85-562-13820

McDAME AEROMAGNETIC SURVEY
1985 ASSESSMENT REPORT FOR THE McDANE GROUP

CASSIAR

LIARD MINING DIVISION

CLAIMS: a list of the 4 mineral claims, 30 crown granted mineral claims and 2 mining leases is given in Section 4 "Property", as the "McDane Group"

REPORT NO: 648
Author: I. Lyn
Owner & Operator: Brinco Mining Limited
N.T.S.: 104P/5
Latitude: 59°19'N
Longitude: 130°51'W
Date: April 1985

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,820

TABLE OF CONTENTS

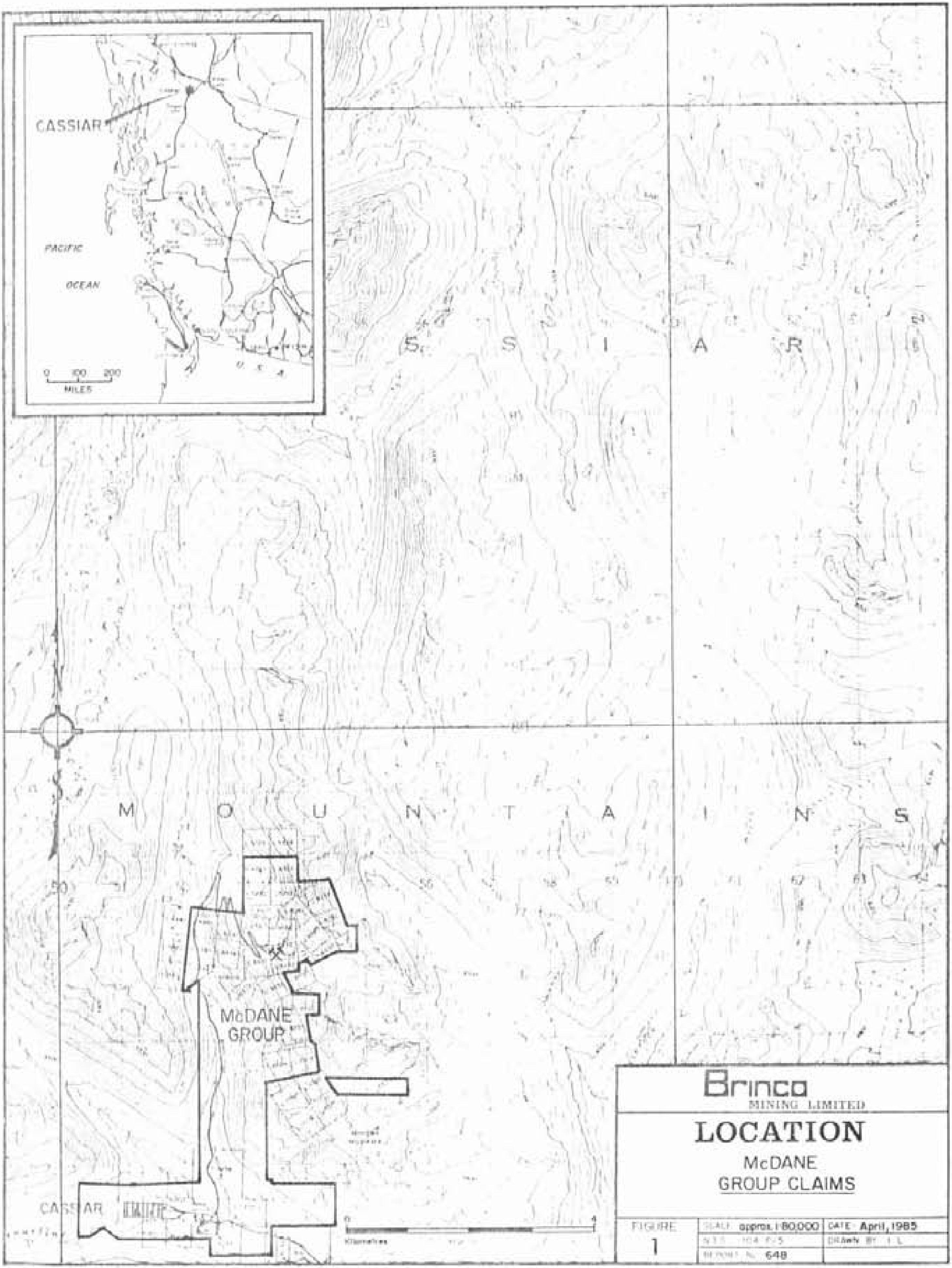
Summary

In November 1984, Apex Airborne flew an aeromagnetic survey over the Cassiar Mine to gather data to be analyzed by the CompuDepth computer analysis of EG & G Geometrics. The purpose of the analysis was to attempt to determine the size depth and attitude of the ultramafic bodies that are host to the asbestos ore, and of other magnetic features. The CompuDepth was done using four lines of magnetic profiles which were flown at both a constant height above the surface and at a constant elevation. In addition a rectangular area of 25 km^2 was flown at constant altitude to compare with a constant terrain clearance survey flown in 1983.

The CompuDepth analysis generated a series of spot depths to magnetic features along the magnetic profiles. These were compiled by Geometrics into an interpretive sketch. Subsequent interpretations of specific parts of the magnetic anomalies, which were not fully satisfied by CompuDepth, were done by R. Sheldrake and R. Woolham.

Location and Access

The Cassiar Mine is located in northern British Columbia, 80 kilometers south of the Yukon Border (Fig. 1) Watson Lake, 157 km by road from Cassiar, is the nearest town with scheduled air service. The aeormagnetic survey covered an area of approximately 25 km^2 centered 4 km north of the town. The terrain is mountainous and rugged with a relief of approximately 800 m.


CASSIAR
PACIFIC
OCEAN
0 100 200
MILES
CASSIAR
MOUNTAINS
McDANE
GROUP
CASSIAR
Brinco
MINING LIMITED
LOCATION
McDANE
GROUP CLAIMS
FIGURE
1
SCALE approx. 1:80,000
DATE April, 1985
648

Property

The McDane Group consists of the following claims, crown granted claims and mining leases:

(See Figure 2)

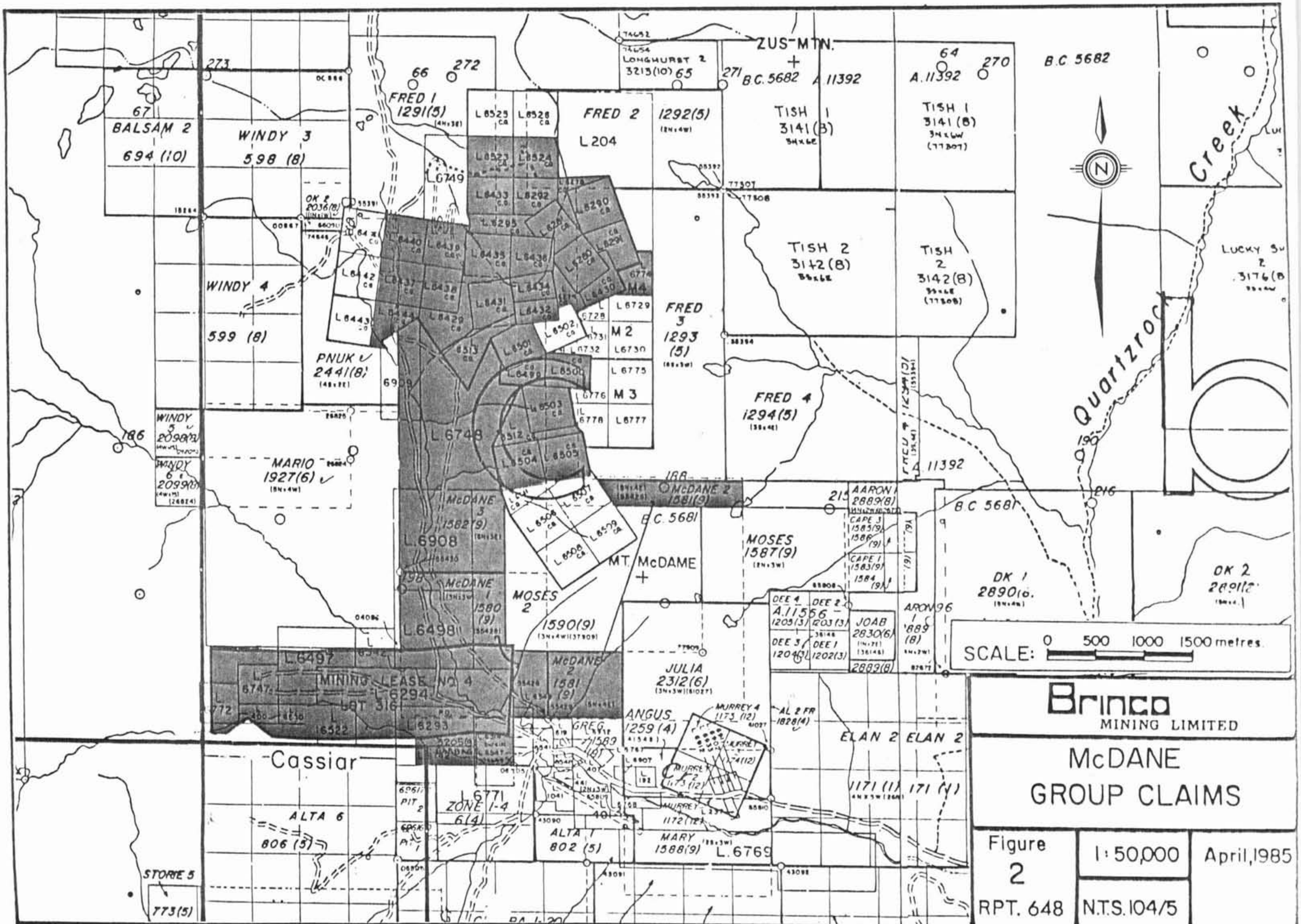
Claims	Record No.	Units	Record Date
McDane 1	1580 (9)	9	5 Sept 1980
McDane 2	1581 (9)	20	5 Sept 1980
McDane 3	1582 (9)	18	5 Sept 1980
Garbage	3205 (9)	2	24 Sept 1984

Crown Granted Claims	
Mist fr.	6278
Rugged fr.	6279
Asbestos 1	6280
Asbestos 2	6281
Asbestos 3	6290
Asbestos 4	6291
Mist 2	6292
Vale fr.	6295
Last fr.	6429
Rugged 7	6430
Last	6431
Rugged 2	6432
Mist 1	6433
Rugged 4	6434
Hill	6435
Dell	6436
Axe	6437
Rugged 8	6438
Rugged 9	6439
Rugged 10	6440
Rugged 14	6444
Lookout 1	6499
Lookout 2	6500
Goat 3	6503
Goat 4	6504
Goat 5	6505
Sheep fr.	6512
Talus fr.	6513
Cirque 1	6523
Cirque 2	6524

Mining Leases	
M4	L6774
Mining Lease No. 4	3161

Total approximately 92 units.

The Aeromagnetic Survey covered all of these claims except for the Garbage and Mining Lease No. 4.



Brinco MINING LIMITED

McDANE GROUP CLAIMS

Figure 2 | 1:50,000 | April, 1985

RPT. 648 | N.T.S. 104/5

Geophysical Survey

The helicopter borne survey was flown under the direction of R. Sheldrake, and A. Rybaltowski of Apex Airborne Surveys Ltd. For CompuDepth Geometrics requested one flightline parallel to the strike of ultramafic body (N.W. - S.E.) and three parallel lines across the centre of the deposit (N.E. - S.W.), the lines extending well beyond the area of anomaly disturbance. These lines total 46 km ling and were flown using both a mean terrain clearance of 122 m (400')(MTC lines) and a constant barometric altitude of 2,040 m (6,700') (CBA lines). In addition a central area of 25 km^2 was flown as a continuous survey block of 150 linear km, consisting of 24 traverses at 200 m spacing and 3 tie lines, at the constant barometric altitude of 2,040 m.

A Geometrics G 803 total field magnetometer suspended 18 m below the helicopter was used for the survey. It measures field strength with a sensitivity of 1 gamma. Aircraft positioning was controlled by a 1:10,000 photomosiac map supplied by McElhanney Surveying and Engineering Ltd. of Vancouver, B.C. and a 1:10,000 topographic map supplied by Brinco. A radar altimeter recorded the terrain clearance when it was less than 600 m. Details of the geophysical equipment used for the survey are given in Appendix 3. A description of the in-flight record and flight path recovery process is in Appendix 4.

The Geophysical data was forwarded to EG & G Geometrics for processing by the CompuDepth analysis. The method is described in their report "Interpretation Report for Brinco Mining Ltd." Appendix 1. The results were presented on a sheaf of computer printout profiles with pencil notes at 1:20,000 scale and an Interpretive overlay map at 1:6,000 scale. The computer profiles have been reduced to 1:60.000 and bound with the report for ease of handling, however copies of the computer generated raw traces are in pockets with Appendix 1.

Apex Airborne Ltd. prepared an aeromagnetic contour map, with contour interval of 10 gammas, of the BCA survey block (Fig. 3). It is on a Topographic base map at a scale of 1:10,000 and shows the total magnetic field, corrected for diurnal variation but not for regional gradient.

Geology

Most of the survey area was over rocks of the Sylvester Group. These are a thick sequence of Devono - Mississippian clastic sediments and intermediate to basic volcanic rocks of oceanic origin. Regionally within the Group are ultrabasic intrusives of peridotite, dunite, pyroxenite, and serpentinite. Two adjacent, relatively small, serpentinite bodies contain the asbestos mineralization at the mine. They are strongly magnetic. The surrounding rocks are nonmagnetic except for the minor occurance of some volcanics.

The Sylvester Group is considered to be an allochthonous klippe that was emplaced on to the underlying Devonian and older carbonate and clastic rocks between the Triassic to Mid-Cretaceous periods. Before and during emplacement the Group underwent considerable thrust related deformation. After emplacement, during the Cretaceous, the autochthonous rocks were intruded by granodiorite batholiths. This caused contact metamorphism and metasomatism of the adjacent carbonates and shales. The extreme western lines of the survey were over the authochthonous rocks and granodiorite.

Discussion of Results

Appendix 1 consists of the interpretive report supplied to Brinco by EG & G Geometrics Ltd. It describes the treatment of the aeromegnetic data, the theory of analysis and interpretation of results.

The CompuDepth analysis suggests that the magnetic source (McDame Ultramafic) is triangular shaped with its base (about 1.8 km wide) to the southeast and with side lengths of about 2 km. The apex is at the outcrop in Cassiar pit and it was shown as plunging to approximately 1,300 m (4,300') above sea level (400 m below surface) along the southeast side. It turned out that the flight lines were poorly located with respect to the magnetic gradient and the assumptions built into the CompuDepth program and so the southern limits and depth to the Ultramafic could not be accurately determined. An estimate of the southern edge at 1,700 m ASL (5,600') seems too shallow compared to extrapolations based on other work. The Ultramafic also seems to be interpreted too large as it extends in the southern part, west of the mapped limits of the Sylvester Group. A possible E - W fault was interpreted in line with section 21500 N (DDH 84-1). This fault is apparently most prominent in the western part of the Ultramafic, down dropping the southern side. The depth interpretations were done primarily on the MTC profiles and the CBA profiles used as checks. The anomalies were more subtle on the CBA profiles and therefore noise in the data had a greater effect.

In conclusion the results of the analysis were disappointing and did not materially increase our knowledge of the McDame Ultramafic.

R. Sheldrake of Apex Airborne Surveys reviewed the Geometrics report and agreed that is was less than satisfactory and somewhat unrealistic. He did a seperate "intuitive" interpretation of the ultramafic using the CBA map. He interpreted that the body could be oval shaped, approximately 1 km x 1.8 km trending southeasterly and plunging to 1,300 m (4,300') ASL at the southeast end. This would be from 300 to 700 m below the surface. It did not appear to be close to the surface anywhere, except of course the northern end of the anomaly in the pit.

On the contoured CBA map (Fig. 3) there is a diffuse magnetic feature on the east side of the main anomaly. Previous surveys had detected this feature, known as Anomaly 5. Mapping had located magnetic basalts on the surface in the vicinity of the anomaly (see geology map with CompuDepth report Appendix 1, Fig. 11) but it was not certain if the anomaly was entirely due to this cause. A ground magnetic survey detected the basalt in one location only, and this was offset from the peaks of the aeromagnetic anomalies. The CompuDepth spot depth did not deal directly with the area, therefore for further clarification of a possible source, all the information that we had available was forwarded to R. Woolham, Geophysicist with Derry Mitchner, Booth and Wahl in Toronto. His report is presented in Appendix 2. It concludes that a magnetic source, not presently explained by the geology, underlies the Anomaly 5 area. The source could possibly be considerable thickened basalt or else a near vertical intrusive plug having an elliptical shape in plan.

