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MINING COMPANIES EMPLOY MT AND AMT WORLD-WIDE

Many mining companies are enthusiastically embracing MT (Magnetotellurics) and AMT (Audio Frequency MT) for exploration; the techniques are experiencing rapid growth.

The present wave of interest started quietly in 1992 when two MT soundings were made on either side of INCO's 1750-meter deep Trillabelle nickel deposit in the famous Sudbury nickel mining area, 400 km north of Toronto. (Although earlier work by the University

of Toronto during the 1970's aroused interest with surveys over a number of shallow ore bodies, it didn't lead to routine application of the technique.)

First 3-D MT/AMT surveys in 1997!

But the 1992 soundings at Trillabelle showed unmistakable evidence of deep conductive mineralization. That positive evidence, combined with the great depth of investigation (three times deeper than previous surface-based Electromagnetic surveys) stimulated more surveys every year since. With each survey came more knowledge, improved field procedures, increased efficiency and lower costs.

The initial surveys in the Sudbury area soon led to more work in Canada and other countries, including USA, Chile, Bolivia, Peru, Argentina, Australia, Papua New Guinea, China and Japan. AMT (1 Hz to 10,000 Hz) and MT (400 Hz to 0.0005 Hz) are becoming recognized as fast, efficient, deep-looking techniques. They can detect conductive ore bodies as deep as 2000m, perform general subsurface geological mapping, clarify fault geometry, correlate faults with geology and help focus on zones and structures favourable for mineralization.

Today many major mining companies (including INCO, Falconbridge, CODELCO, and

Placer Dome) utilize MT and AMT.

So far the surveys have been 2-D (the soundings are made along a number of profiles). In 1997, the first 3-D AMT/MT surveys will be done, providing the ultimate in achievable spatial resolution. Surveys in 3-D are feasible even where access difficulties rule out continuous profiling.

ADVANTAGES OF AMT / MT :

- No man-made signal source needed.
- Logistic simplicity.
- Deep penetration.
- Plane wave source simplifies interpretation.
- Tensor measurement permits reliable interpretation even in complex environments using a technique called "Tensor Decomposition".
- Continuous profiling (where terrain permits) provides a subsurface image with high spatial resolution, data redundancy and a continuous picture.
- AMT/MT are point sounding techniques, with a small "footprint" and high lateral resolution.



Photo: C. Thompson

Confronted with this precariously balanced rock formation on the northeast side of Kyushu Island, Japan, our survey crew was grateful there were no earthquakes in the area.

CONTENTS

- 2** President's Message
On The Road
- 3** Employee News
Nittetsu Co-operation
Welcome
- 4** New Transmitter
Hoping To See You
Grant Awarded