EL31251_2019_A_05_App4_Review_Donald

DONALD PROSPECT

Review of previous exploration, interpretation of magnetics and new gravity data & drillsite recommendations

The Donald prospect is located in the south central part of EL31251, 170 kilometres east of Alice Springs.The prospect can be identified as a distinct semi-circular magnetic anomaly about 1.5 x 2 kilometres in extent; refer Figure 1. The maximum amplitude recorded on helicopter-borne traverses at 30 metres terrain clearance is 2,000 nT.

Multiple geophysical and geochemical datasets have been acquired by previous explorers, notably Mithril resources Ltd,over the prospect area, but no drilling of any type has been undertaken. Gempart (NT) Pty Ltd completed a detailed ground gravity survey in 2018 encompassing the prospect area. Synthesis of all exploration information and interpretation of the combined data sets has identified a high density target which should be drilled to test for possible mineralisation of economic value. Potential orebody models include IOCG and skarn types, and target elements include Cu, Au, Ni, Mo, and W.

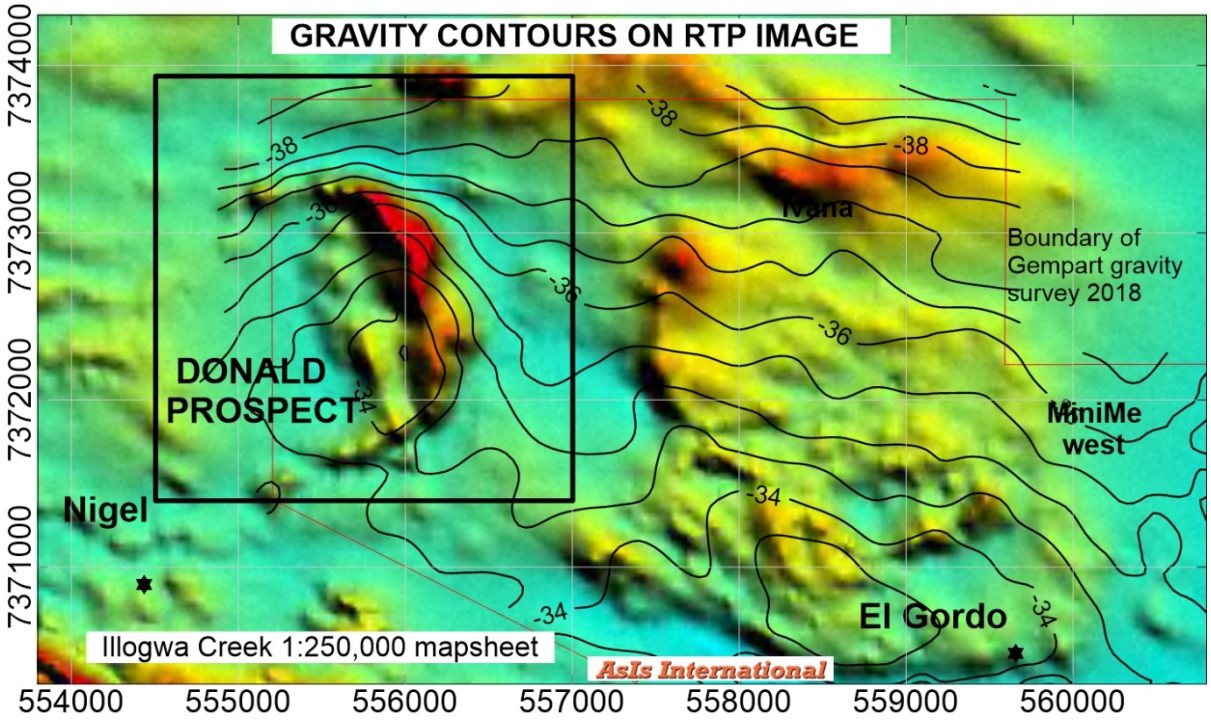

Figure 1.Location of Donald prospect on EL31251.

Geology

The latest available published geology is from the Illogwa 1:250,000 mapsheet published in 1985. It is understood the NTGS have been conducting further mapping in recent years. The prospect area is in the Arunta Block, and comprises outcrop/subcrop of the (?)AlbartaMetamorphics, a division of the Palaeoproterozoic Strangways Metamorphic Complex. The rocks are described as quartzofeldspathic gneiss, biotite and muscovite-biotite schist, massive and compositionally layered amphibolite; minor calc-silicate rock, hornblende gneiss, magnetite-quartzite, granitic gneiss, porphyroblastic feldspar gneiss and biotite gneiss. Geoscience Australiaquote the maximum intrusion age as 1771+/-3Ma, and a metamorphic age of 567+/-9Ma.

Exploration by Mithril 2012-2013

Mithril carried out soil sampling initially on a 200x200 metre grid in 2012; sample number series MI-325 to MI-510. Subsequent infill was completed in 2013 to 100x100 metres; sample number series MO-001C to MO-297C. Assays on the -5mm +1.6mm fraction were determined for As, Ba, Ca, Co, Cr, Cu, Fe, Mg, Mn, Ni, P, Pb, and Zn. Refer Lockhead, A., McKinnon-Matthews, J., 2012, and Mizow, D., 2013.

Anomalous Co, Cu and Ni values to maximum 54ppm, 220ppm and 153ppm respectively occur generally coincident with the eastern part of the magnetic anomaly.

Mithril acquired a substantial amount of geophysical data including airborne EM and magnetics/radiometrics over a large area encompassing many prospects, including the Donald prospect.

A versatile time domain electromagnetic (VTEM) survey was flown by Geotech Airborne Pty Ltd in October 2012 (Mizow, D., 2012). Flightlines oriented at 030-210 degrees were spaced at 300 metres with Tx-Rx loop at a mean terrain clearance of 50 metres.

