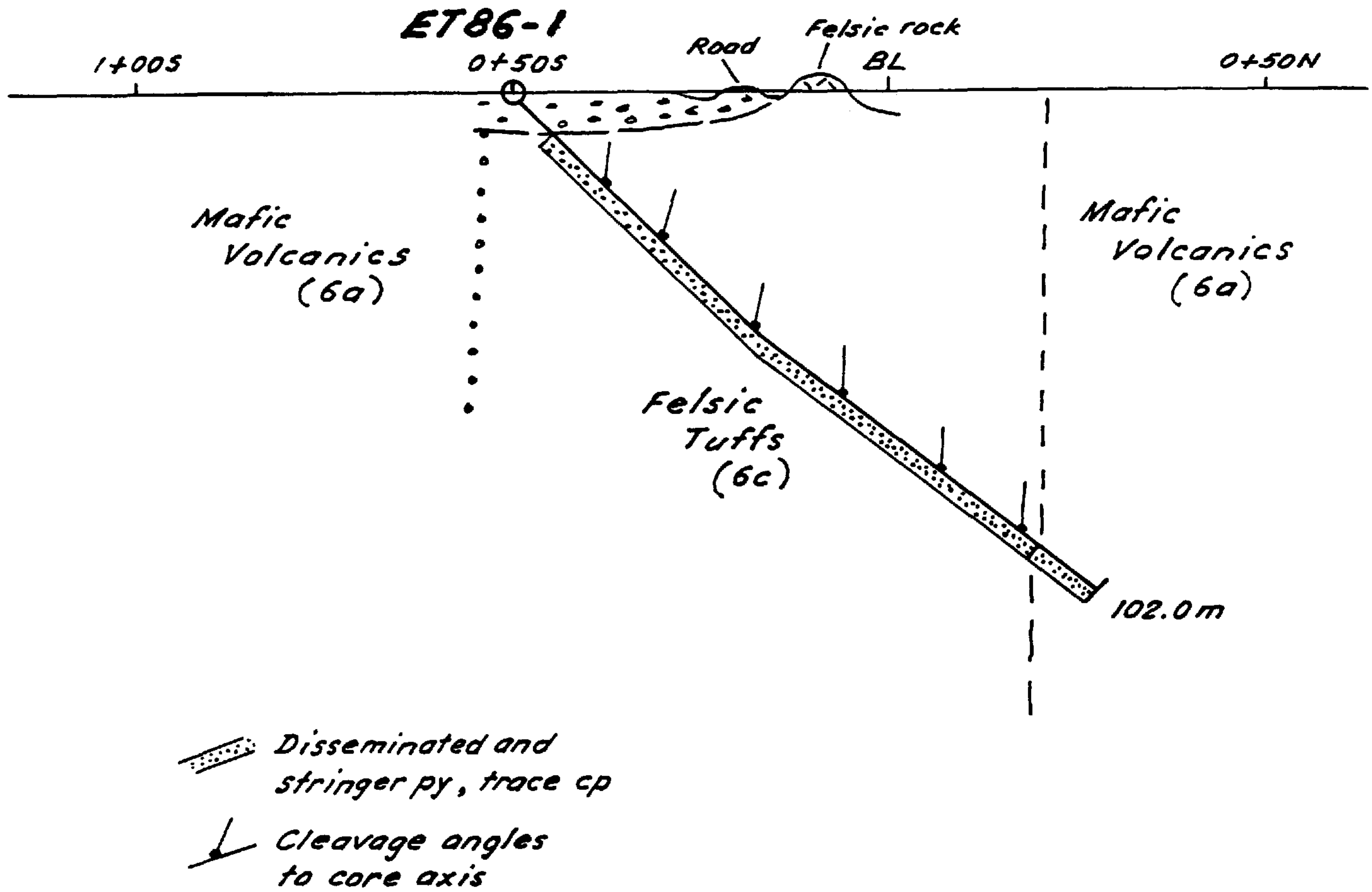
NTS : 21E/13

Fig. 6.

Oct. 1986

KL


LEGEND
LOWER ORDOVICIAN (?)
St. Daniel Formation
7 Greywacke, quartzwacke, slate
CAMBRIAN - L. ORDOVICIAN
Ophiolite - Volcanic Sequence
6d Grey slate, hematitic slate
6c Aphanitic felsic volcanics and tuffs, locally phyric, generally pyritic
6a Pillow basalt and pillow breccia
Intrusive Complex
4cds Diabase dykes, massive microdiabase
SYMBOLS
Area of outcrop, mineralized float
Geological contact (defined; approx.; assumed)
Fault (approx.; assumed)
Cleavage (vertical; inclined)
Trench
Area of alteration - mineralization
carb. Carbonate alteration
hem Hematitic alteration
py Pyrite
cpy Chalcopyrite
mag. Magnetite
N
50 0 100 200 300 400
Metres
Eastern Townships Property
Asbestos Grid
Location of DDH ET86-1
Oct. 1986
KL
ET86-1
L 7+00 E
L 8+00 E
L 9+00 E
4cds
6a
6c
6d
7
carb
hem
cpy
mag
Fig. 7



FinNeth Exploration Inc.

EASTERN TOWNSHIPS PROPERTY

ASBESTOS GRID

DRILL HOLE ET86-1

Line 7+00E/0+50S

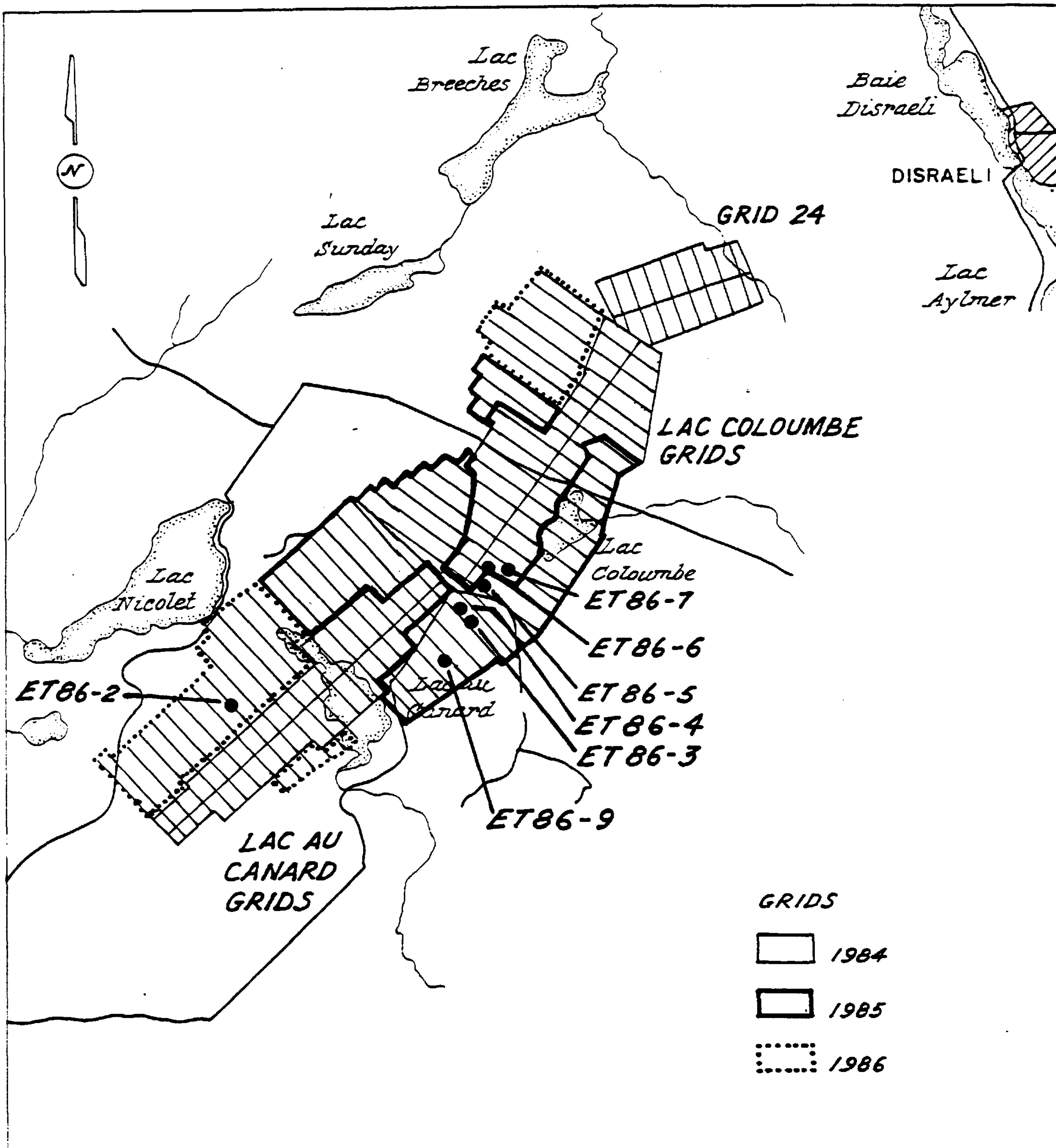
metres

0 10 25 50

NTS: 21E/13

Oct. 1986. KL

Fig. 8



FinNeth Exploration Inc.

EASTERN TOWNSHIPS

LOCATION OF DRILL HOLES

km 1 0 1 2 3 4

Fig. 9.

NTS: 21E/14

Oct. 1986.

KL

LEGEND

7	LOWER ORDOVICIAN (?) Greywacke, quartzwacke, graphitic slate
	CAMBRAIN AND LOWER ORDOVICIAN ophiolite complex - volcanic sequence
6dg	Grey and black graphitic slate
6C	Siliceous volcaniclastic tuff, tuff breccia and siltstone; 6cr - aphanitic and phyric rhyolite and related fragmentals; MIF - magnetite iron formation
6bh	Mafic hyaloclastite
6bx	Pillow breccia, heavily oxidized and hematitic
6a	Pillow basalt and pillow breccia
	INTRUSIVE COMPLEX
/	Dyke (4dt - tronhjemite-felsite; 4cd - diabase)
4dt	Trondhjemite (commonly pyritic)
4Cds	Diabase dykes, hyaline microgabbro and associated intrusive breccias
4C	M.G. to C.G. Gabbro

SYMBOLS

- Area of outcrop, mineralized float
- Geological contact (defined, approximate, assumed)
- Fault (defined, approximate, assumed)
- Cleavage (inclined, vertical)
- Pillow basalt, tops known
- trench
- diamond drill hole
- alteration zone with pyrite
- hematitic alteration in mafic volcanics
- Py,Cp pyrite, chalcopyrite

Eastern Townships Property

Lac au Canard – West Sheet

Location of DDH ET86-2

50 0 100 200 metres

Oct. 1986. KL

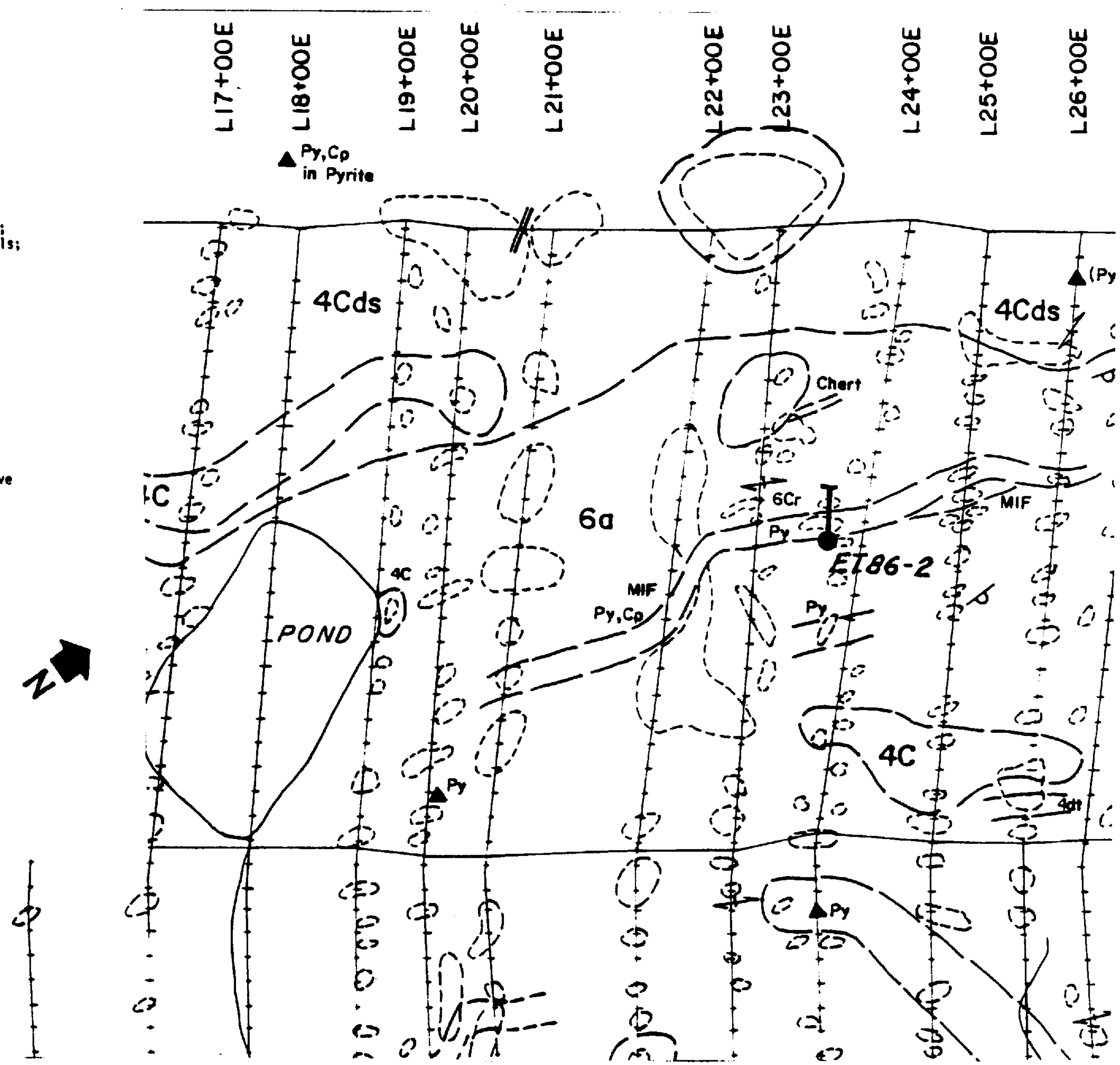
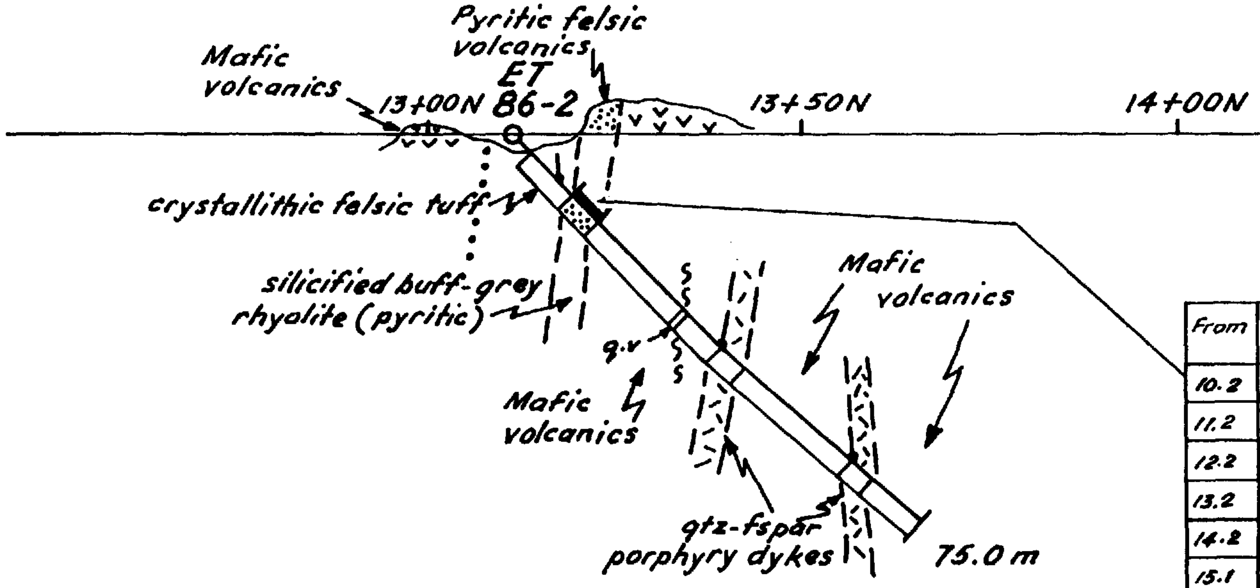


Fig.10.



From	To	Length (m)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
10.2	11.2	1	132	11	160	0.4	90
11.2	12.2	1	646	15	96	1.4	11
12.2	13.2	1	137	16	529	1.2	51
13.2	14.2	1	588	16	732	1.8	34
14.2	15.1	0.9	609	15	841	1.5	56
15.1	15.7	0.6	2870	12	12860	2.1	59

FinNeth Exploration Inc.

EASTERN TOWNSHIPS PROPERTY

LAC AU CANARD WEST

DDH ET 86-2

Line 23+67E/13+11N

Fig. 11

NTS : 21E/14

Nov. 1986. KL

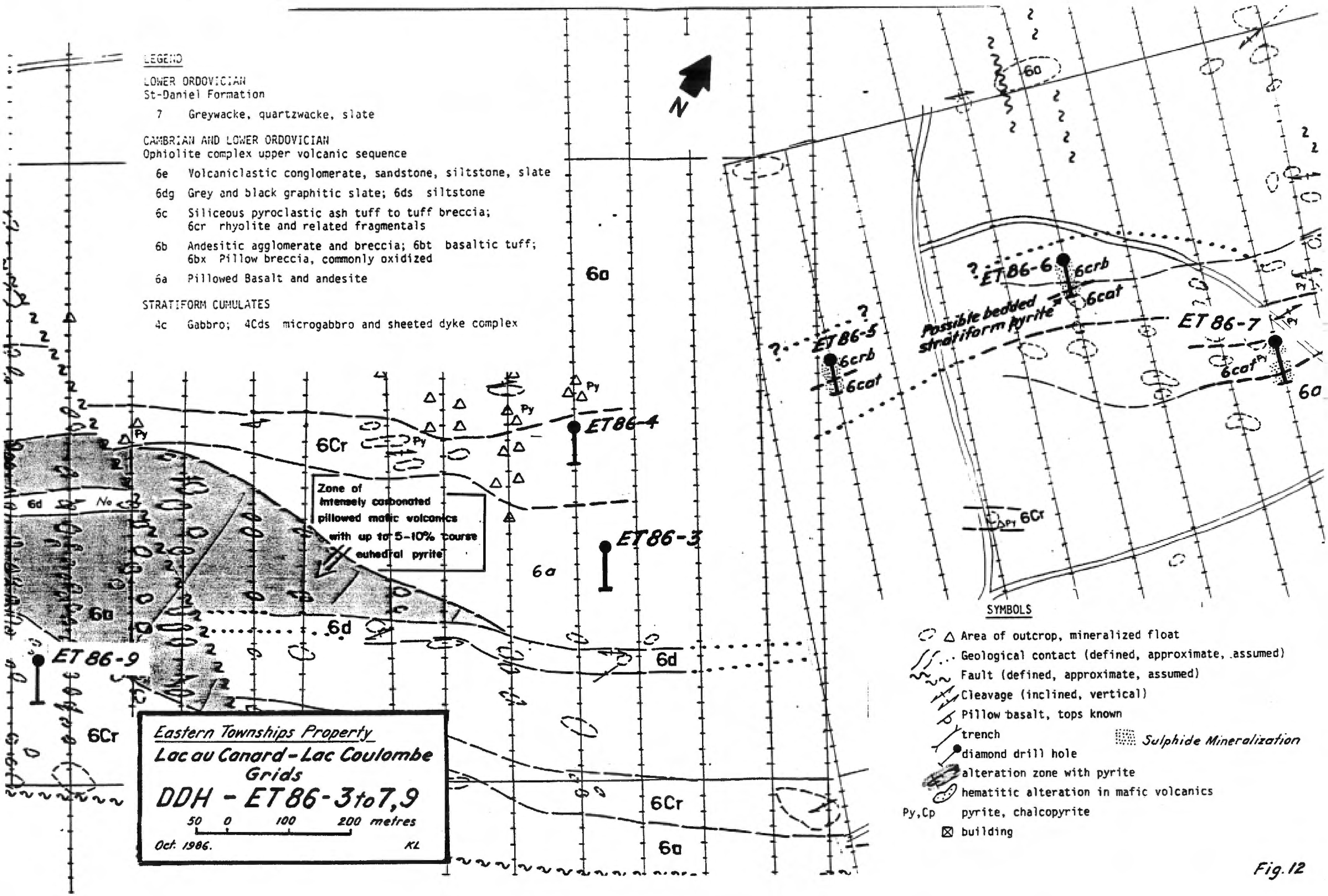
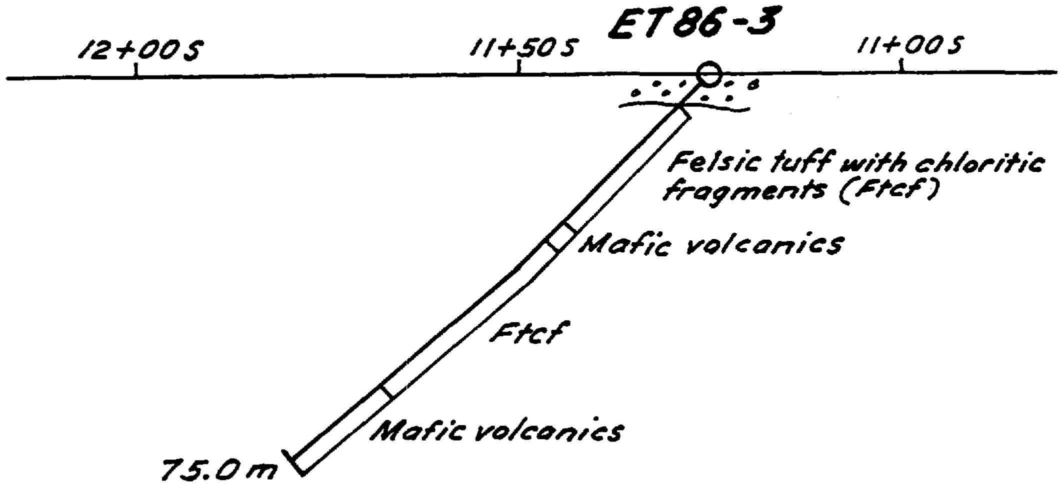

LEGEND
LOWER ORDOVICIAN
St-Daniel Formation
7 Greywacke, quartzwacke, slate
CAMBRIAN AND LOWER ORDOVICIAN
Ophiolite complex upper volcanic sequence
6e Volcaniclastic conglomerate, sandstone, siltstone, slate
6dg Grey and black graphitic slate; 6ds siltstone
6c Siliceous pyroclastic ash tuff to tuff breccia; 6cr rhyolite and related fragmentals
6b Andesitic agglomerate and breccia; 6bt basaltic tuff; 6bx Pillow breccia, commonly oxidized
6a Pillowed Basalt and andesite
STRATIFORM CUMULATES
4c Gabbro; 4Cds microgabbro and sheeted dyke complex
N
Zone of intensely carbonated pillowed mafic volcanics with up to 5-10% course euhedral pyrite
ET86-3
ET86-4
ET86-5
ET86-6
ET86-7
ET86-9
Possible bedded stratiform pyrite
6crb
6cat
6Cr
6a
6d
Py
SYMBOLS
Area of outcrop, mineralized float
Geological contact (defined, approximate, assumed)
Fault (defined, approximate, assumed)
Cleavage (inclined, vertical)
Pillow basalt, tops known
trench
diamond drill hole
alteration zone with pyrite
hematitic alteration in mafic volcanics
Py,Cp pyrite, chalcopyrite
building
Sulphide Mineralization
Eastern Townships Property
Lac au Canard - Lac Coulombe Grids
DDH - ET86-3to7,9
50 0 100 200 metres
Oct. 1986.
KL

Fig. 12



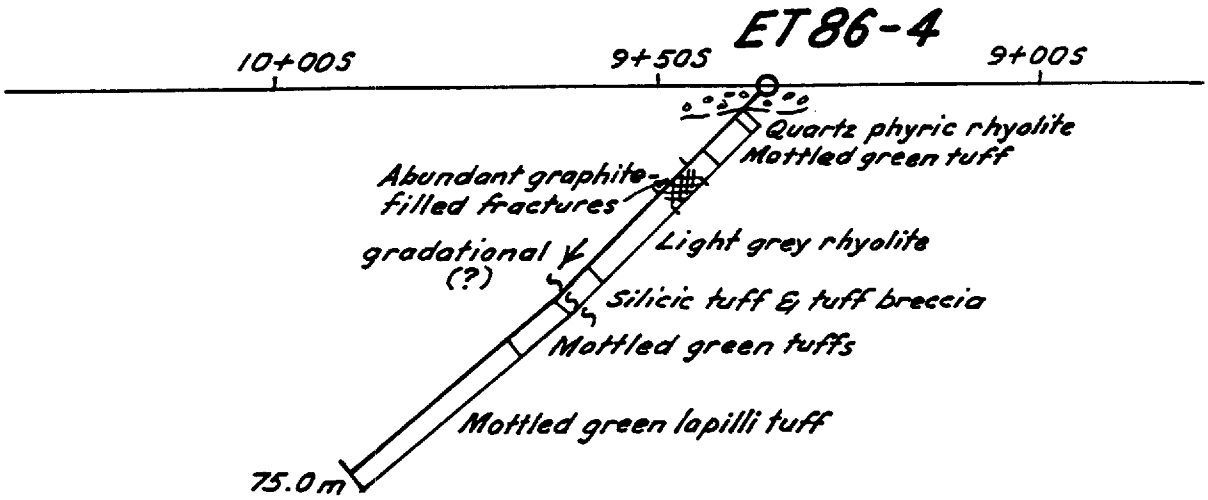
FinNeth Exploration Inc.

EASTERN TOWNSHIPS PROPERTY
LAC AU CANARD - EAST

DDH ET 86-3
Line 64+50E/11+25S

NTS : 21E/14
Oct. 1986. KL

Fig. 13.



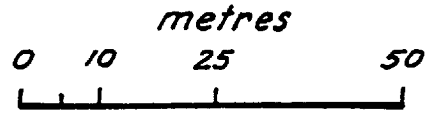
FinNeth Exploration Inc.

EASTERN TOWNSHIPS PROPERTY

LAC AU CANARD - EAST

DDH ET86-4

Line 64+00E/9+35S

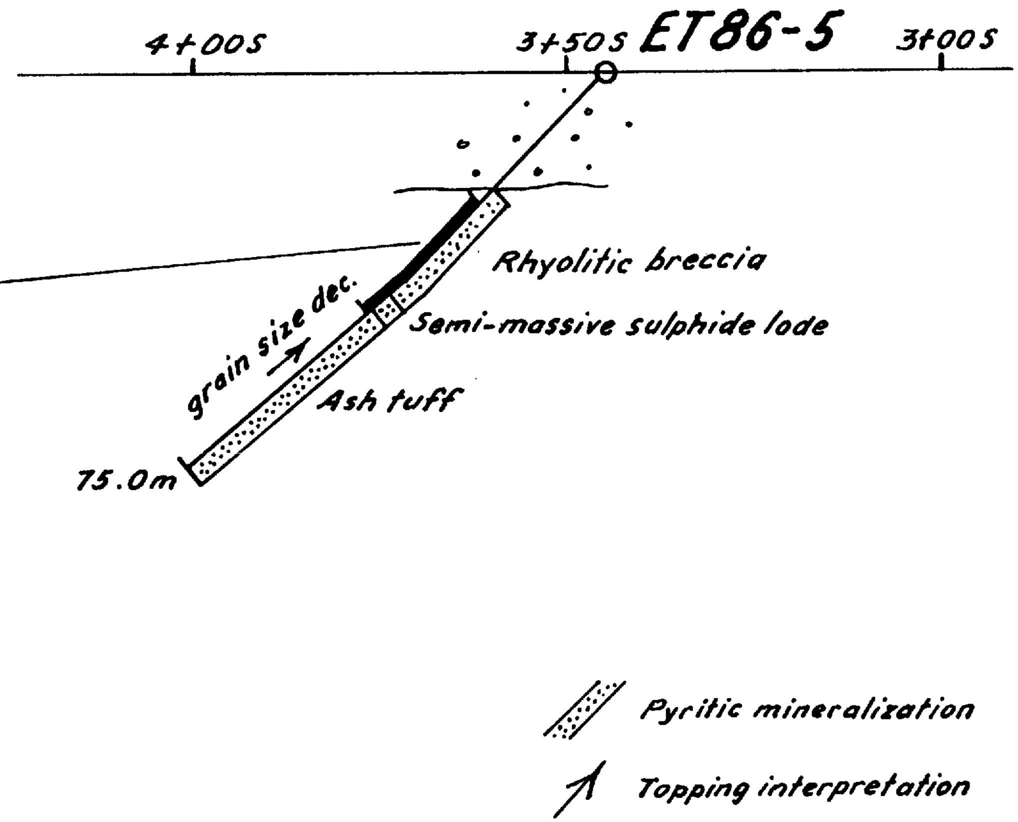


NTS : 21E/14

Oct. 1986. KL

Fig. 14.

From	To	Length (m)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
24.0	25.0	1	3568	17	342	1.8	40
25.0	26.0	1	2247	9	169	1.0	15
26.0	27.0	1	2042	7	110	0.9	9
27.0	28.0	1	780	10	176	1.1	9
28.0	29.0	1	1849	11	200	1.7	8
29.0	30.0	1	4915	8	130	2.5	9
30.0	31.0	1	5110	11	174	3.6	46
31.0	32.0	1	1510	11	201	1.0	12
32.0	33.0	1	1097	14	75	0.8	11
33.0	34.0	1	2672	10	63	0.8	9
34.0	35.0	1	488	7	62	0.5	9
35.0	36.0	1	389	6	55	0.6	8
36.0	37.0	1	540	6	604	0.6	8
37.0	38.0	1	853	14	363	0.7	23
38.0	39.0	1	3742	13	134	1.4	25
39.0	40.0	1	3453	24	119	1.8	11
40.0	41.0	1	8470	20	150	2.8	60
41.0	42.0	1	2833	15	611	1.3	19
42.0	43.0	1	526	20	72	0.9	38
43.0	43.6	0.6	599	21	105	1.3	21



FinNeth Exploration Inc.

