TWEED PROJECT EXPLORATION

SUMMARY REPORT

OCTOBER TO DECEMBER, 1988

TWEED AND BLAKELOCK TOWNSHIPS, ONTARIO

(NTS 42H/8, 42H/9)

OM88-6-C-258

Toronto, Ontario
February, 1989

Peter Cashin
Geologist

TABLE OF C

List of Figures

/79

Conclusions and Recommendation

The fall 1988 Tweed diamond drilling program was successful in delimiting two areas on the property which will require follow-up exploration work. These are:

1) the NE-trending IP/Input lineament tested by drillholes T-88-13 and -14 (Grid 6) was explained as a moderately to strongly silicified and sheared package of argillaceous sedimentary and mafic volcaniclastic rocks. The sheared and altered package occurs over 6.24 to 20 metres of core length and contains massive to semi-massive lenses and veinlets of pyrite with accessory pyrrhotite, chalcopyrite, sphalerite, galena and arsenopyrite. Values of 6629 ppm Zn, 1834 ppm Pb, 156 ppm Cu and 6.2 ppm Ag were returned from 156.61 to 158.04 m in hole 88-14. Geophysics indicates the feature is open to the northeast. Grid 6 constitutes a high priority base metal target area.

2) a 17.16 metre wide, highly sheared and silica-sericite ± ankerite altered package of clastic sedimentary rock bound by two, 1.5 - 2.5 metre thick graphite-sulfide horizons observed in drillhole T-88-20 (Grid 2). The sheared and altered package is mineralized by replacement-type quartz and quartz-calcite veins and veinlets parallel to shear foliation. The sulfides associated with veining are composed of up to 10% pyrite, 2% pyrrhotite and 2% arsenopyrite. Gold values were disappointing and ranged from NIL to 110 ppb Au. Strong deformation and alteration, the presence of Temiscaming-type conglomerates and stratigraphic similarities to the Golden Pond gold deposits in Quebec establish this area as a medium to high priority gold target requiring follow-up exploration.

I recommend that a small linecutting, geophysics and diamond drilling program be undertaken during the spring/summer period. Linecutting, Max Min EM and magnetometer work should be carried out to the northeast and southeast of the Grid 6 IP target area. It is also recommended that magnetics and EM be run over the present grid on 100 metre lines. A minimum of three diamond drillholes for 600 metres will be required to test the defined geological/geophysical targets. The NE-trending feature extends north off the property and a small amount of staking will be required to protect the extension.

A two to three hole diamond drilling program is recommended to further test the E-W shear zone intersected by drillhole T-88-20 on Grid 2. It should be noted that

7 km of strike length on this feature remains to be tested and excellent potential exists for the delineation of Casa Berardi-type gold mineralization. The program as outlined is estimated to cost:

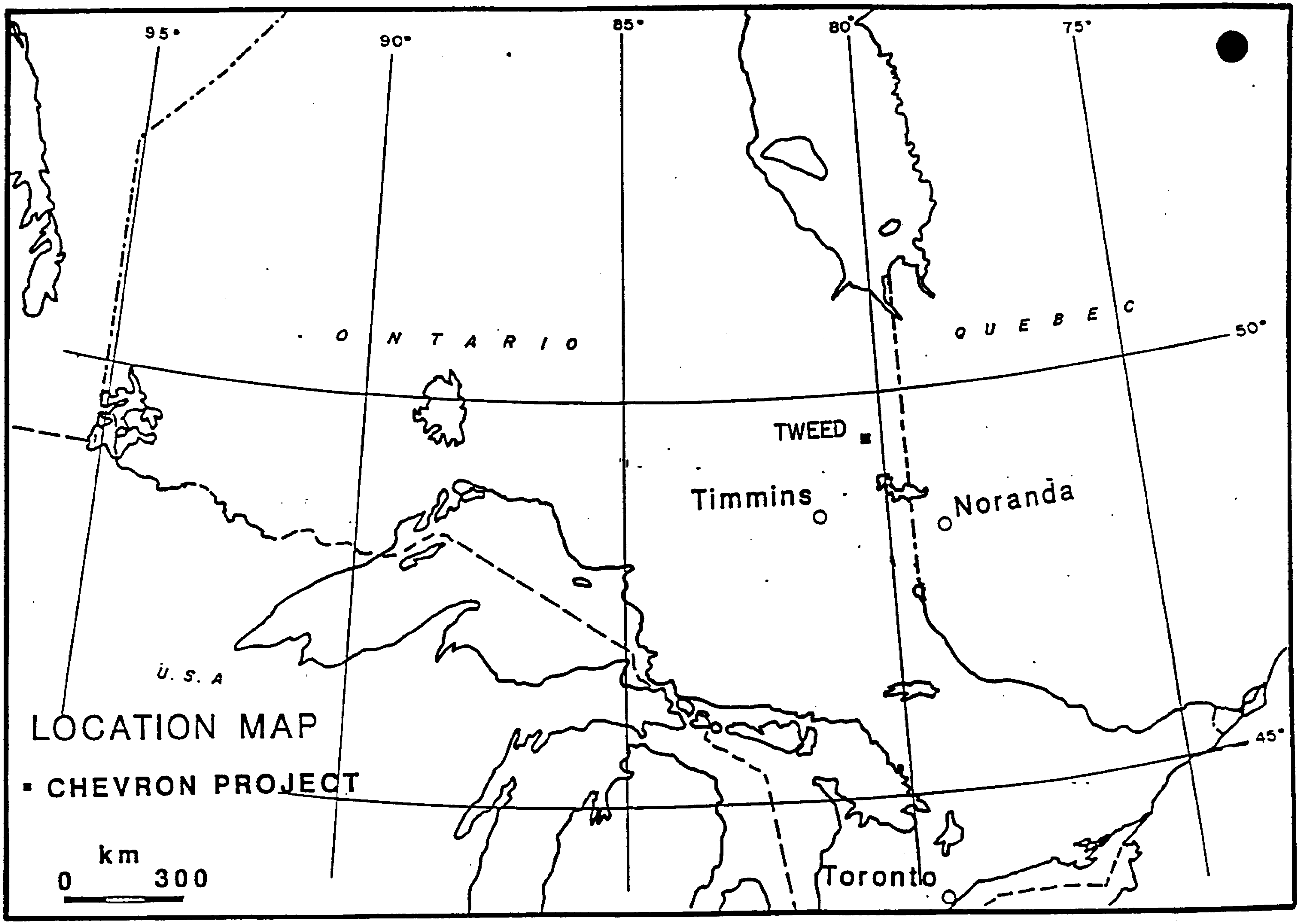
Linecutting (5.0 km) @ $250/km	$	1,250.00
Ground Geophysics (12.0 km) @ $250/km		3,000.00
Minimum 1000m Diamond Drilling @ $100/m		100,000.00
Subtotal		104,250.00
Contingency (cost overruns, additional staking, etc.)		10,000.00
Project Total	$	114,250.00 CAN.

Introduction

The Tweed project is located in the northeastern portion of the Abitibi Greenstone Belt in the Province of Ontario (Figure 1). The property, which was initially optioned by Chevron Minerals from Glen Auden Resources Ltd. in August, 1987, was acquired on the premise of being host to the westward extension of the favourable Casa Berardi gold bearing structure. Evidence for this conclusion was based on regional and detailed airborne and ground geophysical data which revealed a strong electromagnetic lineament trending westward from Montgolfier Township in Quebec across to the southern portion of the Tweed property (Figure 2).

Upon completion of airborne geophysical surveys over the property in 1987, a program of limited ground geophysics was undertaken in late 1987 and early 1988. A first phase of diamond drilling, eight (8) holes for 1264.9 metres, was concentrated on conductors at the southern margin of an ENE-trending magnetic lineament which cuts across the property. Between October 21 to December 21, 1988, a second phase program of 55 kilometres of grid line, Max Min EM and magnetic surveys over four grids, followed by a program of fourteen diamond drillholes, 2708 metres drilled, was completed.

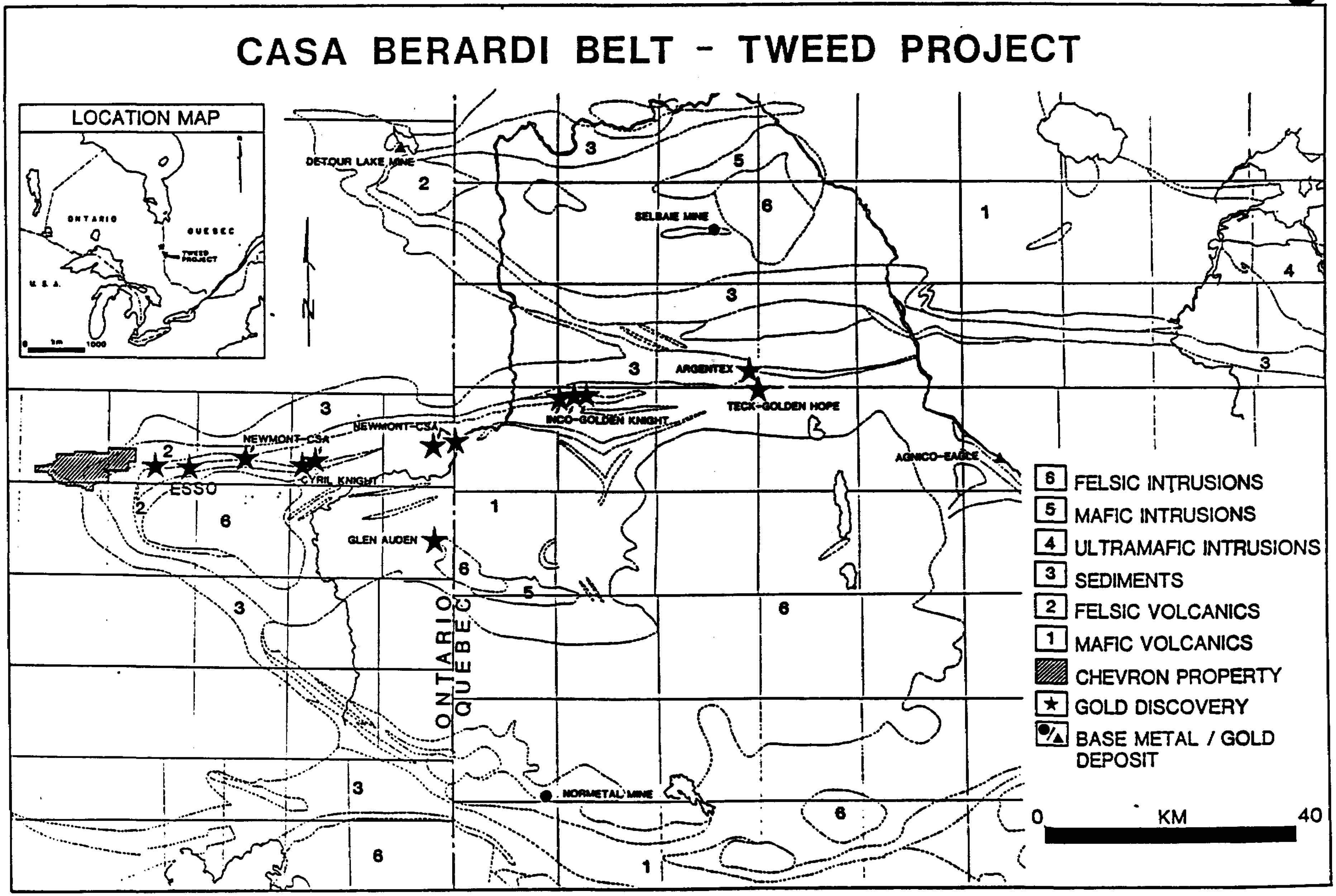
This report will describe results obtained during the second phase of the 1988 program and to make recommendations on further exploration work required on the property. Reference to the data from the Phase I program is made in order to describe the geology of that part of the property.



95°
90°
85°
80°
75°
50°
45°
O N T A R I O
Q U E B E C
TWEED
Timmins
Noranda
U. S. A
Toronto
LOCATION MAP
▪ CHEVRON PROJECT
km
0 300

FIGURE 1

-4-



CASA BERARDI BELT - TWEED PROJECT
LOCATION MAP
ONTARIO
QUEBEC
TWEED PROJECT
U.S.A.
DETOUR LAKE MINE
SELBAIE MINE
ARGENTEX
TECK-GOLDEN HOPE
INCO-GOLDEN KNIGHT
NEWMONT-CSA
NEWMONT-CSA
ESSO
CYRIL KNIGHT
GLEN AUDEN
AGNICO-EAGLE
NORMETAL MINE
ONTARIO
QUEBEC
6 FELSIC INTRUSIONS
5 MAFIC INTRUSIONS
4 ULTRAMAFIC INTRUSIONS
3 SEDIMENTS
2 FELSIC VOLCANICS
1 MAFIC VOLCANICS
CHEVRON PROPERTY
GOLD DISCOVERY
BASE METAL / GOLD DEPOSIT
0 KM 40

FIGURE 2

Property Location and Access

The Tweed property is composed of 298 contiguous mining claims in Tweed Township and 87 claims in Blakelock Townships (Figure 3).

Access to the property is provided via the all-weather Detour Lake Mine road (Hwy 652) which passes through the northwest corner of the property. Alternate access by the Abitibi Paper Co. road system comes to within 13 kilometres of the southeast corner of the property in Tomlinson Township.

Property History

The earliest recorded exploration was undertaken by Texas Gulf Sulfur in 1967, approximately three kilometres west and southwest of the property. Five drillholes were put down to test conductive lineaments outlined by ground geophysics. The conductors were explained by variable concentrations of pyrite-pyrrhotite and speck chalcopyrite in quartz-rich rocks within metasediments and felsic tuffs. No splitting or analyses was reported.

Between 1967 and 1968, Movado Mining Company Limited conducted magnetic and electromagnetic surveys over an area at the northern region of the Tweed property (Grid 5). Two drillholes for 500 feet tested an east-west trending conductor with coincident high magnetics and intersected two sulfide-bearing horizons. The best assays returned from these horizons were 0.1 to 0.2% copper.

In 1974, Noranda Exploration Company undertook vertical loop electromagnetic and magnetometer surveys on a property just west of Floodwood Lake, in the central portion of the Tweed property. No drilling was undertaken on the three parallel conductive features located by their survey.

Hudson Bay Exploration Development Company Limited undertook ground geophysical work over three grids within the Tweed property area in 1977. Several EM-17 HLEM conductors were outlined in the central portion of the property and may be the extension of conductors defined on Noranda's ground. Weak conductors were also delimited 1.2 km north of Floodwood Lake. No drilling was undertaken.

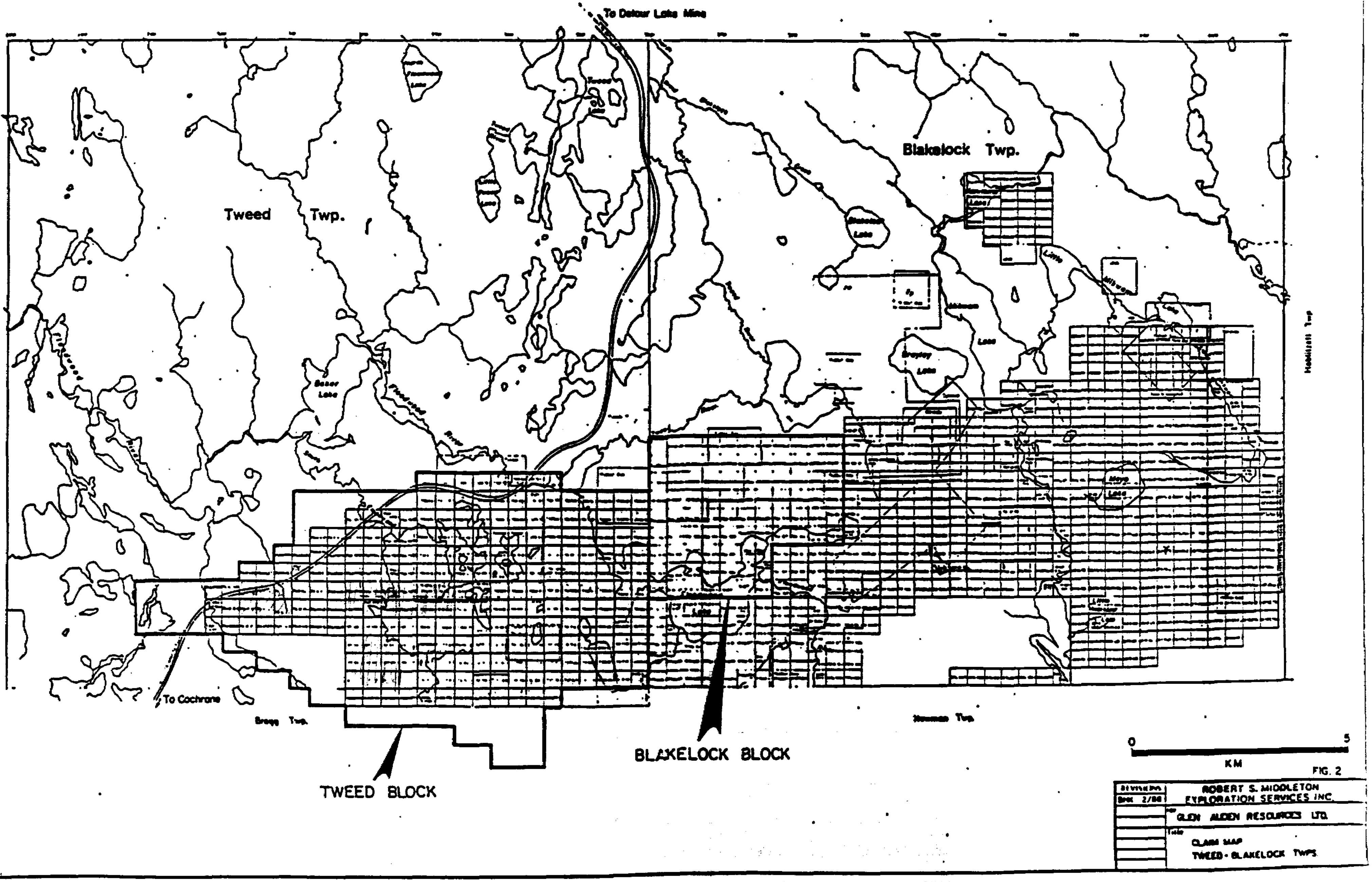

To Detour Lake Mine
Tweed Twp.
Blakelock Twp.
To Cochrane
TWEED BLOCK
BLAKELOCK BLOCK
0
5
KM
FIG. 2
ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.
GLEN AUDEN RESOURCES LTD.
CLAIM MAP
TWEED - BLAKELOCK TWPS

FIGURE 3

In 1982, Utah Mines Limited undertook ground Max Min II and magnetic surveys northeast of the Hudson Bay ground. Three conductors were outlined and were attributed to sulfide and graphitic zones adjacent to oxide facies iron formation. No drilling was reported.

In 1985, 281 line kilometres of Dighem III and magnetometer surveys were flown over the immediate Tweed property area for Glen Auden Resources Ltd. Several discrete east-west, northeast and northwest trending geophysical features were delimited.

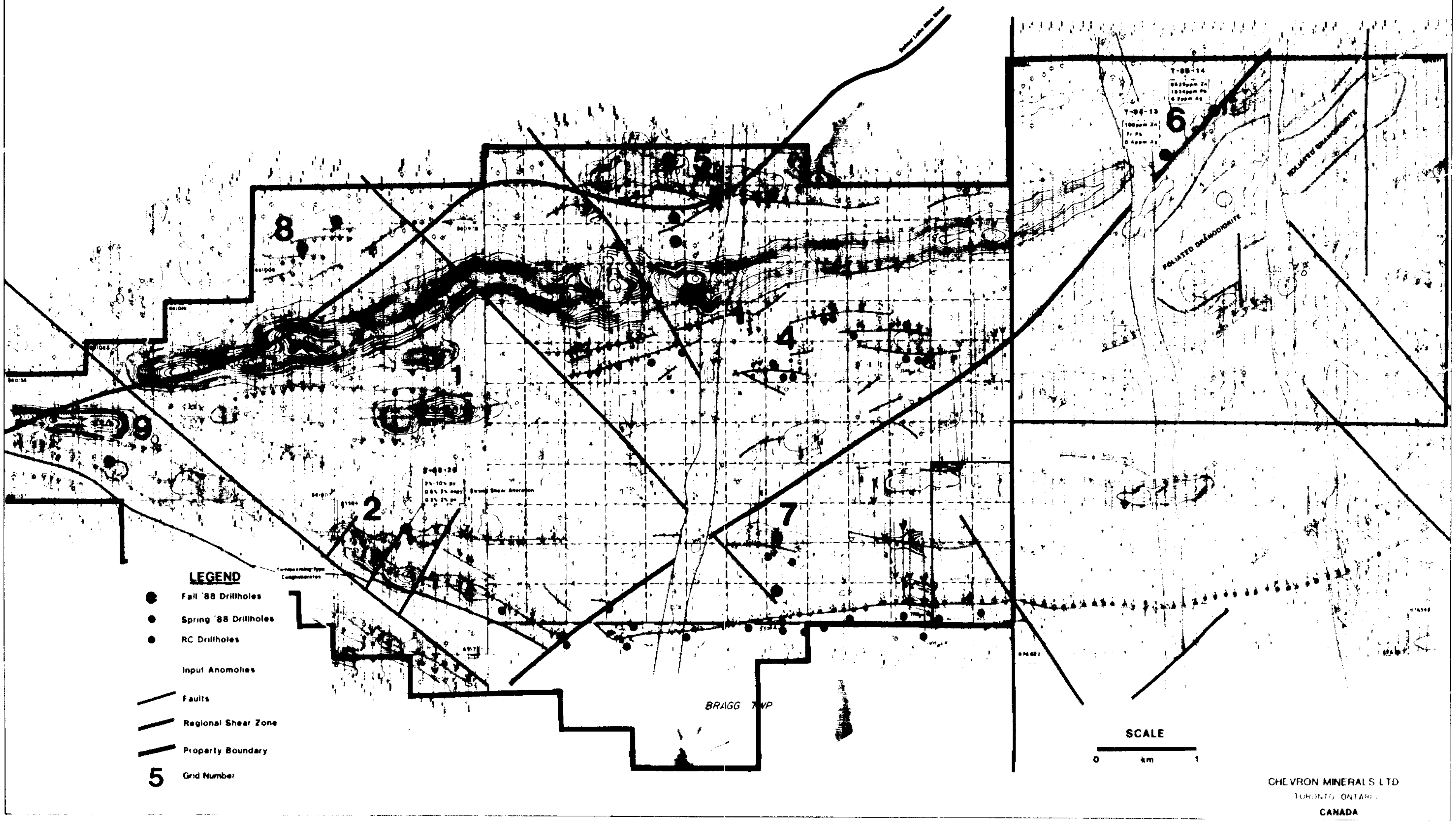
Follow-up reverse circulation drilling of 31 holes was undertaken by Island Canyon Resources over two areas of anomalous airborne geophysics. The highest gold value obtained in heavy mineral separates was 500 ppb in ablation till on the southernmost conductor. Four other samples contained greater than 1000 ppb Au in the southern and central conductive region. The southern feature also returned up to 3700 ppm arsenic, which is believed to be a favourable indicator of Casa Berardi Golden Pond-type mineralization. Bedrock geology did not return anomalous gold but intense sericite alteration was observed in hole GAO-06.

In late 1987 and early 1988, a program of linecutting and ground geophysics was undertaken by the Joint Venture. In total, 180.1 km of line was cut over four grids and a total of 50.2 km of Max Min EM, 99.2 km of magnetics and 38.6 km of IP was completed. An eight hole, 1264.9 metre diamond drilling program was undertaken over targets in proximity to a major east northeast trending magnetic lineament at the northern part of the Tweed ground. No significant assays were returned from this program (Figure 4).

Quaternary Geology

The Tweed property is characterized by rolling, poorly drained, swampy terrain with up to 15 metres of relief. No outcrop has presently been observed on the property due to extensive glacial cover up to 65 metres thick. The glacial geology is composed of numerous eskers and till plains constituted of dry gravelly to bouldery sand material. Local glacial flow directions have not been determined at Tweed but regionally are from the northeast towards the southwest. The RC drilling suggests limited amounts of basal till covers the bedrock.

TWEED COMPILATION MAP 1985 - 1988



Bedrock Geology

Detailed geology of the Tweed property area is poorly known due to paucity of outcrop. Regional geological interpretations by John (1982) and Wilson (1979) have been referred to for the regional geology on the Tweed property. Modifications at the property scale have been made using available geophysical and diamond drilling information.

The geology of the Tweed property can be divided into two broad geological domains. The Northern Domain occurs in proximity to a ENE trending magnetic anomaly at the northern part of the property. This area is characterized by a sequence of ENE-trending interbedded argillites, graphitic argillites, micaceous arenites and wackes. Mafic flows/tuffs constitute a minor component of the Northern Domain stratigraphy. The rock sequence contains a central, multiple series of thin, parallel, banded chert-chlorite-magnetite iron formation units, representing the above mentioned magnetic lineament. Thin polymictic, deformed conglomerate horizons are observed adjacent to the package of iron formation beds. All stratigraphy has been intruded by weakly to strongly biotitic intermediate feldspar porphyry sills and dykes. Units observed within this area are interpreted to have been formed in a distal to basinal depositional environment. This interpretation does not conform to the proximal facies volcano-sedimentary environment expected for the Casa Berardi gold deposits.

The Southern Domain contains fine-grained sedimentary rocks described in the Northern Domain but differs in the higher proportion of Temiscaming-type polymictic conglomerates and lithiclastic rocks present within the stratigraphic column. A major northeast to east-west trending formational conductor occupies the southern portion of the property and is characterized as a graphite-sulfide bearing shear zone. Regionally this conductive lineament is interpreted to be the westward continuation of the Casa Berardi Fault.

All lithologies are observed to dip north at 65° to 75°. Rocks in the Southern Domain display more proximal facies characteristics and more favourably correlate to the Casa Berardi Formation rocks which host the Golden Pond and Estrades deposits. The youngest rocks on the property are north-striking diabase dyke interpreted from airborne magnetic and occupy the eastern part of the property (Figure 4). These dykes are believed to be part of the Abitibi Dyke Swarm (2.1 Ga).

A major NE-trending fault trends across the property and displaces all units in a left-lateral sense. Conjugate, right-handed NW-trending faults have been interpreted from airborne and ground geophysics and are observed throughout the property.

