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A/S BIDJOVAGGE GRUBER

RAPPORT VEDRØRENDE:

Area no 43, a new occurence of Bidjovagge-type copper-gold mineralization in the Gulf/Sydvaranger joint venture area, Kautokeino, Finnmark

RESYMÉ:

Area 43 is situated 11 km to the east of the Bidjovagge Mine in the upper part of the Caskias Greenstone Group. The geology of the area represents a mixed volcanic/sedimentary environment. A total of 894,50 m of diamond drill holes have been drilled in three profiles over a strike length of 100 m. Six out of the seven holes contain Bidjovagge-type copper-gold mineralization. The two best intersections are respectively 8,00 m of 2,05 % Cu and 0,47 ppm Au, and 3,00 m of 2,21 % Cu and 3,59 ppm Au. The mineralization is still open along strike and generally shows a very interesting development towards depth.

The discovery of area 43 is a result of the systematic exploration under the Gulf/Sydvaranger joint venture agreement. Area 43 contains an economic potential in itself and opens very interesting aspects for future exploration in the Caskias Group.

FORDELING

OSLO:

1	Arkiv
2	R. Hagen

PROSPEKTERING A/S
ARKIV - EKSEMPLAR

KIRKENES:

ANDRE:

1	Gulf
1	Bergmester
1	A. Bjørlykke

KOMMENTAR:

Arkiv
Ktk veg.
Geologi

"43" - a new occurrence of Bidjovagge-type mineralization.

General overview of area 43. Picture taken from 50S/50E towards west. In the far background the Caskias mountain with numerous snowdrifts and the Bidjovagge Mine just below the horizon.

CONTENTS

1. Introduction

Area 43 is situated 11 km east of the Bidjovagge Mine in the Gulf/Sydvaranger joint venture area (Fig. 1). The mineralization of area 43 was discovered as a result of the regional exploration under the Gulf/Sydvaranger joint venture agreement. The general area was covered by regional geological mapping in 1981/82 (report no. 1471). Old stream sediment samples were reanalysed by ICP in 1980/81 and regional geochemical maps were produced by NGU. In 1983 a selection of the stream sediment samples were analysed for gold (report no. 1482). Regional helicopter geophysics were flown by Dighem Ltd. in 1982 (report no. 1413).

The discovery of area 43 is mainly a result of the systematic follow-up work of the helicopter survey. A model developed by test surveys over Bidjovagge and Suovrarappat was employed in the selection of targets for follow-up work. In area 43 a break and a doubling of an EM-conductor fits the model very well. The target was given priority because of anomalous gold values in stream sediments about 1,5 km to the north of the irregularities of the conductor (report no. 1482).

Area 43 was surveyed with Apex Max-Min II slingram and vertical field-magnetics in the winter/spring of 1983 (report no 1414). In the summer of 1983 the area was covered by detailed geological mapping and boulder tracing (report no. 1507). The geophysical grid area is totally covered, but boulders of albite felsite and albite breccia were found in the area.

On the basis of an interesting geophysical pattern from the ground surveys and the boulder observations the area was given priority for diamond drilling. In the late fall of 1984 three holes totalling 466,85 m were drilled (report no. 1540). Extensive mineralization was found in two of the holes. The best intersection was 8,0 m of 1,63 % copper and 0,75 ppm gold.

In 1985 the geophysical grid was resurveyed and extended. The surrounding area was covered by geological mapping on a scale of

1 : 5000. Four diamond drill holes with a total length of 427,65 m were drilled in the summer of 1985.

Till sampling as a geochemical test survey was also done in 1985. Preliminary results show that sampling of the C-horizon at a depth of about 0,5 m is not a suitable method in area 43. Complete results will be reported later.

In this report the 1985-results are presented and compiled with the earlier work. Geological and geophysical interpretations are also presented.

2. Geological setting

2.1 General geological setting

Fig. 2.1 is a combined map of HEM conductors and geological outcrops. The map covers the north-eastern part of the Caskias Greenstone Group. Outcrops are mainly taken from report no 1471 by J.S.Sandstad, with minor contributions from mapping by K.I.Olsen, K.S.Nilsen and R.Hagen. Diamond drill holes and areas where various follow-up work have been conducted are shown on the map. Fig. 2.2 covers the same area, but shows the enhanced magnetic field with EM-conductors. The geophysical data are taken from the Dighem reprocessing of two NGU-surveys (report no 1381) and one survey by Dighem Ltd. (report no. 1413). The quality-variations and some off-sets are explained by this compilation of different surveys.

The regional geology is described in report no. 1471 and will not be repeated here. Instead an attemt to establish the stratigraphic position of area 43 will be presented:

In the northern part of the Caskias Group, Bidjovagge-type mineralization has been found at six different locations:

1. The Bidjovagge anticline.
2. The Bidjovagge west anticline.
3. The Suovrarappat anticline.

4. The Dazzavarri anticline (Area 56/57).
5. The Suovrarappat east area (Ddh. SVR 2-85)
6. Area 43.

All locations exept no. 1 and no. 2 are shown on Fig. 2.1. The host rocks of the mineralization are in all cases albite felsite and graphite felsite. Locations no. 1 to no. 4 are characterized by a mainly volcanic environment with tuffs and diabases. These locations probably represent the same stratigraphic level, which is named "The main mineralized level". Location no. 5 occurs in a stratigraphic position about 650 m over the main mineralized level and is situated 1,0 km to the south east of the Suovrarappat area (Fig. 2.1). The environment of this mineralization is a 120 m thick sedimentary sequence within the volcanics. The mineralization occurs in thin albite felsite units, enveloped in argillite which is underlain by graphitic schists. The geology of area 43 reflects a mixed sedimentary and volcanic environment with argillite, tuff and diabase. A small difference in depositional environment between area 43 and the other locations is therefore present.

Fig. 2.1 shows that area 43 is separated from the other mineralized locations by a long north-south striking conductive zone. This zone can be followed on the HEM-maps from below the Dividal Group in the northern part of Fig. 2.1 almost down to the village of Kautokeino, a total length of more than 43 km. The zone is continous apart from missing indications on two flight lines to the east of area 11 and an off-set by a fault to the south-east of Suovrarappat (Fig. 2.1). The zone is very characteristic on the geophysical maps, often with two or more parallell conductors and usually a close association with a magnetic anomaly on the western side (Fig. 2.2). Outcrops show that the zone is associated with carbonate rocks on the eastern side.

The conductor described above represents a change in the EM-pattern when going from west to east in Fig. 2.1. The area to the west of the zone is characterized by long, usually single conductors which are caused by the graphite felsite of the main mineralized level. In addition some conductors with a short strike length are present. One of these is the graphitic schist

associated with the mineraliztion of the Suovrarappat east area. From the long conductive zone and eastwards the EM-picture changes to a pattern of several long, parallell conductors and also many short strikelength conductors. The same pattern can be seen in an assumed synclinal position in the area south west of Suovrarappat.

Geologically this change corresponds to a transition from a mainly volcanic environment with few graphitic units to a sedimentary-volcanic succession with abundant graphitic units.

These considerations over geology and geophysics indicate that area 43 is a mineralized level higher in the stratigraphy than the main level or the Suovrarappat east area.

In Fig. 2.3 a generalized geological section of the eastern parts of the Caskias Group is presented. The location of the section is marked with A - A' in Fig. 2.1. The section is an interpretation based on all available geological and geophysical information. Only the major structures are shown. In the section the main mineralized level occurs in two anticlines. There is good geological and geophysical support for a correlation between the mineralized units of the "56/57 anticline" and the Bidjovagge ore horizon. No mineralization has been found in the "26 anticline" (only one drill hole), but a correlation with the Suovrarappat level seems very probable, see also Figs. 2.1 and 2.2. In Fig. 2.3 the albite felsite and graphite felsite level in the two aniclines have been interconnected through a syncline and a fault. The fault is a part of the major fault system parallell to the river Njivluædno, see also Fig. 2.1. The fault system is more complex than the single fault shown in Fig. 2.3.

The Caravarri sandstone is generally accepted as the the youngest Precambrian formation. In the study presented here, no major structures have been recognized in the area between the "26 anticline" and the Caravarri sandstone, indicating a general younging direction towards east.

The consequence of these structural interpretations supports the theory that the 43 mineralization is located at a higher stratigraphic level than both the main level and the Suovrarappat east area. An anticlinal position for the 43 area has hovever been suggested by J.S.Sandstad (Preliminary geological map Mollejus, 1985) and by K.I.Olsen (pers. comm.).

2.2 Detailed geological setting

A geological map of area 43 is presented in Fig. 3. Exposure is very limited and interpretation is mainly based on geophysics. Long conductors striking north north-west are found in both the eastern and western part of the map area. These conductors represent carbonate-associated graphitic schists. The general stratigrapy between these conductors when going from west towards east is first an interbedded series of meta tuff and argillite. These rocks have only been seen in drill holes in the 43 area. Close to the mineralization extensive albite alteration of the argillite and development of albite felsite and graphite felsite is observed. The mineralization is associated with albite felsite and graphite felsite. The graphite felsite forms a short conductor with a weak plunge towards south. Over the mineralized units follows a meta diabase. Albite alteration is common in the diabase. Albite felsite and graphite felsite are also present on the eastern side of the diabase. No mineralization has been found here, but this zone extends out of the grid area and has been tested only with one drill hole. The felsites of this eastern zone are associated with a thin unit of meta tuff. The succession continues with an argillite. The argillite is fine-laminated with a greenish colour and probably contains a large component of volcanic-derived material. The argillite is overlain by a dolomite which is succeded by a diabase with thin units of argillite and tuff. Parts of the diabase may also represent basaltic flows, but only uncertain extrusive textures have been observed. This volcanic sequence is overlain by an argillite similar to the argillite between the eastern felsites and the dolomite. The long conductor in the eastern part of the map area is interbedded between thick dolomite units. Exposures of

graphitic argillite coincide with the conductor. In the extreme east an exposure of meta tuff is seen close to a dolomite.

The descriptions and interpretations presented above give valuable information regarding the depositional environment of area 43: The very long, carbonate-associated conductive zone below (to the west of) area 43 must represent a relatively quiet period with carbonate sedimentation in a large basin. Organic life is the most likely source for the reduced carbon in the graphitic conductors. This period was succeded by argillaceous sedimentation, tuff deposition and the intrusion of diabase sills. The HEM conductors of area 43 and area 24 and the conductor between these two, all show a somewhat diverging strike compared to to the long conductors on both sides (Fig. 2.1). This pattern could have been caused by late tectonics, but a more likely explanation is unstable conditions with faulting during deposition and very early diabase intrusions. The relatively short strike of the conductors from area 24 to area 43 indicate organic life in small basins or flourishing organic activity in the vicinity of hydrothermal vents.

One diamond drill hole in area 24 shows the rigth rock association with albite felsite, graphite felsite and greenstones with albite alteration, but only very weak mineralization was intersected.

3. Mineralization

3.1 Diamond drilling

In the late autumn of 1984 the diamond drilling of area 43 started. Holes 43-1, 43-2 and 43-3 were drilled. In 1985 two sections were drilled with two holes in each with a step out of 50 m on each side of the 1984 section. In this report all holes are positioned in the new grid of area 43. The collar of hole 43-1 defines the 0/0 point in this grid. A total of 894,50 m was drilled in 1984 and 1985. All core log reports are enclosed in Table 1, and chemical analysis in Table 2.

Drill hole section 50 N is presented in Fig. 4.1. Diamond drill hole 43-4 contains an intersection close to surface with two mineralized zones, one on each side of the graphite felsite. The second zone is the best with 8,00 m with 2,05 % copper and 0,47 ppm gold. In the deeper bore hole 43-5 the best mineralization occurs before the graphite felsite with two separate zones with very encouraging gold and copper grades, respectively 3,00 m of 2,21 % copper and 3,59 ppm gold and 1,70 m of 4,07 % copper and 2,24 ppm gold. The mineralization is irregular. The highest gold grade in one sample is a 1,00 m sample with 10,64 ppm gold. High gold values have not been cut in the calculation of average grades.