Conclusions and Recommendations

The use of the CompuDepth analysis to determine the size and shape of the Asbestos bearing Ultramafics at Cassiar was not completely successful because the orientation of the aeromagnetic lines with respect to the magnetic gradients did not comply with assumptions built into the computer program. However both the CompuDepth and R. Sheldrake's interpretations suggest that the ultramafic extends at least twice as far as has so far been defined by drilling, but nowhere is it near enough to the surface to mine by surface methods. Due to the rugged topography over the body further definition drilling from the surface would have to be wide spaced deep (500 m +) holes. As an underground drilling programme is being implemented the surface drilling is not warranted at this time.

Further work should be done on Anomaly 5 to determine if there is a near surface ultramafic body. The ground magnetic survey should be redone and extended and a 200 m diamond drill program implemented to investigate the magnetic targets.

APPENDIX 1

EG&G GEOMETRICS

INTERPRETATION REPORT

FOR

BRINCO MINING LIMITED

TABLE OF CONTENTS

List of Figures

INTERPRETATION REPORT FOR BRINCO MINING LIMITED

INTRODUCTION

This report is submitted in fulfilment of the agreement between EG&G Geometrics and Brinco Mining Limited to perform an interpretation of aeromagnetic data acquired by Apex Airborne Surveys LTD.

The report consists of this written report, an interpretation map, eight interpreted CompuDepth™ profiles with interpreter's pencil notes, and profiles of various intermediate data processing.

DATA PROCESSING

The digital data acquired by Apex on 26-27 November arrived at Geometrics on 10 December as digital tapes recorded on an Urtec Data System. As no programs to reformat data tapes from that kind of recording system were available, a special program had to be written. Once the program was written and debugged, the eight lines of data were read onto the Prime 750 computer system. The raw data were plotted on an electrostatic plotter (see enclosed raw traces) and examined for data quality. There were two obvious characteristics of the data that had to be dealt with prior to doing the magnetic inversion. The first had to do with the unequally spaced sample intervals; especially for the terrain draped data. This could not be left alone as the inversion program demands equally spaced data. So a second program was devised to resample the data at equally spaced intervals. The second problem was the sample-to-sample moise characteristics of the data. When examining the raw profiles notice that approximately 5 gammas of noise with periods of about 3 samples are present. Amplitude spectra of typical lines were generated and examined; it was decided to filter the data so as to zero any wavelengths less than 5 sample intervals. This was done and the profiles were then ready for the CompuDepth™ analysis. (See enclosed filtered, resampled profiles.)

CompuDepth™ Analysis

In order to run the CompuDepth™ program, the only parameter that must be estimated ahead of time is the maximum expected depth to be sought after. For this survey the drill hole information from the hole marked DDH 84-1, with a depth to the top of the serpentinite at 1248 feet below ground level, provided one estimate. A second estimate for the maximum expected depth was calculated from amplitude spectra of the north-south lines flown at 6700 feet constant barometric altitude and flown at 400 feet mean terrain clearance. (The two spectra accompany this report.) The maximum average depth calculated for the constant barometric line was approximately 1 kilometer, while the average depth for the mean terrain clearance line was approximately 360 meters. Trial CompuDepth™ runs using the 1 kilometer depth for the constant barometric altitude profiles proved reasonably successful. However, for the mean terrain clearance profiles, the maximum value computed from the spectra seemed much too shallow and it was doubled, giving much more satisfactory results.

It must be clearly understood exactly what the mathematical model is for the CompuDepth™ analysis. (See Appendix for a detailed discussion of CompuDepth™.) Essentially, this profile analysis (and any other profile analysis program) assumes that the contrast being sought for extends infinitely perpendicular to the profile. In practice this means that an anomaly of around 3 to 5 times the flight line separation adequately satisfies this assumption. However, it must be emphasized that the only way to know whether the assumption is valid is to examine a contour map. For this project, the topographic map provided by Apex was overlaid on the magnetic contour map dated June, 1983. It was noted that the southern-most flight lines, lines 9999 and 8888, lie almost parallel to and on the southern flank of the major anomaly. Even though these profiles were run through the CompuDepth™ program, the results are most certainly invalid as far as the goal of this project is concerned.

The accompanying CompuDepth™ profiles contain two logical formats. The upper block displays the observed magnetic profile, after resampling and low-pass filtering, as a solid line and the computed magnetic profile derived from the depths displayed on the lower half of the profile as a dashed line. The vertical numbers spaced 50 apart through the middle of the display are the new fiducials after resampling, and therefore do not correspond to the original fiducials as recorded aboard the helicopter. The lower half of the profiles displays the depths calculated by the CompuDepth™ program. The zero level corresponds to the location of the aircraft itself for both the CBA and MTC flying. For the CBA profiles this has an absolute value of approximately 6700 feet above sea level, while for the mean terrain profiles, this represents the location of the aircraft relative to a varying terrain; the straight line is very deceptive and must be examined relative to a topographic map. The curved line lieing anywhere from a few hundred to two thousand feet below the aircraft is a trace of the radar altimeter. Two different depth scales were chosen for the profiles; the 6700 feet constant barometric profiles have a vertical scale approximately twice that of the mean terrain clearance profiles. This was done in order to maximize the detail that may be present in the draped profiles.

The computed depths are displayed as a small box with a vertical bar above and below it. The number directly above the vertical bar indicates the number of depths that were averaged together in that region for display purposes. The length of the vertical bar indicates the average mathematical uncertainty of those depths. The number to the right of the box with a precent sign indicates the percent of the total variance of the backfit that this depth accounted for. The percent can be thought of as analogous to the relative magnetization contrast between the two magnetic sources at that location.

INTERPRETATION RESULTS

In order to understand the geometry of the depth estimates computed by CompuDepth™, an enlarged flight line map at approximately 1:6,000 was derived to overlay on the 1:6,000 scale geology map of the ore deposit. The enlarged map was adjusted to the geologic map by transferring picked recovery points, as seen on the topographic map, to the geologic map. Note that the match is not perfect, which reflects the inability to transfer the points exactly as well as slightly differing scales of the paper maps.

Depths displayed on the northwest-southeast lines, LN 1111 and LN 2222, give essentially the same results in the northwest; the source of the anomalies is at the surface and is certainly marking the approximate contact between the serpentinite, unit 9, and the Sylvester Group, unit 8. To the southeast, the single deeper estimate depicted on LN 1111 could not be resolved on the draped profile data, LN 2222. This may be partly due to the noise that is still left in the data, even after filtering. For the mean terrain clearance data a much more severe filter would tend to destroy legitimate anomalies further to the north where the magnetic sources are much near the surface. As a test a more severe filter was applied to the CBA profile, LN 1111, CompuDepth™ rerun and essentially the same results obtained. This single estimate at the southern end of the profiles must be considered the southern-most extent of the serpentinite.

As indicated on the 1:6,000 map, the interpreter has inferred the existence of a vertical discontinuity on the west side of the anomaly that may be a fault or "fault-like" feature displacing the magnetic body down to the south. The extent or existence of this fault to the east is purely speculative, but partial evidence to support this might be the vertical scatter on the depth estimates on LN 6666. However, this would require extensive modeling to understand what is the cause. The depth estimates on LN 5555 suggest a body that dips eastward to a depth of approximately 4250 feet above sea level. This deep depth on the east side of the LN 5555 is in approximate agreement with drill hole DDH 84-1. There is also a note on the Casiar pit geological map stating "plunging", which the interpreter assumes means the structure is plunging in the same sense as the magnetic interpretation indicates.

The boundary of the serpentinite between lines 7777/12 and 6666/5555 is a problem. The reason is that there are two possible locations for this boundary as indicated by depths on the northerly lines. The existence of the waste dump in this region consisting of 200-300 feet of mixed argillite and greenstone presents a problem in that greenstone, in the interpreter's experience, can be magnetic.

As mentioned earlier, the southern-most of the east-west trending profiles are essentially no help to the determination of the east-west serpentinite contacts as they are generally sub-parallel to the strong southern gradient of the anomaly as depicted on the contour map.

Summary

The edges of and depths to the inferred serpentinite suggest a triangular-shaped body with its base to the southeast, outcropping in the northwest and plunging southeast to approximately 4300 feet above sea level. The body is possibly faulted down on the western perimeter by an east-west trending fault, and has a southern limit as on the south at a depth of 500 feet below the surface. Examination of the contour map suggests that a series of profiles flown northwest-southeast would have given a much better chance at defining the southern boundary of the intrusive. In general, a different choice of the orientations and locations of the profiles would have assisted in achieving the goals of the project more so than the profiles as flown.

The results of this interpretation are encouraging enough to warrant further consideration of magnetic data anslysis, especially if a comprehensive drilling program is envisioned. Further analysis of the June 1983 data could be attempted, as well as a start on a thorough three dimensional magnetic model incorporating drill hole data, underground geology from adits, and the CompuDepth™ results.

APPENDIX

COMPUDEPTH™

1. Introduction

This document is a description of the CompuDepth™ program and its use in the interpretation of magnetic and gravity data. Since interpretation goals and data characteristics vary widely from project to project, the information presented here is necessarily general. In this Section (Introduction), the objectives and limitations of CompuDepth™ are discussed and compared with those of other techniques. Parts of the theory underlying CompuDepth™ which are essential to understanding the results are presented in Section 2. Section 3 contains some guidelines for interpreting CompuDepth™ results.

What is CompuDepth™?

CompuDepth™ is an inversion program designed for rapid, quantitative interpretation of large blocks of gravity or magnetic profile data. The program automatically computes the locations of and depths to the sources of complex anomalies, such as those produced by a weakly magnetic crystalline basement overlain by highly magnetic sources. It has also been used as an independent check for Curie point analysis.

CompuDepth™ analysis has been successfully used to provide a preliminary picture of the geologic structure for exploration programs, both petroleum and mineral, varying from regional size (thousands of square kilometers) to detailed surveys of only tens of kilometers.

The program has proven useful in such diverse geological settings as the salt dome province of offshore Gabon, the Precambrian uranium deposits in Northern Territory, Australia, and the lead mining districts of Missouri.

Like all automatic inversion programs, CompuDepth™ contains certain assumptions. First, it is assumed that the sources of the anomalous potential field along a profile are caused by a finite number of bodies of uniform magnetization or density bounded by planar edges, oriented perpendicular to the profile direction, and infinitely extended perpendicular to the profile direction.

Second, the input data must have reasonably low noise levels in the wavelengths of geologic interest and the data must have reasonably equal sample separation.

Interpretation of results produced by CompuDepth™ (discussed in Section 3) requires careful examination of the extent to which the above assumptions are valid. Experience has shown that the program can produce excellent results (see Gunn, 1979).

Alternative Depth to Source Methods

There are a number of alternative approaches that have been developed for the determination of source-edge locations and depths from potential field data. One simple method consists of matching, either by trial and error, or by least-squares fitting, individual anomalies to the fields of model sources. This approach requires extensive manual intervention, is very time consuming, and is of little use for analysis of large data sets.

Algorithms for model comparison methods have been developed by various investigators (for example, Corbato, 1965 and Johnson, 1969). These programs are designed to fit, by least-squares methods, combinations of simple sources to the observed potential field. The most significant drawback to this approach is that initial estimates of the source distributions are required as a starting point for the calculations. In general, different initial estimates lead to different results. Thus, some a priori knowledge regarding sources, typically unavailable, is required to produce credible results. These modeling methods are more suitable for the detailed analyses that are required for developing mining sites.

Another approach to depth determination uses Fourier analysis techniques. Each source-edge produces a signal whose Fourier transform decreases exponentially with frequency at a rate determined by its depth (Spector and Grant, 1970). Theoretically, it is possible to fit a superposition of exponential functions to the spectrum of the potential field along a profile. From the coefficients of this fit, one could then, in principle, determine source-edge locations and depths.

Unfortunately, depths to edges along a profile typically are of similar magnitudes. The resulting spectrum has the form of the sum of a few exponential terms which decay at an average rate, making the exponential coefficients of individual source-edges poorly determined. This averaging effect is extremely useful if average locations of, and depths to, sources are of interest, but prevents resolution of individual edges.

Advantages of CompuDepth™

The CompuDepth™ algorithm takes advantage of the simplicity of exponential behavior in the frequency domain, while minimizing the averaging effects, to effectively resolve multiple sources at differing depths in a single pass through the data. This is achieved by performing calculations partly in the frequency domain and partly in the spatial domain.

Only one initial estimate concerning the source bodies is necessary - the approximate maximum depth. The algorithm is insensitive to remanent magnetization; modeling methods are not.

It is very fast and can effectively process large data sets - there is a limitation of 4096 samples per profile, but any number of profiles may be processed in a single run.

2. Theory

The same program can be used to process both magnetic and gravity data through Poisson's theorem, which relates the magnetic field of a body to its gravitational field:

$$T_m = \frac{k}{\rho G} \frac{\partial T_g}{\partial i}$$

where T_m and T_g are the magnetic and gravitational fields respectively, k is the magnetic susceptibility of the body, G is the universal gravitational constant, ρ is the density of the body, and i is a unit vector in the direction of magnetization.

In order for the edges' horizontal locations and depths to be determined uniquely, a few theoretical assumptions about the source bodies are required.

First, because the program operates on profile data, a magnetic body's magnetization or gravity body's density is assumed to be homogeneous and infinite along strike (two-dimensional) on both sides of the profile. This assumption is reasonable for many geological features, such as dikes, faults, and folds.

Second, source boundaries are assumed to be oriented perpendicular to the profile (that is, cross-sections of the source bodies are assumed to be parallel to the profile). In practice, good results are obtained if the two-dimensional anomalies do not diverge more than fifteen to twenty degrees from perpendicular to the profile.

Third, the sources' cross-sections are assumed to be polygonal. In principle, this not a limitation, since an arbitrary shape can always be approximated by a polygon of sufficiently many sides. Practically, the number of polygonal edges which can be resolved depends on the size of the source relative to the profile length, the sample interval along the profile, and the depth of individual source-edges below the height of observation.

Since the anomalous field is caused by polygonal bodies of uniform magnetization or density, the sources of the horizontal derivative of the magnetic field, or the horizontal derivative of the vertical derivative of the gravity field, are the regions of magnetization or density contrast - that is, the planar boundaries between the bodies. These sources may be decomposed into sheets of infinite depth. The locations and depths of the tops of the sheet sources are calculated by the CompuDepth™ program.

For a sheet source, infinite in depth, and having a top edge at location x_o and depth z_o, the total field observed at location x and depth zero may be written

$$(1) \qquad T(x) = K_1 \frac{z_o}{(x - x_o)^2 + z_o^2} + K_2 \frac{x - x_o}{(x - x_o)^2 + z_o^2} ,$$

where K_1 and K_2 are constants depending on the magnetization of the sheet.

The Fourier transform of field (1) is

$$(2) \qquad \hat{T}(u) = (K_1 - i \operatorname{sgn}(u) K_2) e^{2\pi |u| z_o} e^{-2\pi i u x_o} .$$

Up to numerical factors, this Fourier transform is an exponential function of frequency with a decay constant whose real part is the depth of the edge and whose imaginary part is the location. The Fourier transform of the field due to a number of sheet sources is a sum of terms of this form, and the problem of finding edge locations and depths, in principle, reduces to fitting a sum of exponentials to the spectrum of the observed (derivative) field.

In practice, two modifications to this procedure are required. First, because fitting exponentials is a nonlinear procedure, this step is broken into two parts. Notice that, if the spectrum is a sum of M exponentials, the relation

$$(3) \qquad \hat{T}(u) = \begin{cases} \sum_{m=1}^{M} A_m \hat{T}(u + ms) & , u > o \\ \sum_{m=1}^{M} A_m \hat{T}(u - ms) & , u < o \end{cases}$$

holds, where the A_m's are suitably chosen complex constants and s is any positive number. The A_m's may be determined by linear least-squares methods. The exponential factors are then determined by the polynomial equation

$$(4) \qquad \sum_{m=1}^{M} A_m y^m = 1 .$$

The M roots y_k, $k = 1, \ldots, M$, are given by

(5) $$y_k = e^{-2\pi/s\ z_k}\ e^{-2\pi i/s\ x_k}$$

where z_k and x_k are the depth and location of the top of the kth edge. The roots y_k may be found once the A_m's have been determined, using standard complex polynomial solution methods. The nonlinearity of the exponential fit is thus reduced to solving a polynomial.

The more fundamental modification arises because solving equations (3) and (4) in the frequency domain is impractical. In typical situations, the sources along a profile have depths which group into a few very similar classes. This means that an exponential fit in the frequency domain could have to resolve many exponentials with nearly identical decay constants. In that case the advantage of spatial separation is lost.