Phase II Results

Grid 2

A total of 13.5 km of linecutting, Max Min EM and magnetics was completed over the Grid 2 area (Figure 4). Jagodits (1987) interpreted this location to be occupied by an isoclinal fold closure. Ground geophysics shows two conductive lineaments with differing character. The northern "limb" is characterized as a moderate to strong, east-west trending conductor with flanking to coincident weak to moderate magnetic signature. The southern "limb" is generally more conductive, NW-striking and coincident with high coincident magnetic gradients. The south conductor is interpreted to be disrupted and drag-folded at the point of intersection with the north conductor. An interpretation of geology (south conductor) being transected by an E-W fault or shear (north conductor) more appropriately explains the airborne geophysical feature observed. The earlier interpretation had the two conductors as the same units repeated by folding.

Drillhole T-88-20 was intended to intersect the northern conductor at line 10+00 W. Geology in the hole was characterized by a sequence of chloritic and biotitic wackes, thin chert-chlorite-magnetic iron formation and intercalated conglomerates. The target was observed to be caused by graphite-sulfide horizons between 126.19 - 128.65 m and 145.8 - 147.33 m. The rock package between the conductive horizons was highly shear foliated and silica-sericite ± ankerite altered wacke and polymictic conglomerate. This section was mineralized by replacement type quartz and quartz-carbonate veinlets and stringers containing 2 - 10% pyrite, 0.5 - 5% pyrrhotite and 0.5 - 1% arsenopyrite. The best assay obtained from this section returned only 110 ppb Au, but the geological section has a strong resemblence to the Golden Pond stratigraphy and constitutes an important target area.

Hole T-88-21 located on the southern conductor at line 12 + 00 W intersected a series of interbedded, fine-grained biotite to chlorite wackes, arenites and polymictic Temiscaming-type conglomerates. No feldspar porphyry intrusive sections were noted within the section. The target was intersected between 92.05 - 95.42m and was explained by a graphitic argillite horizon containing 40 - 45% carbonaceous material with 0.5 - 2% pyrite and 0.3 - 0.5% pyrrhotite. No gold values of any significance were returned from the hole. It was noted that values of up to 140 ppb Au were obtained in the polymictic conglomerate section footwall to the conductor and which contained <1% fine grained disseminated pyrite. Anomalous gold has been observed in the footwall conglomerates at Golden Pond.

Grid 5

Drilling on Grid 5 (Figure 4) in the Phase II program was undertaken to 1) test the western continuation of a graphitic gouge zone obtained in drillhole T-88-7 and believed to be the possible western extension of the Casa Berardi Fault (T-88-10), 2) drill test a moderate conductor north of the graphitic gouge centered on line 17 + 00E (T-88-4) and, 3) complete a drill fence to determine the stratigraphy north of the iron formation (T-88-11a, T-88-12a). Phase II drilling followed up a program of 21.5 km of linecutting, 14.1 km Max Min EM, 14.1 km magnetics and one drillhole for 136.2 m (T-88-7) undertaken in late 1987 and early 1988. Hole T-88-9 intersected a sequence of fine wackes, amphibolite and sheared amphibolites. All rocks were intruded by numerous intermediate feldspar porphyry dykes and sills. The conductor was explained as an electrolyte-filled fault zone between 142.19 - 142.34 m. Of significance was a sheared amphibolite section between 140.3 - 180.46 m containing up to 10% qtz-tourmaline-calcite veinlets and vein with 0.5 - 5% pyrite, 0.3 - 2% pyrrhoitite and 0.5 - 1% chalcopyrite. Biotitic alteration selvages up to several centimentres wide were observed to envelope the quartz-tourmaline veins. Certain aspects of the geology on Grid 5 are similar to those observed at the Detour Lake gold mine and should be the best considered as a potential exploration model over this part of the Tweed property. The assays were generally disappointing, ranging up to 50 ppb Au. Drilling was stopped due to excessive sanding caused by the gouge between 142.19 and 142.34 m. Due to uncertainty of whether the shear zone continues past the end of hole T-88-9, a second 123.74 metre hole (T-88-17) was collared on the conductor axis. The intensity of shearing was lower than in T-88-9 as was the amount of quartz-tourmaline-sulfide veining and alteration. The sheared section observed in hole T-88-9 was confirmed by 88-17 and occured between 75.9 - 84.4 m. No significant assays were reported from this hole.

Drillhole T-88-10 intersected a graphitic zone at 136.29 - 141.4 m containing 3% pyrite, 0.5 - 1% pyrrhotite within a sequence of unaltered to weakly altered biotitic to chloritic wackes, garnetiferous argillite, graphitic argillites and minor mafic volcanics. Stringer sulfides of up to 10% pyrrhotite, 3% pyrite and trace chalcopyrite were observed throughout the section with assays of 1060 ppm Zn, 957 ppm Cu, 1.1 ppm Ag and 10 ppb Au over 0.7 m between 49.45 - 49.85m) and 5250 ppm Zn, 499 ppm Cu, 3.9 ppm Ag and 10 ppb Au over 0.45 m (69.8 - 70.25 m).

Hole T-88-11a and T-88-12a revealed the remainder of the stratigraphy to be a monotonous sequence of graphitic argillites, biotitic to chloritic wackes and arenites, with minor lithic wache and polymictic conglomerates. The magnetic anomaly delimited by airborne geophysics was characterized by banded chert-chlorite-magnetite iron formation horizons between 213.58 - 214.43 m, 222.38 - 224.28 m and 239.95 - 242.6 m (T-88-12). Hole T-88-12a was stopped in iron formation. Small percentages of sulfides were observed in the holes. Of note was a zone of sulfide replacement of oxide iron formation in hole T-88-12a (223.08 - 224.15 m).

No significant assays were return from either of these drill holes.

Grid 6

A program of 53 kilometres of linecutting with 19.4 km of induced polarization survey work was undertaken on Grid 6 in late 1987 - early 1988 over a northeast striking airborne geophysical target in the Blakelock Township area (Figure 4).

Drillhole T-88-13 (line 0+00) tested a high chargeability, moderate resistivity target at the point of intersection with a major NE-trending regional fault interpreted from airborne magnetic surveys. The drillhole cut a series of chloritic wackes, sandstones, silicified graphitic banded argillites. Minor feldspar porphyry intrusive sections were noted in the hole. The geophysical target was explained as a highly altered graphitic fault gouge between at 127.29 - 130.85 m. Sulfide percentages varied throughout the hole from 0.5 - 3% pyrite 0.1 - 1% pyrrhotite and 0.1% chalcopyrite and occured as foliation parallel to oblique hairline to veinlet fracture filling quartz and quartz-calcite. Moderate to intense silica replacement was observed in the wacke sediments footwall to the graphitic gouge, particularly at 132.44 - 133.02 m, 138.02 - 138.68 m and 146.47 - 148.0 m. This silicification is observed as alteration salvages up to 4 cm in width about fracture-filling quartz-chlorite-calcite sulfide veinlets containing 0.3 - 3% fine grained to very fine grained pyrite 0.5 - 2% pyrrhotite, 0.1% chalcopyrite and rare blades of arsenopyrite. Small amounts of red-brown garnets are noted in this section. The best assays were returned from 148.43 - 148.91 m containing 160 ppm Cu, 110 ppm Zn, 0.6 ppm Ag and 20 ppb Au. Assays from the remainder of the hole were low.

Drillhole T-88-14 tested the same geophysical feature one km NE along strike from T-88-13 on line 10 + 00E. The target was characterized as a moderate chargeability, low resistivity induced polarization anomaly interpreted to be caused by accumulations of massive sulfides.

The drillhole intersected biotitic wackes/tuffs, graphitic argillites, chloritic tuff, and sheared and altered wackes/tuffs. The drillhole stopped in a foliated granodiorite intrusive (defined by a magnetic low on the airborne survey, Figure 4). The anomaly was explained by a massive, coarse to medium grained pyrite section at 156.64 - 158.04 m within an altered and sheared package of sediments from 137.65 to 164.5 m. The alteration package was zoned from weakly silicified and hematized sediment at 137.65 - 144.5 m to intensely silicified and sheared rock from 144.5 to 164.5 m. Minor red-brown garnets occur throughout this section. Additional sulfide-rich intervals were observed at 163.19 - 163.87 m (up to 70% fine grained, botryoidal pyrite). Best assays from the hole were returned from the massive sulfide at 156.64 - 158.04 m which gave 6629 ppm Zn, 1834 ppm Pb, 6.2 ppm Ag and trace Au.

The strongly silicified section at 144.5 - 164.5 is believed to be correlative with the silicified section reported in drillhole T-88-13 at 132.44 - 138.68 m and 146.47 - 148.0m. This horizon therefore constitutes a single horizon hosting significant basemetal potential which should be further explored.

Grid 7

A total of 8.2 km of line was cut over a series of short strike-length, east-west trending airborne EM conductors believed to be the potential source of anomalous Au and As values within till samples obtained from a reverse circulation drill program undertaken in 1986. Lines 26 + 00E and 28 + 00E were extended by 600 metres south in order to cover the northeast to east-west striking formational conductor at the southern margin of the property (Figure 4). Ground geophysics delineated a single, east-west trending, weakly to moderately conductive and magnetic lineament between lines 24 + 00E and 29 + 00E at 1600S. The regional formational conductor was detected at approximately 2300S on lines 26 + 00E and 28 + 00E.

Drillhole T-88-15 was intended to drill test the northern conductor on line 28 + 00E. The geology of the hole was characterized by thin horizons of biotitic wacke, massive to amygdaloidal mafic volcanics, mafic agglomerates and cobble to pebble Temiscaming-type conglomerates. The conductor was explained by a graphite-sulfide rich horizon at 114.6 - 121.9 m composed of 70 - 75% black carbonaceous argillite containing 2 - 4% fine grained pyrite, 1 - 2% pyrrhotite and 0.03 - 0.1% chalcopyrite. Minor amounts of quartz-calcite microveining parallel to banding was observed associated with the carbonaceous sections. The best assays obtained from this conductor returned 1250 ppm Zn, 111 ppm Cu and 30 ppb Au over 0.7 metres between 115.4 - 116.6 m. Gold values throughout the section varied between 10 - 50 ppb Au. The remaining assays were all low.

A second drillhole, T-88-16, was put down on the southern conductor. The stratigraphy was characterized by fine grained to lithic wackes in the top of the hole to a lithic arhose and polymictic conglomerate unit at the bottom of the hole. The conductor was caused by a highly brecciated and sheared graphitic and pyritic section at 145.07 - 159.07 m. The section contained 85 - 95% fissile, high grade, coarse graphite hosting 3 - 5% very fine to fine grained pyrite and 5 - 15% sericitized and silicified wallrock fragment up to 3 cm. The graphitic zone may constitute an important industrial mineral resource and will be further investigation. The best value returned from the conductor was 30 ppm Au at 151.17 - 154.22 m. A section of fracture-flooding grey quartz-veining containing 0.1 - 0.5% fine pyrite, 0.1% pyrrhotite was observed at 166.41 - 167.19 m but returned no significant values. No other significant assays were obtained from this hole.

Grid 8

Grid 8 was cut over what Jagodits (1987) interpreted as his "Outer Fold" at the western limits of the Tweed property. A total of 17.7 line kilometres of grid was cut over this feature and Max Min EM and magnetic surveys carried out. The northeast part the grid is occupied by a WNW-trending high gradient magnetic feature. A weak to moderate conductor, the North Conductor is observed on the south flank of the magnetic high between line 23 + 00 W and 42 + 00W. The Middle Conductor has the same WNW strike direction and is observed between line 36 + 00W/725 S and line 47 + 00W/225S. A moderate, coincident magnetic signature is associated with the moderately conductive middle lineament and may be due to accumulations of semi-massive to massive pyrrhotite-pyrite ± graphite. A third conductive lineament, the South Conductor, lies between line 44 + 00W/650S and line 51 + 00W/525 S. The feature is WNW to east striking, moderately to strongly conductive with a weakly magnetic to non-magnetic signature, interpreted to be indicative of concentrations of pyrite-graphite-pyrrhotite. The anomaly continues to the west off the grid.

The midddle conductor was tested by drilling hole T-88-12 on section 44 + 00W. The geology is characterized as interbedded fine grained garnetiferous sediments/ash tuffs of intermediate composition, biotitic wackes, arkoses and minor chert-chlorite-magnetite iron formation sections. The hole was stopped in a massive to foliated polymictic conglomerate, which is correlative to the conglomerates intersected at 187.75 - 199.0m in drillhole T-88-21. The polymictic conglomerate fragment were highly flattened and had at 10:1 aspect ratio.

The conductor was intersected between 100.28 - 100.63 m and is associated with a massive pyrrotite cemented quartz breccia zone contain 5% cherty quartz vein fragments up to 8mm. The hangingwall rocks to the massive sulfides were observed to be highly garnetiferous over one metre. Assays from the sulfide section returned 100 ppm Zn, 59 ppm Cu, 0.2 ppm Ag and 50 ppb Au. Small arsenopyrite blades were also observed associated within late quartz-calcite veinlets in biotitic wacke at 136.14 - 136.6 m. Assays of 0.39% As and 10 ppb Au were returned. The polymictic conglomerates were observed to host local concentration of disseminated pyrite up to 1.0%. Gold values of up to 140 ppb associated with this sulfide-enriched section and the highest values obtained on the property.

Grid 9

Grid 9 was cut over a group of parallel, short strike-length conductors (Figure 4) north of the Detour Lake Mine Road. A total of 12.4 kilometres of grid was cut and Max-Min EM and magnetic surveys undertaken. Two east-west, en echelon, broad, weakly to moderately conductive anomalies were defined by the survey. Magnetic contours are disrupted by a possible NW-trending cross fault, which is interpreted to trucate and displace an initially single east-west oconductor, and displacing it in a left-lateral manner. A displacement of approximately 150 metres is interpreted.

Drillhole T-88-18a was intended to intersect the northeastern portion of the conductor on line 16 + 00W. The hole was abandoned at 110.6 metres due to excessive cave in the hole, within a section of sulfide-bearing graphitic argillite. The rock was observed to be composed of 70 - 75% carbonaceous material containing 15 - 20% pyrite microveinlets, nodules and disseminations throughout. Numerous other small pyrite-graphite bearing argillite sections were observed throughout the hole. It is uncertain whether or not the more carbonaceous unit was the target, but appears to underlie the anomaly. Biotitic arenites and waches are observed interbedded with the graphitic sections. A large body of intermediate feldspar porphyry intrusive was observed at 77.89 85.17. Smaller intrusive sections were noted throughout the section.

The best assays were returned from a highly oxidized, interbedded sandstone and graphitic section bearing 1 - 3% pyrite bands where 1.29 ppm Ag was returned between 64.0 - 65.2 m. No other significant assays were reported in the hole.

Drilling on the southwestern conductor by hole T-88-19 was completed to a depth of 138.98 metres. The stratigraphy was similar to hole 88-18 and characterized by interbedded graphitic argillites and biotitic waches. Feldspar porphyry intrusive dykes and sills were observed throughout the section. Graphitic argillite section were observed to contain from 0.5 - 5% pyrite, 0.1 - 0.5% pyrrhotite as foliation parallel microveinlets and disseminations in a quartz-calcite gangue. No significant assays were detected in this drillhole

Discussion

Diamond drilling of various geophysical and geological targets on the Tweed property has aided in deciphering the stratigraphy and in outlining areas of higher economic potential. These high priority regions will require more detailed follow-up.

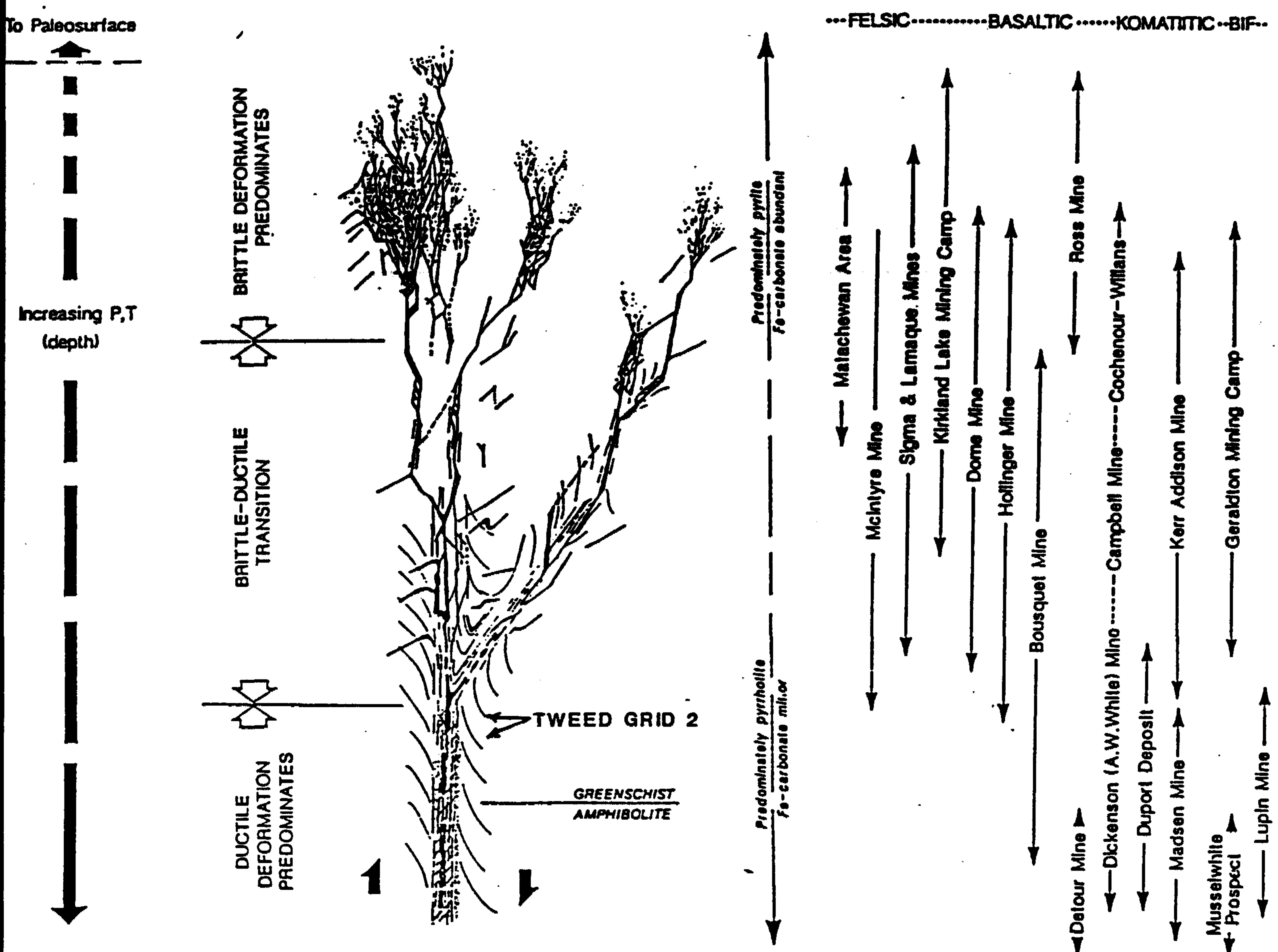
Drilling has defined two, crude, geologic domains on the property. The Northern Domain is predominated by distal to basinal facies turbiditic epiclastic and chemical sedimentary rocks. Geophysical conductors within the domain are explained as variable stratabound to stratiform concentrations of sulfide bearing graphitic argillites and semi-massive to massive pyrrhotite-pyrite ± chalcopyrite. The second, or Southern Domain, has a higher proportion of coarse pyroclastic and epiclastic rocks and Temiscaming-type polymictic conglomerates within the stratigraphy. Rocks within the Southern Domain were deposited in a proximal facies, tectonically unstable environment. The tectonics may have been due to prolonged movement along a major fault plane defined by the the southern conductor tested by drillhole T-88-16 on Grid 7. Although conductors have all been explained by graphite and barren sulfides within the stratigraphy, a higher degree of alteration and tectonic deformation in this region is noted (T-88-20, Grid 2). This package of rocks more closely resembles the lithostratigraphic characteristic of the Casa Berardi Formation to the east and may have important implications on the economic potential of this part of the belt. It is uncertain which of the two domains the rock assemblage at Grid 6 is associated. Structural transposition of the rocks adjacent to a NE regional fault zone (fault gouge in T-88-13) has obscured some of the stratigraphic relationships in the area. The fine grained nature of the clastic rocks observed in drillholes T-88-13 and T-88-14 would most appropriately place the succession, within the Northern Domain package. Drilling has only tested 100 - 150 metres thickness of the Grid 6 stratigraphy.

As discussed earlier, the highly altered, sheared sedimentary rocks in hole T-88-20 (Grid 2) have a strong resemblence to the Golden Pond deposit lithologies. The pyrite-pyroholite-arsenopyrite sulfide assemblage observed in the hole is also similar. Discussions with Golden Pond geologists have indicated that gold is not always present in areas deemed to have all the necessary alteration and structure characteristics. The greater abundance of vein quartz at Casa Berardi compared to the Tweed property may be the missing pertainant parameter. The metamorphic grades of the two properties varies from greenschist at Golden Pond and lower amphibolite facies at Tweed. The deeper-seated Tweed rocks, as recently modelled by the Ontario Geological Survey (1988, Figure 5) would more likely host mineralization which has ductile deformation characteristics, similar to the Detour Lake or the Duport deposits. Compared to the wide, brittle-ductile quartz lodes observed at Golden Pond, deposits at Tweed would be characterized by replacement-type, shear parallel, sulfide bearing quartz and quartz-carbonate microveinlets, veins and losenges (Figure 5). This is the observed characteristics of mineralization on Grid 2. The shear zone on hole T-88-20 is observed to be 17.16 metres wide and has an associated alteration halo which extends 3.05 metres into the hangwall and 5.97 metres into the footwall from the shear. It is believed that hole T-88-20 has delimited a potentially important deformation and alteration zone. Total minimum strike length on this shear structure from geophysics is 2.7 kilometres.

Also of significance on this part of the property is the presence of pebble to cobble, polymictic conglomerates at the bottom of drillhole T-88-21, south of the described shear zone. The pebbles are composed of foliated wacke, chert and large cobbles of biotitic feldspar porphyry intrusive and form up to 35% of the rock. Lithic clasts are variably stretched, with a maximum aspect ratio of 10:1. Presence of these Temiscaming-type conglomerates at the footwall of the Golden Pone East mine sequence has been noted and are interpreted as indicators of a high strain environment. This same variety of conglomerate was observed to the bottom of hole T-88-22 on Grid 8 and constitutes an important marker horizon along which additional exploration should be carried-out. Follow-up work over this area is recommended.

Grid 6 diamond drillholes have defined a NE-striking altered and sulfide mineralized horizon which hosts significant Zn, Pb and Ag values. A minimum strike length of 2.0 km on the structure is indicated by induced polarization and is open toward the northeast. The massive sulfide horizon intersected in T-88-14 is highly silicified and strongly shear foliated. Alteration zonation from strong silicification adjacent the sulfides to weak hematization towards the northwest is noted. Chloritic tuffs/metasediments lie further to the northwest from the altered rocks. A conspicuous banded chert-chlorite-sulfide iron formation up to 0.8 metres thick is observed to mark the northwestern limit of the altered package of rocks. A biotite and chlorite-rich sediment forms the footwall to the sulfide-bearing section. Similar

IL●LIZED COMPOSITE DEPOSITIONAL M●DEL-ARCHEAN LODE GOLD DEPOSITS



Minerals common to upper level deposits

BASALTIC	BIF
White mica(±Cr,etc.) Chlorite	Chlorite Stilpnomelane
KOMATIITIC	**FELSIC**
Talc Tremolite Chrome mica Chlorite	White mica Albite ±Hematite ±Chlorite ±Anhydrite ±Potassium feldspar

+pyrite, +Fe-carbonate

Minerals common to lower level deposits

BASALTIC	BIF
Cordierite Staurolite Chloritoid Garnet Hornblende Biotite	Grunerite Hornblende Biotite Garnet
KOMATIITIC	**FELSIC**
Biotite Anthophyllite ±Talc ±Tremolite ±Chrome mica ±Chlorite	Potassium feldspar Phlogopite [Scapolite]

+pyrrhotite, −Fe-carbonate

Figure 5

atigraphy one kilometre to the southwest (T-88-13) has been intersected but is lacking concentrations of massive sulfides. Strong geologic similarities with Bathurst, New Brunswick sulfide ore is noted. Lack of an Archean example of these Zn-Pb rich mineralization precludes the establishment of a refined exploration model. Aspects of the model are drawn from an Archean Zn-Pb-Cu sulfide accumulation described by Osterberg et. al. (1987) in which sub-economic Zn-Pb sulfide concentrations have been documented in the Onaman area, NW Ontario. At Bathurst, the Zn-Pb rich, Cu-poor nature of the sulfide deposits is attributed to the large proportion of sedimentary rocks relative to mafic rocks in the stratigraphic column. Therefore, a modified Noranda-type basemetal model in which the abundance of sedimentary strata gave rise to Zn-Pb rich sulfide accumulations, can be applied to account for the Grid 6 mineralization. Graphite-sulfide rich horizons have been described from 10 to 30 metres uphole from the silicified zone in hole T-88-13 and 14 and may be similar to the graphitic argillite observed to overlie the Kidd Creek sulfide ores.

The ores at Brunswick No. 12 are characterized as elongate, conformable and highly deformed bodies of massive sphalerite-galena-chalcopyrite-pyrite within dominantly sedimentary stratigraphy. Stringer sulfides are not commonly associated with Bathurst camp ores, probably due to transposition associated with the extreme deformation imposed on the rocks. Lateral zonation from splalerite-galena-arsenopyrite to massive galena-chalcopyrite to fine grained pyrite with minor sphlalerite-galena-chalcopyrite, has been documented at some of the sulfide deposits in the camp (eg. Caribou). In the Onaman area, the interpreted discharge site at the water-rock interface is manifested by rocks composed dominantly of S^iO_2 and hydrous aluminium silicate phases. This rock is believed to represent a leached cap to the hydrothermal system at or above which sulfides were precipitated (Ostenberg et. al., 1987).

The Zn-Pb rich pyrite section observed in hole T-88-14 has many of the characteristics described for sulfides observed in the Bathurst and Onaman Areas. These are 1) Zn-Pb rich sulfides in association with sedimentary stratigraphy, 2) strong silicification and fabric development in association with the sulfide-bearing section, 3) lack of volcanic stratigraphy adjacent to ore. These observations may change as data on stratigraphy and alteration zonation are collected. Felsic volcanic stratigraphy observed at Noranda is lacking in the Grid 6 strat section and may be indicative of insufficient stratigraphic information from our limited drilling, or a distal sulfide accumulation away from a felsic volcanic edifice. The extensive silicification and possibly aluminosilicate alteration observed in holes T-88-13 and 14 may be due to siting over a hydrothermal discharge area, and may have important implications on the economic importance of this area. Drilling has only tested 100 to 120 metres of the Grid 6 stratigraphy. Additional stratigraphic drilling will be necessary before the geologic setting of the area can be deciphered. As an example, the Brunswick No. 12 mine sequence is observed to have a thickness of 300 metres or more. A good test for metal zonation trends on the sulfide zone and of stratigraphic information would be to probe the depth extension of the T-88-14 intersection and along strike from it. Minimum step-outs of 200 metres would give sufficient geochemical/stratigraphic vector information to direct future exploration efforts. Other important areas southeast of the granodiorite body intersected at the bottom of hole T-88-14 are outlined by airborne geophysics. These will be tested by ground geophysics and, if necessary, by diamond drilling in the next exploration program.

