## 1. SUMMARY

This report describes processing and interpretation of SkyTEM airborne electromagnetic data from the Winnecke area, Northern Territory. The SkyTEM data have been interpreted with reference to other datasets available for the area, including airborne magnetics and radiometrics, LANDSAT satellite images, and known mineral occurrences.

The entire SkyTEM dataset has been inverted using the rapid layered-earth inversion (LEI) program iTEM. LEI depth slices and conductivity-depth sections have indicated a number of anomalous bedrock conductors. The highest-priority EM anomalies are:

- **Conductor S2**, Flightlines 21340-21360, ~7,426,218 mN.
- **Conductor S6**, Flightlines 21150-21170, ~7,421,194 mN.
- **Conductor S7**, Flightline 20930, ~7,419,487 mN.

LEI results suggest that most geological units within the survey area dip to the north, although southerly dips are evident on some cross-sections.

None of the discrete conductors identified in this study are associated with known mineral occurrences. A number of known occurrences are however associated with more extensive electromagnetic and magnetic trends, or with faults interpreted on the basis of the combined electromagnetic, magnetic interpretation.

Airborne magnetic and radiometric data have been qualitatively interpreted. Preliminary interpretation of magnetic, electromagnetic and LANDSAT trends suggests the existence of a large number of ~NE-striking faults throughout the survey area.

A number of radiometric anomalies have been interpreted, based on eU and eU/eTh ratio. One of these (UT2) appears to be associated with a placer Au/PGE mineral occurrence (Sloan’s Gully). Highest priority for follow-up should be placed on targets with coincident eU/eTh ratio and eU anomalies, where the anomalous response is at least three time background (anomalies UT1-5, 7 and 8) and those associated with mapped faults and shears or electromagnetic trends (anomalies UT5, 9 and 12, U1 – 5).
2. ACQUISITION

2.1 Electromagnetic data

SkyTEM is a helicopter-borne time-domain electromagnetic system. The system acquisition parameters are described in the survey data acquisition report already provided to Western Desert Resources (Reid, 2008), and are summarized below:

Survey Company  Geoforce Pty Ltd
Dates Flown   15 – 17 January 2008
Client    Western Desert Resources Ltd (WDR)
Terrain Clearance  30 metres (nominal)
EM System   SkyTEM (High moment)
Peak transmitter moment  119,320 A.turns.m^2
Delay times   59.8 μs (SkyTEM channel 8) –  8.8 ms (SkyTEM channel 30)
Traverse Line Spacing  150 metres
Traverse Line Direction  N – S
Datum    MGA53 / GDA94

2.2 Magnetic and Radiometric data

Magnetic and Radiometric data were acquired during late 2007 – early 2008 using an FU24 fixed-wing aircraft. The full survey and data processing specifications are contained in the survey logistics report (UTS Geophysics, 2008). The main survey parameters were:

Survey Company  UTS Geophysics
Client    Western Desert Resources Ltd (WDR)
Terrain Clearance  40 metres (nominal)
Traverse Line Spacing  100 metres
Traverse Line Direction  N – S (000-180)
Tie Line Spacing  1000 metres
Tie Line Direction  E – W (090-270)
Magnetometer   Scintrex CS-2 Caesium vapour
Sample rate   10 Hz
Spectrometer   Exploranium GR-820, 256 channels
Crystal volume   32L
Sample rate   1 Hz
Datum    MGA53 / GDA94
3. INTERPRETATION

3.1 Geology

The geology of the Winnecke Goldfield consists of mainly Proterozoic crystalline and metamorphic rocks of the Arunta Block unconformably overlain by nappes and folded outliers of the Neoproterozoic Heavitree Quartzite and Bitter Springs Formation of the Amadeus Basin (Rohde, 2006). There appears to be some confusion over the nature of the thrust faulting at Winnecke. Rohde (2006) states that ‘Amadeus Basin sediments to the south were thrust over the Palaeoproterozoic Arunta basement to the north’, while Kavanagh (1999) states that movement is ‘north to south’.

A geological map provided to Geoforce by WDR (TanamiGold_20020037_Interpreted_Geology_mga53.ecw) indicates that thrust fault planes and shear zones within the survey area dip toward the north.

