



Gravity : key method to conductive overburden!

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Geophysical methods employing artificial sources such as electromagnetics, are great tools for exploration of semi-massive to massive sulphide deposits potentially bearing base or precious metal mineralization. In such cases these ore bodies would show poor electrical conductivity, then resistivity / induced polarization would be the most suitable survey method to be employed. Both these artificial methods have significantly been improved over the last couple of years (**InfiniTEM**[®], 3D-IP) and will now produce a more detailed and better resolved picture of the subsurface geology. However, actual penetration depth for these two techniques is greatly affected by conductive overburden.

Alternatively, natural field methods such as gravity and magnetotellurics, are best capable of detecting and delineating deeply seated massive sulphide deposits underlying clay overburden. Gravity investigation is especially powerful and of high interest as it is logistically simpler to carry out and thus achieved at lower operating costs than with magnetotelluric surveying.

In order to assist evaluating the relevance of gravity on your exploration projects we have exemplified a series of profiles for different ore masses. They represent the maximum amplitudes resulting from gravity (Bouguer) anomalies that were calculated using various depths to source. A theoretical uniform massive sulphide ore density of 4.2 (sphalerite, chalcopyrite & pyrite) within a host rock density of 2.7 were used for calculation purposes.

Figure 1 (see back) shows gravity profiles obtained from a sphere model approximating a simplified 3D ore body. Similarly, **figure 2** shows profiles obtained from a 2D vertical dyke model (500 m X 500 m). Both models clearly illustrate that a larger tonnage prospect will be detected to much greater depth extent. Furthermore, depth of investigation is also a function of source geometry as indicated by comparison of the two models. The results show that for a smaller ore body the sphere model yields a greater range of detection and inversely, for a larger ore body the vertical dyke model will show a deeper threshold of detection.

Within the last five years, Abitibi Geophysics has achieved over 25 000 gravity stations and is now a leading consulting company in ground gravity as applied to the mining industry in Canada.

<u>Ex.:</u>	<u>Model</u>	<u>Tonnage</u>	<u>Detection Threshold</u>
	Sphere	5 Mt	180 m
	Vertical Dyke	5 Mt	120 m
	Sphere	20 Mt	380 m
	Vertical Dyke	20 Mt	> 600 m

Do not hesitate to contact us, Abitibi Geophysics, in order to optimize your exploration program with gravity. We can supply you with detection profiles for different ore body densities most suitable for your application.