Summary

Exloration drilling over numerous geophysical targets have led to the discovery of two significant areas having excellent gold and base metal potential.

Diamond drilling on the Grid 2 area has intersected a highly sheared and altered package of sediments bound by two, parallel graphitic horizons. Mineralization is characterized as replacement-type quartz and quartz-carbonate microveinlets, veins and losenges hosting pyrite-pyrrhotite-arsenopyrite mineralization. The sheared package is flanked to the south by Temiscaming-type polymictic conglomerates having a minimum strike length of 3.0 kilometres. These lithologies occur at the footwall to ore at Golden Pond.

A second area with base metal sulfides was defined on Grid 6 where a drillhole intersected massive sulfide mineralization over 1.4 metres grading 6629 ppm Zn, 1834 ppm Pb, 6.2 ppm Ag and trace Au. The rocks hosting the sulfide horizon are highly deformed and silicified sediments. An analogy to Bathurst, New Brunswick massive sulfide ores has been proposed but additional work is required to confirm the model.

disk 07/9

References

Abernethy, R.K., 1936, Report on Reverse Circulation overburden Drilling in Tweed Township, Ontario: R.S. Middleton Exploration Services Inc. for Glen Auden Resources Ltd.

Abernethy, R.K., 1988, A brief summary of the Diamond Drill Program Tweed Township, Ontario: R.S. Middleton Exploration Services Inc. for Chevron Canada Resources Ltd.

Colvine, A.C., Fyon, J.A., Heather, K.B., Marmont, S., Smith, P.M., and Troop, D.G., 1988, Archean Load Gold Deposits in Ontario: O.G.S. Miscellaneous Paper, 139, 136p.

Hodges, D.G., 1988, A Brief Report on the Geophysical Surveys on the Property of Chevron Resources Ltd., Tweed and Blakelock Townships, Ontario.

Jagodits, F.L., 1987, Preliminary Report on the Interpretation of Multi-Sensor Helicopter-Borne Surveys Tweed, Blakelock and Bragg Townships: Excalibur International Consultants Ltd. for Chevron Canada Resources Limited.

Johns, G.W., 1982, Geology of the Burntbush-Detour Lakes Area, District of Cochrane: O.G.S. Report 199, 82p.

Kilty, S.J., 1985, Digem III Survey of the Tweed Township Area, Ontario: Dighem Surveys and Processing Inc. for Glen Auden Resources Ltd.

Ostenberg, S.A., Morton, R.L., and Franklin, J.M., 1987, Hydrothermal Alteration and Physical Volcanology of Archean Rocks in the Vicinity of the Headway-Coulee Massive Sulfide Occurance, Onaman Area, Northwestern Ontario: Econ. Geol., v.82, p.1505-1520.

Wilson, B.C., 1979, Geology of the Twopeak Lake Area, District of Cochrane: O.G.S. Report 184, 38p.

/001

APPENDIX I

1988 DRILLHOLE SUMMARY

Spring Program

Hole #	Grid #	Collar Location (metres)	Direction/ Inclination (degrees)	Target Depth (m)	Final Depth (m)	Target Signature
T-88-1	1	8 + 75w/ 0 + 90s	180/-45	176.7	249.1	MAG/EM
T-88-2	1	8 + 75w/ 1 + 10s	360/-45	158.8	224.6	MAG/EM
T-88-3	4	24 + 00E/ 7 + 25N	360/-45	102.8	145.4	EM
T-88-4	4	33 + 00E/ 7 + 75N	180/-45	102.8	145.4	MAG/EM
T-88-5	4	39 + 00E/ 6 + 05N	180/-45	79.0	111.7	EM
T-88-6	4	27 + 00E/ 2 + 00N	180/-45	92.0	130.1	EM
T-88-7	5	27 + 00E/19 + 40N	180/-45	96.3	136.2	EM
					1264.9m	

Fall Program

Hole #	Grid #	Collar Location (metres)	Direction Inclination (degrees)	Target Depth (m)	Final Depth (m)	Target Signature
T-88-9	5	17 + 00E/23 + 25N	180/-50	142.19 - 142.34	180.46	MAG/EM
T-88-10	5	22 + 00E/20 + 25N	180/-50	136.29 - 141.40	203.0	EM
T-88-11	5	17 + 00E/16 + 90N	180/-50	ABANDONED AT 62.7 m		
T-88-11a	5	17 + 00E/16 + 92N	180/-50	-	300.53	GEOLOGY
T-88-12	5	17 + 00E/14 + 75N	180/-50	ABANDONED AT 48.7 m		
T-88-12a	5	17 + 00E/14 + 73N	180/-50	213.58 - 242.6	242.6	GEOL/MAG
T-88-13	6	0 + 00 /1 + 00N	135/-50	109.61 - 118.0	166.82	IP
T-88-14	6	10 + 00E/0 + 45S	135/-50	156.64 - 158.04	221.2	IP
T-88-15	7	28 + 00E/14 + 75S	180/-50	114.60 - 121.19	200.0	EM
T-88-16	7	28 + 00E/21 + 75S	180/-50	145.07 - 159.07	181.65	EM
T-88-17	5	17 + 00E/22 + 00N	180/-50	75.90 - 84.40	123.74	GEOL/EM
T-88-18	9	16 + 00W/18 + 22N	180/-50	69.10 - 77.89,	110.30	EM
				94.23 - 110.30		
T-88-19	9	18 + 00W/16 + 25N	180/-50	88.39 - 113.19	138.98	EM
T-88-20	2	10 + 00W/12 + 75S	180/-50	126.19 - 128.64	222.19	EM
				145.80 - 147.33		
T-88-21	2	12 + 00W/15 + 00S	180/-50	92.05 - 95.42	209.08	EM
T-88-22	8	44 + 00W/2 + 25S	180/-50	100.28 - 100.63	163.37	EM
					2775.32 m √	
			1988 Project Total		4040.22 m	

/10

APPENDIX II

1988 DIAMOND DRILL LOGS

Note: these have also been filed for assessment 2.12293

#63.5352

OM 88-6-C-258

THIS SUBMITTAL CONSISTED OF VARIOUS REPORTS, SOME OF WHICH HAVE BEEN CULLED FROM THIS FILE. THE CULLED MATERIAL HAD BEEN PREVIOUSLY SUBMITTED UNDER THE FOLLOWING RECORD SERIES (THE DOCUMENTS CAN BE VIEWED IN THESE SERIES):

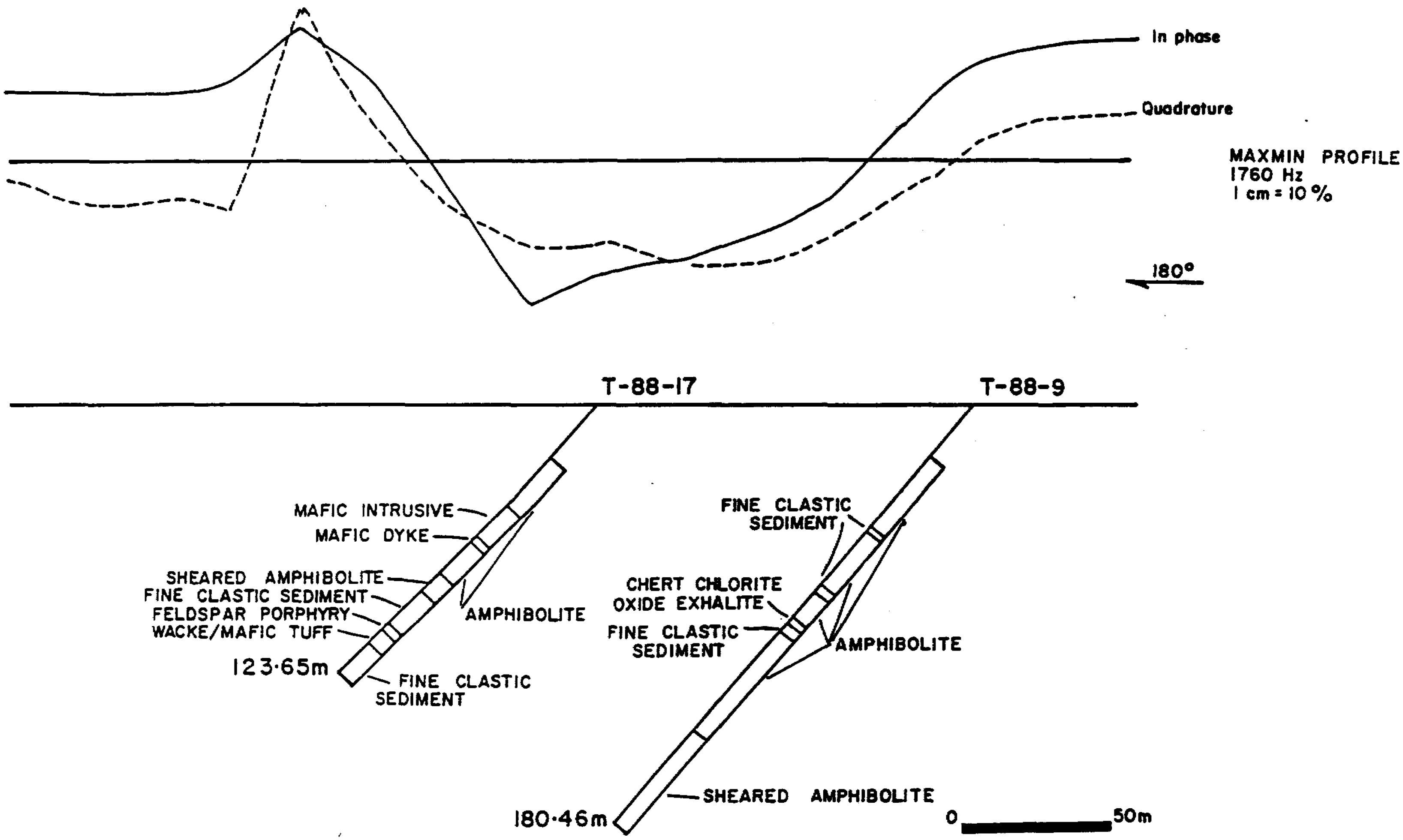
Tweed Project Exploration Summary Report → See 2.12293, Report of
October - December, 1988; Peter Cashin; Work W8908-76
Feb. 1989

Appendix II - 1988 Drill Logs

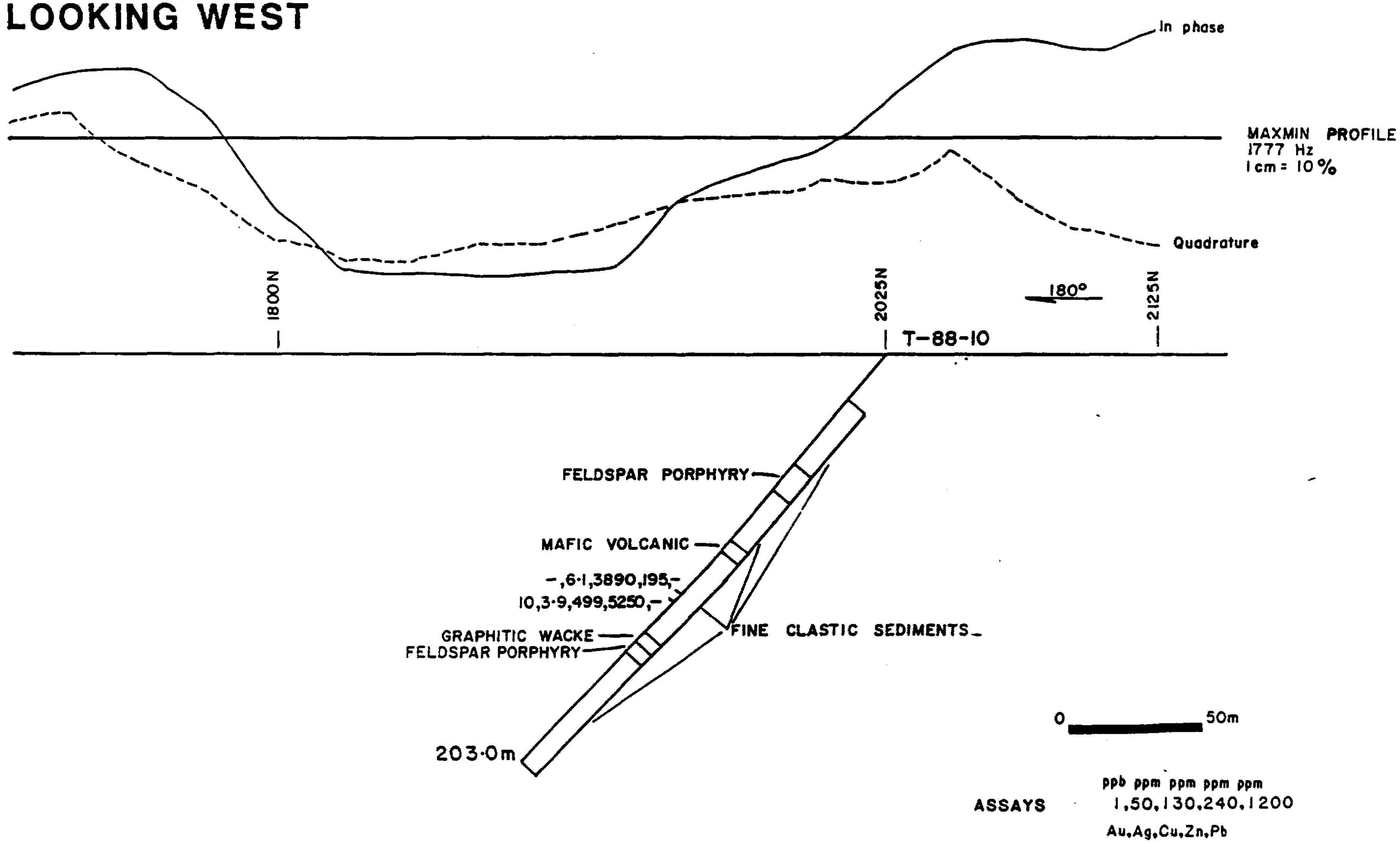
APPENDIX III

SKETCH DIAMOND DRILLHOLE SECTIONS

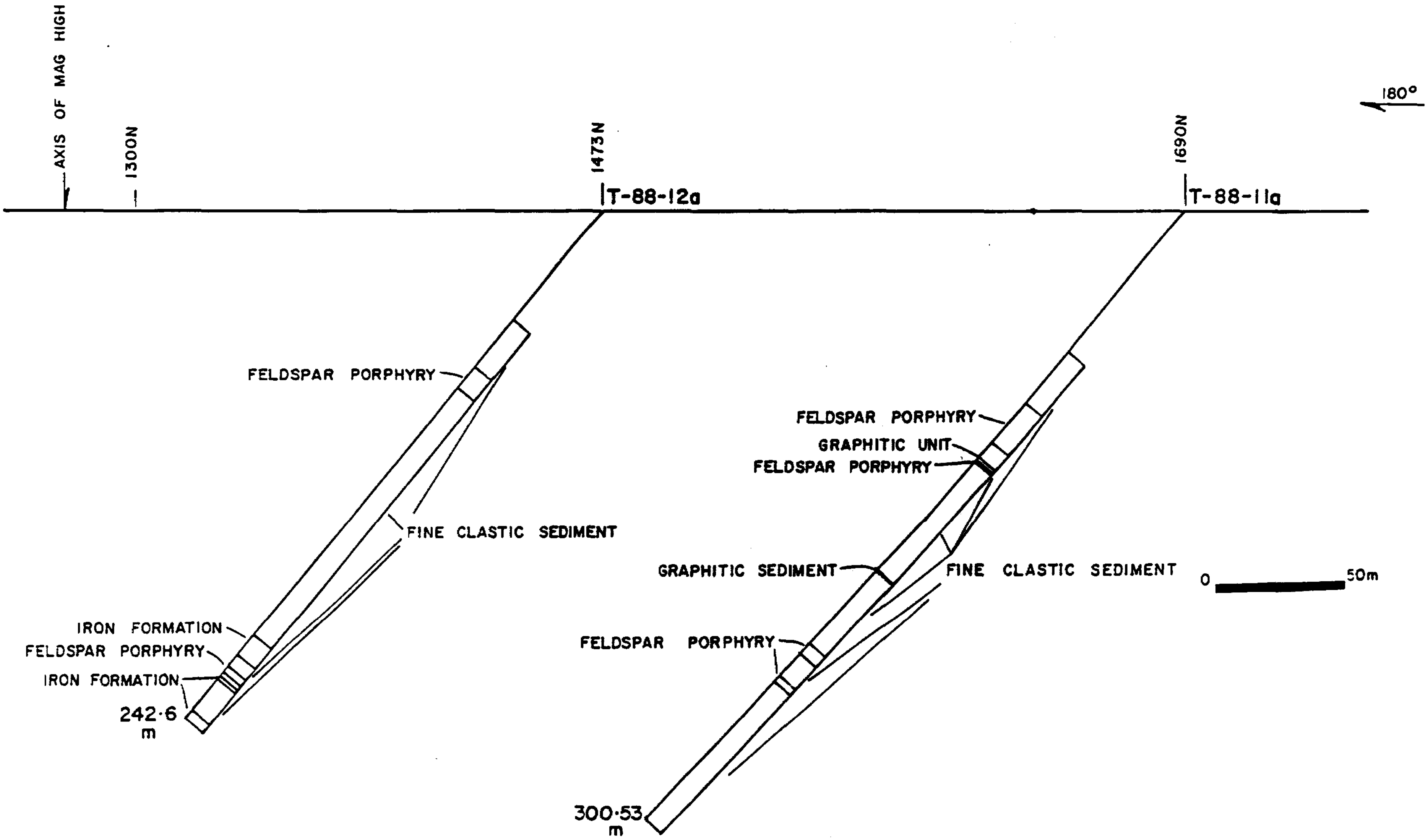
TWEED PROJECT
GRID 5 SECTION L18E
LOOKING WEST



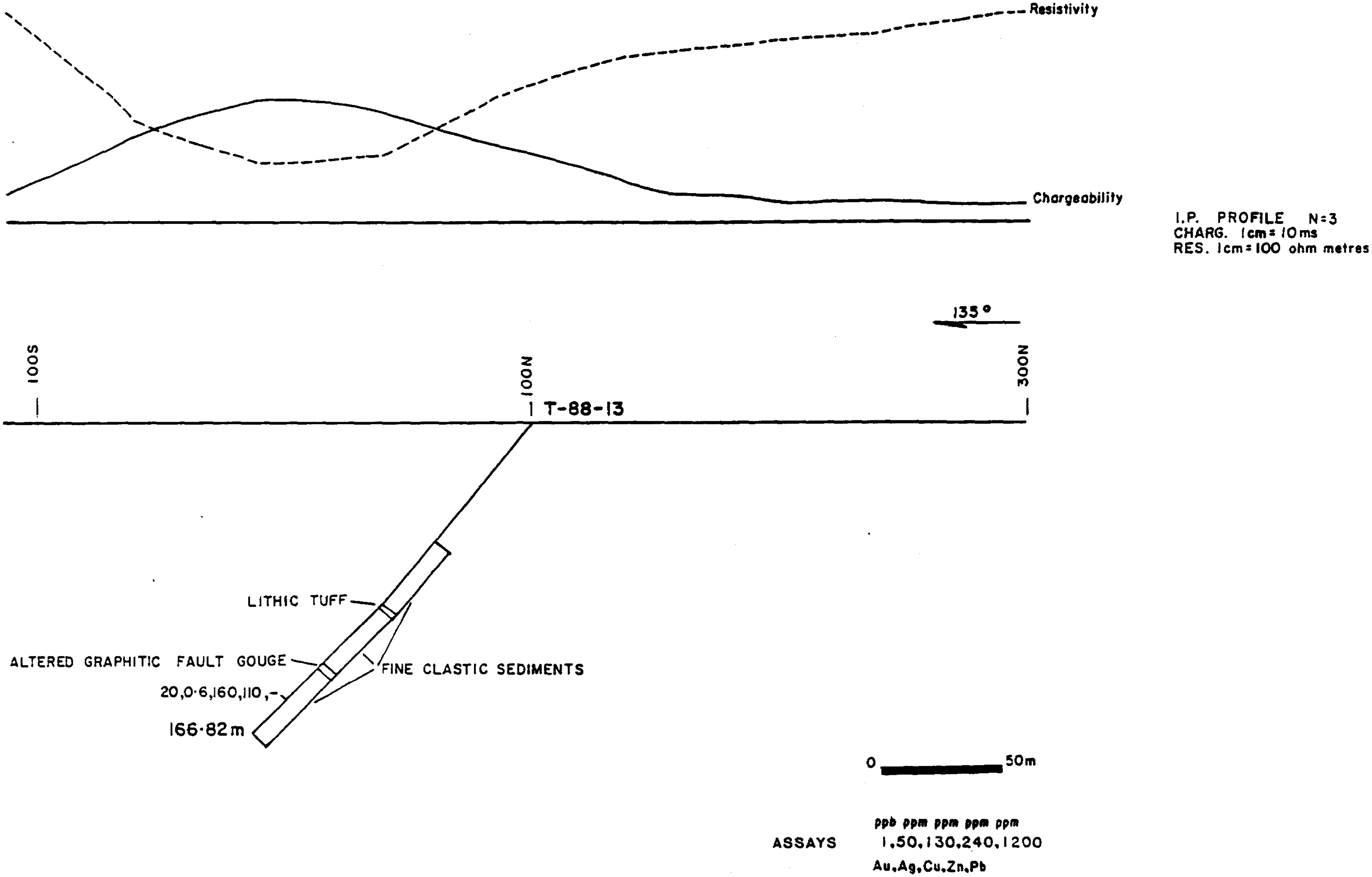
TWEED PROJECT
GRID 5 SECTION L22E
LOOKING WEST



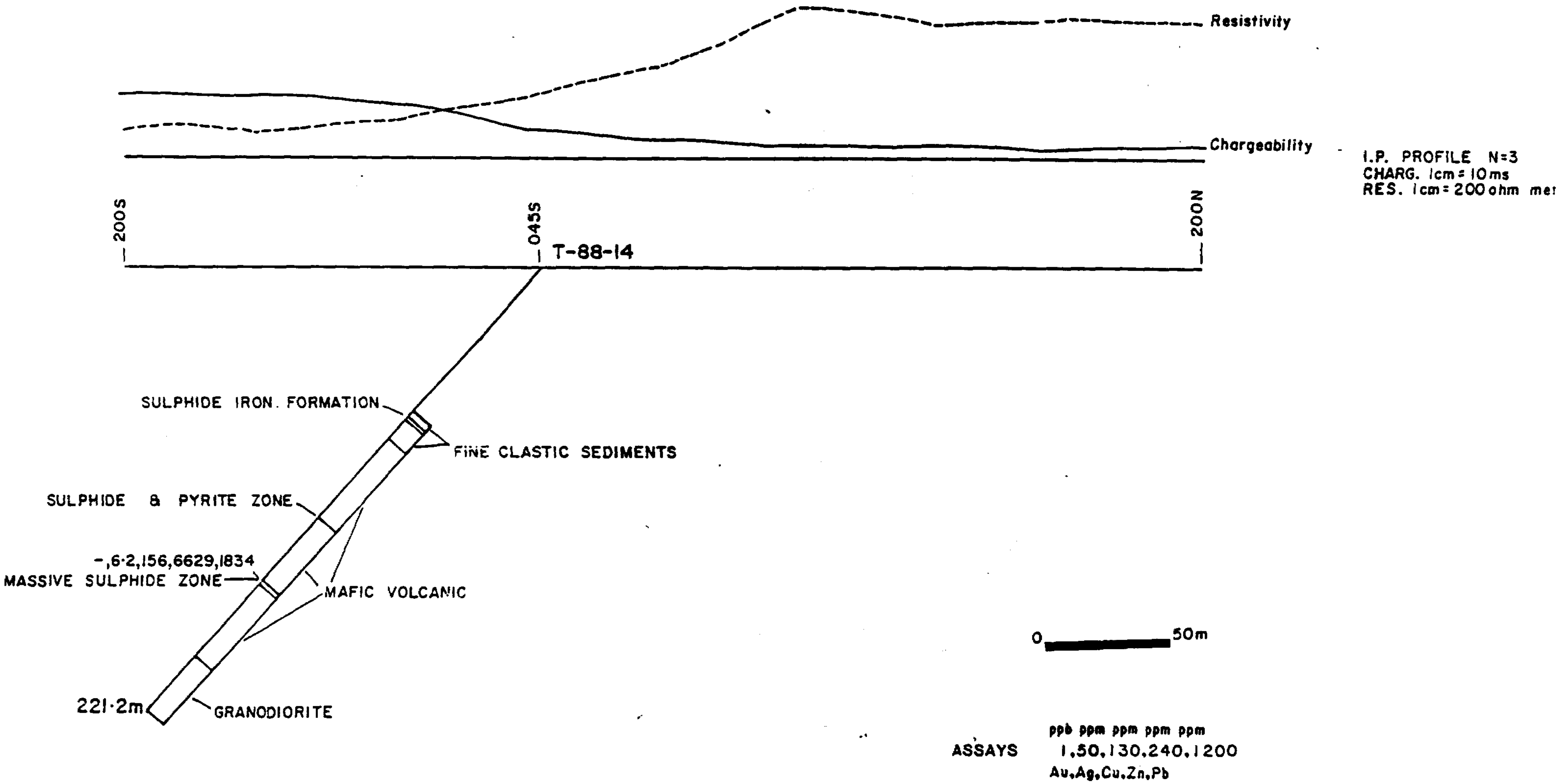
TWEED PROJECT
GRID 5 SECTION L17E
LOOKING WEST



