



GROUND MAGNETIC SURVEYS FOR MINERAL EXPLORATION

High resolution and instant results at a low cost

Ground magnetic surveys provide high resolution information about variations in the near surface geology as well as in the depth.

Instrumentation

Ramboll applies either proton precession magnetometers or caesium vapour magnetometers. It can be as single sensor or as dual sensor configuration.

In walking mode the magnetometer can be a GEM19-TGW proton with gradient configuration or a Geometrics 859AP caesium magnetometer in a single sensor configuration.

As a base station we use either a Scintrex MP3 or in some cases a permanent base station if it exists within a reasonable distance.

The magnetometers are outfitted with a GPS system.



Geometrics 859 console

Surveying

The measurements are conducted with high accuracy.

The surveys are typically run along a predetermined linear grid laid out at the site.

Readings are virtually continuous and results can be

monitored in the field as the survey proceeds.

A MAG survey can be done virtually anywhere a person can walk.

In some cases the operation is carried out very efficiently by using a snowmobile towing a

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Specification

- **Penetration depth:** The data collected represent a total field or gradient measurement. During the processing details about the more near surface structures can be extracted.
- **Resolution:** The in-line resolution depends on the survey speed.
- **Field production per day:** The number of line kilometers per day is very dependent on the terrain conditions. In flat terrain the magnetometer will typically be operated in continuous walk pace.
- **Strengths:** It is a simple and robust survey technique providing real time results. A very valuable parameter in combination with eg. electromagnetic data.
- **Limitations:** Not all targets of interest are magnetic.

sled with the sensor.

Another alternative is to use a UAV as the carrier or an ordinary helicopter/fixed wing aircraft for larger surveys though the resolution will be reduced due to the height.

Limitations

A magnetometer is sensitive to local interferences, such as fences, overhead wires and other man made electrical installations.

Solar wind can cause a geomagnetic storm which will add noise to the data and at some occasions restrict the period for field operation. Weather forecast determines the solar activity and hence the magnetic weather is available.



Magnetic base station

Conclusion

The magnetic data are of great value for the geologists while the field operation takes place.

During the desktop study the magnetic data provide useful information as well.

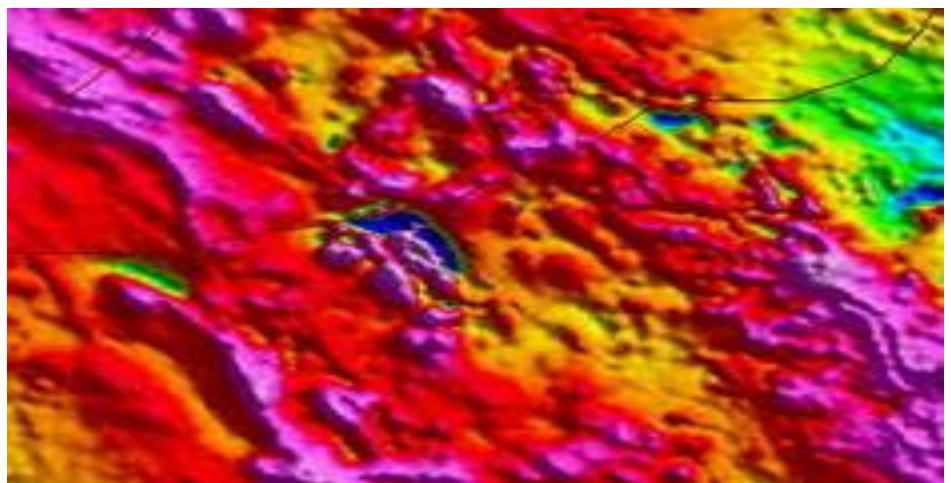
Often the geologist is dealing with a cover on top of the structures of interest. The magnetic data provides instant data guiding the geologist on where the target of interest is located beneath the cover.

The field operation is very often adjusted and tailored on site. In that way observations can be reproduced and detailed while the crew is still on site.



Raw magnetic data plotted while the survey takes place.

It is relatively inexpensive to collect the magnetic data and the results provide structural information with a limited amount of data processing.



Total magnetic field grid