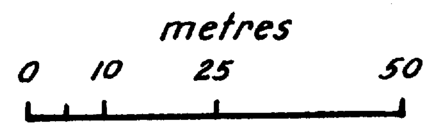
EASTERN TOWNSHIPS PROPERTY

LAC COULOMBE - WEST

DDH ET 86-5

Line 1+00W/3+45S

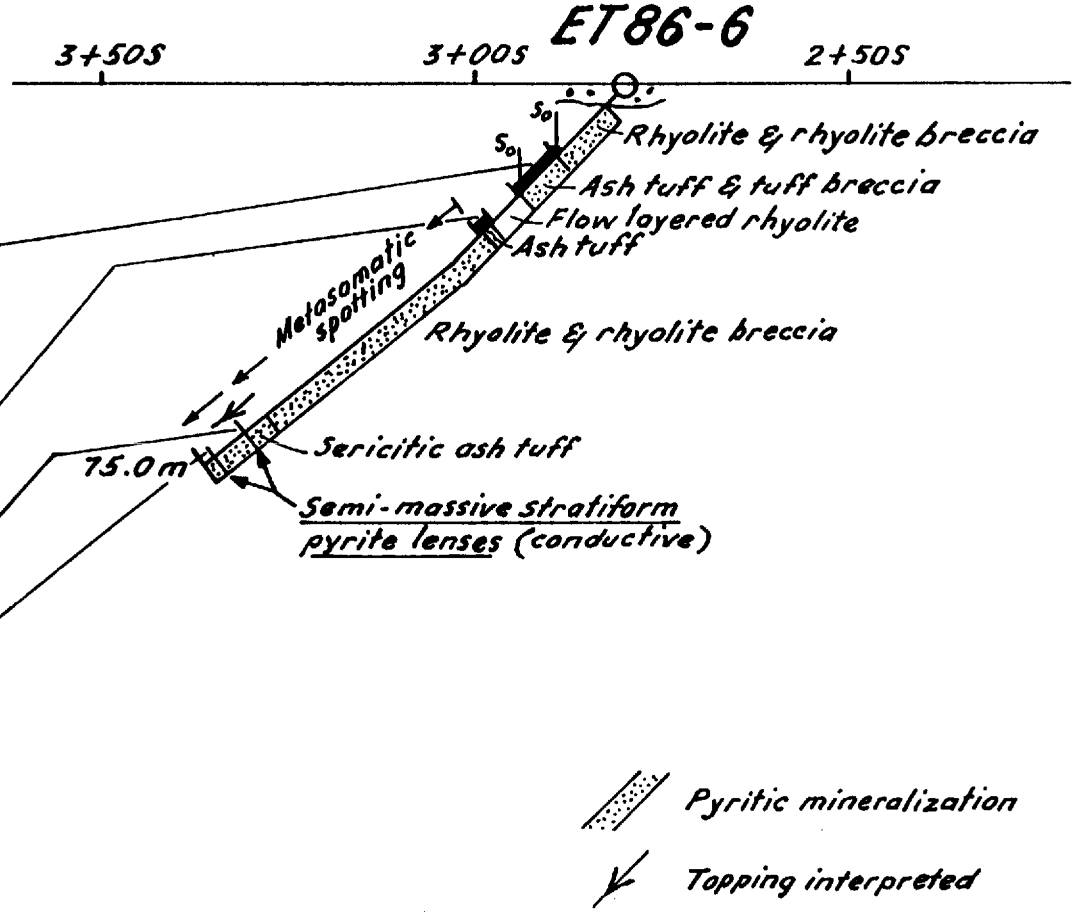
Fig. 15.



NTS : 21E/14

Nov. 1986. KL

From	To	Length (m)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
12.2	13.2	1	47	35	428	1.0	10
13.2	14.2	1	27	24	1002	1.0	9
14.2	15.2	1	374	16	3385	1.1	9
15.2	16.2	1	411	22	4570	1.4	11
16.2	17.2	1	227	21	2800	1.0	12
17.2	18.2	1	292	17	1345	1.0	10
18.2	18.9	0.7	567	52	5590	2.3	60
24.4	25.4	1	119	44	672	2.0	36
25.4	26.4	1	50	38	649	1.9	36
26.4	26.9	0.5	41	38	242	1.0	12
67.0	67.2	0.2	133	21	361	1.3	15
72.13	72.4	0.27	70	24	586	1.6	24



FinNeth Exploration Inc.

EASTERN TOWNSHIPS PROPERTY

LAC COULOMBE WEST

DDH ET 86-6

Line 3+00E/2+80S

metres

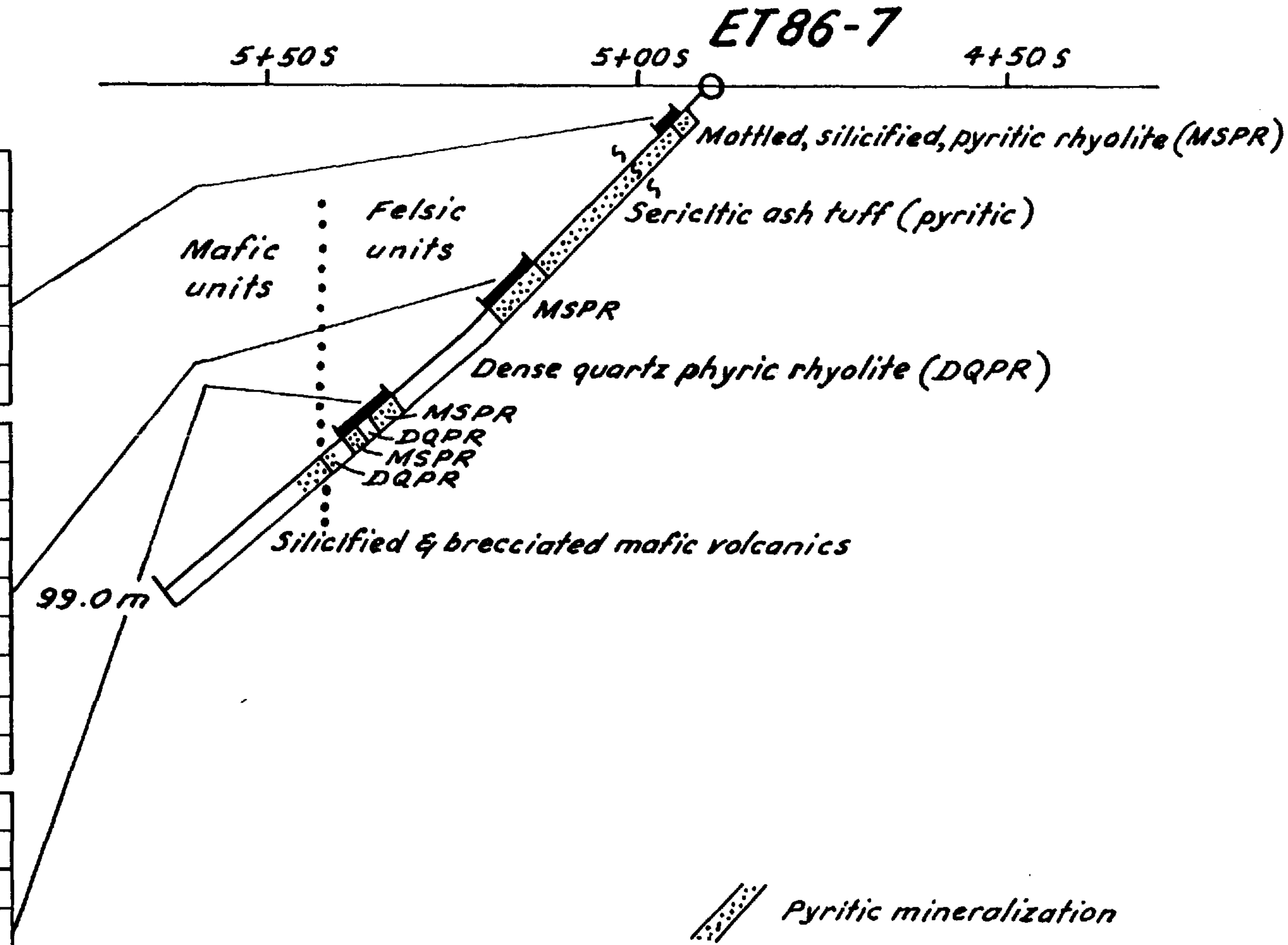
0 10 25 50

Fig. 16

NTS : 21E/14

Nov. 1986. KL

From	To	Length (m)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
5.0	6.0	1	95	12	75	0.7	8
6.0	7.0	1	1211	11	77	1.4	8
7.0	8.0	1	75	13	119	1.0	7
8.0	9.0	1	320	14	164	1.1	7
9.0	10.0	1	93	18	261	1.6	6
32.5	33.5	1	75	5	44	0.4	6
33.5	34.5	1	198	8	34	0.7	7
34.5	35.5	1	98	7	77	0.4	7
35.5	36.5	1	55	7	22	0.5	9
36.5	37.5	1	77	12	58	0.6	9
37.5	38.5	1	168	10	24	0.6	12
38.5	39.5	1	218	16	52	0.8	14
39.5	40.5	1	1230	10	35	1.0	9
40.5	40.96	0.46	361	12	23	0.7	9
58.8	59.8	1	584	10	654	0.9	10
59.8	60.8	1	2041	10	67	2.1	11
60.8	61.8	1	1294	11	504	1.6	8
61.8	62.8	1	555	11	557	1.4	8
62.8	63.8	1	64	9	186	0.7	7
63.8	64.8	1	815	14	481	1.5	13
64.8	65.8	1	2516	12	380	2.4	12
65.8	66.7	0.9	3132	14	375	3.2	10



metres
0 10 25 50

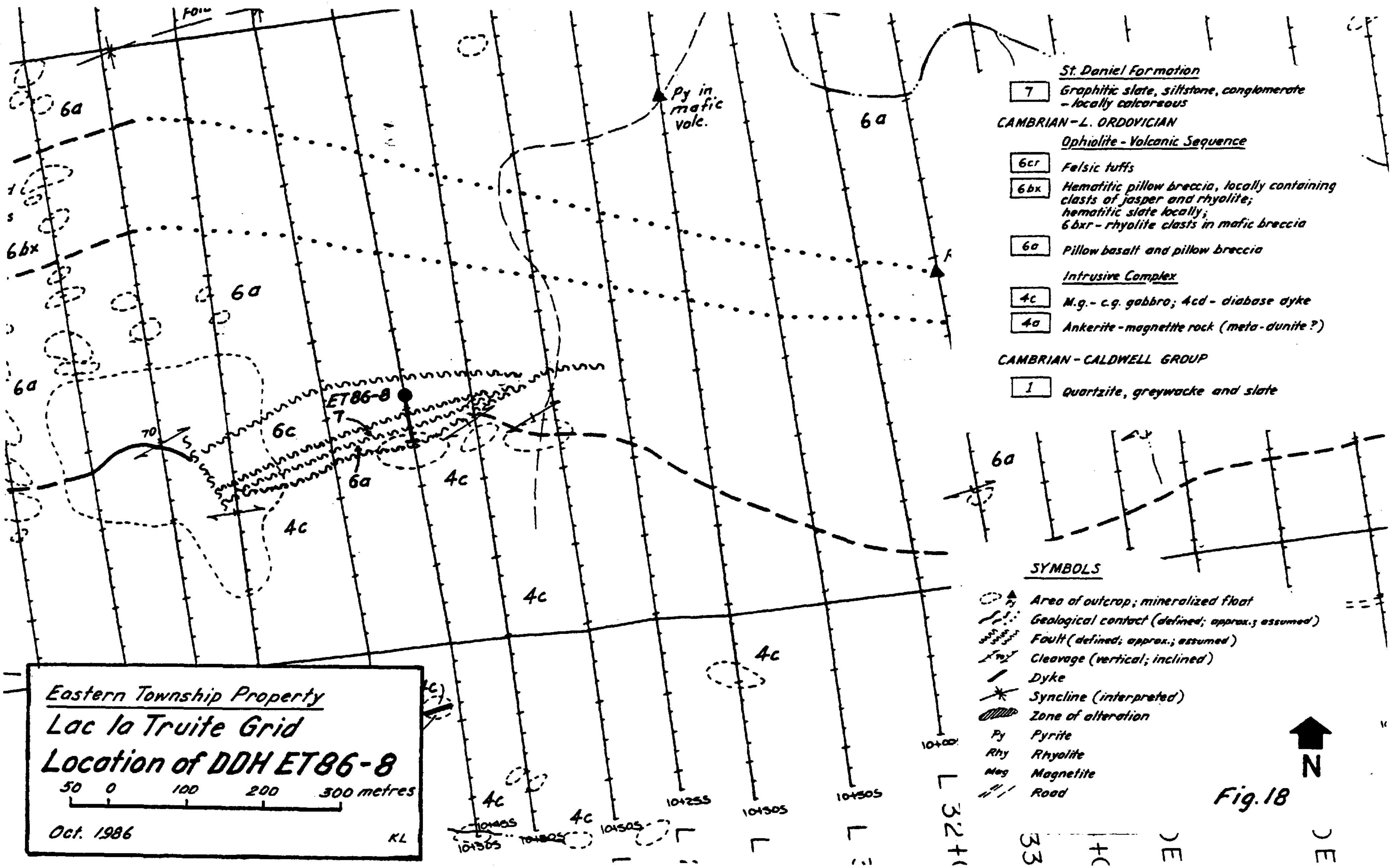
NTS : 21E/14
Nov. 1986. KL

Fig. 17

FinNeth Exploration Inc.

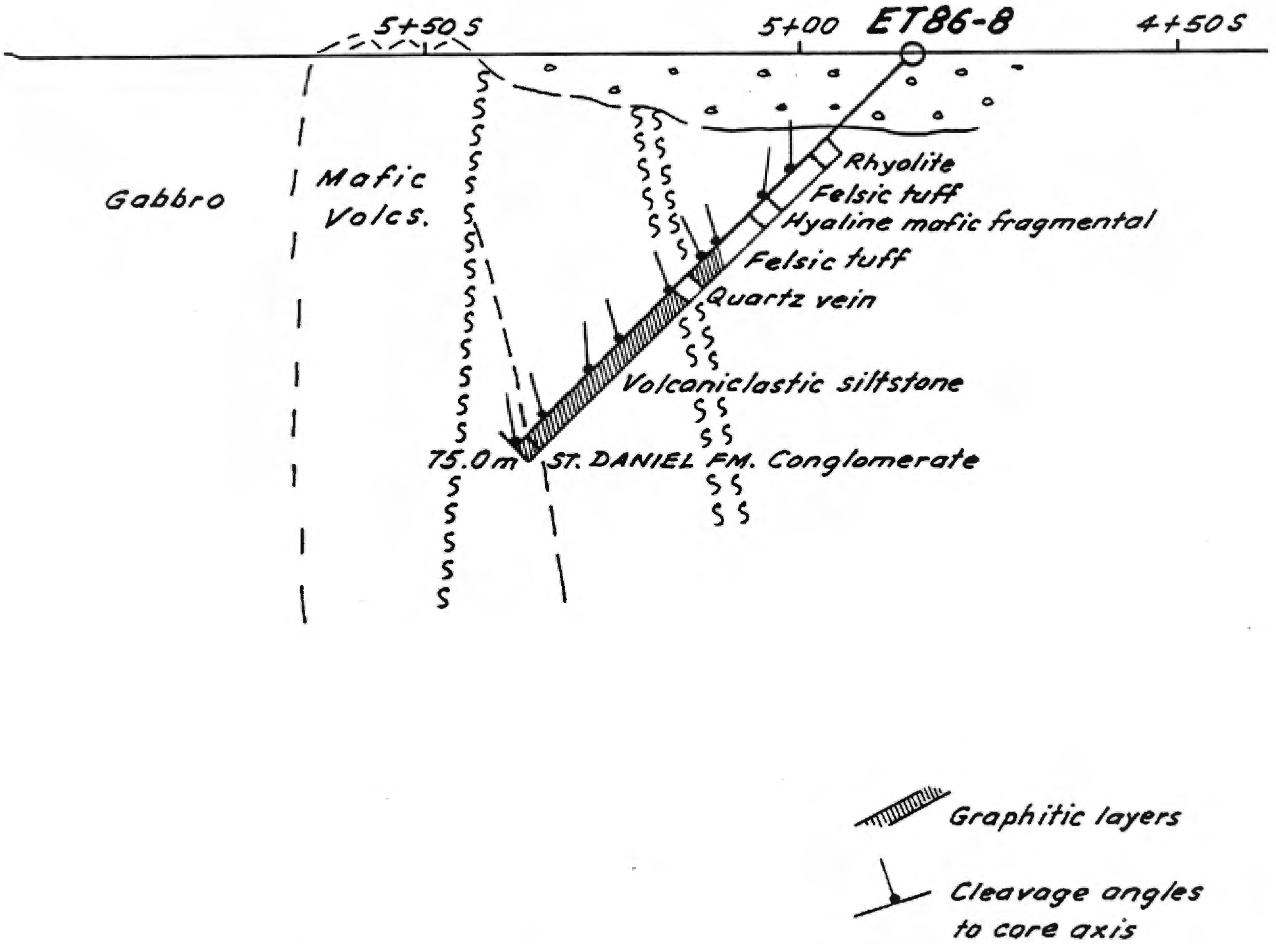
EASTERN TOWNSHIPS PROPERTY
LAC COULOMBE - WEST

DDH ET 86-7
Line 6+00E/4+90S



St. Daniel Formation
7 Graphitic slate, siltstone, conglomerate - locally calcareous
CAMBRIAN - L. ORDOVICIAN
Ophiolite - Volcanic Sequence
6cr Felsic tuffs
6bx Hematitic pillow breccia, locally containing clasts of jasper and rhyolite; hematitic slate locally; 6bxr - rhyolite clasts in mafic breccia
6a Pillow basalt and pillow breccia
Intrusive Complex
4c M.g. - c.g. gabbro; 4cd - diabase dyke
4a Ankerite - magnetite rock (meta-dunite ?)
CAMBRIAN - CALDWELL GROUP
1 Quartzite, greywacke and slate
SYMBOLS
Area of outcrop; mineralized float
Geological contact (defined; approx.; assumed)
Fault (defined; approx.; assumed)
Cleavage (vertical; inclined)
Dyke
Syncline (interpreted)
Zone of alteration
Py Pyrite
Rhy Rhyolite
Mag Magnetite
Road
N
Py in mafic volc.
ET86-8
6a
6bx
6c
4c
Eastern Township Property
Lac la Truite Grid
Location of DDH ET86-8
50 0 100 200 300 metres
Oct. 1986
KL

Fig. 18



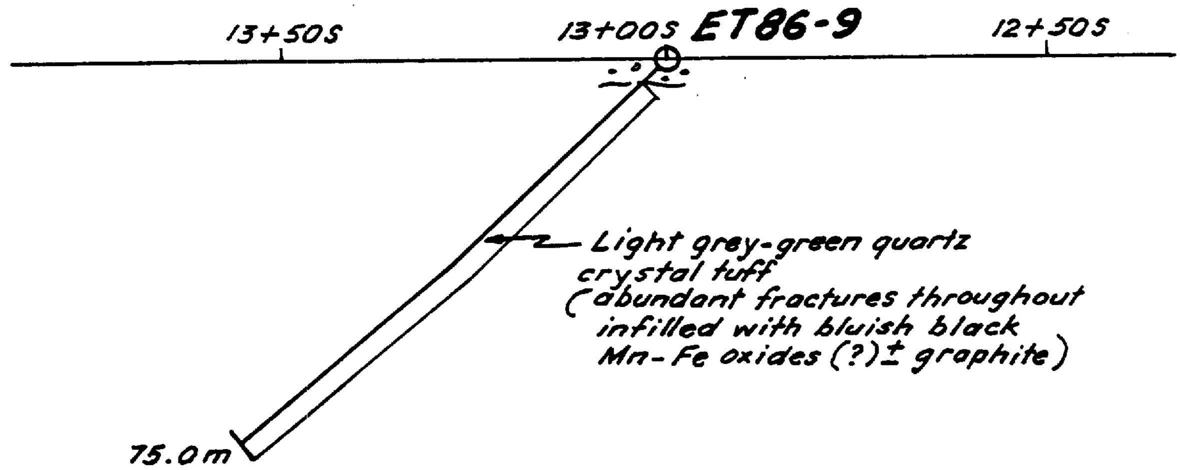
FinNeth Exploration Inc.

EASTERN TOWNSHIPS PROPERTY
LAC LA TRUITE GRID
DRILL HOLE ET86-8
Line 26+00E/4+85S

metres
0 10 25 50

NTS: 21E/13
Oct. 1986. KL

Fig. 19.



FinNeth Exploration Inc.

EASTERN TOWNSHIPS PROPERTY
LAC AU CANARD - EAST

DDH ET86-9

Line 55+50E/13+00S

metres
0 10 25 50

NTS: 21E/14
Oct. 1986. KL

Fig. 20

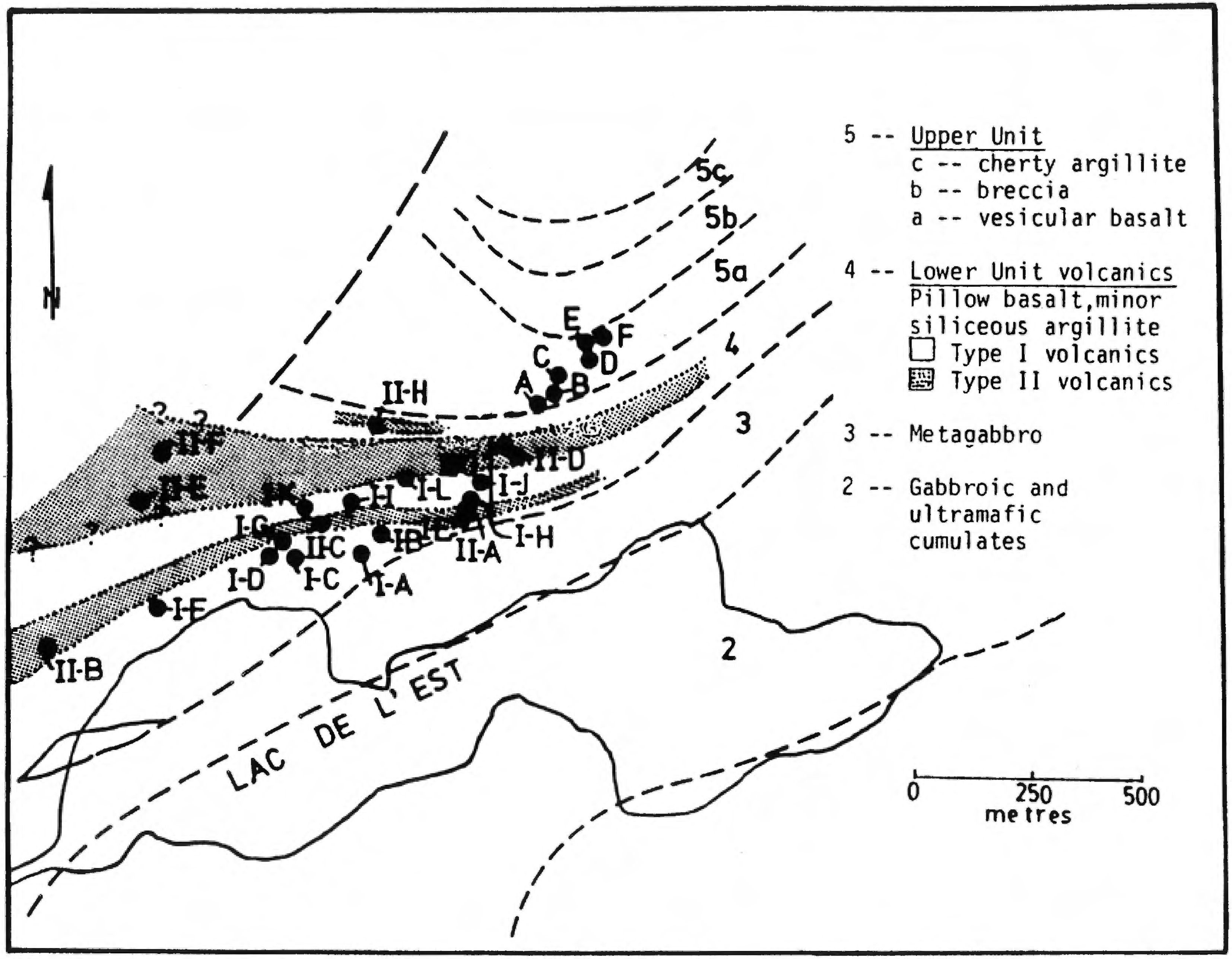


Fig. 21- Geology of the Lac de l'Est area, showing sample locations and the inferred distribution of type I and II volcanics. Geology is after Hébert and Laurent (1979), with division of lower volcanic unit into type I and II volcanics according to the present study.

(after Oshin & Crockett, 1986)

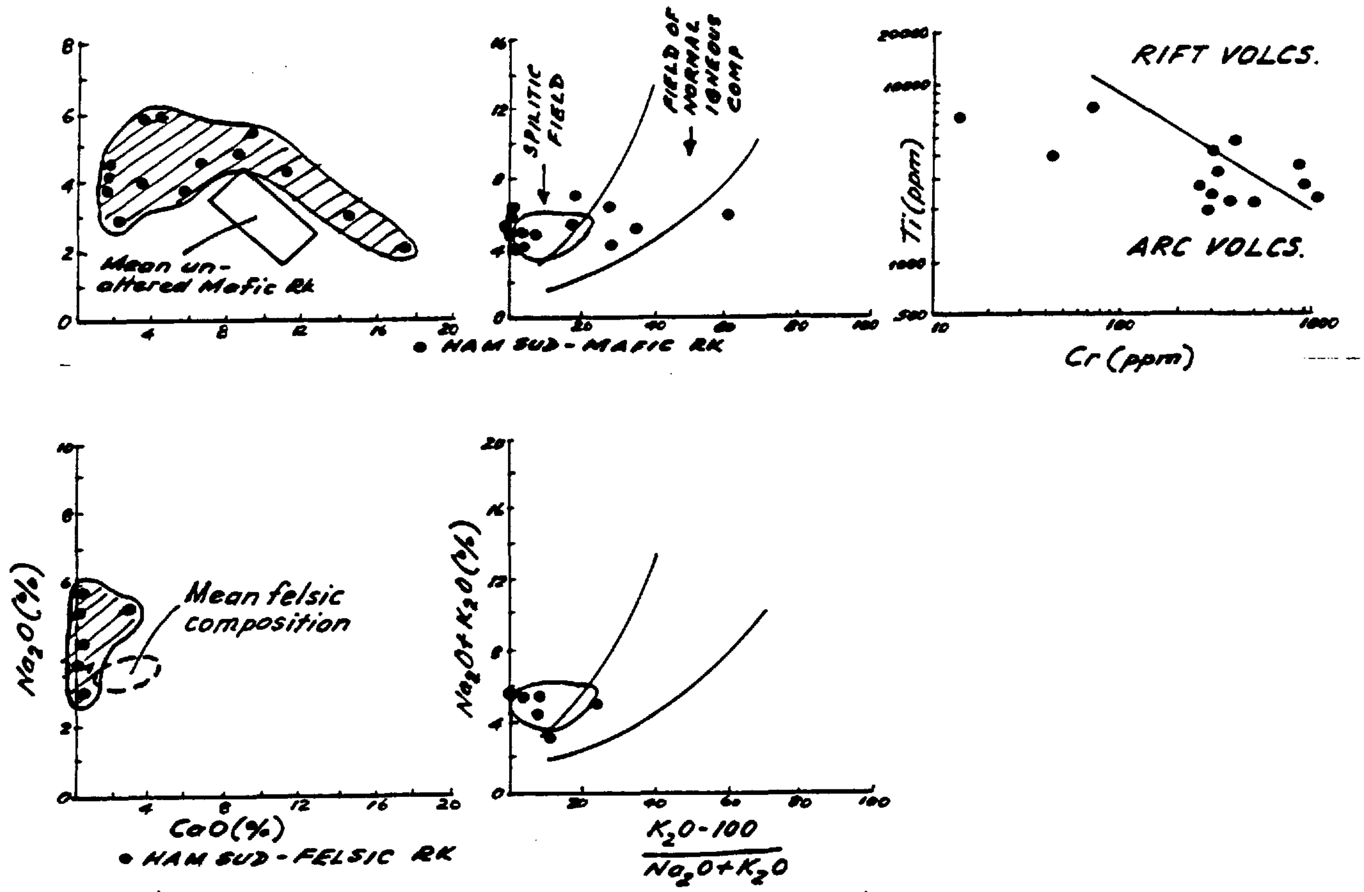


Fig. 22. Chemical variation diagrams Na_2O - CaO, Na_2O - K_2O, Ti - Cr; (after Stephens et al, 1984)

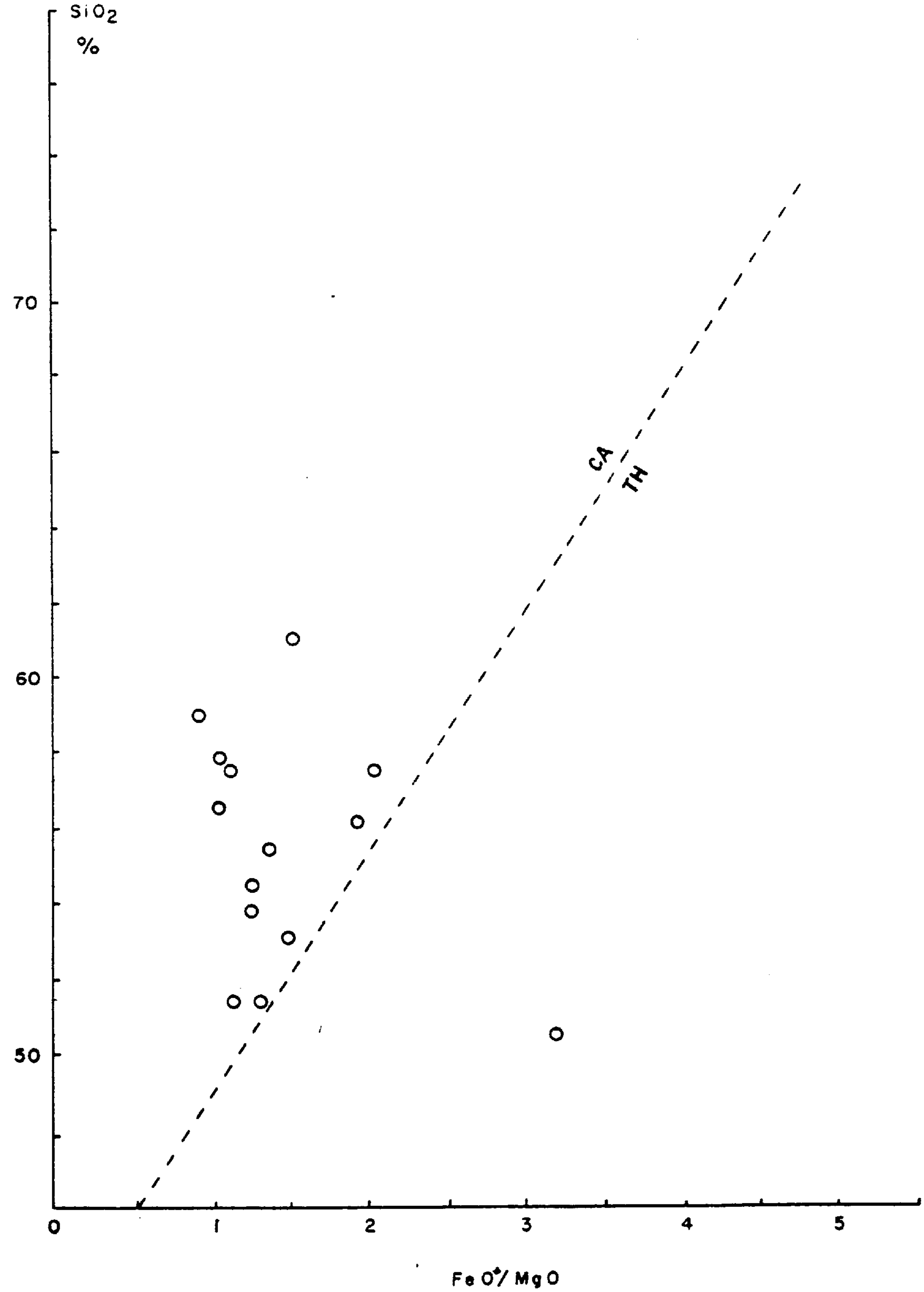


Fig. 23. SiO_2 vs FeO^{+}/MgO

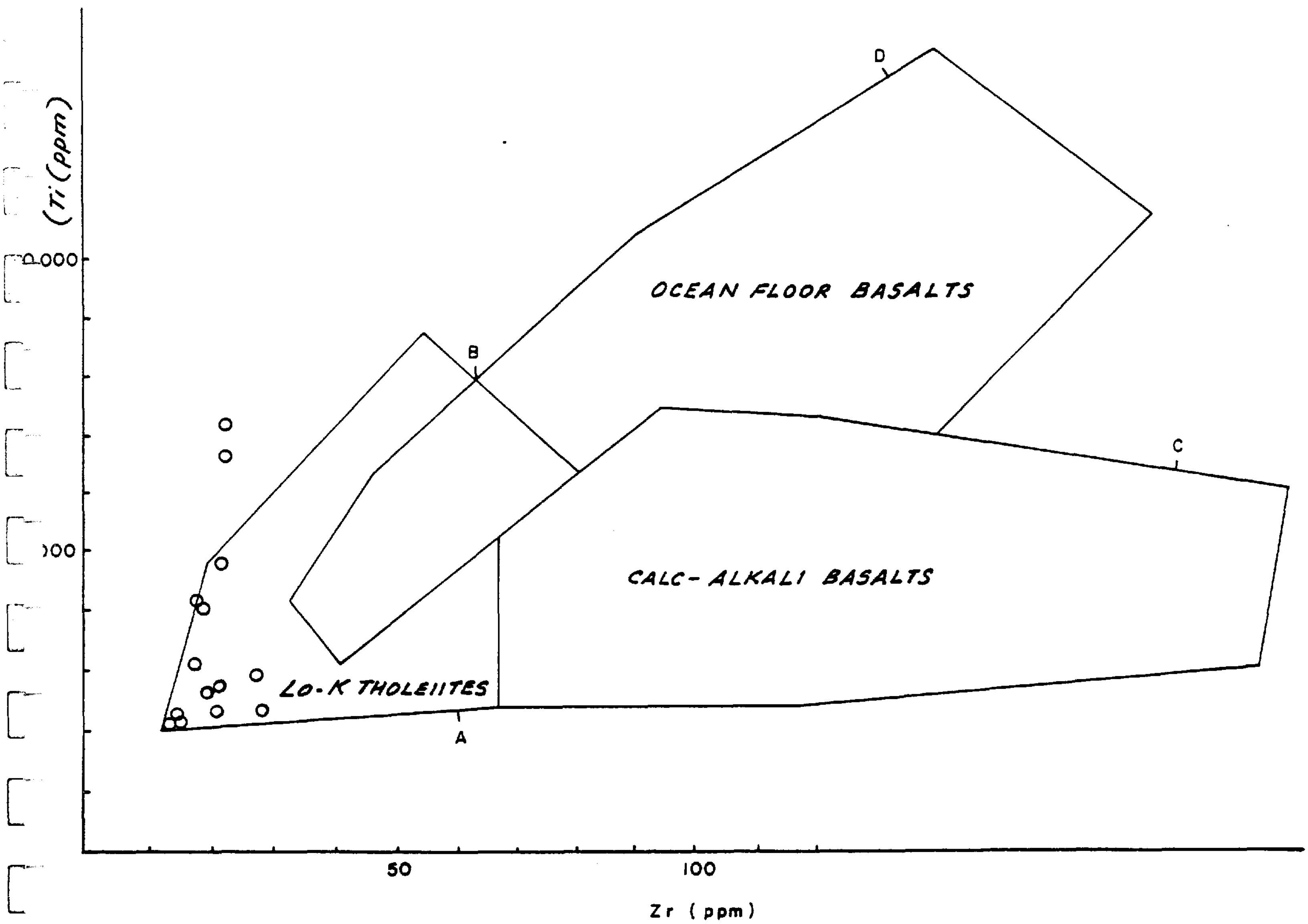


Fig. 24. Ti vs Zr (after Pearce and Cann - 1973)