Low-level helicopter-borne magnetics and radiometrics data were acquired by Daishsat Surveys in March 2012 (Lockhead, A., McKinnon-Matthews, J., 2012). Flightlines oriented 035-215 degrees were flown at a spacing of 100 metres with sensor at a mean terrain clearance of 30 metres.

The geochemical anomalies were not further followed up and no further work was carried out, probably due to winding back of exploration programs as the commodity price and investment cycle started to decline in 2014.

Figure 2 shows location of Mithril's geochemical sample sites and airborne survey traverses, and Gempart's gravity reading sites.

Exploration by Gempart 2018

A ground gravity survey was conducted over an area encompassing the Donald prospect area in November 2018. Contractor Daishsat Surveys acquired readings on a nominal 200x200 metre grid, with infill readings on 100 metre lines and station spacing 100 or 50 metres. A broad Bouguer gravity anomaly of amplitude 2 milliGals is observed over the Donald prospect, but importantly it is not coincident with the magnetic anomalies. Contours of 1VD gravity show the complexity of the anomaly, and define the highest amplitude component as an elongate NW-SE striking feature, located in between magnetic anomalies, at about 556050mE 7372250mN. Refer Figure 3.

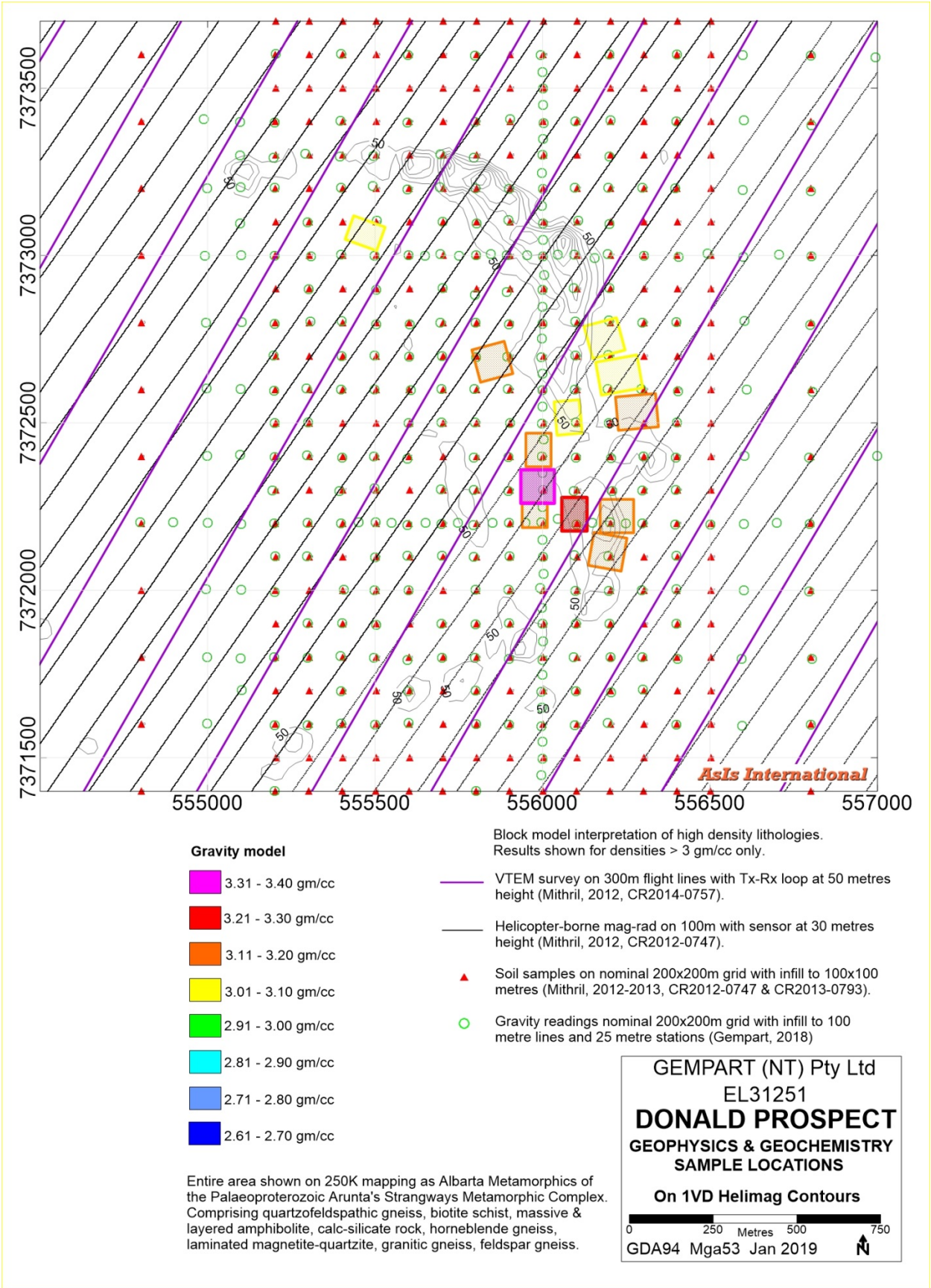

Figure 2.Location of Mithril soil samples and airborne traverses, and Gempart gravity readings.