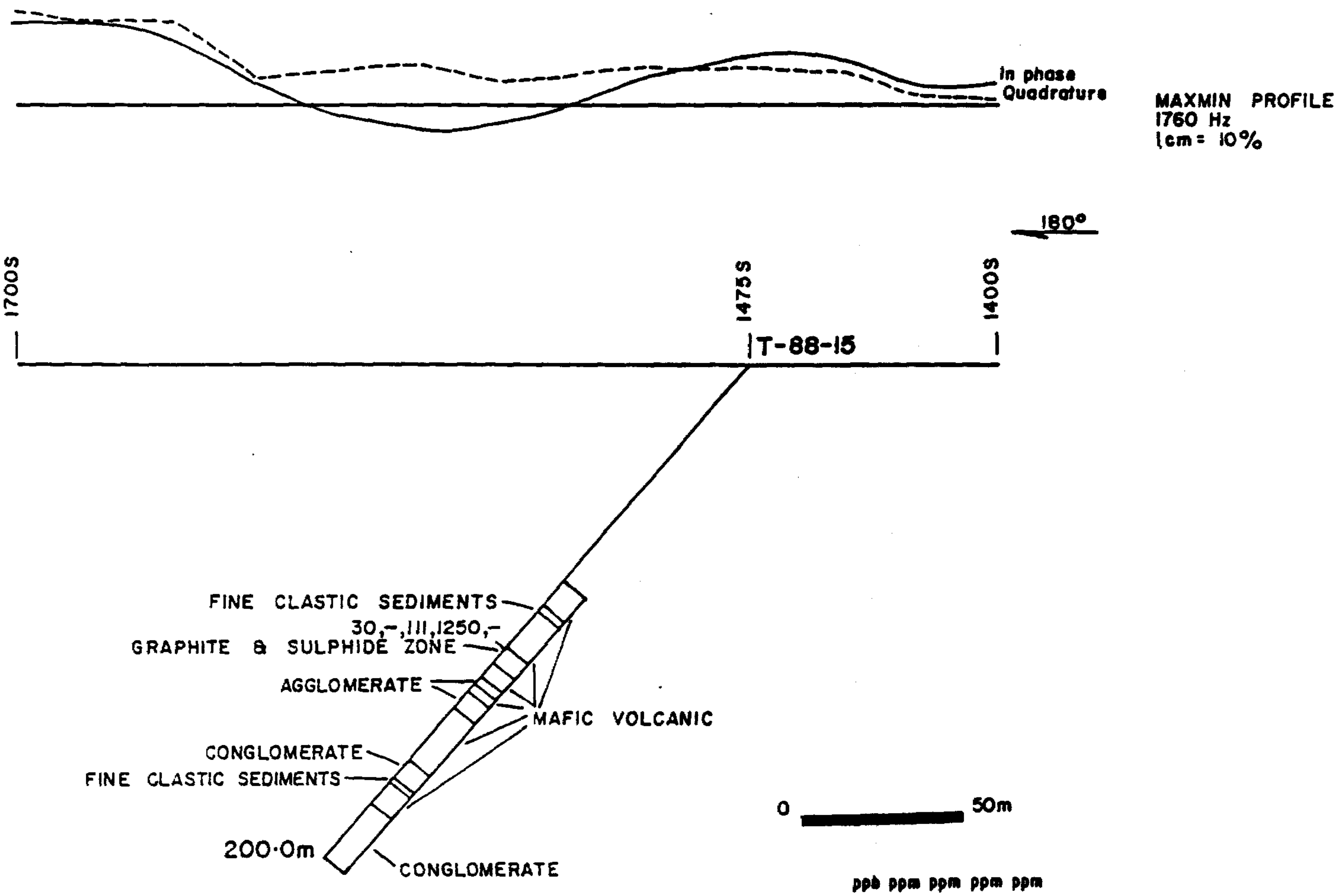
TWEED PROJECT
GRID 6 SECTION LOO
LOOKING WEST



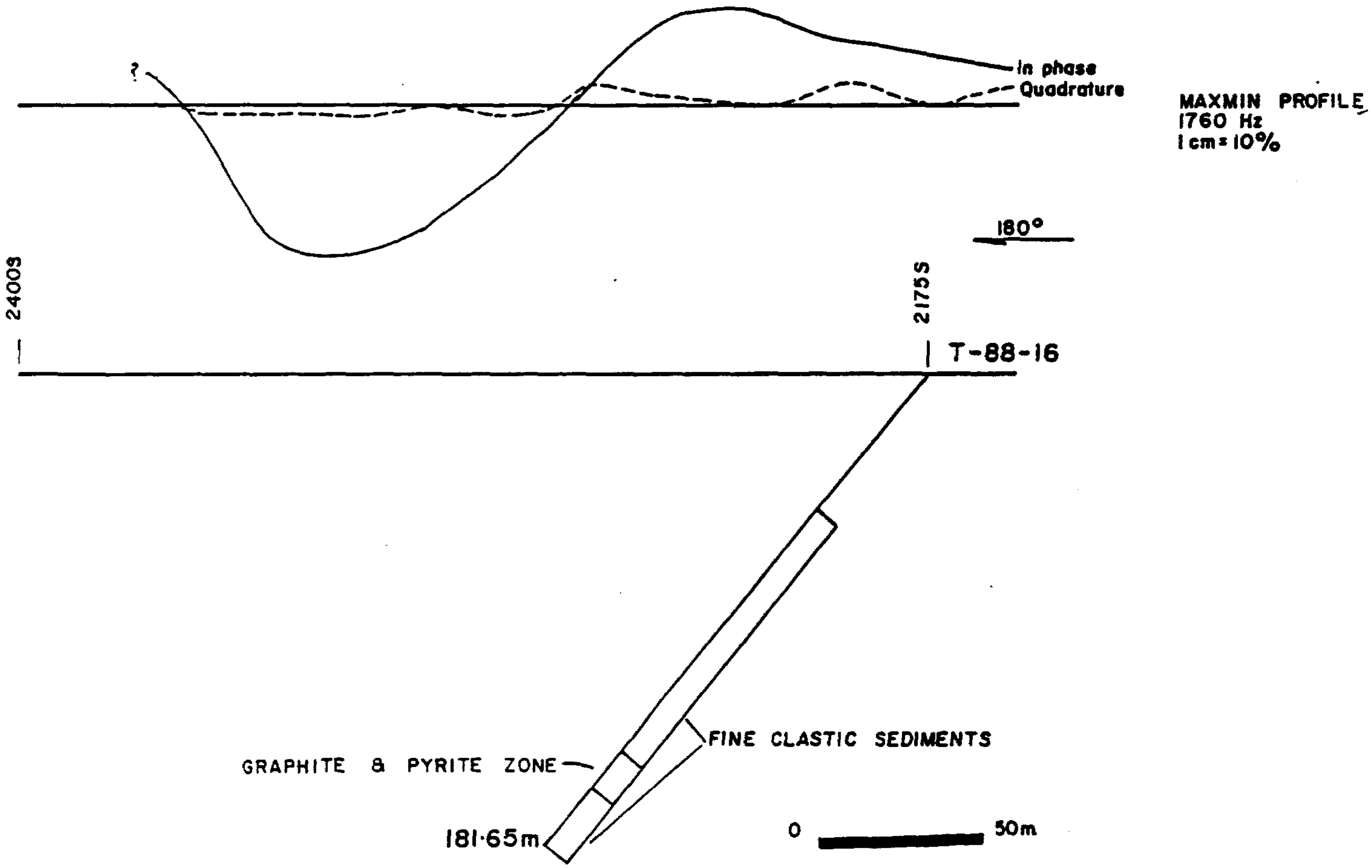
TWEED PROJECT
GRID 6 SECTION L10E
LOOKING WEST



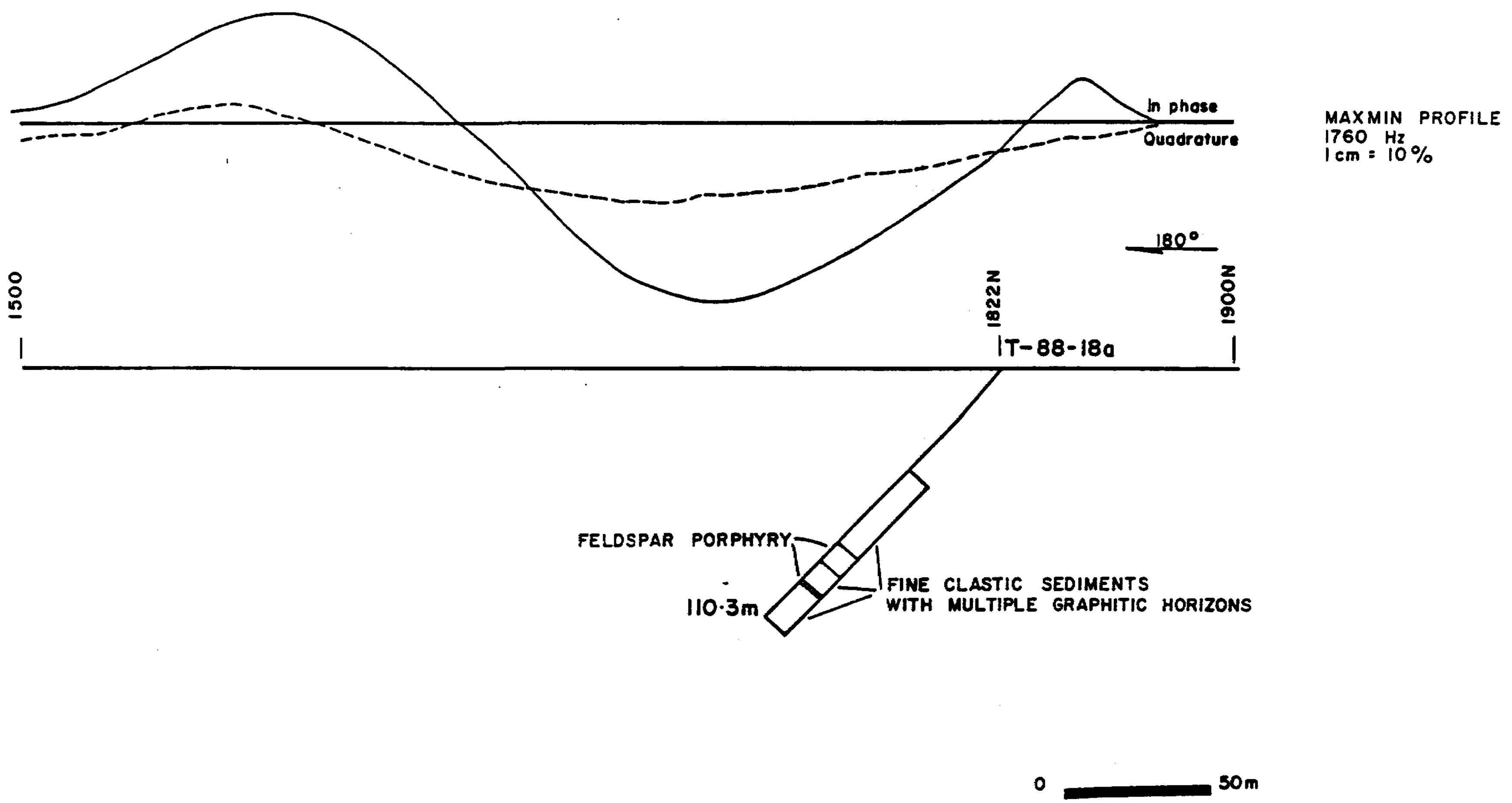
TWEED PROJECT
GRID 7 SECTION L28E
LOOKING WEST



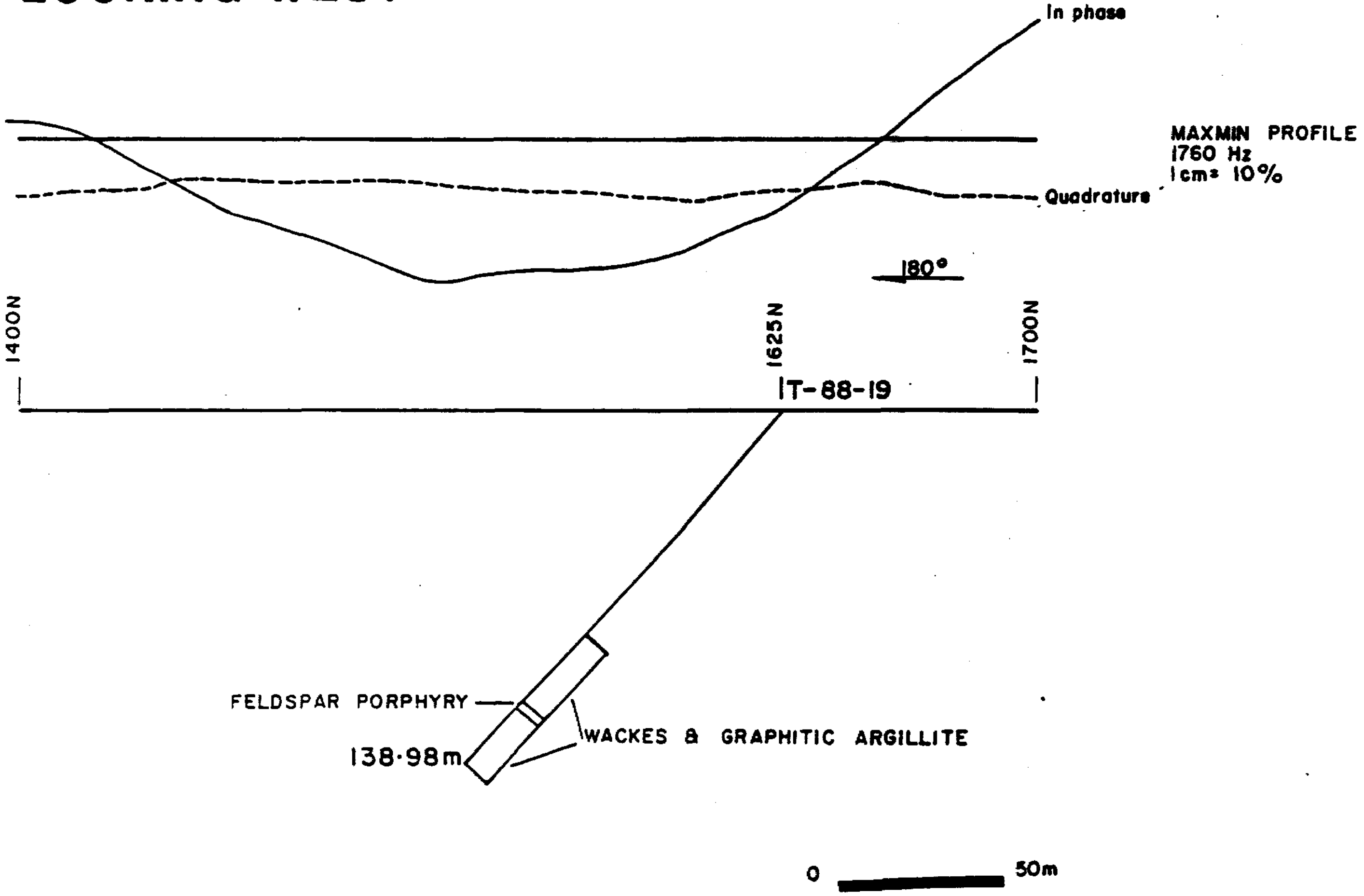
TWEED PROJECT
GRID 7 SECTION L28E
LOOKING WEST



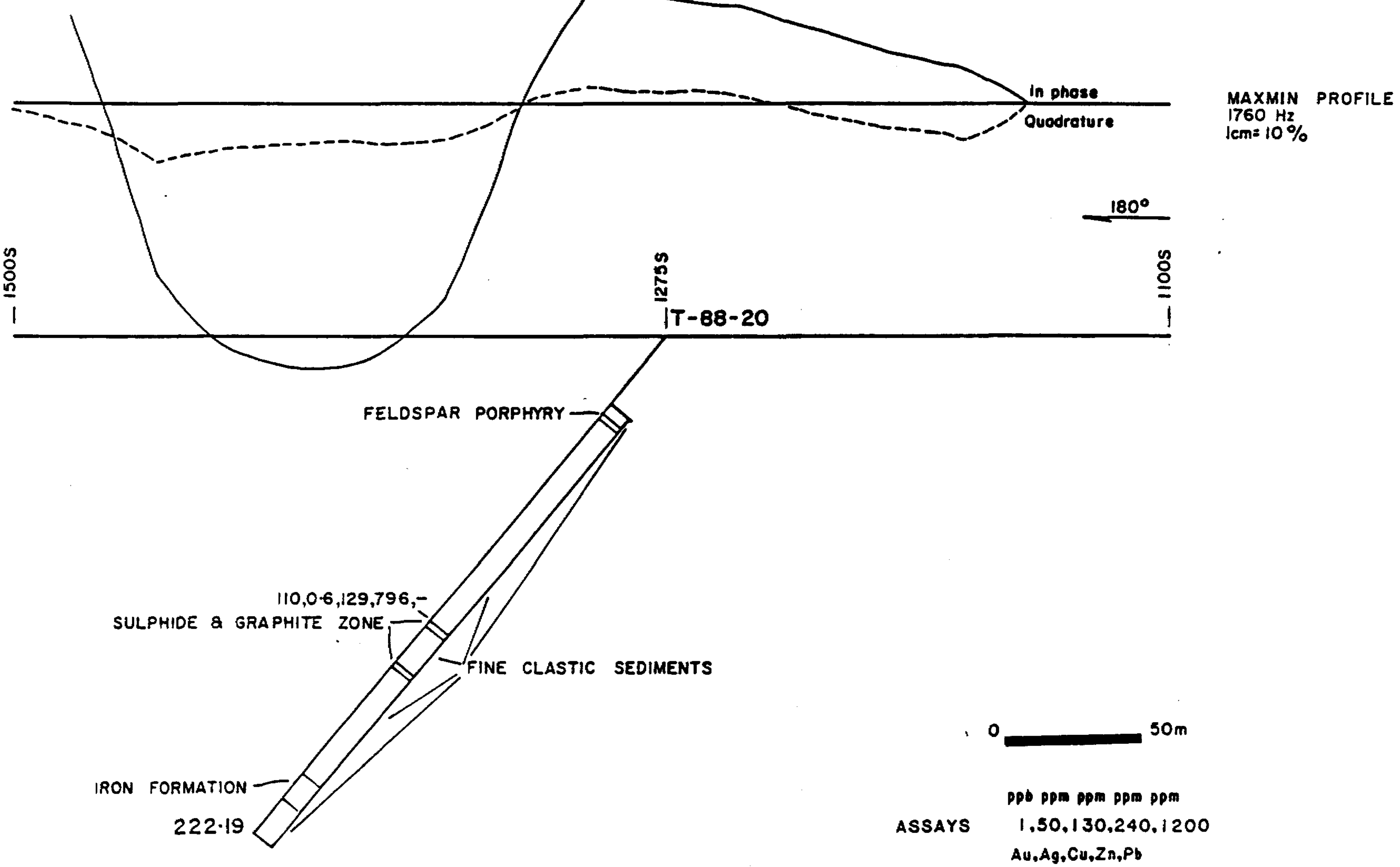
TWEED PROJECT
GRID 9 SECTION L16W
LOOKING WEST



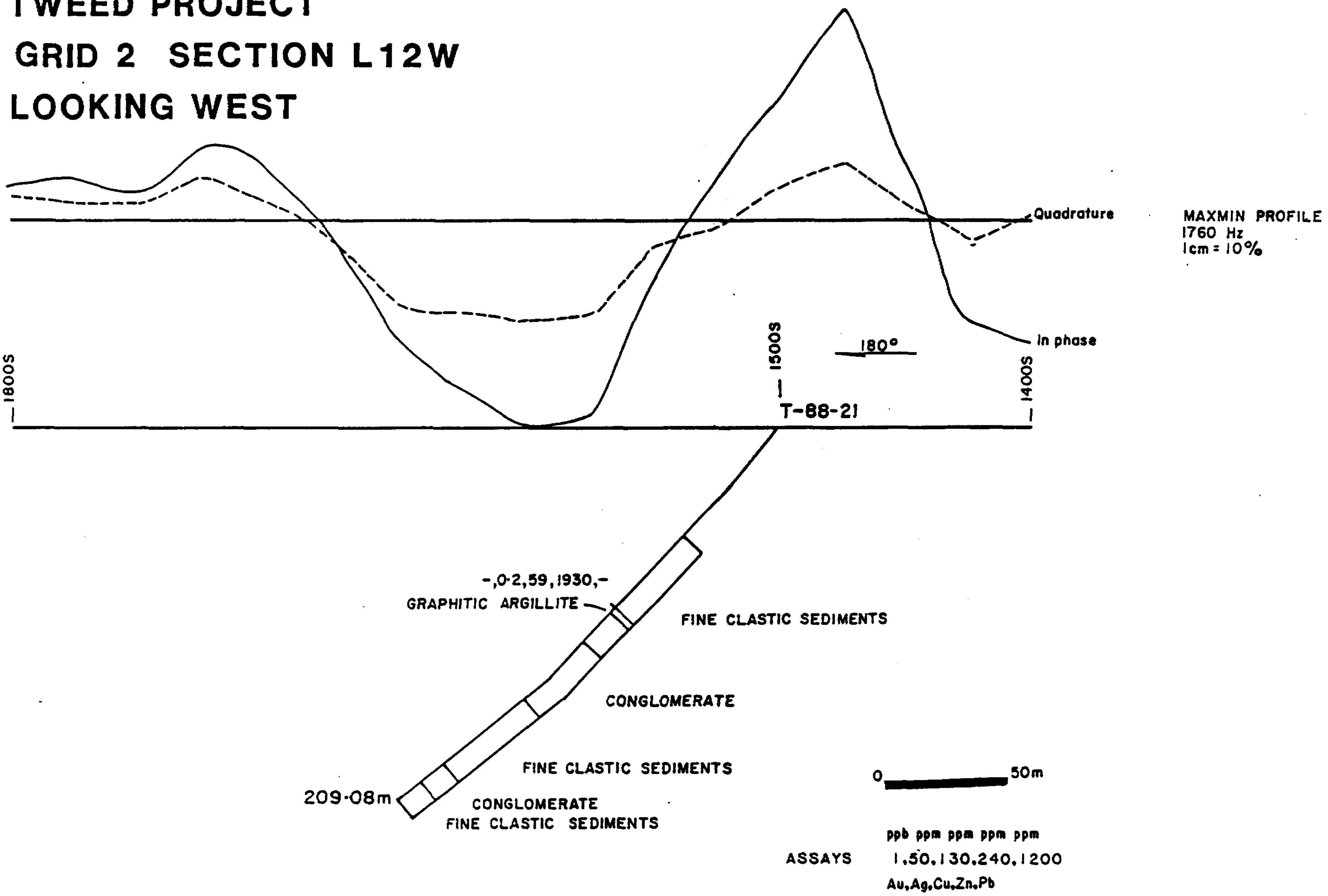
TWEED PROJECT
GRID 9 SECTION L18W
LOOKING WEST



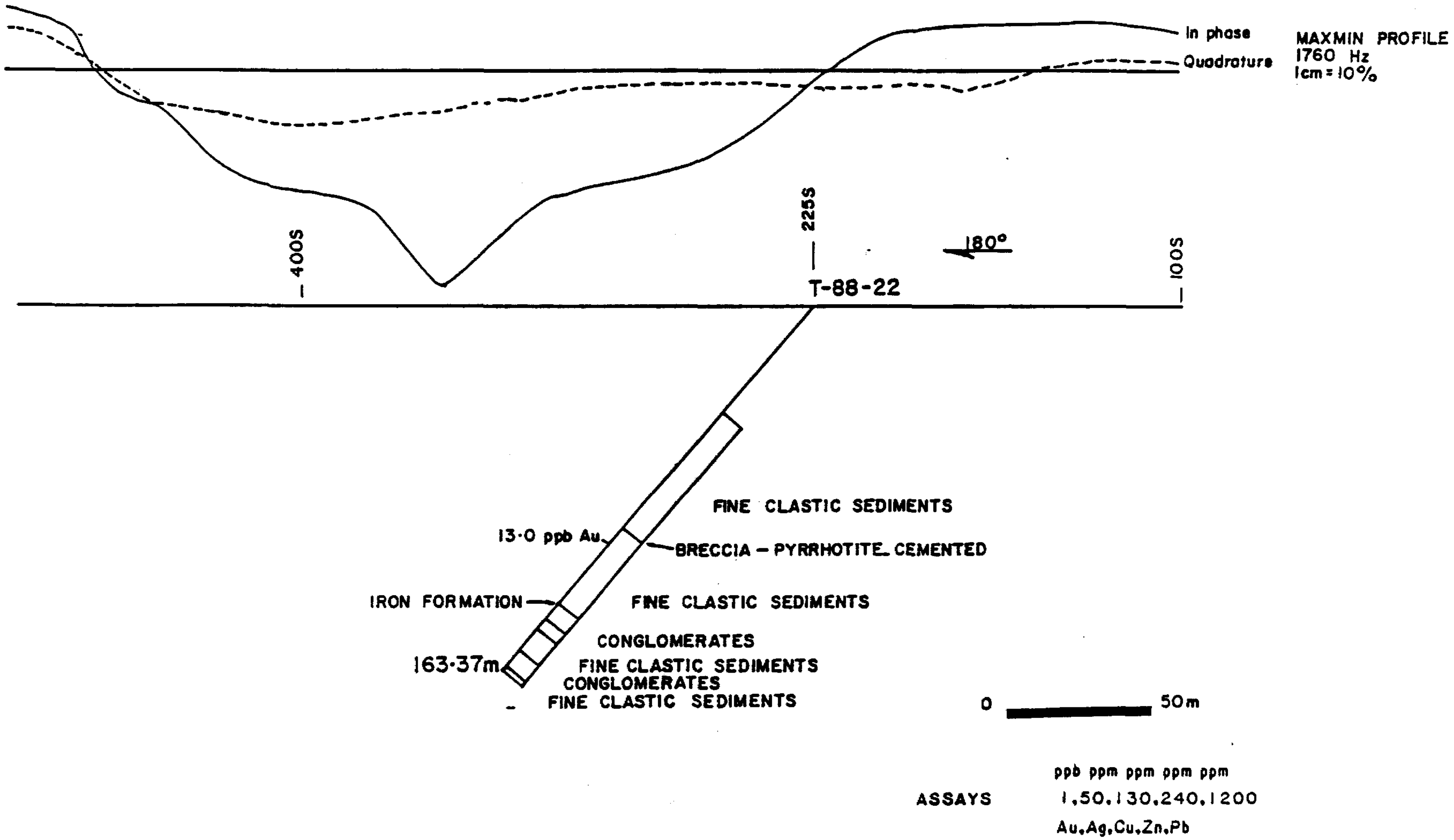
TWEED PROJECT
GRID 2 SECTION L10W
LOOKING WEST



TWEED PROJECT
GRID 2 SECTION L12W
LOOKING WEST



TWEED PROJECT
GRID 8 SECTION L44W
LOOKING WEST



GROUND MAGNETIC AND MAX-MIN II EM SURVEYS:RESULTS AND INTERPRETATIONS

TWEED PROJECT

OCTOBER - DECEMBER 1988

W.E. GLENN

JANUARY 1989

ABSTRACT

A series of geophysical surveys were conducted on the Chevron Resources, 385 claim property in Tweed and Blakelock Townships in October and November 1988. The magnetic and electromagnetic surveys were conducted to investigate in detail some of the interesting features outlined by a Dighem airborne magnetic and EM survey. Numerous conductors and magnetic highs, some coincidental, were outlined. Fourteen diamond drill holes tested some of these conductors, and one anomaly outlined in early 1988.