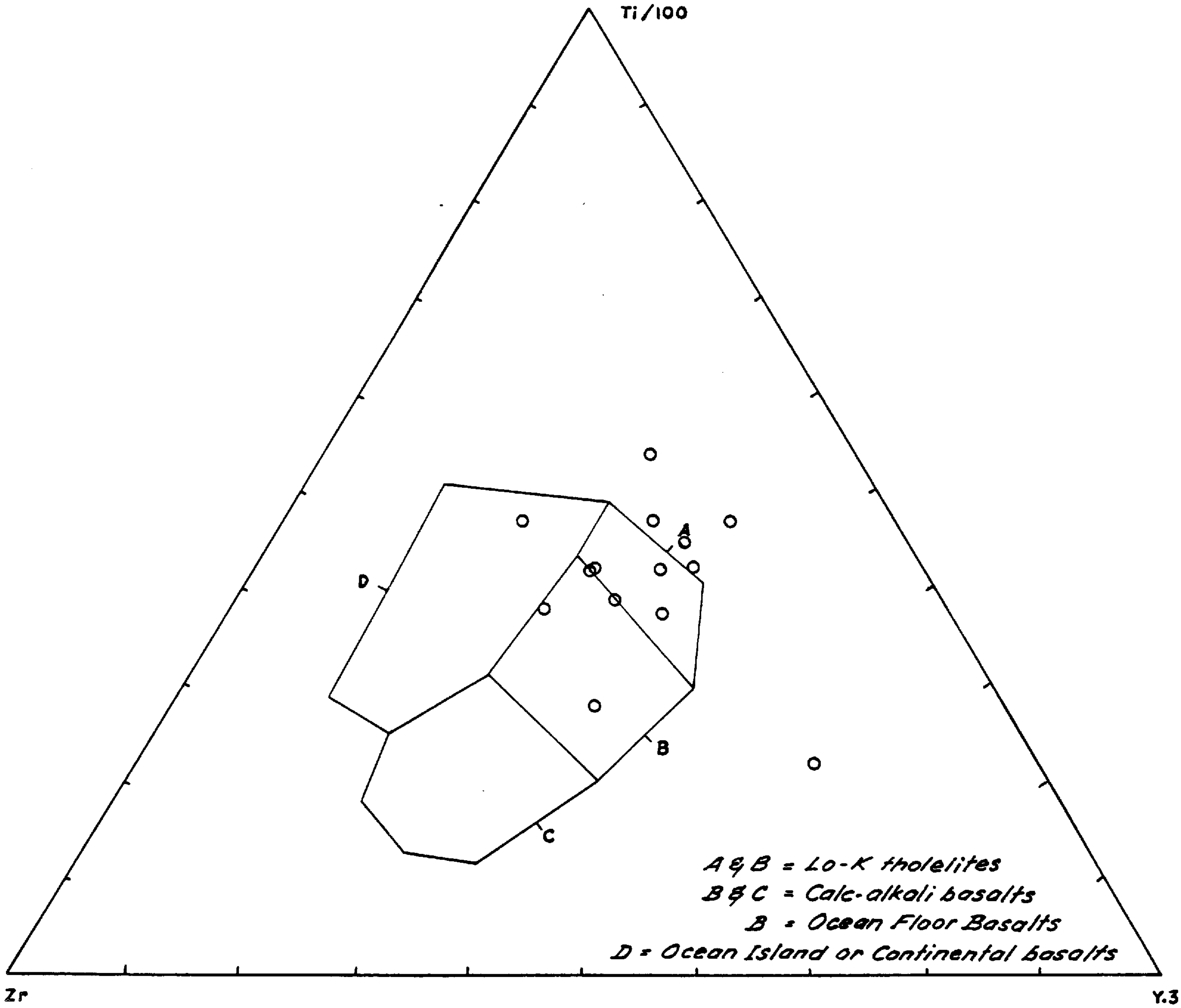
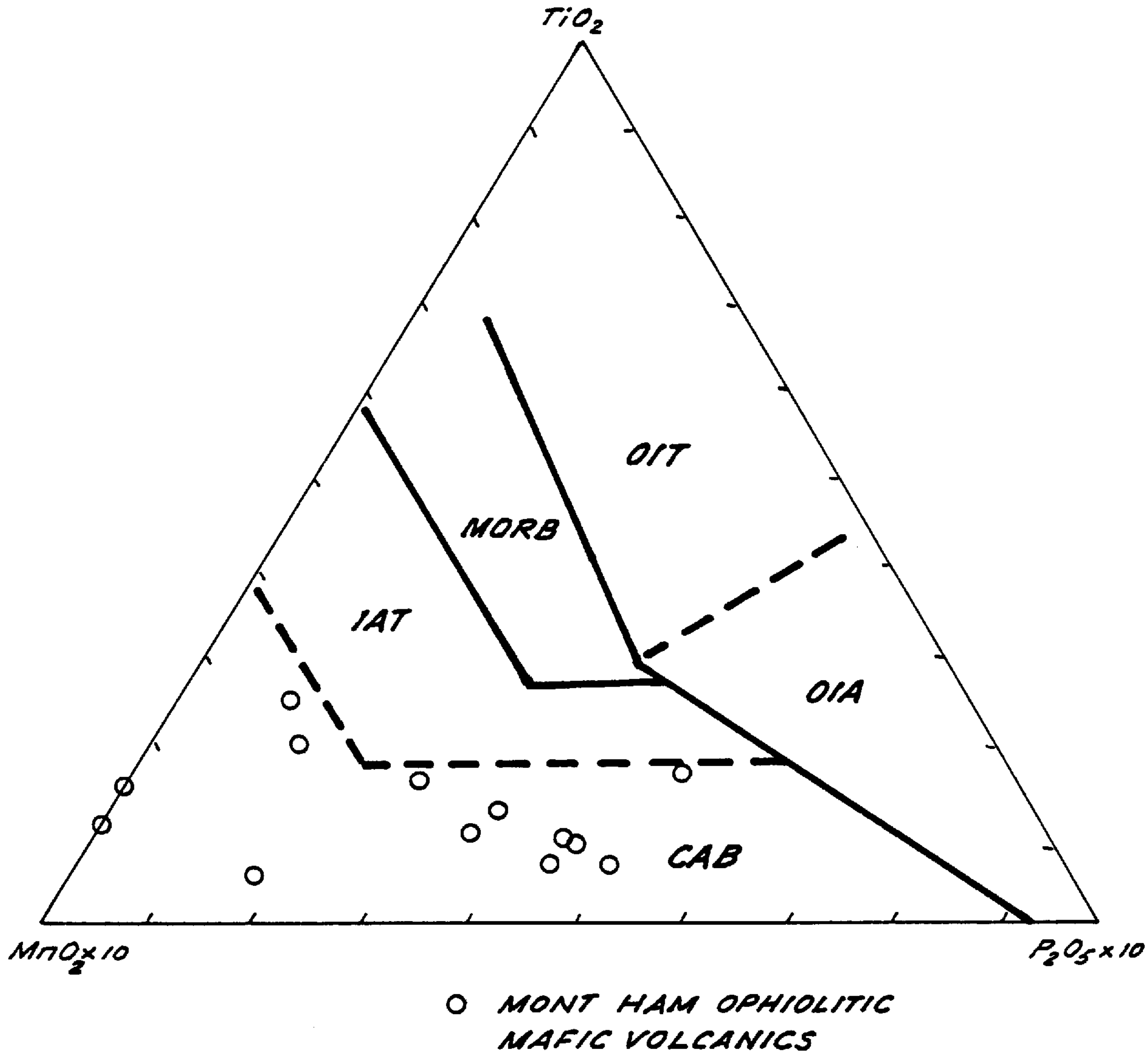


Fig. 25. Ti/100 - Zr - Y.3 (after Pearce and Cann - 1973)



MORB - Mid-ocean ridge basalt
OIT - Ocean Island tholeiite
IAT - Island arc tholeiite
OIA - Ocean Island alkali basalt
CAB - Calc-alkali basalt

Fig. 26 - $TiO_2 - MnO_2 \times 10 - P_2O_5 \times 10$

After E. Mullen EAPS (1983)

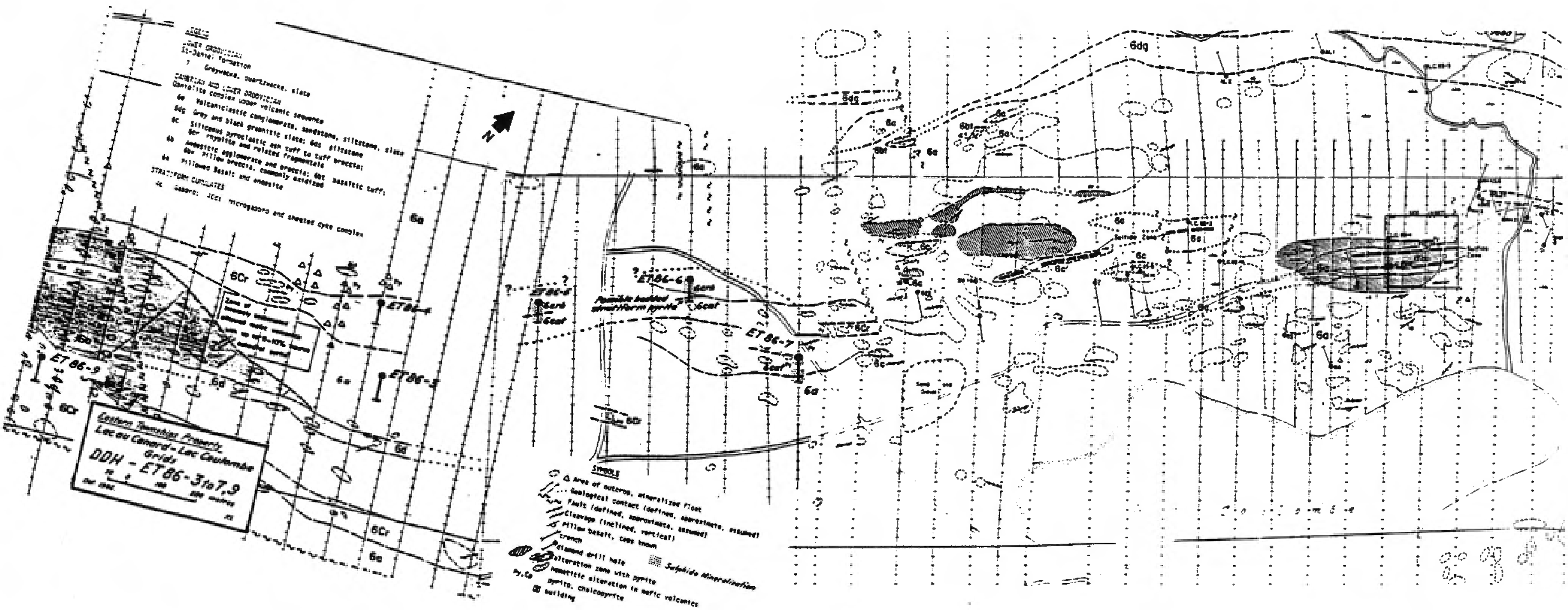

Greywacke, quartzwacke, slate
Volcaniclastic conglomerate, sandstone, siltstone, slate
Pillowed basalt and andesite
6Cr
6a
6dg
6c
6bt
ET 86-4
ET 86-3
ET 86-9
ET 86-5
ET86-6
ET 86-7
Possible bedded stratiform pyrite
Eastern Townships Property
Lac au Canard - Lac Coulombe
Grids
DDH - ET86-3 to 7,9
SYMBOLS
Area of outcrop, mineralized float
Geological contact (defined, approximate, assumed)
Fault (defined, approximate, assumed)
Cleavage (inclined, vertical)
Pillow basalt, tops known
trench
diamond drill hole
alteration zone with pyrite
hematitic alteration in mafic volcanics
Py, Cp
pyrite, chalcopyrite
building
Sulphide Mineralization

Fig. 27

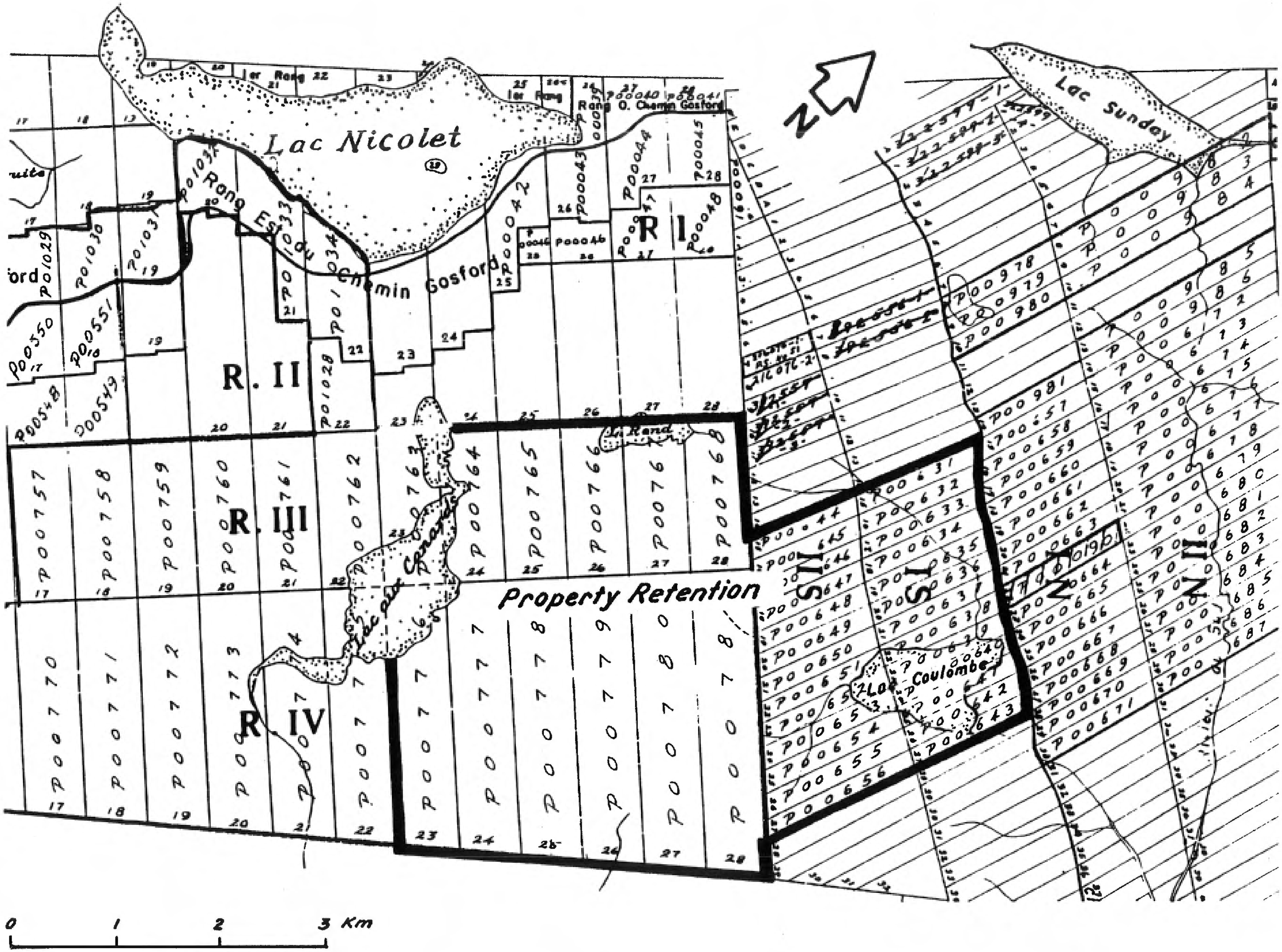


Fig. 28. Eastern Townships Properties: **RECOMMENDED PROPERTY RETENTION**

KL - March, 1987

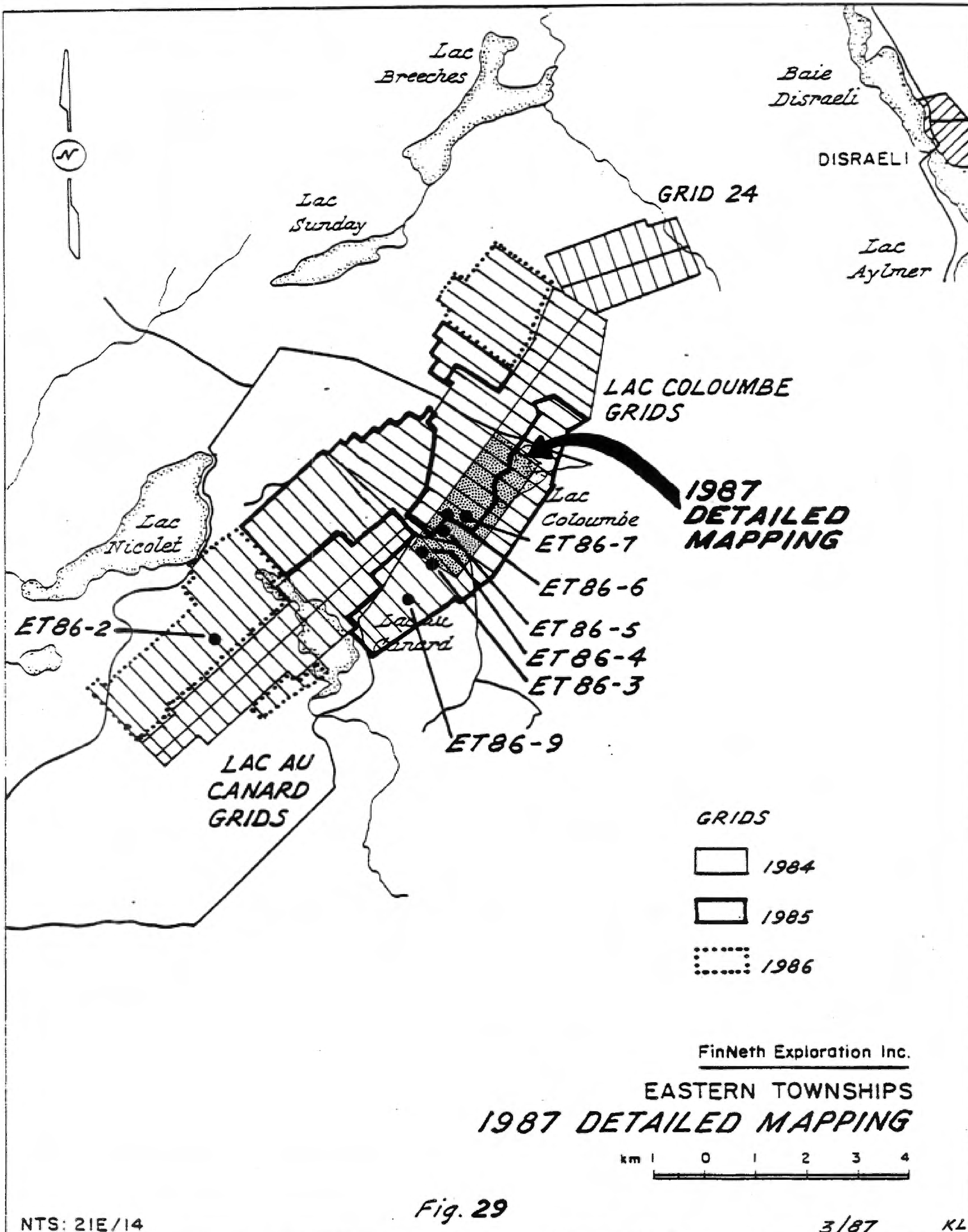

Lac Breeches
Baie Disraeli
DISRAELI
Lac Sunday
GRID 24
Lac Aylmer
LAC COLOUMBE GRIDS
1987 DETAILED MAPPING
Lac Coloumbe
Lac Nicolet
ET86-7
ET86-6
ET86-5
ET86-4
ET86-3
ET86-2
ET86-9
Lac au Canard
LAC AU CANARD GRIDS
GRIDS
1984
1985
1986
FinNeth Exploration Inc.
EASTERN TOWNSHIPS
1987 DETAILED MAPPING
km 1 0 1 2 3 4
NTS: 21E/14
3/87
KL

Fig. 29

Table I

MAJOR ELEMENTS AND NORMATIVE MINERALOGY

	FV 9064		FV 9065		MV 9066		FV 9067		MV 9068		MV 9069		FV 9070		MV 9071		MV 9072	
	Recalculated to 100%																	
SiO_2	60.50	64.91	54.20	57.29	42.40	50.62	51.30	55.41	75.80	79.64	51.00	56.43	76.40	79.70	56.80	60.94	49.30	53.18
TiO_2	0.50	0.54	0.40	0.42	0.57	0.68	0.44	0.48	0.17	0.18	0.29	0.32	0.11	0.12	0.26	0.28	0.68	0.73
Al_2O_3	12.40	13.31	14.10	14.90	12.80	15.28	15.20	16.42	10.10	10.61	12.90	14.27	10.20	10.64	13.10	14.06	14.80	15.96
Fe_2O_3	11.20	12.02	9.59	14.14	5.51	6.58	10.48	11.32	3.06	3.22	9.26	10.25	2.36	2.46	9.71	10.42	11.60	12.51
Fe O																		
MgO	3.35	3.59	7.37	7.79	1.72	2.05	8.12	8.77	2.54	2.69	9.08	10.05	1.39	1.45	6.53	7.00	7.59	8.19
MnO	0.10	0.11	0.16	0.17	0.87	1.04	0.11	0.12	0.02	0.02	0.13	.14	0.03	0.03	0.16	0.1	0.13	0.14
CaO	0.71	0.76	3.40	3.59	14.70	17.55	2.47	2.67	0.24	0.25	3.65	4.04	0.27	0.28	2.25	2.41	2.41	2.60
Na_2O	3.96	4.25	4.89	5.17	1.87	2.23	2.72	2.94	3.68	4.07	3.64	3.80	4.12	4.42	4.12	4.42	4.03	4.35
K_2O	0.45	0.48	0.50	0.53	3.13	3.74	1.73	1.87	0.39	0.41	0.30	0.33	1.32	1.38	0.11	0.12	1.96	2.11
P_2O_5	0.03	0.03	L0.01	L0.01	0.20	0.24	0.02	0.02	0.03	0.03	0.09	0.10	0.14	0.15	0.16	0.17	0.21	0.23
LOi	4.70		2.45		13.80		4.65		2.50		7.00		1.35		4.45		5.20	
TOTAL	97.90		97.06		97.57		97.24		97.68		97.38		97.21		97.65		97.91	

	FV 9064	FV 9065	MV 9066	FV 9067	MV 9068	MV 9069	FV 9070	MV 9071	MV 9072
Q	35.08	15.95	7.41	23.38	59.47	19.67	51.03	27.90	12.29
Or	35.06	3.30	26.36	11.93	2.54	2.17	8.49	0.75	13.48
Ab	38.57	46.22	22.55	26.85	26.43	38.12	33.52	40.13	39.67
An	2.41	16.82	24.65	12.99	0.56	20.96	0.19	11.40	10.36
$C^{(wo)}$	5.34	0	0	5.57	5.34	0.31	2.96	2.97	3.25
Di	0	0	0	0	0	0	0	0	0
Hy^{En} Fs	0	0	0	0	0	0	0	0	0
Mt	0	0	2.07	0	0	0	0	0	0
Il	0.25	0.38	1.29	0.27	0.05	0.34	0.07	0.39	0.32
Hem	12.17	10.11	6.06	11.54	3.19	10.70	2.42	10.55	12.74
Ru	0	0	0	0	0	0	0	0	0
Sp	1.0	0.84	0	0.81	0.38	0.35	0.19	0.18	1.38
Ap	0.08	0	0.67	0.05	0.08	0.26	0.36	0.43	0.57

MAJOR ELEMENTS AND NORMATIVE MINERALOGY

	FV 9064	FV 9065	MV 9066	FV 9067	MV 9068	MV 9069	FV 9070	MV 9071	MV 9072
Trace Elements									
Ni	?2	6	7	61	?2	50	?2	42	22
Cr	56	50	15	457	53	366	50	360	82
Zr	34	16	22	22	51	17	129	21	21
Y	17	13	12	11	20	9	39	8	20
Nb	L1	L1	L1	L1	L1	L1	L1	L1	L1

MAJOR ELEMENTS AND NORMATIVE MINERALOGY

	MV 9073		MV 9074		MV 9075		FV 9076		MV 9077		MV 9078		MV 9079		MV 9080		MV 9081	
SiO_2	53.40	55.95	48.30	54.52	53.60	57.55	75.40	78.33	77.50	80.46	54.80	57.38	44.10	51.51	55.70	58.80	48.60	53.76
TiO_2	0.26	0.27	0.4	0.24	0.28	0.30	0.23	0.24	0.21	0.22	0.39	0.41	0.19	0.22	0.22	0.22	0.20	0.22
Al_2O3	15.30	16.02	12.60	14.22	13.30	14.28	10.20	10.53	9.05	9.40	13.80	14.45	12.80	14.95	12.10	12.77	11.90	13.16
Fe_2O_3	9.49	0.94	7.75	8.75	10.20	10.95	3.76	3.88	3.42	3.55	10.60	11.10	7.33	8.56	7.99	8.43	8.24	9.11
FeO																		
MgO	4.98	5.22	6.34	7.16	9.59	10.29	0.57	0.59	0.28	0.29	5.21	5.46	5.84	6.82	9.34	9.86	6.80	7.52
MnO	0.15	0.16	0.18	0.20	0.24	0.26	0.07	0.07	0.03	0.03	0.14	0.12	0.14	0.12	0.12	0.13	0.17	0.19
CaO	45.53	4.74	8.58	9.68	1.77	1.90	0.45	0.46	0.21	0.22	4.59	4.80	10.60	12.38	5.75	5.88	9.32	10.31
Na_2O	5.68	5.95	4.38	4.94	3.72	3.99	5.67	5.85	5.42	5.63	5.84	6.12	3.69	4.31	3.63	3.83	5.05	5.59
K_2O	1.55	1.62	0.10	0.11	0.21	0.23	0.05	0.05	0.20	0.21	0.11	0.12	0.87	1.02	0.06	0.06	0.13	0.14
P_2O_5	2.60		8.85		4.30		0.65		0.30		2.90		11.70		3.35		7.15	
TOTAL	98.08		97.55		97.54		97.55		97.42		98.40		97.32		98.08		97.56	
Q		7.59		13.64		28.06		42.40		45.73		14.23		8.36		27.00		12.24
Or		10.05		0.75		1.43		0.31		1.27		0.71		7.01		0.40		0.94
Ab		52.72		47.21		36.28		51.09		48.99		54.18		42.59		34.23		52.28
An		12.82		18.39		8.39		1.84		0		12.20		21.56		18.45		11.54
$C^{(wo)}$		0		0		4.94		0.20		AC=0.39		0		0		0		0
Di		0		0		0		0		0		0		0		0		0
$Hy^{En}Es$		0		0		0		0		0		0		0		0		0
Mt		0		0.06		0.03		0		0		0		0		0		0.04
IL		0.35		0.45		0.57		0.16		0.07		0.30		0.35		0.29		0.42
Hem		9.82		9.28		11.08		3.78		3.35		10.79		9.44		8.40		9.49
Ru		0		0		0		0		0		0		0		0		0
Sp		0.21		0		0		0.38		0.45		0.61		0.09		0.20		0
Ap		0.36		0.48		0.63		0		0		0.08		0.25		0		0

MAJOR ELEMENTS AND NORMATIVE MINEROLOGY

	MV	MV	MV	FV	FV	MV	MV	MV	MV
	9073	9074	9075	9076	9077	9078	9079	9080	9081
Trace Elements									
Ni	43	72	83	4	5	9	55	9	55
Cr	354	326	1006	51	55	44	342	926	531
Zr	19	21	27	55	56	18	14	29	15
Y	4	21	7	23	25	11	7	10	5
Nb	L1	L1	L1	L1	L1	2	L1	2	L1

MAJOR ELEMENTS AND NORMATIVE MINEROLOGY

	MV 9082		MV 9083	
SiO_2	54.70	57.75	45.30	51.48
TiO_2	0.39	0.41	0.18	0.21
Al_2O_3	11.80	12.46	12.20	13.86
Fe_2O_3	8.13	8.58	6.93	7.88
Fe O				
MgO	7.98	8.42	6.06	6.89
M_nO	0.15	0.16	0.14	0.16
CaO	6.83	7.21	13.40	15.23
Na_2O	4.50	4.75	2.56	2.91
K_2O	0.16	0.17	1.07	1.22
P_2O_5	0.08	0.08	0.16	0.18
LOi	2.70		8.60	
TOTAL	97.42		97.40	

	MV 9082	MV 9083
Q	22.18	16.57
Or	1.05	8.17
Ab	42.44	27.97
An	12.86	24.08
$C^{(wo)}$	0	0
Di	0	0
$Hy^{En}Fs$	0	0
Mt	0	0
Il	0.36	0.39
Hem	8.55	8.45
Ru	0	0
Sp	0.55	0
Ap	0.21	0.48