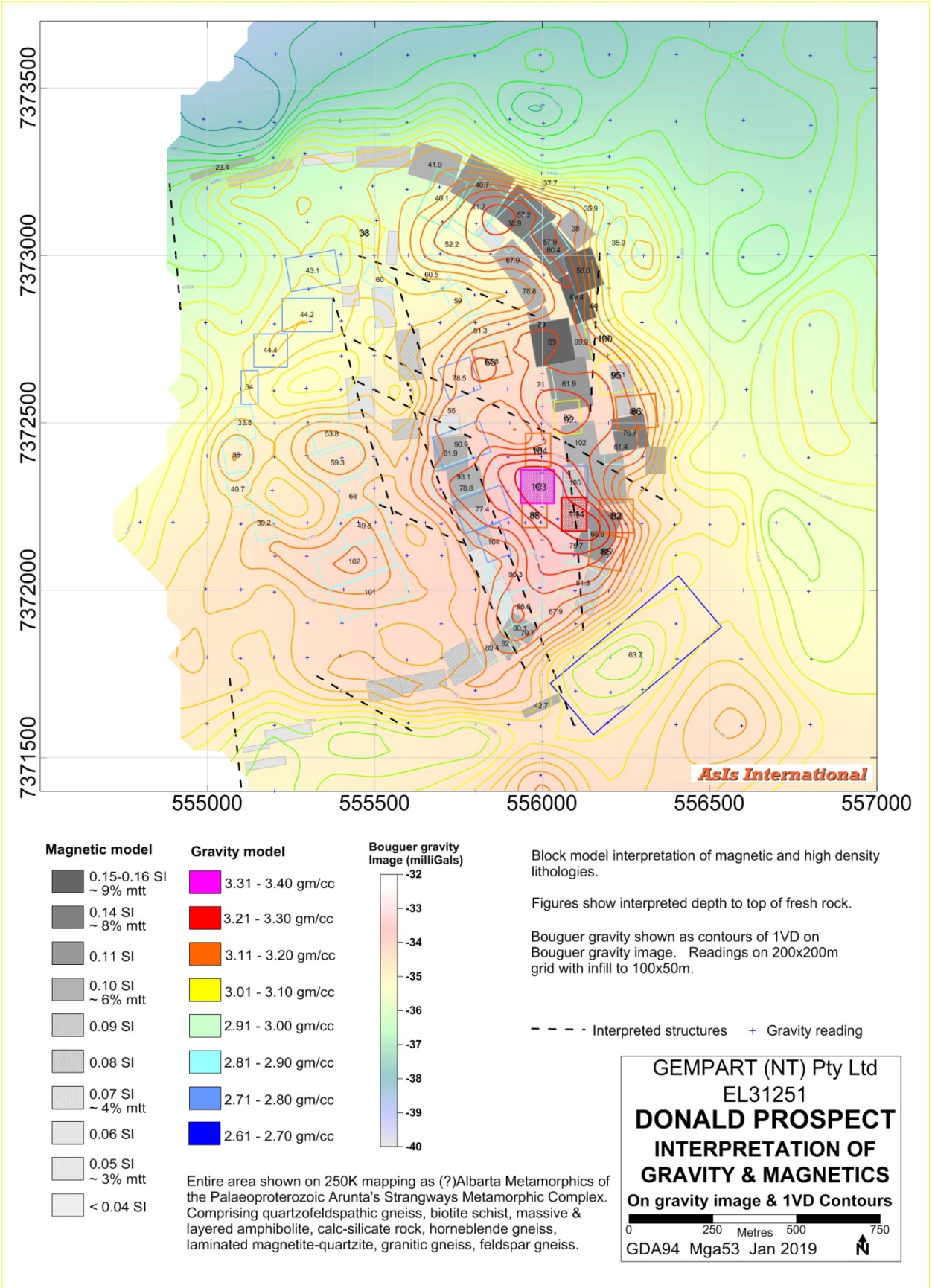

Figure 3.Donald prospect.Interpretation of gravity and magnetics on gravity.

Interpretation

In order to construct a geological model and define the anomalous mass causing the gravity anomaly, the aeromagnetic and gravity data were subject to detailed quantitative interpretation. The process was:

1. Derive profiles on 100 metre spaced NS and EW traverses from the gridded aeromagnetics and gravity.
2. Forward model the magnetics to establish dips and depth to fresh rock.
3. Using the calculated dips and depths as a guide, forward model the gravity.
4. Interpret lithologies and structures from the data and model.

A 3D view of the final model built up of tabular magnetic and gravity blocks is shown at Figure 4. The results suggest the overall structure is synformal, with dips on the periphery of the semi-circular complex typically 60-75 degrees, steepening to vertical and reversing in the southwestern part. Depths on the periphery are interpreted to be 25 metres in the north, 80 metres in the south, and 100 metres in the central part coincident with the centre of the gravity anomaly. The magnetic units probably represent banded magnetite-quartzite rocks, with lesser layered amphibolites, mafic gneiss or granitic gneiss. The lithologies of higher density are interpreted to represent amphibolites, calc-silicate rocks and mafic gneiss. The interpreted model on gravity and magnetics is shown at Figures 3 and 5, and geological interpretation shown at Figure 6.