The solution to this problem is to define new Fourier-transformed fields by

(6) $$\hat{T}_m(u) = \begin{cases} \hat{T}\ (u + ms) & , \ u > o \ , \\ \hat{T}\ (u - ms) & , \ u < o \ . \end{cases}$$

These new fields are obtained by "shifting" the Fourier transform ms units toward DC. In terms of the new fields, Equation (3) takes the form

(7) $$\hat{T}(u) = \begin{cases} \sum_{m=1}^{M} A_m\ \hat{T}_m(u) & , \ u > o \ , \\ \sum_{m=1}^{M} A_m\ \hat{T}^*_m(u) & , \ u < o \ . \end{cases}$$

The new fields may now be back-transformed, and Equation (7) written in terms of spatial equivalents:

(8) $$T(x) = \bar{T} + \sum_{m=1}^{M} [(\mathrm{Re}\ A_m)\ T_m(x) + (\mathrm{Im}\ A_m)\ H\ T_m(x)],$$

where $\bar{T}$ is the mean value of $T(x)$ along the profile, and H is the Hilbert transform operator, whose frequency domain form is

(9) $$\hat{H}(u) = \begin{cases} i, & u > o \quad , \\ -i, & u < o \quad . \end{cases}$$

Equation (8) may be solved for segments (windows) of the profile, using a limited number of coefficients. The solutions obtained in any window are generally dominated by edges located in or near that window. Sweeping the window along the line produces a full suite of edge depths and locations.

C. Using CompuDepth™

Normally CompuDepth™ is the last program used on a magnetic or gravity data set. All the usual corrections (such as diurnal corrections) have been applied in compilation, and profile plots and a contour map of the data made. This map is crucial for deciding which portions of the data are sufficiently two-dimensional to use CompuDepth™. It will also be useful in selecting the 'best' edges and, except for offset profiles, is the only tool for computing strike corrections.

The profiles and contour map must be examined to determine if CompuDepth™ will be useful for the geologic problem at hand. If the data are excessively noisy, or the anomalies of interest are not reasonably linear, or if they are large compared to the line length, or very close to the ends of the survey lines, CompuDepth™ should not be used. If the anomalies of interest are linear, but not perpendicular to the survey lines, profiles may be extracted from the gridded data used to make the contour map.

Each CompuDepth™ profile is produced by the CDSTRP program. Input parameters include: The profile data and clustered depth file from the CompuDepth™ run. The profiles are composed of two logical displays. (See enclosed example.) The upper display contains the input magnetic or gravity trace as a solid line and a dashed line representing the mathematical back-fit due to the edges picked by the CompuDepth™ analysis. The lower display contains the depths to sources: the vertical scale is in thousands of feet below sea level. Each little box represents the top of the edge of a polygonal body. The vertical bar above and below each box represents the mathematical uncertainty for that estimate. The number directly above the vertical bar is the number of sources found within a predetermined search radius in that region and averaged together for the display. The number with a percent sign to the right of the box represents the percent of the variance of the back-fit accounted for by that particular edge.

For this particular survey other display information was included, also shown on the example. The CDSTRP program uses the radar and barometric altimeters to compute the terrain for magnetic data, which was displayed inside the top division of the depth-to-sources display. Also, by using the altimeter data for magnetics or terrain data for gravity, the clustered depths were converted from depth below the survey altitude to depth below sea level.

The next step is to make an approximate determination of the depths to the sources of interest. Any information, such as borehole data or geological maps (even external to the survey), can be very valuable, both at this stage and in preparing a final interpretation. Depth estimates should be obtained from the data - from profile or two-dimensional power spectra, or by slope measurement of profile or contoured anomalies. A low-pass filtered or reduced to the magnetic pole contour map can be helpful here, and at later stages, for delineating major structures.

Once preliminary depth estimates have been obtained, test runs of CompuDepth™ should be made using profiles typical of the magnetic or gravity character of the entire data block. Set the parameters as indicated by the estimates. For test runs, the expanded list file must be examined carefully. Items to be checked include:

A) Are almost all the edges for the solutions of the smallest or largest allowable number of solutions being rejected? In this case, overhead can be saved and extraneous depths eliminated by changing the allowable number.

B) Are the edges picked reasonably consistent with the initial depth estimates? If not, either some features in the data have been overlooked, or grossly incorrect parameter values have been used in setting up CompuDepth™. When the geology of an area is not well understood, the magnetic or gravity structure can be quite different from that expected. But if independent estimates from the data themselves (e.g., from power spectra) disagree grossly with the results from CompuDepth™, a decision must be made about where the error lies.

C) Does the back-fit match the variations in the data at the wavelengths of interest? If not, some parameter adjustment may be called for; but it is possible that the back-fit is poor for essentially spurious reasons and should be discarded. Examine the edges used in the back-fit to determine if unreasonable selections have been made.

D) Does the clustering seem reasonable? To determine this, examine the unclustered depths by running CDSTRP again. If the clustering is not reasonable, it may be possible to adjust the resolution to obtain better groupings. If not, the raw edge picks may have to be used, and clustering done by hand.

E) Do some of the depths in the vicinity of the linear features display coherence from line to line? If not, something is wrong. Probably an incorrect estimate of the depth to those sources is indicated.

After examination of the results of the test run, it may be advisable to perform further tests. For example, if some unsuspected, very deep sources are indicated by CompuDepth™, a run with the parameters adjusted to resolve these may be in order. Occasionally these sources are picked at a much too shallow depth when the parameters are not set to resolve them, and deep picks in the final results may have to be regarded with suspicion. Questions of this type should be settled in advance, if possible.

When satisfactory results have been obtained on the test lines, the full data set can be processed, and final CompuDepth™ profiles made. Final interpretation can then begin.

Begin with the best-defined and most two-dimensional anomalies. Series of profiles, a few at a time, may be overlaid to locate those edges with the strongest continuity from line to line. Discard depths associated with anomalies present on only one or a few profiles and obviously spurious edges.

Very shallow edges with small standard deviations are typically produced when a "model" containing more than the actual number of resolvable edges is fit to the data. Such edge picks are not difficult to distinguish from real sources at, or near, the surface. The latter (if two-dimensional) will correlate from line to line, whereas the spurious picks will be quite random.

Any available external information will be helpful at this stage. Edges in good agreement with borehole data can help establish the validity of similar patterns nearby. Known faults will often be clearly reflected in the CompuDepth™ results, and edge clusters having a similar distribution to those along known faults should be examined for the presence of further faulting.

Correlations with topographic features should be considered. Prominent terrain is an example, but less obvious features such as major drainages may also be important. The guiding principle is accord with geologic fact - does the structure suggested by CompuDepth™ make sense in the context of the geology of the area?

The program ZPLOT then plots the depth file in a survey line map form, labeling the depths along each profile. Once the spurious edges have been identified, the clustered depth file can be edited to remove them. If more than one layer of magnetic or gravity structure appears in the CompuDepth™ output, it may be useful to make separate maps for each horizon of interest.

Drafting of the interpretation map can be done on a large sheet of vellum. First trace known major structural features onto the interpretation map. These can be used as a guide throughout the drafting. Begin with the areas showing the best resolved and most two-dimensional features (usually the deepest depth estimates), laying down contour lines where these are clearly defined by the picked edges.

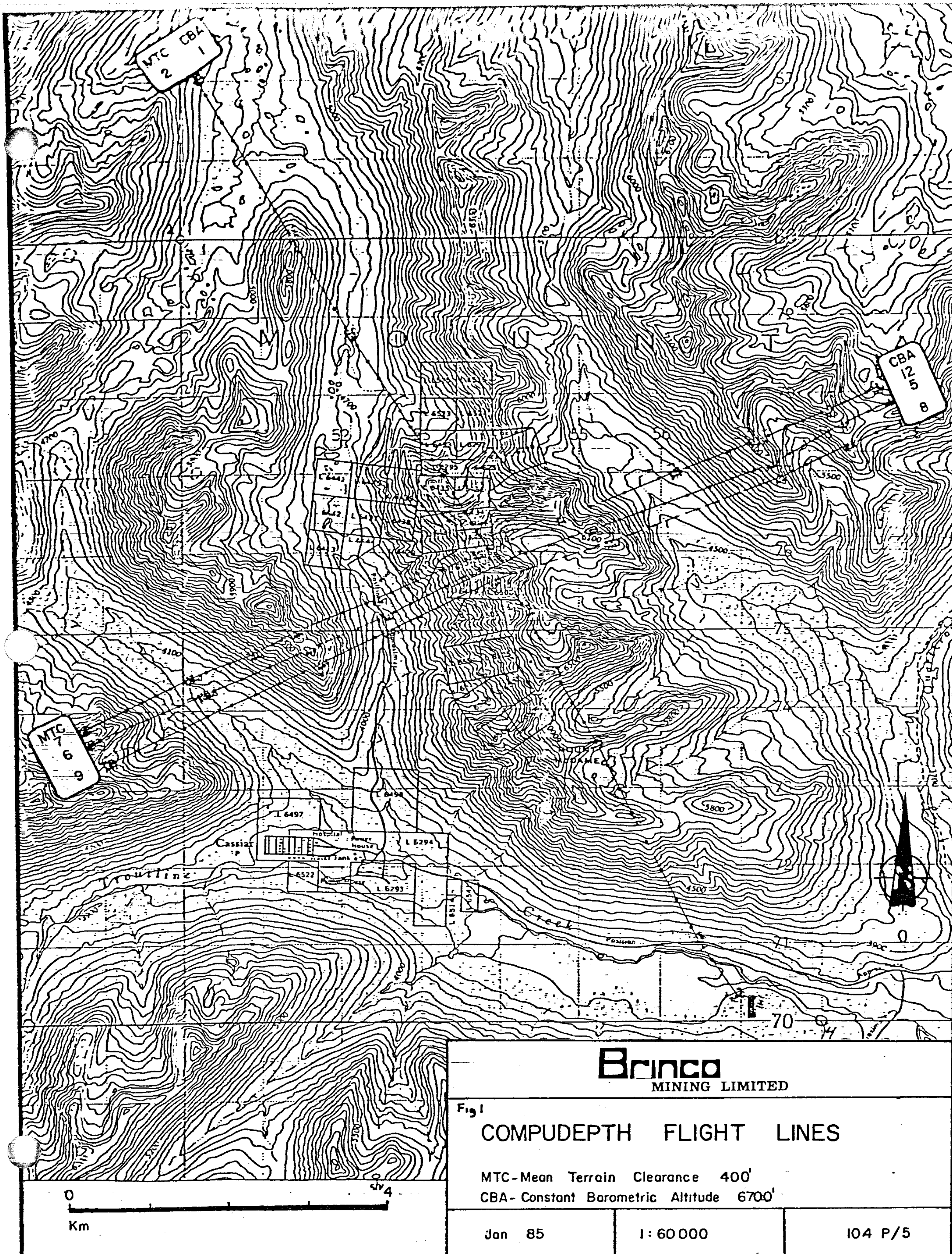
Strike corrections, if indicated, should be applied at this stage. If the feature strikes at an angle to the perpendicular to the profiles, depths should be multiplied by cos . Strike corrections should not be used for angles over 30°. Better depth estimates may be obtained by extracting a few profiles from gridded data over the area.

If depths from borehole data are consistently greater than those suggested by CompuDepth™, it may be advisable to bias downward all depths picked by the program in that area by an amount growing roughly linearly with depth. However, such a situation usually reflects a less-than-optimal choice of parameters for CompuDepth™. Consideration should be given to redoing selected portions of the processing with parameters better adapted to that area.

If the 'structure' indicated by CompuDepth™ cannot be contoured, accept an average depth value from power spectra, and move on to more usable areas. Cases include areas where high-susceptibility volcanic material overlays the basement structure.

When a preliminary depth to sources ('basement') contour map is completed, review the results by overlaying the CompuDepth™ profiles on the preliminary interpretation map and comparing results. Adjust contours, or profile interpretation when necessary.

The magnetic or gravity structure interpretation map cannot be considered as definitive, or even final. Rather, it should be viewed with some skepticism until it has been carefully compared with other geologic data and or further geophysical data, such as seismic data. In local areas of the survey, it may be desirable to rerun CompuDepth™ to resolve conflicts with ancillary information.



Brinco
MINING LIMITED

Fig 1

COMPUDEPTH FLIGHT LINES

MTC - Mean Terrain Clearance 400'
CBA - Constant Barometric Altitude 6700'