	MV 9082	MV 9083
Trace Elements		
Ni	81	50
Cr	873	277
Zr	18	13
Y	12	7
Nb	L1	L1

Magma type	Location	No. of analyses	Ti	Zr	Y	Nb	Sr	Cr	Ni
Ocean ridge									
Ocean floor basalts	Alula-Fartak trench, Gulf of Aden	24	8300	77	27	1.5	123		
	Carlsberg Ridge $5\frac{1}{2}^\circ$N	7	10150	117	35	4.0	140		
	Palmer Ridge	8	6500	70	24	7.0	121		
	Gulf of Aden – median valley	7	6150	64	22	6.5	119		
	Mid Atlantic Ridge 45°N	7	8050	93	23	15	188		
	Mid Atlantic Ridge 24° and 30°N	12	8850	129	45	–	108		
	Juan de Fuca Ridge	4	11950	122	47	5.0	125		
	Marianas small ocean basin	3	8100	101	25	6.0	197		
	Ocean floor basalt – mean	72	8350	92	30	5.0	131		
Volcanic arc									
Low-K tholeiites	Izu arc (Oshima)	14	6700	44	21	1.0	184		
	Tonga arc (Falcon Is.)	7	4550	33	17	1.5	179		
	Marianas arc (Guam)	8	3900	52	16	2.5	218		
	Fiji (Viti Levu)	5	4900	68	22	–	344		
	South Sandwich Is.	12	4850	44	18	2.0	127		
	Low-K tholeiite – mean	46	5150	52	19	1.5	207		
Calc-alkali basalts	Java arc	53	5300	107	24	3.5	384		
	Lesser Antilles (St. Lucia)	5	5850	90	23	3.0	239		
	Japan	2	5750	64	15	2.0	420		
	Calc-alkali basalt – mean	60	5400	106	23	2.5	375		
Shoshonites	Fiji (Viti Levu)	9	3700	52	16	–	1193		
Ocean island									
Ocean island basalt	Jebel at Tair (Red Sea)	3	11800	137	28	11	240		
	Hawaii	20	14850	164	25	14	338		
	Galapagos	7	17800	251	39	24	329		
	Reunion	15	19850	178	28	–	522		
	Zubair (Red Sea)	11	15350	250	33	35	373		
	Hanish Zukur (Red Sea)	10	19350	297	33	46	578		
	Madeira	3	16350	251	27	64	776		
	Flores, Azores	9	19150	262	28	90	889		
	Ocean island basalts – mean	78	16250	215	29	32	438		
Continental									
Continental basalt	Deccan traps	9	11850	132	28	10	187		
	Tuli Syncline, Rhodesia	12	16800	328	–	27	683		
	Paka, Gregory Rift	3	15550	132	31	24	495		
	Afar, Ethiopia	11	15900	177	29	21	431		
	Continental basalts – mean	35	15150	215	29	20	460		
	Mt. Ham Mafic volcanics	14	3500	23	10	<1		426	52
	Thetford- Lower type I	12	11450	58	31			30	<5
	Thetford- Lower type II	8	2500	26	9			342	77
	Thetford- Upper	8	2200	21	7			2442	296

Table 2. Average trace element compositions of various volcanic environments Pearce and Cann (1973) with additional data from the Mont Ham Ophiolite (his report) and the Thetford Ophiolite (Oshin and Crockett, 1986)

	Special Exploration Permit Number	Range	Lot	Hectares	Expiry Date*
HAM SUD TWP.	P00764	III	024 + the lake	80.00	Feb. 21/86
	P00765	III	025	80.00	Feb. 21/86
	P00766	III	026 + the lake	80.00	Feb. 21/86
	P00767	III	027 + the lake	80.00	Feb. 21/86
	P00768	III	028 + the lake	80.00	Feb. 21/86
	P00776	IV	023 + the lake	131.00	Feb. 21/86
	P00777	IV	024 + the lake	136.00	Feb. 21/86
	P00778	IV	025	140.00	Feb. 21/86
	P00779	IV	026	144.00	Feb. 21/86
	P00780	IV	027	148.00	Feb. 21/86
	P00781	IV	028	149.00	Feb. 21/86
GARTHBY TWP.	P00631	I-S	015	21.00	Feb. 21/86
	P00632	I-S	016	21.00	Feb. 21/86
	P00633	I-S	017	20.00	Feb. 21/86
	P00634	I-S	018	20.00	Feb. 21/86
	P00635	I-S	019	20.00	Feb. 21/86
	P00636	I-S	020	20.00	Feb. 21/86
	P00637	I-S	021	20.00	Feb. 21/86
	P00638	I-S	022 + the lake	20.00	Feb. 21/86
	P00639	I-S	023 + the lake	20.00	Feb. 21/86
	P00640	I-S	024	20.00	Feb. 21/86
	P00641	I-S	025	20.00	Feb. 21/86
	P00642	I-S	026	20.00	Feb. 21/86
	P00643	I-S	027	20.00	Feb. 21/86
	P00644	II-S	015	19.00	Feb. 21/86
	P00645	II-S	016	20.00	Feb. 21/86
	P00646	II-S	017	20.00	Feb. 21/86
	P00647	II-S	018	21.00	Feb. 21/86
	P00648	II-S	019	22.00	Feb. 21/86
	P00649	II-S	020	22.00	Feb. 21/86
	P00650	II-S	021	22.00	Feb. 21/86
	P00651	II-S	022 + the lake	23.00	Feb. 21/86

Table III

Special Exploration Permit Number	Range	Lot	Hectares	Expiry Date*
P00652	II-S	023 + the lake	23.00	Feb. 21/86
P00653	II-S	024 + the lake	24.00	Feb. 21/86
P00654	II-S	025 + the lake	24.00	Feb. 21/86
P00655	II-S	026	25.00	Feb. 21/86
P00656	II-S	027	26.00	Feb. 21/86
		TOTAL AREA	1742 hectares	

* ALL SPECIAL EXPLORATION PERMITS RENEWED TO 1988

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: Asbestos L7E/0+50S Direction: 320 ° Dip: - 45° Hole No.: ET86-1

Logged By: G. Lutes Casing: 24 ' Sheet No.: 1/1

Started: Oct. 3, 1986 Core Size: BQ Corrected Tests: ______

Finished: Oct. 4, 1986 102 m = -38°

Property: Asbestos / Eastern Twps. Property 941

FROM	TO	(metres) DECRIPTION
0	7.2	Overburden
7.2	93.0	Light grey-green felsic tuff (Ash tuff) with locally interbedded crystal tuffs. -stringers and disseminations of pyrite and trace of chalcopyrite locally. 12: Ss @ 47° C.A. 18: Ss @ 50° C.A. 28: Ss @ 60° C.A. -quartz-carbonate veins locally and local carbonate alteration in volcanics. 45: So Ss @ 55° 60: Ss @ 55° 76: Ss @ 67° 90: Ss @ 60° -downhole contact against mafic volcanics gradational through mixed mafic-felsic fragmentals.
93.0	102.0	-Mafic Volcanics: medium green chlorite volanics -uphole contact dark green chlorite-rich and well cleaved (altered hyaline and fragmental top) -fragmental from about 93-97 m.
	102.0	END OF HOLE.

gl/20

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: 23+67E/13+11N Direction: 130° Dip: -45° Hole No.: ET86-2

Logged By: G. Lutes Casing: 10' Sheet No.: 1/2

Started: October 9, 1986 Core Size: BQ Corrected Tests:

Finished: October 11, 1986 75 m = 41°

Property: Lac Au Canard - West - Eastern Townships Property 941

FROM	TO (metres)	DECRIPTION
0	3.50	Boulders in overburden.
3.50	10.25	Crystallithic felsic tuff (sericitic) - no sulphides 8 m - Ss 43° C.A. - rock is heterogeneous with regard tograin size, clast size and composition and locally may contain some fragmental mafic material.
10.25	15.6	Silicified buff-grey rhyolite -uphole contact sharp (possibly sheared?) -stringer and disseminated pyrite common and chlorite-pyrite veinlets and stringers most common in association. -carbonate filled microfractures and veinlets common. -downhole contact sharp and last 10 cm. contains some jasper clasts.
15.6	38.6	Medium green chloritic Mafic Volcanic -pistachio green common (sericitic, epidotitic?) -trace disseminated py ± cp locally. -generally few vesicles and with some inclusions of felsic clasts at uphole contact. 32-33: Quartz vein = (dilatent fracture?)
38.6	42.7	Light-medium grey silicic quartz-feldspar porphry dyke -aphanitic ground mass -no sulphides -upper and lower contacts sharp @ 55-60° C.A. -occasional xenolith of mafic volcanics.

FROM	TO	DESCRIPTION
42.7	62.0	Medium green chloritic mafic volcanic: identical to 15.6 - 38.6 45: Ss developed @ 40° C.A. 51 - 62m: rock becomes light coloured, increasingly hyaline and brecciated.
62.0	62.5	Light-medium grey silicic quartz-feldspar porphry dyke: -identical to 38.6 - 42.7 -upper and lower contacts sharp at about 45° C.A. 64.5: 20 cm rose quartz vein = fault?
62.5	75.0	Mafic Volcanic Fragmentals and Tuffs?: -identical to 51 - 62 m -section from 69-72 has well developed cleavage at 10-20° C.A. and contains some pyritic laminations (rock looks like reworked mafic volcanic).
	75.0	END OF HOLE

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: 64+50/11+25S Direction: 140° Dip: -45° Hole No: ET86-3

Logged By: Glenn Lutes Casing: 17' Sheet No.: 1/2

Started: Oct. 17, 1986 Core Size: BQ Corrected Tests:

Finished: Oct. 18, 1986 75 m = -40°

Property: Lac au Canard - East Grid - Eastern Twps. Property 941

FROM	TO	(metres) DECRIPTION
0	6	Overburden
6	27.6	Light to medium green, felsic tuff with mottled chloritic fragments up to 0.5 m: - very similar to mottled tuff in ET86-4 - generally sericitic and locally siliceous - carbonate generally absent - very little veining or alteration - only local disseminated pyrite - possibly mixed mafic-felsic components? (volcaniclastic sediments?)
27.6	30.5	Medium to dark green, dense mafic volcanic with amygdules: - rock is generally fine grained and only slightly chloritic. - uphole contact is hyaline from 27.6 to 27.8 and suggests chilling at contact.
30.5	59.8	Mottled green tuff as at 6-27.6: - uphole contact sharp with some inclusions in mafic volcanic unit suggests tops uphole? - carbonate content generally high and increases downhole 52.5: some chert fragments 56.6 - 57.3= quartz carbonate vein (fault?)
59.8	75.0	Dense Medium green mafic volcanic - uphole contact shows disrupted contact over ~1 m with apparently fragments of uphole unit in downhole unit?

FROM	TO	DESCRIPTION
		59.8 - 64.0 (approx.): rock is aphanitic and possibly autobrecciated and is certainly hyaline (hyaloclastite) 64 - 75: rock becomes darker green and amygdules present - fine disseminations pyrrhotite throughout (< 1%).
	75.0	END OF HOLE (No conductive minerals on structures in section, but some pyrite disseminations and veins in bottom unit may be responsible for I.P.)

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: L64E/9+35S Direction: 140° Dip: -45° Hole No.: ET86-4

Logged By: G. Lutes Casing: 10' Sheet No.: 1/2

Started: Oct. 16/86 Core Size: BQ Corrected Tests:

Finished: October 17, 1986 75 m = 40°

Property: Lac Au Canard East, Eastern Townships Property 941

FROM	TO	(metres)	DECRIPTION
0	4		Overburden
4.	5.5		Light grey quartz rhyolite: -dense, massive rock (H Knife)therefore non-sericitic -unaltered, with trace diss. pyrite and rare veinlets of pyrite.
5.5	11.2		Medium to Dark green mottled tuff with mixed mafic-felsic components: -upper and lower contacts knife-sharp with irregular trend and appear non-erosional. -Clasts comprise chloritic variety (mafic component?) up to 1 cm (altered mafic glass?) and sericitic variety with no quartz spicules observed. -size grading of clasts from 0.5 cm at uphole contact to about 1-2 mm at downhole contact. Grading is fairly regular and suggests tops downhole. -no compaction of flow layering developed. -trace. disseminated pyrite locally but not significant. -no $CaCo_3$
11.2	33.2		Light grey rhyolite: with devitrification spots and aphyric. -trace disseminated pyrite and local sulphide veinlet. 15-20 (approx.) numerous fractures filled with high grade graphite. 24-30 (approx.) numerous original gas cavities (lithophysae?) -indicates that this was a lava = true rhyolite. -downhole contact gradational into (overlying?) tuff-breccias.

FROM	TO	DESCRIPTION
33.2	38.8	Light grey silicic tuff and tuff breccia -uphole contact gradational. -downhole contact sharp and possibly faulted @ 40° C.A.
38.8	47.5	37-37.5: brecciated felsic fault. Light, medium and dark green tuffs from fine to coarse ash size and -locally mixed mafic-felsic lapilli tuffs as per uphole unit and local tuff-breccia.
47.5	75.0	Lapilli tuff with mixed mafic-felsic component -identical to unit from 5.5 - 11.2 -size grading not apparent across unit but is somewhat variable from 2-3 mm to about 6-7 mm locally. -some secondary $CaCO_3$ in matrix and veinlets locally.
	75.0	END OF HOLE

gl/23

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: L+00W / 3+45S   Direction: 120°   Dip: -45°   Hole No.: ET86-5

Logged By: G. Lutes   Casing: 69'   Sheet No.: 1/2

Started: October 15, 1986   Core Size: BQ   Corrected Tests:

Finished: October 16, 1986   75 m = 40°

Property: Lac Coulombe Grid / Eastern Townships

FROM	TO (metres)	DECRIPTION
0	20.25	Overburden
20.25	42.0 (approx.)	Light grey-green rhyolite breccia:

-rock is generally aphanite, aphyric with first 1-2 metres having the appearance of hydraulic fracturing.

-Bulk of unit is breccia with fragments angular or rounded and up to 20-30 (?) cm in size.

-matrix to breccia is sulphide-rich (pyrite ± chalcopyrite) with local trace of sphalerite.

-latest fracturing and veining contains chalcopyrite-rich sulphide assemblage (± sphalerite, galena) in quartz gangue and lots of open pore space (suggests perhaps that Cp is deposited in stringer-zone post-py and in a near surface environment?)

-reaction rims around fragments are common and obvious and many fragmental sections intergrade with heavily veined sections showing original relationships.

38.9 - 39.3: Heavy stringers py-cp.

39.3 - 39:9: Semi-massive pyrite with trace Cp (recovery poor and section fractured & faulted) Section probably a thick lode.

39.9 - 41.5 (approx.): Heavy stringers of py-cp.

-sulphide assemblage generally contains less Cp below about 42 m and become less abundant.

FROM	TO	DESCRIPTION
42.0	75.0	<u>Light toned grey-green ash tuff</u>: generally containing finer grained pyrite and lesser Cp. Rock is slightly coarser grained and more sericitic than the adjacent uphole unit of rhyolite breccia but is lithologically and texturally similar. - brecciation is less common in this unit and grain size appears to increase downhole. 53.9 - 54.0 (10 cm) = stringer of py-cp in $CaCO_3$ rich gangue. 67.0 : Ss developed @ 50° C.A. - grain size relatively coarse (≤ 1 mm) at bottom of hole and tuff appears non-welded with local quartz spicules.
	75.0	END OF HOLE.

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: L3+00E/2+80S Direction: 125° Dip: -45° Hole No.: ET86-6

Logged By: G. Lutes Casing: 10' Sheet No.: 1/2

Started: October 14, 1986 Core Size: BQ Corrected Tests:

Finished: October 15, 1986 75 m = 39°

Property: Lac Coulombe, Eastern Townships, Property 941

FROM	TO (metres)	DECRIPTION
0	3.4	Overburden
3.4	12.2	Light grey rhyolite and rhyolite breccia: -reaction rims common around fragments -disseminated and stringer pyrite locally -relict So = original flow layering apparent locally.
12.2	19.0	Mixed tuff, Tuff breccia: fine grained pyrite and locally chalcopyrite in laminated and disrupted felsic tuffaceous rock. Possible stratiform mineralization. -upper and lower contacts sharp over 1-2 cm @ about 45° C.A.
19.0	24.4	Light grey, locally flow layered rhyolite: -few veins or brecciation -no sulphides So = 45-50° C.A. -uphole and downhole contacts sharp and // So // Ss
24.4	26.0 (approx.)	Light grey-green ash tuff: -disseminated and stringer pyrite common -uphole contact sharp -downhole contact gradational
26.0	63.2	Light grey Rhyolite + Rhyolite breccia: identical to 3.4 - 12.2 -dense and massive -aphyric -spherulites locally and/or metasomatic spotting 36: extensive wall-rock alteration noted around narrow sulphide veinlets - these probably lead to hydraulic fracturing and brecciation.

FROM	TO	DESCRIPTION
		52.5 - 53.0: brownish altered fragments of sericitic tuff? 54.2 - 54.9: brownish altered fragments of sericitic tuff?
63.2	75.0	Medium grey-green sericitic tuff with 1-3% very fine disseminated pyrite in ground mass. -uphole contact appears to contain large fragments of adjacent unit. (tops downhole?) -local laminations maybe So -occasional spotting through section. 66.2: 10 cm py-cp vein with quartz-carbonate gangue. 67.0 - 67.2: Semi-massive pyrite - possibly stratiform and measurably a moderately good conductor. 68.7 - 69.3: Light brown tuff? 72.1 - 72.3: Semi-massive pyrite - possibly stratiform and measurably a moderately good conductor. -metasomatic spots increasing in size downhole 75: So // Ss @ 50° C.A.
	75.0	END OF HOLE.

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: L6+00E/4+90S Direction: 120° Dip: -45° Hole No.: ET86-7

Logged By: G. Lutes Casing: 12' Sheet No.: 1/2

Started: October 11, 1986 Core Size: BQ Corrected Tests: 99 m = 40°

Finished: October 14, 1986

Property: Lac Coulombe, Eastern Townships , Property 941

FROM	TO (metres)	DECRIPTION
0	5	Overburden
5.0	7.0 (approx.)	Mottled, silicified and brecciated rhyolite with abundant stringers of coarse pyrite. = TYPE 1 - RHYOLITE
7.0	32.5	Medium green sericite ash tuff 7.0 - 9.0 (approx.) frequent clasts of uphole unit. -disseminated and stringer pyrite common. 10.5 - 12.5: frequent breccias. 14.4: gossanous fault zone -frequent breccias throughout with many varieties of tuffaceous felsic rhyolite.
32.5	41.0	Mottled, silicified and brecciated rhyolite: identical to 5.2 - 7.0 -coarse pyrite stringers common throughout -downhole contact sharp.
41.0	58.8	Light green dense quartz phyric rhyolite: few veins or alteration and no silicification. TYPE 2 - RHYOLITE -diss. sulphides throughout =< 0.5% 47.8 - 47.9 pyritic vein -downhole contact sharp.
58.8	62.0	TYPE 1 - RHYOLITE
62.0	64.0	TYPE 2 with fragments of Type 1
64.0	66.8	TYPE 1
66.8	70.5 (approx.)	TYPE 2: appears to be gradational with silicified mafic volcanic breccia downhole.

FROM	TO	DESCRIPTION
70.0	99.0	Silicified and brecciated mafic volcanic with local breccias with cherty and tuffaceous clasts and local sulphide veins and disseminates. These volcanics are largely sericitic. -although markedly vesiculated, extensively altered with loss of Fe^{+++}, Mg^{++} probable.
	99.0	END OF HOLE.

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FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: Lac La Truite/L26E 4+85S Direction: 230° Dip: -45° Hole #: ET86-8

Logged By: G. Lutes Casing: 52' Sheet No.: 1/2

Started: Oct. 6, 1986 Core Size: BQ Corrected Tests:

Finished: Oct. 8, 1986 75 m = 35°

Property: Eastern Townships 941

FROM	TO	METRES .	DECRIPTION
0	15.8		Overburden
15.8	18.3		Quartz phyric, light grey/grey rhyolite: massive rock and uncleaved with no sulphides.
18.3	26.5		Light green felsic tuffs - generally sericitic with variable coloration and development of So-laminations. -crystallithic material common. 19.3 - 21.0 (approx.) generally folded multi-coloured laminae of coarse to fine ash size. 22: So Ss @ 45° C.A. -buff grey (clasts?) of quartz phyric rhyolite common.
26.5	30.0 (approx.)		Hyaline Mafic fragmentals(?) locally containing clasts of possible felsic derivation. -uphole contact and sharp @ 40° C.A. 30: broken oxidized rock over 10-20 cm = fault.
30.0	41.8		Light grey-green felsic tuffs = heterogeneous and fragmental with clasts of rhyolite and (black laminated chert ± graphitic slate?) 36: So Ss @ 60° C.A. 38-41.8: Generally softer sericitic fine ash tuffs with local interlaminated graphitic slate bands 5-10 cm. locally.

FROM	TO	DESCRIPTION
41.8	44.5	Quartz Vein with open space growth indicating dilational movement. 39: Ss @ 70° C.A.
44.5	72	Light green volcaniclastic siltstone with frequent graphitic laminae. These graphitic laminae are slip surfaces for the shearing deformation prevalent through the section. 45: Ss @ 65° -uphole contact sharp where dislocated against quartz vein. -Numerous pencil-line width slip planes through section (slip surface graphitic). -Rock generally coarser silt uphole and finer silt size downhole and increasing frequency of graphitic-slatey interbeds (slip planes) downhole. -Tops therefore suggested downhole. -Relationship to uphole adjacent unit of light-grey green felsic tuffs is interpreted as gradational overlying and dislocated by later quartz vein (dilatent fracture). 55: Ss @ 58° C.A. 60: Ss @ 50° C.A. 58: graded (1 cm) sand-silt laminae
~~suggests~~		tops up the hole (to north) 69: Ss @ 60° C.A.
72	75	St. Daniel Fm(?): Conglomerate with black slatey matrix, rounded elongate clasts up to ± 10 cm. recognizable. -Uphole contact gradational over 5-10 cm. -many clasts are carbonate-rich.
	75	END OF HOLE

FINNETH EXPLORATION INC.

DIAMOND DRILL RECORD

Location: 55+50E/13+00S Direction: 145° Dip: -45° Hole No.: ET86-9

Logged By: G. Lutes Casing: 12' Sheet No.: 1/1

Started: Oct.18/86 Core Size: BQ Corrected Tests:

Finished: Oct. 21/86 75 m = -40°

Property: Lac au Canard- East - Eastern Twps. Property 941

FROM	TO	(metres)	DECRIPTION
0	4		Overburden
4	75		Light grey-green, quartz crystal tuff: - quartz crystals to 1-2 mm in aphanitic ground mass - abundant fractures throughout section with blueish black secondary minerals. (± graphite?) as infilling (possibly some manganese stain?) and where pervasive = breccia - local white feldspar crysts to 1-2 mm. - disseminated cubes of pyrite to 2-4 mm throughout but $<<<$ 1%.
	75		END OF HOLE No assays.

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ASSAY REPORT

Hole # ET 86-2

Samples	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
9104	132	11	160	0.4	90
9105	646	15	96	1.4	11
9106	137	16	529	1.2	51
9107	588	16	732	1.8	34
9108	609	15	841	1.5	56
9109	2870	12	12860	2.1	59

gl/41

<u>ASSAY REPORT</u>

Hole # ET 86-5

Samples	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
9144	3568	17	342	1.8	40
9145	2247	9	169	1.0	15
9146	2042	7	110	0.9	9
9147	780	10	176	1.1	9
9148	1849	11	200	1.7	8
9149	4915	8	130	2.5	9
9150	5110	11	174	3.6	46
9151	1510	11	201	1.0	12
9152	1097	14	75	0.8	11
9153	2672	10	63	0.8	9
9154	488	7	62	0.5	9
9155	389	6	55	0.6	8
9156	540	6	604	0.6	8
9157	853	14	363	0.7	23
9158	3742	13	134	1.4	25
9159	3453	24	119	1.8	11
9160	8470	20	150	2.8	60
9161	2833	15	611	1.3	19
9162	526	20	72	0.9	38
9163	599	21	105	1.3	21

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<u>ASSAY REPORT</u>

Hole # ET 86-6

Samples	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
9110	47	35	428	1.0	10
9111	27	24	1002	1.0	9
9112	374	16	3385	1.1	9
9113	411	22	4570	1.4	11
9114	227	21	2800	1.0	12
9115	292	17	1345	1.0	10
9116	567	52	5590	2.3	60
9117	119	44	672	2.0	36
9118	50	38	649	1.9	36
9119	41	38	242	1.0	12
9120 (Semi-Mass. Py)	133	21	361	1.3	15
9121 " "	70	24	586	1.6	24

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ASSAY REPORT

Hole # ET 86-7

Samples	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb
9122	95	12	75	0.7	8
9123	1211	11	77	1.4	8
9124	75	13	119	1.0	7
9125	320	14	164	1.1	7
9126	93	18	261	1.6	6
9127	75	5	44	0.4	6
9128	198	8	34	0.7	7
9129	98	7	77	0.4	7
9130	55	7	22	0.5	9
9131	77	12	58	0.6	9
9132	168	10	24	0.6	12
9133	218	16	52	0.8	14
9134	1230	10	35	1.0	9
9135	361	12	23	0.7	9
9136	584	10	654	0.9	10
9137	2041	10	67	2.1	11
9138	1294	11	504	1.6	8
9139	555	11	557	1.4	8
9140	64	9	186	0.7	7
9141	815	14	481	1.5	13
9142	2516	12	380	2.4	12
9143	3132	14	375	3.2	10

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Appendix II

Geochemical Orientation Studies Over the Lingwick and Lac Coulombe Base Metal Occurrences

by

C.F. Gleeson PhD, P.Eng.

1. INTRODUCTION

On June 26th and 27th, 1986 the writer accompanied by G. Lutes and J. Bertrand of FinNeth Exploration Inc. carried out two geochemical pilot studies over the Lingwick and Lac Coulombe base metal occurrences. The object of the work was to test the applicability of near surface soil geochemical methods to the search for base metal deposits in this region. The two sites selected are considered typical of much of the terrain in this part of the Eastern Townships.

2. LOCATION

The Lingwick property is located about 50km northeast of Sherbrooke, (Figure 2.1) in Lingwick Township Quebec. The Lac Coulombe property is located 60km northeast of Sherbrooke in Garthby Township, Quebec.

3. SETTING

The Lingwick deposit is a Zn-Cu-Ag deposit within Ordovician felsic meta volcanic rocks (Weedon Schist).

The deposit was found as a result of following up a Cu-Zn-Pb stream sediment anomaly found by Soquem in 1966. Subsequent geological mapping and prospecting uncovered two old pits in a silicified massive pyrite zone in sericite schist (felsic tuff?). Soil (B horizon) geochemistry showed weak Cu-Zn anomalies over this zone (Figure 3.1) but stronger ones down

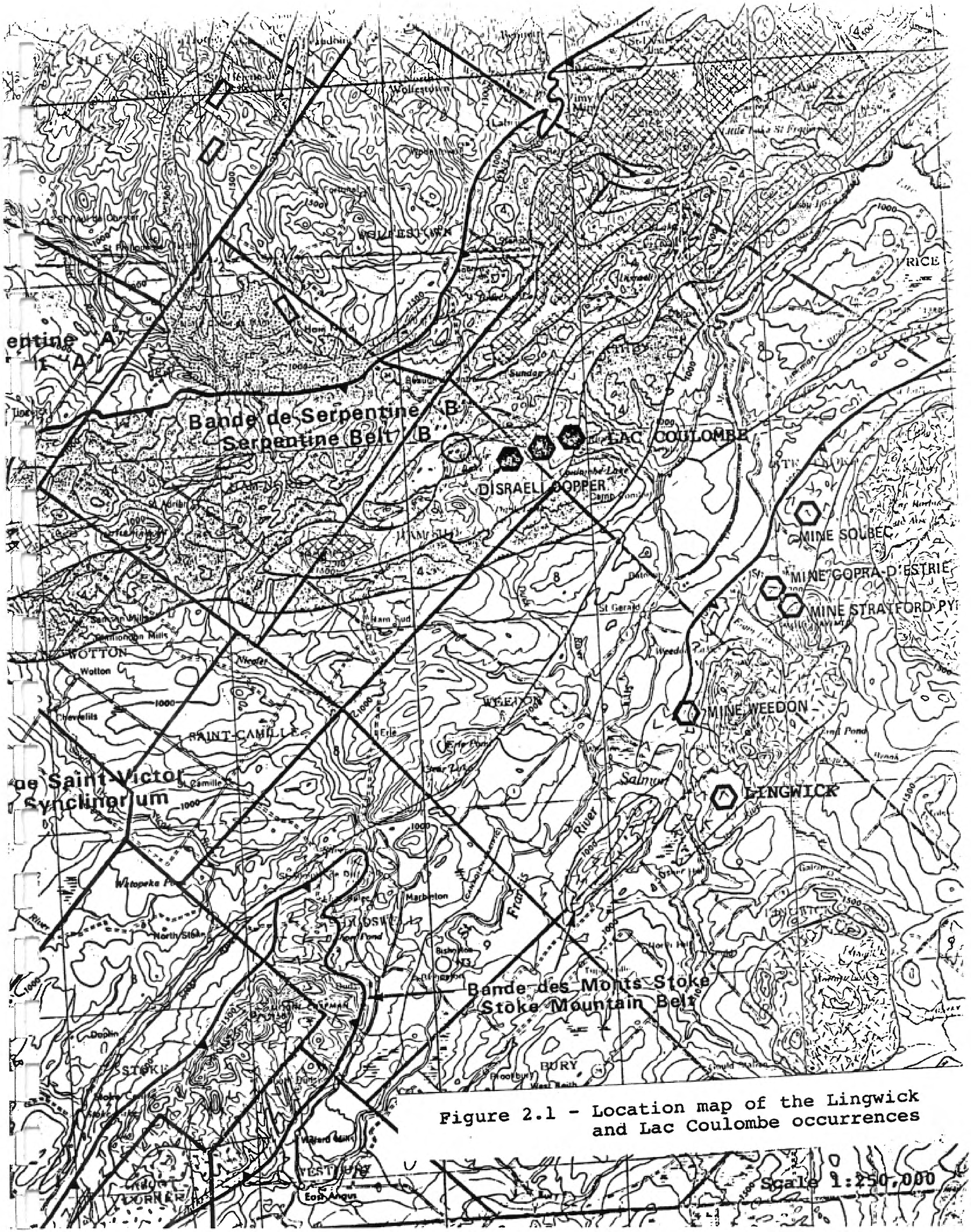


Figure 2.1 - Location map of the Lingwick and Lac Coulombe occurrences

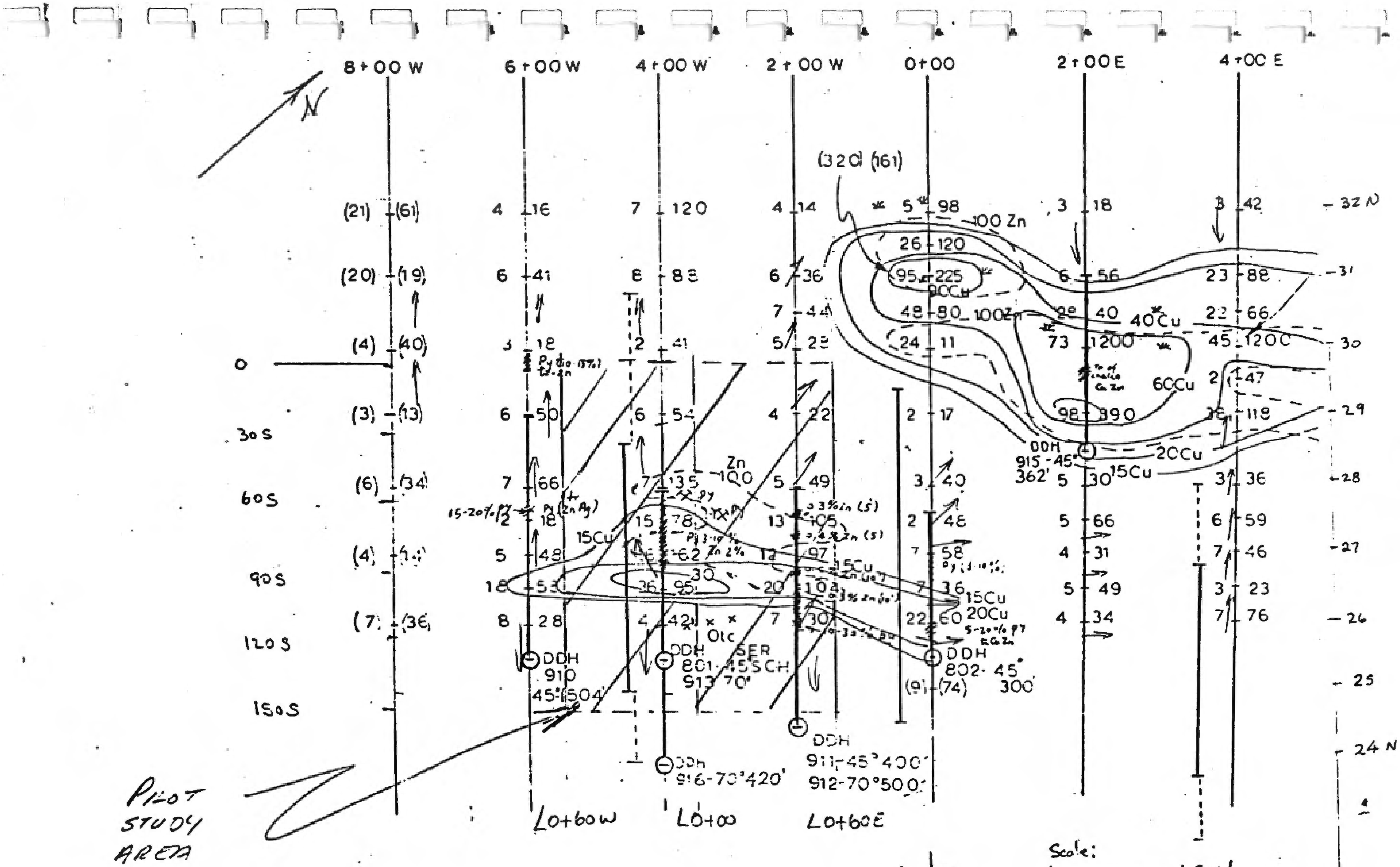


Figure 3.1 - Location of Lingwick pilot study with respect to Soquem's grid and Cu-Zn (ppm) in "B" soil (-80 mesh) horizon 1967

Soquem diamond drill hole

direction of slope

Soquem IP anomaly

slope to the northeast and south. These occurred in boggy areas and in part they are interpreted to represent hydromorphic dispersion by ground waters from this deposit and others in the area. Magnetic and horizontal loop E-M surveys showed no positive responses over the massive sulphide zone. However an IP survey carried out in 1968 gave an anomaly. Subsequent drilling showed that the deposit is lens shaped and blind. It appears comformable to the enclosing schists which strike northeast and dip 55-60°SE. The Zn-Cu zone appears to be in the footwall of the pyrite body (Figure 3.2). The deposit reportedly contains 350,000 tons of grading 6% Zn, 0.6% Cu and 0.5 oz/ton Ag.