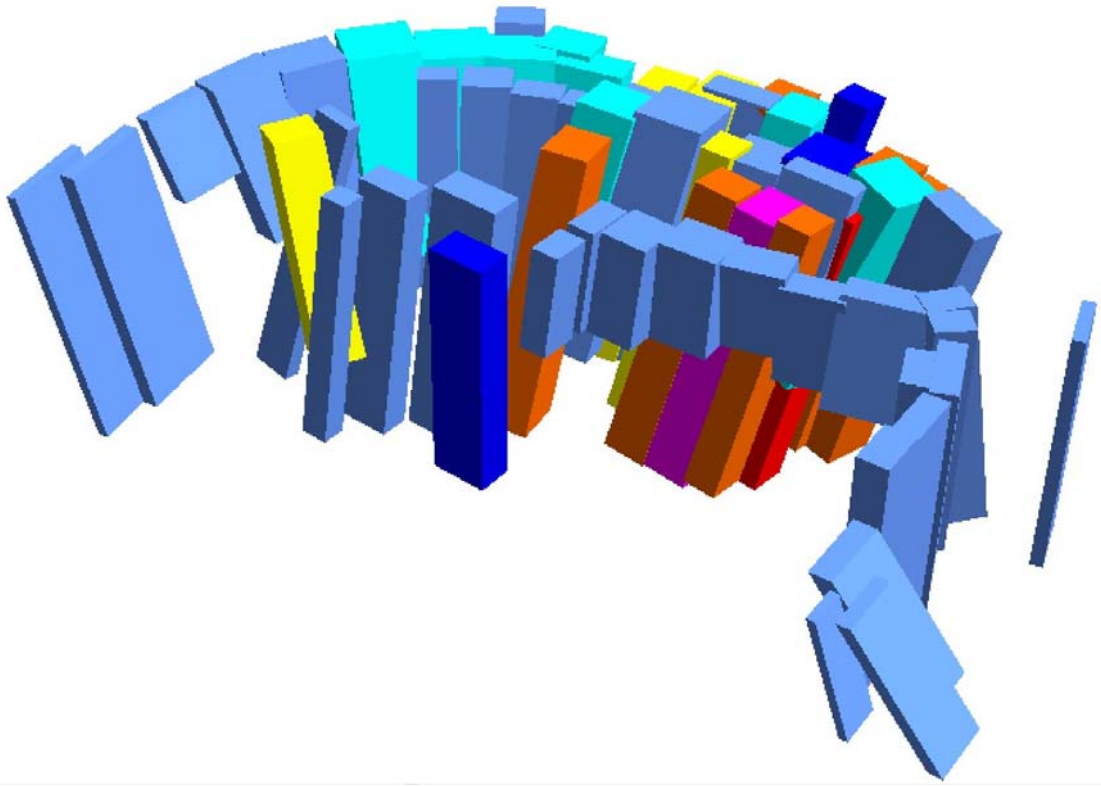

Figure 4.Donald prospect. 3D view, looking NE, of interpreted magnetic and gravity model. The target gravity anomaly source is shown in magenta.

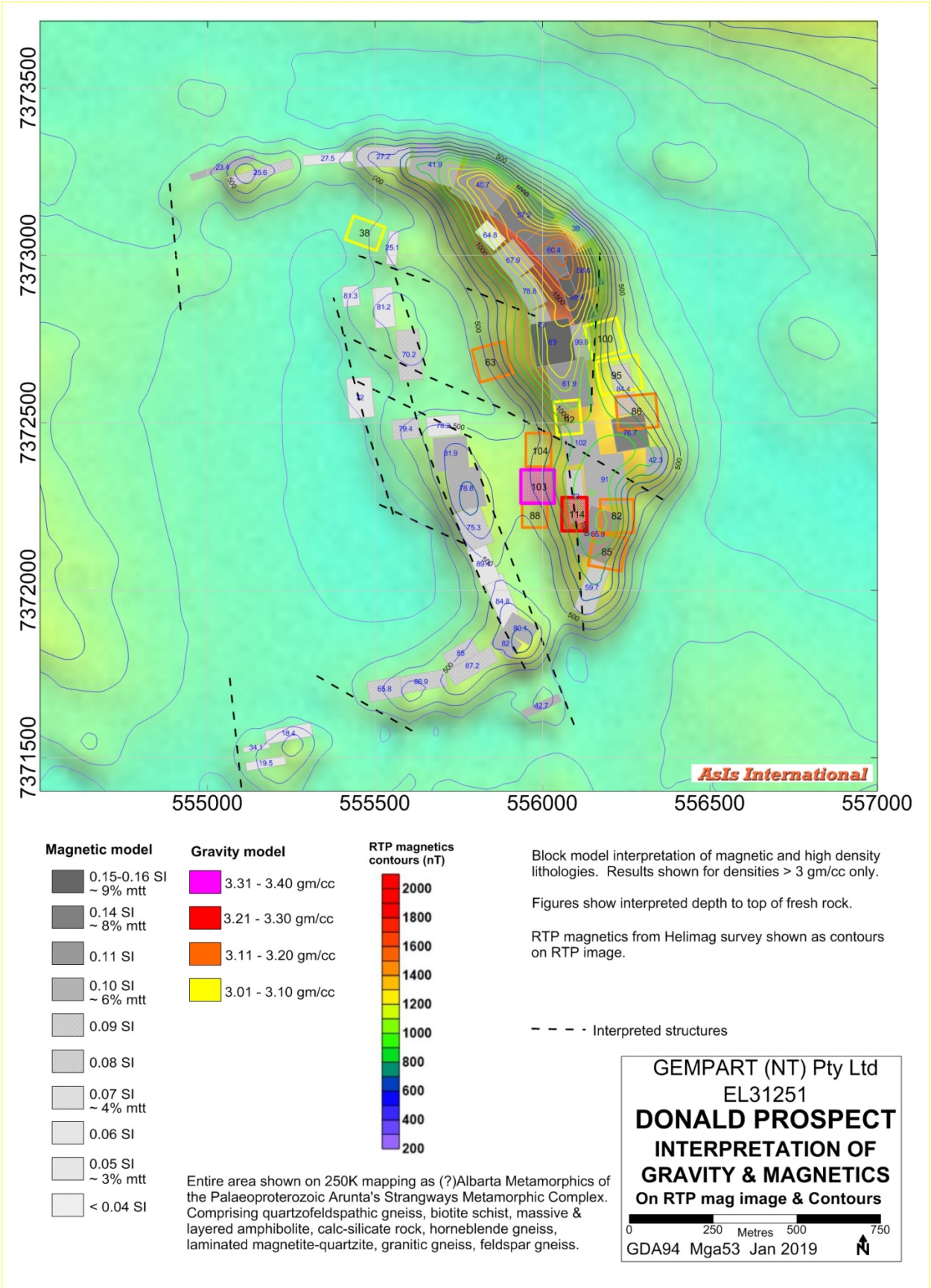

Figure 5.Donald prospect.Interpretation of gravity and magnetics on magnetics.

