HOISTEM EM FOR EXPLORING UNDER REGOLITH COVER

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Airborne electromagnetic surveying is a well-established method used in the mineral exploration industry for exploration of mineral resources under cover. The development of new generation AEM systems, together with advanced techniques for data processing and display, offer AEM as useful tool for exploration through regolith cover. It is difficult to interpret AEM data in areas similar to Australia, which is dominated by strong variations of conductivity within the regolith. New generation, broad-bandwidth AEM systems such as HoistEM are needed to detect and interpret conductive bodies under regolith. The HoistEM system is similar to an in-loop ground electromagnetic system, and due to its low flying height, it can surpass penetration and definition of most current airborne EM systems. It works as an in loop system having a large loop transmitter (375 square metres) with a large coplanar receiver coil in the centre of the transmitter loop. Processing of Hoistem data has been used to generate conductivity depth images (CDI) for detection of conductive manganese ore targets beneath Permian sediments and regolith cover in Western Australia. The Hoistem data was processed with EMFlow software developed by CRCAMET. EMFlow converts AEM data into conductivity image (CDI) sections. CDI techniques convert the amplitude versus delay-time data into a conductivity depth section. The CDI method provides not only a visual separation between surficial and deep conductors, but it also provides a tool for rapid estimation of conductive layer thickness that reflects regolith cover. EMFlow has made it practical to process data gathered by HoistEM, to separate the ore body response from conductive paleochannels and other conductive bodies (Figure1).
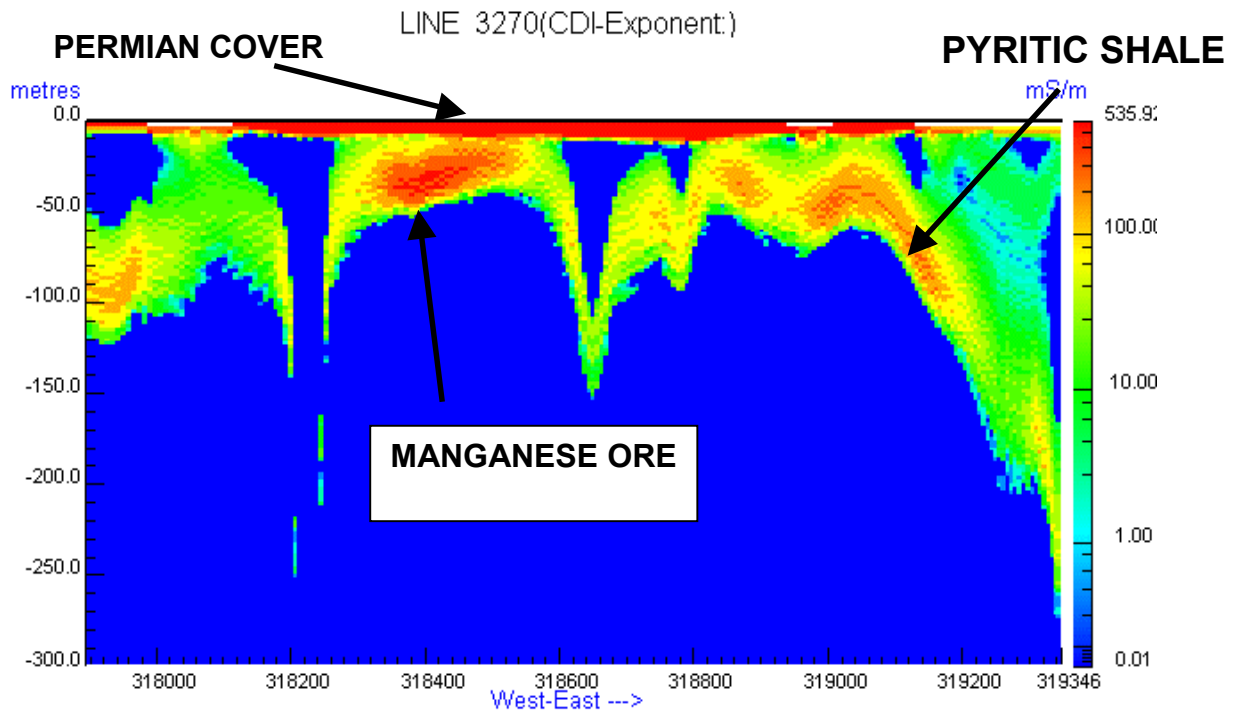

Figure 1: Hoistem CDIs section of manganese ore.