Fig. 4.2 shows section 0 N. Holes 43-2 and 43-3 are projected into the section, for a vertical projection of the holes, see Fig. 7.2. Hole 43-2 was drilled to test the eastern conductor. Negligible mineralization was found, but good a thickness of albite felsite and graphite felsite was intersected. Due to a misinterpretation of the geophysical data hole 43-1 was drilled at an acute angle to the bedding. Several zones of mineralization were intersected, but the grades are low. An interesting feature is the increasing gold to copper ratio towards the bottom of the hole. Hole 43-3 was drilled to get an intersection at a better angle. The best zone in this hole is 8,00 m of 1,63 % copper and 0,75 ppm gold. Over the best 5,00 m the same zone shows 1,85 % copper and 1,08 ppm gold. It is very difficult to correlate the results in hole 43-3 with hole 43-1. The section in Fig. 4.2 is a projection and there is also uncertainty regarding the position of the holes, since the hole deviations have not yet been measured. Elevated values of cobalt and gold in a 1,00 m sample in a similar position in both holes (see Fig. 4.2) may indicate that the relative position of the holes is correct. If this assumption is valid the results show a very interesting development towards depth. The zone of 0,68 % copper and 0,19 ppm gold in hole 43-1 changes to 8,00 m of 1,63 % copper and 0,75 ppm gold over a short distance, and the deepest zone in 43-1 cannot be found at all on a higher level in 43-3.

Hole 43-3 contains only two narrow zones of graphite felsite. A comparision with sections 50 N and 50 S shows that the hole should be continued until the diabase is reached.

In section 50 S holes 43-6 and 43-7 were drilled (Fig. 4.3). Only weak mineralization was found in hole 43-6. Four mineralized zones were intersected in the deeper 43-7. The best zone contains 1,73 % copper and 0,28 ppm gold over 5,00 m. Two of the zones occur in albite felsite and two in graphite felsite.

In Fig. 5 an attemt to make a generalized section of the 43-mineralization is presented. The section is based on the drilling results. From the bottom the section starts with alternating units of meta tuff and argillite. The tuff is green, finegrained and a bedding is usually seen. Some albite alteration is observded in the tuff. An albite felsite unit with a pyrite mineralization occurs in association with the tuff. The pyrite is cobaltiferous with analysis of up to about 0,1 % cobalt in 1,00 m samples. Over this albite felsite follows a series of argillite with sporadic occurences of albite felsite and tuff. The argillite is finegrained, the colour is light brown. Intense albite alteration is common in the argillite. Closer to the mineralization albite felsite becomes the most abundant rock type. Parts of the albite felsite show signs of representing an alteration product from argillite. The albite felsite is brecciated with albite, carbonate and occasionally quartz veins and veinlets.

The mineralization occurs as chalcopyrite veinlets and disseminations in albite felsite and locally in a coarser, massive albite-carbonate rock. The chalcopyrite veinlets often form a stockwork texture in the albite felsite. Some zones of a more massive pyrite-chalcopyrite mineralization are also found. Both albite felsite and graphite felsite are mineralized. As indicated on Fig. 5 the chalcopyrite zones are very irregular and a dense drilling pattern is required to outline possible ore bodies.

The last unit in the column of Fig. 5 is the meta diabase. The rock is mediumgrained and ophitic textures are often observed.

Albite alteration is common in the diabase, but epidotization and scapolitization have also been registrated.

Polished and thin sections have been prepared from mineralization and country rock. The results of the microscopy will be presented in a later report.

3.2 Chemical analysis

Chemical analysis of copper, cobalt, nickel, iron, lead, zinc, silver and gold are presented in Table 2.1. Copper and gold values are plotted along the drill hole sections (Figs. 4.1 to 4.3). Cobalt values higher than 0,1 % are also plotted.

The mineralization is a copper-gold mineralization with negligable amounts of lead, zinc and silver. Nickel and cobalt is found in association with the mineralization, but the grades are too low to be of economic interest.

Cumulative percentages of gold and copper values of the 192 samples from area 43 are plotted in a log-normal diagram in Fig. 6. The distribution of gold is approximately linear up to about 1,5 ppm. Above this point the number of samples is small and the gold values may be assumed to follow a log-normal distribution. The variance of this distribution is described by the slope of the curve in Fig. 6. The slope is almost identical to the slope described by gold values from the B ore body of Bidjovagge (report no. 1223).

The copper distribution of area 43 is more complex. The curve in Fig. 6 may represent two log-normal distributions, a background distribution and a distribution from mineralized samples.

The 192 samples from area 43 show a positive correlation between copper and gold. The correlation coefficient is 0,59.

Results from INAA multielement analysis of ten samples from area 43 are presented in Table 2.2. The ten samples are supplementary

samples from outside the best mineralization. The element pattern is very similar to samples from Bidjovagge. The main difference compared to Bidjovagge is an arcenic enrichment in the 43 area samples. The tungsten enrichment in area 43 is not as strong as in Bidjovagge. These differences may be caused by a very limited number of samples, both from area 43 and from Bidjovagge.

The albite felsite is the origin of the high sodium values. Other typical features of the mineralization is a low barium contents and an enrichment in uranium. Gold and copper are however the only elements of economic importance.

4. Geophysics

4.1. Slingram survey

Area 43 was surveyed with the Apex Max Min II slingram system. 14 profiles, totalling 3575 m were surveyed. Spacing between profiles was 50 m. The measurements included two frequencies, 1777 Hz and 222 Hz and most lines were surveyed with coil separations of both 50 m and 100 m. An interpretation of the results is included in Fig. 3.

Field curves of the high frequency (1777 Hz) are presented in Fig. 7.1. Some lines are shown with 50 m coil separation and some with 100 m coil separation. On the 100 m coil sep. curves a levelling error is present. The correct zero level for inphase and quadrature components are +6 % and + 2 % respectively. Due to the occurence of two lakes and a steep hillside only two lines (50 S and 100 S) have been surveyed far enough towards east to pick up the complete anomaly from the eastern conductor. The western shoulder or parts of it can be seen on all lines and the position of the conductor is well established. An exact interpretation regarding thickness, depth, dip and quality is impossible due to the limited information. In profiles 50 S and 100 S the conductor is narrow (<10 m), the depth is shallow (<10 m) and the quality is good. On most of the other profiles a shallow depth and a good quality are also indicated.

The negative inphase anomaly east of 150 E on profiles 50 S and 100 S is noise due to the very difficult topography of this part of the grid.

No signs of the western conductor (which represents the graphite felsite associated with mineralization) are present on line 150 N. On line 100 N a weak anomaly can be seen. This anomaly may be caused by a termination of the conductor between 50 N and 100 N or by a continuation of the conductor at depth. If the conductor continues, the depth in profile 100 N is about 30 m. With a termination the end of the conductor must be at about 85 N. These estimates are based on the study of model curves.

Lines 50 N and 0 N show a good, very shallow conductor. An estimated thickness of about 20 m on line 0 N is confirmed by diamond drilling (Fig. 4.2).

The anomaly is clearly present on lines 50 S, 100 S and 150 S, but the amplitude is of the anomaly is generally decreasing towards south, which indicates an increasing depth to the top of the conductor. A depth of 15 to 20 m for line 150 S is estimated by the use of model curves. This depth is approaching the maximum depth penetration with 50 m coil sep. Data from 100 m coil sep. measurements are therefor presented for lines 200 S to 500 S.

The anomaly is present on lines 200 S and 250 S and with some uncertainty also on line 300 S. A depth estimate of line 250 S shows about 40 m. A good interpretation is impossible due to some topographic noise and the influence from the shallow eastern conductor.

On lines 300 S and 350 S there are some very weak and uncertain indications at 150 W and 140 W. The topography here is flat and the cause may be a conductor at depth.

From the slingram data it can be concluded that the western conductor with the ore association has got a continuation southwards to profile 300 S, where the depth is about 50 m. This

should be confirmed and the conductor should be followed farther south with an EM system with a greater depth penetration than the slingram. A transient EM system or a turam system would be the best choice.

The possible termination of the conductor at around 85 N should be investigated by closely spaced survey lines in this area.

In Fig. 7.1 only the high frequency slingram data are presented. The low frequency of 222 Hz gives additional information which is included in the interpretation. It is recommended to use a multi-frequency system also in the future.

4.2 Magnetic survey and geological interpretation.

In the summer of 1985 the central parts of the grid were re-surveyed with a proton magnetometer. This survey included lines 100 N, 50 N, 0 N, 50 S and 100 S with a 5 m distance between reading points. The results are presented as an isomagnetic map in Fig. 7.2. The survey contains two areas of uncertain data. These are shown by broken contours. Magnetic variations around the collar of hole 43-1 may be caused by the casing pipe. Near hole 43-7 one data point is missing and the magnetic depression indicated is most likely false, because the drill rig was positioned here during the survey.

The general magnetic picture is a magnetic high striking grid-north-south in the eastern part of the area. To the west of this magnetic ridge there is a marked magnetic depression, especially in the southern profiles. Towards west the magnetic field is gradually increasing.

The details of the magnetic pattern can best be described in view of the geology and EM-results. Shown on Fig. 7.2 are therefore also drill hole projections and the estimated suboutcrop of the graphite felsite based on drilling and the slingram survey. With this compilation several interesting features are demonstrated:

1. The main magnetic ridge in the eastern part of the area is caused by the meta diabase. The local variations over this unit are probably due to a varying degree of albite alteration. Susceptibility measurements of the cores (see Table 1) show that when albite alteration increases, magnetite content decreases. The magnetic pattern is most uniform in profiles 50 S and 100 S, while albite alteration is probably more developed in the northern profiles.

2. The graphite felsites are located on each side of the diabase. The low magnetic susceptibility of the graphite felsite corresponds to positions on the flanks of the magnetic ridge.

3. Albite felsite and argillite with albite alteration are generally very magnetite-poor. The diamond drilling shows that these rocks mainly occur on the western side of the western conductor. The main magnetic low is centered around line 50 S. This area may represent a centre for the albite alteration and the development of albite felsite.

4. The increasing magnetic field in the western part of the area fits very well with drill hole observations of tuff and argillite with a certain magnetite contents.

5. The best mineralization near surface (ddh 43-4) is located to the side of the main magnetic low (the most intense footwall alteration?). The albite felsite with sulphide mineralization has got a low to medium magnetic susceptibility and should be associated with a slightly higher magnetic level than the unmineralized albite felsite.

6. The development of the magnetic pattern from 50 N to 100 N is very interesting with respect to the continuation of the mineralization in hole 43-4. The area with same the magnetic level as over the best mineraliztion is widening towards north. From Bidjovagge it is known that the area in the continuation of a terminated graphite felsite unit is a favourable position for mineraliztion.

A detailed magnetic map is a great help for the geological interpretation. Magnetic surveys should be included in the future exploration of area 43.

5 Conclusions and recommandations

Area 43 is a new occurence of Bidjovagge-type mineralization at a higher stratigraphic level than the previously known occurences.

Zones containing encouraging grades of copper and gold have been intersected, but the mineralization is irregular as in Bidjovagge and require a dense drilling pattern.

The mineralization is still open along strike and towards depth. The information available indicate that the best potential is in the continuation towards north, but the drilling sections also show a positive development towards depth.

EM- and detailed magnetic surveys give valuable information for the location of new drill holes and for the geological interpretation. An EM-system with a better depth penetration than the slingram is required to follow the zone towards south.

In addition to investigations of the already known mineralization, the zone of albite felsite and graphite felsite intersected in hole 43-2 should be further explored. Also this zone has got a good potential for mineralization. Albite alteration is common in the diabase close to the zone, and a boulder of albite-carbonate rock with weak chalcopyrite mineralization has been found close to the conductor at 360 S - 70 E. The zone is about 1,8 km long and should as a first step be covered by detailed geophysics.

The stratigraphic position of the conductor between area 43 and area 24 is makes it a very interesting target.

The detailed geological mapping on a scale of 1:5000 should be extended to cover also area 24. The topographic maps required for

this job can be made from air photos at a price of about NOK 50.000.

On the Dighem flight lines 1690 and 1700 there are two grade 1 conductors (1690 E and 1700 E) less than 1 km south of area 43. The very low conductance and high magnetic correlation of these conductors is a contrast to the EM-signature of the numerous graphitic conductors of the area. These anomalies should be investigated during the future exploration of area 43.

The occurence of Bidjovagge-type mineralization at a new stratigraphic level opens interesting aspects for the exploration of the Caskias Greenstone Group. It seems important to intensify the work in area 43, the results can then be utilized in the regional exploration.

To get a quick answer regarding the potential of area 43 is also important in respect of the ore reserve situation at the Bidjovagge Mine.

Stabekk, 06.02.1986.

Ragnar Hagen

Ragnar Hagen

TAB 1.

DIAMANTBORING Kautokeino 19 84.

Kjerneobservasjoner.

Borhull nr. 43 - 1 Profil

Koordinator: Y 0 Ø X 0 N

Påsatt i høyde 540 m.

