Kontinentales Tiefbohrprogramm der Bundesrepublik Deutschland

AMT, CSAMT and MT in the Range of 16 kHz to 512 s

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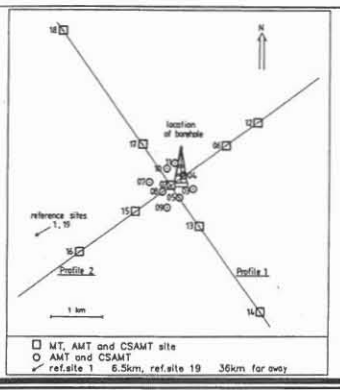
GEOMETRA

AIM OF PROJECT

ELECTRO-MAGNETIC (EM) PRE-INVESTIGATION OF THE BOREHOLE LOCATION AND ITS ENVIROMENT BY ACTIVE AND PASSIVE EM METHODS

CALCULATION OF A RESISTIVITY MODEL OVER A DEPTH RANGE OF 100 M TO 30 KM ON TWO PROFILES

MAP OF MEASUREMENT SITES



CONTRACT

GEOMETRA HAS EXECUTED THE MEASUREMTS WITH THREE EM METHODS IN A WIDE FREQUENCY RANGE:

METHOD	FREQUENCY/ PERIOD RANGE	DEPTH OF PENE-TRATION
AMT	18 KHZ-10 HZ	40 M-1,5 KM
CSAMT	8 HZ- 1 HZ	80 M-1.5 KM
MT, MT-ECRE*	4 HZ- 512 S	1,5 KM-30 KM

EVALUATION AND INTERPRETATION

PROFILING OF 1-D-MODELS CALCULATED ACCORDING TO THE MAGNETOTELLURIC IN-FORMATION

CALCULATION OF GEOMAGNETIC TRANSFER-FUNCTIONS AND REPRESENTATION OF MAGNETIC ANOMALIES

ECRE* INTERPRETATION-

JOINT 2-D-INTERPETRATION OF THE MAGNETOTELLURIC AND MAGNETIC TRANSFER FUNCTIONS

FINAL REPORT: 25.1.88

PROSPECT

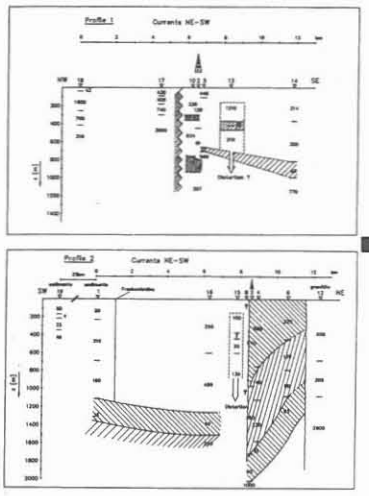
THE BOTH INTERPRETATION SEQUENCES SHOW COMPLEX STRUCTURES. AT GREATER DEPTH FROM 1.5 KM TO 30 KM. THE STRUCTURES ARE LESS COMPLEX.

THE 2-D-ECRE-MODELLING PERFORMED BY GEOMETRA FOR THE DEEPER STRUCTURES LEADS TO REASONABLE MODELS WITH GOOD FIT OF MODEL AND FIELD DATA. THE REMARKABLE RESULT IS A GOOD CONDUCTOR AT A DEPTH OF ABOUT 10 KILOMETERS.

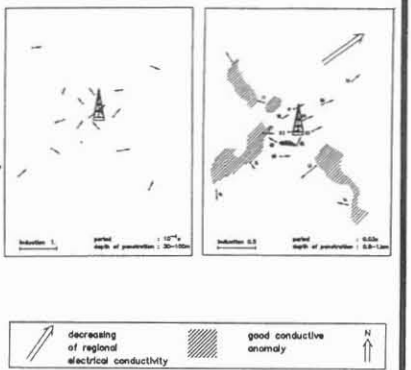
HOWEVER PROFILING OF 1-D AMT/CSAMT MODELS AND THE CALCULATION OF THE MAGNETIC TRANSFER FUNCTIONS YIELDS ONLY A FIRST GUESS OF THE GEOLOGICAL REALITY OF THE UPPER LAYERS.

THEREFORE WE RECOMMEND A 2-D OR 3-D INTRPRETATION OF THESE DATA BY THE UNIVERSITIES.

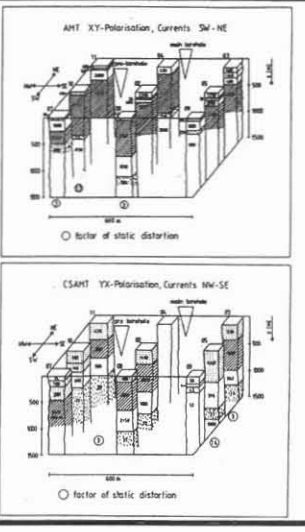
AMT: PROFILING OF 1-D-MODELS



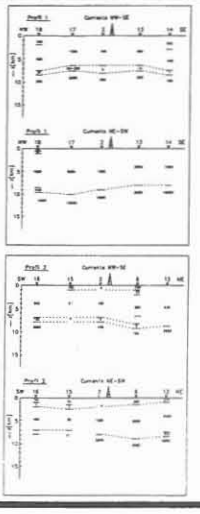
MAGNETIC FIELD ANOMALIES



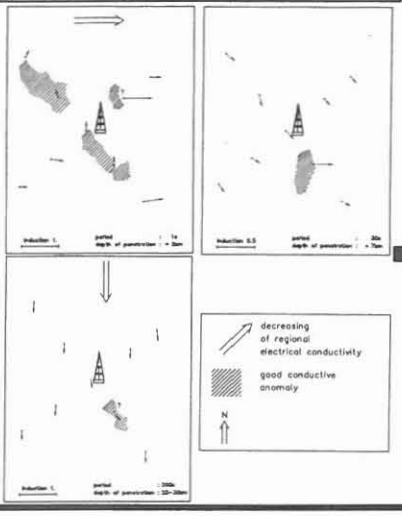
INNER PART OF TARGET AREA



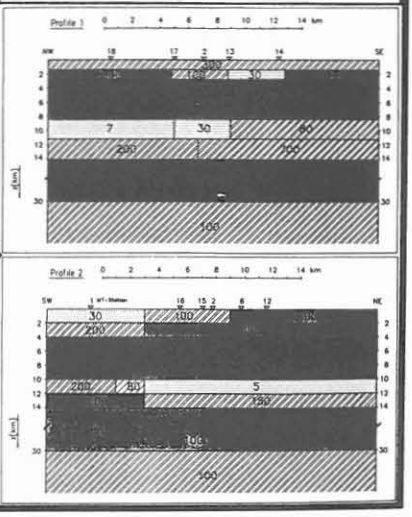
MT: PROFILING OF 1-D-MODELS



MAGNETIC FIELD ANOMALIES



2-D ECRE * INTERPRETATION



* ECRE = ELECTRICAL ... GEOPHYSICAL & ENGINEERING INTERPRETATION OF MAGNETOTELLURIC AND MAGNETIC TRANSFER FUNCTIONS