The area surveyed with airborne geophysics is dominated by the Winnecke Shear zone, a wide corridor of intense and complex, laterally continuous east-west trending greenschist shearing within a predominantly gneissic terrane (Rohde, 2006).

3.1 Airborne electromagnetics

3.1.1 Processing

The entire SkyTEM dataset was inverted using iTEM, a new approximate layered-earth inversion (LEI) algorithm (Christensen et al., 2008). The iTEM inversion used a 30-layer model, in which layer thicknesses were fixed, and the EM data were inverted for the layer conductivities. The inversion was conducted on a least-squares basis (L2 norm).

Example conductivity-depth sections generated from the inversion results are presented in Section 3.1.2. Digital copies of conductivity depth sections for all flight lines are provided on CD.

Sunshaded enhanced images of the iTEM inversion results were produced for the following depth intervals:

- 50-57 m (Layer 8) – see Figure A8
- 98-106 m (Layer 14)
- 144-154 m (Layer 19) – see Figure A9
- 199-212 m (Layer 24)
- 253-268 m (Layer 28) – see Figure A10

Other EM overlays used in the interpretation included the digital terrain model and height-corrected raw data, provided with the original SkyTEM digital dataset (Reid, 2008).
<table>
<thead>
<tr>
<th>Layer number</th>
<th>Thickness (m)</th>
<th>Depth to top (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.000</td>
<td>0.000</td>
</tr>
<tr>
<td>2</td>
<td>7.018</td>
<td>7.000</td>
</tr>
<tr>
<td>3</td>
<td>7.054</td>
<td>14.018</td>
</tr>
<tr>
<td>4</td>
<td>7.108</td>
<td>21.072</td>
</tr>
<tr>
<td>5</td>
<td>7.180</td>
<td>28.180</td>
</tr>
<tr>
<td>6</td>
<td>7.270</td>
<td>35.359</td>
</tr>
<tr>
<td>7</td>
<td>7.380</td>
<td>42.630</td>
</tr>
<tr>
<td>8</td>
<td>7.508</td>
<td>50.010</td>
</tr>
<tr>
<td>9</td>
<td>7.655</td>
<td>57.517</td>
</tr>
<tr>
<td>10</td>
<td>7.822</td>
<td>65.172</td>
</tr>
<tr>
<td>11</td>
<td>8.009</td>
<td>72.994</td>
</tr>
<tr>
<td>12</td>
<td>8.216</td>
<td>81.003</td>
</tr>
<tr>
<td>13</td>
<td>8.445</td>
<td>89.219</td>
</tr>
<tr>
<td>14</td>
<td>8.695</td>
<td>97.664</td>
</tr>
<tr>
<td>15</td>
<td>8.967</td>
<td>106.359</td>
</tr>
<tr>
<td>16</td>
<td>9.262</td>
<td>115.326</td>
</tr>
<tr>
<td>17</td>
<td>9.581</td>
<td>124.588</td>
</tr>
<tr>
<td>18</td>
<td>9.925</td>
<td>134.169</td>
</tr>
<tr>
<td>19</td>
<td>10.294</td>
<td>144.094</td>
</tr>
<tr>
<td>20</td>
<td>10.689</td>
<td>154.388</td>
</tr>
<tr>
<td>21</td>
<td>11.112</td>
<td>165.078</td>
</tr>
<tr>
<td>22</td>
<td>11.563</td>
<td>176.190</td>
</tr>
<tr>
<td>23</td>
<td>12.044</td>
<td>187.753</td>
</tr>
<tr>
<td>24</td>
<td>12.556</td>
<td>199.797</td>
</tr>
<tr>
<td>25</td>
<td>13.099</td>
<td>212.353</td>
</tr>
<tr>
<td>26</td>
<td>13.677</td>
<td>225.452</td>
</tr>
<tr>
<td>27</td>
<td>14.289</td>
<td>239.129</td>
</tr>
<tr>
<td>28</td>
<td>14.938</td>
<td>253.418</td>
</tr>
<tr>
<td>29</td>
<td>15.625</td>
<td>268.355</td>
</tr>
<tr>
<td>30</td>
<td>infinite</td>
<td>283.981</td>
</tr>
</tbody>
</table>

Table 1 iTEM layered model parameters.