" i retning 283g

" med helning 50°

Borhullets lengde 178,65

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0- 2.30	Jordboring			
2.30-50.80	Metadiabas, massiv, middelsk. Høyt mt innh. Lokalt mt i slirer. Soner med ofittisk textur. Qtz albitt (karb) årer er vanlige. I soner er b.a. fullstendig albittisert til grå fink. albittfels. Omv. soner har noe minere mt enn b.a. Årer med epidot finnes. Spor cp i qtz-alb-årer.			
50.80-53.15	Albittfels, grå massiv. Innh. skarpt grønt mineral, glimmer? Lav mag. Noe cp fra 52.50.			
53.15-54.65	Grafittfels. Lavt C-innhold. Lav mag. Spor cp i albitt-qtz-årer. Lokalt finnes kink-folder.		53.90: 39°	
54.65-60.80	Albittfels, grå, massiv. Lokalt med qtz-alb i stockwork Litt py. Lav mag.			
60.80-114.50	Grafittfels. Noen soner med albittfels de første 2 m, senere tildels høyt C-innh. Lav mag. Alb-qtz hyppig som årer og stikk. Foldeomb. v/ 62.40 m. Økende py og spor cp fra 64.00 m. Cp-min 76 84. Cp alene, gjerne i slirer i grafittfels. Spor po. 112.40-113.00: Albittfels-sone.		86.25: 21° 97.50: 36°	
114.50-135.50	Albittfels, grå med qtz-alb årer i stockwork. Lav mag. Noe cp v/ 115.60 og 116.20. Py min. fra 117.20. Tildels soner med massive py slirer. Brun fels med mindre py fra 121 m.			

Ark 2. Bh. nr. 43 - 1 Profil

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
135.50-153.30	Albitt b.a., massiv - tildels diffus fol. middelsk. grå. Lav mag. Inneh. py i impr. og noe cp fra 136.50-149 m. 150 - 153: Rikelig py.			
153.30-157.60	Albittfels, brunlig med hyppige qtz-alb årer. Inneh. litt py. Lav mag. 155.50-157.60. Rusten og vitret b.a.			
157.60-162.70	Albitt b.a. Middelsk. massiv. diffus fol. Inneh. skarpt grønt min. Rusten og vitret 157.60-162.70 med mørke spetter (sjelden) cc ?		161.10: 45° 162.50: 38°	
162.70-175.70	Albittfels, brunlig. Gjennomsatt av alb.-qtz årer. Lav mag. Noe py, spor cp. Argillittiske bånd og slirer ? Foldeomb. v/ 167 m.	170.35-171.		
175.70-178.65	Argilitt. Brun, fink. tildels laminert. Lav mag.		175.90: 58°	
	Hullet avsluttet v/ 178.65 m.			
	20. november 1984			
	Ragnar Hagen			

DIAMANTBORING Kautokeino 19 84.

Kjerneobservasjoner.

Borhull nr. 43 - 2 Profil

Koordinator: Y 43 Ø X 12.5 S

Påsatt i høyde 547 m.

* i retning 80g

* med helning 50°

Borhullets lengde 101,50 m

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0- 3.42	Jordboring			
3.42- 56.95	Grønnstein, massiv, middelsfink. Basalt ? Middels- høy mag. Inneh. hyppige alb-karb årer og omfattende alb. omv. Alle overg. fra frisk b.a. til ren albittfels. Omv. soner har lavere mag (middels mag.) Spredte py-korn og spor cp.		58.30:53° 59.30:36° 63.50:34° 67.70:35° 71.60:58°	
56.95- 71.70	Albittfels. Varierende uts. Ofte bundet med grønne tufittiske soner. Lokalt tynne karb. årer.			
71.70- 95.05	Grafittfels. Oppsprukket. Inneh. årer og stikk av alb. karb. Litt py. Lav mag.		84.1o:49° 89.20:13° 93.80:32°	Foldeomb.?
95.05- 96.10	Albittfels, grå, lav mag. Spredte karb. h. soner. Gradvis overgang til:			
96.10-101.50	Tuff. Grønn, fink. Lav mag. Diffust båndet.		97.80:50°	
	Hullet avsluttet v/ 101.50.			
	Ragnar Hagen			

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DIAMANTBORING Kautokeino 19 84.

Kjerneobservasjoner.

Borhull nr. 43 - 3 Profil

Koordinator: Y 204,40 V X 15 N

Påsatt i høyde 527 m.

« i retning 83g

« med helning 45°

Borhullets lengde 186,70 m

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0-19.00	Jordboring			
19.00-26.75	Tuffitt. Lys grønn, fink. Oppknust de første 2.5 m. Alb. karb. finfordelt og som diskordante og konkord. bånd. Noen rustne soner (ankeritt og sulfider). Middels mag (lokalt høy mag).		20.60:45° 22.50:70° 24.70:58°	
26.75-33.30	Argillitt, fink. Lys grå, båndet. Middels - høy mag.		29.30:61° 32.60:67°	
33.30-40.10	Tuffitt, fink. grønn. Svakt grafittholdig 35-36 m. Tildels massiv, men også finlaminert. Alb. karb. i bånd og årer og slirer. Lav mag.		37.80:73°	
40.10-41.40	Argilitt som 26.75-33.30. Diffus båndning. Høy mag.		40.55:61°	
41.40-54.00	Tuffitt som 33.30-40.10. Varierende mag., vanligvis lav. Siste 3 m omv. b.a. med overg. til albitt-fels. Middels mag.		43.80:59° 47.80:67°	
54.00-59.90	Albittfels, brun, diffust lagret. Karbonatholdig. Alb-karb. i tynne stikk. Noe py. Py i slirer v/ 57 m. Siste m: lys karb-rik.			
59.90-72.20	Argilitt, fink., grå-grønn farge. Tildels kraftig oppknust. Intense foldestr. synlig. Finlam. Middels mag. Inneh. spredte karb. årer.			
72.20-97.10	Tuffitt, fink., grønn. Diffust lagret. Alb. karb i årer og slirer. Lokalt som finford. 1-2 mm store korn. Middels mag. Inneh. inn-leiringer av argillitt og sandig matr. Foldeombøyninger observert.			

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DIAMANTBORING Kautokeino 19 84.

Kjerneobservasjoner.

Borhull nr. 43 - 3 Profil

Koordinator: Y 204,40 V X 15 N

Påsatt i høyde 527 m.

" i retning 83g

" med helning 45°

Borhullets lengde 186,70 m

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0-19.00	Jordboring			
19.00-26.75	Tuffitt. Lys grønn, fink. Oppknust de første 2.5 m. Alb. karb. finfordelt og som diskordante og konkord. bånd. Noen rustne soner (ankeritt og sulfider). Middels mag (lokalt høy mag).		20.60:45° 22.50:70° 24.70:58°	
26.75-33.30	Argillitt, fink. Lys grå, båndet. Middels - høy mag.		29.30:61° 32.60:67°	
33.30-40.10	Tuffitt, fink. grønn. Svakt grafittholdig 35-36 m. Tildels massiv, men også finlaminert. Alb. karb. i bånd og årer og slirer. Lav mag.		37.80:73°	
40.10-41.40	Argilitt som 26.75-33.30. Diffus båndning. Høy mag.		40.55:61°	
41.40-54.00	Tuffitt som 33.30-40.10. Varierende mag., vanligvis lav. Siste 3 m omv. b.a. med overg. til albitt-fels. Middels mag.		43.80:59° 47.80:67°	
54.00-59.90	Albittfels, brun, diffust lagret. Karbonatholdig. Alb-karb. i tynne stikk. Noe py. Py i slirer v/ 57 m. Siste m: lys karb-rik.			
59.90-72.20	Argilitt, fink., grå-grønn farge. Tildels kraftig oppknust. Intense foldestr. synlig. Finlam. Middels mag. Inneh. spredte karb. årer.			
72.20-97.10	Tuffitt, fink., grønn. Diffust lagret. Alb. karb i årer og slirer. Lokalt som finford. 1-2 mm store korn. Middels mag. Inneh. inn-leiringer av argillitt og sandig matr. Foldeombøyninger observert.			

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Ark 2. Bh. nr. 43 - 3 Profil

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
97.10-110.70	Albittfels, fink., grå, tildels massiv, Lokalt diffust båndet. Lav mag. Inneh. foldeomb. Også brune - rosa soner. Tildels karb. holdig. Spredte qtz- alb årer.			
101.70-113.30	Tuffitt, grå-grønn, fink., diffust lagret. Inneh. omv., lyse soner. Middels mag.		112.80:60°	
113.30-153.30	Albittfels som 97.10-110.70. Noe mer bastant lagning. 121-125: Tett brun fels ved qtz-alb i stock-work. Svakt grafittholdige soner v/ 127.40-127.70 og 128.20-128.70. Noe py. Økende py fra 141 m. Nesten massiv py 144.00-144.30. Grafittfelsfragm. i breksjert b.a. fra 147 m. Fra 149 m stockwork med py og noe cp. Delvis grov- middelsk. alb.-karb. b.a. med felsfragm.		114.60:54° 131.80:60° 136.30:56°	
153.30-160.05	Albittfels, tett mørk rødbrun. Alb- qtz- årer i stockwork. Lokalt god cp. min. Lav mag.			
160.05-168.90	Albitt b.a. lys, massiv, fin- middelsk. Lav mag. Noe cp. og disseminert cc 160.05-162. Klorittisert b.a. 163.40-163.80. Fra 166.60: Økende innh. av mørke silikater. Ofte i slirer - danner en uklar lagning. Noe cp 168.00-168.90.		167.80:57°	
3.90-169.30	Grafittfels. Breksjert med albæ karb. årer. Cp på kontaktene mot albittfels. Lav mag.			
169.30-170.15	Albittfels, rødgrå, tett. Lav mag. Noe cp.			
170.15-170.75	Grafittfels. Høy C. Oppsprukket og breksjert med alb-karb. og cp v/ 170.75. Lav mag.			
170.75-171.95	Albittfels, rødgrå, breksjert med alb. qtz- karb. og noe cp. Lav mag.			

Ark 3. Bh. nr. 43 - 3 Profil

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
171.95-186.70	Albitt b.a. Massiv, middelsk. grå. Diffus lagning? 45°. Varierende uts. fra lys grå til lys grønn. Omv. basalt? Lav mag. Skarpt grønt min. 176.40-176.60.			
	Hullet avsluttet v/ 186.70.			
	agnar Hagen			

DIAMANTBORING Kautokeino 19 85

Kjerneobservasjoner.

Borhull nr. 43 - 4 Profil

Koordinater: Y 94,50 V X 53 N

Påsatt i høyde 526 m m.

- i retning 778
- med helning 37°

Borhullets lengde 66,00 m

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0 - 3.55	Jordboring			
3.55-20.40	Albittfels/albittkarbonat b.a. massiv, diffust lagning. Middelsk. - fink. Inhomogen med karb.rike soner og albitt-rike soner. Rikelig med finkornige, brunlige albitt-spetter i lysere og grovere karb.-rik matrix. Grønt, ukjent min. danner diffus lagning. Lokalt noe py. særlig i grovere karb. soner. Dels rusten og forvitret. Lokalt oppknust MS = 0.		4.70: 55°	
20.40-25.25	Argillitt, brunlig fink. albittfels-lign. diffus lagn. Opptil 30 cm karb. årer med py. Foldeomg. v. 21.85. MS = 0.			
25.85-29.80	Albittfels, grålig, mørk fink. Grovere alb. + qtz (rødlig) danner stockwork. Litt cp og bn/cc opptrer som spredte korn i rødlig fase. MS = 1. Siste 10 cm: brunlig fels.			
29.90-42.60	Grafittfels, tett, gjennomvevd av karb. alb. årer, varierende c-innh. MS = 0 (1) diffus lagning. Noe py fra 35.00. Litt cp 36.30-37.70 og 40 - 41.		33.30: 68°	
42.60-47.95	Albittfels, grålig-rødlig, tett, massiv. Spredte karb. årer. Cp i stikk og m/karb. årer. Noe py. MS = 1 - 2.			
47.95-50.10	Karb. - py - cp. Grovk. massiv sone. innhomogen. Tildels god cp. MS = 1 - 2.			

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Ark 2 Bh. nr. 43 - 4 Profil

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
50.10-53.85	Albittfels, som 42.60-47.95 Omv. diabas 52.20-52.50 Noe cp 50.10-51 og i karb. årer v. 52.65, 52.85 og 53.35.			
53.85-66.00	Diabas. Middelsk. massiv. Hyppige karb. årer m. omv. Tildels sterk omv. alb.fels. MS = 3 (omv.) MS = 4 (ikke omv.) Fra 60 m noe scapolittisering samt epidotisering og hm -farge på stikk. Også kalkspat-årer. Hullet avsluttet v. 66.00 m. Ragnar Hagen			

DIAMANTBORING Kautokeino 19 85

Kjerneobservasjoner.

