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Rapportarkivet

Bergvesenet rapport nr	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering
BV 485			Trondheim	**Åpen**
Kommer fra ..arkiv	**Ekstern rapport nr**	**Oversendt fra**	**Fortrolig pga**	**Fortrolig fra dato:**
Falconbridge	Sul 295-73-23	Sulfidmalm A/S		

Tittel

Reconnaissance geophysical measurements in the Fagermo area, Pasvik. Sept 1973.

Forfatter	Dato	Bedrift
B Lieungh	Sept. 1973	Sulfidmalm A/S

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Sør-Varanger	Finnmark	Finnmark	24334	Kirkenes

Fagområde	Dokument type	Forekomster
Geofysikk	Rapport	
Råstofftype	**Emneord**	
Malm/metall	Ni	

Sammendrag

A/S SULFIDMALM

INTER-OFFICE MEMORANDUM

Date: Oslo, 10th June, 1974'

To: Falconbridge Nikkelverk A/S

cc: A. M. Clarke, H. T. Berry, B. Lieungh, R. B. Band, F. Hansen.

From: J. B. Gammon

Subject:

905-23N. Fagermo geophysics, Pasvik. Report Nr. 295/73/23.

Please find attached Lieungh's account of a VLF - mag survey carried out in the Fagermo area, Pasvik.

J. B. Gammon.

MOTTATT 12. 06. 74 RESV. ARK.
ADM. DIR. FORSKN./UTV.
TEKNISK DIR. EL. LYSE AVD.
PERSONALDIR. M.L. AVD.
ADM. SJEF. AVD.
AVD.

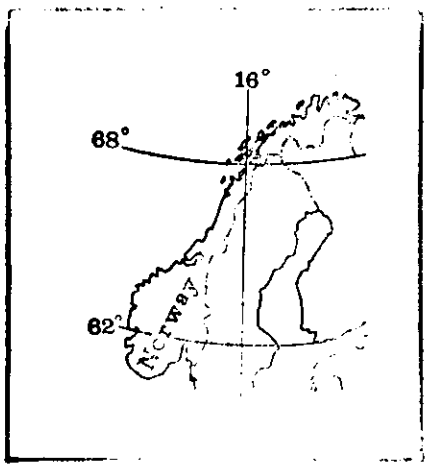
FOR FALCONBRIDGE NIKKELVERK A/S

A/S SULFIDMALM

PROJECT 905-23N

RECONNAISSANCE GEOPHYSICAL MEASUREMENTS IN THE FAGERMO AREA PASVIK, FINNMARK. SEPT. 1973-

BY
B. LIEUNGH



Report Nr. 295-73-23

Available information.

Magnetic and electromagnetic (real and imaginary component) maps based on helicopter measurements by Terratest cover the area to the north-west of the survey area.

Between Terratest's survey area and the Soviet border along the Pasvik river there was no previous geophysical data.

This assignment.

This work was agreed upon at a meeting between representatives of A/S Sulfidmalm and A/S Sydvaranger at Kirkenes Turisthotel 5/8-73.

The aim was to carry out reconnaissance magnetic and electromagnetic measurements (VLF - EM) with a large profile spacing to form the basis for possible later helicopter measurements.

The measurements should be mainly concentrated around the serpentine rocks north of Fagermo farm.

The Grid.

The base line was placed in the most favorable position from the geological topographic conditions in a direction of N 134^{g}. It was surveyed on the ground by surveyer Hjalmar Rognmo from Hesseng during the period 30/8 - 7/9 - 1973.

The base line at both ends is connected to Widerøe's trignometrical points for the topographic mapping. (Drillhole 14 and a point at Skogfoss). The baseline is marked with pickets every 200m. It is intended that these will be replaced with bolts later.

The profile lines were put out by pace and compass. These were picketed every 50 m. This was done at the same time as the geophysical measurements.

../2

The baseline and the grid is shown on the following figures. Bad correlation between the map and the terrain makes replacement of the grid somewhat uncertain.

Apparatus.

1) For the magnetic measurements a geometric G-816 Protonmagnetometer was used with digital readout of the total magnetic field.

The apparatus was oriented in the same direction under all measurements. The apparatus' measurement limit is $\pm$ 1γ. The curves are drawn up at $\pm$ 5γ accuracy. The magnetometer was borrowed from the University of Oslo by professor J. A. W. Bugge.

2) For the electromagnetic measurements a Crone Radem VLF instrument was used. This has $\pm$ 1/2° accuracy on the dip angle measurements. All readings were made to $\pm$ 1° accuracy. The apparatus was borrowed from Canada and flown to the project by A/S Sulfidmalm.