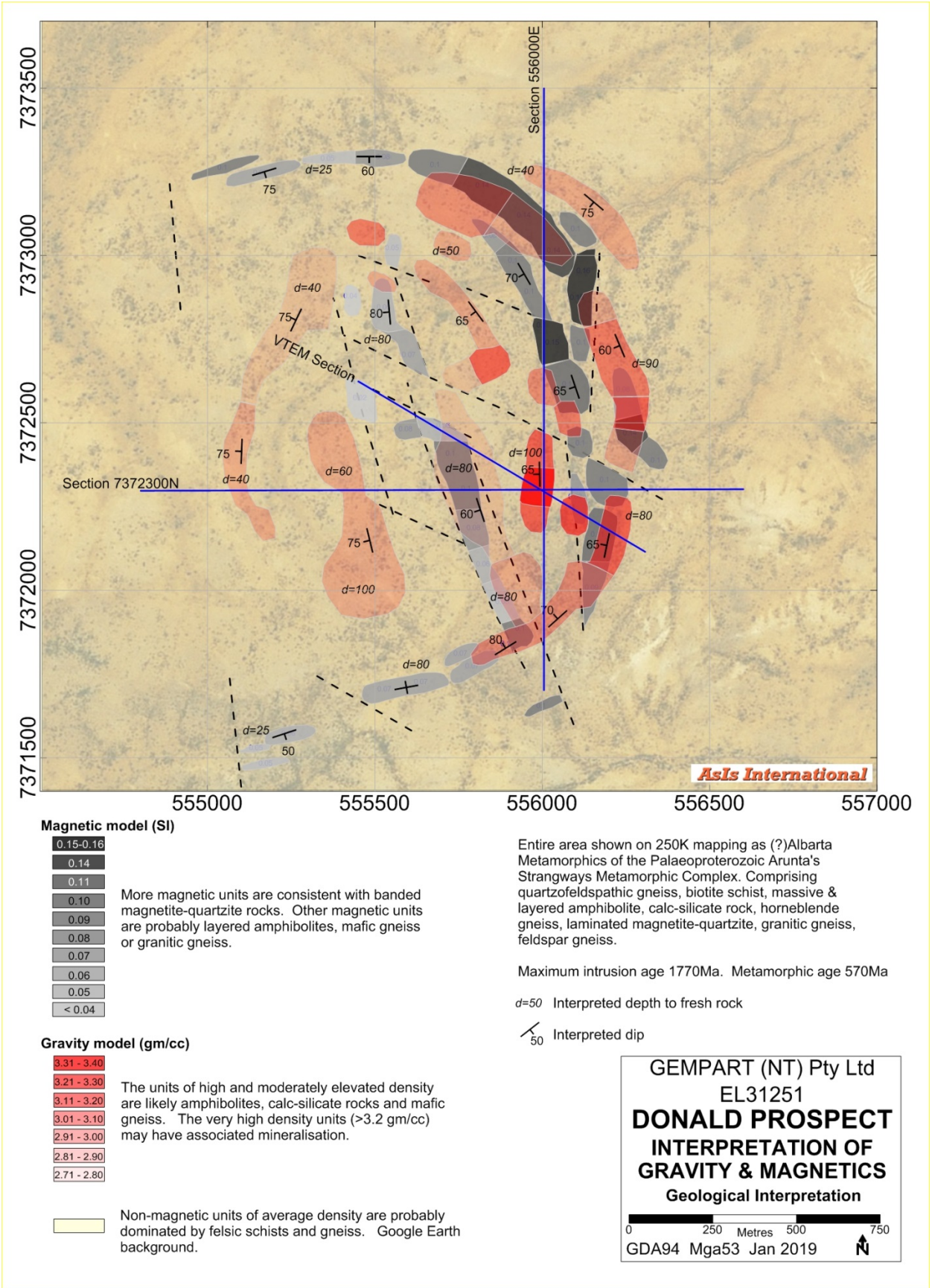

Figure 6.Donald prospect.Geological interpretation from gravity and magnetic model.

The gravity interpretation suggests an equidimensional source of diameter about 100 metres and 100 metres deep is a possible source of the highest amplitude part of the gravity anomaly. The calculated density is 3.4 gm/cc, with an adjacent source of similar dimensions having a density of 3.2 gm/cc. Refer sections on 7372300N and 556000E at Figures 7 and 8 respectively. The source may represent an IOCG or skarn model of mineralisation. Deposits of this type in the Strangways Metamorphic Complex include Johnnies Reward, located in the Strangways Range 150 kilometres to the northwest, and Molyhil Mine, 100 kilometres to the north. The former is a magnetite-copper-lead-zinc-gold metamorphic skarn. Molybdenum and tungsten mineralisation at Molyhil occurs as a magnetite / sulphide-rich hornfels unit

Of interest is the location of elevated Co, Cu and Ni values from the Mithril soil sampling. Contours of assay values on the interpreted model are shown at Figure 9. The coincident geochemical anomalies follow the trend of the magnetic periphery adjacent to the interpreted anomalous gravity source.

A detailed interpretation of the VTEM survey data was completed by K. Blundell, although the complete report is not included in the Mithril Annual technical reports. The area of the Donald prospect is relatively resistive, and no bedrock conductors were detected. Any mineralisation with possible sulphide associations might be expected to generate an EM response in a survey of this type. However by reference to the cross-section at Figure 10 it is seen that the interpreted target gravity source is located in between the 300 metre spaced flight lines. This indicates the distance from the Tx-Rx loop to possible sulphides is 200 metres, which may explain absence of a discernible response.