Borhull nr. 43 - 5

Koordinator: Y 135,70 Profil

X 54,60

Påsatt i høyde 525 m m.

- i retning 778 (grid øst)
- med helning 55°

Borhullets lengde 130,00

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0 - 7.00	Jordboring			
7.00-16.55	Albittfels, i veksling med lyse brune karbonatrike - argillittiske lag. Albittfels er fink. brunlig, breksjert m/ karbonatårer, lokalt i stockwork. Rusten og forvitret. Noe py, rikelig py 11,70-11.85. Lokalt grønt ukjent min. MS = 1. Kjernetap 12.35-12.80.		8.50:54° 15.55:71°	
16.55-18.95	Tuff, grønn, fink. med diffus lagning. Karb. i årer og stikk, og lokalt som subhedrale 2-3 cm blaster. Oppknust. Rusten. MS = 3. Foldestruktur v/ 17,65-18.65.			
18.95-21.75	Albittfels, tett brun-rød. Massiv. Karb. i tynne stikk. Litt py i spredte tynne årer. MS = 1.			
21.75-35.50	Argilitt. Lys brun fink. karb. holdig, diffust lagret. Gjennomsatt av karb. årer og slirer samt delvis fels omv. MS = 1.		21.50-76° 27.70-80° 33.35-60°	
35.50-75.80	Argilitt - Albittfels., gråbrun, diffus lagning. Lokalt mye karb. Inhomogen - varierende fra gråbrun lagdelt fels til argilitt og spettet fels. Rikelig med karb. med diffuse kanter. Lokalt noe py. Rusten og vitret i karb. holdige soner (ikke karb. årene). MS = 0 - 1 Fra omlag 50 m åkende soner av middelsk. albitt karb. b.a. med mørke spetter. Noe py. Mørk breksjert fels (grafitt ?) 68.30-69.00	74.60-75.40	37.30-45° 48.50-46° 56.30-28° 62.30:37°	
75.80-75.90	Grafittfels deformert. Noe karb. MS = 1	75.90-76.00		

Ark 2 Bh. nr. 43 - 5 Profil

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
76.00-78.95	Albittfels, varierende grå-rødlig. Massiv Mørk (grafitth.) med cp og py min. i tynne stikk og stockwork MS = 1 76 -77 Mest py 77 -77.50 Noe cp i massif rødlig fels 77.50-79 Uregelmessig, men bra cp			
78.95-86.70	Albittfels, brunlig, middelsk. - fink. med rikelig grønt ukjent min. MS = 1 Fra 83 m fels uten grøn min. Oppknust 84.90-85.40 Cp min. fra 85.30.	79.70:30°		
86.70-102 40	Grafittfels, def. oppknust. Tildels høy C. Inneh. rikelig karb. årer. Lokalt svak cp. Fra 91.00 mest py. MS = 0			
102.40-104 00	Albittfels. Grå Gjennomvevd av karb. årer. Noe cp. MS = 1			
104.00-130 00	Grønnstein (diabas) massiv middelsk. MS = 2 - 3 Felsomvandlinger fram til 107.75. Etterhvert kalkspat årer m. spor py. og spor cp. Epidotisering 111-118 m Fra 125 m: MS = 4 Ofittisk textur v. 128.36 Felsomv. 129.20-129.90. Kalk-årer gjennomsetter felsomv. Hullet avsluttet v. 130 m. Ragnar Hagen			

DIAMANTBORING Kautokeino 19 85

Kjerneobservasjoner.

Borhull nr. 43 - 6

Koordinator: Y 80 V

Påsatt i høyde 533 m m.

- i retning 778
- med helning 40°

Borhullets lengde 65.35 m

Profil

X 48 S

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0 - 5.50	Jordboring			
5.50-10.60	Argilitt. Lys brun, karb. holdig med fels-soner. Inhomogen. Spredte karb.årer. Rusten og vitret. MS = 1 Lokalt diffus lagn.		9.40: 68°	
10.60-11.40	Albittfels, grå, med grønt min. MS = 1.			
11.40-12.50	Tuff, grønn, tildels sterkt omv. Diffus lagn. av omv.? Omv. diabas ?? MS = 2		12.35: 58°	
12.50-23.85	Albittfels i veksl. med karb.holdig argillitt. Karb. årer. Finlaminert grafitt b.a. 18.55-19,2° MS = 1 Spor py.	18-18.35	16.16: 64°	
23.85-33.95	Argillitt, brun, matt, karbonatholdig. Karb. årer m. noe py, rusten og vitret i lokale soner. MS = 1 Noen tegn til felsomv.		25.30: 85°	
33.95-34.85	Grafittskifer, oppknust, varierende S, tildels lav. Noe py. MS = 1		33.40: 59°	
34.85-36.50	Argilitt. Karb.h., noen felssoner. Grafittholdig, fragmenter og bånd. Breksjert, deformert, lokalt sees lagning. MS = 1		34.40: 64°	
36.50-39.60	Tuffitt, argillittisk, men mørkere og grønnaktig, med karb. årer. Diffus lagn. MS = 1		37.90: 65°	

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Ark 2 Bh. nr. 43 - 6 Profil

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
39.60-40.88	Albittfels, gråbrun, noe cp til 40 m, ellers spor. MS = 1			
40.88-49.35	Argillitt, matt, albittfelslign. inhomogen med karb. årer Noe py MS = 1 Lokalt sees lagn.		44.70: 69° 48.75: 62°	
49.35-51.15	Albittfels, grå inhomogen m. karb. årer. MS = 1			
51.15-58.00	Grafittfels, lav C til 52.10. Noe cp, py. oppknust. MS = 1		52.30: 53.20	
58.00-65.35	Grønnstein, massiv middelsk. Kalkårer. Første 20 cm alb. omv. MS $ 2 - 3 (økende) Noe felsomv. v. 65.10 Spor cp i kalkårene.			
	Hullet avsluttet v. 65.35.			
	Ragnar Hagen			

Kjerneobservasjoner.

Borhull nr. 43 - 7

Koordinator: Y 124.30 V

X 47.50 S

Påsatt i høyde 530 m m.

* i retning 77g

* med helning 65°

Borhullets lengde 168,30 m

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
0 - 1.20	Jordboring			
1.20-11.90	Albittfels, brun, massiv, noe karb. holdig. Utvikling til b.a. fullst. gjennomvevd av karb. årer og med økende py. Virkelig py 5.40-9.40 MS = 1		11.40: 53°	
11.90-14.80	Tuffitt, fink., diffus lagning. Breksjert med kalkspat og karb. årer. MS = varierende 1-2-3. Inneholder lokalt 1-2 mm lyse spetter. Foldestruktur v. 13.70.			
14.80-18.45	Albittfels. Overganger fels - finlaminert karb. b.a. Deformert MS = 2		15.05: 51°	
18.45-23.20	Grønnstein, massiv, diffus lagning, middelsk. karbonatisert m. mt. i karb. årer. Litt py. Foldestruktur ? MS = 3			
23.20.29.60	Argillitt, inhomogen som også karb. b.a. og albittfels. Fels gjennomvevd av karb. årer. Tildels finlaminert argillitt. MS = varierende 1-2-3 B.a. inneholder små syn-sedimentære forkastninger.		23.60: 46° 28.30: 35°	
29.60-32.75	Tuffitt fink. inhomogen båndet b.a. grønnlig, deformert. MS = 1 Foldestruktur v. 30.60		31.40: 44°	
32.75-100.90	Argillitt, inhomogen sone som 23.20-29.60 Representerer albittisering av karb.holdig laminert argillitt ? Albittisering er etterfulgt av silifisering i enkelte soner. Også karb. årer. Etterhvert også tynne, mørke, finlaminerte bånd - grafittholdige ? Litt cp v. 97.35.		49.30:62° 57.20:30° 67.55:64° 75.30:22° 79.65:43° 88.60:64° 90.40:44°	
100.90-110.25	Albittfels, uren, brunlig i gradvis overg. fra argillitt. Svak cp og noe py 101.75-109.20. MS = 0			

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Ark 2 Bh. nr. 43 - 7 Profil

Boret meter	Bergart	Kjerne-mangel	Skifrighet	Bergart prøve
110.65-117.50	Albittfels som 100.90-110.25 Noe cp 111.00-115.80 plus py i stockwork. Silifisering og albitisering og karb. ledsager min. Fra 115.80 . Mindre omv., lagdelt b.a. med avtagende min.		115.90-30° 117.30:57°	
117.50-126.35	Arbillitt, brun, finkornig, matt. Noe py i årer. Noe breksjert og omv. inneh. tynne qtz-alb. årer. MS = 1		125.30:49°	
126.35-129.10	Albittfels, båndet uren, grålig. MS = 1. Noe py og spor cp. Gradvis noe C (grafitt).			
129.10-142.55	Grafittfels, varierende, tildels meget lavt C-innh. Cp min. i Stockwork. 129.00-134.15 135.55-142.45 MS = 1			
142.55-151.20	Argillitt omv. med qtz karb. årer. Svake tegn til felsdannelse i massiv b.a. MS = 1		147.00:40°	
151.20-152.00	Albittfels, i gradvis overg. fra avg. qtz-karb. i nettwork. Noe py og spor cp mot grafittkontakt. MS = 0 - 1			
152.00-159.20	Grafittfels, tildels høy C. Tett gjennomvevd av karb. årer med noe py. MS = 1 (0). Oppknust, særlig ved 158-159.			
159.20-162.50	Albittfels, tett brun, diffus lagn. noe py nær kontakt med grafittfels. MS = 0 (1)		159.45:39° 160.40:53°	
162.50-164.00	Tuff, lagdelt, def. med karb. årer Omv. mot fels. MS = 1		163.75:75°	
164.00-168.30	Diabas, massiv middelsk. Fink. mot tuff. (ckilled margin ?) Kalkspat-årer fra 162,50. MS = 3			
	Hullet avsluttet ved 168.30			

Ragnar Hagen

TAB 2.

TABELL 2.1.

Kjemiske analyser

Borhull	Lengde	% Cu	ppm Pb	ppm Zn	ppm Ni	ppm Co	ppm Ag	ppm Au
43 - 1	51-52	0.03	33	4	61	20	- 0.1	- 0.02
	52-53	0.26	16	23	106	46	"	- 0.02
	53-54	1.07	16	7	44	18	"	0.06
	59-60	0.11	37	15	131	297	"	-0.02
	75-76	0.72	13	15	484	53	"	-0-02
	76-77	2.28	18	19	627	217	"	-0.02
	77-78	0.40	5	10	375	74	"	0.08
	78-79	1.77	25	12	742	181	"	0.08
	79-80	1.05	18	29	207	50	"	0.04
	80-81	0.40	9	9	385	100	"	-0.02
	81-82	0.19	7	11	471	101	"	-0.02
	82-83	2.04	14	20	361	121	"	1.20
	83-84	0.97	10	12	128	19	"	-0.02
	87-88	0.35	16	22	45	22	"	0.04
	90-91	0.39	16	22	105	53	"	0.06
	91-92	0.39	15	18	93	34	"	0.03
	92-93	0.12	12	12	207	77	"	0.02
	96-97	1.09	16	28	497	157	"	0.34
	97-98	1.60	15	38	618	125	"	0.34
	98-99	0.42	17	22	210	47	"	0.13
	115-116	2.11	6	11	94	48	"	-0.02
	116-117	0.73	4	13	106	72	"	0.05
	117-118	0.22	45	21	840	1505	"	0.10
	129-130	0.04	43	21	310	192	"	-0.02
	136-137	0.56	26	15	234	267	"	0.04
	137-138	0.45	38	16	208	199	"	0.14
	138-139	0.58	38	22	123	112	"	0.10
	139-140	0.56	39	18	54	34	"	0.17
	140-141	0.82	38	18	209	163	"	0.34
	141-142	0.52	36	17	76	40	"	0.12
	142-143	0.80	38	21	86	59	"	0.32
	143-144	1.28	42	18	119	73	"	0.27
	144-145	0.65	34	18	286	285	"	0.13
	145-146	0.12	60	22	368	532	"	0.06
	146-147	0.02	32	20	107	228	"	0.04
	147-148	0.03	22	14	192	298	"	0.15
	148-149	0.27	33	19	296	259	"	-0.02
	149-150	0.09	34	17	224	171	"	0.02
	150-151	0.03	58	27	885	1183	"	0.11
	154-155	0.03	16	14	59	52	"	-0.02
	155-156	0.01	16	21	80	58	"	-0.02
	159-160	0.05	20	32	97	43	"	-0.02
	161-162	0.14	*	100	43	130	-2	0.02
	162-163	0.69	20	33	166	218	-0.1	0.17
	163-164	0.68	18	22	53	21	-0.1	0.61
	164-165	0.02	38	30	57	25	-0.1	-0.02
	165-166	0.38	*	-100	73	110	-2	0.12
	166-167	0.75	31	17	446	529	-0.1	1.18
	167-168	0.12	*	-100	183	280	-2	0.09
	168-169	0.34	*	-100	183	271	-2	0.24
	169-170	0.12	*	-100	316	260	-2	0.18
	170-171	0.009	*	-100	173	290	-2	0.26
	171-172	0.004	*	-100	111	170	-2	0.13
	173-174	0.009	14	21	251	228	-0.1	0.02