The Lac Coulombe copper occurrence is in an east-west trending,steeply dipping pyroclastic zone in basaltic and andesitic volcanic rock of the Ordovician ophiolite complex.

Overburden in the vicinity of both occurrences is relatively thin, generally less than 5m of sandy till. The last regional glacial flow during Wisconsin was from the northwest. The Lingwick deposit occurs at a height of land with the ground sloping to the northeast and south. The Lac Coulombe occurrence is situated in relatively flat, low and in places wet ground.

4. METHODS

At each site a well decomposed humus sample ("A" horizon), a "B" horizon soil sample and a near surface till ("C" horizon) sample was taken. On the Lingwick grid, samples were taken at 15m intervals on lines spaced 200m apart. At Lac Coulombe the sample interval was 25m on L21+50E.

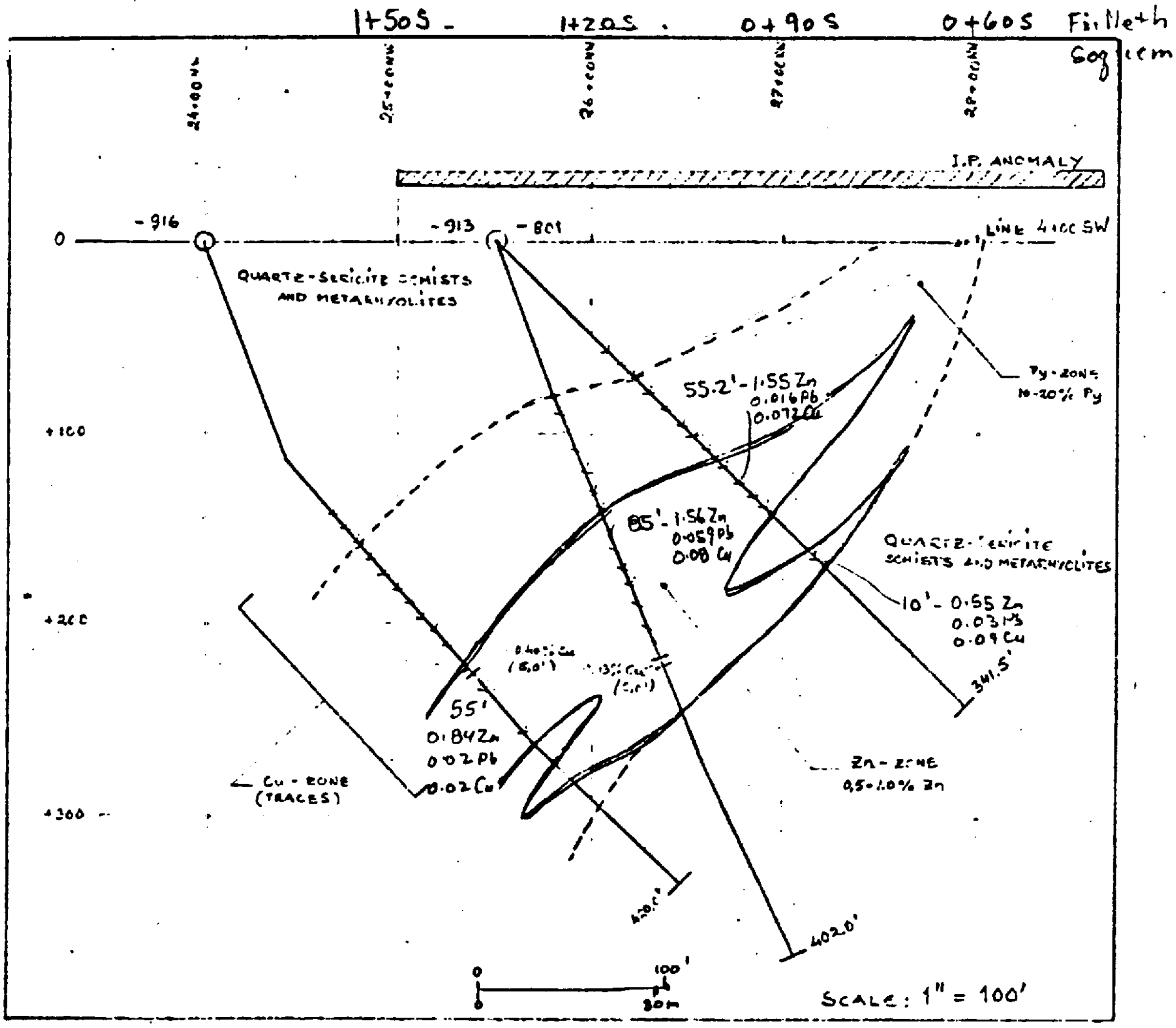


Figure 3.2 - Idealized cross section along L4+00SW
(0+15W FinNeth) over Lingwick Zn-Cu Zone

Samples were sent to Bondar-Clegg's laboratory in Ottawa where they were dried and sieved. The humus was sieved to minus 80 mesh (177 microns) while the soil samples were screened to minus 80 mesh (177 microns) and minus 250 mesh (63 microns). All samples were analyzed for Cu, Pb, Zn and Ag by atomic absorption spectometry after digestion with hot aqua regia. Hg was determined with a cold-vapor atomic absorption method after extraction with HNO_3, H_2SO_4, HCL and $KMnO_4$. Thirty six sites were sampled over the Lingwick grid and seven (L21+50E) over the Lac Coulombe grid. The results have been plotted on Figures 5.1.1 to 5.1.25 and on Figures 5.2.1 to 5.2.5 respectively.

5. RESULTS

5.1 Lingwick

The area of the Zn-Cu occurrence is well drained and moderately covered with mature mixed hardwoods. The soils are sandy podzolic. A typical sample profile would consist of the following: A horizon (L, F and H), 0-8cm, made up of forest litter and humus, sample taken from lower part; A_e horizon, 8-10cm grey sandy leached horizon; B horizon, 10-30cm, medium brown to reddish brown sandy soil, sample taken in upper portion (B_f); and "C" horizon, +30cm light to medium brown sandy, stoney till.

The sulphide zones shown in Figures 5.1.1 etc are surface projections from Soquem's diamond drill profiles. A sample of silicified tuff from the pit northeast of L0 contained 5 to 20 percent fine grained pyrite and 134ppm Cu, 102ppm Zn, 1.4ppm Ag, 58ppm Pb and 360ppb Hg.

The results from the humus samples (Figures 5.1.1 - 5.1.5) show a weak (20-38ppm) Cu anomaly more or less coincident with the main sulphide zone. However there is little correlation between the sulphide zone and the distribution of Zn, Pb, Ag and Hg in humus.

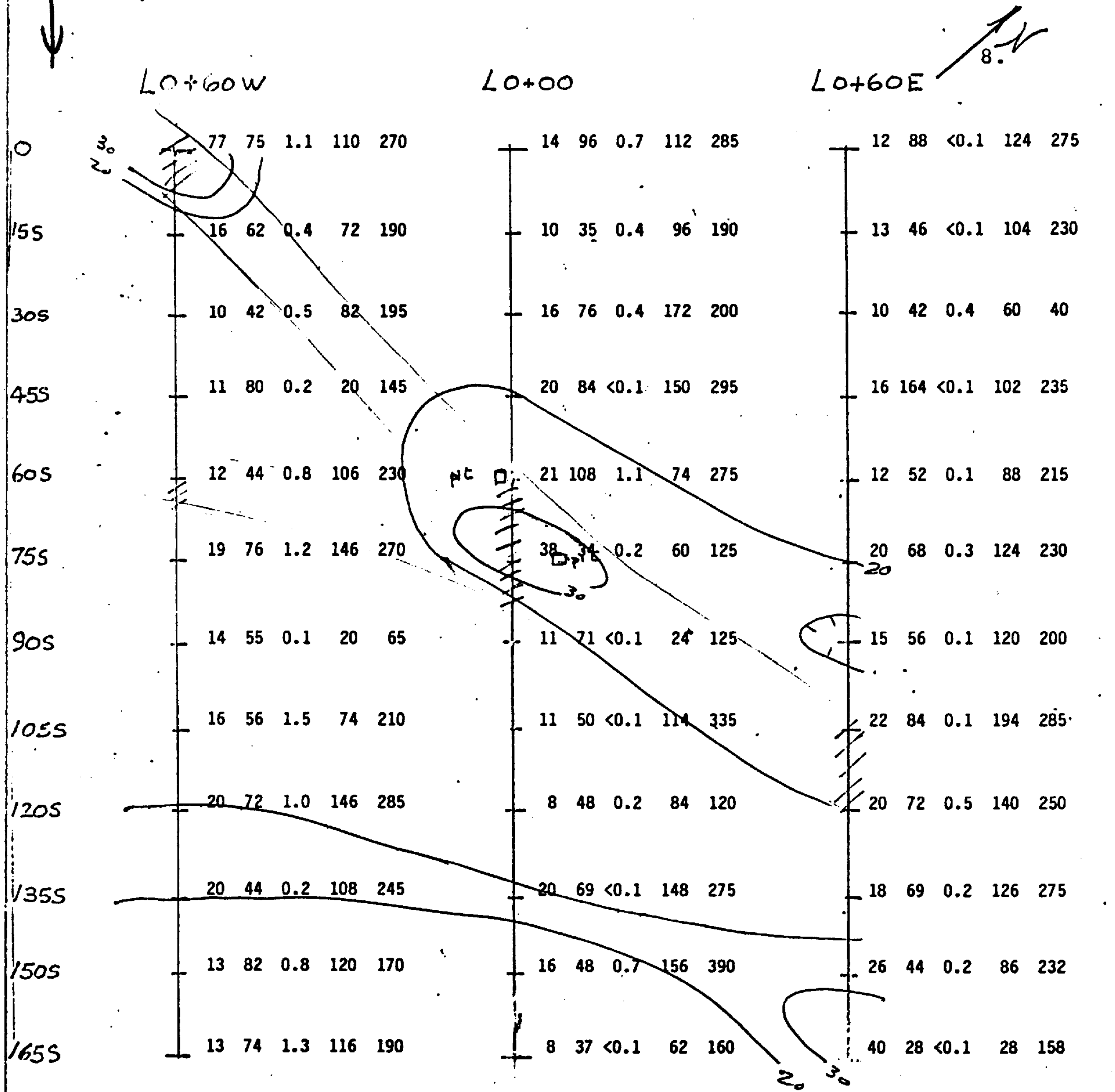
The -80 mesh fraction of "B" horizon soils (Figures 5.1.6-5.1.10) have coincident but relatively weak anomalies over the sulphide zones (eg 16-76ppm Cu, 106-144ppm Zn). These results are not too different from those obtained by Soquem in 1967 (Figure 3.1).

The distribution patterns for Cu, Pb, Zn, Ag and Hg in the -250 mesh fraction of the "B" horizon soils (Figures 5.1.11-5.1.15) are similar to those in the -80 mesh fraction of the "B" horizon soils. Again Cu-Zn are the best indicators of the sulphide zone.

The results from the till samples ("C" horizon) are shown in Figures 5.1.16 to 5.1.25. Anomalous values for all the metals are slightly higher in the -250 mesh fraction than in the -80 mesh fraction. The main sulphide zone on L0 and L0+60E is well defined by Cu-Pb-Zn-Hg in both fractions. However the anomaly contrast is better with the -250 mesh fraction. Also there appears to be a slight displacement of the anomaly down ice on L0.

5.2 Lac Coulombe

The results from all fractions are shown in



LINGWICK GEOCHEMICAL PILOT STUDY

"A" HUMUS HORIZON (-80 mesh)

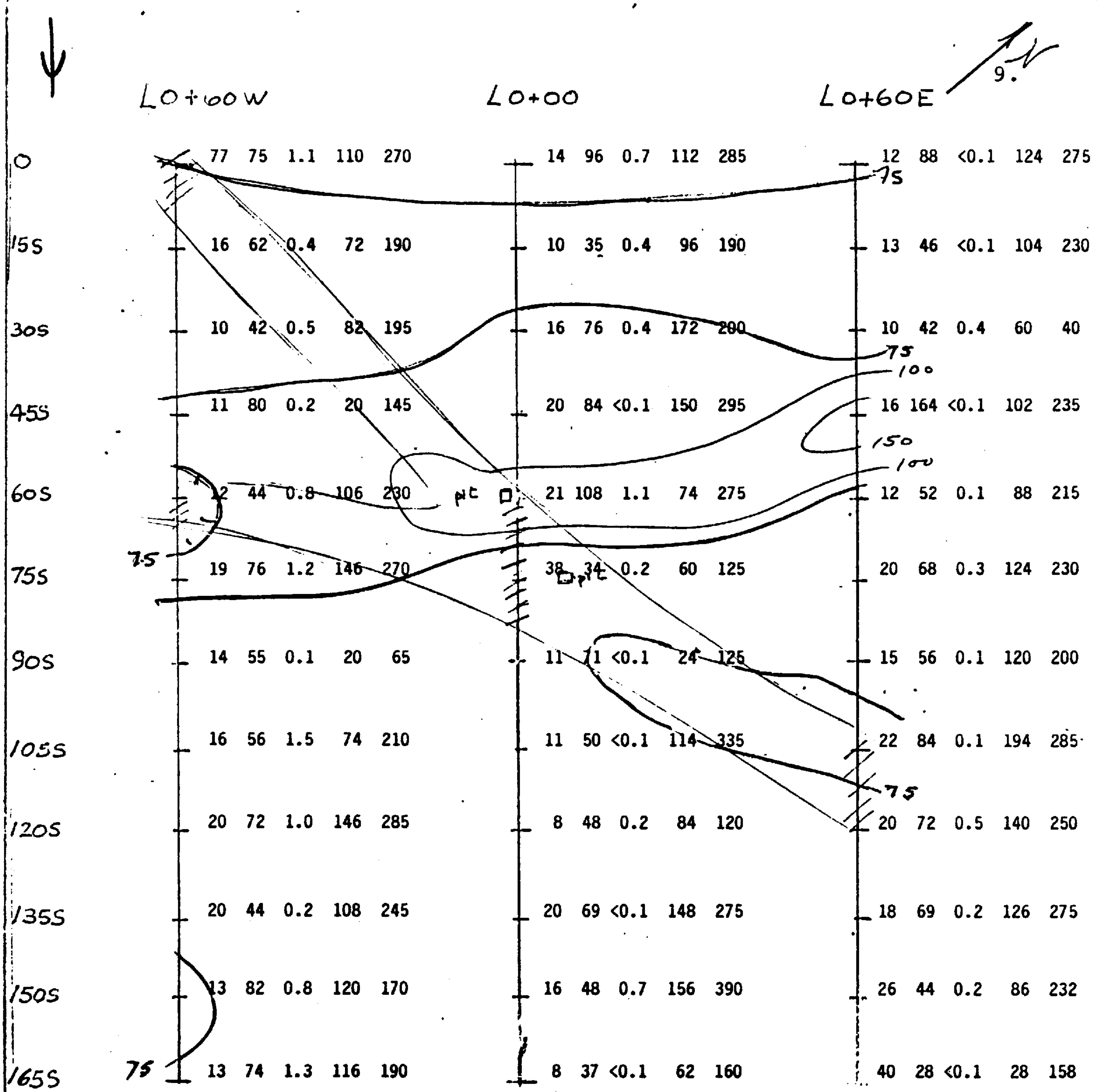
Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

Lingwick sulphide zone

FIGURE 5.1.1

Copper contoured

0 40 m.
Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"A" HUMUS HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

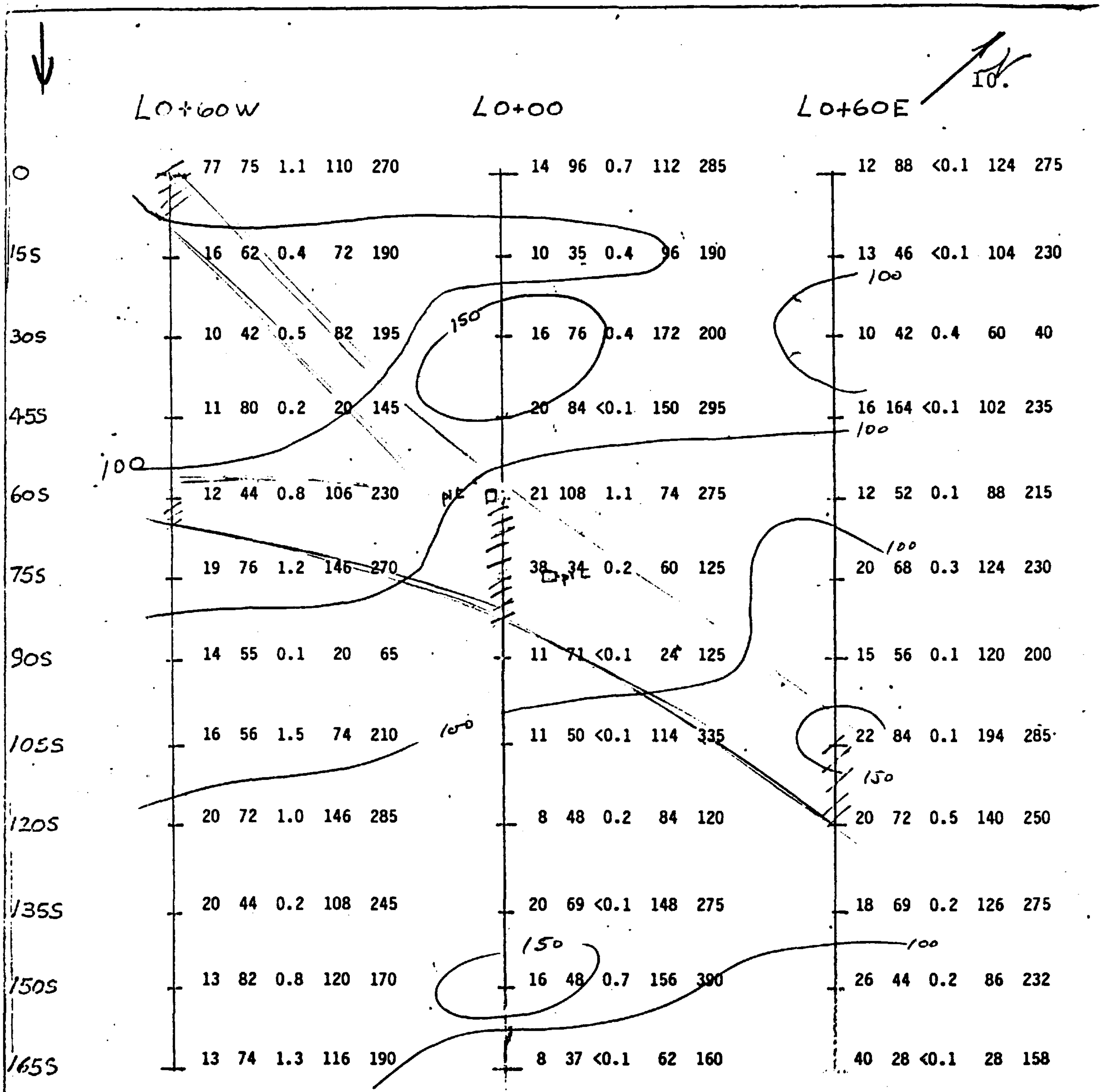
Lingwick sulphide zone

FIGURE 5.1.2

Zinc contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"A" HUMUS HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

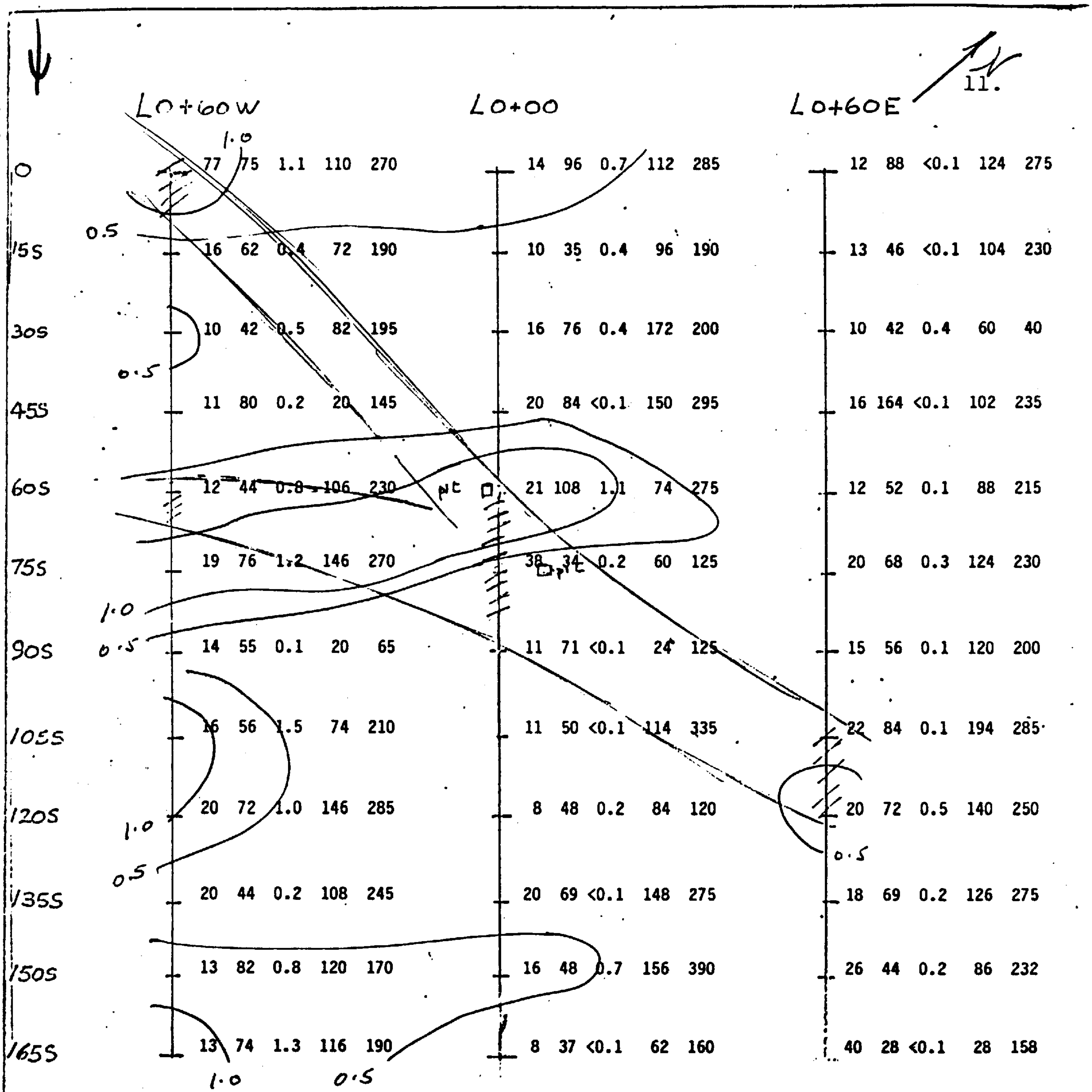
Lingwick sulphide zone

FIGURE 5.1.3

Lead contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"A" HUMUS HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

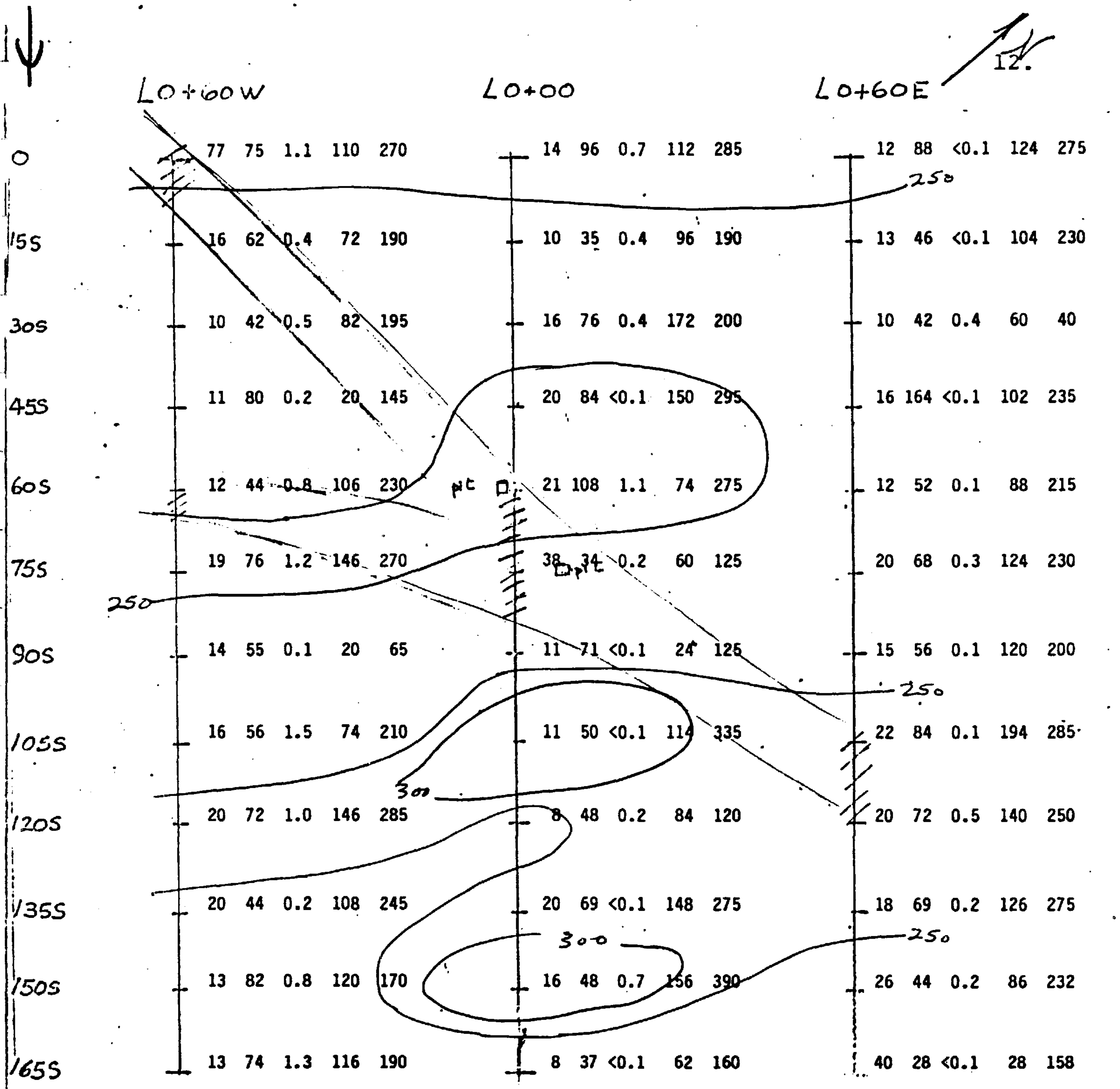
Lingwick sulphide zone

FIGURE 5.1.4

Silver contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"A" HUMUS HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