The work done on this property is only a start, and many promising targets remain to be examined.

INTRODUCTION

During the fall of 1988 a program of geophysical surveying was conducted over several grids on the 385 claim Tweed and Blakelock Townships property of Chevron Canada Resources Ltd optioned from Glen Auden Resources Limited. The work conducted consisted of line cutting, magnetic and electromagnetic surveying and diamond drilling.

The ground geophysical surveys were conducted to "follow-up" anomalies detected by airborne surveys over the property by Dighem Surveys in 1986. Grids were cut over selected airborne anomalies. A total of 46.3 km each of Max-Min EM and ground magnetic surveying was done.

LOCATION AND ACCESS

The property is located on the south half of the border between Tweed and Blakelock Townships, District of Cochrane, Ontario. The Detour Lake Mine Road crosses the west and north parts of the property, providing all season road access to the property. Access to the grid is aided by several winter roads established during earlier surveys and during the overburden drilling program in 1985 (Abernethy, 1986). Snowmobiles and helicopters were also used for access to the more remote parts of the grid.

REGIONAL GEOLOGY

The property is located in the Abitibi Greenstone Belt of the Superior Province of the Canadian Shield. The rocks consist mainly of Archean age metamorphosed volcanic and intercalated sedimentary units, intruded by mafic to intermediate or felsic bodies. No outcrop occurs on the property and geology is known from limited wide spaced drill holes and interpretation of magnetic maps (Jagodits, 1987, Cashin, 1989).

The regional metamorphism is dominantly greenschist facies with minor contact zones of amphibolite grade. The metavolcanic rocks are generally mafic to intermediate flows, pillowed flows, and pyroclastic breccias. There are lesser amounts of intermediate to felsic metavolcanics composed of tuffs and breccias with minor flows.

The metasedimentary rocks comprise interbedded greywacke, tuffs, siltstone, shale, and conglomerate. Sulphide and oxide facies iron formations form as a result of exhalative activity along metavolcanic flow interfaces.

The metavolcanics and metasediments have been intruded by Precambrian batholiths, stocks, and dikes of granite, diorite, and gabbro, and all of these rocks have been intruded by late Precambrian diabase dikes.

The geology is steeply dipping, and strikes generally east-west. It is an area of low relief and sparse outcrop, covered by Pleistocene tills and muskeg.

The "iron formations" are closely related to much of the gold mineralization as shown by the recent gold discoveries (Inco-Golden Knight's Golden Pond in Casa Berardi, Golden Hope in Estrades, and Newmont in Noseworthy Township). The gold occurs within several rock types, including oxide and sulphide iron formations, metasediments, and metavolcanics. Carbonate and silica alteration with pyritization is directly associated with the gold mineralization. Hence IP, EM, and magnetics can be useful tools to locate gold bearing drill targets.

SURVEY PROCEDURE

The survey was conducted with a Max Min II, a frequency domain horizontal loop electromagnetic system designed by Apex Parametrics. Two co-planar coils are carried along the survey line in an in-line fashion, separated by a fixed distance. One coil transmits a sinusoidally varying EM field at any of five available frequencies. This field sets up a secondary response in any conductors in the earth, and this secondary field, along with the transmitted primary are sensed on the second receiver coil. A cable linking the two coils provides a phase reference signal between the transmitter and receiver, and a communications link.

The measured secondary field is some fraction of the original primary, and is phase-shifted in time. This field is resolved into two components, in phase having the same phase as the primary field, and quadrature, which is shifted by a phase angle of 90°. Both components are measured as a percentage of the primary field.

Multiple frequencies are used to improve the information gathered by the system. The higher frequencies respond more strongly to weak conductors than the low frequencies, while the low frequencies provide greater depth penetration and more accurate responses to stronger conductors. Two frequencies were used, 440 Hz and 1760 Hz.

Depth penetration is also a function of coil separation. Greater coil separation increases the depth of exploration, but reduces resolution and decreases the signal-to-noise ratio. A generally accepted rule of thumb is that the dept of exploration is roughly equal to half of the coil separation. (This depth depends on host rock and overburden conductivities). A 100 m coil separation was used. Grid 2,7, 8, and 9 were surveyed. Grids 1, 3, 4, and 6 were surveyed in an earlier program Hislop (1988). The total magnetic field was measured at 25 m intervals and 12.5 m intervals over higher anomalies.

INTERPRETATION OF RESULTS

GRID 2

Grid 2 was established south-west of Four Island Lake, and south of the South Floodwood River. A total of 13.5 km of lines were cut and surveyed (Map 1). Magnetic and EM surveys were completed on a 200 m line spacing. Both surveys gave a strong, double anomaly (see Maps 2 and 3) that converged from east to west suggesting a fold closure. The southern limb is more conductive whereas the northern limb is associated with a weak magnetic high. The coincident magnetic and EM signature could be due to pyrohotile in a massive sulphide zone. Both limbs were selected as drill targets.

GRID 7

Grid 7 was positioned to cover a coincident weak airborne EM and magnetic anomaly in the south-eastern part of the property (Map 1). A total of 8.2 km of grid was cut on 100 m spaced lines. All lines were surveyed with magnetics and Max-Min II. Weak east-west EM conductors bordering magnetic highs were outlined about 1600 S and 2300 S (Maps 4 and 5). Both anomalies were selected as drill targets.

GRID 8

Grid 8 was positioned over a fold feature interpreted from aeromagnetic data. A total of 12.4 km was surveyed. The magnetic data (Map 6) suggest two high magnetic units trending east-west converge about 4950 W. The associated EM conductors (Map 7) suggest the units converge and combine weakly to the west end of the grid at about 200 S on 5100 W. Also, the conductor is coincident with the magnetic high on the south "limb" and the two anomalies are offset on the north limb. The south limb is interpreted to contain more massive sulphides.

A third anomaly trending east-west at 600 S between 4300 W and 4900 W is both conductive and magnetic. It is interpreted to be a small massive sulphide zone.

All three conductors were selected for drilling but only the lower fold limb was drilled in the 1988 program.

GRID 9

The airborne survey showed several weak, coincident east-west trending EM and magnetic high anomalies north of the Detour Lake Road where it crosses the northern part of claim group (Map 1). A total of 12.4 km of grid was cut on 100 m spaced lines. Ground magnetic and Max-Min II EM surveys were completed on all lines (Maps 8 and 9). One east-west conductor either is offset about 1600 N and 1650 W or is two en echelon conductors, one at 1700 N and one at 1500 N.

The magnetic data would support an interpretation of a north-west fault offsetting the conductor. The conductor itself is not magnetic. A drill hole was planned to test the conductor.

CONCLUSIONS AND RECOMMENDATIONS

This property exhibits geophysical signatures in EM and magnetics very similar to those observed over the Casa Berardi deposits, and much work remain to be done before its potential can be completely assessed.

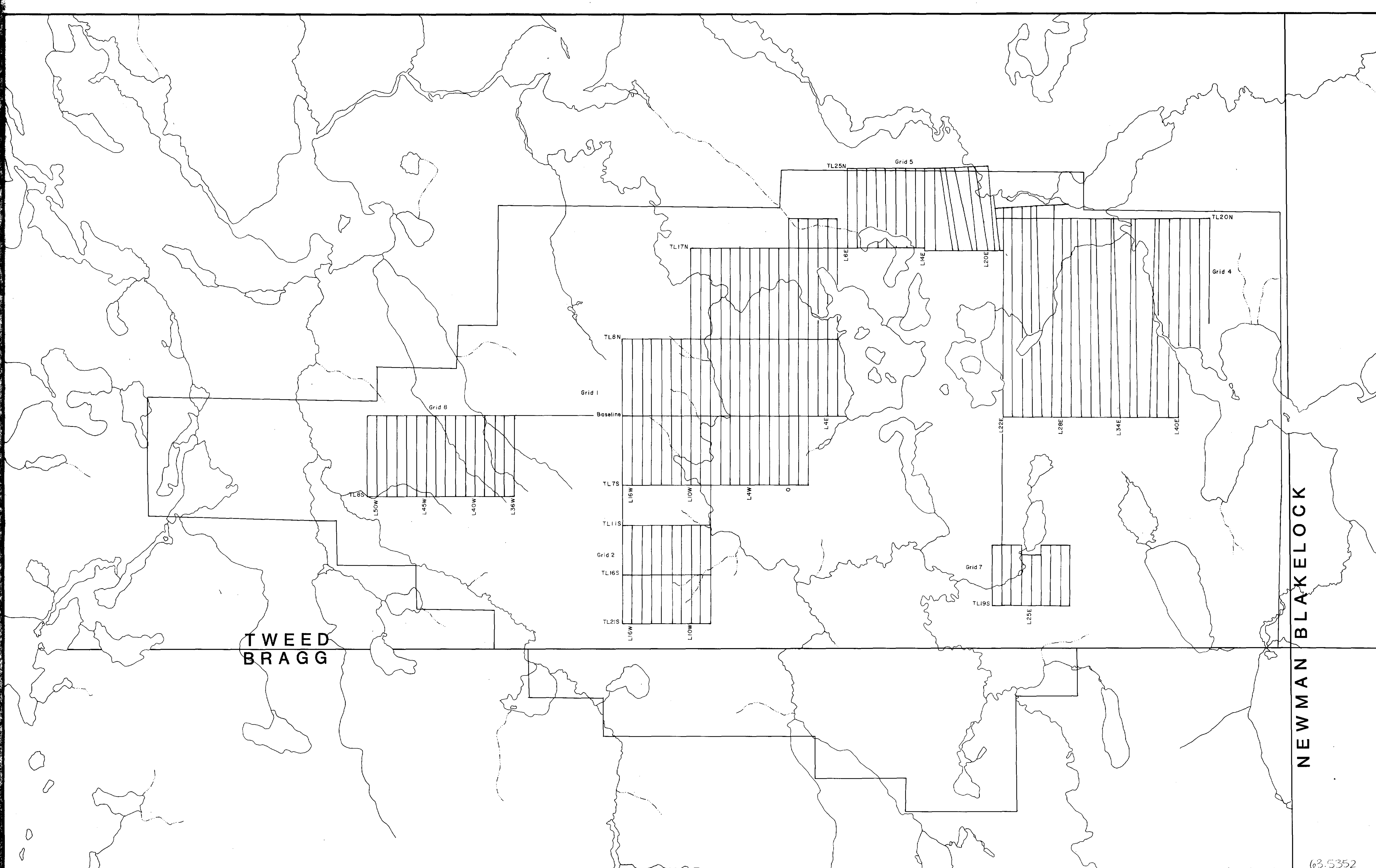
The diamond drill results have been reported by Cashin (1989) and each case the conductors were "explained" by massive sulphides or graphite. Additional drilling of anomalies on Grids 6, 2, and 8 should be done.

REFERENCES

Abernety, R.K. 1986, Glen Auden Resources Limited
Report on Reverse Circulation Overburden Drilling in Tweed Township, Ontario

Cashin, P. 1989, Tweed Project
Exploration Summary Report
October to December, 1988
Tweed and Blakelock Townships, Ontario

Jagodits, F.L. 1987, Preliminary Report
The Interpretation of Multi-Sensor Helicopter Borne Surveys, Tweed
Blakelock and Bragg Townships
Excalibur International Consultants Ltd.



Om88-258

63.5352

Chevron Canada Resources Limited
Minerals Staff

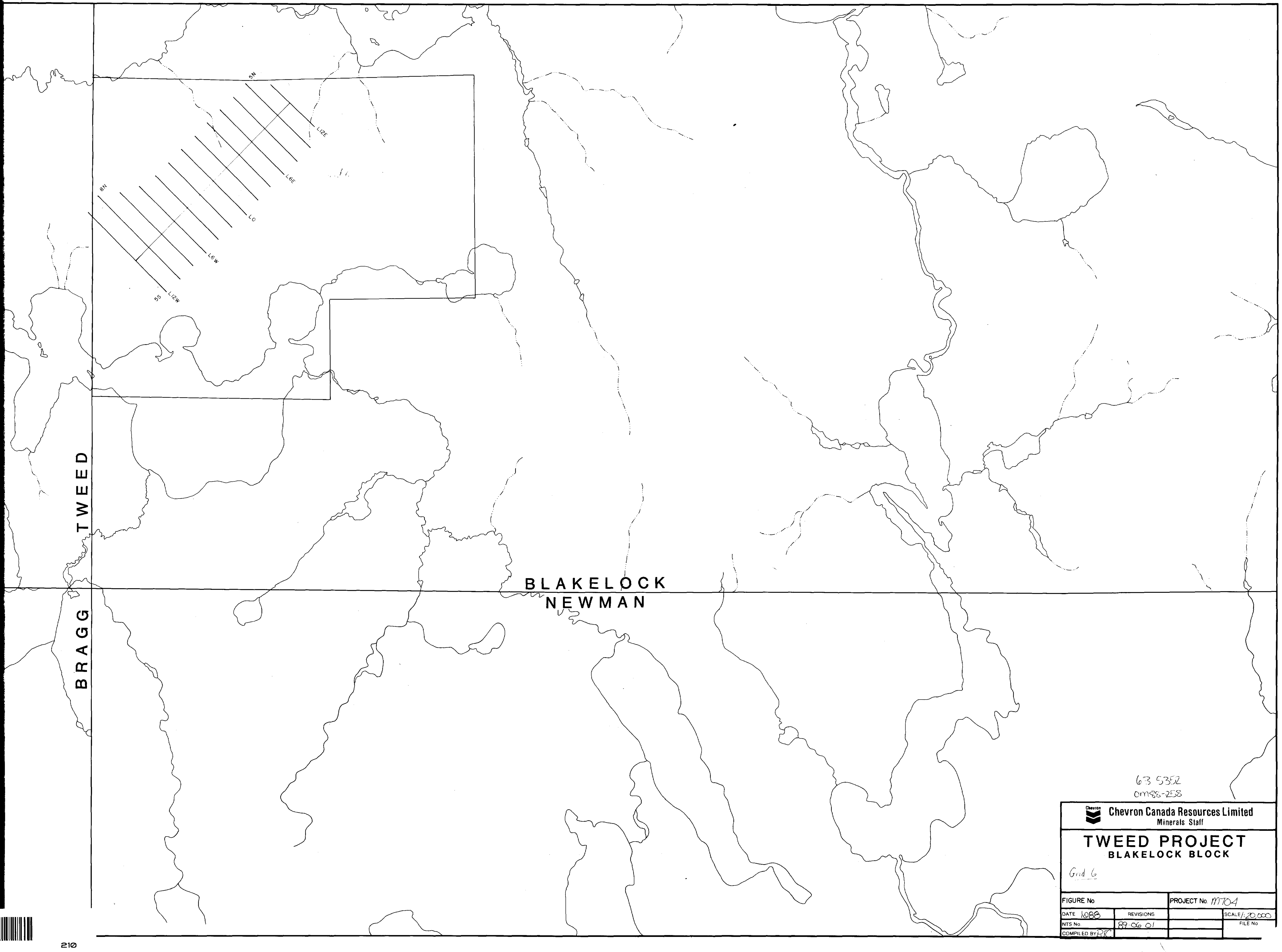
TWEED PROJECT
TWEED BLOCK

MAP 1		PROJECT No. M593	
DATE 1988	REVISIONS		SCALE 1:20,000
NTS No.	SW 89-06-01		FILE No.
COMPILED BY PJC			

42H09SE0015 63.5352 TWEED

200

M593 · Tweed



63 5352
OM88-258

Chevron Canada Resources Limited
Minerals Staff

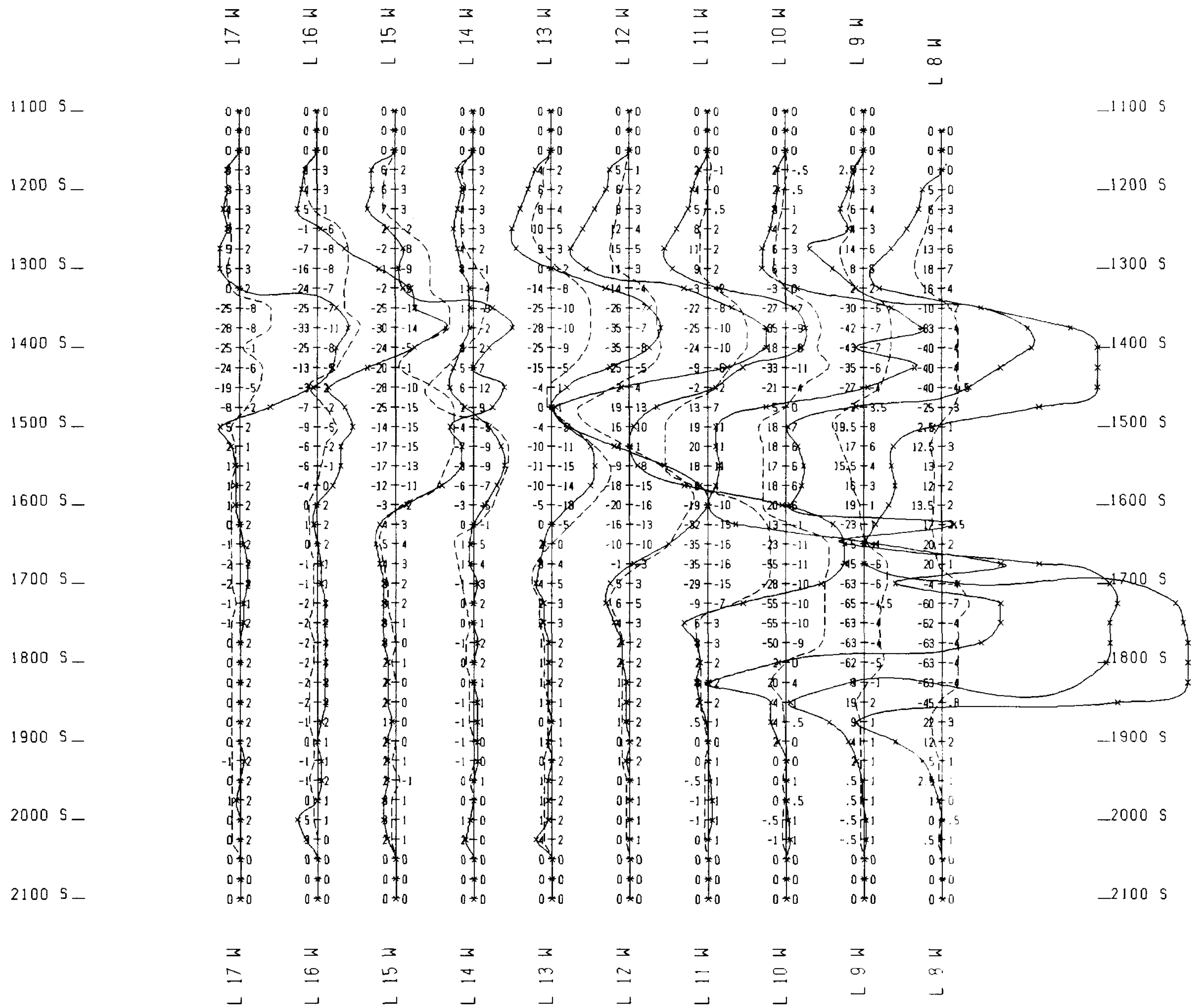
TWEED PROJECT
BLAKELOCK BLOCK

Grid 6

FIGURE No.		PROJECT No. M704	
DATE 1088	REVISIONS		SCALE 1:20,000
NTS No.	89·06·01		FILE No
COMPILED BY RTC.			

210

M593 Tweed.



MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3399
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE ——×——×——×
QUADRATURE – – – – – –

COIL SEPARATION 100 m.

+10%
0
-10%

POSTING IN PHASE / QUADRATURE

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352

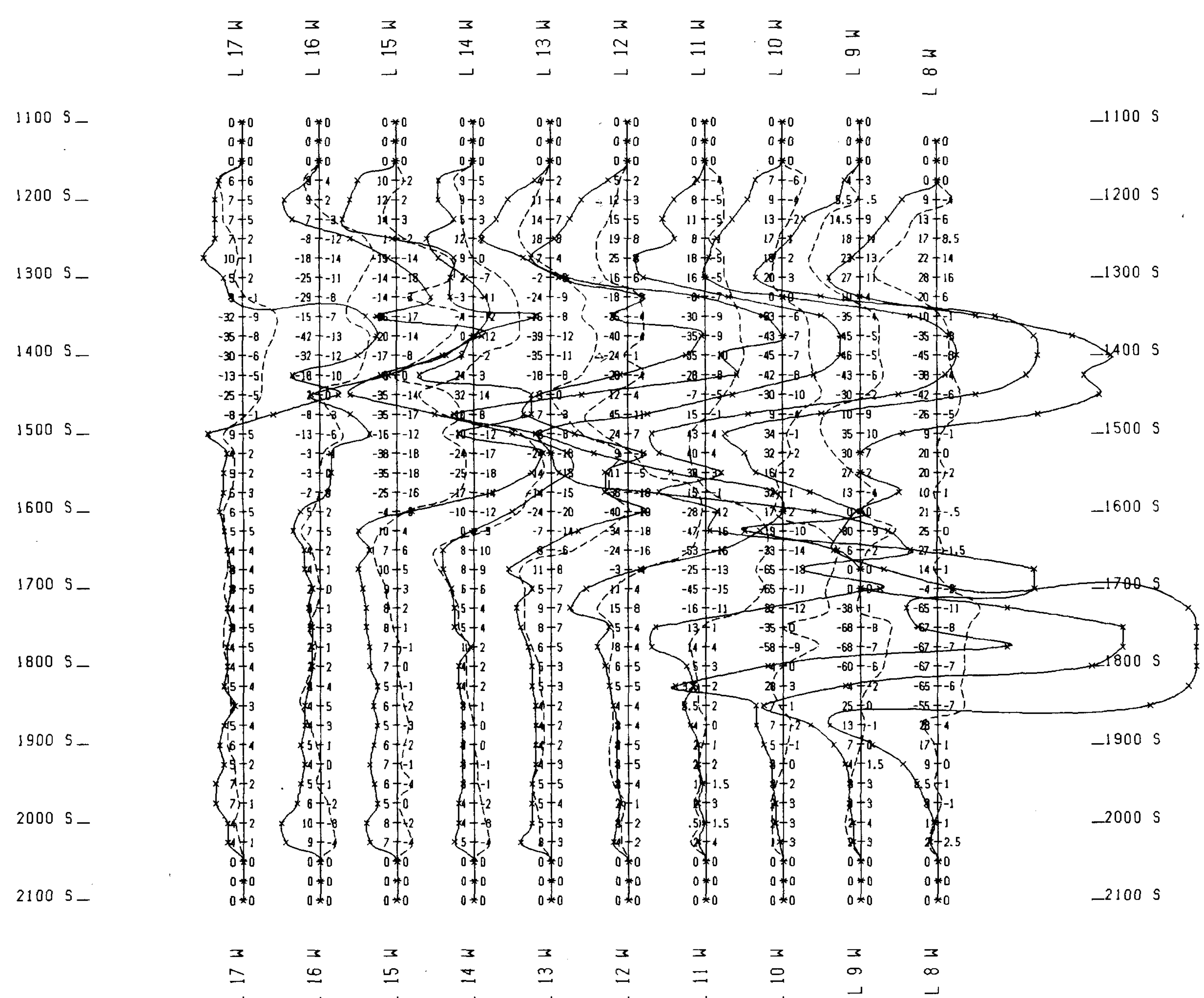
OM88-258

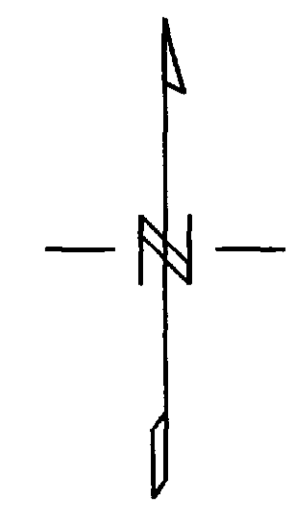
ROBERT S. MIDDLETON EXPLORATION SERVICES INC.	
For CHEVRON MINERALS LTD.	
Title GRID 2 MAXMIN SURVEY (440 Hz) Tweed Township, Ont.	
Date: November 1988	MAP 3A
Operator: T. McAllister	Job # M-63

he Earth Sciences

42H08SE0015 63.5352 TWEED

220

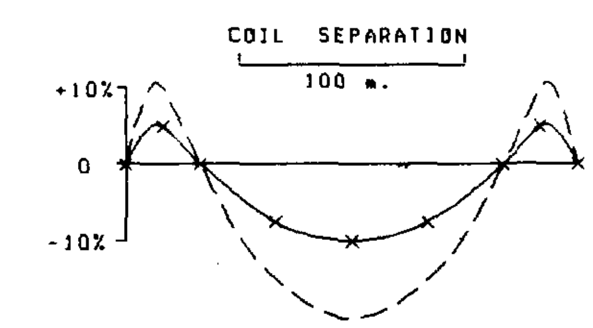




MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3399
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE
QUADRATURE



POSTING: IN PHASE / QUADRATURE

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

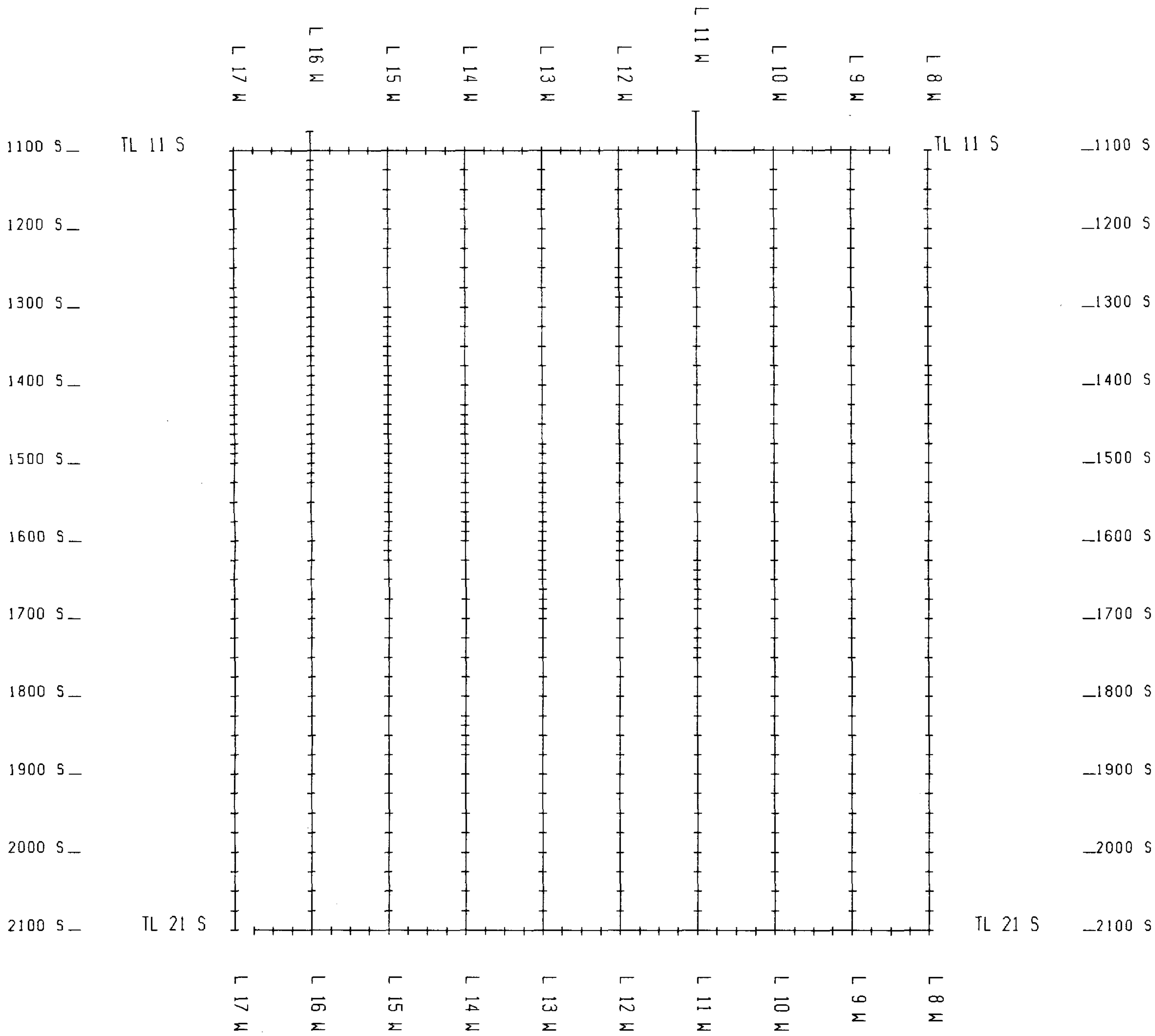
63.5352
Om83-258

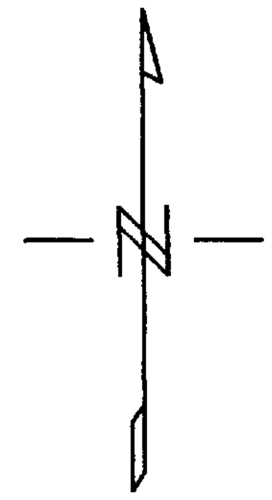
ROBERT S. MIDDLETON EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title GRID 2
MAXMIN SURVEY (1760 Hz)
Tweed Township, Ont.