Borhull	Lengde	% Cu	ppm Pb	ppm Zn	ppm Ni	ppm Co	ppm Ag	ppm Au
43 - 1	173-174	0.04	*	-100	86	150	-2	0.02
	174-175	0.003	*	-100	168	260	-2	0.07
	175-176	0.005	*	-100	149	390	-2	0.02
*	Ikke analysert							
43 - 2	35-36	0.003	27	12	37	23	-0.1	0.03
	65-66	0.008	26	14	81	84	"	0.02
	74-75	0.29	9	11	179	48	"	0.06
43 - 3	56-57	0.01	7	35	44	117	"	-0.02
	57-58	0.01	2	14	45	176	"	-0.02
	100-101	0.01	18	25	32	- 1	"	-0.02
	123-124	0.02	1	8	41	71	"	0.02
	144-145	0.04	29	18	773	1033	"	0.14
	147-178	0.16	29	62	202	180	"	0.05
	148-149	0.42	27	14	165	230	"	0.08
	149-150	0.95	31	38	171	156	"	0.05
	150-151	0.64	38	30	179	191	"	0.05
	151-152	0.82	37	16	225	238	"	0.24
	152-153	0.95	35	22	148	141	"	0.48
	153-154	1.91	22	17	230	306	"	0.86
	154-155	2.41	29	28	260	264	"	3.23
	155-156	2.50	27	15	201	158	"	0.63
	156-157	1.49	14	34	265	94	"	0.21
	157-158	0.50	11	9	189	146	"	0.09
	158-159	1.20	14	38	229	177	"	0.20
	159-160	2.10	7	11	346	221	"	0.36
	160-161	0.61	1	9	26	1	"	0.08
	161-162	0.15	4	10	17	-1	"	-0.02
	162-163	0.23	6	11	35	-1	"	0.02
	163-164	0.04	7	8	417	128	"	-0.02
	168-169	0.40	20	77	114	127	"	0.34
	169-170	0.52	7	16	235	46	"	0.03
	170-171	0.79	14	12	164	29	"	0.13
	171-172	0.46	15	14	50	6	"	0.24
	172-173	0.06	17	23	71	22	"	-0.02

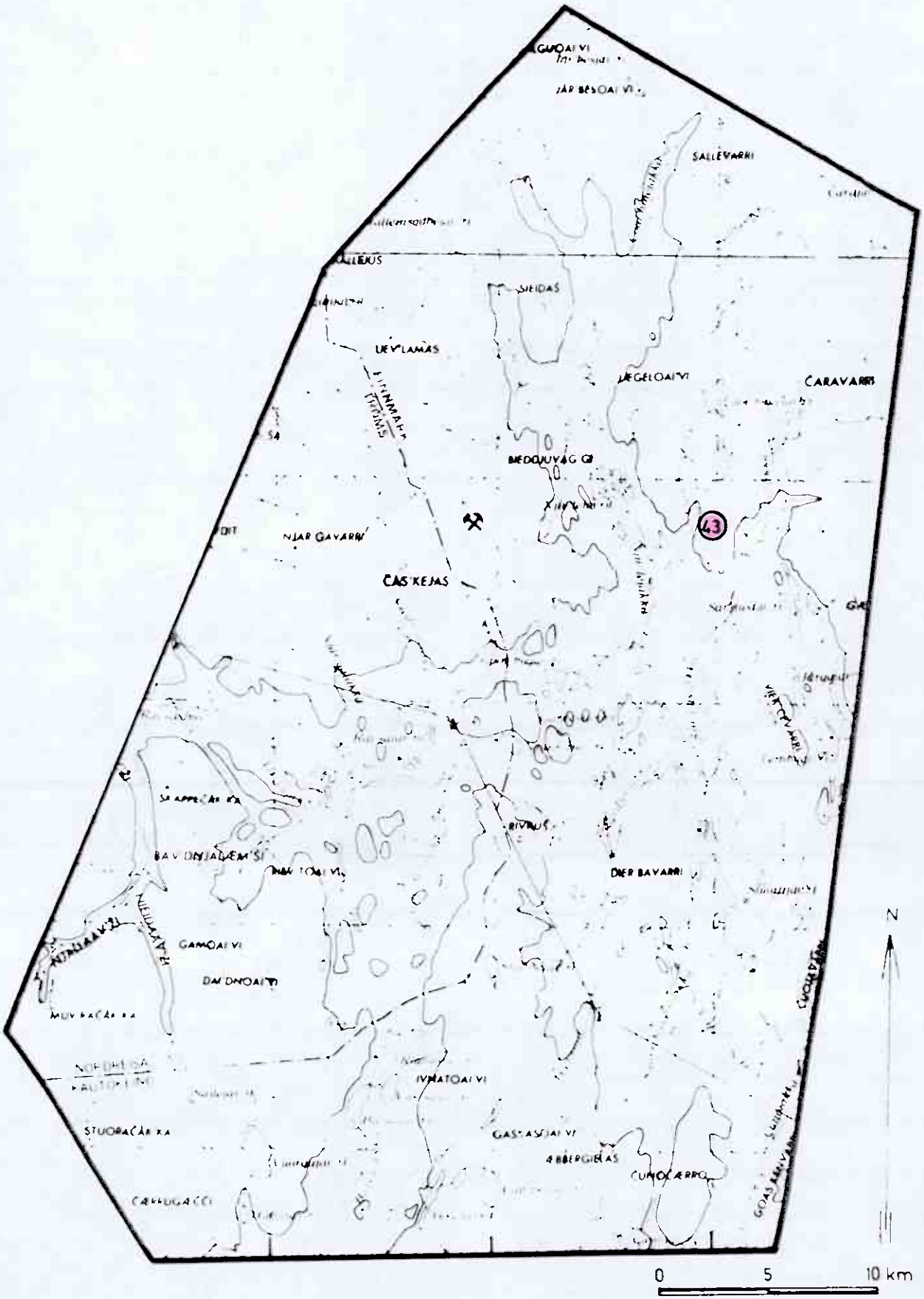
Borhull	Lengde	ppm Cu	ppm Ni	ppm Co	% Fe	ppm Au	ppm Ag
43 - 4	14-15	1012	865	1323	26.40	0.04	-0.01
	26-27	2.52 %	446	163	3.12	0.57	"
	27-28	3155	718	71	0.54	0.38	"
	28-29	2613	789	92	0.47	0.34	"
	29-30	972	287	53	0.27	0.02	"
	36-37	5081	86	27	2.67	0.12	"
	37-38	6200	119	53	2.83	0.08	"
	40-41	2896	327	198	0.73	0.04	"
	41-42	630	198	162	0.18	-0.01	"
	42-43	1867	178	103	0.27	0.02	"
	43-44	2.04 %	90	26	1.80	1.05	"
	44-45	2.82	67	19	2.33	0.65	"
	45-46	7500	24	17	2.45	0.12	"
	46-47	3880	26	14	2.09	0.04	"
	47-48	7050	85	73	6.50	0.41	"
	48-49	3.00 %	177	149	14.70	0.65	"
	49-50	4.42 %	209	293	20.30	0.65	"
	50-51	2.36 %	112	117	9.90	0.24	"
	51-52	4486	105	48	4.84	0.07	"
	52-53	9350	74	86	6.70	0.08	"
	53-54	639	46	111	4.63	0.02	"
	54-55	81	49	35	5.03	0.02	"
43 - 5	11 - 1	423	253	358	8.18	0.02	"
	37 - 38	20	57	123	4.47	0.04	"
	40 - 41	1018	87	74	4.15	0.04	"
	72 - 73	101	134	138	4.54	0.03	"
	75.4- 76	3036	43	49	0.61	0.10	"
	76 - 77	1.40 %	167	413	5.80	0.08	"
	77 - 78	6200	15	15	2.65	0.05	"
	78 - 79	4.62 %	1304	184	5.72	10.64	1.3
	79 - 80	606	73	46	3.60	0.04	-0.1
	85 - 86	3.61 %	529	109	3.13	0.71	-0.1
	86 - 86,7	4.74 %	2913	580	4.37	4.43	0.9
	86,7- 88	1909	469	91	0.31	-0.02	-0.1
	88 - 89	3890	117	46	0.58	-0.02	"
	89 - 90	2290	74	25	0.46	-0.02	"
	90 - 91	2438	67	26	0.60	0.04	"
	90 - 92	219	25	22	3.42	-0.02	"
	92 - 93	3985	82	45	5.91	0.05	"
	93 - 94	1175	101	108	3.70	0.05	"
	99 -100	616	117	34	2.12	0.02	"
	100 -101	370	159	53	2.56	0.04	"
	102.4-103	6100	213	51	0.68	0.12	"
	103 -104	7700	60	13	1.41	0.19	"
	129 -130	115	10	69	3.57	-0.02	"
43 - 6	32 -33	1183	79	26	5.27	0.02	"
	33 -34	519	143	44	7.24	-0.02	"
	34 -35	489	117	41	5.93	-0.02	"
	39.6 -40	4537	148	145	4.75	0.05	"
	51.15-52.3	6750	170	40	5.34	0.15	"
	53.2 -54	4700	289	42	3.18	0.29	"
	54 -55	6200	424	73	3.42	0.12	"
	55 -56	423	204	59	3.36	0.02	"
	56 -57	3958	127	89	3.47	0.18	"
	57 -58	7450	267	261	2.09	0.37	"
	63 -64	3392	80	26	5.86	0.04	"
	64 -65	66	71	37	3.96	0.02	"

Borhull	Lengde	ppm Cu	ppm Ni	ppm Co	% Fe	ppm Au	ppm Ag
43 - 7	5-6	59	184	205	7.68	0.02	- 0.01
	6-7	110	509	834	17.96	0.07	"
	7-8	158	552	986	20.08	0.06	"
	19-20	67	76	40	7.04	-0.02	"
	35-36	37	16	13	1.06	-0.02	"
	46-47	19	48	85	4.09	-0.02	"
	64-65	194	138	79	4.29	-0.02	"
	97-98	684	365	249	4.51	-0.02	"
	100-101	247	158	57	4.81	-0.02	"
	101-102	1245	141	126	4.11	-0.02	"
	102-103	3040	159	93	3.90	0.02	"
	103-104	6650	134	59	4.91	0.05	"
	104-105	5350	75	28	3.78	0.10	"
	105-106	1300	70	33	2.82	0.02	"
	106-107	6200	96	49	3.47	0.05	"
	107-108	5030	72	77	2.17	0.17	"
	108-109	6400	40	35	1.49	0.05	"
	109-110	590	41	16	0.59	-0.02	"
	110-111	447	45	11	0.30	-0.02	"
	111-112	1.98 %	254	89	2.74	0.56	"
	112-113	8650	61	29	2.69	-0.02	"
	113-114	1.30 %	299	130	6.18	0.32	"
	114-115	8400	186	57	3.95	0.24	"
	115.116	4440	57	11	2.78	0.10	"
	116-117	910	66	35	4.34	-0.02	"
	117-118	386	99	54	4.59	-0.02	"
	118-119	610	201	92	9.44	-0.02	"
	126-127	1213	158	29	8.48	-0.02	"
	127-128	344	162	53	8.04	0.03	"
	128-129	379	128	35	4.98	0.02	"
	129-130	8700	182	48	2.03	0.20	"
	130-131	1.70 %	175	50	2.95	0.05	"
	131-132	7700	272	73	1.65	0.08	"
	132-133	8520	567	132	1.87	0.18	"
	133-134	7720	442	108	1.78	0.18	"
	134-135	184	196	21	4.04	0.02	"
	135-136	650	189	32	3.99	0.03	"
	136-137	4828	145	36	3.97	0.08	"
	137-138	2975	148	41	4.13	0.07	"
	138-139	3.05 %	173	51	4.73	0.29	"
	139-140	1.52 %	350	88	2.84	0.21	"
	140-141	1.93 %	303	87	4.01	0.36	"
	141-142	1.76 %	140	50	3.22	0.50	"
	142-143	4012	181	76	6.16	0.08	"
	151-152	218	191	140	6.80	0.02	"
	152-153	294	274	52	3.19	0.02	"
	160-161	229	24	72	0.91	-0.02	"

TABELL 2.2 Multielement-analyser (INAA) av prøver fra borhull 43-1.