Jan 85	1:60000	104 P/5

MTc NW-SE

LINE LN 2222

BRINCO MINING LTD. COMPUDEPTH INVERSION
DATA ACQUIRED 26 11 89
HORIZONTAL SCALE 1: ~~20000~~ 1:60000

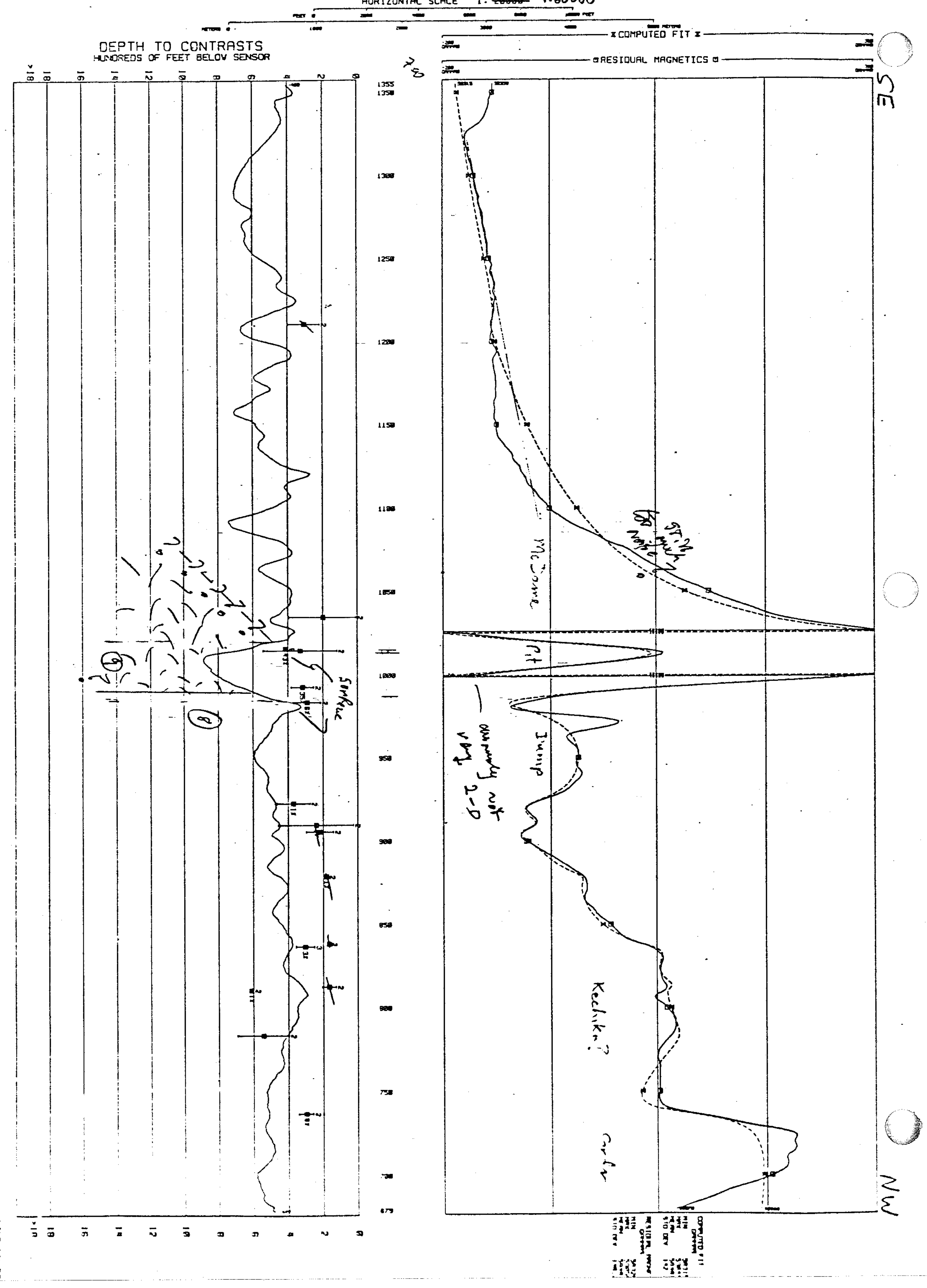


Fig 2
COMPUDEPTH LINE 2
MTC

CBA NW-SE

LINE LN 1111

BRINCO MINING LTD. COMPUDEPTH INVERSION

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE ~~1:20000~~ 1:60000

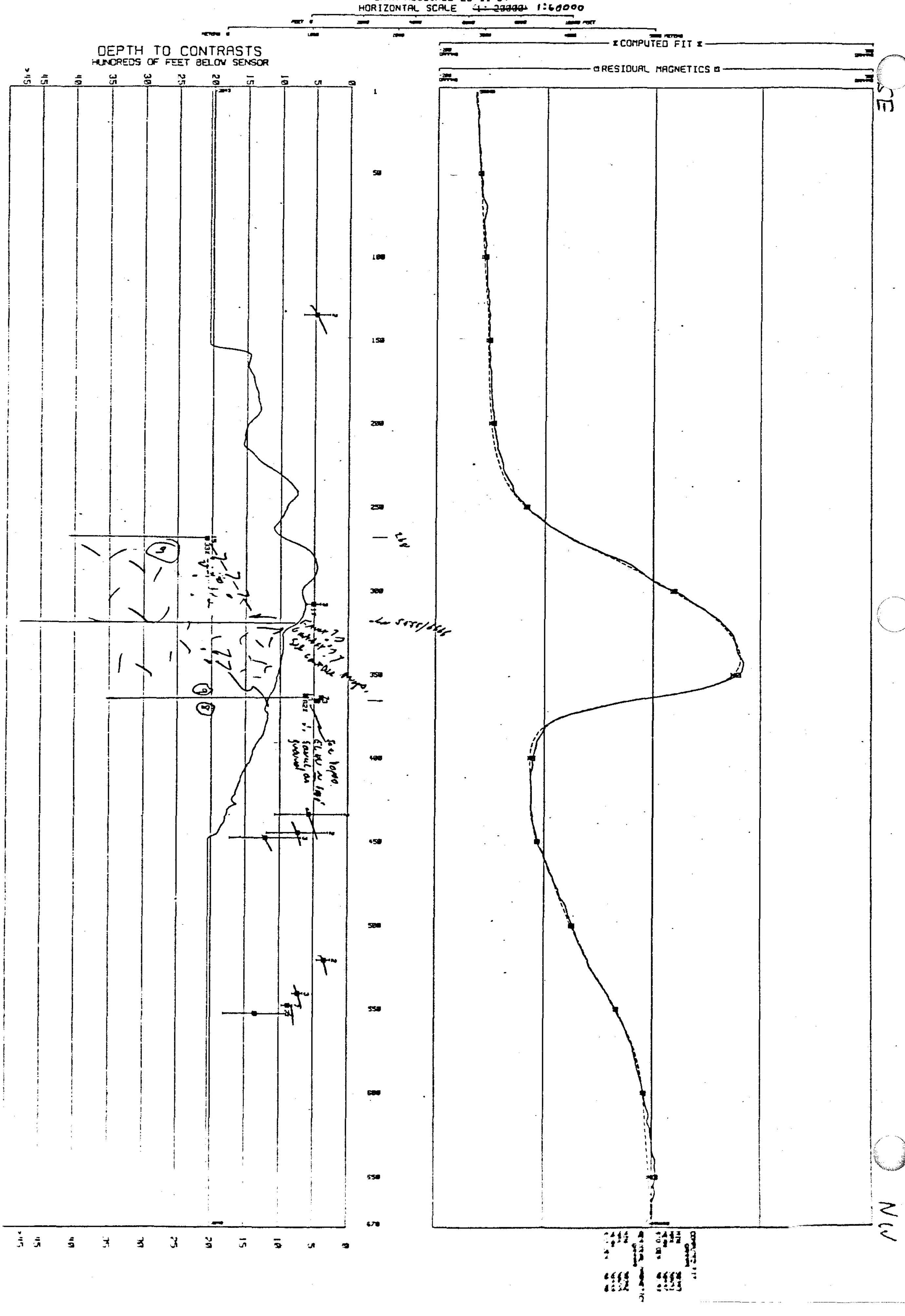


Fig 3
COMPUDEPTH LINE I
CBA

MTC

LINE LN 7777

BRINCC MINING LTD. COMPUDEPTH INVERSION

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE ~~1:20000~~ 1:60,000

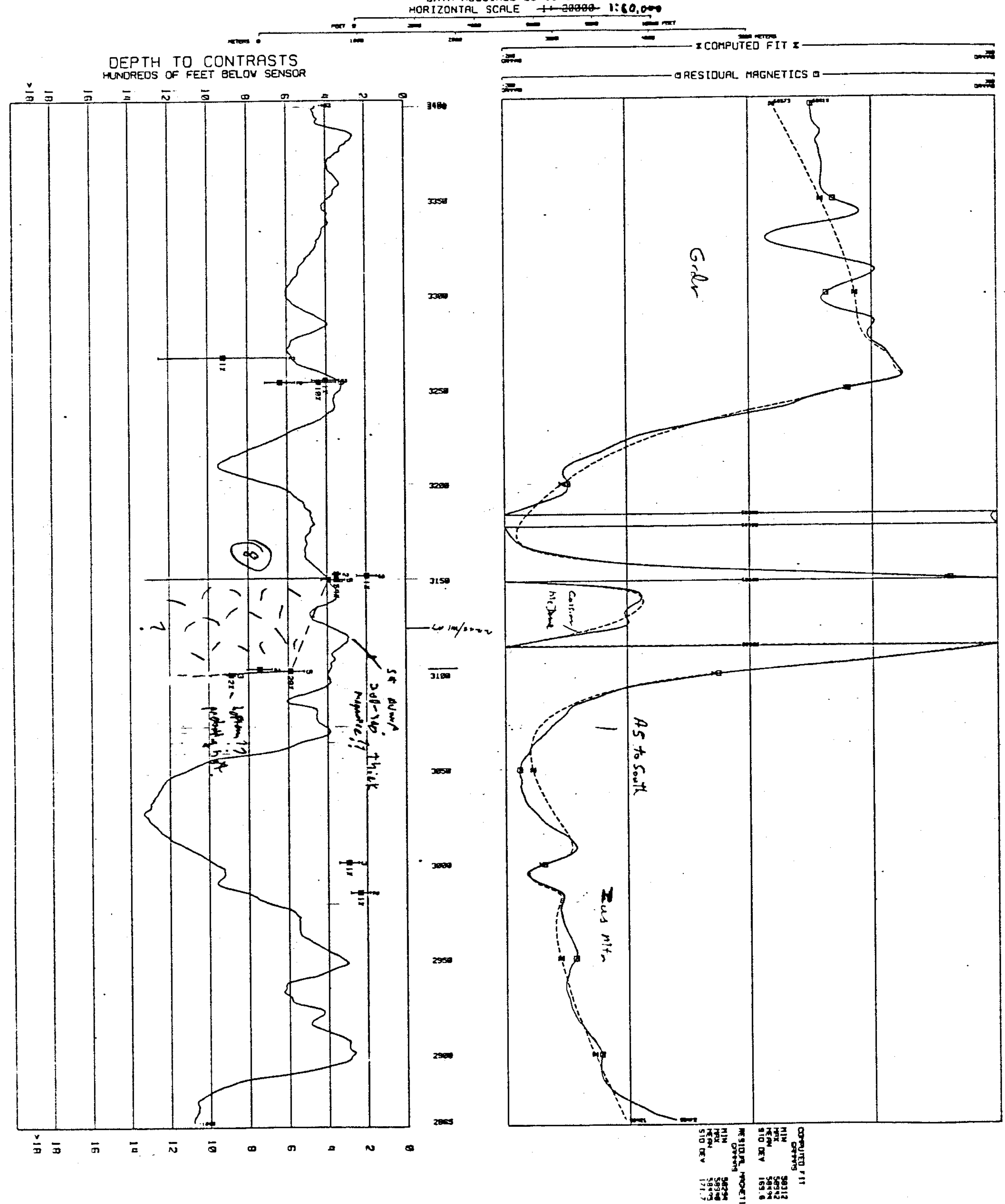


Fig 4
COMPUDEPTH LINE 7
MTC

CBA

LINE LN 12

BRINCO MINING LTD. COMPUDEPTH INVERSION

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE ~~1: 20000~~ 1:60,000

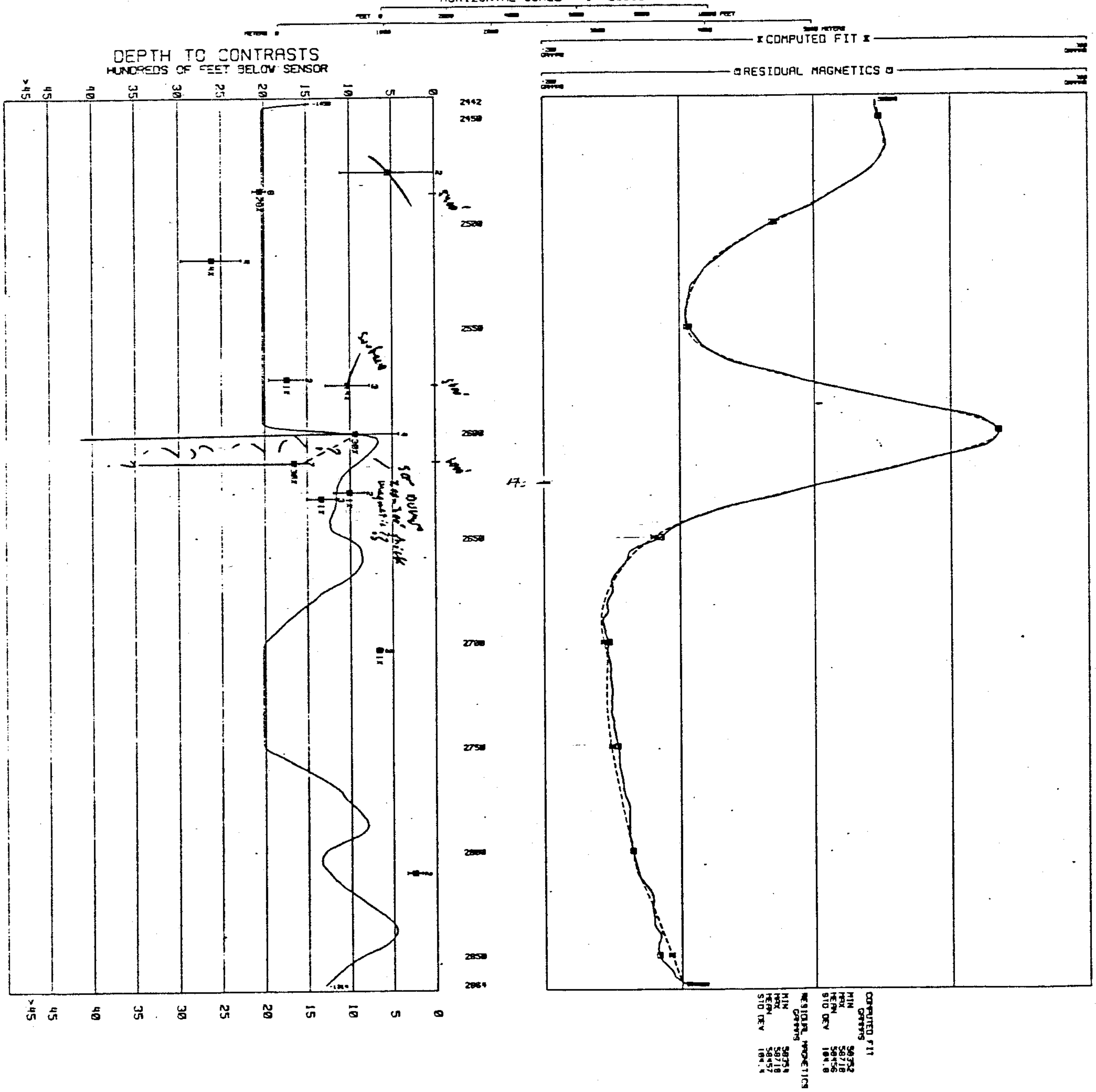


Fig 5
COMPUDEPTH LINE 12
CBA

MTC

LINE LN 6666

BRINCO MINING LTD. COMPUDEPTH INVERSION

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE ~~1:20000~~ 1:60000

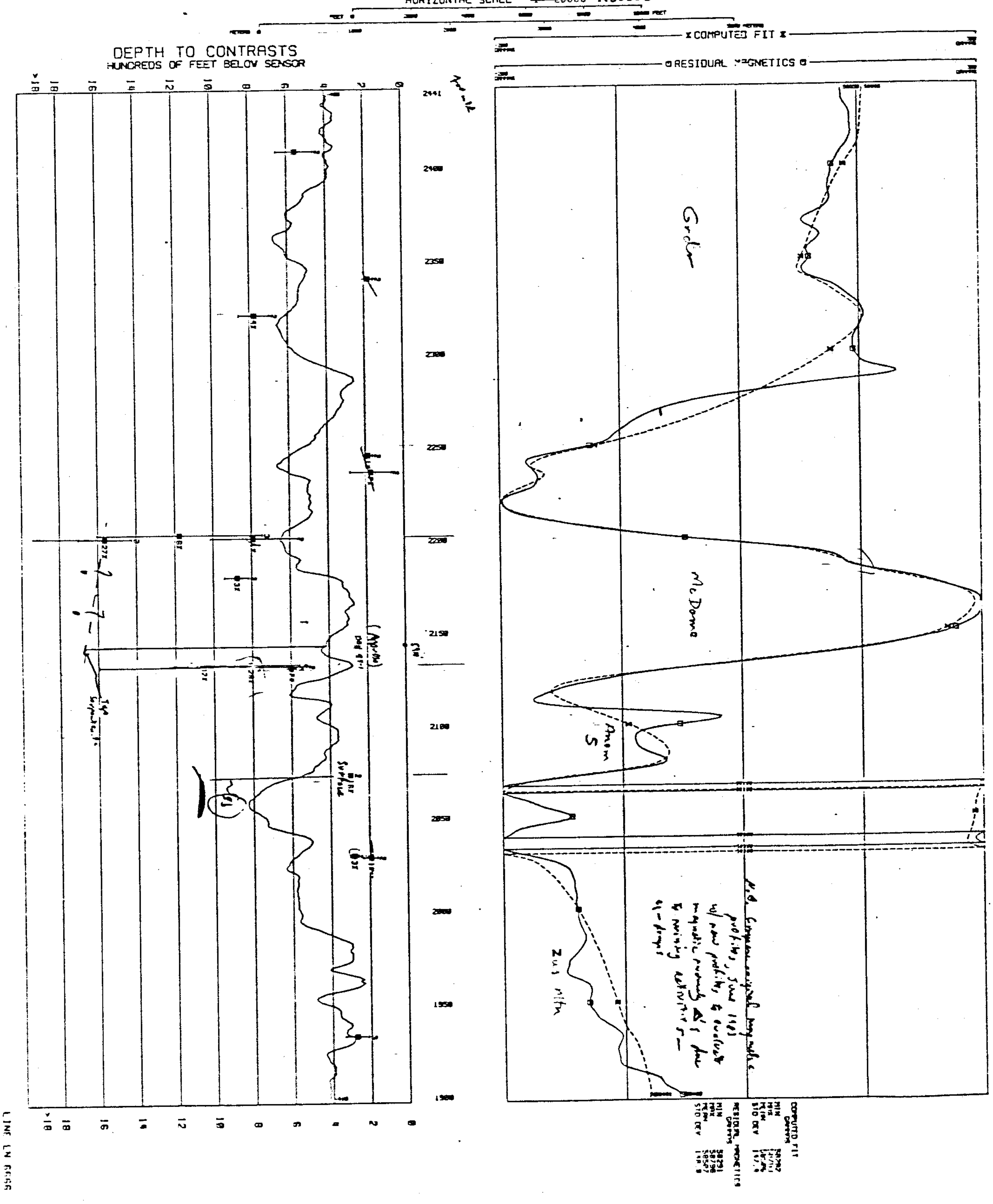


Fig 6
COMPUDEPTH LINE 6
MTC

CBA

LINE LN 5555

BRINCO MINING LTD. COMPUDEPTH INVERSION

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE ~~1: 20000~~ 1:60000

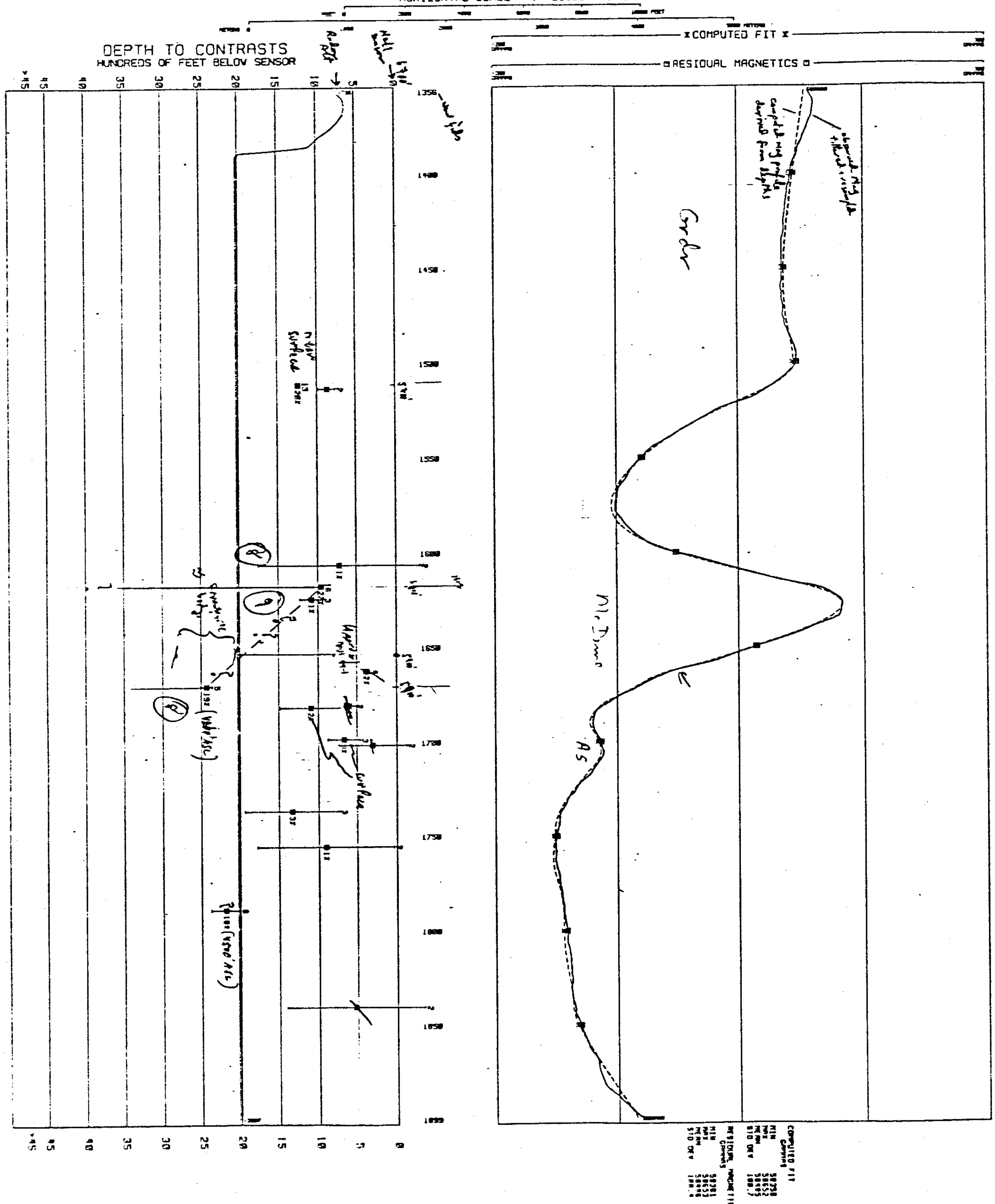


Fig 7

COMPUDEPTH™ LINE 5

CBA

MTC

LINE LN 9999

BRINCO MINING LTD. COMPUDEPTH INVERSION

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE ~~1: 20000~~ 1:60000

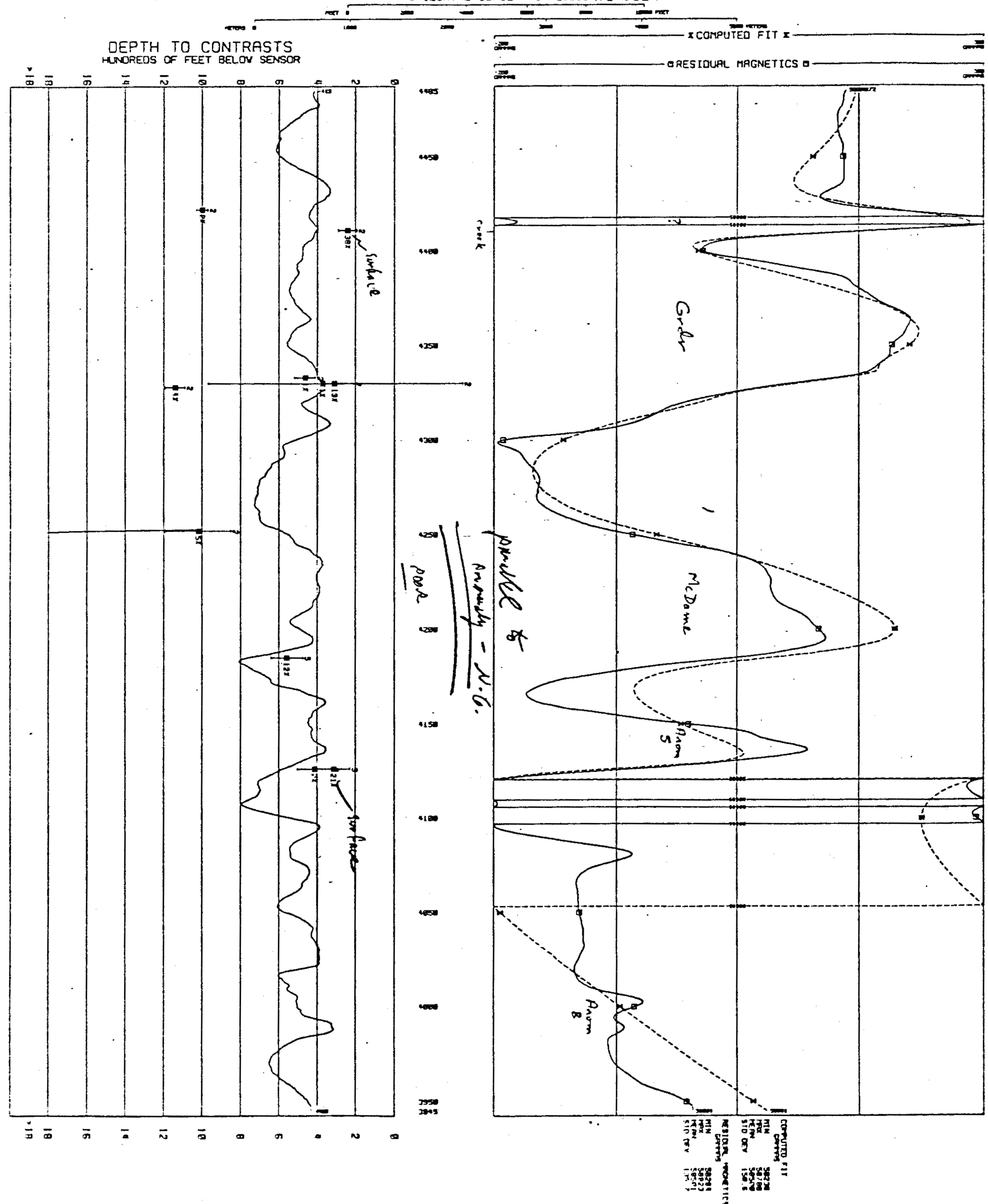


Fig 8
COMPUDEPTH LINE 9
MTC

C8A

LINE LN 8888

GRINCO MINING LTD. COMPUDEPTH INVERSION

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE ~~1: 20000~~ 1:60,000

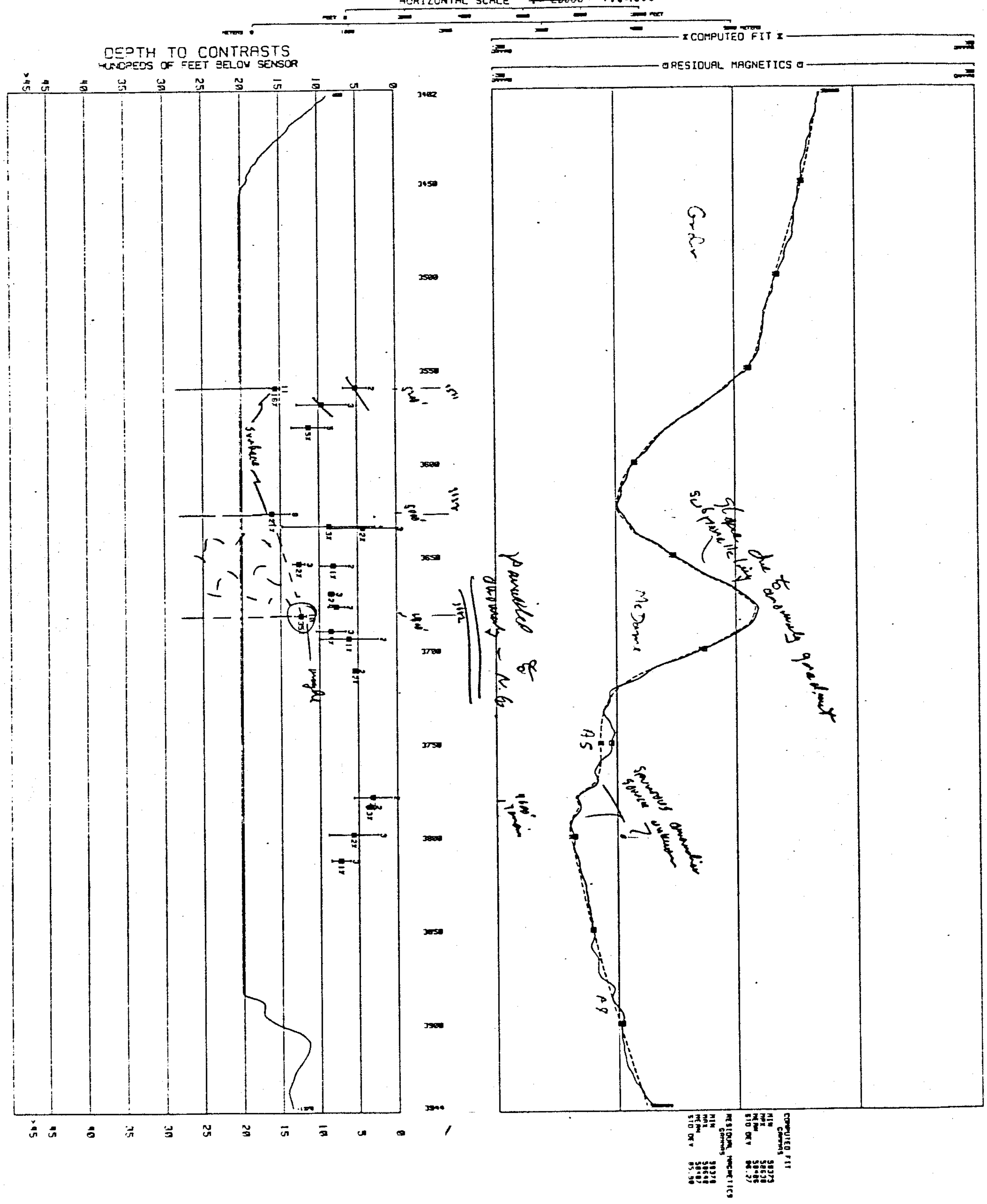


Fig 9

COMPUDEPTH LINE 8

C8A

APPENDIX 2

DERRY, MICHENER, BOOTH & WAHL
CONSULTING GEOLOGISTS AND ENGINEERS

SUITE 410 - CONFEDERATION SQUARE
20 RICHMOND STREET EAST
TORONTO, CANADA M5C 2R9
TELEPHONE: (416) 368-4636
TELEX: 06-23686
TELECOPIER: (416) 367-3347

MEMORANDUM

TO: Brinco Mining Limited
Mr. A. A. Burgoyne
Mr. R. Hewton
Mr. I. Lyn

DATE: March 18, 1985

FROM: R. W. Woolham

CASSIAR OFFSITE

INTERPRETATION OF ANOMALY 5

INTRODUCTION