The Survey.

Magnetic measurements.

The measurements were carried out with a magnetometer mounted in a specially constructed rucksack such as the operator had both hands free. Measurements were made at a base station at border marker nr. 111, in the morning and the evening to give a control of larger magnetic field strength variations and possible faults with the instrument. The measurements along the profiles were made at 50 m intervals with smaller intervals where necessary.

VLF - EM measurements.

Dip angle measurements were carried out in an attempt to find so called "cross-overs" over the edges or outcrops of EM - conductive zones.

As a sending station we used MS (Gorkij - USSR), which lies in the most favorable direction in the field with respect to the strike of the rocks. This station had at this time, very irregular sending times and signal strength, something which delayed the measurements. At the same time we carried out measurements using station BOF (Bordaux of France), which had much more stable continual signals but which was not lying in such a favorable position with respect to the strike of the rocks.

An attempt was made on field strength measurements from the MS - station but this had to be abandond because of the irregularity in the sending signals. The observations were made at 50 m intervals. This is somewhat wide spread for detailed investigations but this was only a reconnaissance survey. A shorter measuring interval 25, 12 or 6 m was used where it was necessary to determine the exact position of cross-overs. For the dip angle measurements the dip - direction to the south and east was considered negative whereas a dip - direction to the north and west was given a positive foresign.

The results.

Several VLF cross-over and magnetic anomalies of different sizes have appeared on the profiles. Below the most marked cross-overs and possible magnetic correlations have been set up in a list. Some possible causes of the anomalies can be powerlines together with reindeer and sheep fencing made of steel.

Graphite schists have been observed at several places along the profiles and in addition there are several places where one could expect to find graphite schist if the rocks were exposed. These are indicated in the column under causes but does not mean necessarily that the cause of the anomaly has been determined.

Profile 1200 E

VLF "Cross-over"			Coincident magnetic anomaly			Possible cause
very	strong	1700 N		none		
	strong	1624 N		weak	1650 N	
	weak	1275 N		"	1250 N	
very	strong	1050 N		strong	1025 N	Possibility of graphite schists
"	strong	625 N		none		
	strong	550 N	very	weak	550 N	
	"	450 N	)			
	"	375 N	)	strong	400 N	Possibility for graphite schists
very	weak	200 N		none		
very	strong	400 S		none		Reindeer fence 385 S
	weak	550 S		"		
	"	825 S		weak	850 S	
	strong	1025 S	very	weak	1000 S	
	"	1175 S		weak	1200 S	
very	strong	1250 S		none		High tension power line
	strong	1375 S		strong	1350 S	
	"	1550 S		strong	1500 S	
	weak	1750 S		none		Reindeer fence
very	strong	1825 S	very	strong	1800 S	

Profile 1600 E

VLF "Cross-over"			Coincident magnetic anomaly		Possible -cause
very	strong	675 N	none		
"	"	500 N	very weak	500 N	Possibility of graphite schists
	strong	375 N	None		
very	weak	200 N	"		
very	strong	550 S	"		
	weak	750 S	"		
	"	875 S	"		
very	strong	975 S	"		High tension power line

Profile 2000 E

No VLF "cross-over"

Profile 2100 E

VLF "Cross-over"			Coincident magnetic anomaly		Possible cause
	strong	775 N	very good	750 N	
	"	575 N	none		graphite schists
	"	475 N	"		" "
	"	325 N	"		possibility of graphite schists
	"	175 N	"		
very	strong	275 S	"		high tension power line
	strong	700 S	strong	700 S	sheep fence
	weak	950 S	none		
very	strong	1100 S	weak	1150 S	
"	weak	1400 S	none		
	strong	1750 S	strong	1775 S	

Profile 2200 E

	weak	50 S	none	
	strong	225 S	"	
	strong	250 S	"	

