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SOUTHERN GEOSCIENCE  
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## MEMORANDUM

<b>TO</b>	John Collier & Chris Bain, Davenport Resources
<b>FROM</b>	Michael Sykes
<b>DATE</b>	April 2017
<b>REPORT NO.</b>	SGC3183
<b>RE</b>	VTEM anomaly modelling review

An airborne electromagnetic survey (AEM) was flown over the Southern Cross Bore project area in 2013 by Geotech Pty. Ltd. on behalf of Arunta Resources. The VTEM data were interpreted by SGC in 2014 and anomalies at the Johnny's Rewards prospect site were modelled using thin conductive plates. In 2017 SGC was asked by Davenport Resources Limited to review the VTEM plate modelling in relation to drill hole assay data now available. This memo summarises the review.

### 1 JOHNNY'S REWARD PROSPECT - VTEM

The Johnny's Reward prospect is an iron-oxide, copper-gold deposit at which a significant amount of drill hole information has been obtained to help define the potential resource. The VTEM survey conducted in 2013 identified the prospect as a distinct magnetic and electromagnetic high. Plate modelling of the late-time VTEM anomaly on line 1180 suggested the conductor was about 85 m below the surface and dipping towards the east. The late time AEM anomaly and resulting plate are shown in Figure 1. There hasn't been any effort to model the magnetic anomaly at this stage.

The AEM responses on the two adjacent VTEM lines (1170 and 1190) also indicated late-time conductive responses, but of lesser amplitude than that on line 1180. The responses across the three lines could not be modelled using a single, large plate as the anomalies on the adjacent lines were considerably broader. The anomalies on lines 1170 and 1190 resulted in conductive plates that were slightly less conductive and deeper than the plate modelled on line 1180. The three conductive plates are shown together in Figure 2 together with drill hole traces coloured by copper content.

### 2 DRILL HOLE ASSAYS

Reverse circulation and diamond drill holes have been drilled at Johnny's Reward to test the extents of the mineralisation. Many of the holes have intersected mineralisation and assay results have been used to colour the drill hole traces<sup>1</sup> according to the concentrations of gold and copper. In Figure 2 the red colour on the drill traces represents 2% or more copper.