The results of a ground investigation of airborne magnetic Anomaly 5 were discussed in a report by I. A. Lyn of November 14, 1983. At that time it was thought that a thin magnetic basalt layer dipping at about 40^{o} to the east probably explained the anomaly. A second examination of the flight line profiles and corresponding geological information suggested that the Anomaly 5 responses were not totally explained by the magnetic basalt. Ground magnetics also seemed to indicate that the basalt layer had a very localized magnetic response. It was concluded that a second more detailed analysis of the anomaly was necessary.

RESULTS

In such a study as this, exact anomaly location and characteristics are important factors in an accurate analysis. The more exact flight line recovery information on the photograph provided by I. Lyn has been utilized to locate the anomaly peaks related to the 1983 Anomaly 5 response. These peaks are plotted on Figure 1 in addition to the ground magnetic anomaly locations and geology. Anomalies A, B and C all appear to correlate with the magnetic basalt layer. Anomaly D, however, does not correlate with any presently known surface magnetic source. Its ground expression has not been completely measured, but a buildup of magnetic response near anomaly D does occur, as seen in Figure 4 of Lyn's report.

Comparing the Anomaly A ground and airborne responses using a dyke model provides a good fit to a near surface narrow source. Thus the attenuation of Anomaly A, from approximately 2,000 nT to 200 nT when the sensor is raised from ground level to 60 metres mean terrain clearance, is explained. By comparison, the amplitude falloff of Anomaly D is much lower being about 800 nT at ground surface to 300 nT at 60 metres above ground. This suggests that a larger and geometrically more voluminous source is present under location D. This conclusion is also supported by the anomaly characteristics seen in the contour map of the 1984 airborne survey flown at constant barometric altitude. The anomaly is elliptical in shape and is shifted southeast from the original anomaly highest amplitude centre obtained with the survey flown at a lower altitude.