Recommendations for further work

It is highly recommended that the modelled source of the observed gravity anomaly be drilled to test for mineralisation. A single angled diamond drillhole is initially proposed. The proposed drillhole is shown on section 7372300N at Figure 7. Collar information is:

Easting	: 555830
Northing	: 7372300
RL	: 359 metres
Inclination	: -60
Declination	: 90 degrees True
Length	: 300 metres

G. Bubner 24 January 2019

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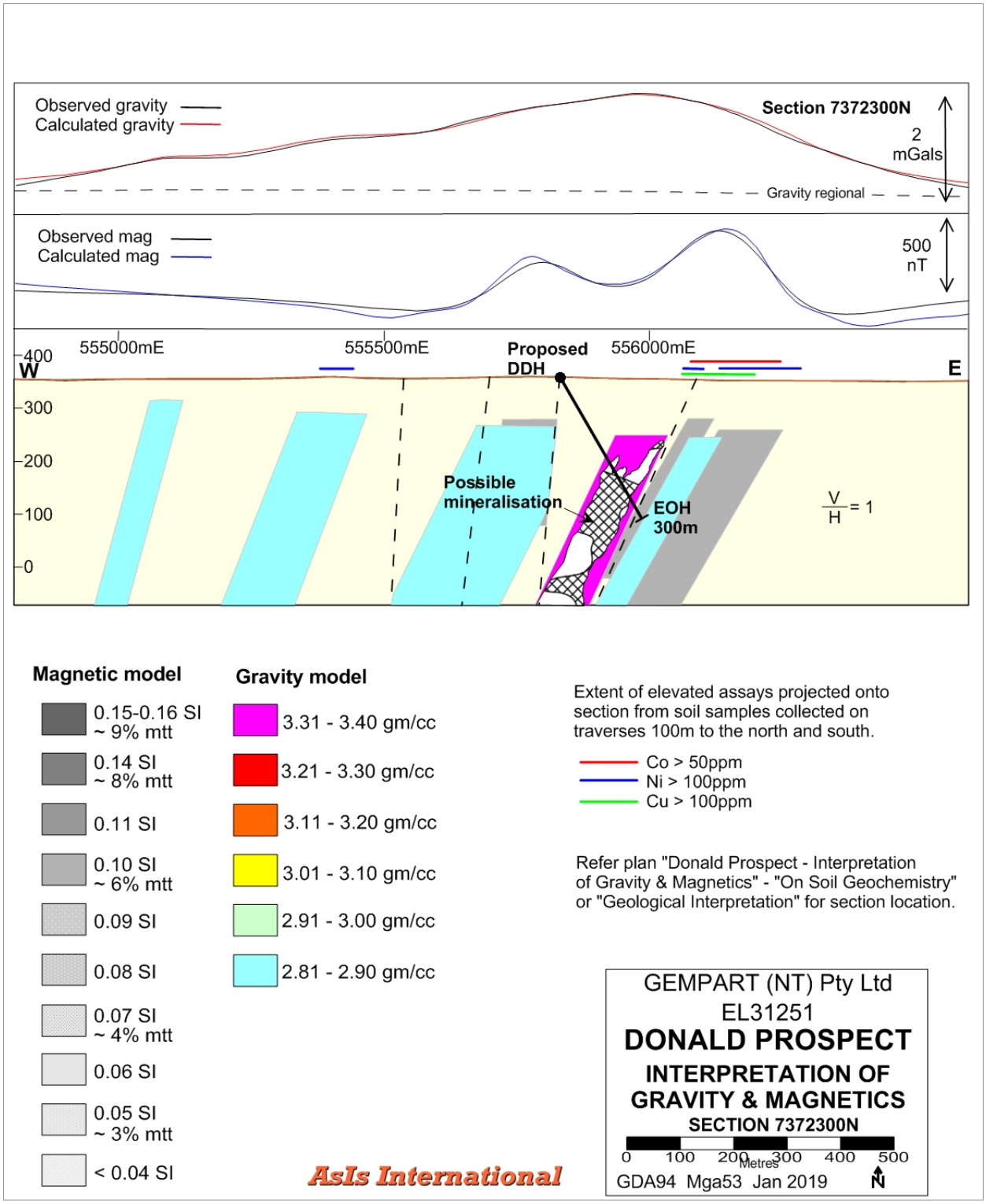

Figure 7.Donald prospect.Interpretation of gravity and magnetics on section 7372300N.