### 3.1.2 Interpretation

The EM interpretation was performed as follows:

LEI sections and plan depth slices were visually inspected, and anomalous conductors were identified. Profiles of the raw SkyTEM data were then inspected to verify and rank the conductors picked from the LEI profiles, and to pick any other conductors not evident on the LEI sections and plans. Table 2 lists the main conductors identified, along with a qualitative interpretation of dip and an estimated time-constant.

The major EM trends were also digitized, and have been saved in MapInfo TAB format. ‘Shallow’ trends were picked from the 50 – 57 m iTEM depth slice, and ‘deep’ trends from the 199-212 m slice. Trends picked from both EM and magnetic data have been used to identify possible faults (see Section 3.4).
Figure 1 shows the 144-154 m iTEM depth slice with discrete conductors and shallow and deep EM trends superimposed.

Conductivities derived from the LEI are moderate to low, particularly below the weathered layer. Comparison with the digital terrain model (Figure A1) shows that the Heavitree Quartzite and Bitter Springs Formations, which trend WNW-ESE through the survey area, are poorly conductive. The main WNW-ESE trending conductive zone crossing the survey area is located just to the north of the extensive shear zone which marks the northern extent of these Neoproterozoic units. This major conductive trend is associated with outcrop of the Arltunga Gneiss Complex. The high conductivities are presumably the result of increased porosity due to shearing, but could also be due to metasedimentary units. LEI conductivity-depth sections show conductors dipping toward both the northern and southern ends of the survey lines. The majority of conductors on the LEI sections appear to dip to the north, consistent with the northerly dip of thrusts and shear zones indicated on geological maps. Few of the conductors and trends identified from the EM data appear to be associated with modern watercourses.

Major features identified in the EM interpretation have included:

A weak east-west conductive zone extending from (421,300 mE, 7,419,400 mN) to (424,100 mE, 7,419,700 mN) in the southern part of the survey area. This anomalously-conductive zone lies within otherwise highly-resistive rocks of the Arltunga Gneiss Complex.

A northeast-trending zone of anomalously high conductivity, extending from (418,300 mE, 7,419,400 mN) to (420,000 mE, 7,421,500 mN). This feature crosscuts the ~ESE-WNW geological strike indicated by magnetic data, and is partly coincident with an extensive fault mapped at surface.

A number of other EM trends are coincident with mapped faults, e.g., (435,000 mE, 7,419,700 mN); (420,000 mE, 7,423,800 mN); (418,000 mE, 7,422,200 mN) and (419,700 mE, 7,423,100 mN).
Figure 1 Combined SkyTEM interpretation superimposed on iTEM 144 – 154 m conductivity depth slice. Circles = discrete conductors; solid lines = more extensive conductors; dashed lines = trends. Black = deep; White = shallow. Labels denote conductors S1 – S13.
3.1.2a Bedrock conductors

Table 2 summarises anomalous bedrock conductors identified from LEI depth slices and crosssections. Each anomaly has been assigned a priority based on the character of the anomalous response in the raw data and the estimated time constant. A number of conductors are not confirmed, as the associated anomaly in the raw data is either very weak or is close to the SkyTEM noise level. The LEI conductors associated with these anomalies are likely to be artifacts of the iTEM inversion algorithm. These suspect conductors have been assigned the lowest priority for follow-up (3). Conductors with time constants exceeding 0.5 ms have been assigned highest priority (1). The range of time constants usually associated with mineralization is 0.5 – 20 ms.