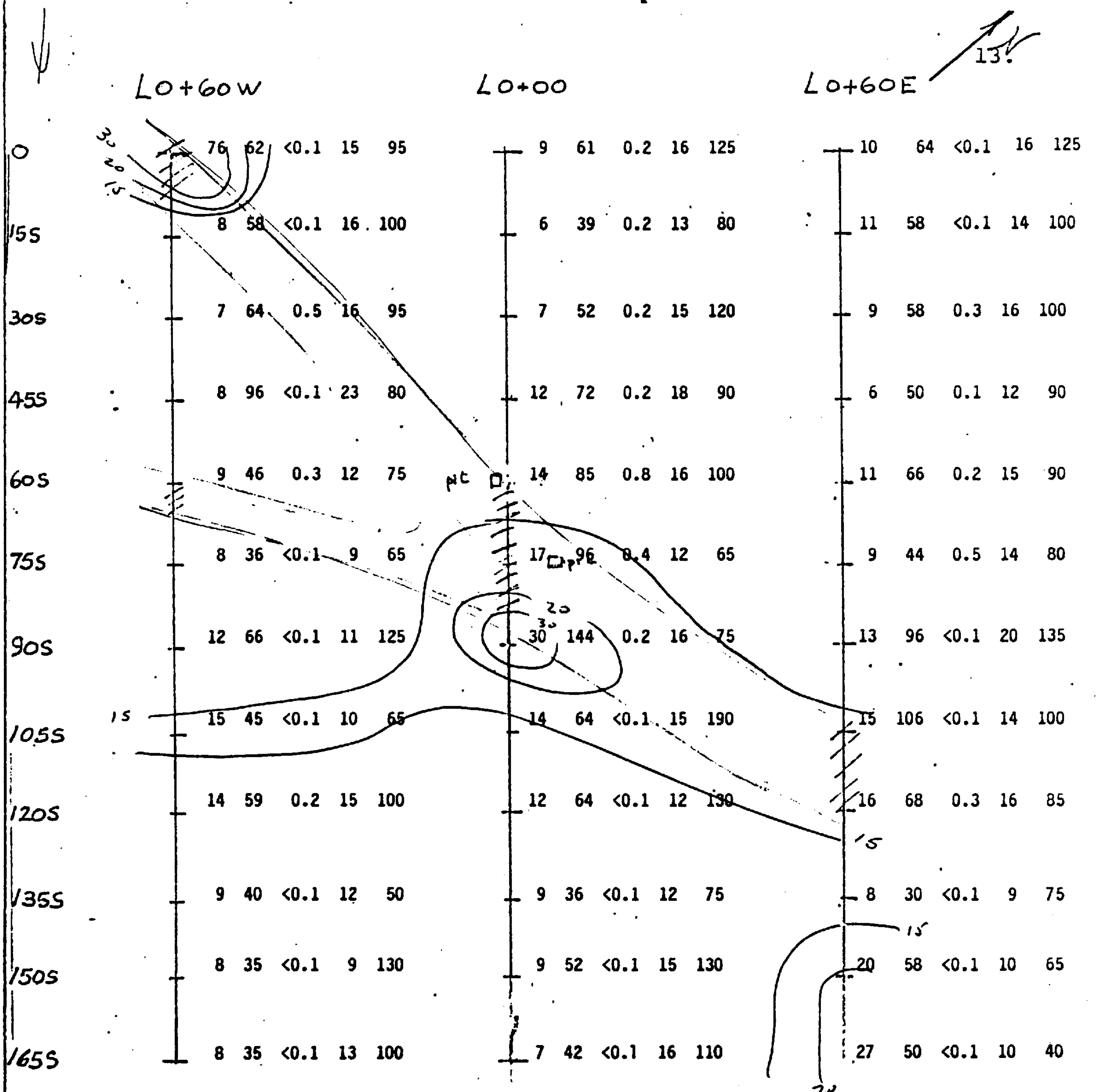
Lingwick sulphide zone

FIGURE 5.1.5

Mercury contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

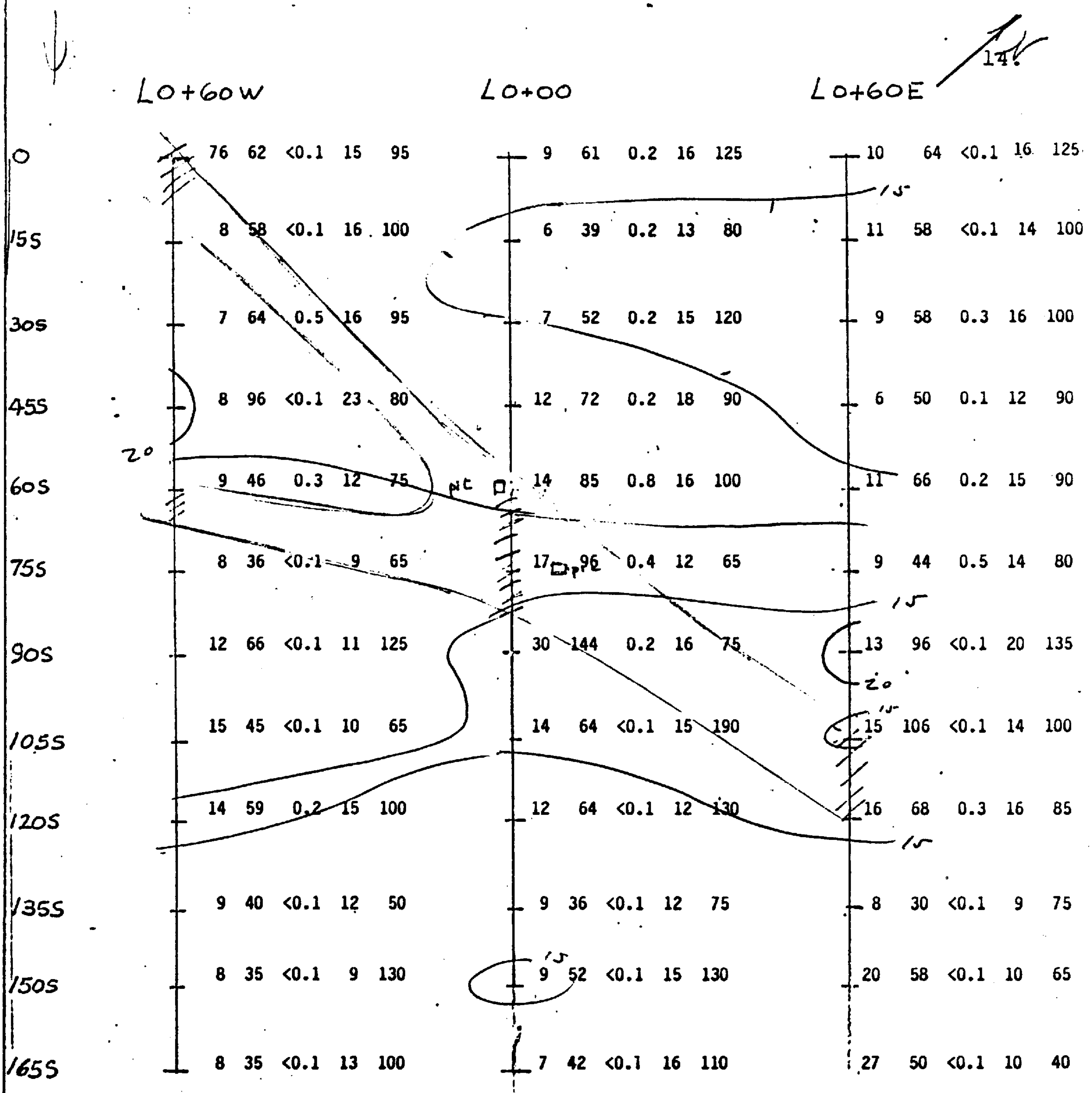
Lingwick sulphide zone

FIGURE 5.1.6

Copper contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

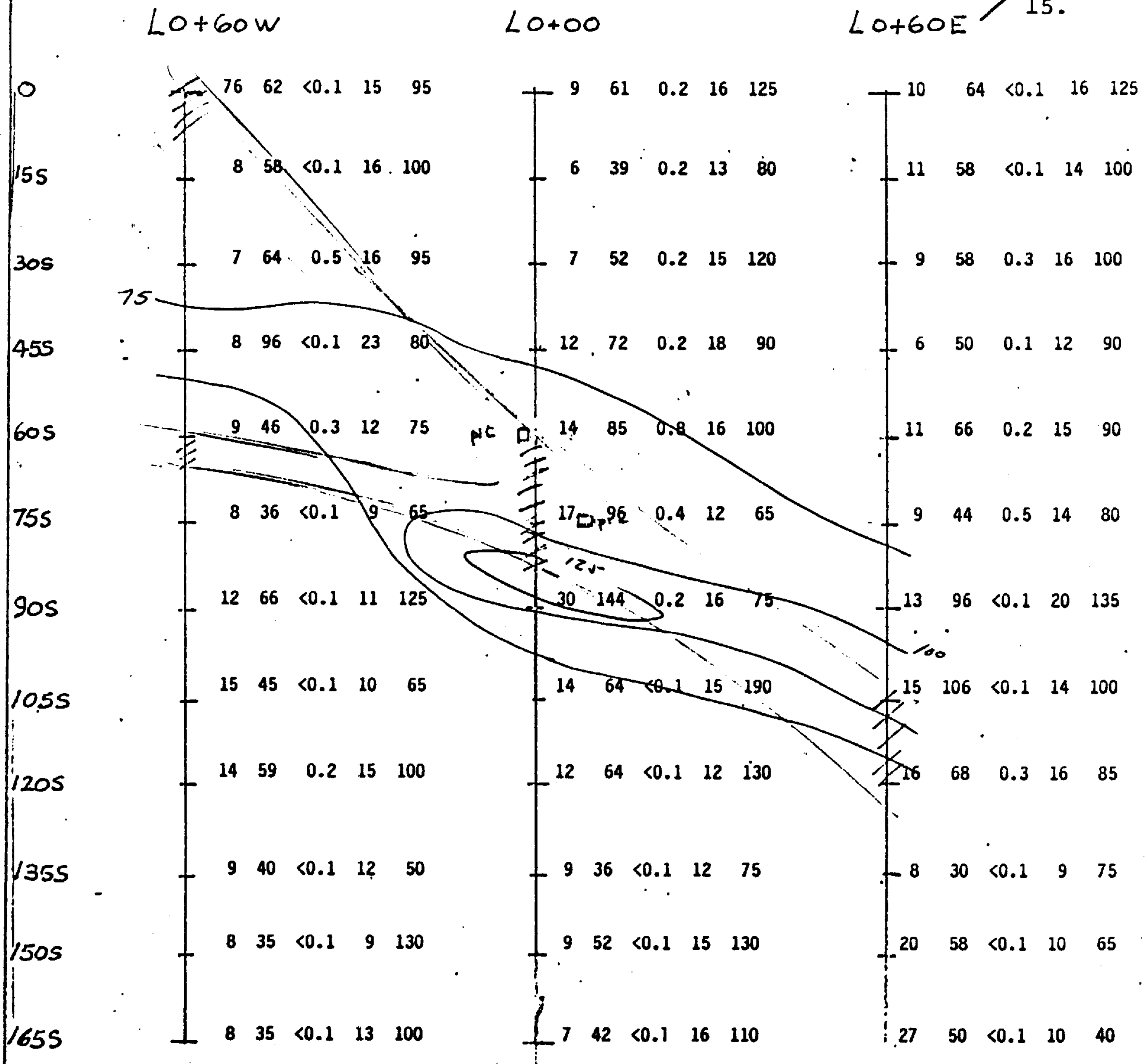
Lingwick sulphide zone

FIGURE 5.1.7

Lead contoured

0 40 m

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

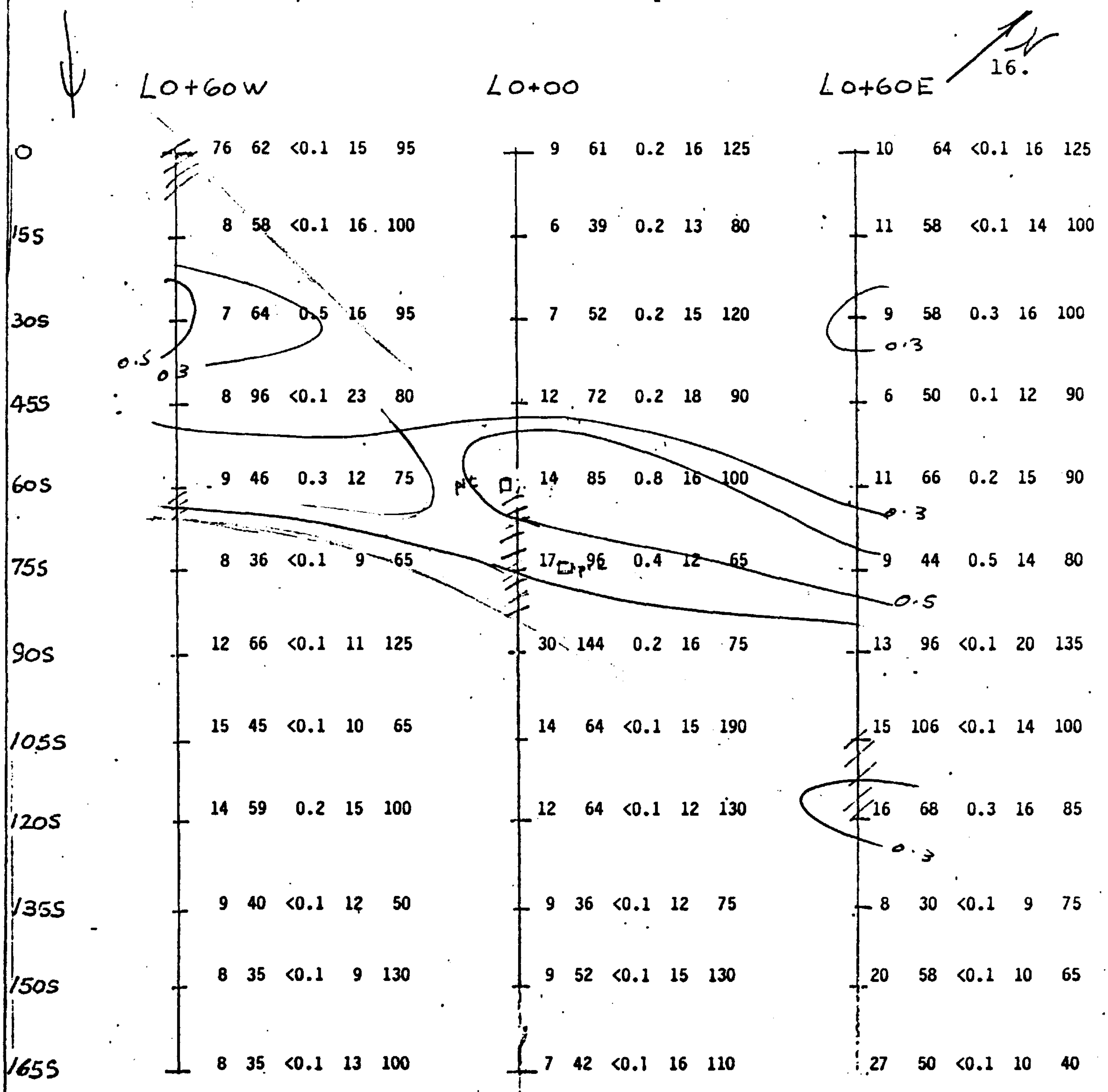
Lingwick sulphide zone

FIGURE 5.1.8

Zinc contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

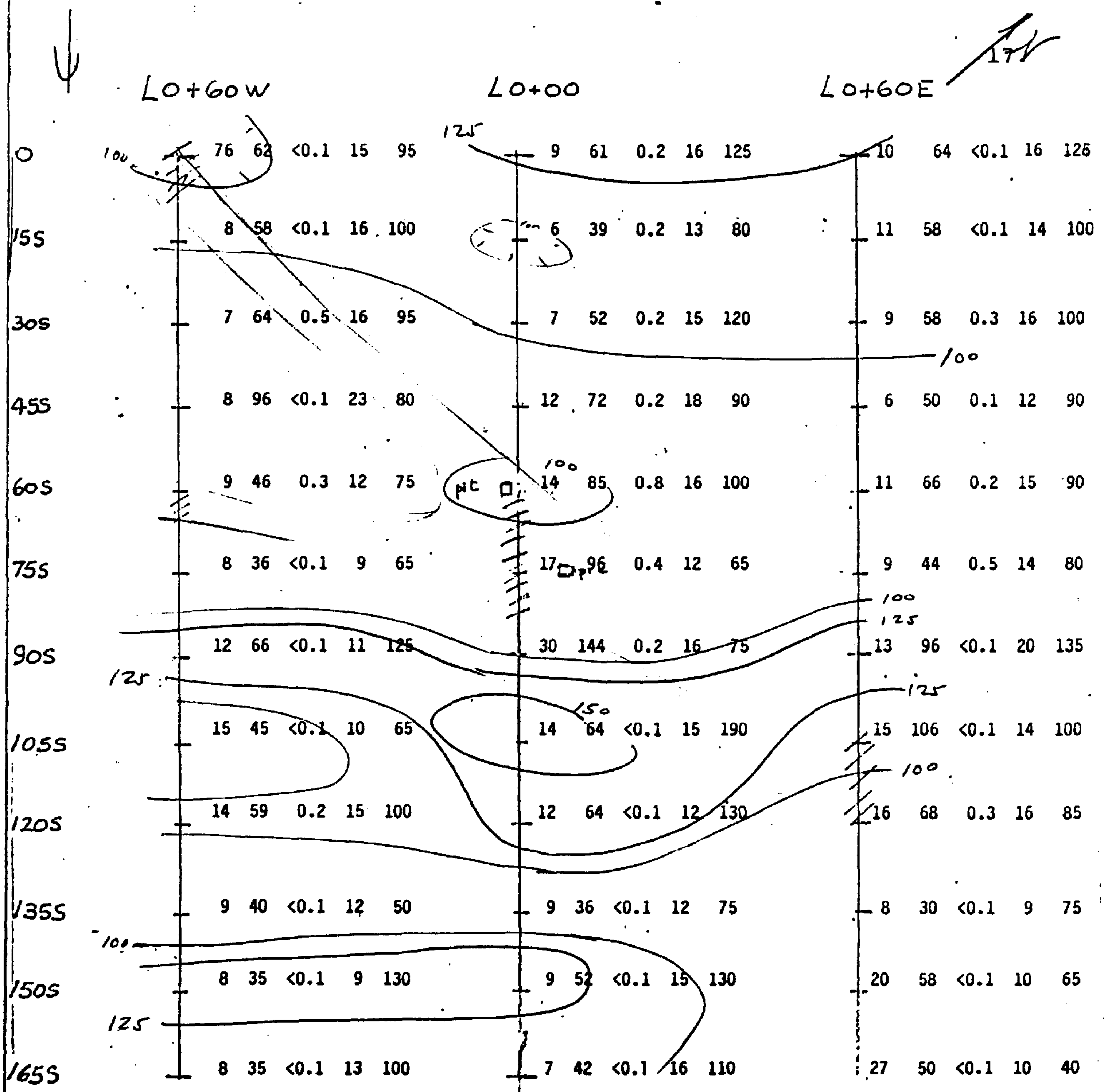
Lingwick sulphide zone

FIGURE 5.1.9

Silver contoured

0 — 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

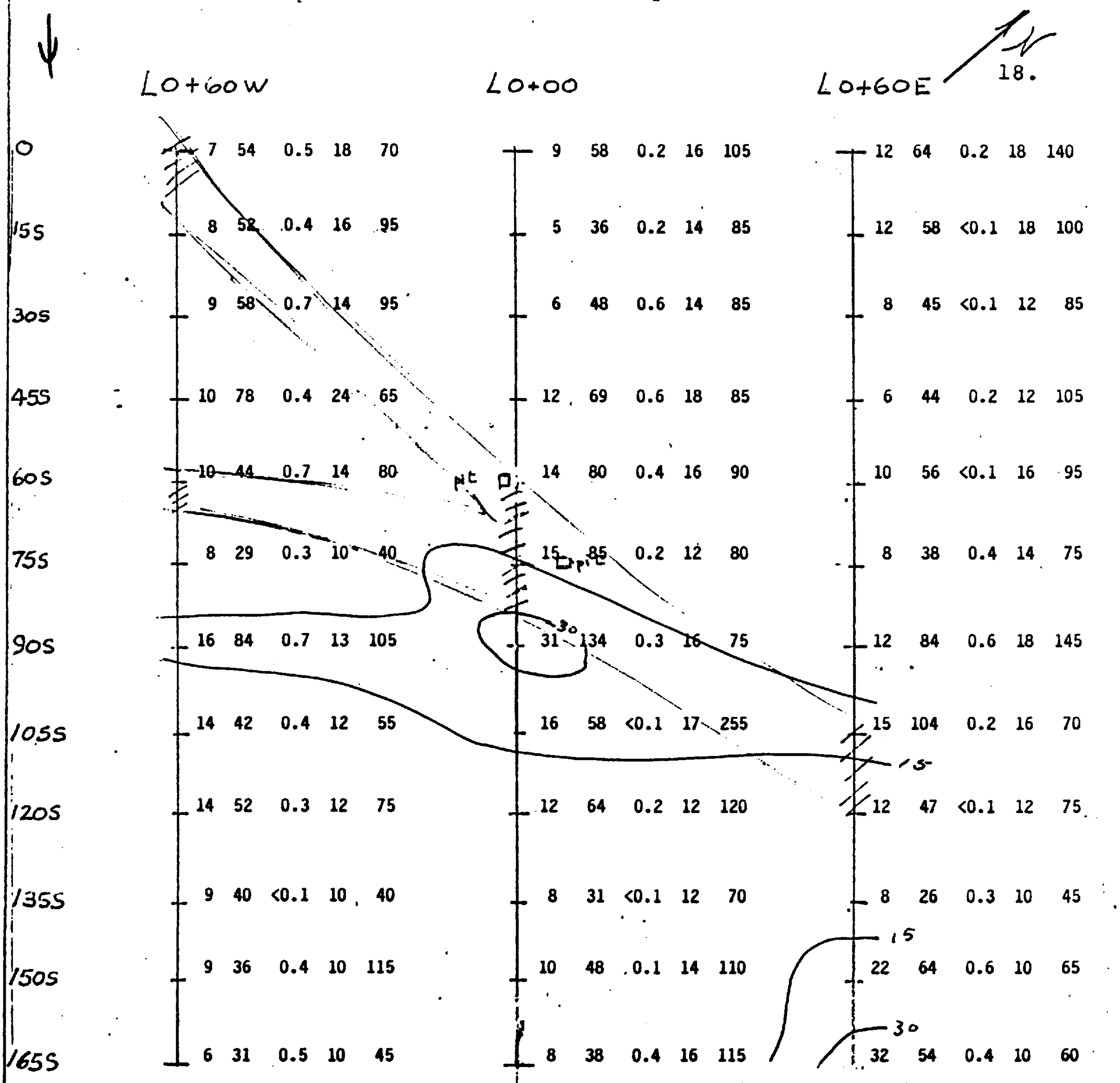
Lingwick sulphide zone

FIGURE 5.1.10

Mercury contoured

0 40 m

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

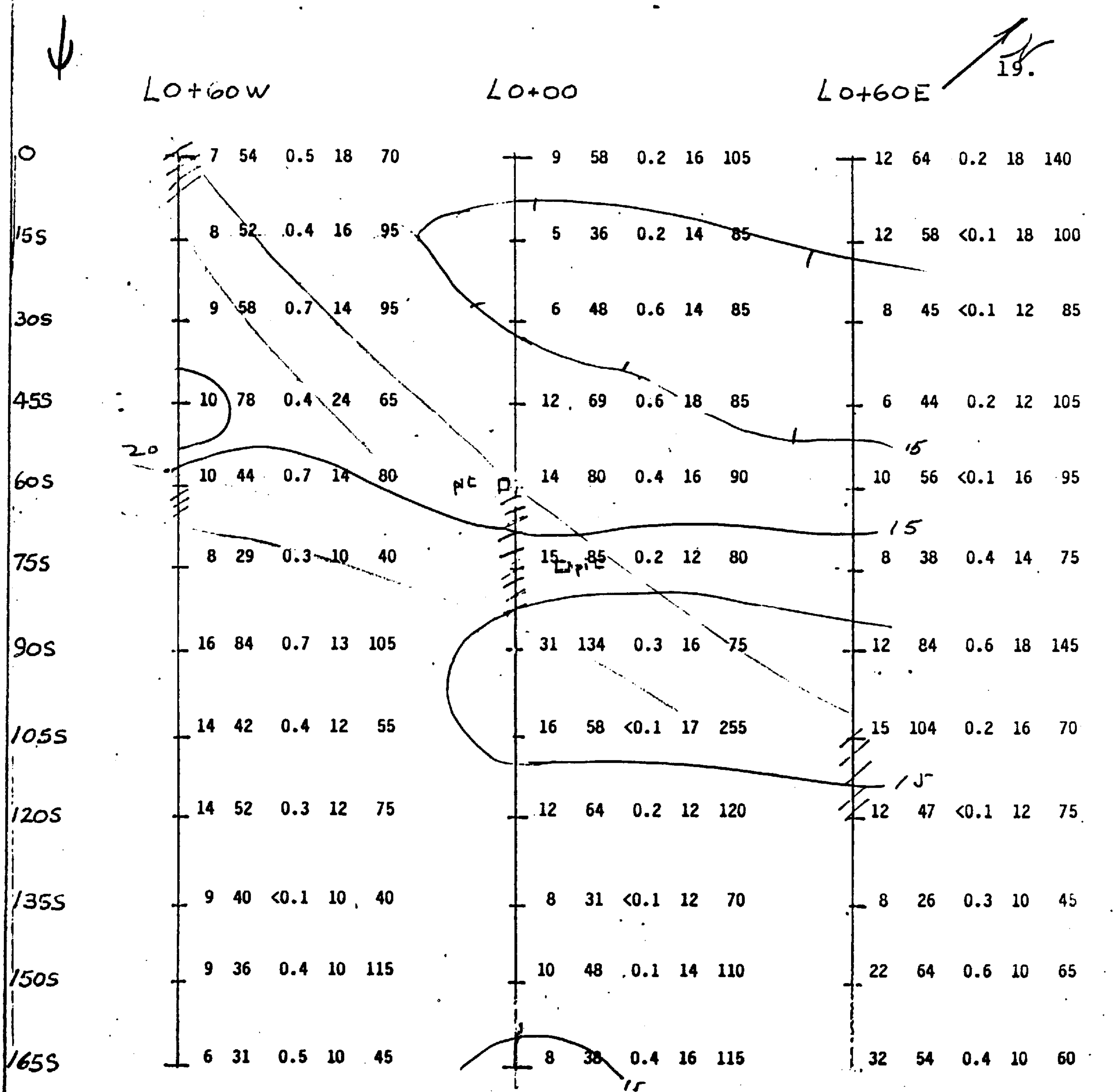
Lingwick sulphide zone

FIGURE 5.1.11

Copper contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

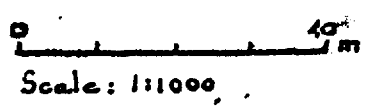
"B" HORIZON (-250 mesh)

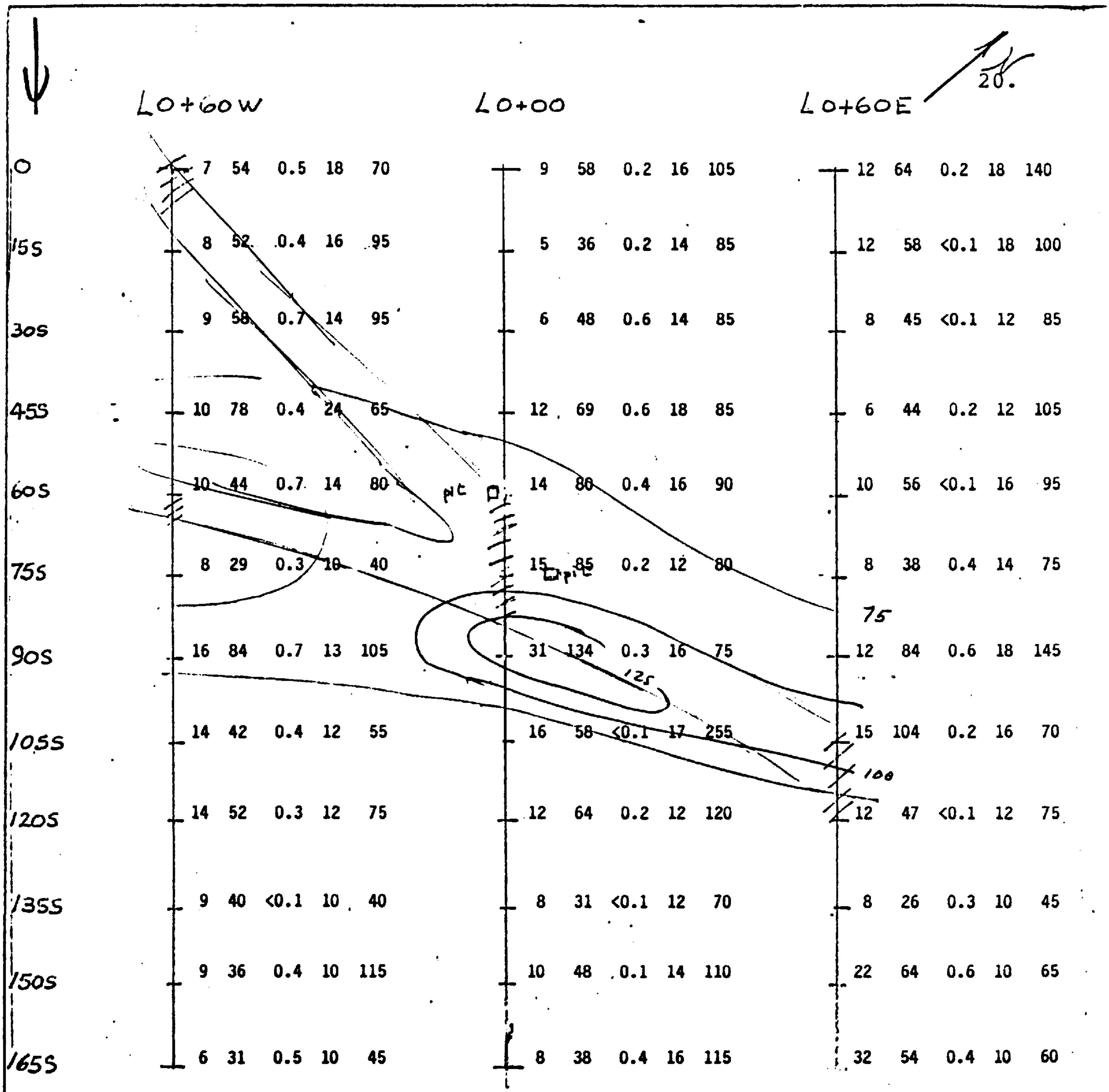
Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

Lingwick sulphide zone

FIGURE 5.1.12

Lead contoured





LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

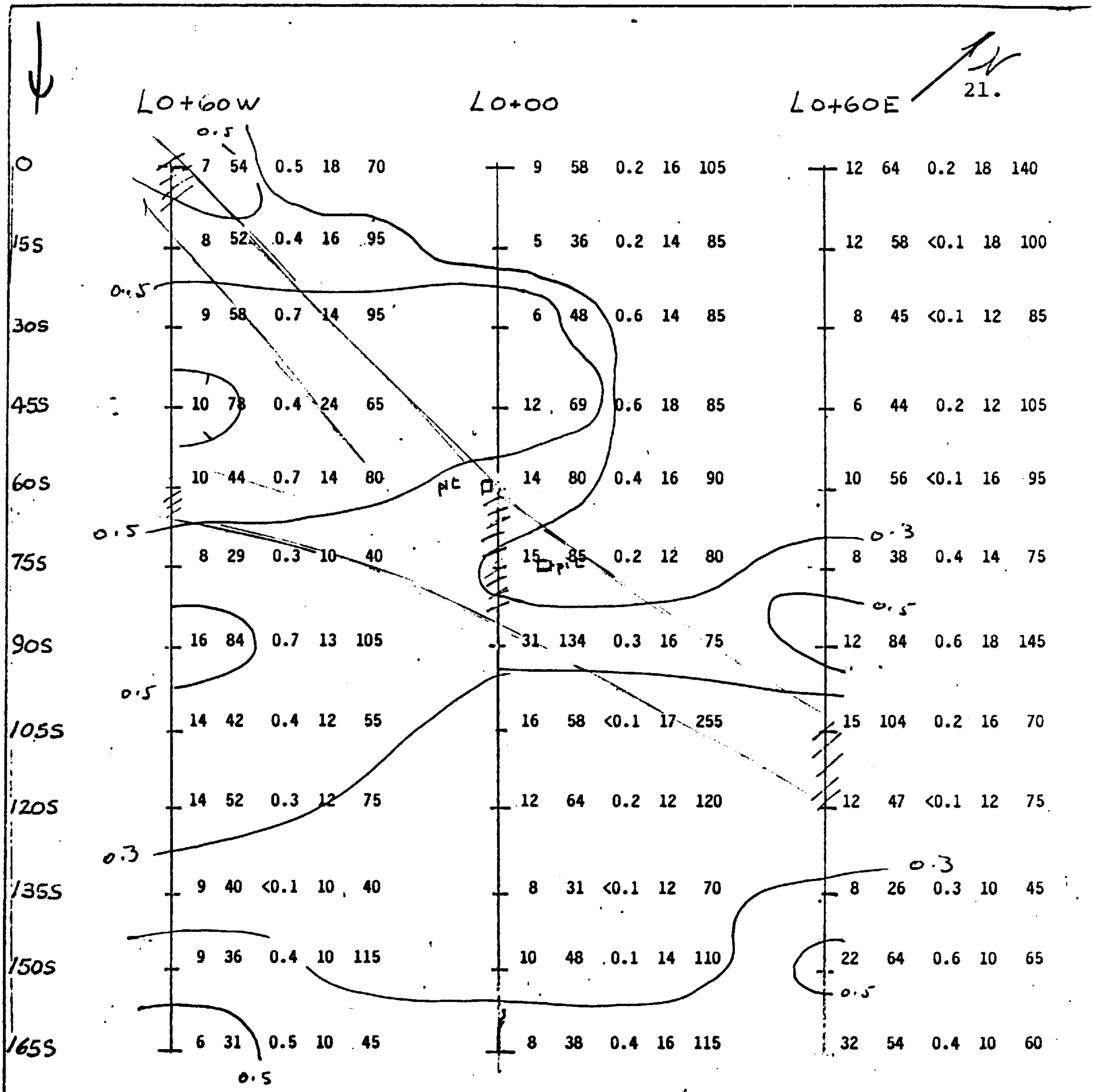
Lingwick sulphide zone

FIGURE 5.1.13

Zinc contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

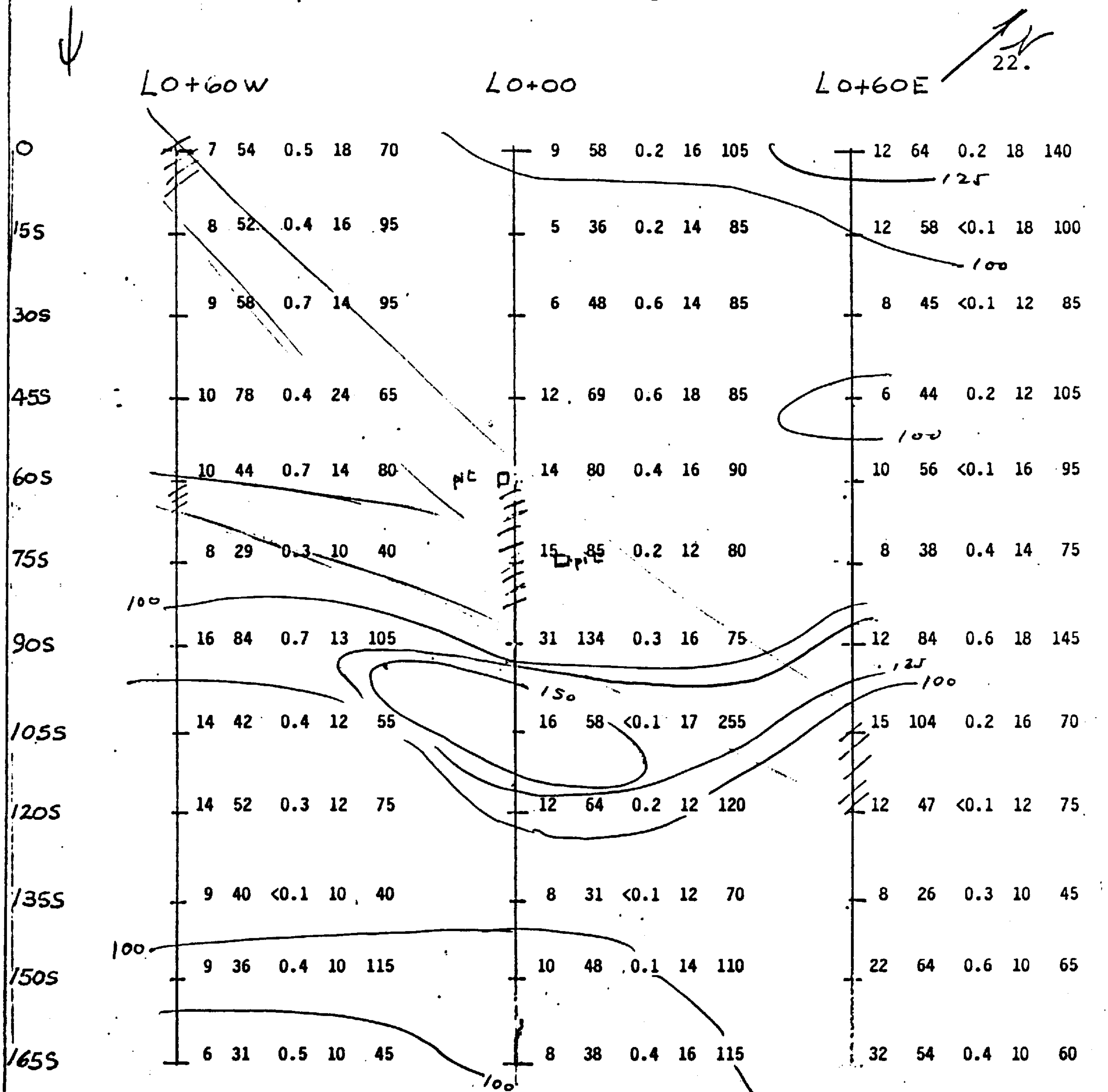
"B" HORIZON (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