Profile 2300 E

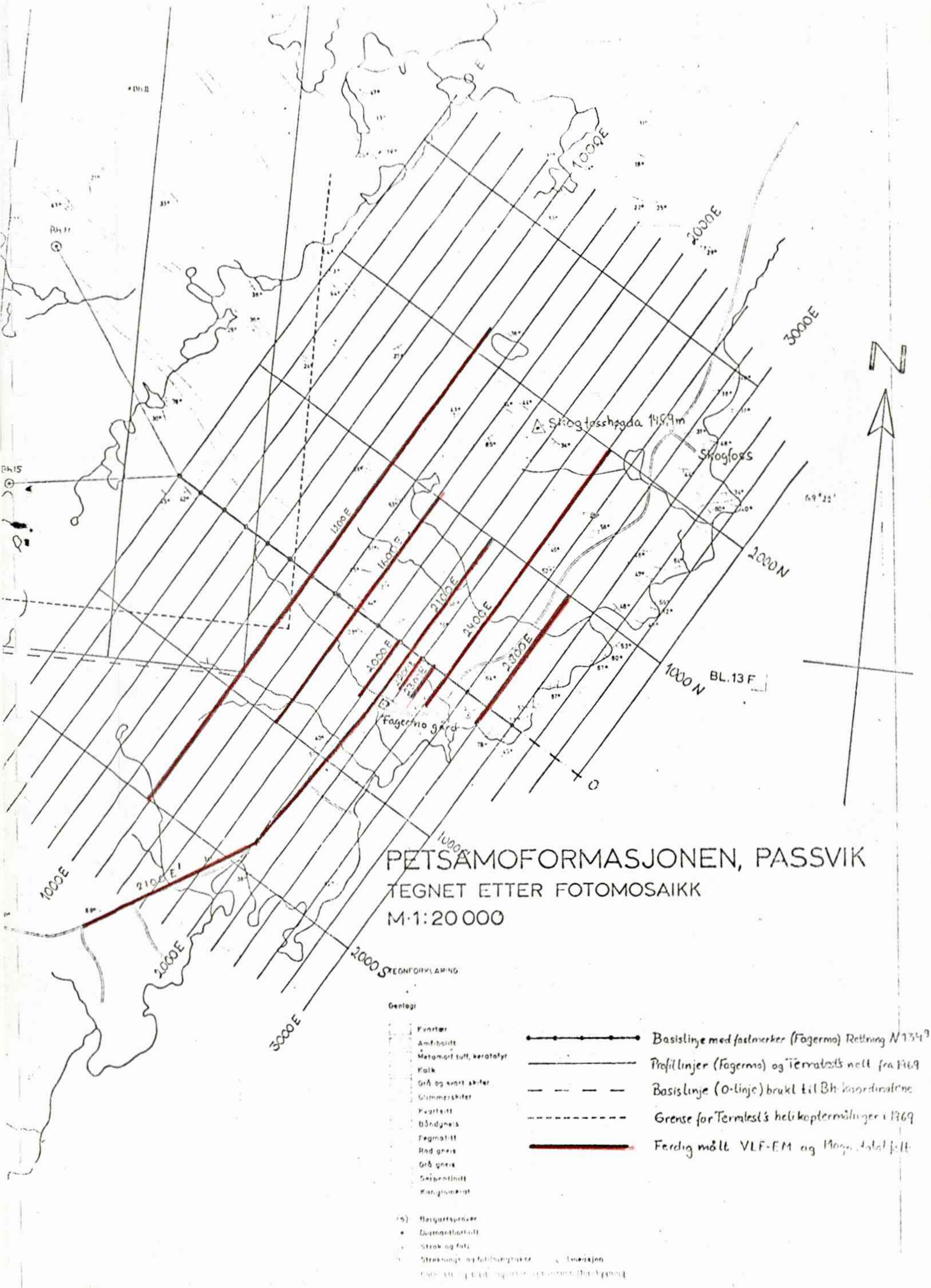
VLF "Cross-over"		Coincident magnetic anomaly		Possible -cause
very strong	25 S	none		
strong	125 S	strong	125 S	
strong	200 S	very strong	200 S	high tension power line
strong	275 S	" "	250 S	