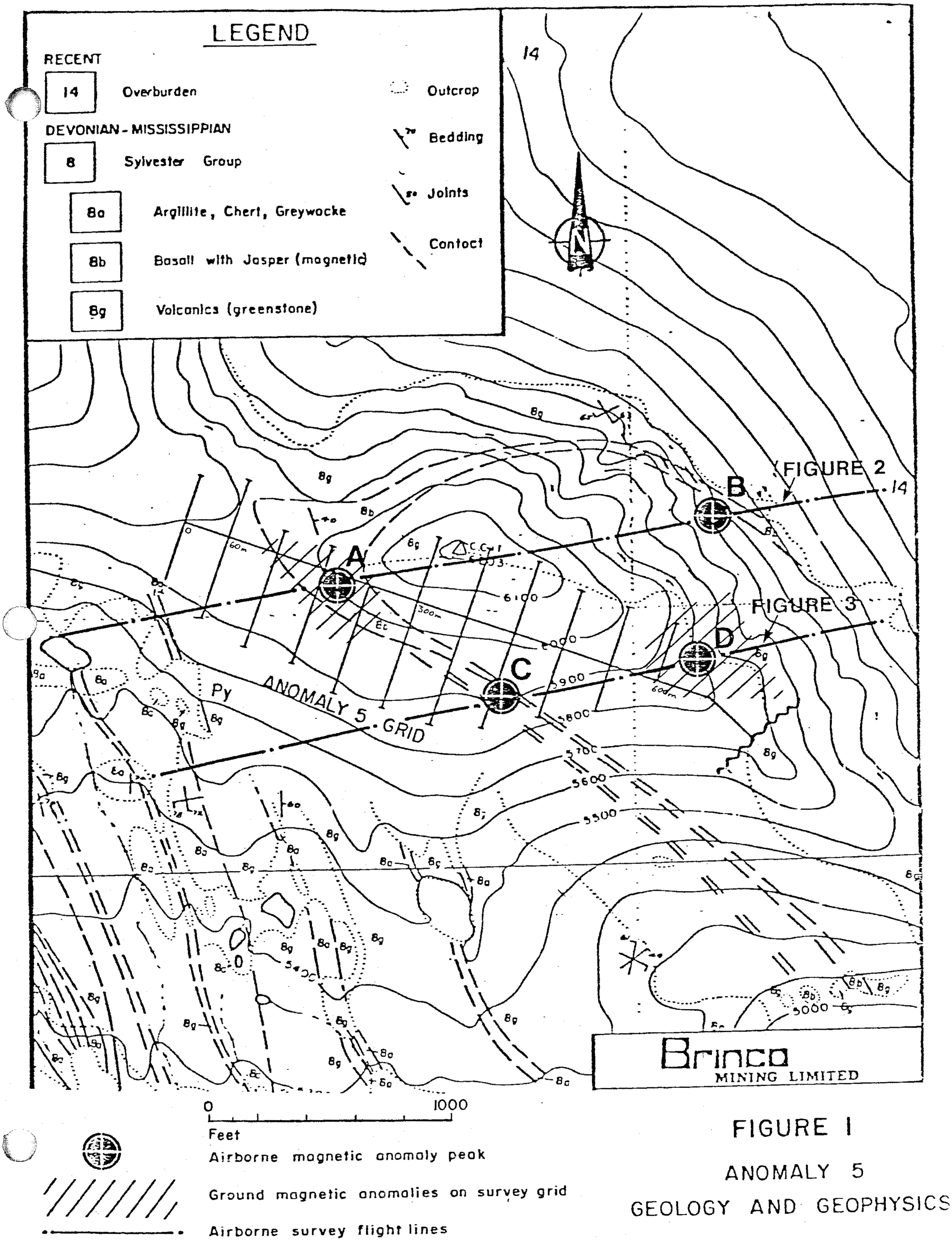


FIGURE I

ANOMALY 5

GEOLOGY AND GEOPHYSICS

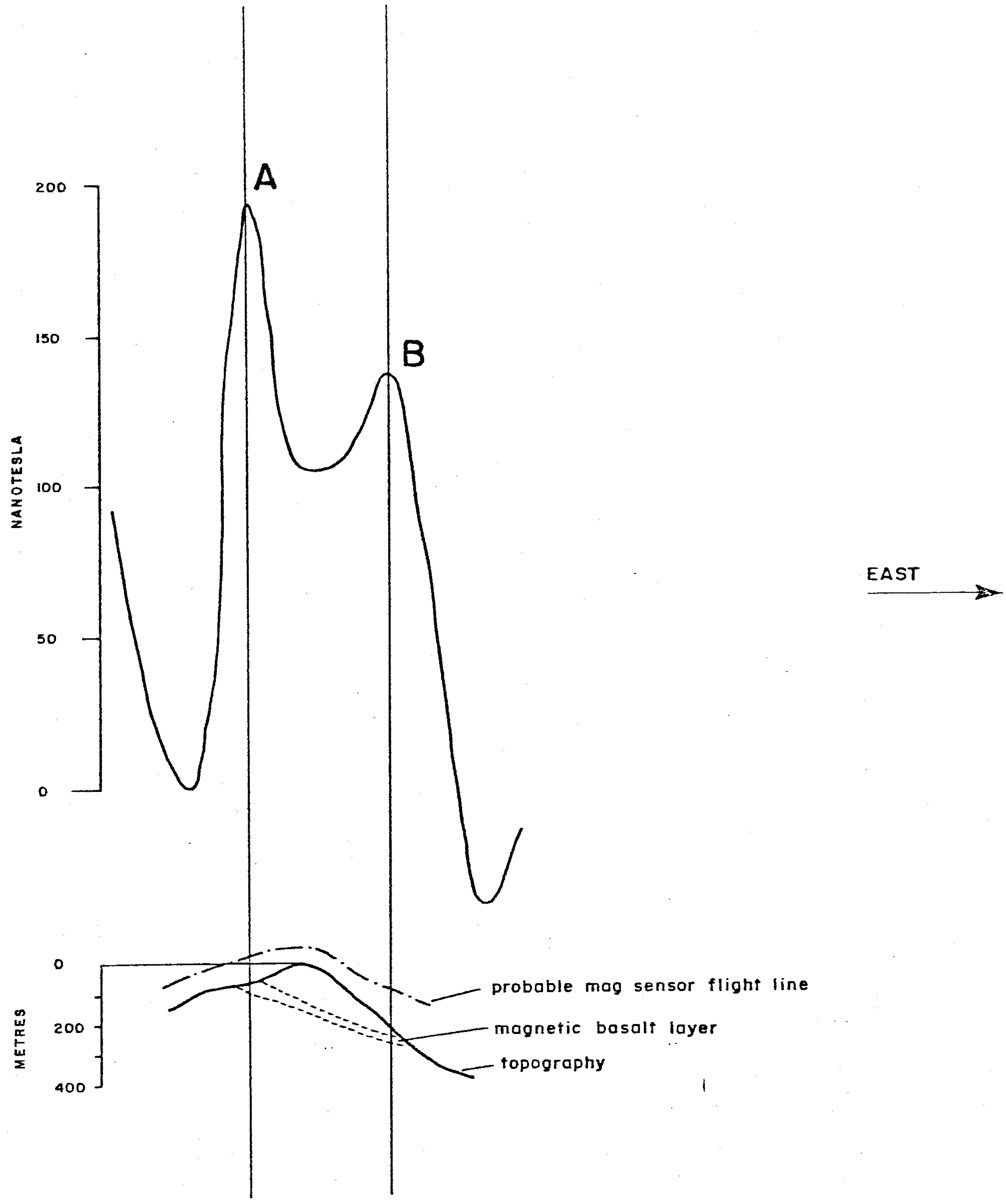


FIGURE 2

AIRBORNE MAGNETIC TRAVERSES

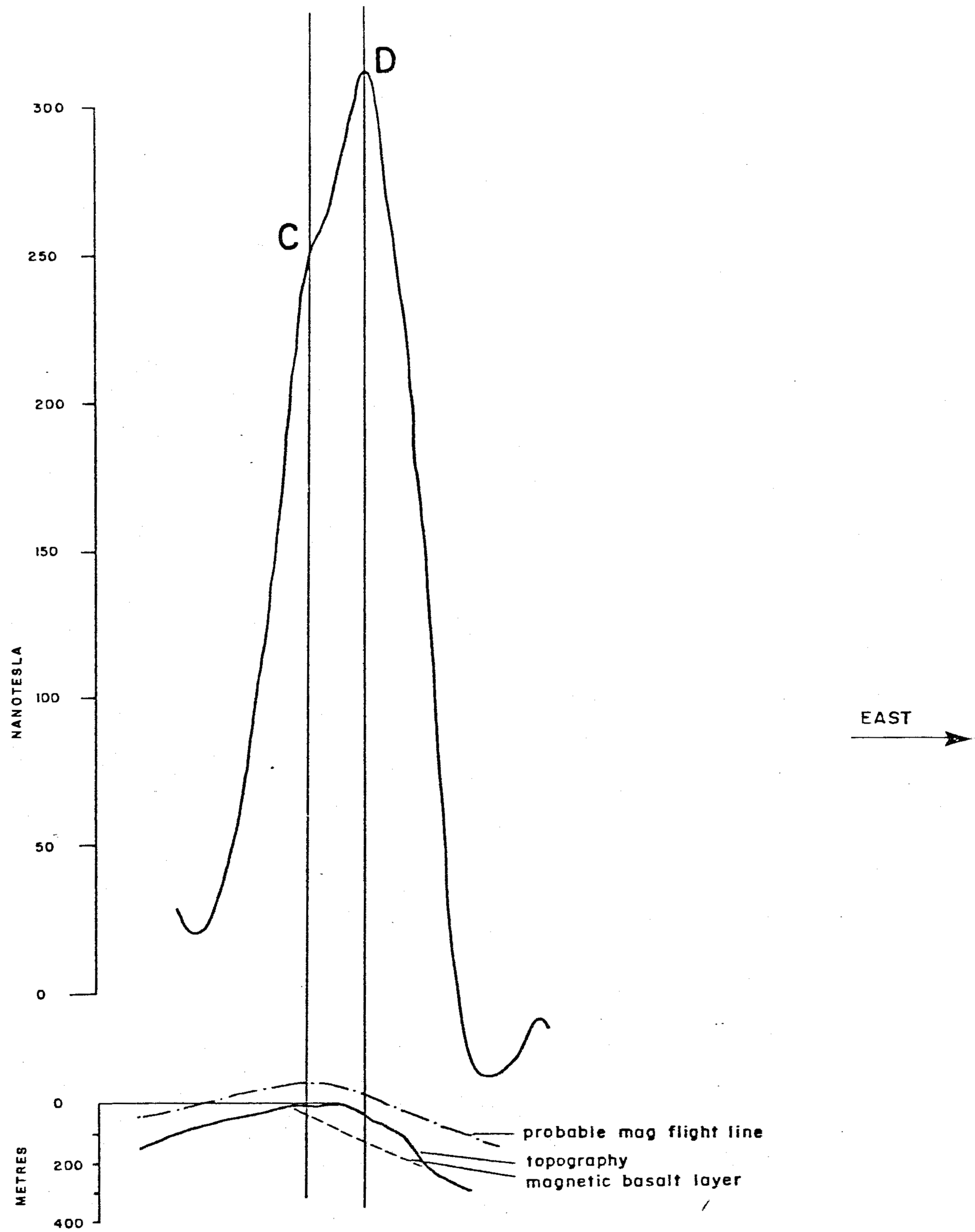


FIGURE 3

AIRBORNE MAGNETIC TRAVERSES

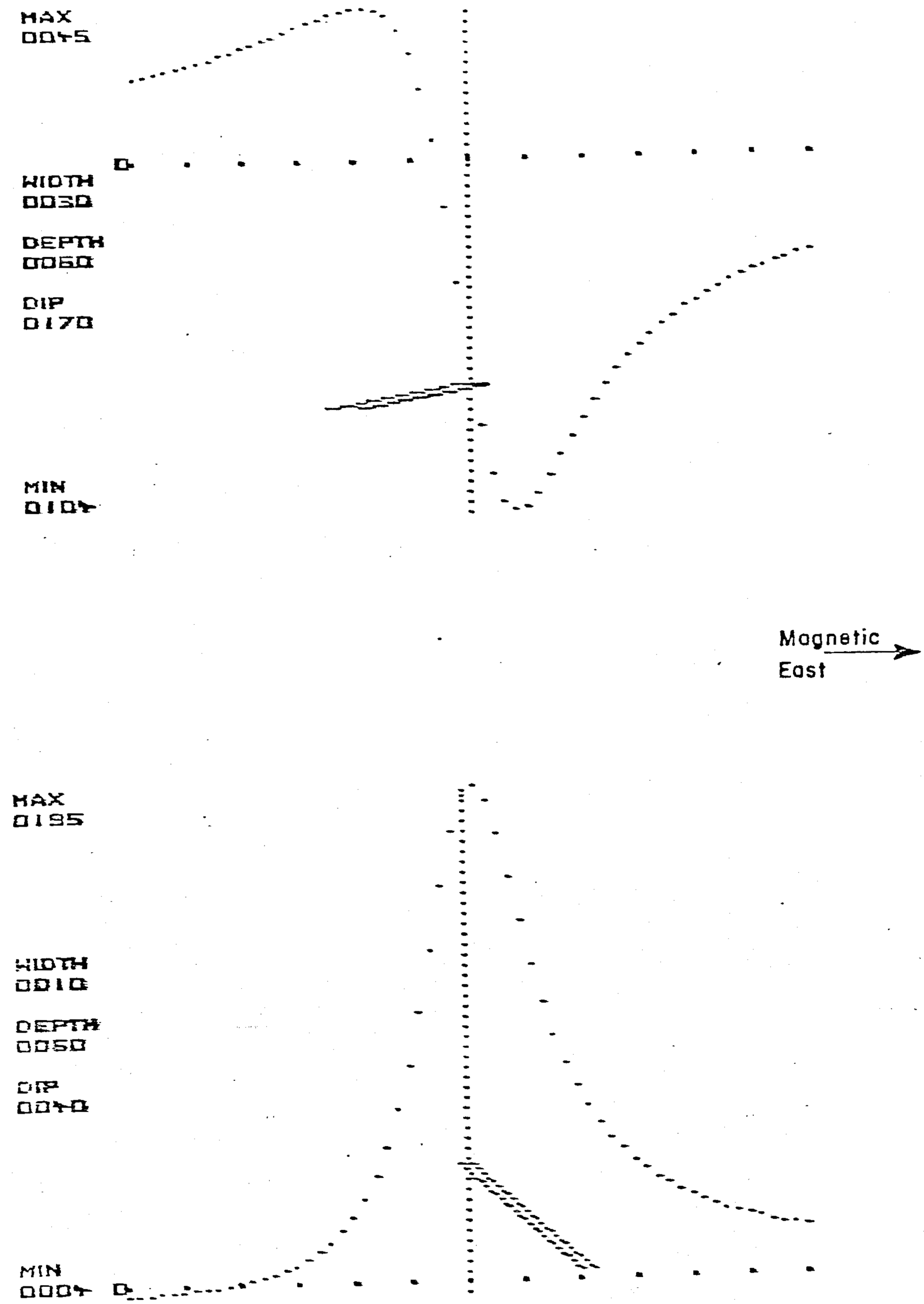


FIGURE 4

RESPONSE OF DIPPING DYKE MODEL FOR ANOMALY 5

Analysis of the airborne and ground amplitudes characteristic of Anomaly D suggests that a buried source is present. For purposes of illustration, the 1984 flight line results over the anomaly have been used, as their scale has been corrected for aircraft speed variations. Note, however, that these lines cross the area in almost the exact same location as the 1983 survey and the profiles are identical. Figures 2 and 3 are profile sections along the flight lines shown on Figure 1. Note that Figure 2 shows two separate narrow width anomalies over the exposed portions of the magnetic basalt on either side of the hill. Figure 3, however, shows that Anomaly C is very probably related to the basalt layer but dominating the response is Anomaly D. In order to evaluate the possible source of anomaly D, an analysis of the amplitude response alteration with differing magnetic sensor altitudes has been performed. Using a point pole model, a reasonable fit to the three data sets for a source at 100 metres below surface is obtained. The elongated nature of the anomaly asymmetrical shape and negative east flank can be poorly modeled as a dyke source. A depth to source of 40 metres below surface was obtained using the dyke model. The pole and dyke models assume "infinite" depth and strike extent and thus only provide a first approximation to the maximum and minimum limits to the source depth. Table 1 lists the parameters used to evaluate the anomaly characteristics of Anomaly D. Note that the anomaly amplitude and half width at surface had to be estimated as only a portion of the anomaly was covered by the grid. The best fit was obtained for the point source. The dyke model was not valid for the highest altitude data set.

Figure 4 shows the type of response expected from narrow near surface dykes having low dips traversed at right angles to their strike. Very high amplitude negative components would be expected on the east and north sides of a dyke oriented with respect to the topography related to Anomaly 5. Such negatives are suggested by the 1983 survey results and no doubt relate to the thin magnetic basalt layer source. The Anomaly D response and the southeasterly extension of Anomaly D, however, lack a significant negative component relative to its positive component. This provides further evidence that a second source may be present under Anomaly 5.

CONCLUSIONS

Present information provides strong evidence that a magnetic source, not presently explained by geology, underlies the Anomaly 5 area. The source could be explained by a considerable thickening of the magnetic basalt layer with an increase in magnetite and/or an upward faulting of the layer in the down-dip location under Anomaly D. The thickening would necessarily have to be confined to an area about 250 metres wide and 700 metres long. In addition, this thicker more magnetic zone could not outcrop. This scenerio is geologically possible if a paleochannel was filled by a basalt flow. Alternatively, the source could be a near vertical intrusive plug having an elliptical shape in plan. Its average radial dimensions probably would not exceed 75 metres. Depth to the top of the plug is estimated to average 75 metres with a minimum depth limit of 25 metres and maximum of 125 metres. The magnetite content cannot be estimated.

RECOMMENDATIONS

Further investigation of this anomaly is warranted. Expanded magnetic traverses, where possible, are needed to define the amplitude and extent of the ground magnetic expression related to Anomaly D. If physically possible, a geological traverse down the northeast face of the hill, which encompasses the Anomaly D response, is recommended. The initial grid survey suggests the magnetite content in the basalt layer is erratic; therefore, further magnetic traverses to extend lines 1+20E, 1+80E and 2+40E are suggested to confirm this premise.

Investigation of Anomaly D by a single borehole will probably be mandatory. The additional magnetic information may aid in selecting an optimum drill site notwithstanding the restrictions imposed by topography.

Respectfully submitted,

DERRY, MICHENER, BOOTH & WAHL

R. W. Woolham

R. W. Woolham, P.Eng.

RWW/h

TABLE 1

ANOMALY 5 MAGNETIC PARAMETERS

Average regional total magnetic field 58,300 nanotesla.

Magnetic inclination - 73°
Magnetic declination - 32° East.

Sensor Height Above Surface Metres	Anomaly Amplitude nT	Half Amplitude Anomaly Width Metres
1	approx. 800	150 ± 50
60 ± 10	320 ± 10	400 ± 100*
320 ± 45	30 ± 5	500 ± 100*

*Note: These widths not corrected for flight line direction relative to anomaly strike.

Approximate fit of point pole model to data gives depth to top of source as 100 metres.

Approximate fit of dyke model to data gives depth of 40 metres and near vertical dip.
No fit possible to highest sensor height data.

APPENDIX 3

INSTRUMENTATION

Magnetometer:

Type:	Towed sensor type, proton precession model G803 manufactured by Geometrics Corporation, Toronto.
Cycling Time:	1.0 second.
Sensing Head Design:	5 inch diameter toroid.
Sensitivity:	1.0 gamma.

