

3D Magnetic Modelling For Iron Ore Exploration in Gambang, Kuantan, Pahang

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The geology of the survey area at Gambang consists of weathered soil near the surface with underlying meta-sedimentary rock, which was formed as a result of contact metamorphism from the granitic body at deeper zone. The meta-sedimentary rocks are mainly grey colour hornfels with poor lineation and shale in some places. Mineralisation of iron ore occurred as isolated body within the meta-sedimentary rock. The iron ore deposit is mainly Magnetite associated with Pyrite, Chlorite and Galena. A ground magnetic survey conducted within the area has enabled detailed mapping of the iron ore deposit, which lead to 3D magnetic modelling of the ore body.

More than 500 magnetic station readings with 10m spacing were collected within the 4.5 hectares area. The magnetic data were processed to obtain a diurnal effect corrected, reduced-to-equator Total Magnetic Intensity (TMI) map, which represents the actual magnetization for the survey area. A negative magnetism area of -1000nT to -6000nT with lower magnetic values concentrated in

the centre portion is identified as the magnetic anomaly. The magnetic readings in surrounding area range from 0 to 1000nT. The anomaly is interpreted as a causative body with a higher susceptibility near the surface and extends downward. An Analytical Signal (AS) map, which is defined as gradient of magnetic force, shows an area of high magnetic gradient which can be correlated to the magnetic anomaly found in TMI map. In addition, a 3D modelling based on the susceptibility contrast was constructed to study the subsurface distribution of this magnetic anomaly.

The 3D inversion of magnetic data shows an area of high magnetic susceptibility with the dimension of about 100m x 30m, and oriented in NE-SW direction. Based on 3D inversion modelling, the ore body is measured to be 20 to 40 metres thick and dipping towards the southwest. This 3D modelling result was found agreeable to the field observation and borehole data.