Date: November 1988	MAP 3B
Operator: T. McAllister	Job # M-63





CONTOUR INTERVALS

20

100

500

2500

BASE LEVEL 58,000 nT REMOVED

INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS

WIDE MAGNETIC MODELS

INTERPRETED CONTACT

INTERPRETED FAULT

TOPOGRAPHY

CLAIM POST (located)

CLAIM POST (position approx.)

LAKE

STREAM

SWAMP

ACCESS ROAD

BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352

Om88-258

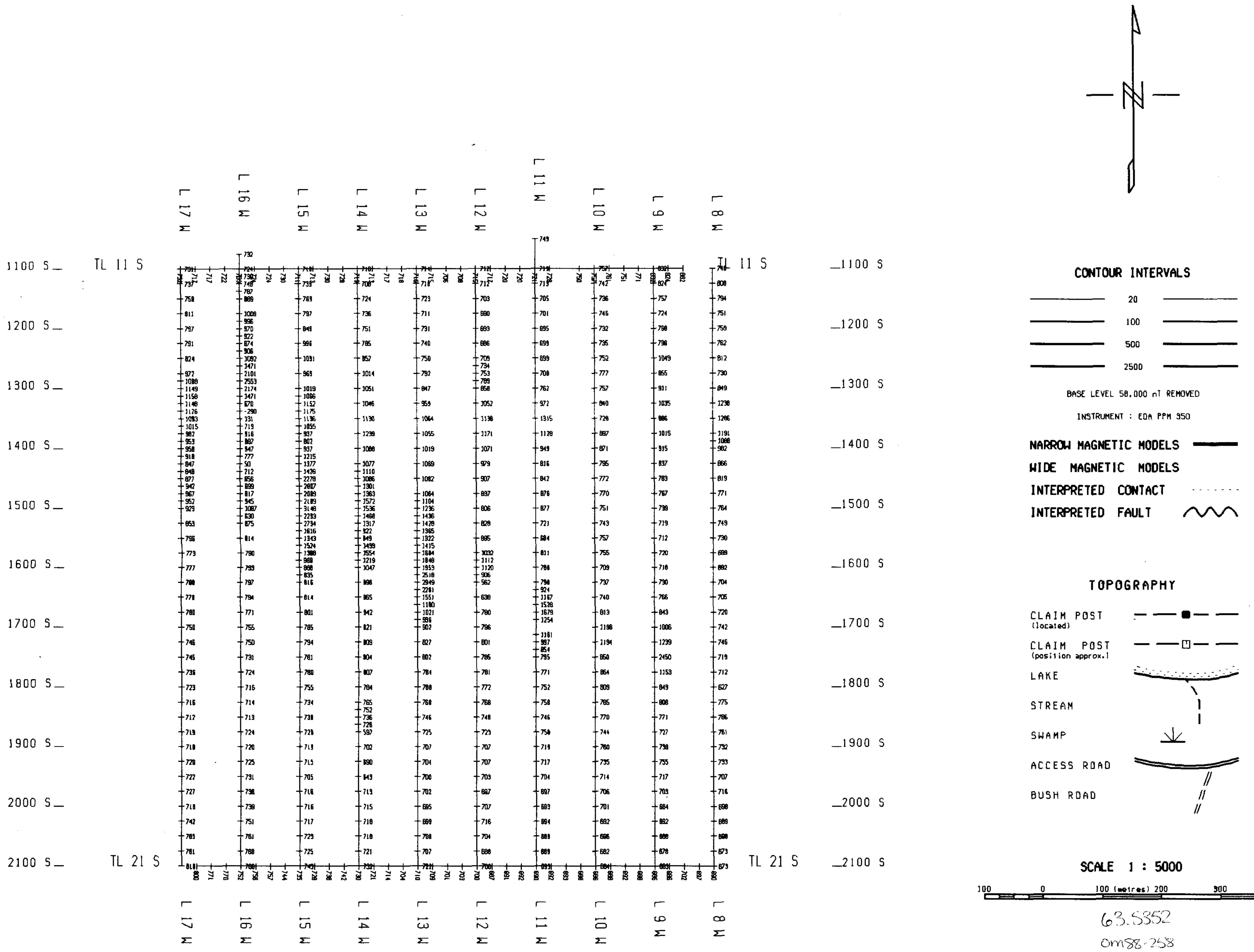
ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 2
MAGNETIC SURVEY

Date: November 1988	N.T.S.:
Operator: T.McAllister	Job # M-63

240



63.5352

OM88-258

ROBERT S. MIDDLETON EXPLORATION SERVICES INC.

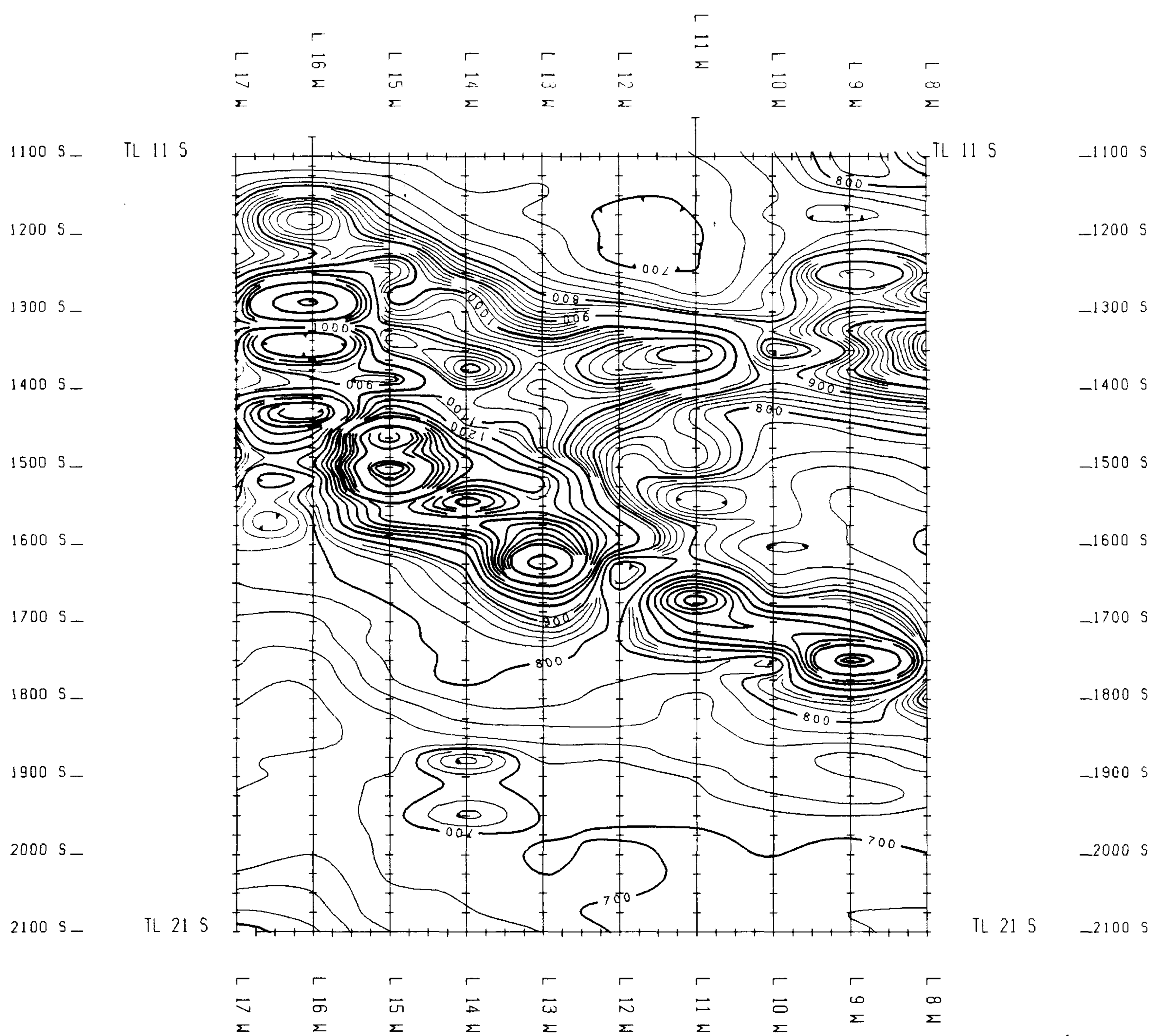
For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 2
MAGNETIC SURVEY

Date: November 1988	N.T.S.:
Operator: T. McAllister	Job # M-63

42H09SE0015 63.5352 TWEED

250



CONTOUR INTERVALS

20
100
500
2500

BASE LEVEL 58,000 nT REMOVED

INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS
WIDE MAGNETIC MODELS
INTERPRETED CONTACT
INTERPRETED FAULT

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

M593 Tweed.

635352

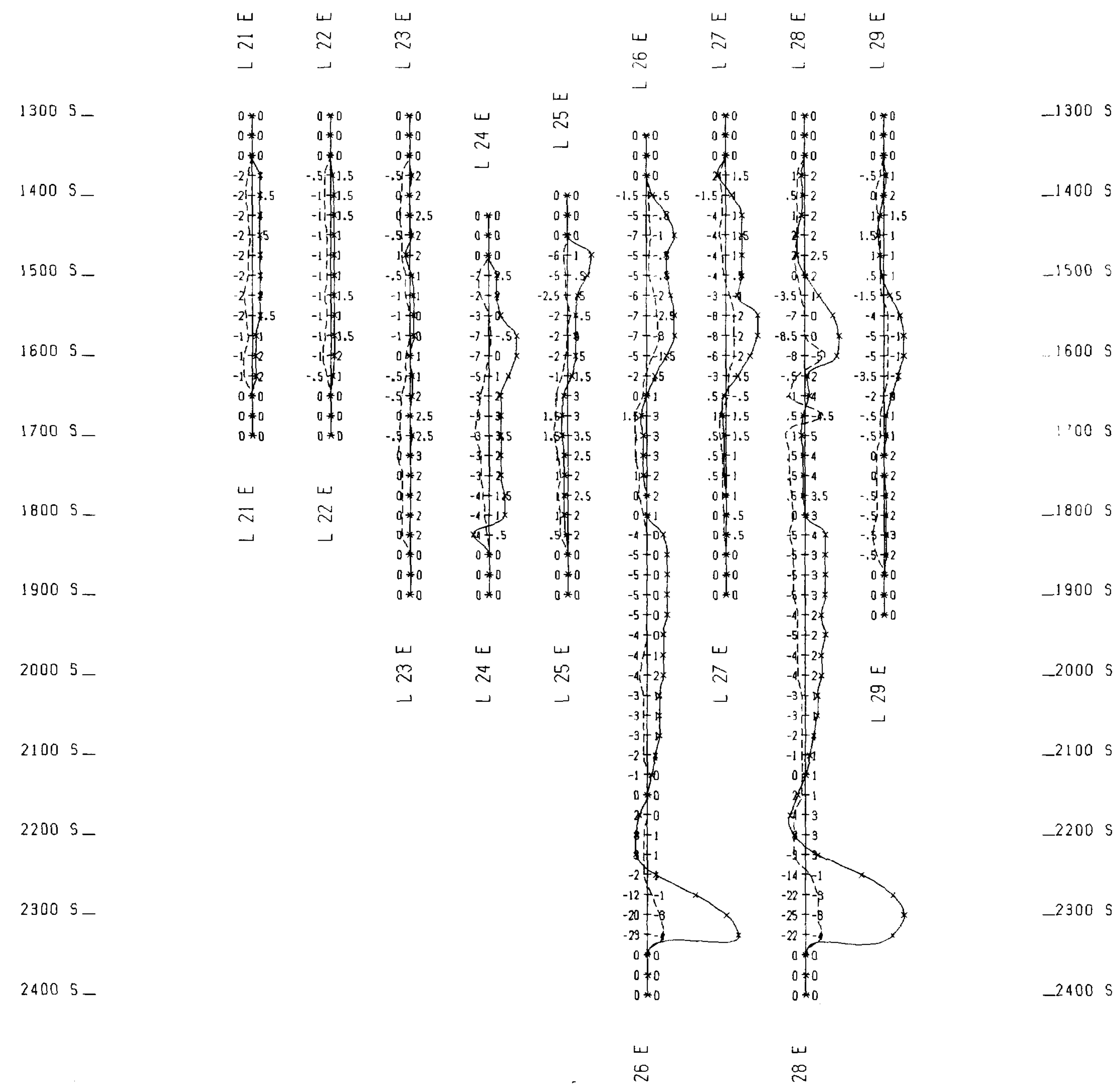
OM88-258

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 2
MAGNETIC SURVEY

Date: November 1988	MAP 2
Operator: T. McAllister	Job # M-63



MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3399
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE
QUADRATURE

COIL SEPARATION 100 m.
+10%
0
-10%

POSTING IN PHASE / QUADRATURE

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352

OM88-258

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

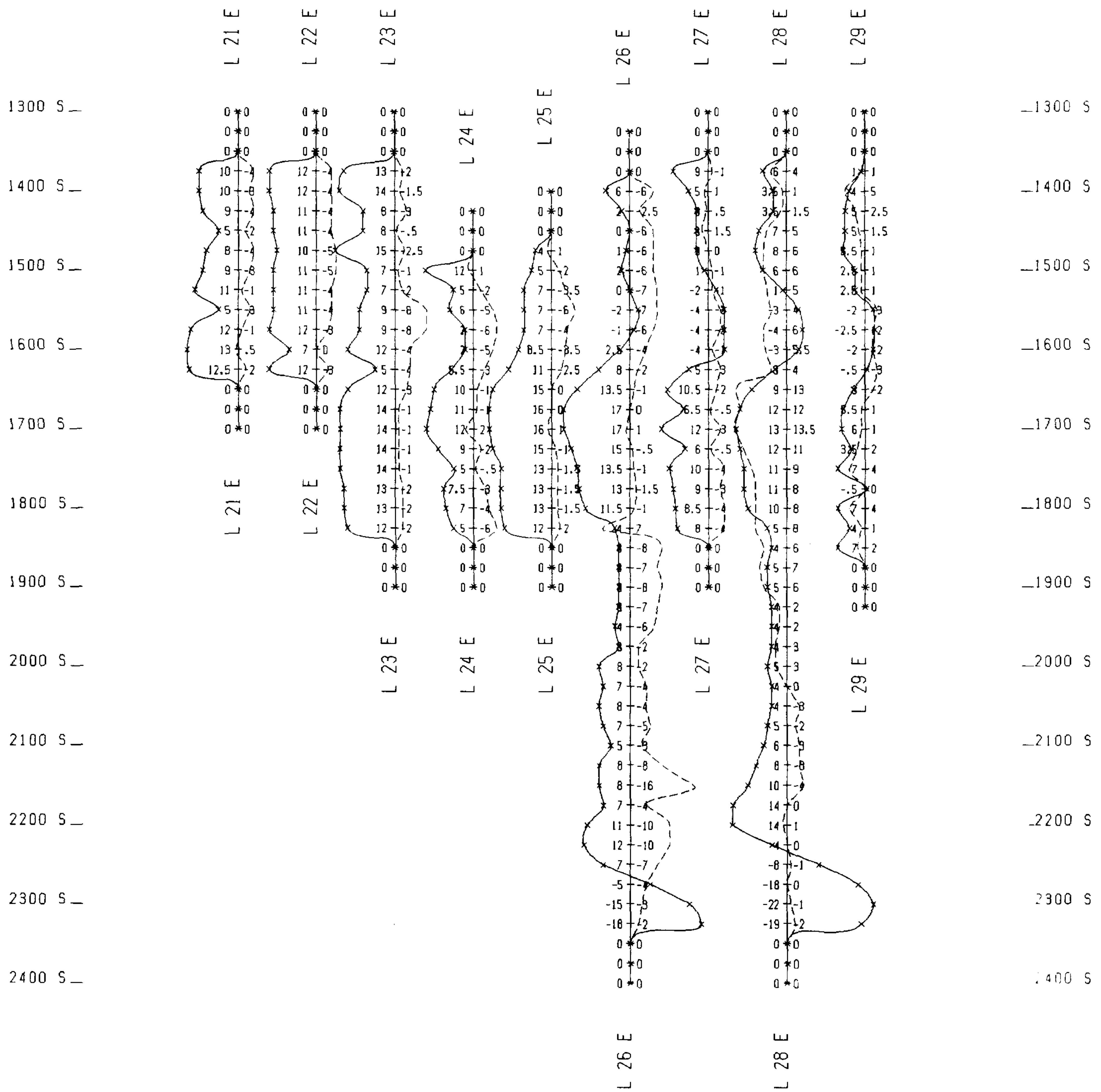
Title GRID 7
MAXMIN SURVEY (440 Hz)
Tweed Township, Ont.

Date: November 1988 | MAP 5A
Operator: T. McAllister | Job # M-63

M593 Tweed Grid 7 MaxMin (440)

42H09SE0015 63.5352 TWEED

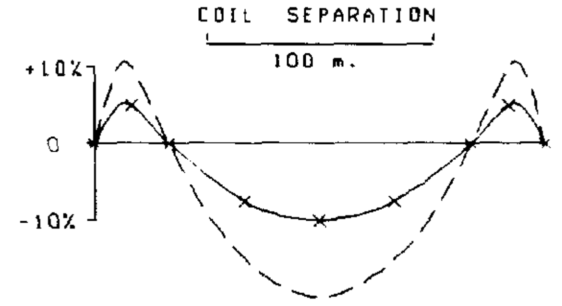
270



MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3399
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE ×——×——×——×
QUADRATURE – – – – – – –



POSTING $\frac{\text{IN PHASE}}{\text{QUADRATURE}}$

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352
OM88-258

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For
CHEVRON MINERALS LTD.

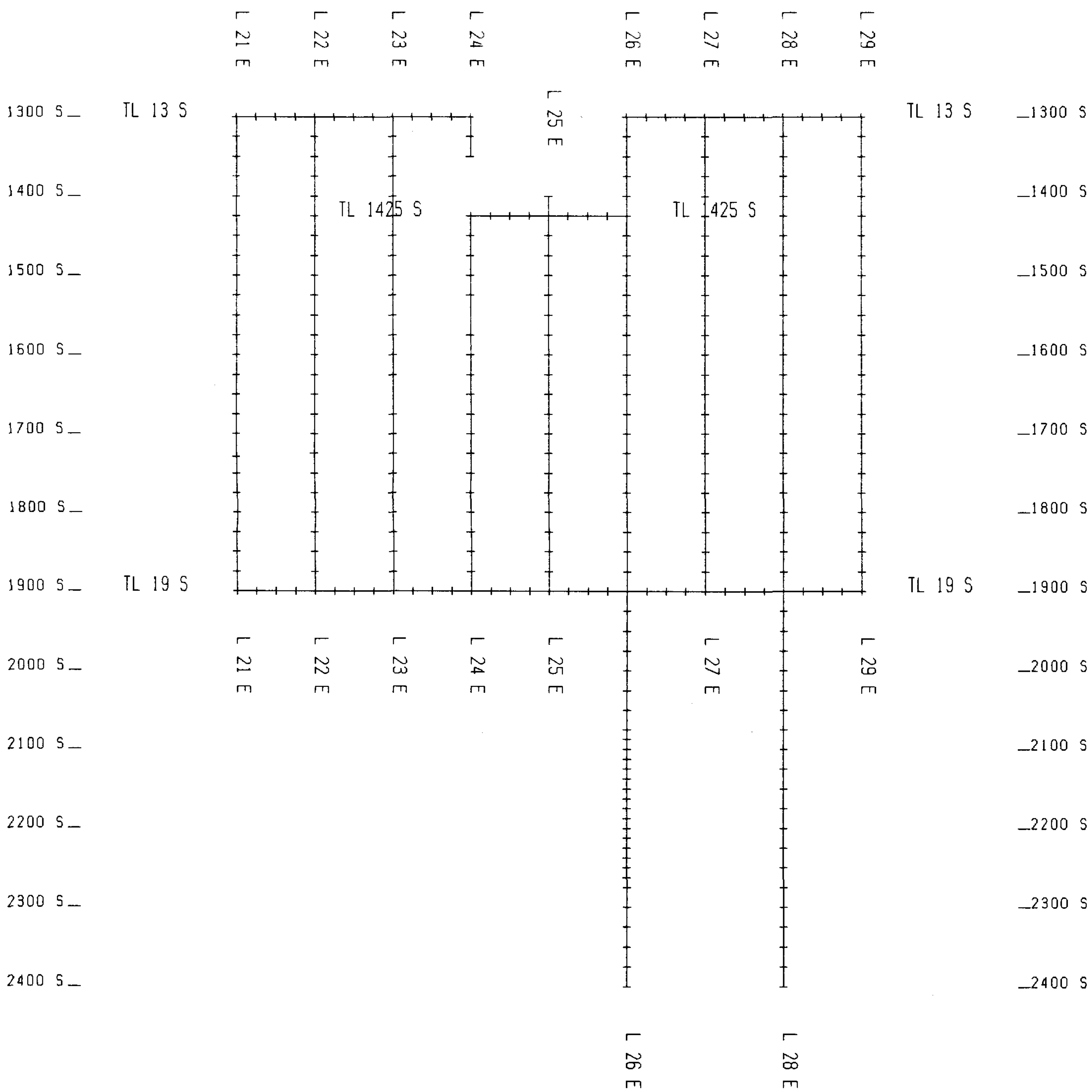
Title
GRID 7
MAXMIN SURVEY (1760 Hz)
Tweed Township, Ont.