<sup>1</sup> All drill hole collars have been adjusted to the SRTM elevation

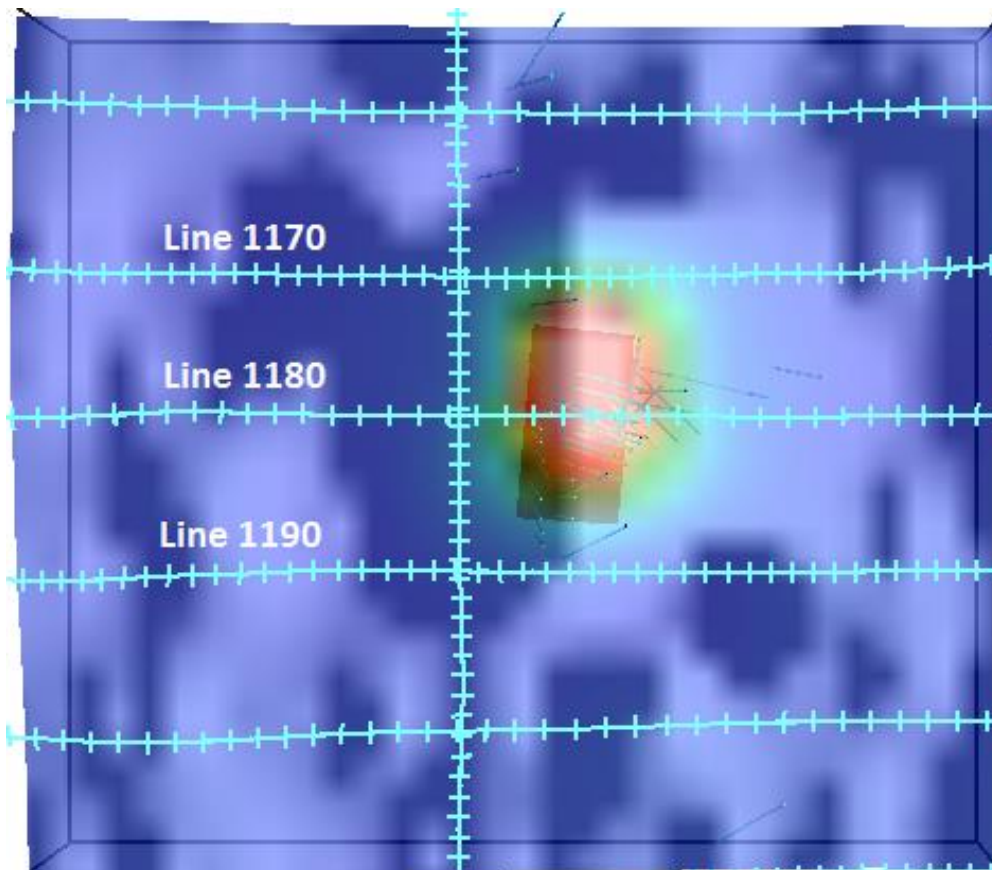


Figure 1. Late time VTEM anomaly and modelled thin plate at Johnny's Reward.

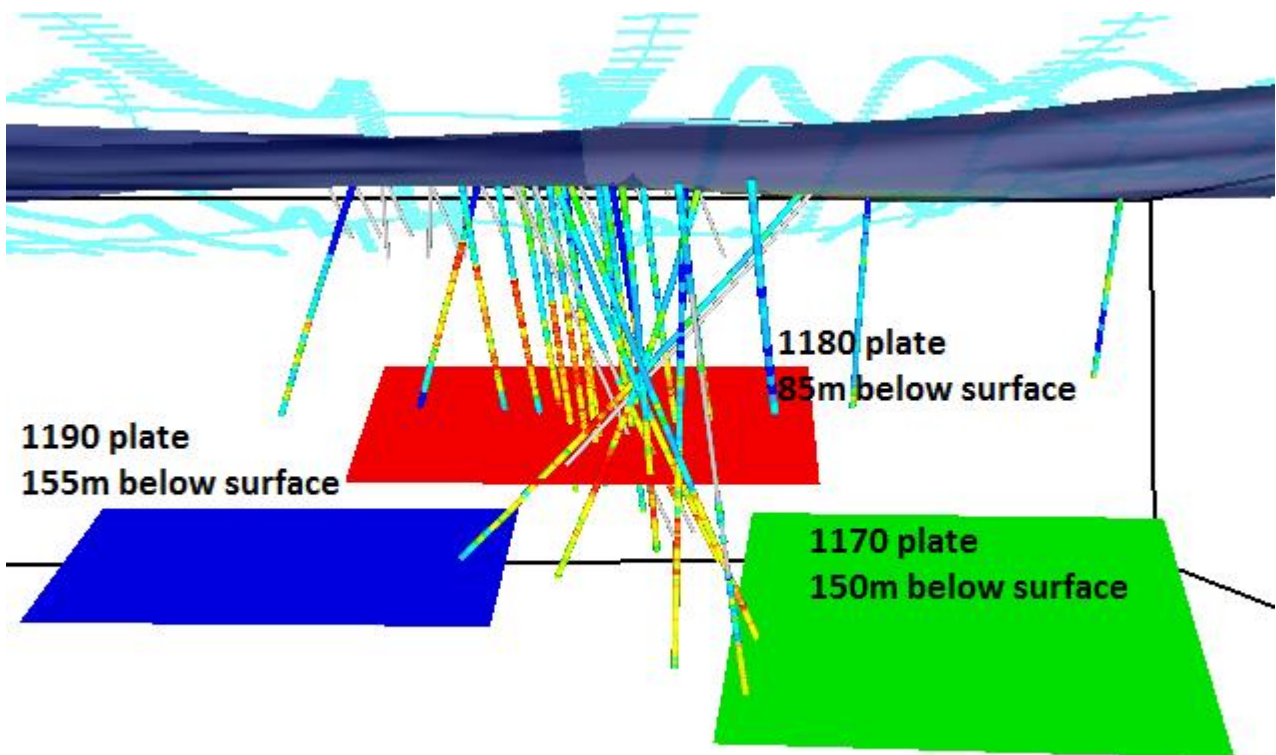


Figure 2. Modelled conductive plates at Johnny's Reward together with drill hole traces coloured by copper content.