Lingwick sulphide zone

FIGURE 5.1.14

Silver contoured



LINGWICK GEOCHEMICAL PILOT STUDY

"B" HORIZON (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

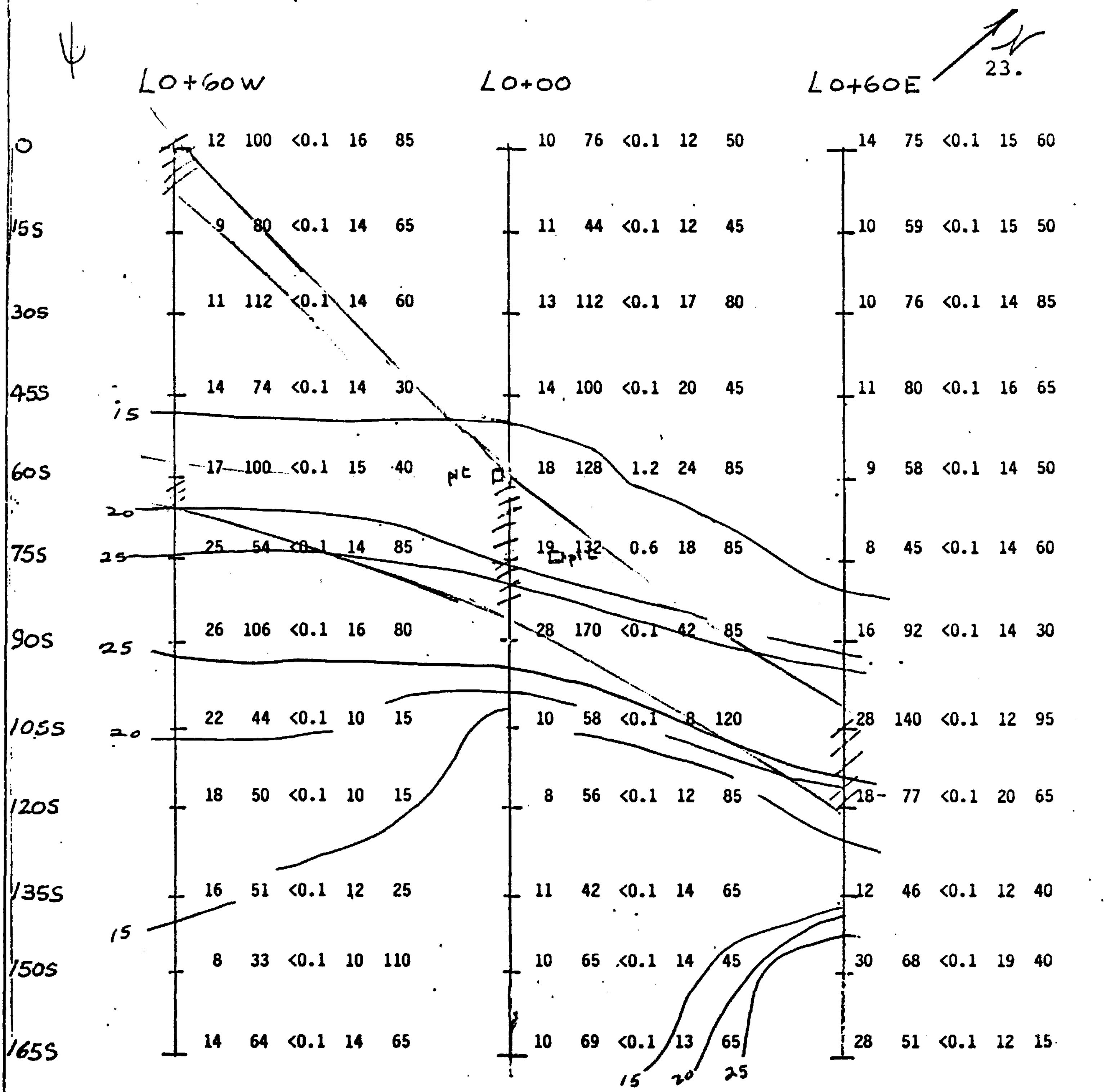
Lingwick sulphide zone

FIGURE 5.1.15

Mercury contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

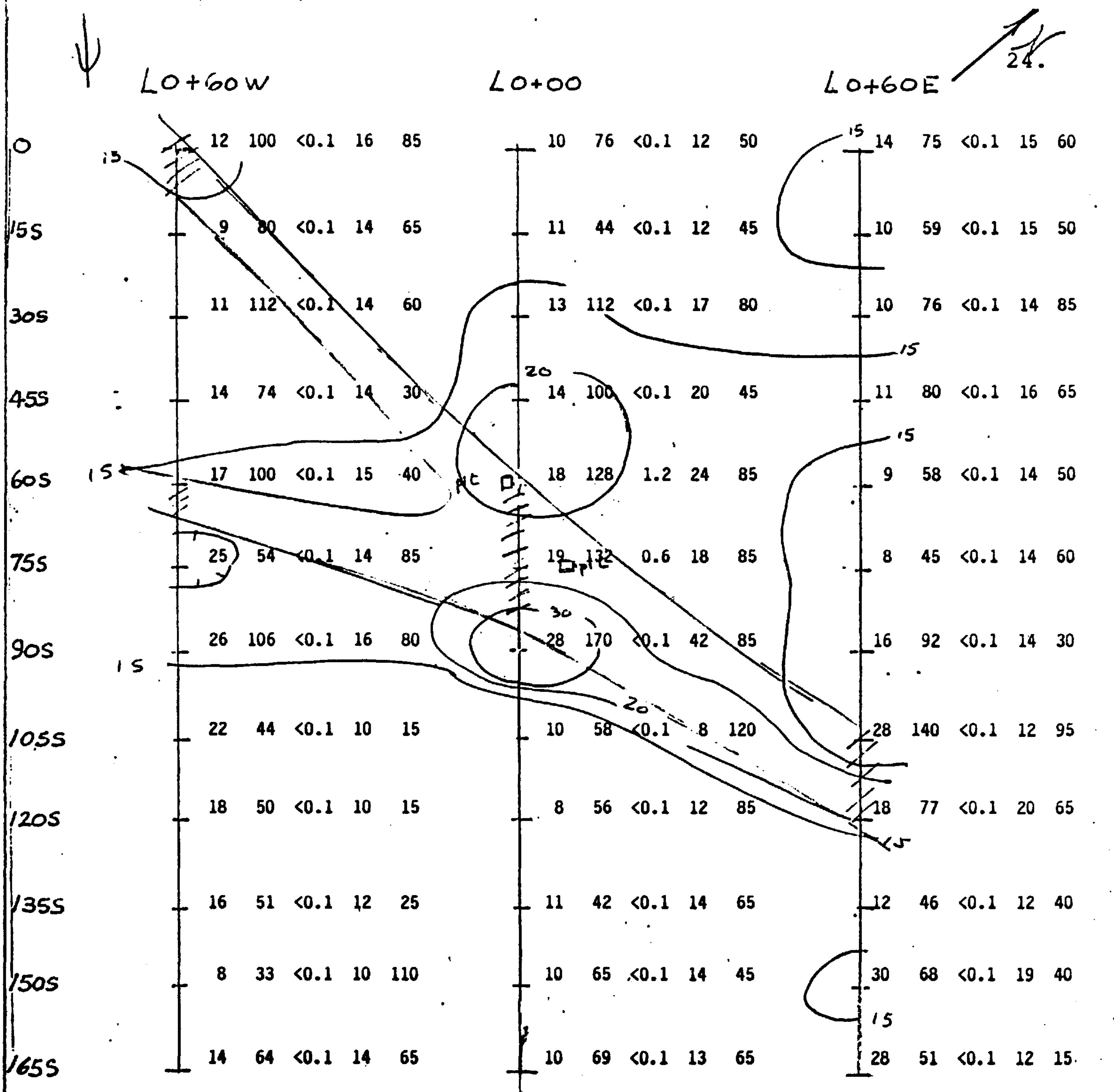
Lingwick sulphide zone

FIGURE 5.1.16

Copper contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-80 mesh)

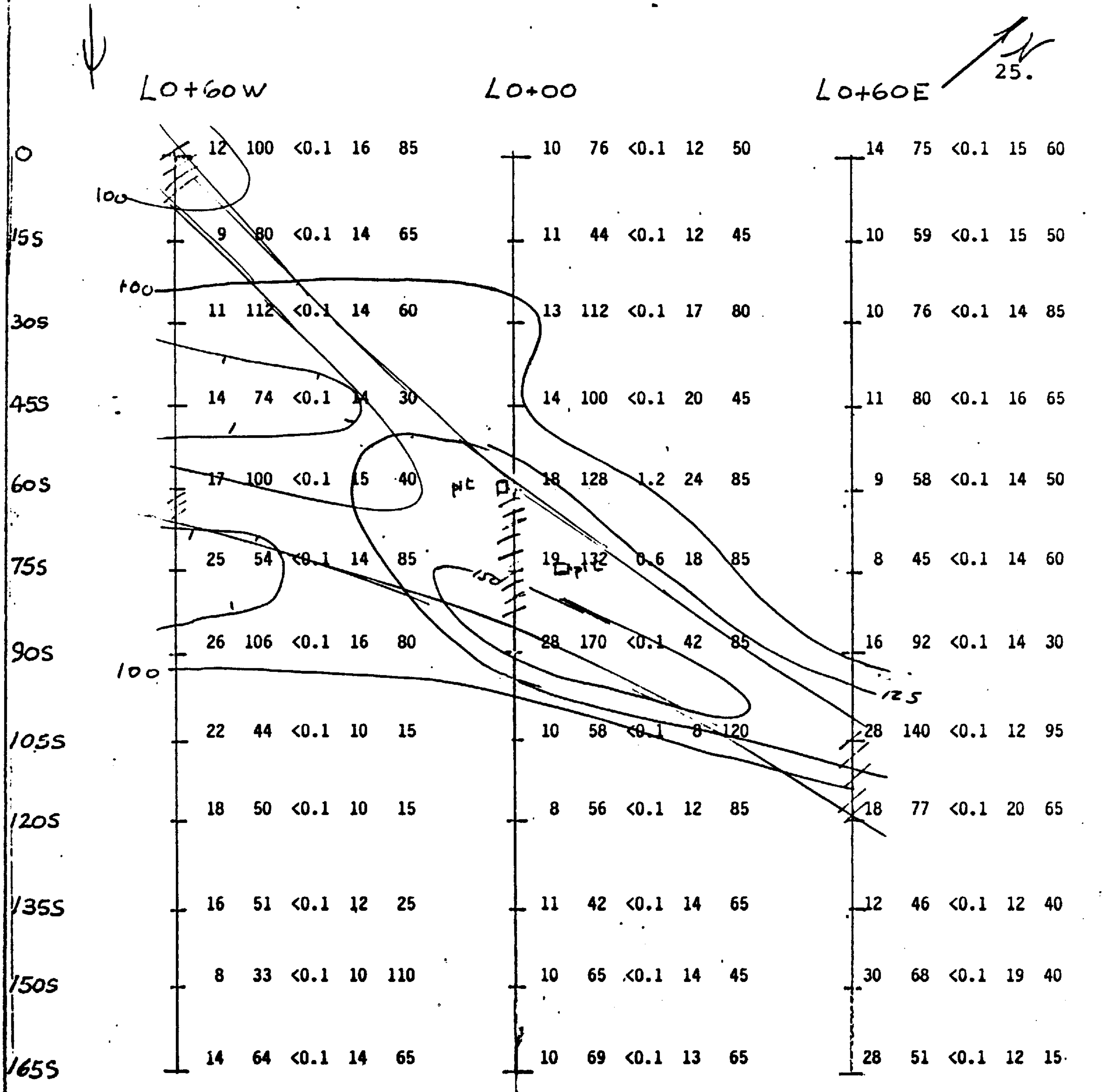
Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

Lingwick sulphide zone

FIGURE 5.1.17

Lead contoured

0 40 m.
Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

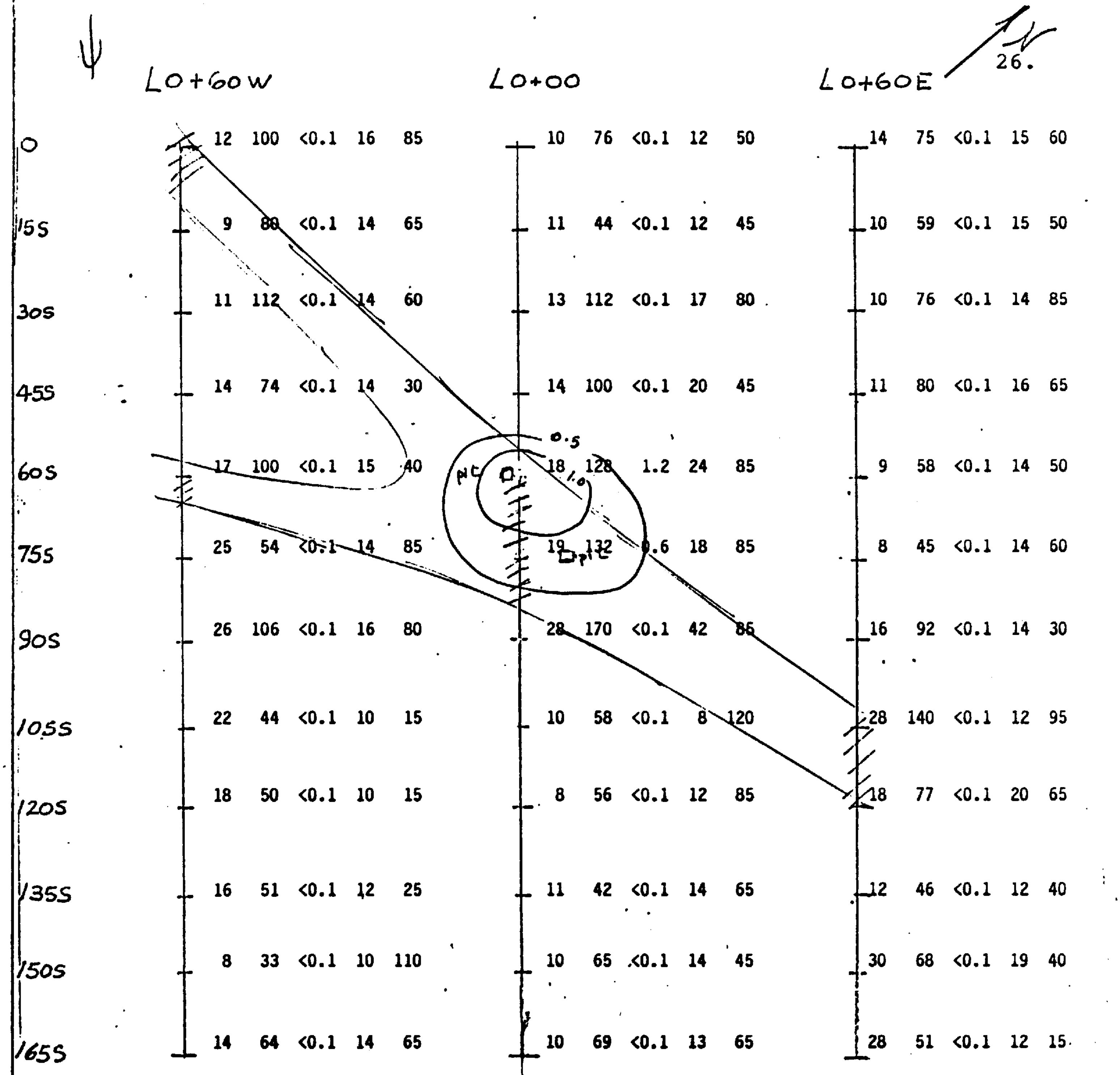
Lingwick sulphide zone

FIGURE 5.1.18

Zinc Contoured

0 40 m.

Scale: 1:1000



Station	L0+60W Cu	Zn	Ag	Pb	Hg	L0+00 Cu	Zn	Ag	Pb	Hg	L0+60E Cu	Zn	Ag	Pb	Hg
0	12	100	<0.1	16	85	10	76	<0.1	12	50	14	75	<0.1	15	60
15S	9	80	<0.1	14	65	11	44	<0.1	12	45	10	59	<0.1	15	50
30S	11	112	<0.1	14	60	13	112	<0.1	17	80	10	76	<0.1	14	85
45S	14	74	<0.1	14	30	14	100	<0.1	20	45	11	80	<0.1	16	65
60S	17	100	<0.1	15	40	18	128	1.2	24	85	9	58	<0.1	14	50
75S	25	54	<0.1	14	85	19	132	0.6	18	85	8	45	<0.1	14	60
90S	26	106	<0.1	16	80	28	170	<0.1	42	85	16	92	<0.1	14	30
105S	22	44	<0.1	10	15	10	58	<0.1	8	120	28	140	<0.1	12	95
120S	18	50	<0.1	10	15	8	56	<0.1	12	85	18	77	<0.1	20	65
135S	16	51	<0.1	12	25	11	42	<0.1	14	65	12	46	<0.1	12	40
150S	8	33	<0.1	10	110	10	65	<0.1	14	45	30	68	<0.1	19	40
165S	14	64	<0.1	14	65	10	69	<0.1	13	65	28	51	<0.1	12	15

LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

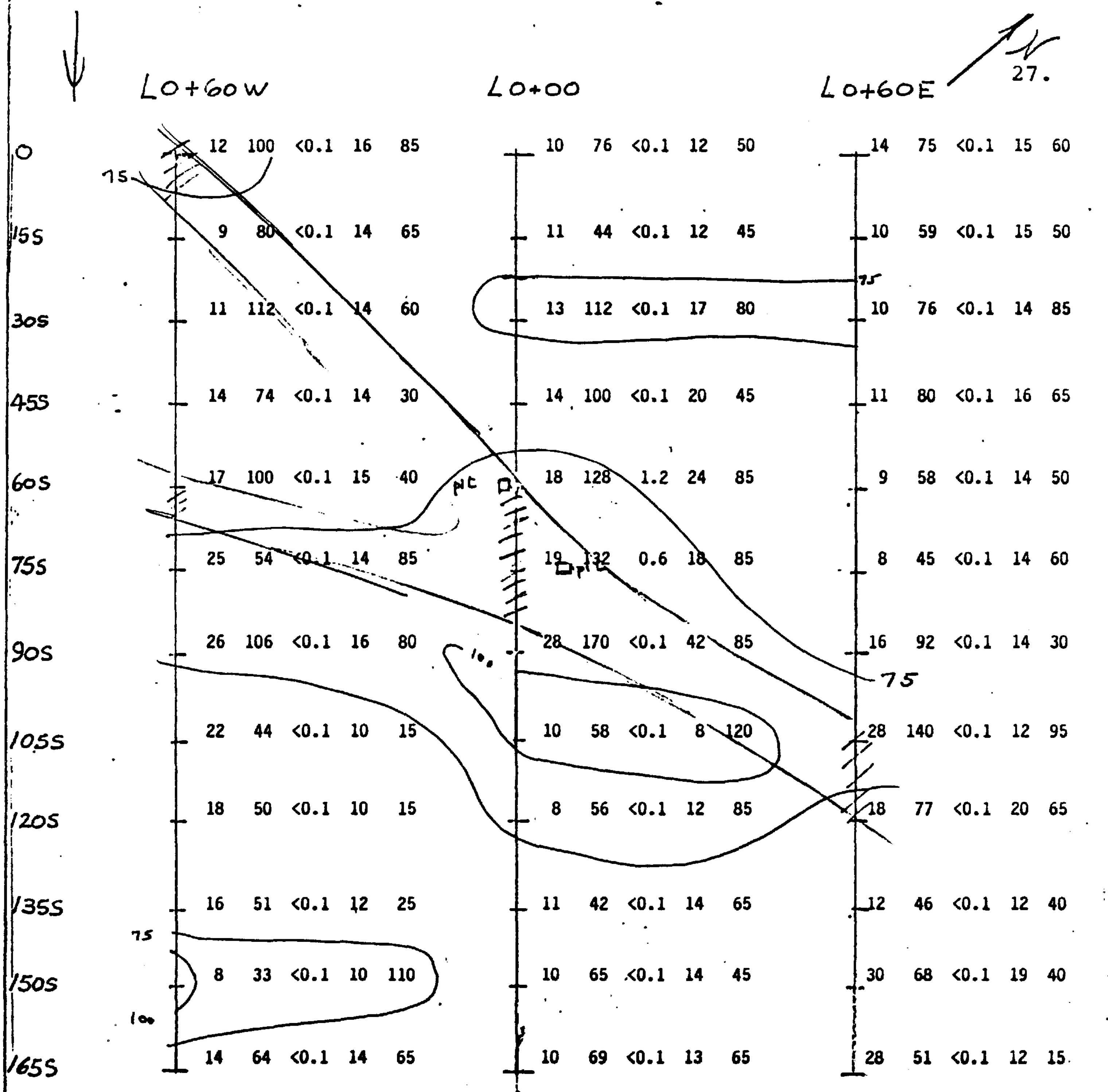
Lingwick sulphide zone

FIGURE 5.1.19

Silver contoured

0 — 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-80 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

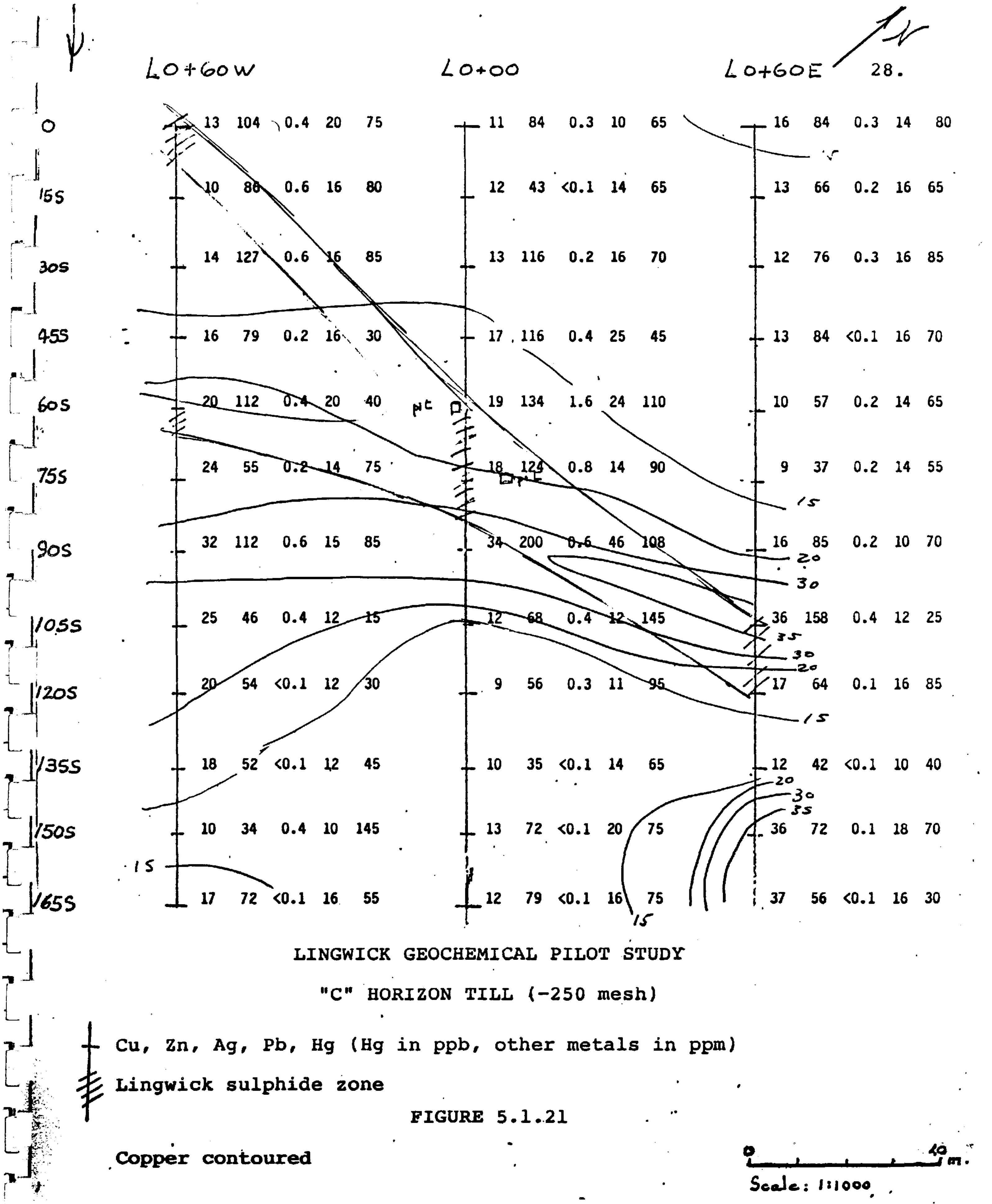
Lingwick sulphide zone

FIGURE 5.1.20

Mercury contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

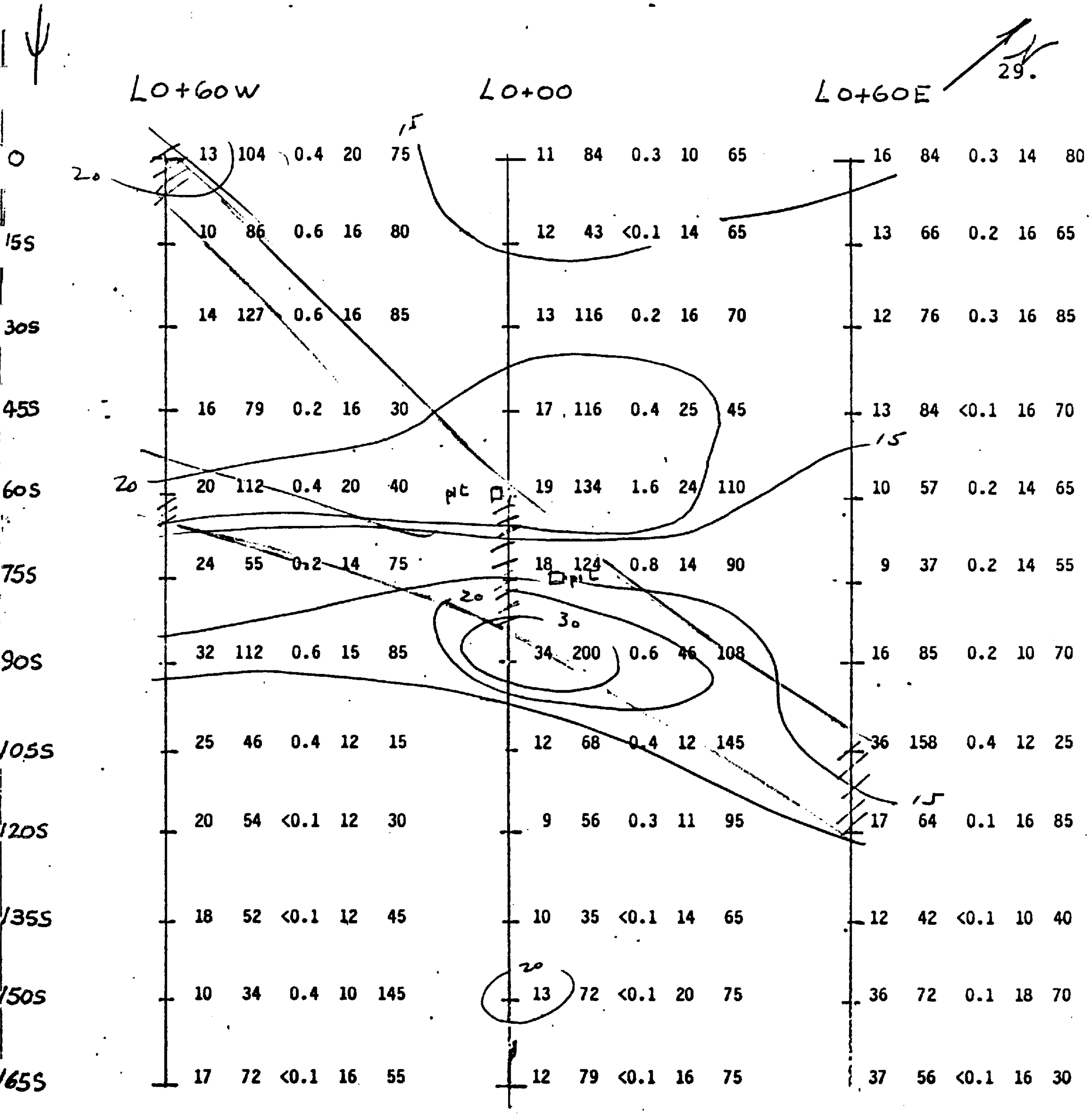
"C" HORIZON TILL (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