Date: November 1988	MAP 5B
Operator: T. McAllister	Job # M-63

M593 Tweed Grid 7 MAXMIN (1760)

Sciences

280



CONTOUR INTERVALS

.5
25
100
500

BASE LEVEL 58,000 nT REMOVED

INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS
WIDE MAGNETIC MODELS
INTERPRETED CONTACT
INTERPRETED FAULT

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

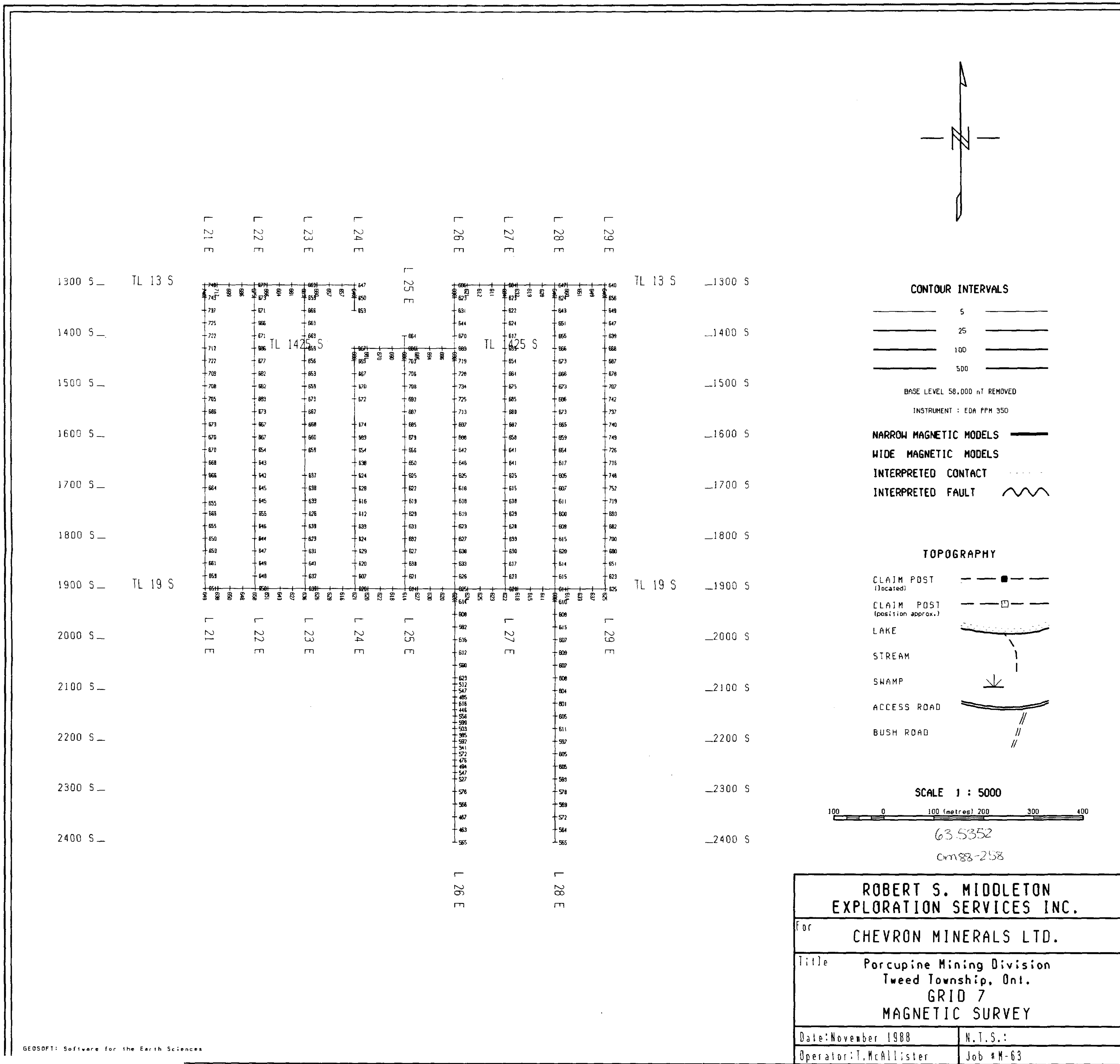
100 0 100 (metres) 200 300 400

63.5352

OM88-258

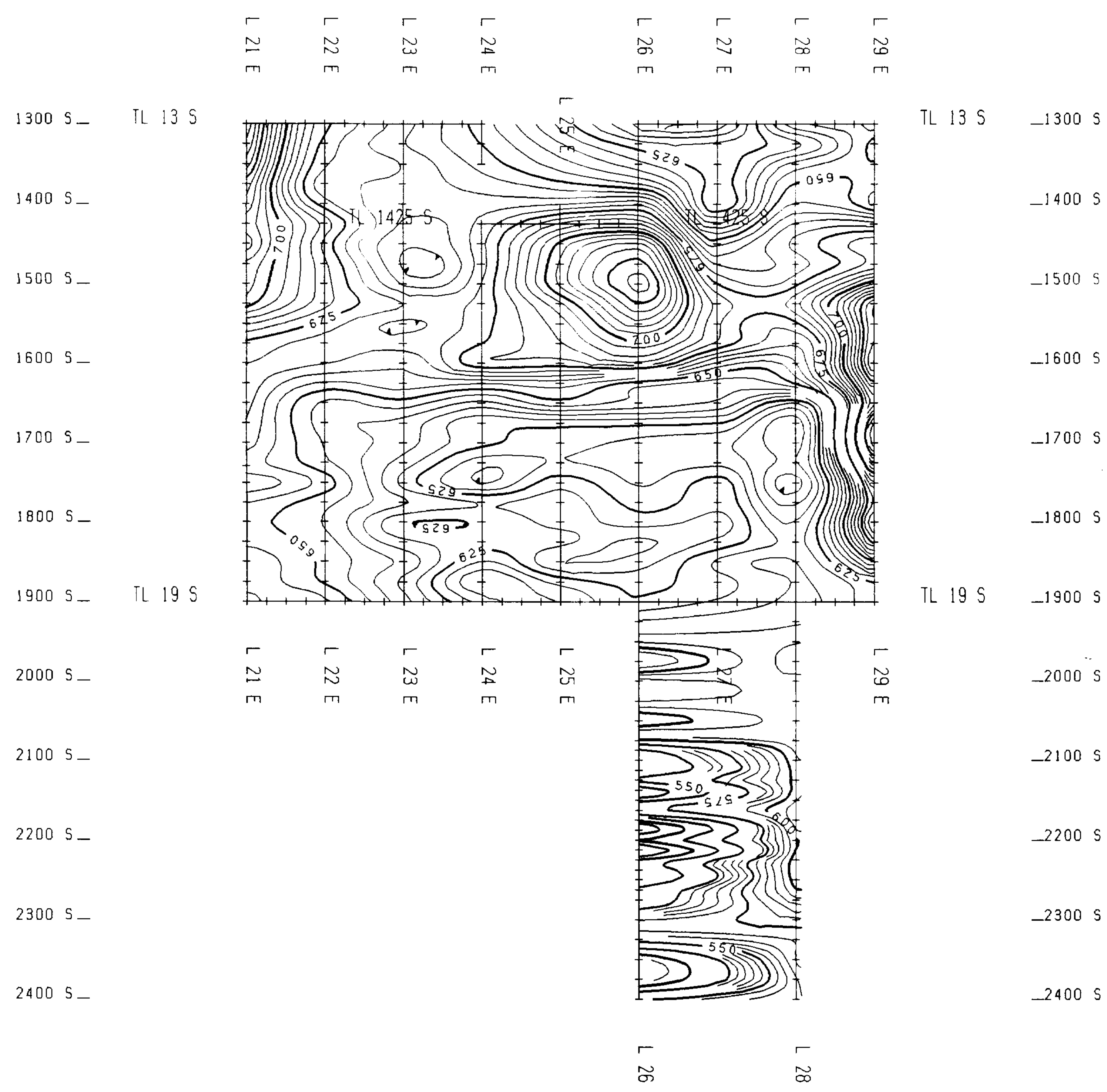
ROBERT S. MIDDLETON EXPLORATION SERVICES INC.	
For CHEVRON MINERALS LTD.	
Title Porcupine Mining Division Tweed Township, Ont. GRID 7 MAGNETIC SURVEY	
Date:November 1988	N.T.S.:
Operator:T.McAllister	Job #M-63

GEOSOFT: Software for the Earth Sciences



42H09SE0015 63.5352 TWEED

300



CONTOUR INTERVALS

5
25
100
500

BASE LEVEL 58,000 nT REMOVED

INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS
WIDE MAGNETIC MODELS
INTERPRETED CONTACT
INTERPRETED FAULT

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352
OM83-258

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 7
MAGNETIC SURVEY

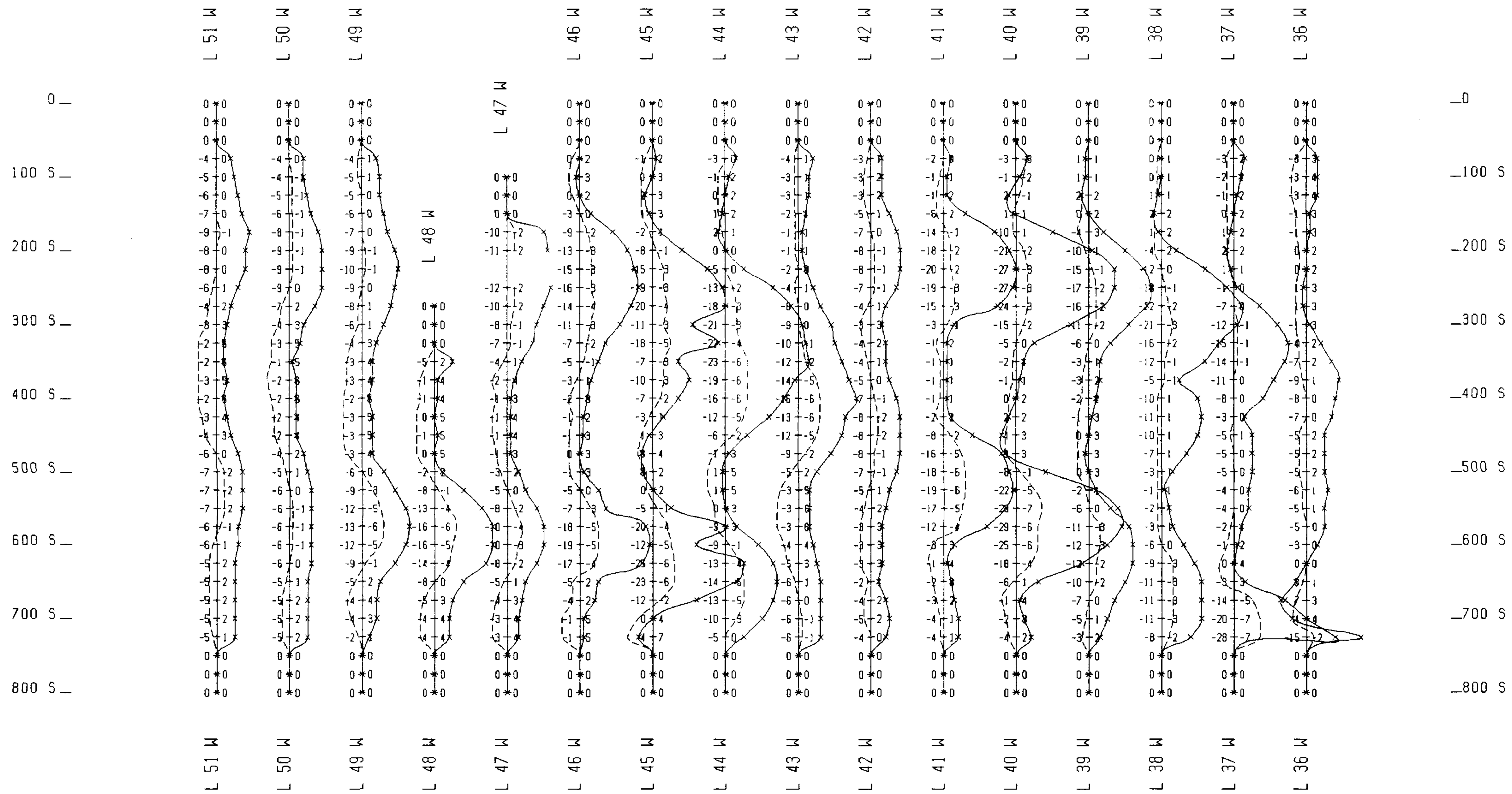
Date:November 1988	MAP 4
Operator:T.McAllister	Job #M-63

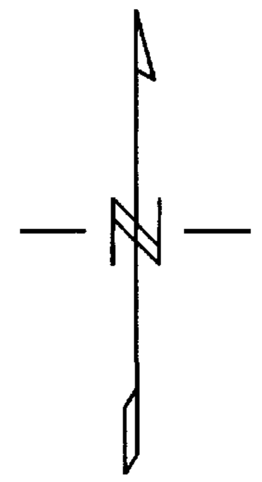
M593 Tweed Grid 7 Mag

Sciences

42H09SE0015 63.5352 TWEED

310

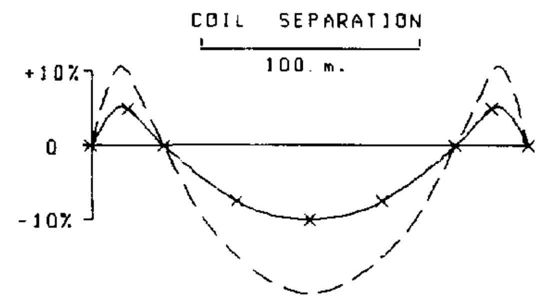




MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3399
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE
QUADRATURE



POSTING $\frac{\text{IN PHASE}}{\text{QUADRATURE}}$

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

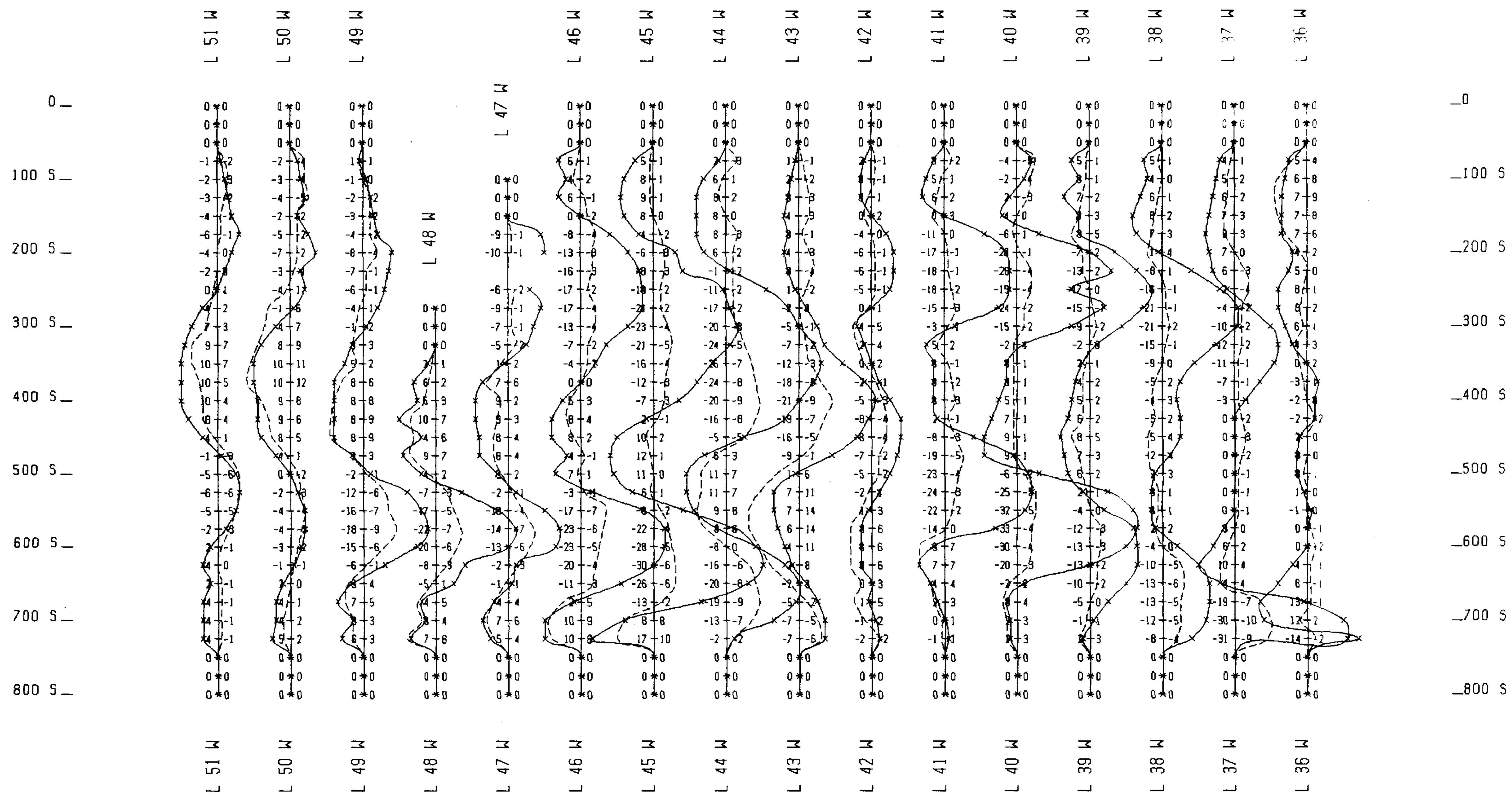
63.5352
OM88-253

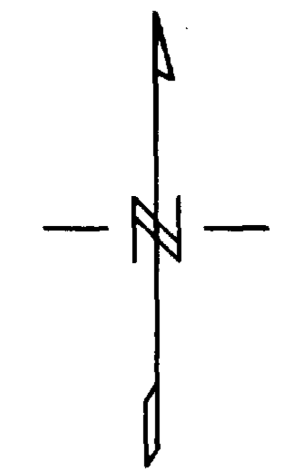
ROBERT S. MIDDLETON EXPLORATION SERVICES INC.	
For CHEVRON MINERALS LTD.	
Title GRID 8 MAXMIN SURVEY (440 Hz) Tweed Township, Ont.	
Date:November 1988	MAP 7A
Operator:B.Polk	Job #M-63

M593 Tweed Grid 8 MaxMin (440)

42H09SE0015 63.5352 TWEED

320

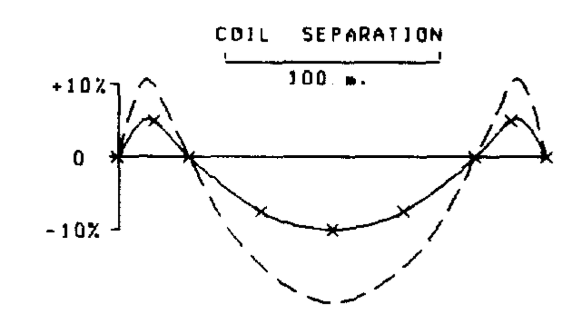




MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3999
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE ×—×—×—×
QUADRATURE - - - - - -



POSTING IN PHASE / QUADRATURE

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352
Omss-258

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title

GRID 8
MAXMIN SURVEY (1760 Hz)
Tweed Township, Ont.

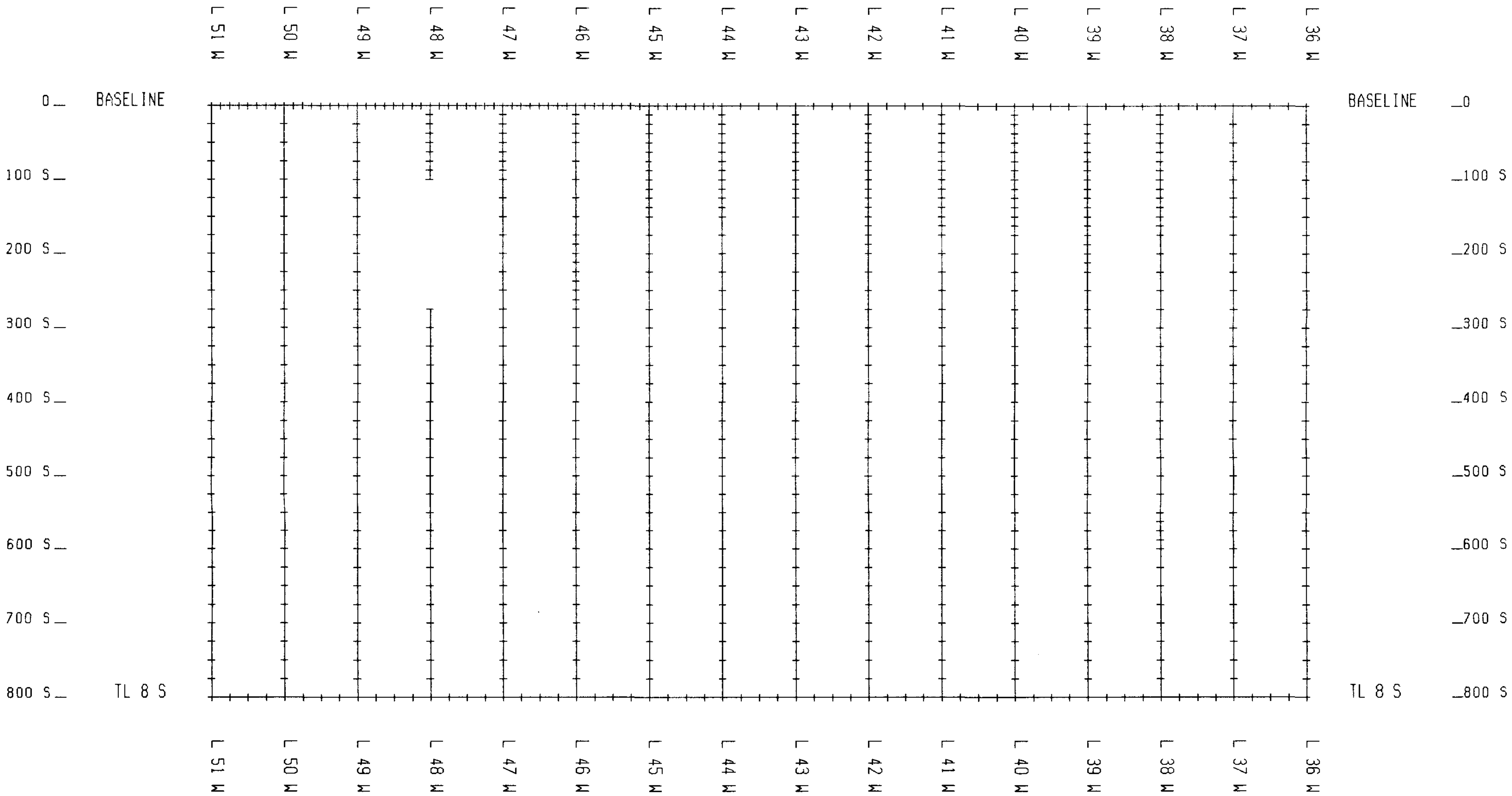
Date: November 1988	MAP 7B
Operator: B. Polk	Job # M-63

GEOSOFT: Software for the Earth Sciences

M593- Tweed.

42H09SE0015 63.5352 TWEED

330



CONTOUR INTERVALS

20
100
500
2500

BASE LEVEL 58,000 nT REMOVED

INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS

WIDE MAGNETIC MODELS

INTERPRETED CONTACT

INTERPRETED FAULT

TOPOGRAPHY

CLAIM POST (located)

CLAIM POST (position approx.)

LAKE

STREAM

SWAMP

ACCESS ROAD

BUSH ROAD

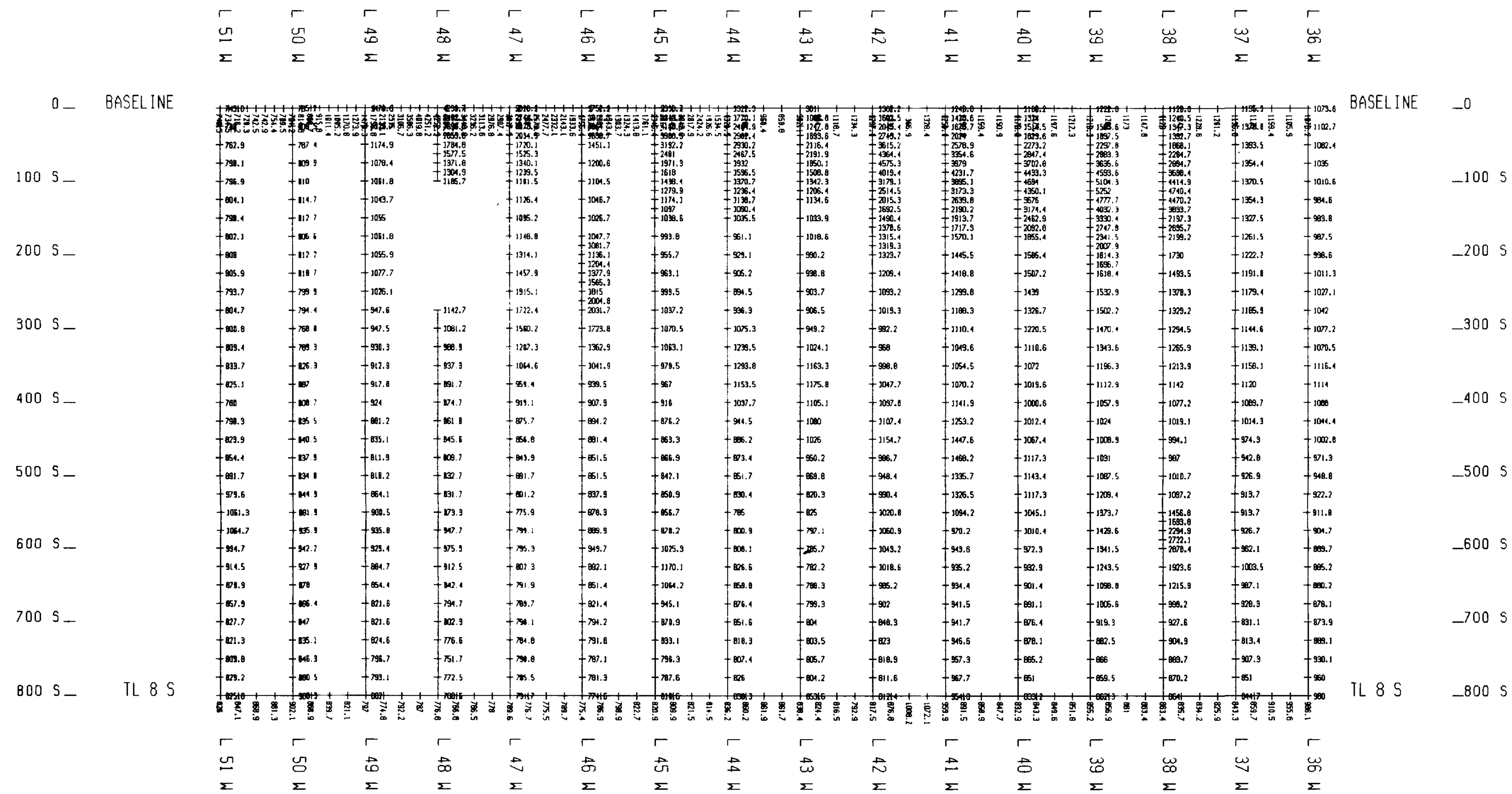
SCALE 1 : 5000

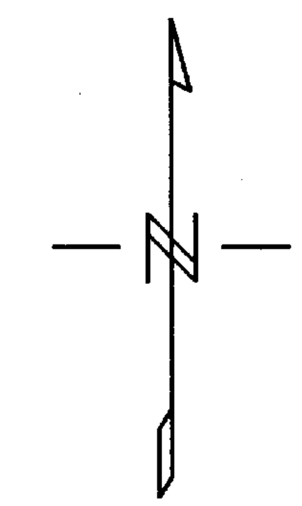
100 0 100 (metres) 200 300 400

63.5352

OM88-258

ROBERT S. MIDDLETON EXPLORATION SERVICES INC.	
For CHEVRON MINERALS LTD.	
Title Porcupine Mining Division Tweed Township, Ont. GRID 8 MAGNETIC SURVEY	
Date:November 1988	N.T.S.:
Operator:T.McAllister	Job #M-63





CONTOUR INTERVALS

20

100

500

2500

BASE LEVEL 58,000 nT REMOVED

INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS

WIDE MAGNETIC MODELS

INTERPRETED CONTACT

INTERPRETED FAULT

TOPOGRAPHY

CLAIM POST (located)

CLAIM POST (position approx.)