Profile 2400 E

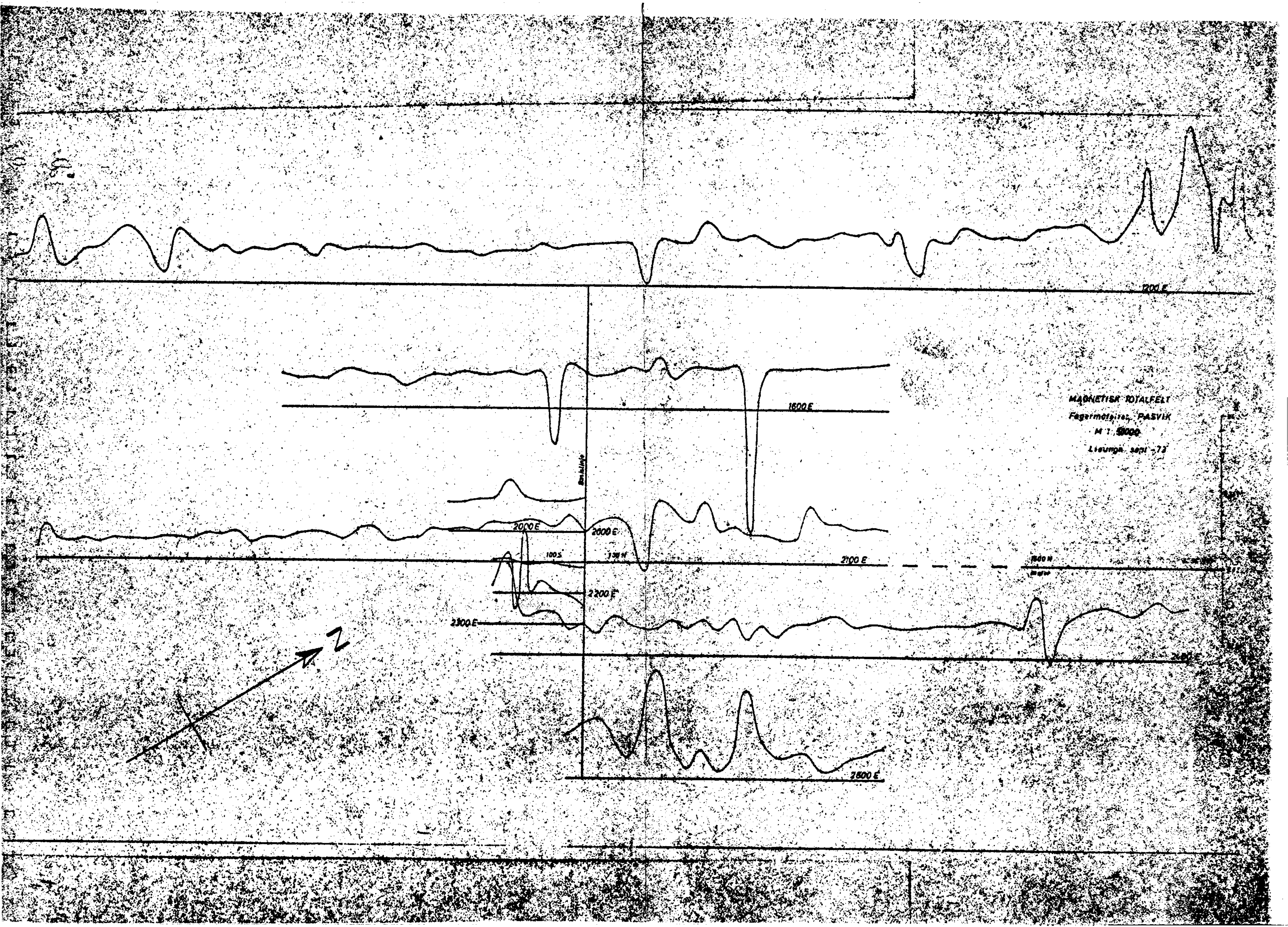
strong	1925 N	weak	1900 N	
very strong	1475 N	very strong	1500 N	possibility of graphite schists
strong	900 N	none		
strong	775 N	weak	1825 N	possibility of graphite schists
very strong	625 N	strong	600 N	
strong	375 N	weak	400 N	
very strong	50 S	none		
" "	250 S	very strong	250 S	