The central conductive plate (1180) modelled at Johnny's Reward appears to have been extensively tested by the drilling and the conductive plate consistently intersects the drill holes in regions of higher mineralisation. However, the highest concentrations of copper and gold appear to be located above the conductive plate (at about 40 m below the surface). Drill holes E058/005 and 12JRRCD014 suggest that the higher mineralisation concentrations continue down-dip of the conductive plate and remain open towards the east.

Drill hole 13JRRCD036 intersects the 1170 model plate near its lower and southern edge and near the end of the drill hole where the assay results indicate slightly elevated concentrations of gold and copper. Drill hole 12JRRCD014 also exhibits elevated gold and copper concentrations near the end of hole and close to the southern edge of the 1170 plate. This hole doesn't intersect the conductive plate and there are no other holes that test the conductive plate further to the north.

The 1190 model plate has not been tested by any of the drill holes.

### 3 RE-MODELLING OF VTEM DATA

SGC has been supplied with a model (inferred from drill hole assay results) that shows the mineralisation at Johnny's Reward dipping towards the east at about 42°. Based on this information the VTEM anomalies on lines 1170-1190 were re-modelled with conductive plates that dip to the east at 42°. The main anomaly on line 1180 can be seen in Figure 3 to be replicated by a slightly larger, shallower plate with a slightly lower conductance. The top of the revised plate is about 60m below the surface. Efforts to model the anomalies on all three lines using a single plate dipping at 42° were unsuccessful. A better (but fairly loose) fit with the VTEM data could be produced on the three lines using a single plate that dips at 30° angled 15° north of east and plunging to the north at about 20°. This plate does not match the mineralisation model provided to SGC and is considered to be unreliable.

The best way to match the anomalies on lines 1170 and 1190 is to include deeper plates below each line as done previously. The revised plate models can be seen in Figure 4 to closely match the orientation of the mineralisation model supplied to SGC. The conductive plate below line 1180 intersects the regions in the drill holes showing elevated copper concentrations. The deeper plates beneath lines 1170 and 1190 have not been tested by any of the drill holes. The anomaly on line 1170 was best matched using a dip of 33° rather than 42°. The difficulty experienced in matching the VTEM data suggests the geology is more complicated than can be adequately described by thin plate modelling.

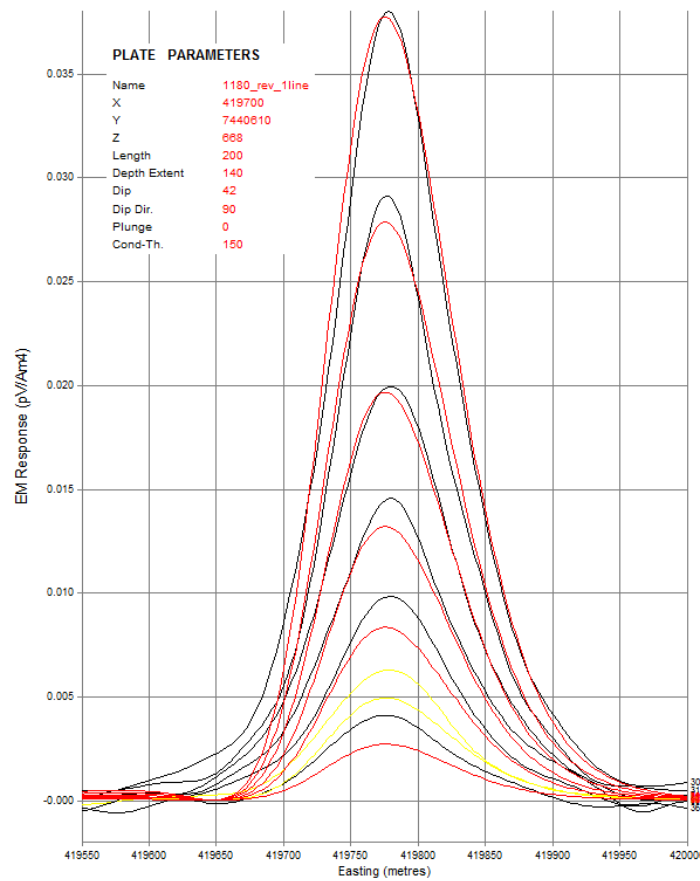


Figure 3. Model fit (red) with the VTEM data (black) on line 1180 using a revised dip of 42°