Ancillary Equipment:

UDAS Digital Acquisition System with recorder.

Geocam 35 mm Flight Path Camera

Bonzer Radio Altimeter

Geometrics G826 Magnetic Base Station and recorder.

Helicopter:

Bell 206 B Helicopter supplied by Frontier Helicopters Ltd., Watson Lake, Y.T.

APPENDIX 4

THE "ANALOGUE" CHART AND FLIGHT PATH RECOVERY

The in-flight tape is a roll of chart paper which moves through the digital printer at a speed of 5.48 cm per minute.

The digital printer chart facilitates the use of a full alpha-numeric system. All "header" sensitivity and fiducial information is printed automatically.

The chart is 520 dots wide as follows:

Dots	Channel Number
0 - 60	helicopter height - 10 feet per dot (1 - 600 feet).
60 - 520	magnetometer fine 2 gammas per dot.
60 - 520	magnetometer course 100 gammas per dot.

The helicopter flight path is recovered from 35 mm film, which is exposed at 2.0 second intervals during the flight traverses. After processing and annotating, recognizable fiducials are pin-pointed on the photomosiac map.

APPENDIX 5

ITEMIZED STATEMENT OF COSTS: McDANE GROUP

Apex Airborne Ltd.

Supply Geophysical System	@	$300/day for 7 days		$ 2,100.00
Geophysicist (Sheldrake)	@	$250/day for 8 days		$ 2,000.00
Electronics Technician	@	$150/day for 8 days		$ 1,200.00
Expenses				$ 2,083.93

EG & G Geometrics

CompuDepth Computer Analysis, Interpretation Report and Plots US $5,400.00			= CAN	$ 7,241.25
Derry Mitchner Booth and Wahl - Cassiar Offsite Interpretation of Anomaly 5 by. R. Woolham				$ 1,206.25
Report Preparation - I. Lyn	@	$145/day for 2 days		$ 290.00
Typing and Maps				$ 100.00
			Total	$16,221.58

APPENDIX 6

Statement of Qualifications

I, Ian A. Lyn, of 32B West 11th Street, Vancouver, B.C. hereby certify that:

1. I received a Bachelor of Science degree in Geology from the University of Toronto in 1978.

2. I am a member of the Canadian Institute of Mining and Metallurgy, and associate of the Geological Association of Canada.

3. I have been employed by Brinco Mining Limited since 1978.

Ian Lyn

Ian A. Lyn

CERTIFICATION

I, RONALD F. SHELDRAKE, of the City of Vancouver, Province of British Columbia, hereby certify as follows:

1. I am President of **Apex Airborne Surveys Ltd.** a company incorporated under the laws of the Province of British Columbia.

2. The Vancouver Office of **Apex Airborne Surveys Ltd.** is located at Suite 514 - 625 Howe Street, Vancouver, British Columbia.

3. I received my B.Sc., in Geophysics from the University of British Columbia in May, 1974.

4. I have practised my profession since that date.

5. I did not examine the claims area, but I am not aware of any claim conflict and believe that the data presented herein is reliable.

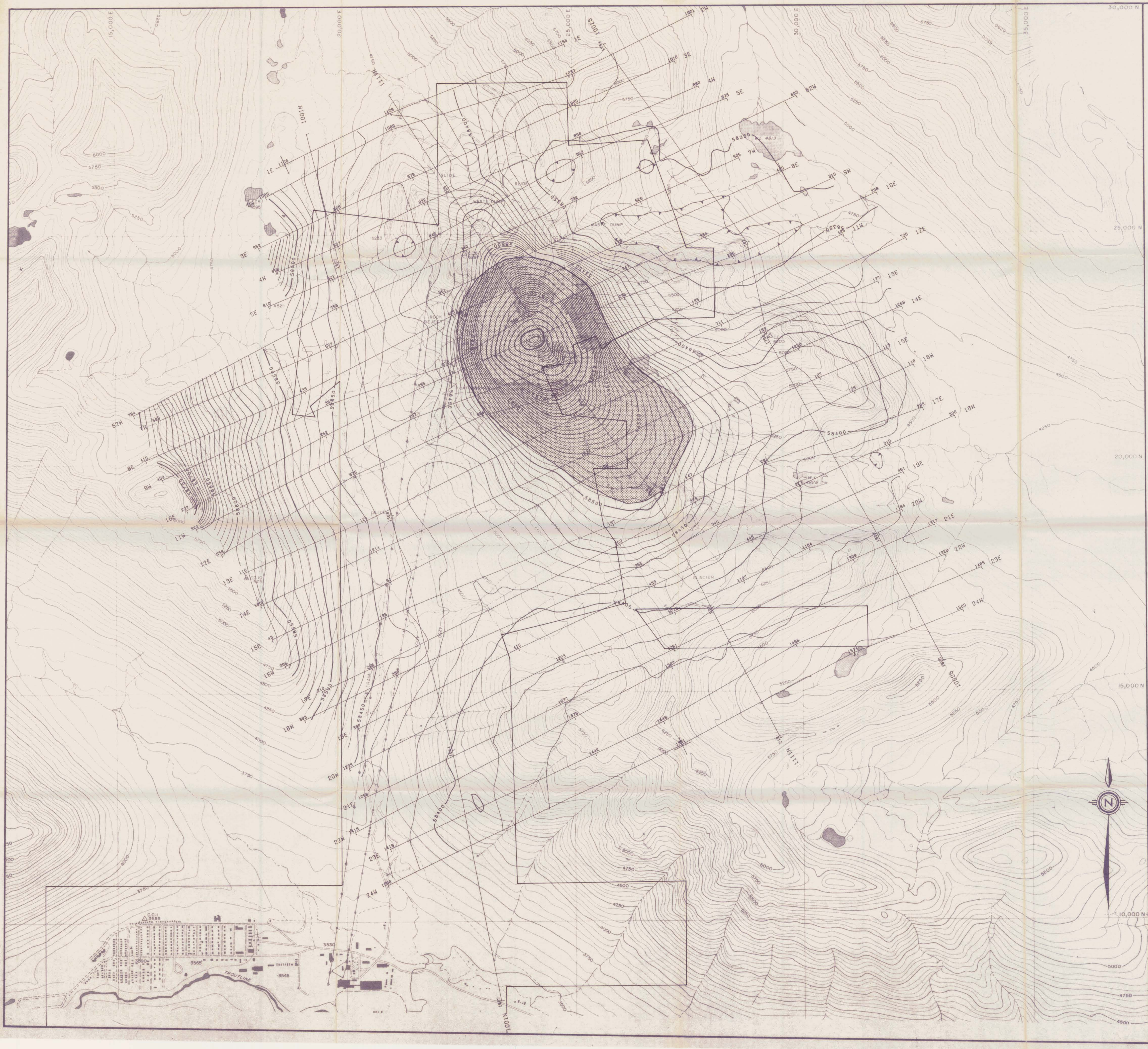
6. I have no interest, direct or indirect, in BRINCO MINING LIMITED or its affiliates, nor do I expect to receive any.

7. I consent to the use of this report in or in connection with a Prospectus or in a Statement of Material Facts.

Ronald F. Sheldrake

Apex Airborne Surveys Ltd.

June 20, 1983.



LEGEND

Ultramafic body (interpreted)

NOTES:

INSTRUMENT:	G 803 Geometrics Total Field.
Flight altitude	6700' ±100'
Inclination	78°
Declination	33° E

Absolute values in nanoteslas.

BRINCO MINING LTD.

CONSTANT BAROMETRIC ALTITUDE MAGNETOMETER SURVEY

CASSIAR MINE AREA — CASSIAR, B.C.

SCALE	DATE	N.T.S.	BY	DWG №
1:10,000	Feb 20, 1984	104 P/5	RFS	

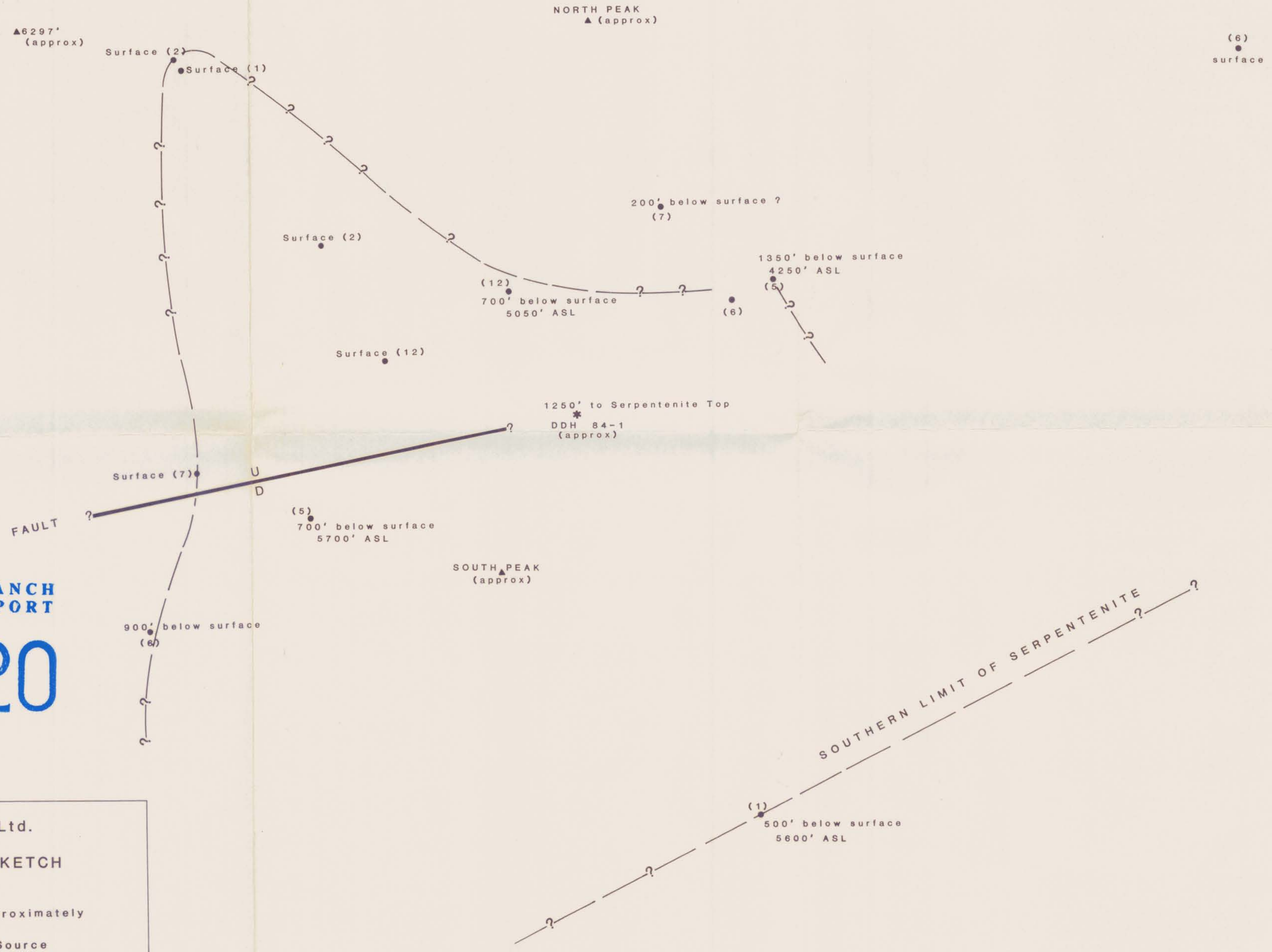
Scale 0 200 400 600 metres

APEX AIRBORNE SURVEYS LTD.

Figure 3 Rpt. 648

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,820



BRINCO MINING Ltd.

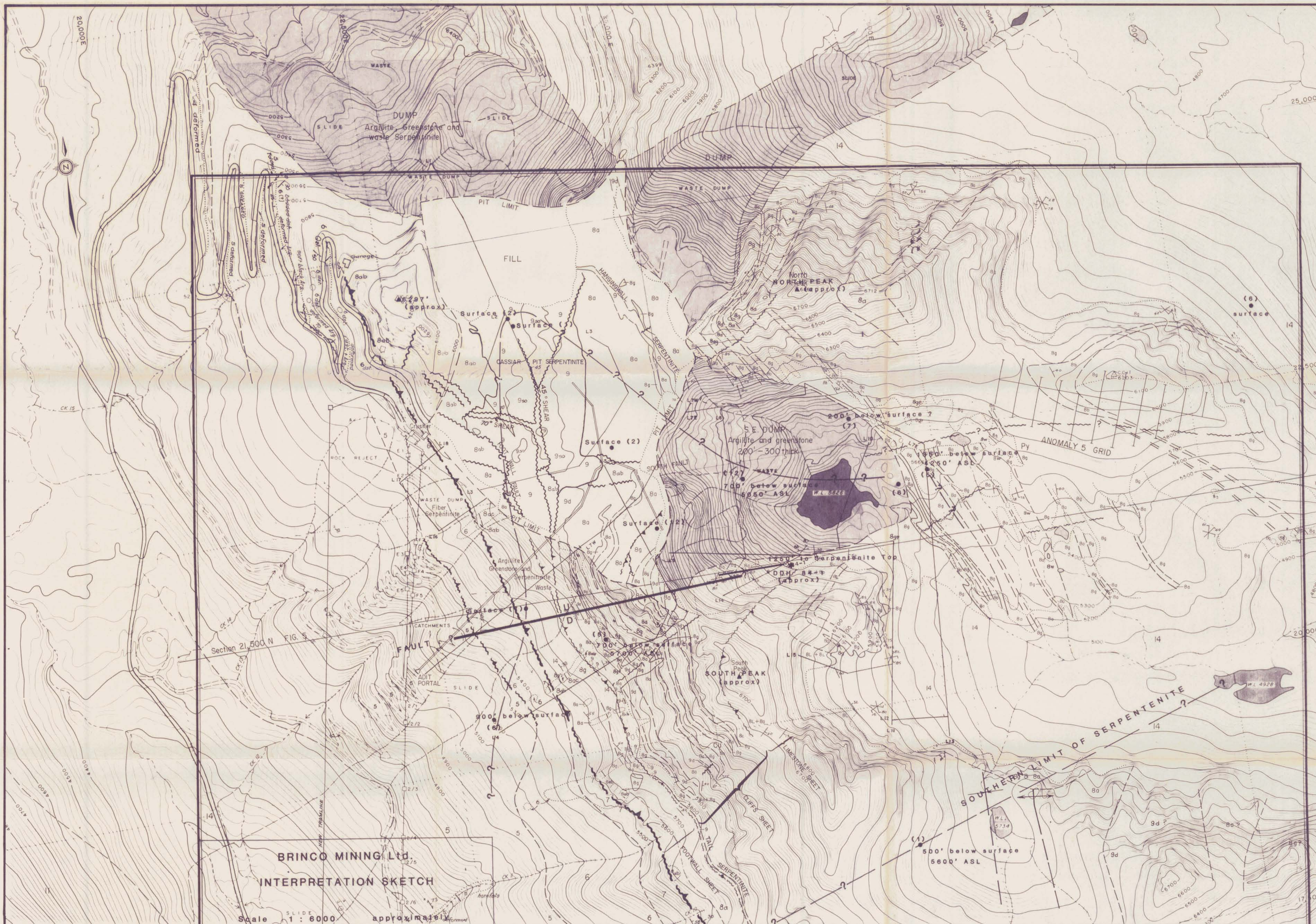
INTERPRETATION SKETCH

Rpt. 648 Appendix I fig. 10

Scale 1 : 6000 approximately

1350 feet - Depth to Source
(5) - Line Number, example: LN 5555

EG&G GEOMETRICS



SYMBOLS

- Projected location of McDame Asbestos Deposit.
- Outcrop
- Bedding
- Joint
- Contact
- Fault
- Anticline
- Syncline
- Thrust fault

LEGEND

PLEISTOCENE AND RECENT

14	Overburden

JURASSIC AND CRETACEOUS

11	Troutline Stock, quartz monzonite

MISSISSIPPIAN (?)

9	Serpentinite (Undifferentiated)
9so	Serpentinite with Asbestos Ore
9d	Diorite / Gabbro

DEVONIAN-MISSISSIPPIAN

8	Sylvester Group
8a	Argillite, chert, greywacke
8b	Basalt with Jasper (magnetic)
8ab	Graphitic argillite
8g	Volcanics (greenstone)
8L	Limestone
8w	Greywacke

DEVONIAN

7	McDame Group. Limestone, grey-black, fetid; black dolostone, spaghetti stone.

ORDOVICIAN, SILURIAN, DEVONIAN (?)