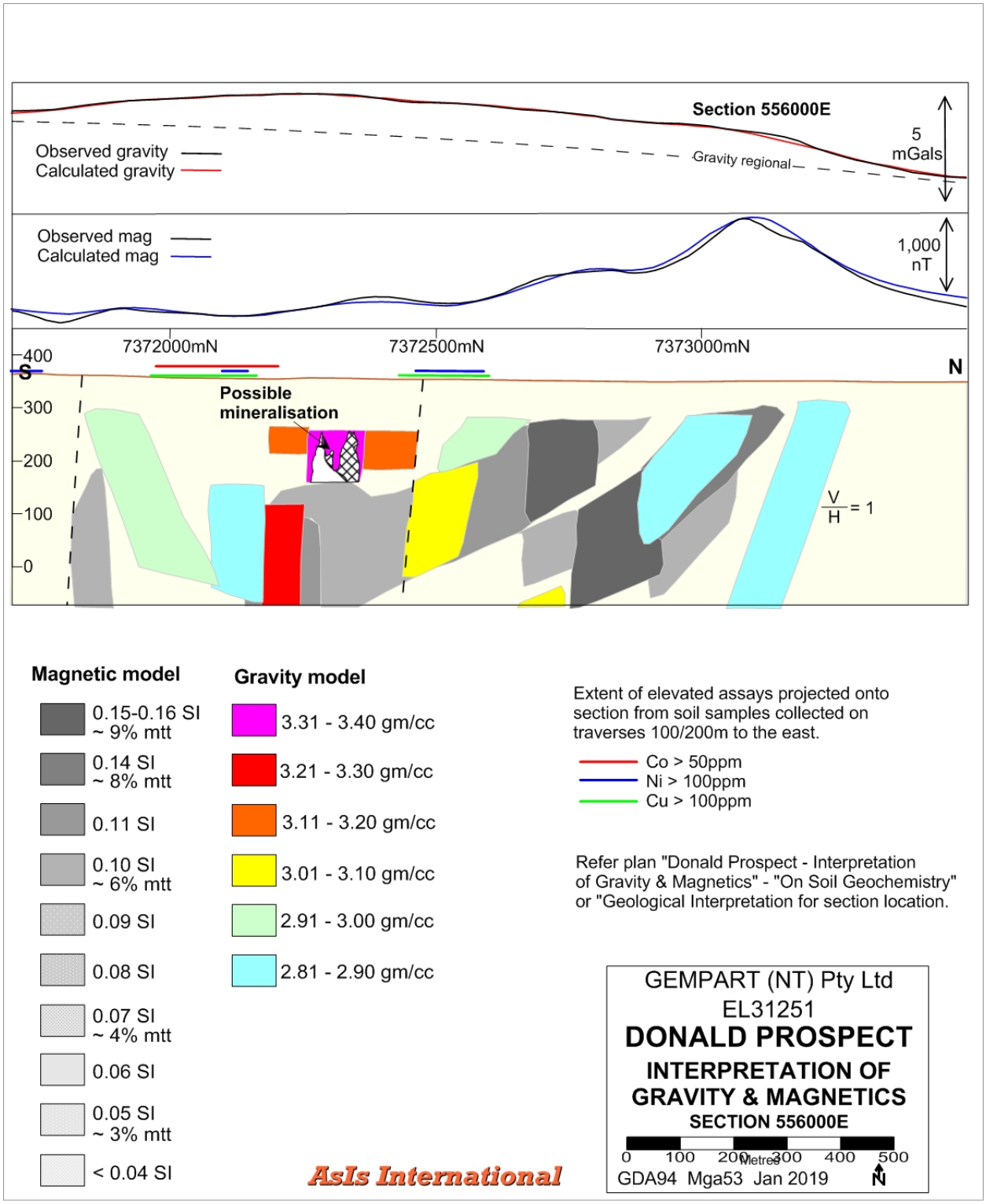

Figure 8.Donald prospect.Interpretation of gravity and magnetics on section 556000N.