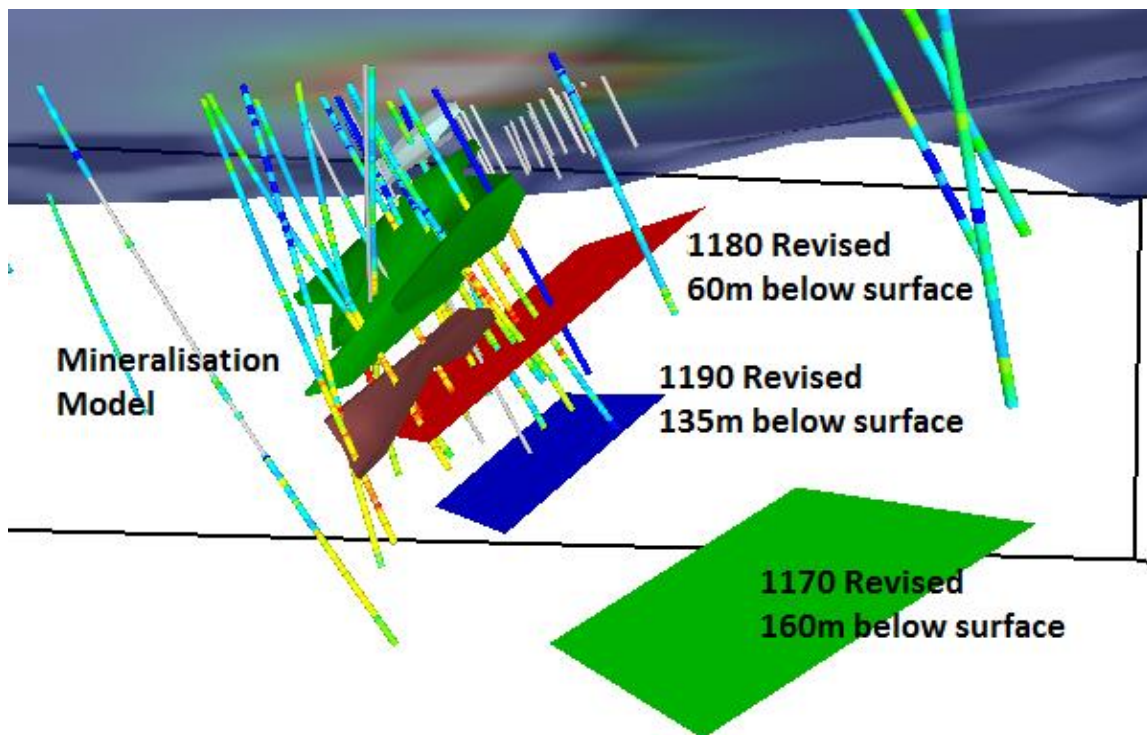


Figure 4. Revised plate models to match the 42° dip of the mineralisation model.

## 4 CONCLUSIONS AND RECOMMENDATIONS

The main central VTEM anomaly at Johnny's Reward was originally modelled as a conductive plate that is about 85 m below the surface and dipping towards the east at about 24°. Drill hole assay results indicate the highest concentrations of gold and copper are above this plate model but the mineralised zone appears to dip more steeply towards the east than suggested by the conductive plate.

The VTEM anomalies observed on lines 1170-1190 have been re-modelled by constraining the dip of the conductive plates to more closely match the dip shown in the mineralisation model provided to SGC. The three anomalies could not be modelled adequately using a single conductor with the dip shown in the mineralisation model. This does not mean that there is more than one conductor in the area, but simply that the conductor is not adequately modelled using thin plates.

Based on the VTEM plate modelling alone, the Johnny's Reward anomaly appears to be the combination of two deeper conductors to the north and south of a shallower conductor. The shallow conductor has been drilled and found to have elevated concentrations of copper and gold, but remains open to the east. Neither of the deeper conductors (if they exist) has been adequately tested by drilling.

SGC recommends that drill hole 13JRRCD036, if still open, should be surveyed with a down-hole electromagnetic probe to determine the presence and location of any deeper conductors. This is a relatively deep hole, towards the east of the known mineralisation and would help to ascertain the down-dip extent of the mineralisation.

It is also recommended any future drilling, especially outside the currently known mineralisation, should be surveyed with DHEM.

We further recommend that modelling of the magnetic responses be undertaken to determine the relationship between the magnetic and conductive responses of the deposit. Magnetic susceptibility information from the core samples would also help this understanding.