6	Sandpile Group. Interbedded quartzite, dolostone, minor phyllite.

CAMBRIAN-ORDOVICIAN

5	Kechika Group. Thin bedded black shales, volcanics, argillites and limestone.

LOWER CAMBRIAN

4	Atan Group—Upper. Limestone, dolostone.

FEET 0 500 1000 1500 FEET

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,820

Brinco
MINING LIMITED

FIG. 11 Rpt 648 Appendix 1
CASSIAR PIT MAG. SURVEY
GEOLOGY
WITH COMPUDEPTH OVERLAY

OCT. 1983	1" = 500'	Drawn by. I. L.
Revised DEC. 1984	104 P/5	Traced by. J.W.

Fig 12
LINE LN 2222 MTC
Raw Trace

Fig 13
LINE LN 1111 CBA
Raw Trace

Fig 14
LINE LN 7777 MTC
Raw Trace

LINE LN 12

BRINCO LTD MAGNETIC DATA

DATA ACQUIRED 26 11 84

HORIZONTAL SCALE 1: 20000

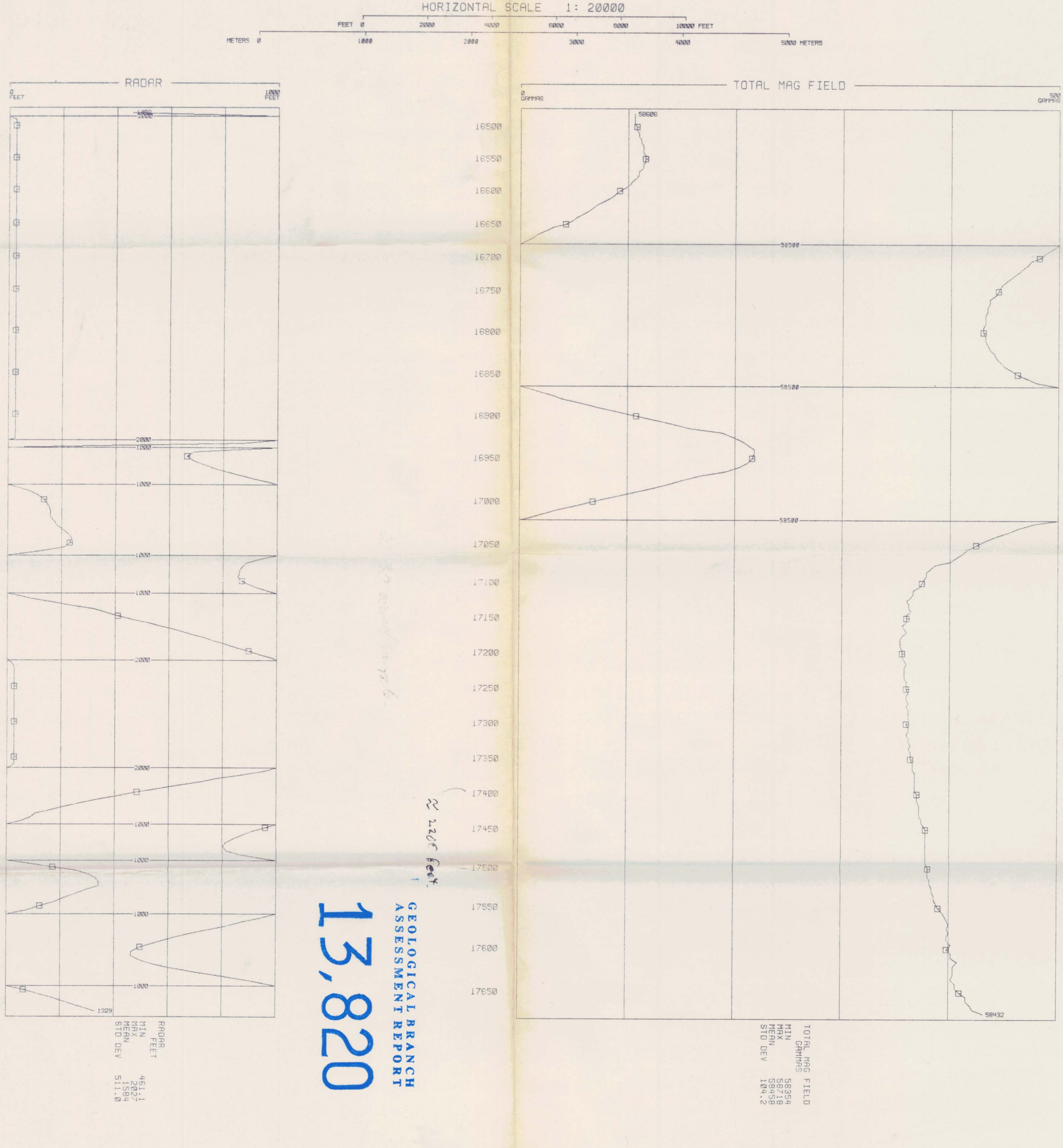
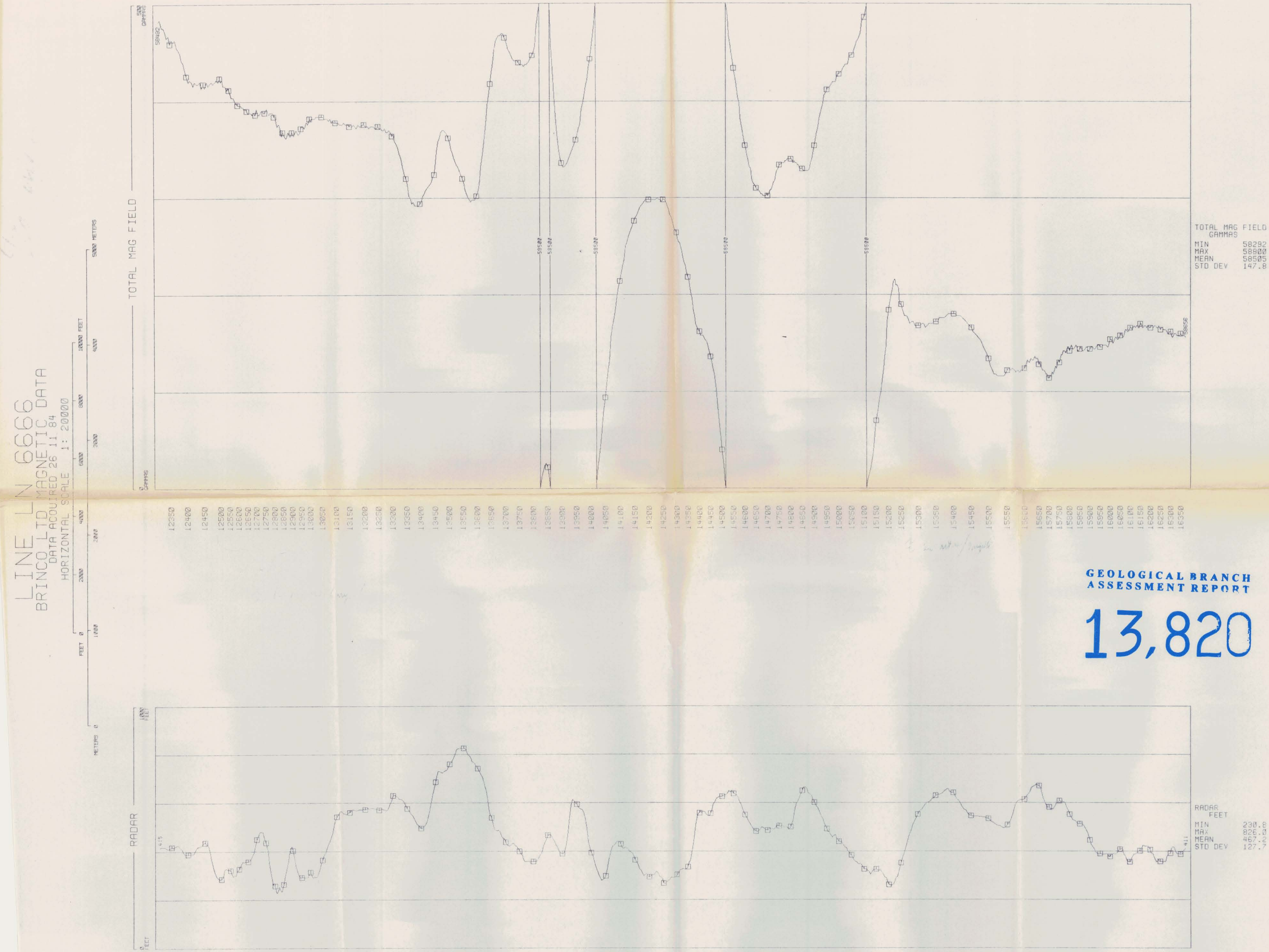


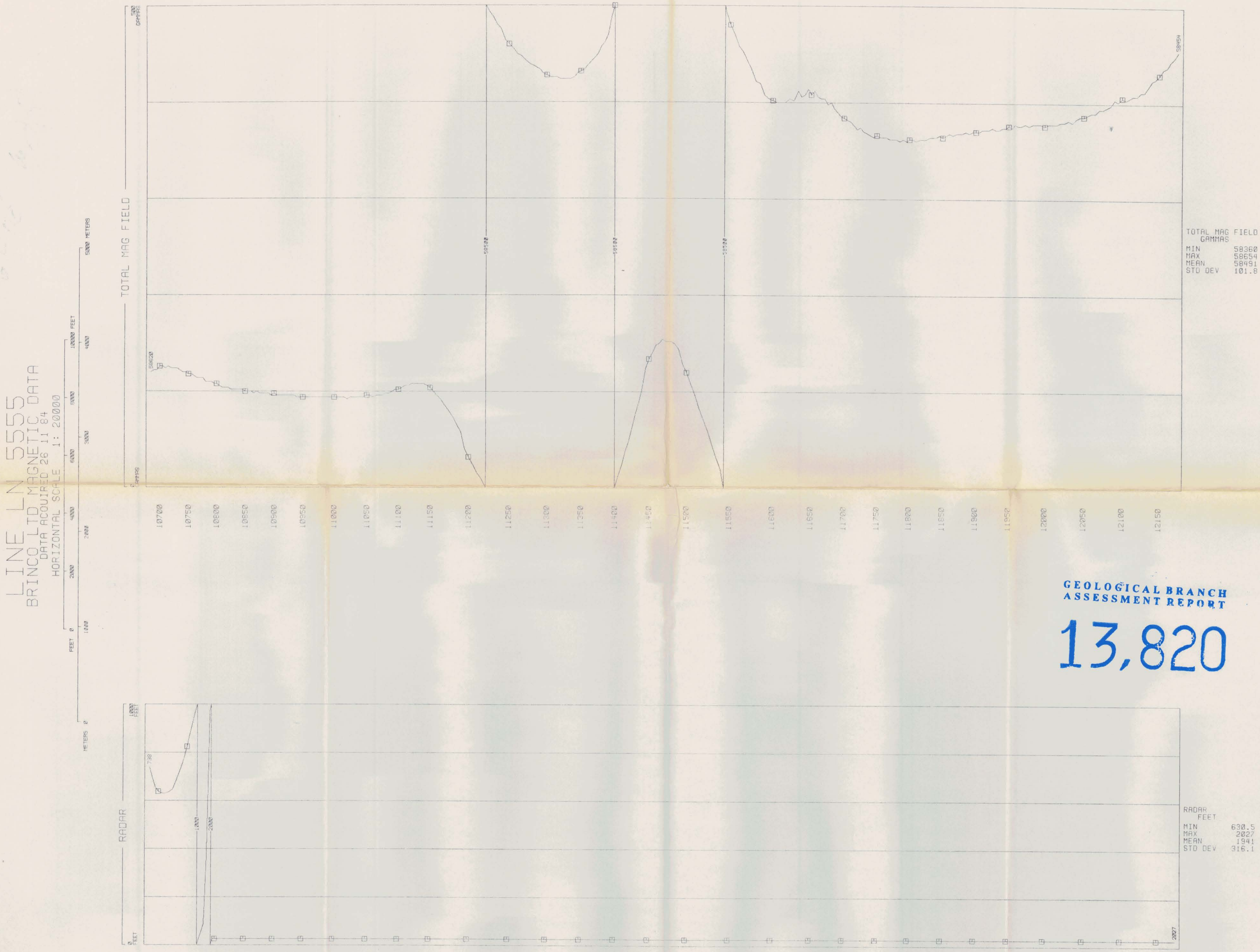
Fig 15
LINE LN 12 CBA
Raw Trace



GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,820

Fig 16
LINE LN 6666 MTC
Raw Trace



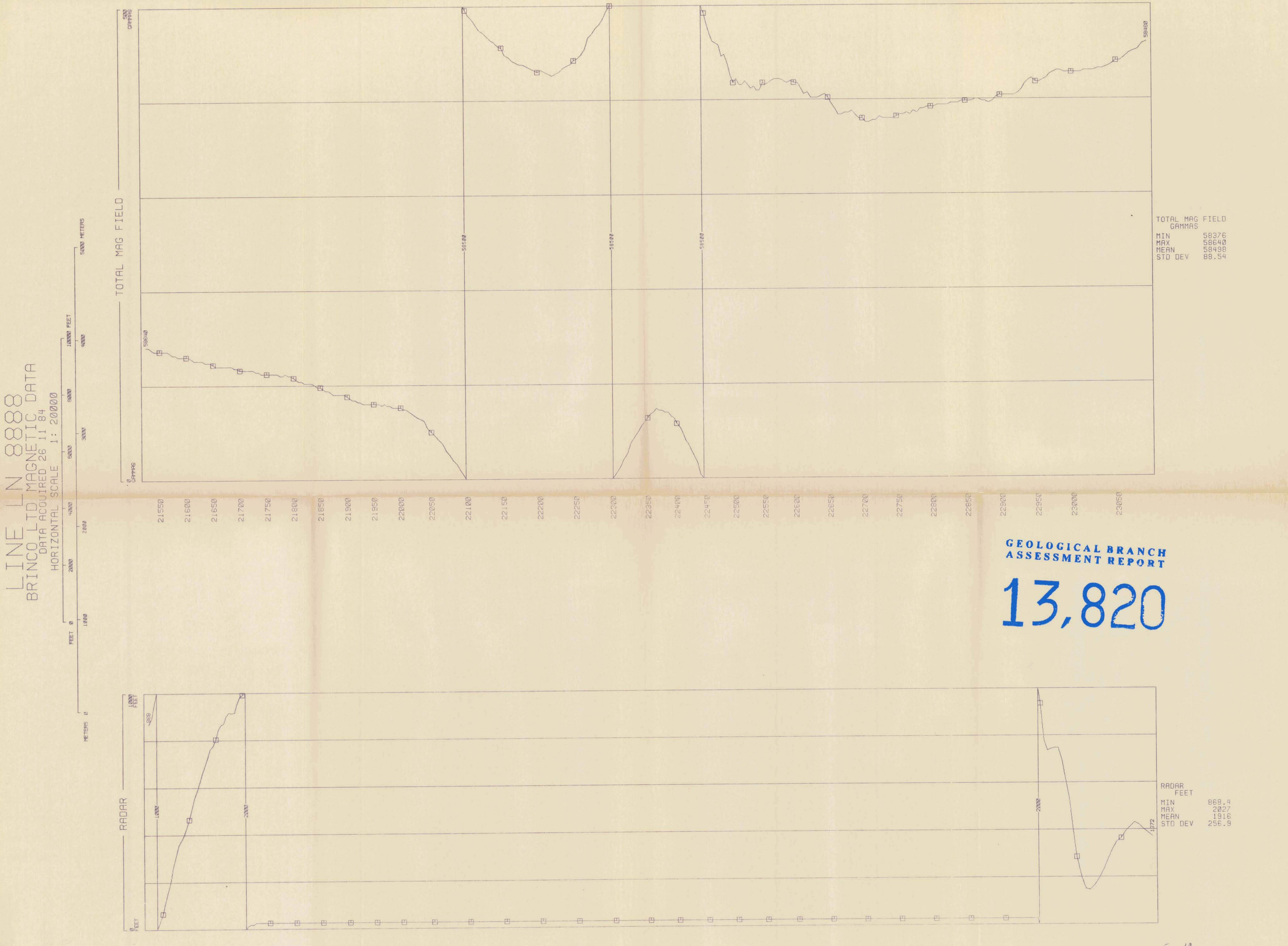
GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,820

Fig 17
LINE LN 5555 CBA
Raw Trace

LINE LN 9999
BRINCO LTD MAGNETIC DATA
DATA ACQUIRED 26 11 84
HORIZONTAL SCALE 1: 20000

Fig 18
LINE LN 9999 MTC
Raw Trace



GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,820

Fig 17
LINE LN 8888 CBA
Raw Trace