Lingwick sulphide zone

FIGURE 5.1.21

Copper contoured



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

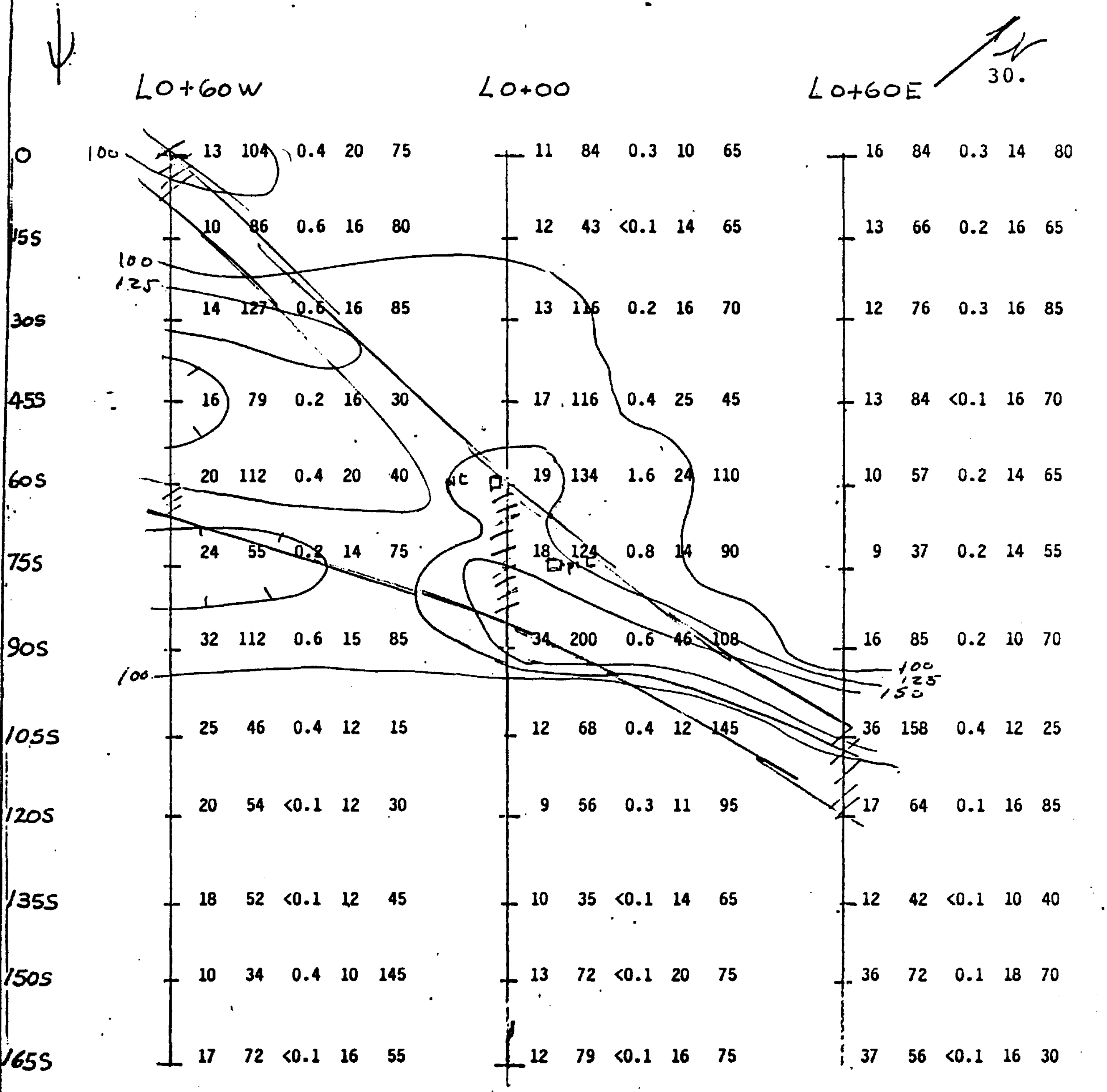
Lingwick sulphide zone

FIGURE 5.1.22

Lead contoured

0 — 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

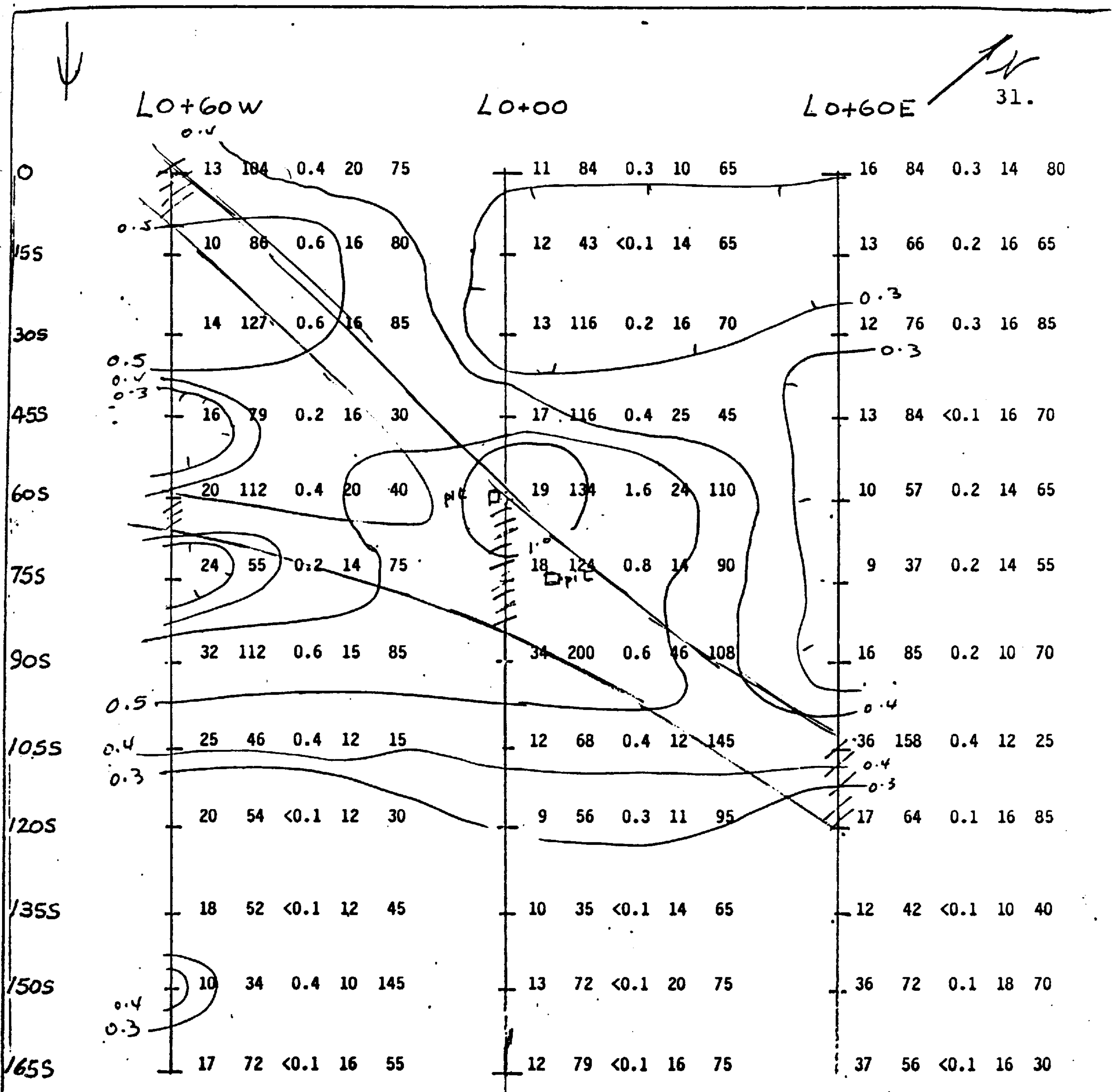
Lingwick sulphide zone

FIGURE 5.1.23

Zinc Contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

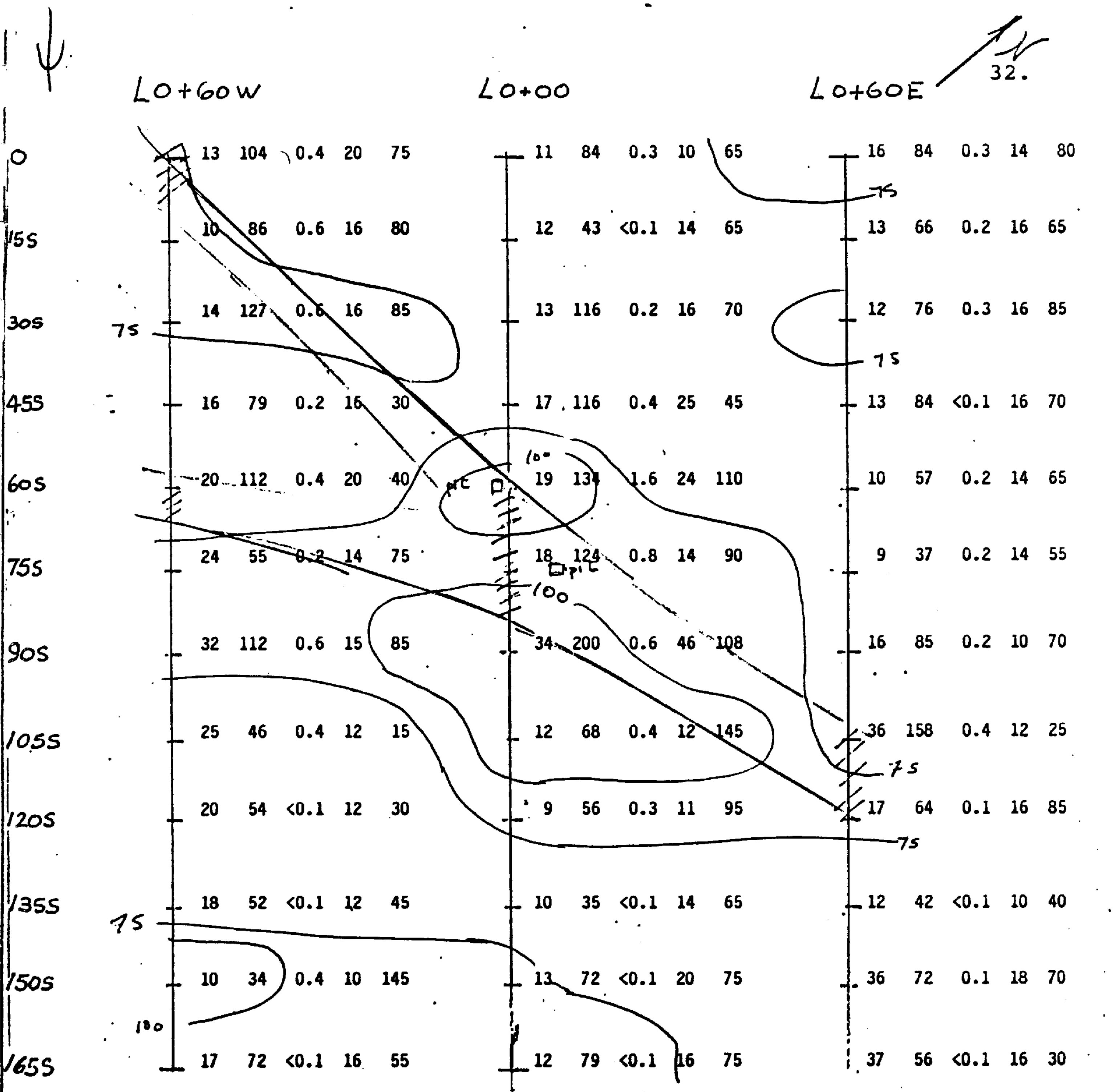
Lingwick sulphide zone

FIGURE 5.1.24

Silver contoured

0 40 m.

Scale: 1:1000



LINGWICK GEOCHEMICAL PILOT STUDY

"C" HORIZON TILL (-250 mesh)

Cu, Zn, Ag, Pb, Hg (Hg in ppb, other metals in ppm)

Lingwick sulphide zone

FIGURE 5.1.25

Mercury contoured

profile on Figures 5.2.1 to 5.2.5.

The section sampled is somewhat imperfectly drained with low ground (semi-bog) occurring along the south and north sectors of the line. The soils are sandy and covered with 5-15cm humus. At the better drained points on the line podzols are found and gleisols occupy the swampy portions of the line.

The sulphide zones are marked by high values for Cu (76ppm), Ag (1.7 and 3.6ppm) and Hg (389ppb) in the humus layer. The B horizon soils show high Hg over the more northerly sulphide lens and increases in Cu (87-200ppm and 84-240ppm in -80m and -250m fractions respectively) over and 25m down ice from the south sulphide zone. Zn increases to 71 and 74ppm here also. The till samples are anomalous at the same points but the anomaly contrast is greater than in the "B" soils. Cu values at 2+50S and 2+75S are 98 and 600ppm respectively in the -80 mesh fraction of the till and 275ppm Zn at 2+75S.

These results compare favorably with those obtained last year by G. Lutes on adjoining lines to the east (Anomaly -A).

The Cu and Zn values in the -250 mesh fraction of the till increase to 690 and 320ppm respectively at 2+75S.

6. CONCLUSIONS AND RECOMMENDATIONS

Both tests show that best anomaly definition and anomaly contrast is obtained from Cu and Zn in the -250 (63 micron) mesh fraction of the till. The results confirm that near surface sampling of the till is effective in defining base metal targets

LAC COULOMBE

GEOCHEMICAL PILOT STUDY

L21+50E

"A" HUMUS HORIZON(-80mesh)

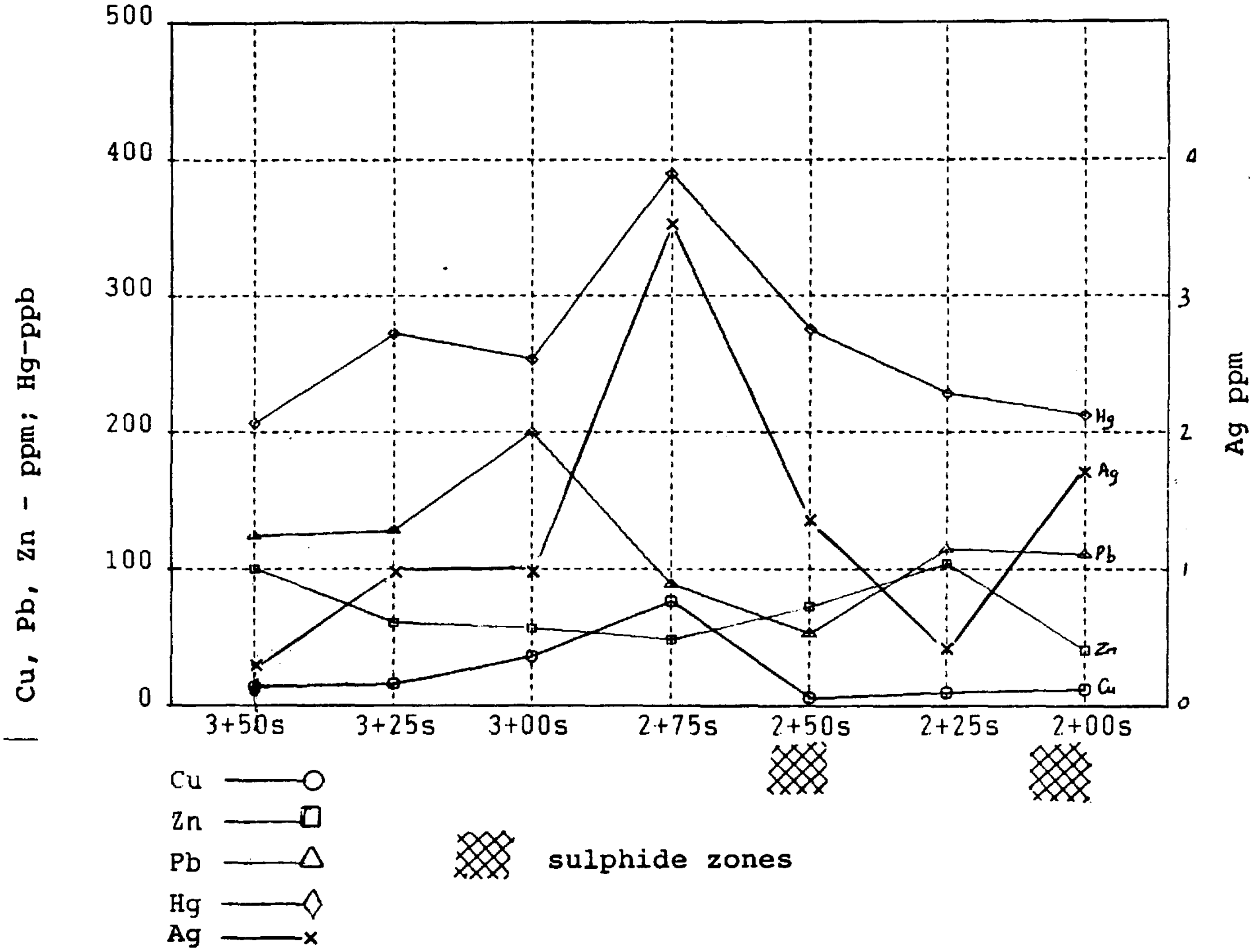


FIGURE 5.2.1

LAC COULOMBE

GEOCHEMICAL PILOT STUDY

L21+50E

"B" HORIZON(-80mesh)

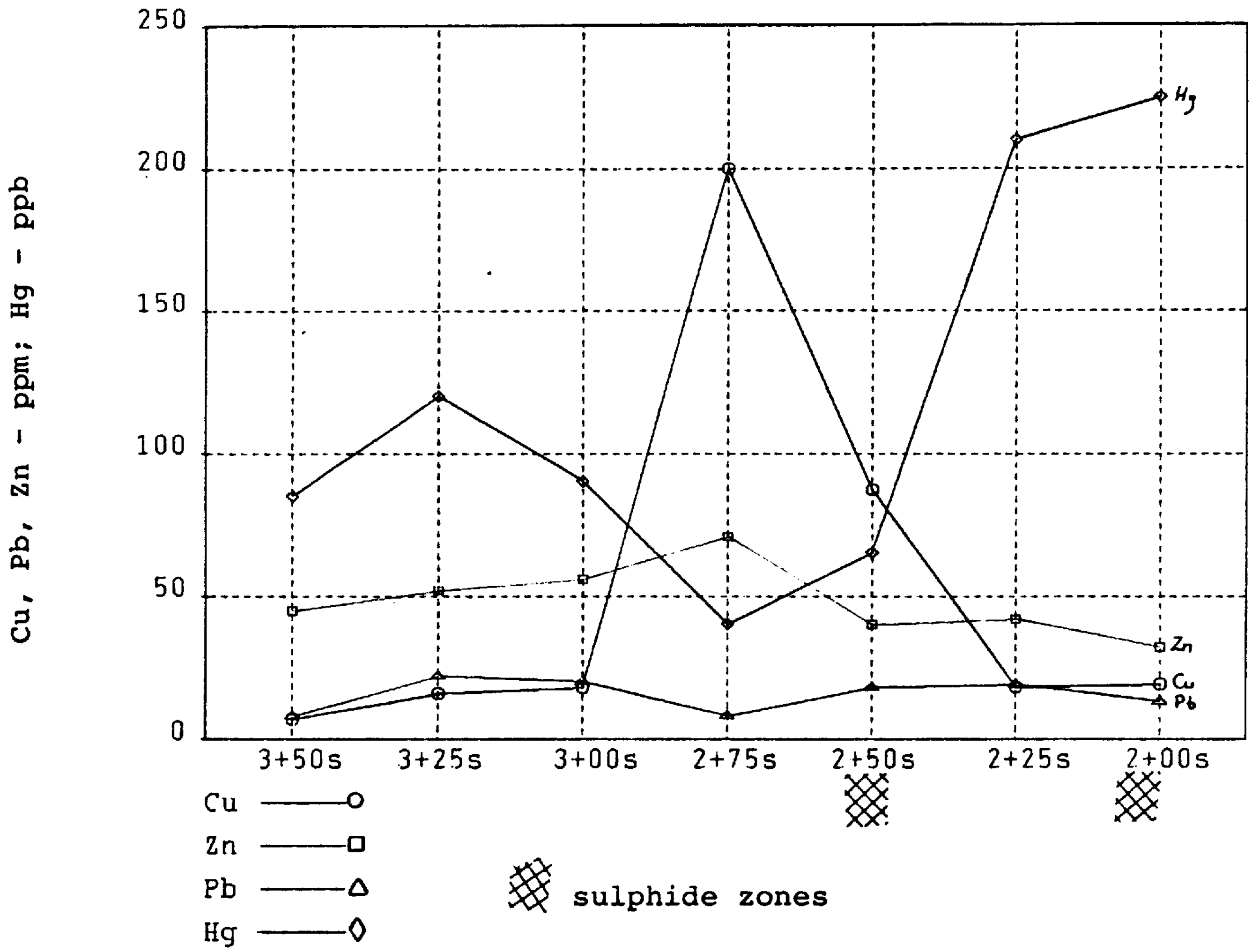


FIGURE 5.2.2

LAC COULOMBE
GEOCHEMICAL PILOT STUDY
L21+50E

"B" HORIZON(-250mesh)

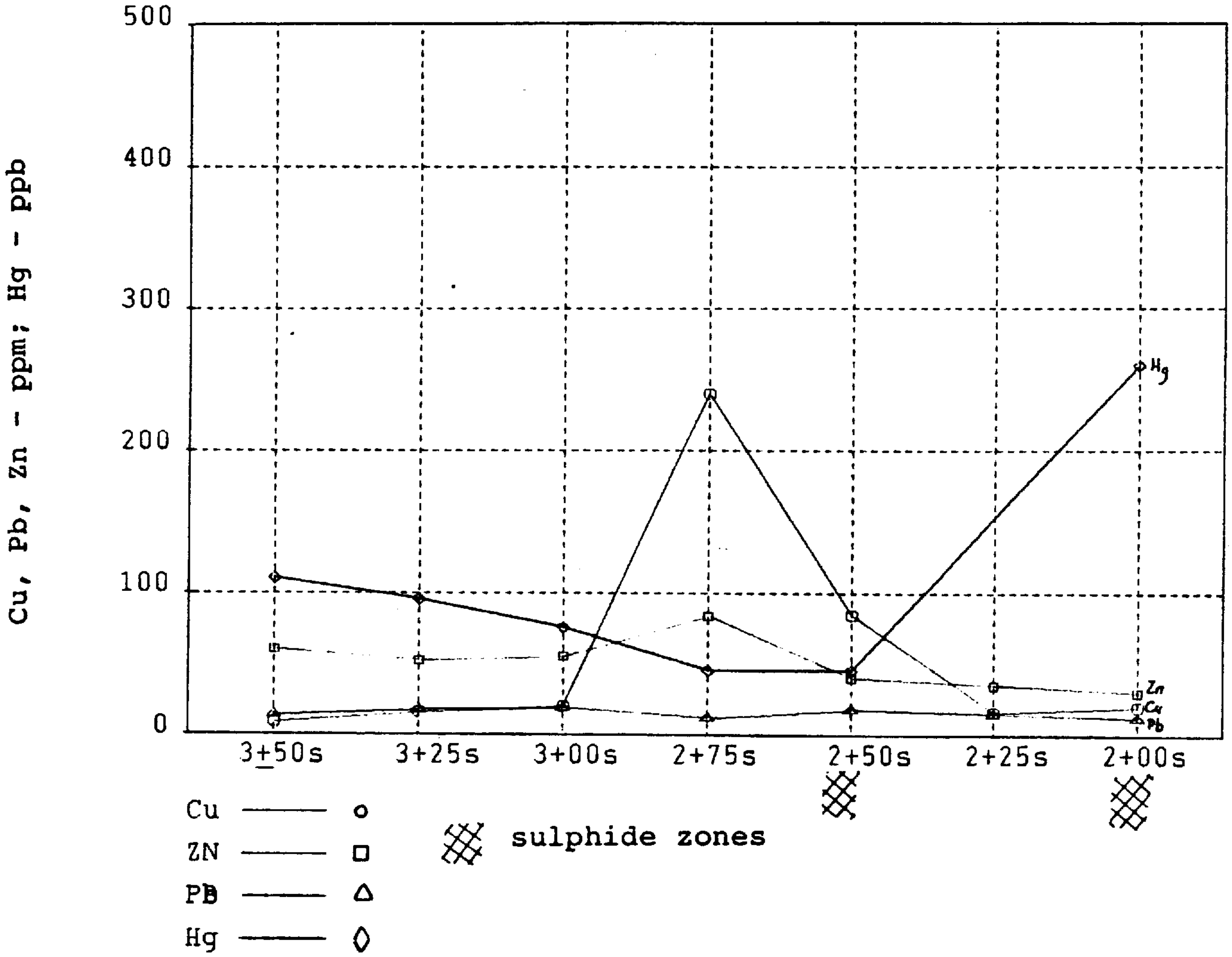


FIGURE 5.2.3

LAC COULOMBE

GEOCHEMICAL PILOT STUDY

L21+50E

'C' HORIZON TILL(-80mesh)

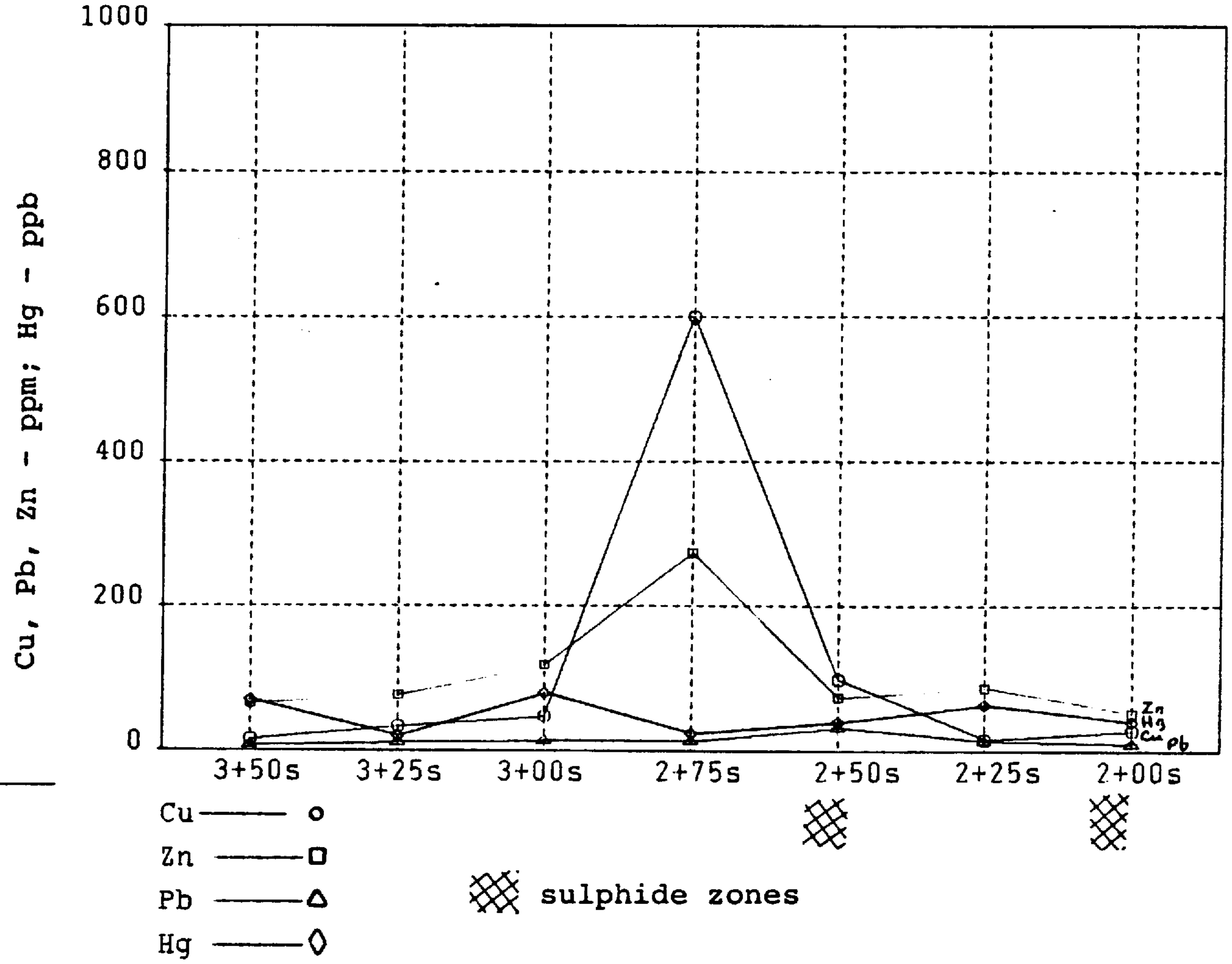


FIGURE 5.2.4

LAC COULOMBE

GEOCHEMICAL PILOT STUDY

L21+50E

'C'HORIZON TILL(-250mesh)

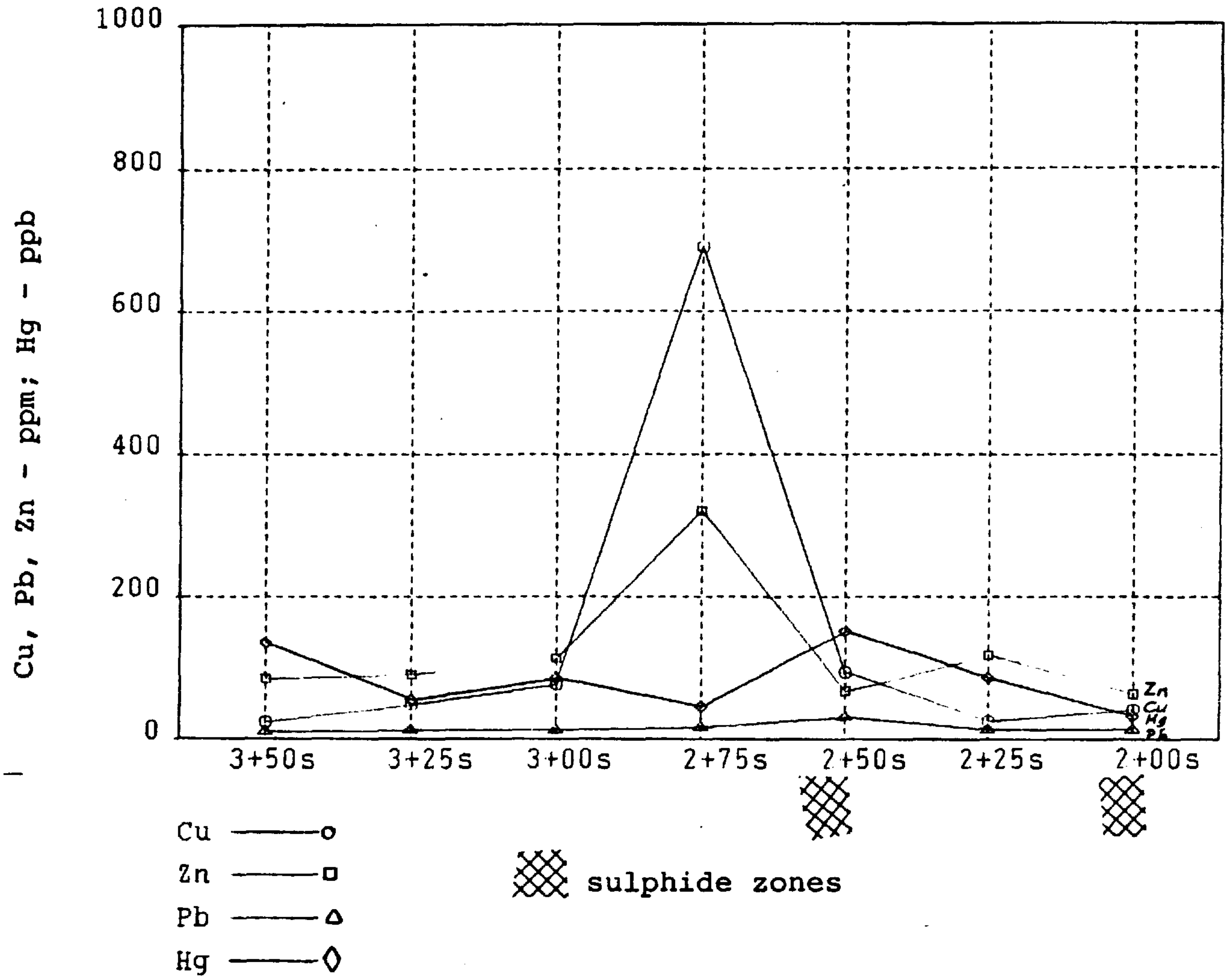


FIGURE 5.2.5

in the area. However at Lingwick where the deposit is blind, close spaced samples (60m x 15m) are required to define the zone of interest. However at Lac Coulombe where the deposit subcrops sampling at 25m intervals on lines 100m apart appears to be sufficient.

Respectfully submitted by

C.F. Gleeson

C.F. Gleeson PhD, P.Eng.

July 31, 1986