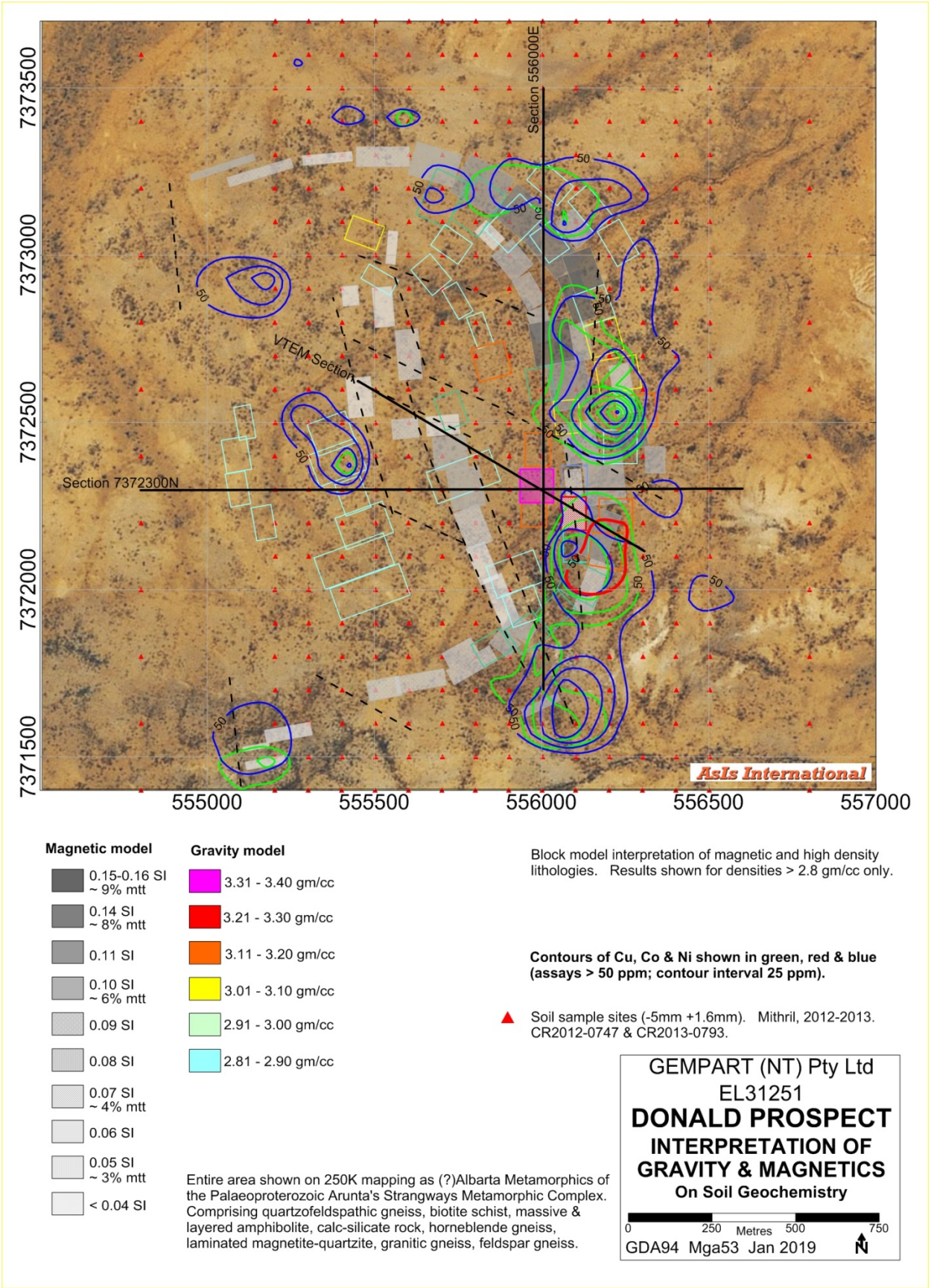

Figure 9.Donald prospect.Interpretation of gravity and magnetics on soil sample assays.

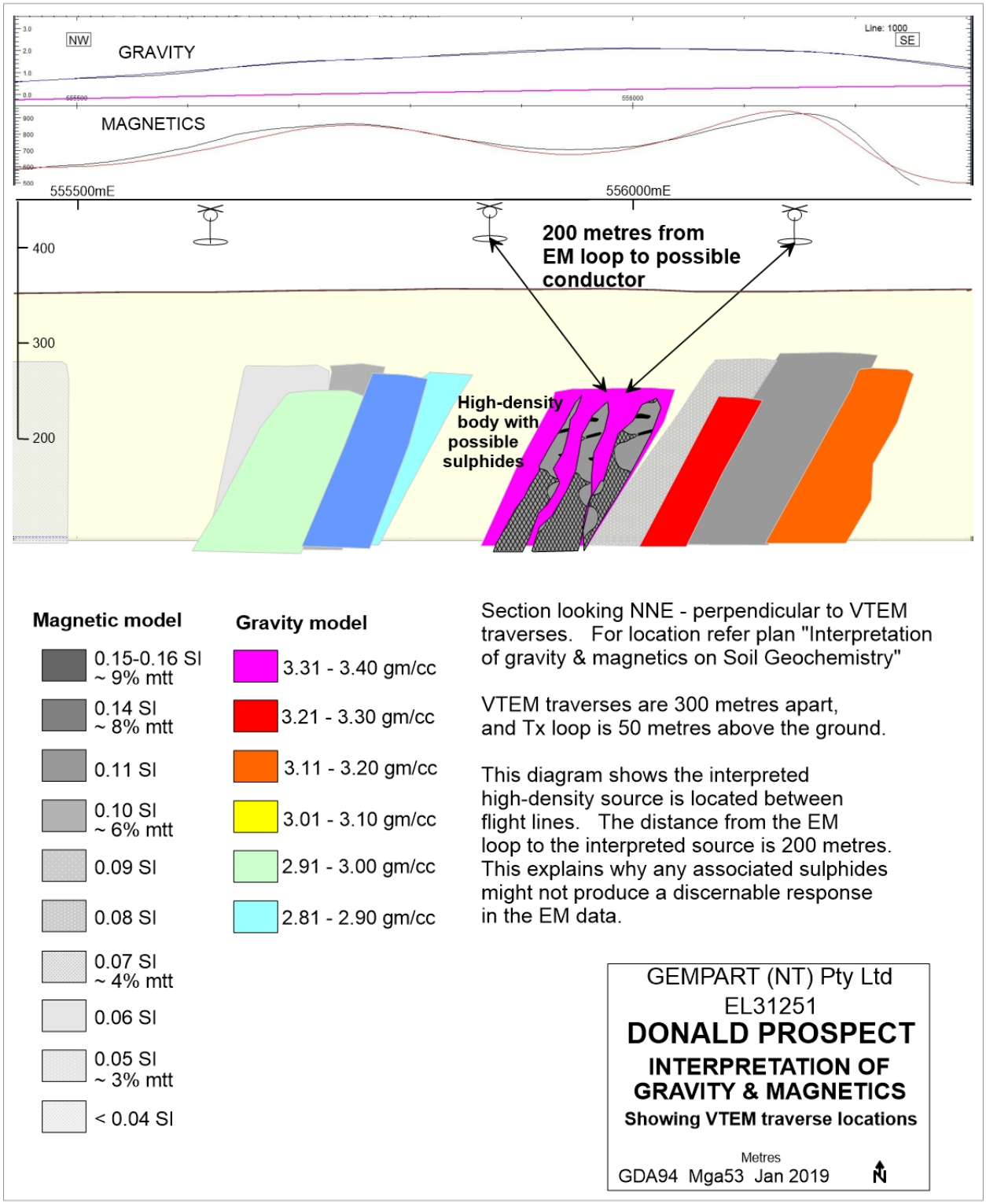

Figure 10.Donald prospect.Interpretation of gravity and magnetics on section perpendicular to VTEM flight lines.

References

Lockhead, A., McKinnon-Matthews, J., 2012.EL 25643 Mount Isabel and EL 25653 Acacia Bore Sammy JV Project Annual technical report for the period 20 August 2011 to 19 August 2012.Mithril Resources Ltd. Northern Territory Geological Survey, Open File Company Report CR2012-0747.

Mizow, D., 2013. EL 25643 Mt Isabel and EL 25653 Acacia Bore Sammy JV Project Group technical reporting status Annual technical report for the period 20 August 2012 to 19 August 2013.Mithril Resources Ltd. Northern Territory Geological Survey, Open File Company Report CR2013-0793.

Mizow, D., 2014. EL 25643 Mount Isabel and EL 25653 Acacia Bore Sammy Project Annual technical report for the period 20 August 2013 to 19 August 2014.Mithril Resources Ltd. Northern Territory Geological Survey, Open File Company Report CR2014-0757.