BIF Hill Magnetic Model

Western Desert Resources (WDR)

Executive Summary
The target known as BIF Hill has been modelled using the WDR helimagnetic data.

The data suggests there may be some magnetic remanence but it has not been considered in this report (and does not look too bad but care should be taken).

Both pipe and ellipsoid models have been generated with both giving similar results.

The magnetic source models as NE-SW elongate pipe/ellipsoid plunging south with a depth extent of 350-500m.

While there is outcrop associated with the target the modelling suggests the top of fresh magnetic rock is below the surface, possibly due to weathering.

TWO drillholes have been proposed to test the magnetic target, but all available data should be reviewed prior to finalising collar locations.

Figure 1. shows the top of the modelled source and proposed drillholes on a DEM image (SRTM).
Data
Helicopter borne magnetic data supplied by WDR has been used. The data was acquired on NS spaced ~80m apart at an average ground clearance of 35m.

The data has been gridded and filtered with TMI, RTP, AnaSig, and RTP1VD grids supplied with this report in .ers and MapInfo format.

The data shows that the anomaly is isolated and possibly an altered, thickened part of a NE-SW trend. The NE-SW trend could also be unrelated to the source of the intense isolated high.

The position of the anomaly in the RTP and Analytic Signal grids is slightly offset indicating that the magnetic source may have remanent magnetism (remanence has not been factored into this model)

Modelling
The modelling has been performed using ModelVision. The data was imported with the height calibrated using SRTM data. The data directly around the BIF Hill target then cropped out of the large set. FOUR lines cover the target. The modelling uses EIGHT lines, the central four with two on either side.
The pioneers of Tennant Creek goldfields used magnetic modelling of the Au-Cu-Bi bearing ironstones to plan drillholes and favoured ellipsoid model bodies. This proved to be a very successful method of modelling the lodes, especially the large lodes.

Both ellipsoidal and pipe models have been generated for BIF Hill. The model sessions are discussed below. Each model session has a figure with a plan, the sections at 1:1 horiz:vert, and proposed drillholes to test the magnetic target.

**Pipe Model**
The pipe model is shown below in Figure 2. The resultant model has a low-moderate magnetic susceptibility, is elongate NE-SW and depth to top of ~100m. The model suggests the source is plunging moderately south (60 degrees). The SRTM data shows a local topographic rise associated with the magnetic anomaly, and G Bubner suggested that the ironstone outcrops, but the modelling suggests a source below the surface. This suggests that the top of the body has weathered or that the pipe model is not the best approximation of the source geometry.

**Ellipsoid Model**
The ellipsoid model is shown in Figure 3. The geometry of the ellipsoid model is very similar to the pipe model, with a low-moderate magnetic susceptibility, an elongate NE-SW trend, and a depth to top of ~80m. The ellipsoid model plunges south at ~60 degrees. The top of the modelled source is closer to the surface, but still 80m deep. This supports the weathering interpretation. The ellipsoid model is so close to the pipe model that drillholes planned using either would be located similarly.
The models are presented for comparison in Table 1.

<table>
<thead>
<tr>
<th>Model</th>
<th>SI</th>
<th>Depth to Top</th>
<th>Length</th>
<th>Width</th>
<th>Depth Extent</th>
<th>Strike</th>
<th>Plunge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe</td>
<td>0.055</td>
<td>100</td>
<td>250</td>
<td>140</td>
<td>500</td>
<td>40</td>
<td>60S</td>
</tr>
<tr>
<td>Ellipsoid</td>
<td>0.06</td>
<td>80</td>
<td>220</td>
<td>140</td>
<td>350</td>
<td>40</td>
<td>50S</td>
</tr>
</tbody>
</table>

Table 1. Magnetic model parameters, length units are meters and angles are degrees.

A pair of drillholes have been proposed, based on the modelling, to test the magnetic source. These are presented in Table 2. Hole A aims to drill against the plunge/dip while hole B is designed to drill down the plunge/dip.

<table>
<thead>
<tr>
<th>Hole</th>
<th>X</th>
<th>Y</th>
<th>RL</th>
<th>Azi</th>
<th>Dip</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>392925</td>
<td>7775525</td>
<td>332</td>
<td>315</td>
<td>60</td>
<td>300</td>
</tr>
<tr>
<td>B</td>
<td>392800</td>
<td>7775675</td>
<td>332</td>
<td>135</td>
<td>60</td>
<td>300</td>
</tr>
</tbody>
</table>

Table 2. Drillholes proposed to test the magnetic target, length units are meters and angles are degrees.

**Discussion**

This modelling has been performed hurriedly and a more comprehensive model is suggested with greater geological input if the target is to be further developed.

Figures 4, 5 and 6 show the top of the pipe model and proposed drillholes on TMI, RTP and AnaSig magnetic data respectively. The images show that the NE end of the model coincides the best with all the various data. The drillholes target the TMI anomaly just south of its peak, this puts them directly into the RTP anomaly, but just SE of the centre of the analytic signal anomaly. It is recommended that all available knowledge be utilised before finalising hole collar locations.
Figure 4. Magnetic model (pipe topface) with proposed drillholes on TMI magnetic image.
Figure 5. Magnetic model (pipe topface) with proposed drillholes on RTP magnetic image.
Figure 6. Magnetic model (pipe topface) with proposed drillholes on Analytic Signal magnetic image.