SAMPLE NUMBER / ELEMENT UNITS	Ba PPM	La PPM	Hf PPM	Ta PPM	W PPM	Ir PPB	Au PPB	Th PPM	U PPM	Ni PPM	Cu PPM	Na PCT	Cr PPM	Fe PCT	Co PPM	Zn PPM	As PPM	Se PPM	Mo PPM	Ag PPM	Cd PPM	Sb PPM
43-1 160-161	<50	4	1	<0.5	8	<50	2	0.4	1.0	49	30	4.26	340	4.2	20	<100	7.0	<5	5	<2	<2	0.3
43-1 161-162	<50	4	2	<0.5	16	<50	23	0.3	2.1	43	1490	4.74	430	5.0	130	<100	62.0	<5	7	<2	<2	1.0
43-1 165-166	<50	4	3	1.0	16	<50	120	1.0	6.4	73	3830	3.73	230	6.9	110	<100	50.0	<5	7	<2	<2	0.2
43-1 167-168	<50	29	5	1.0	15	<50	92	10.0	12.0	183	1220	6.03	290	4.7	280	<100	107.0	<5	11	<2	<2	<0.1
43-1 168-169	<50	4	3	<0.5	12	<50	248	4.0	3.8	271	3480	7.65	380	9.4	310	<100	234.0	20	10	<2	<2	1.1
43-1 169-170	<50	7	3	1.0	17	<50	180	3.1	4.8	316	1260	7.81	390	7.4	260	<100	319.0	30	11	<2	<2	<0.1
43-1 170-171	<50	2	3	1.0	15	<50	264	5.5	14.0	173	96	7.35	310	3.7	290	<100	162.0	<5	13	<2	<2	1.0
43-1 171-172	<50	<2	4	1.0	11	<50	130	7.9	7.4	111	48	6.55	310	4.0	170	<100	176.0	<5	21	<2	<2	1.0
43-1 173-174	<50	<2	4	<0.5	12	<50	20	7.5	5.9	86	45	5.85	360	4.1	150	<100	119.0	9	19	<2	<2	1.0
43-1 174-175	<50	<2	4	1.0	13	<50	70	10.0	5.5	168	39	6.87	330	6.0	260	<100	250.0	8	13	<2	<2	1.0
43-1 175-176	<50	<2	3	<0.5	9	<50	28	2.0	2.0	149	57	4.75	380	8.0	390	<100	454.0	8	12	<2	<2	1.0

FIG. 1.



Joint venture Norwegian Gulf - A/S Sydvaranger

Location map, "43"

Scale 1 250 000

Trace

PROSPEKTERING A/S

Fig 1

FIG. 2.

LEGEND

EM anomalies are graded as to the probability that they reflect bedrock conductors. There are four grades as follows:

Symbol	Probability Grade	Probability Rating
●	4	> 90%
◉	3	75–90%
◎	2	60–75%
○	1	40–60%

Flight Line

5 ← Fiducial

4 ← Fiducial

44 Line Number

Vertical coaxial coils

Coil seperation 6.7m

Frequency 1000 Hz

EM interpretation

G Good conductor (R/I > 2)

M Medium conductor (1 < R/I < 2)

D Poor conductor (R/I < 1)

P Quality of conductor undefined due to magnetic polarization

□ Anomaly not recognized by Dighem's processing

(O) Anomaly caused by magnetic polarization or by conductive overburden

⊗ Anomaly caused by noise

? Interpretation uncertain

Conductor axis

Conductor axis, uncertain

← Positioning error

Flight Line

Fiducial 2120 (Not recovered from film)

Fiducial 2118 (Recovered from film)

Fiducial 2110 (Not recovered from film)

Fiducial 2104 (Recovered from film)

501 Line number and flight direction

ALLOCHTONOUS ROCKS

Tierfa nappe and Kalak nappe

1 Quartzite and metarkose

AUTOCHTONOUS ROCKS

Dividal Group. Eocambrian

2 Argillite, sandstone and conglomerate

PRECAMBRIAN ROCKS

Caravarre Sandstone. Proterozoic

4 Sandstone

Caskias Group. Proterozoic

Argillite

5 Carbonate rocks

12 Acid tuff

6 Graphite felsite/graphite schist

7 Albite felsite

13 Amphibole-chlorite rock

Banded amphibolite

12 Meta-tuff/metatuffite

11 Metadiabase

Metabasalt

Carbonatization, albitization, breccia

Cu-mineralization Outcrops/drillhole

Anticline/syncline

Fault

Thrust plane

11 Follow-up area

Diamond drillhole

N

0 1.0 2.0 km

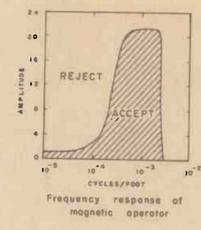
EASTERN CASKIAS GROUP GEOLOGY HEM	M 1 20 000 Målt: Tegn: RH 1/86 Trace:
PROSPEKTERING A/S	Fig. 2.1

Flight Line

Fiducial 2120 (Not recovered from film)
Fiducial 2118 (Recovered from film)
Fiducial 2110 (Not recovered from film)
Fiducial 2104 (Recovered from film)
Line number and Flight direction

ISOMAGNETIC LINES
(enhanced field)

5000 gammas
1000 gammas
200 gammas
100 gammas
magnetic depression



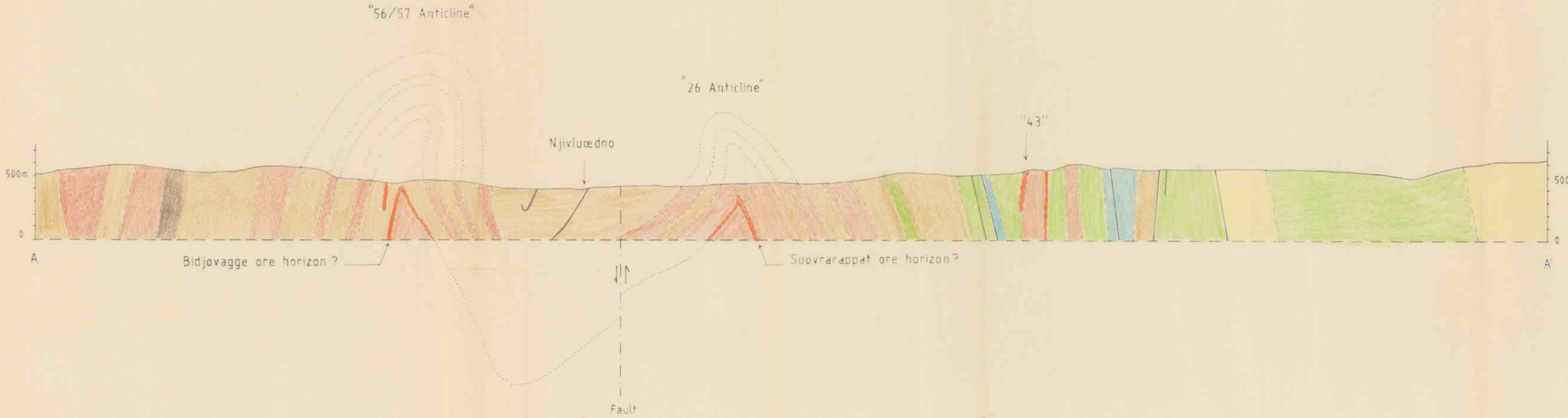
Frequency response of magnetic operator

Eastern Caskias Group
Enhanced magnetics

M
1.20.000
Målt:
Tegn:
Trace:
Fig. 2.2

PROSPEKTERING A/S

GENERALIZED GEOLOGICAL SECTION EASTERN CASKIAS GROUP



LEGEND

- Caravarri sandstone
- Argillite
- Carbonate rocks
- Graphite schist
- Amphibole-chlorite rock
- Albite felsite/graphite felsite
- Meta tuff/meta tuffite
- Meta diabase

0 0.5 1.0 1.5 20km

Geological section A-A	Scale 1:20.000
	Drawn: HN 12/85
	Trace: HB 12/85
PROSPEKTERING A/S	Fig 2.3

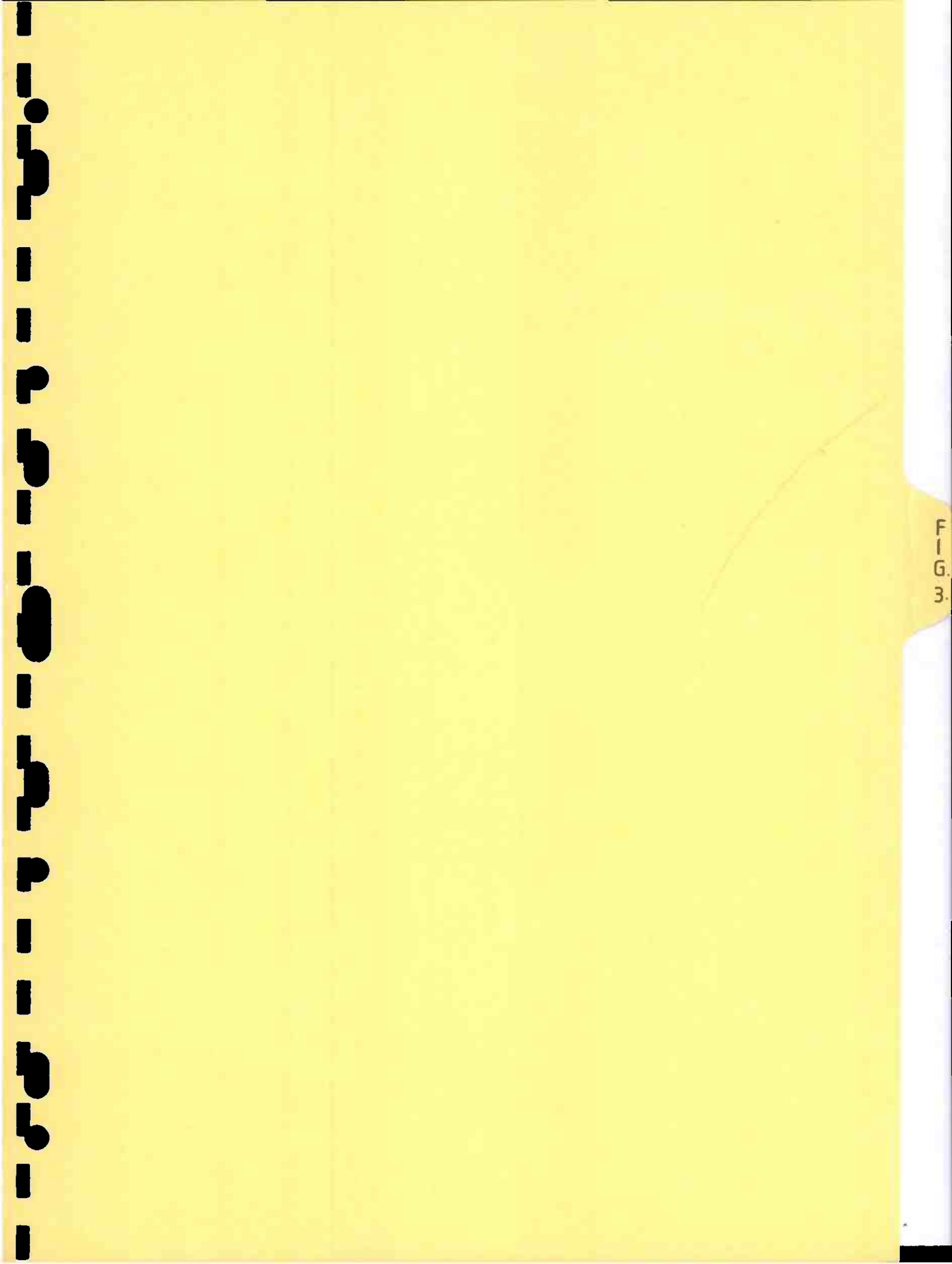


FIG. 3.