Figure 1: Apparent Gravity Detection Depth – Sphere Model

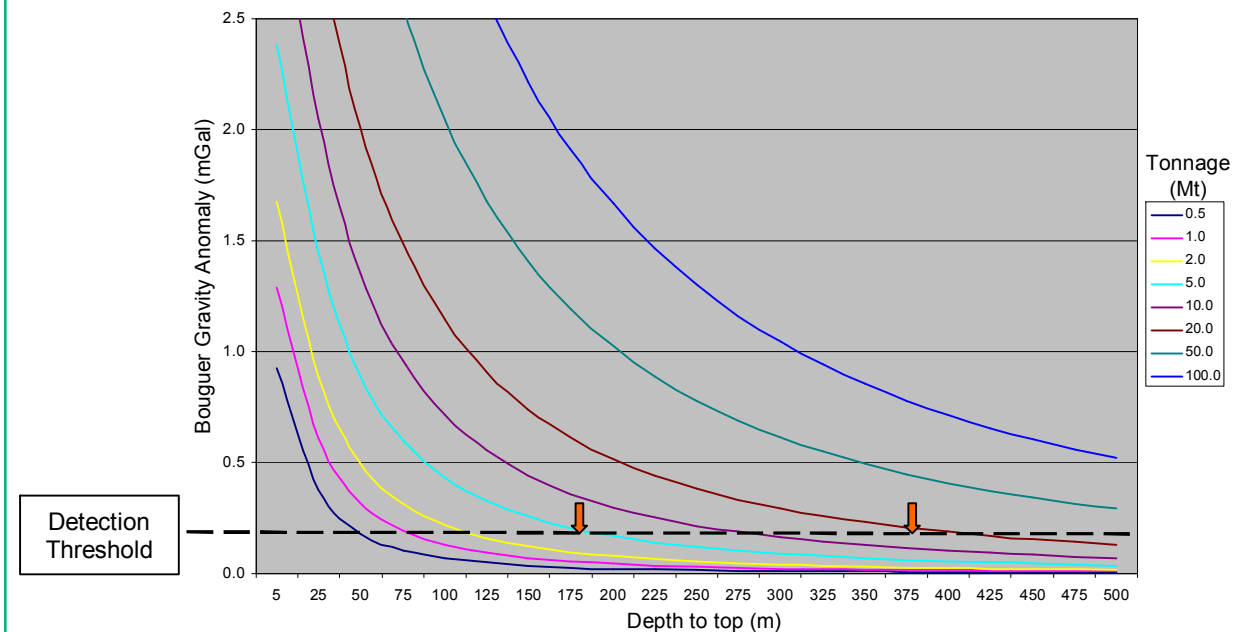
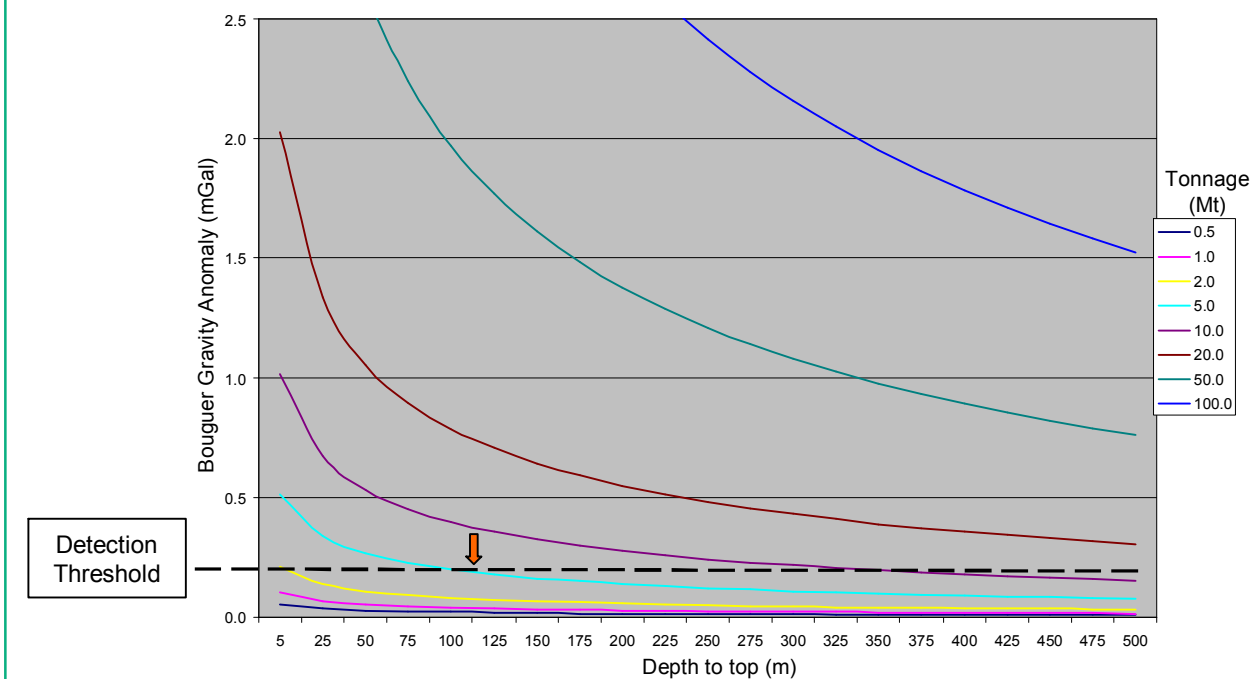


Figure 2: Apparent Gravity Detection Depth – Vertical Dyke Model



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