Profile 2800 E

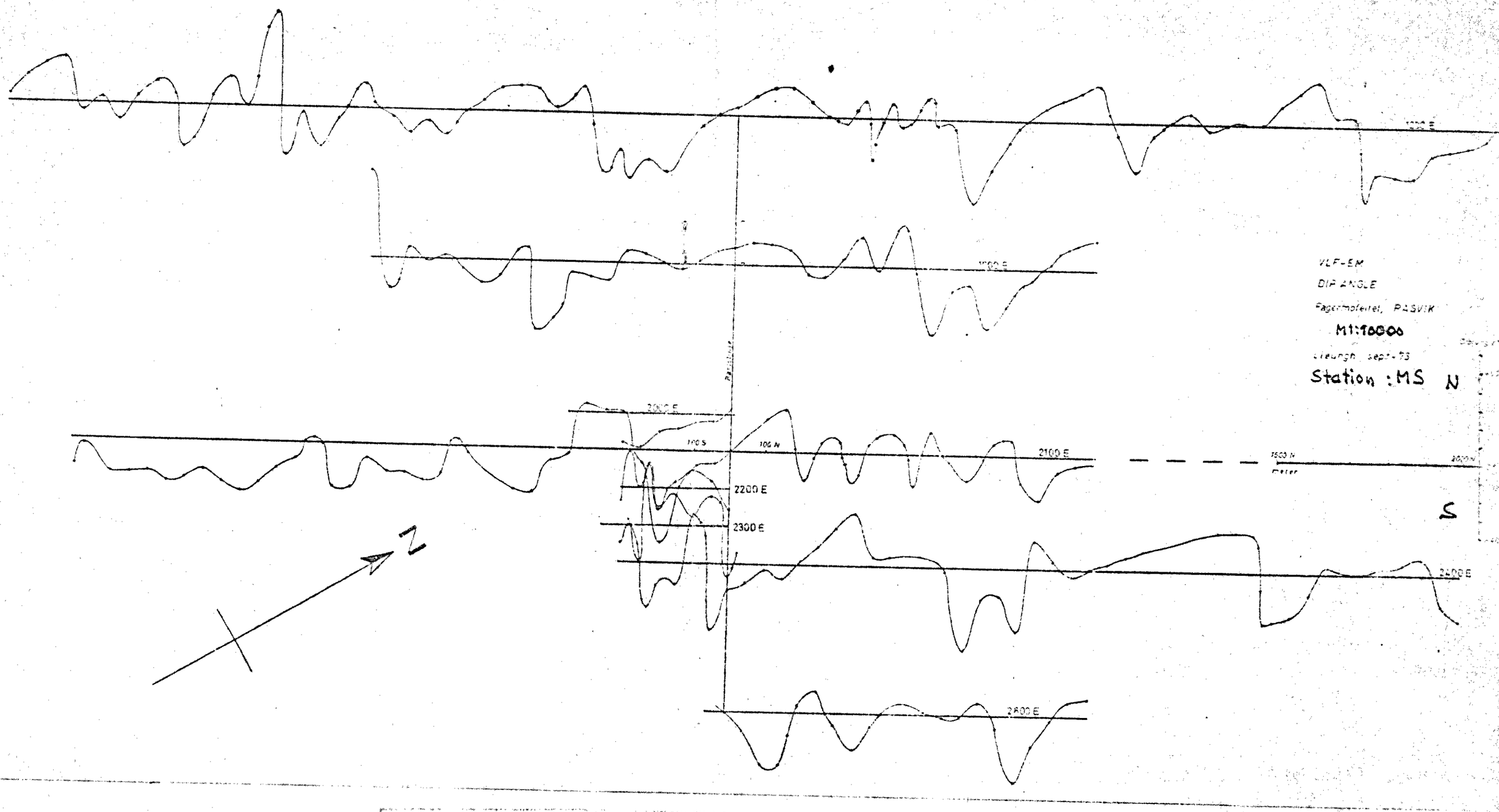
very strong	750 N	weak	750 N	possibility of graphite schists
weak	550 N	very strong	550 N	
strong	275 N	" "	250 N	
"	50 N	strong	50 N	



PETSAMOFORMASJONEN, PASSVIK
TEGNET ETTER FOTOMOSAIKK
M·1:20 000
Skogfosshøgda 145,9m
Skogfoss
Fagermo gård
BL.13 F
1000E
2000E
3000E
1000 N
2000 N
2000 S
1200 E
1600 E
2100 E
2400 E
2000 E
2700 E
2100 E
TEGNFORKLARING
Geologi
Kvartær
Amfibolitt
Metamorf tuff, keratofyr
Kalk
Grå og svart skifer
Glimmerskifer
Kvartsitt
Båndgneis
Pegmatitt
Rød gneis
Grå gneis
Serpentinitt
Konglomerat
Bergartsprøver
Diamantborhull
Strøk og fall
Basislinje med fastmerker (Fagermo) Retning N134°
Profillinjer (Fagermo) og Terratest's nett fra 1969
Basislinje (0-linje) brukt til Bh koordinatene
Grense for Termlest's helikoptermålinger i 1969
Ferdig målt VLF-EM og



1200 E
MAGNETISK TOTALFELT
Fagermofjellet, PASVIK
M 1:5000
1600 E
Basislinje
2000 E
2000 E
100 S
150 N
2100 E
2200 E
2300 E
2500 E


VLF-EM
DIP ANGLE
Pagermoteret, PASVIK
M1:10000
Station : MS N
2000 E
100 S
100 N
2100 E
2200 E
2300 E
2400 E
2500 E
7500 N
8000 N
meter
S
N