ČAPPESČÅIVVAT

100W
0
100E
200E
100N
100S
200S
300S
400S
500S
DEEP
MIKKUJAVRIT
523
536
583
70°
82°
86°
88°

LEGEND
GEOLOGY:

- 6 Dolomite
- 5 Argillite
- 8 Graphite felsite / graphite schist
- 3 Albite carbonate rock
- 7 Albite felsite
- 12 Tuff
- 13 Diabase
- Outcrop
- Cp mineralization
- # Albite alteration
- Diamond drill hole

GEOPHYSICS

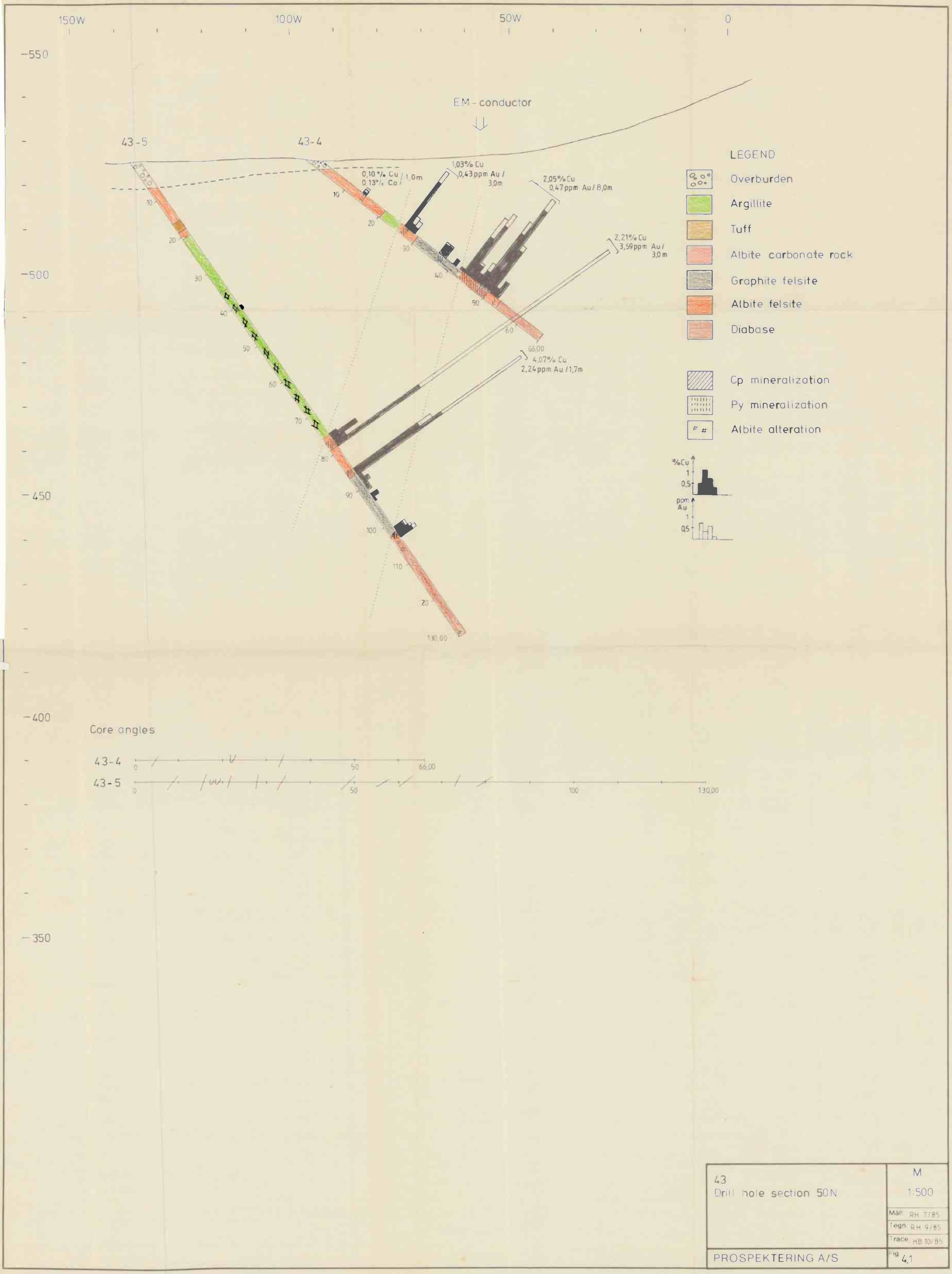
- Survey line, ground geophysics
- EM conductor, slingram
- EM conductor, helicopter survey

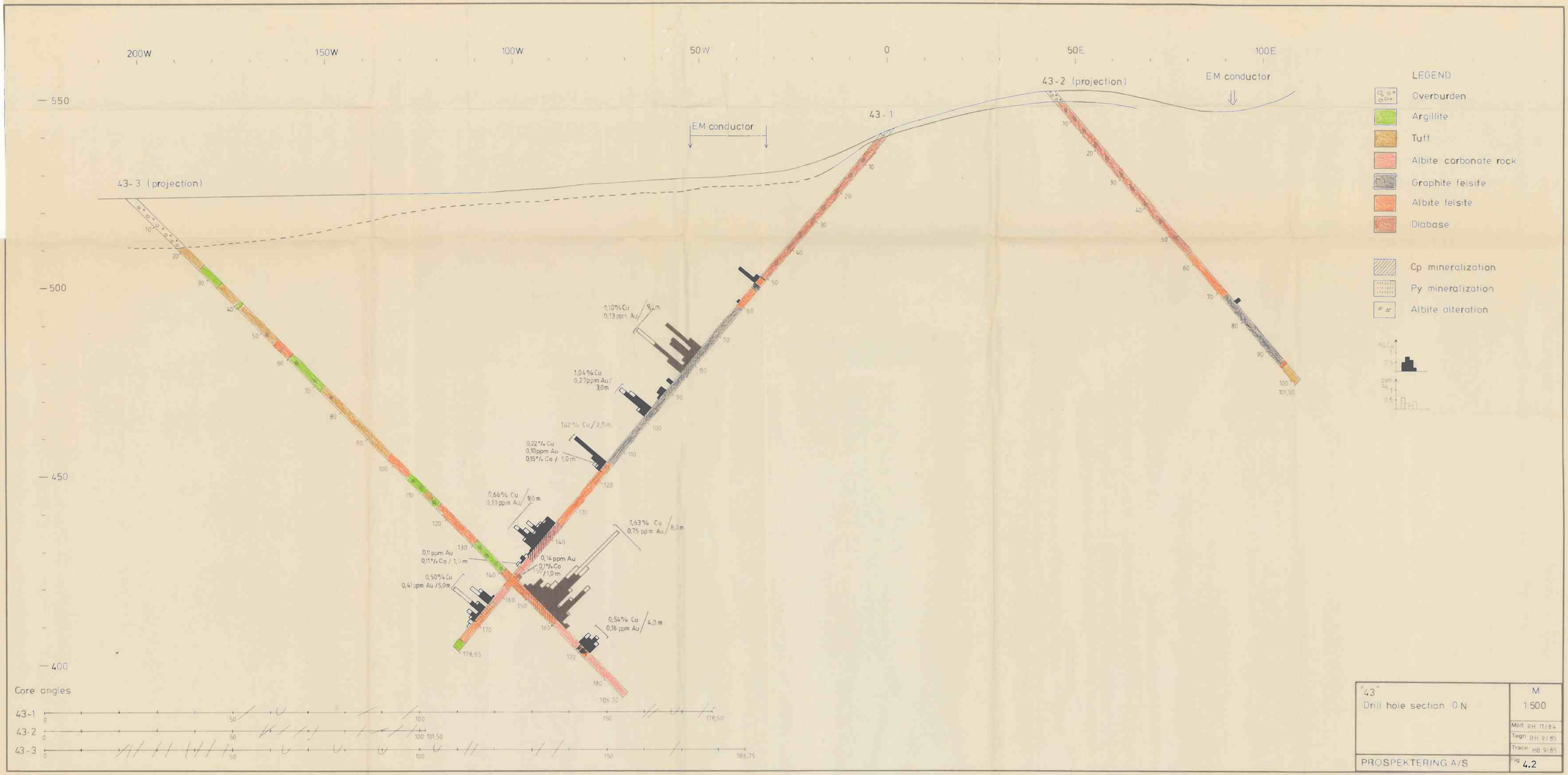
N

0 100 200m

Area 43 Geology Geophysics	M 1:5000
	Mål RH 7/85 Tegn RH 9/85 Trace HB 9/85
PROSPEKTERING A/S	Fig 3

FIG. 4.


150W
100W
50W
0
-550
-500
-450
-400
-350
EM - conductor
43-5
43-4
0,10 % Cu
0,13 % Co
1,0m
1,03% Cu
0,43 ppm Au / 3,0m
2,05% Cu
0,47 ppm Au / 8,0m
2,21% Cu
3,59 ppm Au / 3,0 m
4,07% Cu
2,24 ppm Au / 1,7m
66,00
130,00
LEGEND
Overburden
Argillite
Tuff
Albite carbonate rock
Graphite felsite
Albite felsite
Diabase
Cp mineralization
Py mineralization
Albite alteration
%Cu
ppm Au
Core angles
43-4
43-5
43
Drill hole section 50N
M
1:500
Måll. RH 7/85
Tegn. RH 9/85
Trace HB 10/85
PROSPEKTERING A/S
Fig 4.1


200W
150W
100W
50W
0
50E
100E
550
500
450
400
43-1
43-2 (projection)
43-3 (projection)
EM conductor
EM conductor
1,10% Cu
0,13 ppm Au/ 9,4m
1,04% Cu
0,27ppm Au/
3,0m
1,42% Cu/2,0m
0,22% Cu
0,10ppm Au
0,15% Co / 1,0m
0,66% Cu
0,19 ppm Au/ 9,0m
1,63% Cu
0,75 ppm Au/ 8,0m
0,11 ppm Au
0,11% Co / 1,0m
0,14 ppm Au
0,1% Co
/1,0m
0,50% Cu
0,41 ppm Au /5,0m
0,54% Cu
0,18 ppm Au/ 4,0m
178,65
186,70
101,50
LEGEND
Overburden
Argillite
Tuff
Albite carbonate rock
Graphite felsite
Albite felsite
Diabase
Cp mineralization
Py mineralization
Albite alteration
Core angles
43-1
43-2
43-3
178,50
101,50
186,75
"43"
Drill hole section 0 N
M
1:500
Mål: RH 11/84
Tegn: RH 9/85
Trace: HB 9/85
PROSPEKTERING A/S
Fig. 4.2

150W 100W 50W 0

-550 -500 -450 -400 -350

EM - conductor

43-7 43-6

0,09% Co / 2,0m

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 165 168,30

10 20 30 40 50 65,35

1,08% Cu
0,24ppm Au /
5,0m

0,99% Cu
0,13ppm Au / 5,0m

1,73% Cu
0,28 ppm Au / 5,0 m

LEGEND

- Overburden
- Argillite
- Tuff
- Albite carbonate rock
- Graphite felsite
- Albite felsite
- Diabase
- Cp mineralization
- Py mineralization
- Albite alteration

%Cu 1 0,5

ppm Au 1 0,5

Core angles:

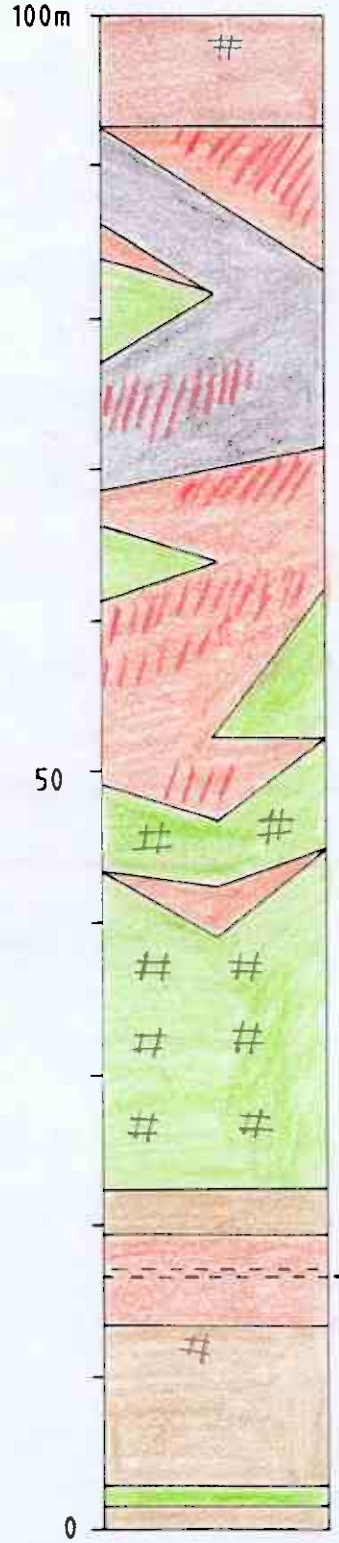
43-6 0 50 65,36

43-7 0 50 100 150 168,70

43 Drill hole section 50 S	M 1:500
	Mål: RH 7/85 Tegn: RH 9/85 Trace: HB 10/85
PROSPEKTERING A/S	Fig 4.3

FIG. 5.