LAKE

STREAM

SWAMP

ACCESS ROAD

BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352

OM88-258

ROBERT S. MIDDLETON EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

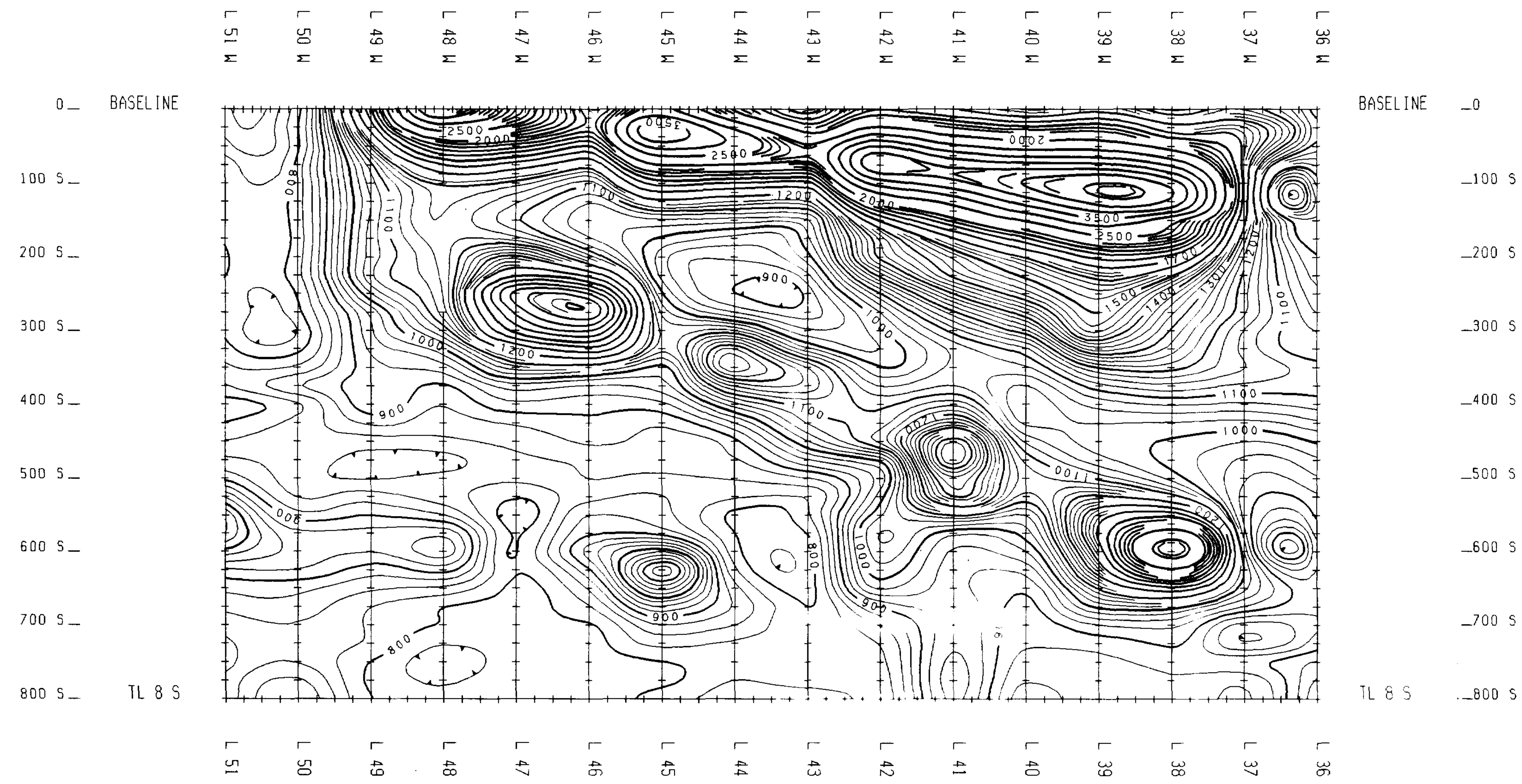
Title Porcupine Mining Division
Tweed Township, Ont.
GRID 8
MAGNETIC SURVEY

Date: November 1988	N.T.S.:
Operator: T. McAllister	Job #M-63

GEOSOFT: Software for the Earth Sciences

42H09SE0015 63.5352 TWEED

350



M593 TWEED GRID 8 MAG

63.5352

OM88-258

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

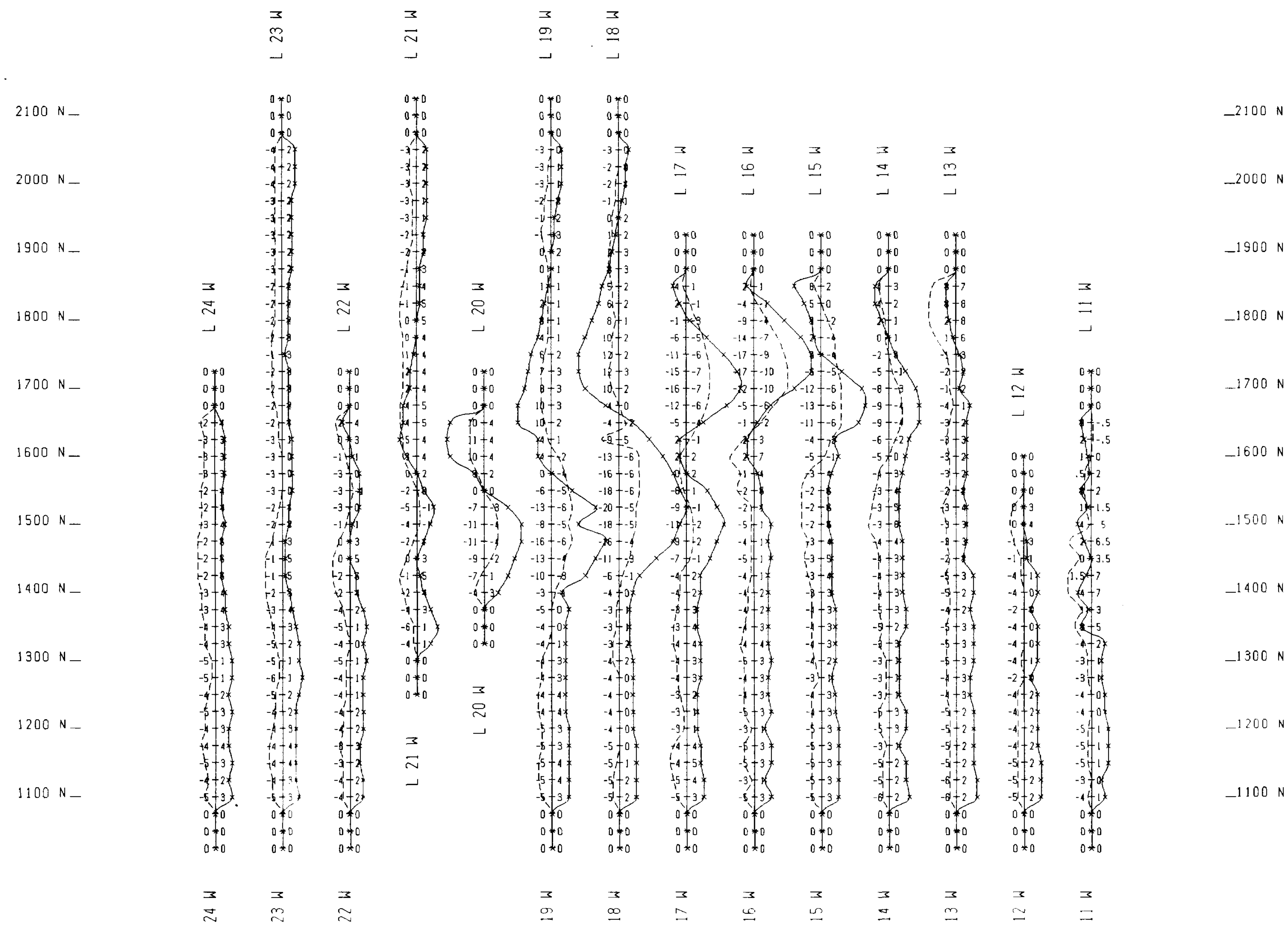
For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 8
MAGNETIC SURVEY

Date: November 1988 | MAP 6
Operator: T. McAllister | Job #M-63

42H09SE0015 63.5352 TWEED

360



MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3399
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE ×——×——×——×
QUADRATURE – – – – – – –

COIL SEPARATION 100 m.
+10%
0
-10%

POSTING IN PHASE / QUADRATURE

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352
OM88-255

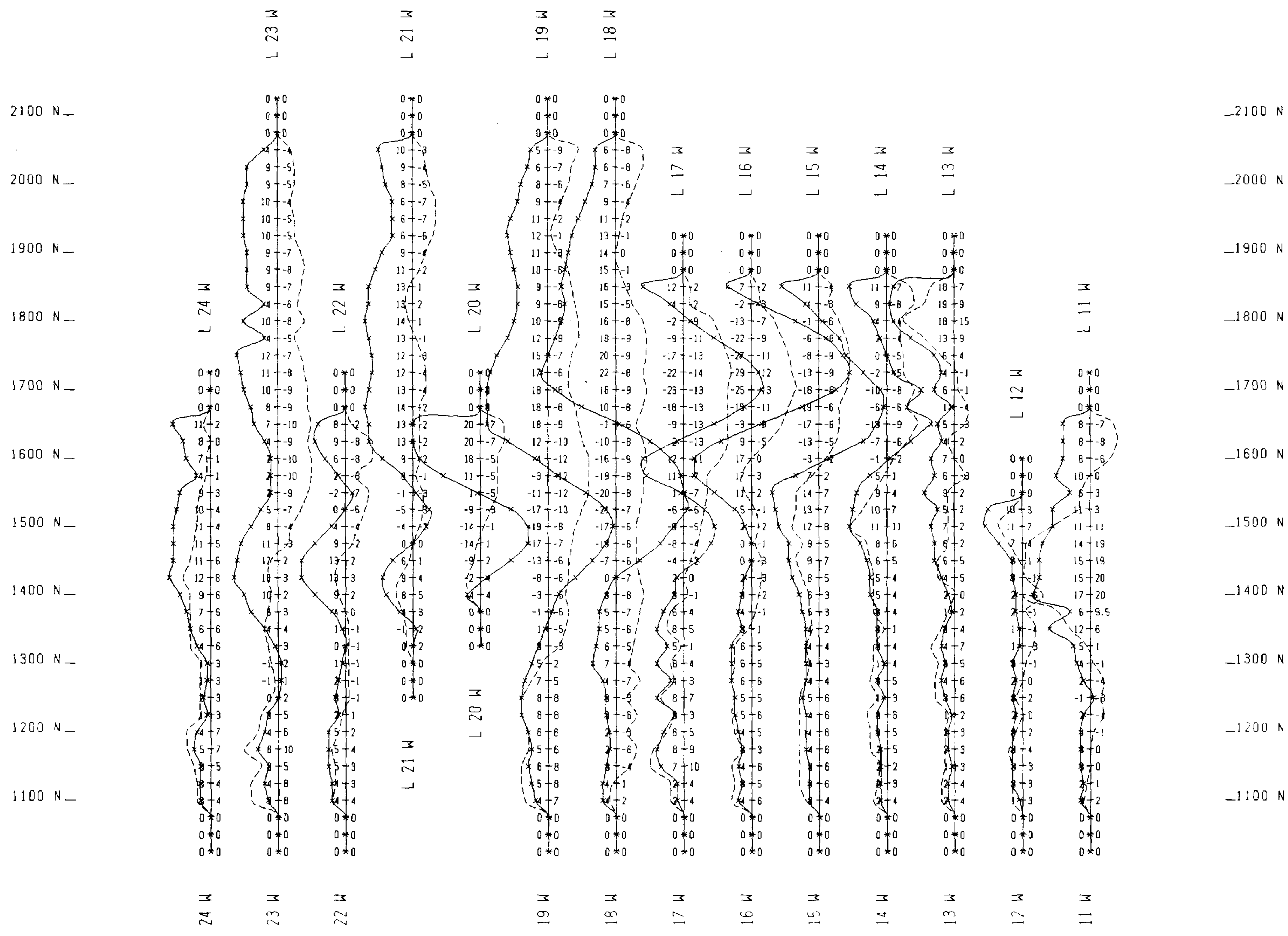
ROBERT S. MIDDLETON EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title
GRID 9
MAXMIN SURVEY (440 Hz)
Tweed Township, Ont.

Date: November 1988	**MAP 9A**
Operator: B. Polk	Job # M-63

370



MAX-MIN HORIZONTAL LOOP LEGEND

INSTRUMENT: Apex Max-min I
SERIAL #: 3399
SCALE: 1 cm. = 10 %
FREQUENCY: 440 Hz, 1760 Hz

INPHASE ——×——×——
QUADRATURE – – – – – –

COIL SEPARATION 100 m.

+10%
0
-10%

POSTING: IN PHASE / QUADRATURE

TOPOGRAPHY

CLAIM POST (located)
CLAIM POST (position approx.)
LAKE
STREAM
SWAMP
ACCESS ROAD
BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352

ROBERT S. MIDDLETON EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

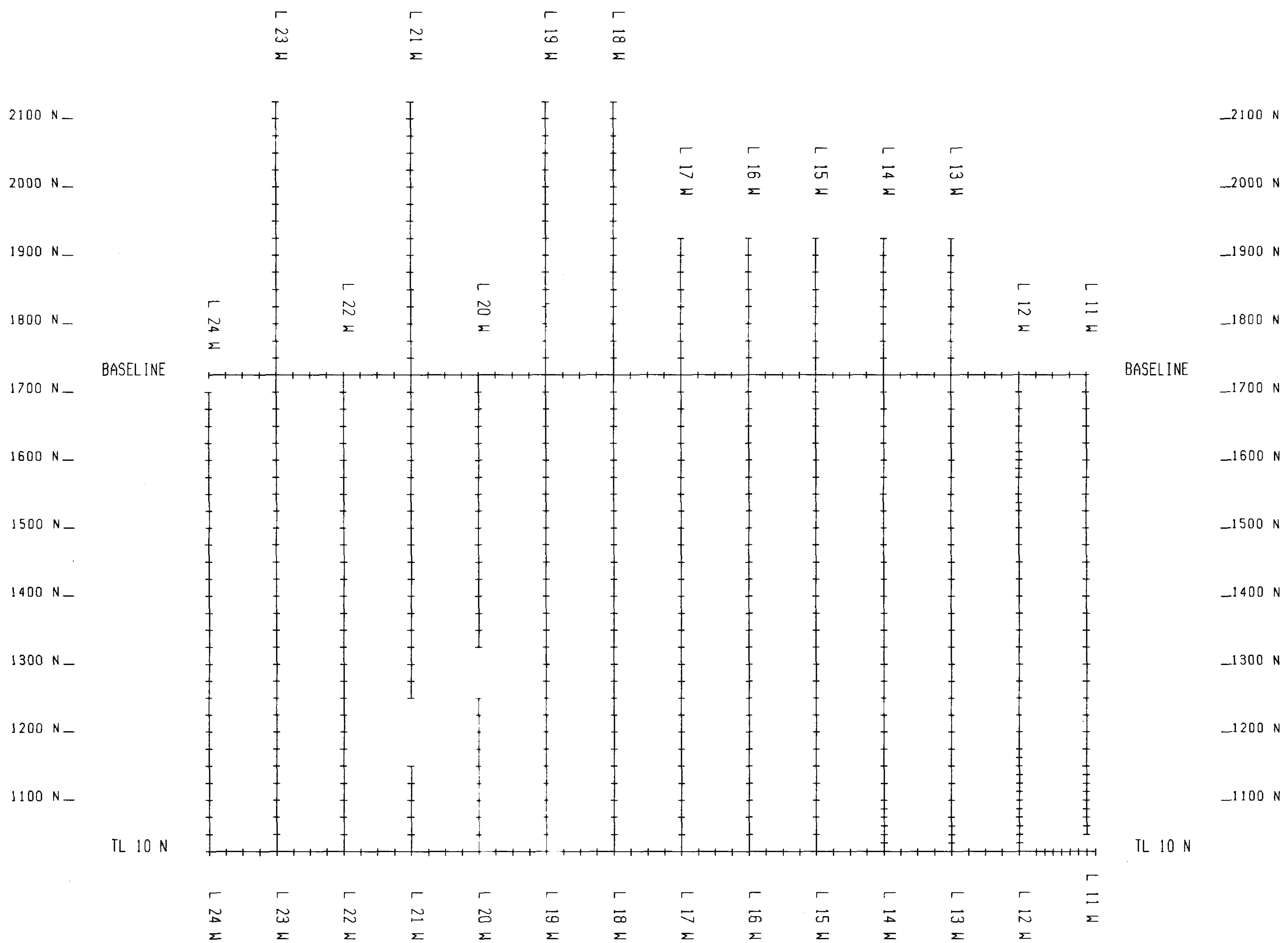
Title
GRID 9
MAXMIN SURVEY (1760 Hz)
Tweed Township, Ont.

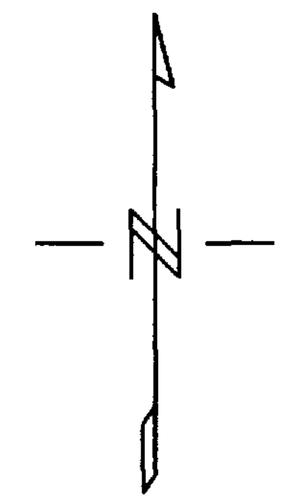
Date: November 1988	MAP 9B
Operator: B. Polk	Job # N-63

Sciences

42H09SE0015 63.5352 TWEED

380





CONTOUR INTERVALS

25
100
500
2500

BASE LEVEL 58,000 nT REMOVED

INSTRUMENT : EDA PPM 350

NARROW MAGNETIC MODELS

WIDE MAGNETIC MODELS

INTERPRETED CONTACT

INTERPRETED FAULT

TOPOGRAPHY

CLAIM POST (located)

CLAIM POST (position approx.)

LAKE

STREAM

SWAMP

ACCESS ROAD

BUSH ROAD

SCALE 1 : 5000

100 0 100 (metres) 200 300 400

63.5352

OM88-258

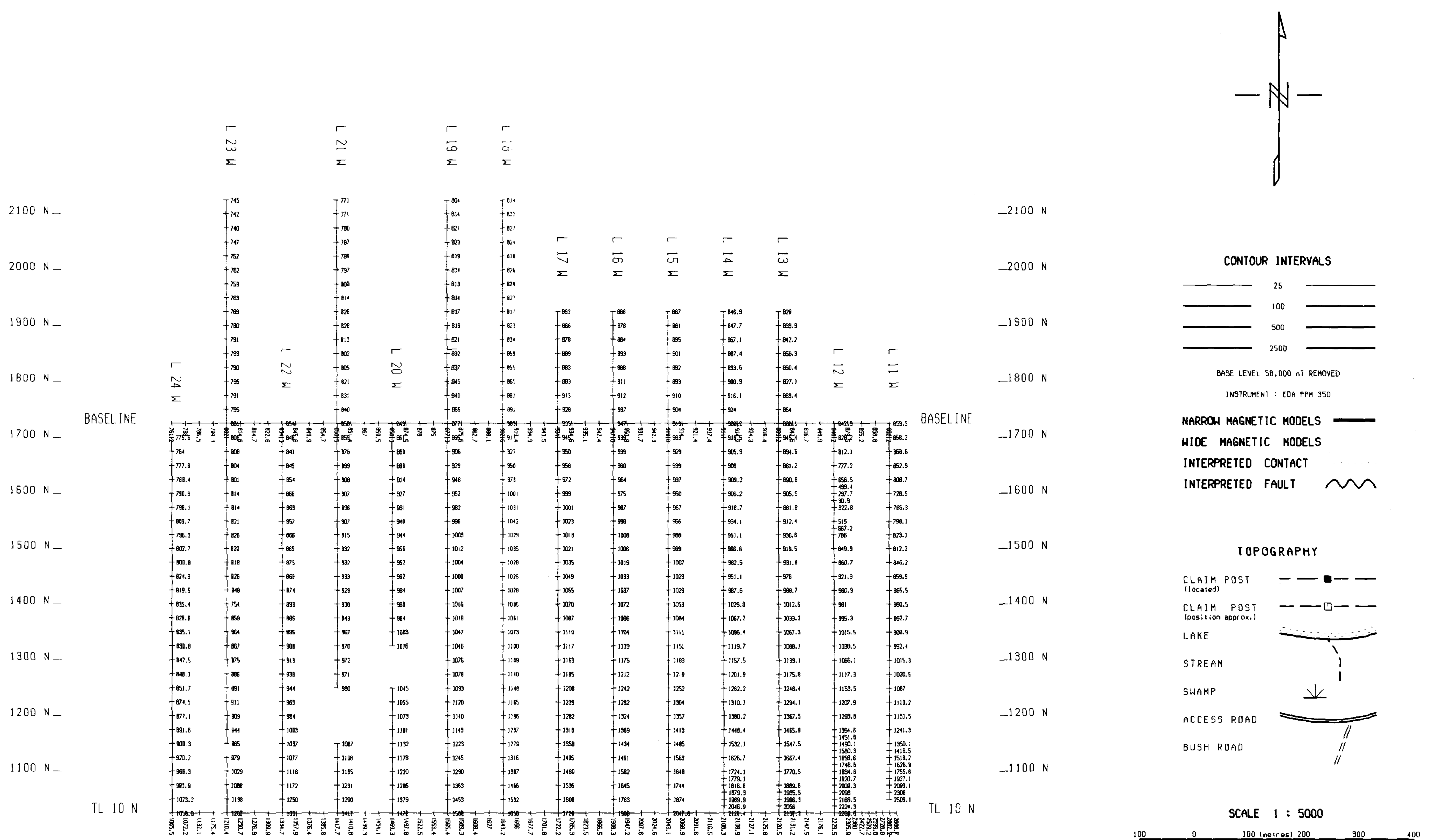
ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 9
MAGNETIC SURVEY

Date: November 1988	N.T.S.:
Operator: T. McAllister	Job # M-63

GEOSOFT: Software for the Earth Sciences



63.5352

OM83 258

ROBERT S. MIDDLETON EXPLORATION SERVICES INC.

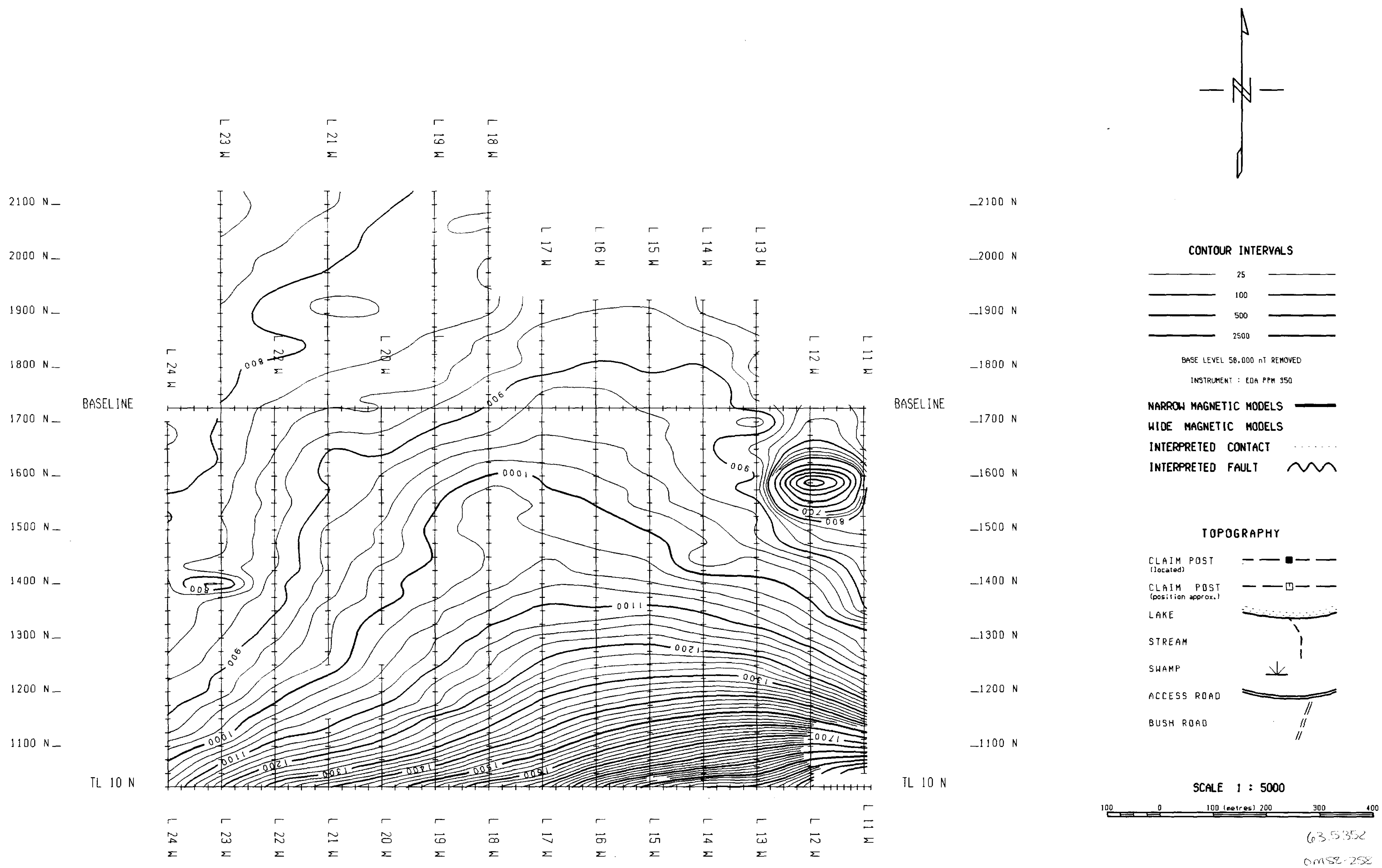
For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 9
MAGNETIC SURVEY

Date: November 1988	N.T.S.:
Operator: T. McAllister	Job # M-63

GEOSOFT: Software for the Earth Sciences

400



M593 TWEED GRID 9 MAG

63.5352

OMSZ-252

ROBERT S. MIDDLETON EXPLORATION SERVICES INC.

For CHEVRON MINERALS LTD.

Title Porcupine Mining Division
Tweed Township, Ont.
GRID 9
MAGNETIC SURVEY

Date: November 1988	MAP 8
Operator: T. McAllister	Job # M-63

Earth Sciences

410