GENERALIZED SECTION "43" MINERALIZATION

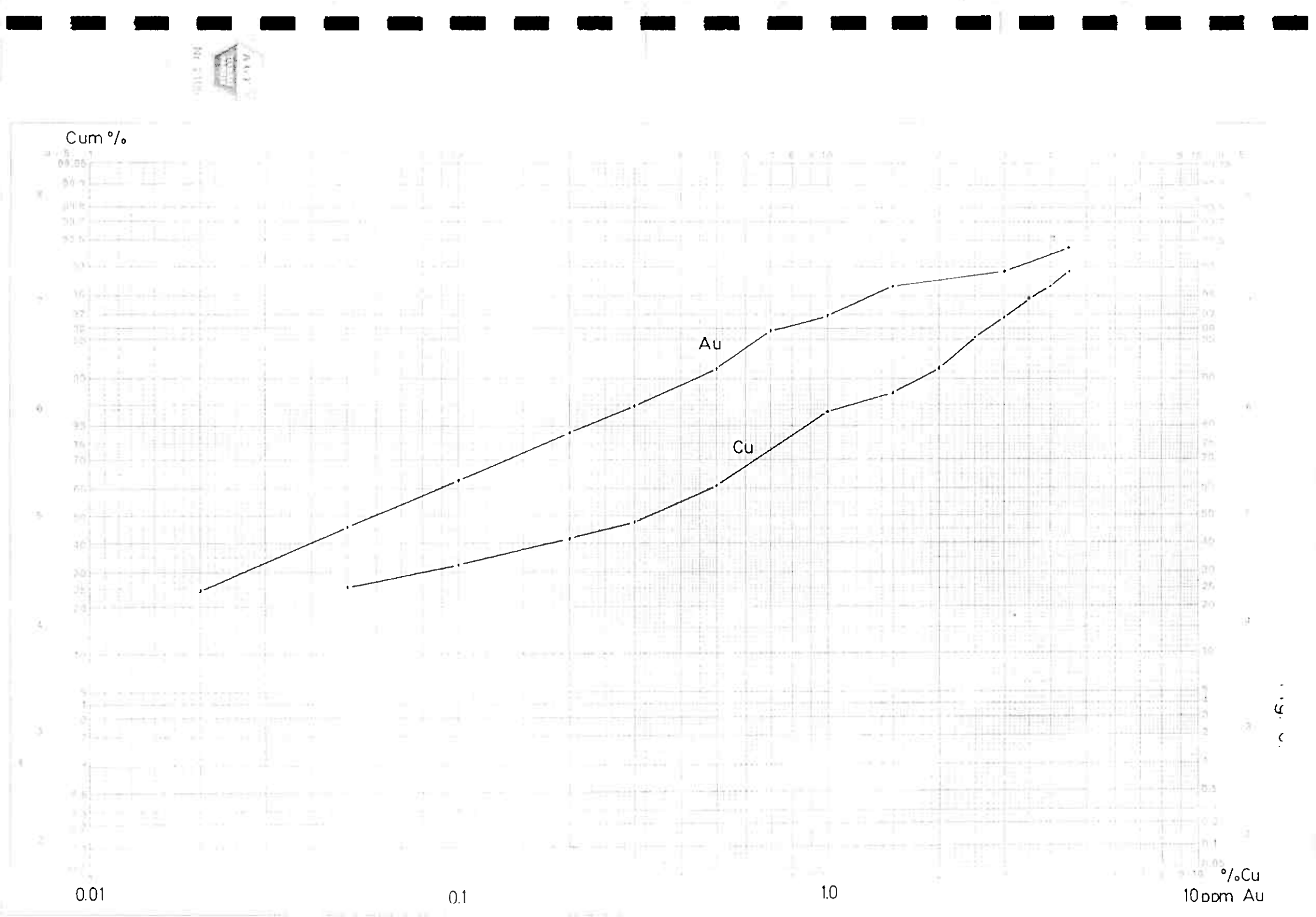


LEGEND

- Meta diabase
- Graphite felsite
- Albite felsite
- Argillite
- Meta tuff
- Cp mineralization
- Albite alteration

Generalized Section "43"	Scale 1:500
	Draw. RH 12/85
	Trace: HB 12/85
PROSPEKTERING A/S	Fig. 5.

FIG. 6.


Cum %
Au
Cu
0.01
0.1
1.0
%Cu
10 ppm Au

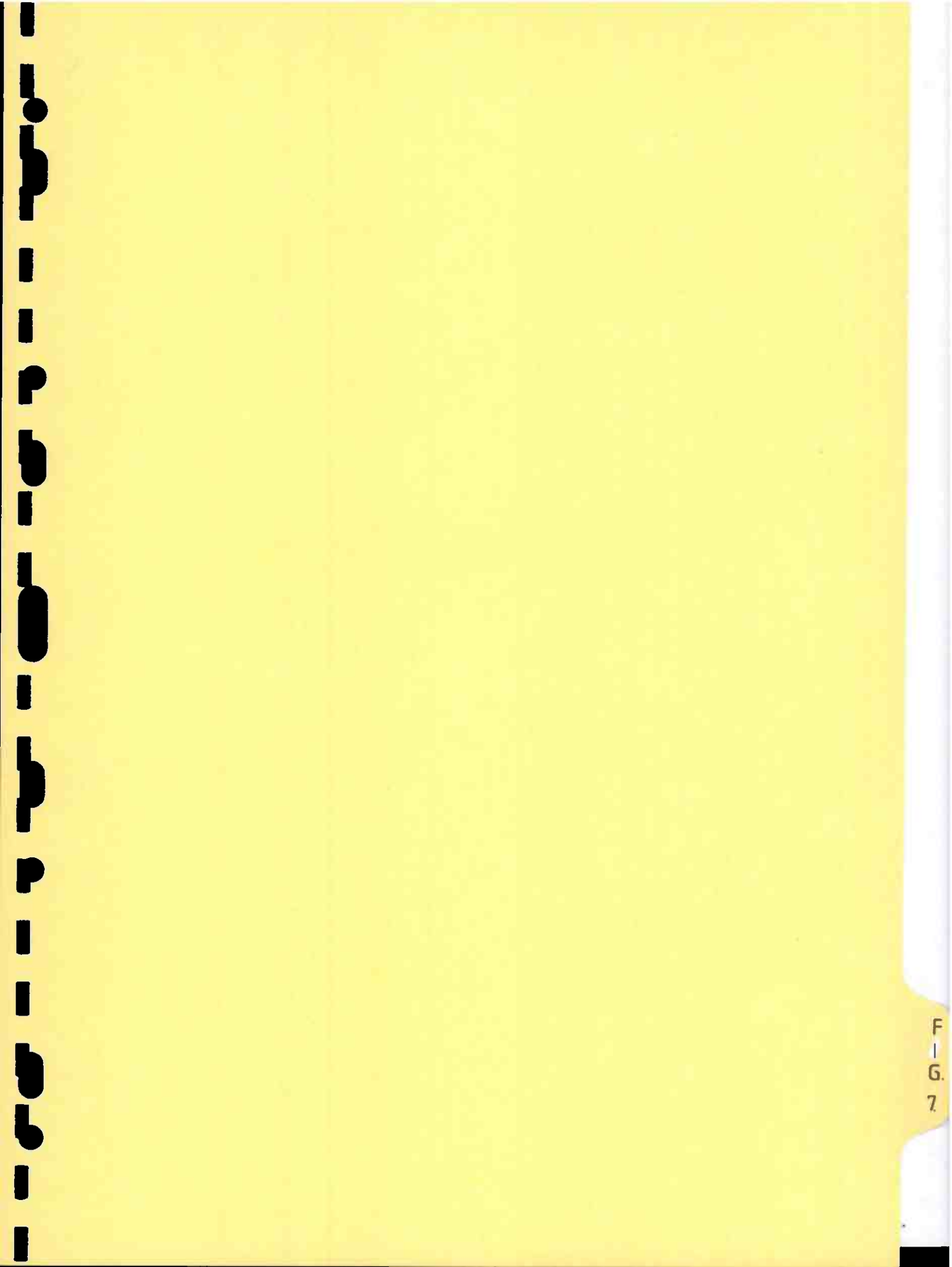
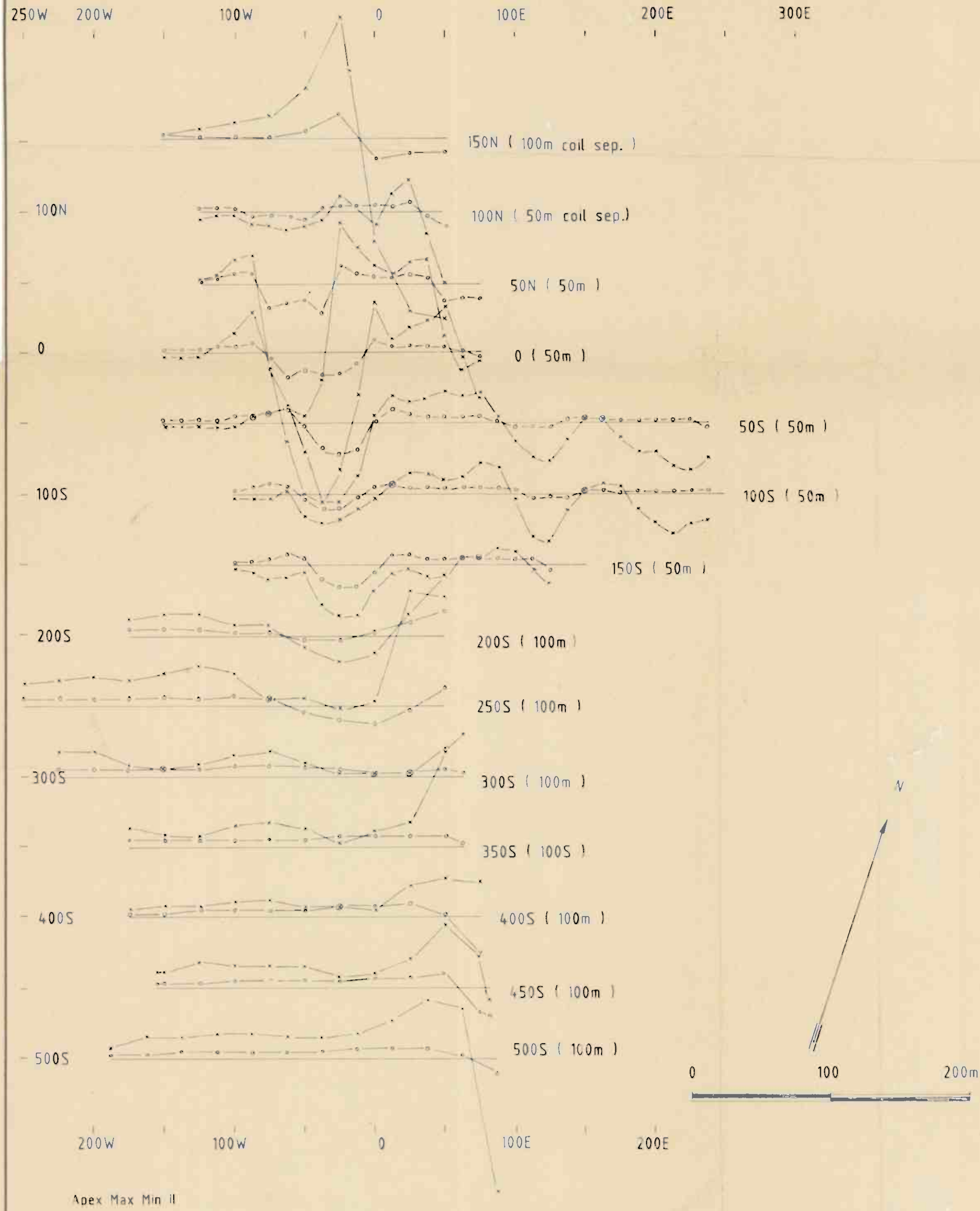


FIG. 7.



43
Slingram Survey
Field curves 1777 Hz

M
1:2500

Målt:
Tegn:
Trace:

PROSPEKTERING A/S

Fig. 7.1

200 W
100 W
0
100 E
100N
50N
0
50S
100S

Magnetic total field
-50.000nT

4000 Isomagnetic line

2900 Magnetic depression

Uncertain data

43-1 Drill hole (projection)

Geological legend,
see fig. 2.1.

Sub-outcrop
graphite felsite

Mineralization

N

0 50m

Area 43
Mag. total field

EM interpretation
Drill hole projection

Scale
1:1000

ER 7/85
RH 8/85
Trace HB 1/86

PROSPEKTERING A/S

Fig 7.2