<table>
<thead>
<tr>
<th>Anomaly ID</th>
<th>Line</th>
<th>Northing</th>
<th>Dip</th>
<th>Time constant (ms)</th>
<th>Priority (1 = highest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>21450</td>
<td>7426239</td>
<td>S</td>
<td>0.36</td>
<td>2</td>
</tr>
<tr>
<td>S2</td>
<td>21340-21360</td>
<td>7426218</td>
<td>N</td>
<td>4.8</td>
<td>1</td>
</tr>
<tr>
<td>S3</td>
<td>21290</td>
<td>7421000</td>
<td>S</td>
<td>-</td>
<td>3*</td>
</tr>
<tr>
<td>S4</td>
<td>21290</td>
<td>7420780</td>
<td>?</td>
<td>-</td>
<td>3*</td>
</tr>
<tr>
<td>S5</td>
<td>21230</td>
<td>7423505</td>
<td>N</td>
<td>-</td>
<td>3*</td>
</tr>
<tr>
<td>S6</td>
<td>21150-21170</td>
<td>7421914</td>
<td>N</td>
<td>0.7</td>
<td>1</td>
</tr>
<tr>
<td>S7</td>
<td>20930</td>
<td>7419487</td>
<td>N</td>
<td>0.99+</td>
<td>1</td>
</tr>
<tr>
<td>S8</td>
<td>20840-20870</td>
<td>7423055</td>
<td>N?</td>
<td>2.28</td>
<td>2*</td>
</tr>
<tr>
<td>S9</td>
<td>20790-20830</td>
<td>7422794</td>
<td>N</td>
<td>-</td>
<td>3*</td>
</tr>
<tr>
<td>S10</td>
<td>20750</td>
<td>7422804</td>
<td>N</td>
<td>0.1</td>
<td>3</td>
</tr>
<tr>
<td>S11</td>
<td>20690-20710</td>
<td>7422537</td>
<td>N</td>
<td>0.1</td>
<td>3</td>
</tr>
<tr>
<td>S12</td>
<td>20650</td>
<td>7422723</td>
<td>N?</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>S13</td>
<td>20180</td>
<td>7418060</td>
<td>N</td>
<td>0.22</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2: Conductors identified from iTEM LEI sections. An asterisk in the last column indicates that the conductor should be verified by ground follow-up. For conductors S3 – 5 and S9, this is because the associated EM anomalies are weak, although anomalously-high conductivity is indicated by the LEI. SkyTEM decay curves from Anomaly S8 show unusual characteristics (non-monotonic decays). Should S8 prove to be a genuine conductor, its high time constant suggests that it should be given a high priority for further follow-up.

3.1.2b Example response profiles and LEI sections

Figure 2 shows the observed SkyTEM responses on Line 21360, which crosses conductor S2 at approximately 7426218 mN. The asymmetry of the response suggests the conductor dips towards the northern end of the survey line.

Figure 3 shows the iTEM LEI section for Line 21450, which crosses conductor S1. Lithological conductors dipping to both the south and north can be seen on the southern part of the line.

Figures 4 and 5 show SkyTEM response profiles and the iTEM LEI section for Line 20930, which crosses conductor S7 at its southern end. A number of north-dipping lithological conductors are evident in the central and northern parts of the line.
Figure 2  SkyTEM response profiles from Line 21360. Conductor S2 is indicated by the vertical yellow line near the northern end of the line.

Figure 3  iTEM LEI section for SkyTEM Line 21450.
Figure 4  SkyTEM response profiles from Line 20930. The position of conductor S7 is indicated by the vertical yellow line near the southern end of the profile.

Figure 5  iTEM LEI section for SkyTEM Line 20930.
A number of other strong conductors have been identified within the survey area. These generally have large strike extent and are considered most likely to be carbonaceous sediments or other ‘stratigraphic’ conductors. Figure 6 shows the SkyTEM response profiles from Line 21210. The strong double-peaked Z-component EM anomaly at ~7,422,250 mN has a strike extent of ~1.6 km when viewed in plan, and is likely to be of stratigraphic origin. The locations of this and other conductors of significant strike extent have been digitized as EM trends (e.g. Figure 1).

Figure 6  SkyTEM response profiles from Line 21210. The vertical yellow line indicates the position of the likely stratigraphic conductor referred to in the main text.

3.1.2c Association with known mineral occurrences

Known mineral occurrences associated with EM conductors/trends are summarized below. None of these occurrences are associated with the strong EM conductors listed in Table 2:

(422,629 mE, 7,422,571 mN) Unnamed Au: Shallow and deep EM trends
(422,629 mE, 7,421,571 mN) Old Camp Au: Deep EM trend
(426,629 mE, 7,420,071 mN) Unnamed Au: Shallow EM trend
(427,229 mE, 7,419,971 mN) Unnamed Au: Deep EM trend
(435,429 mE, 7,419,371 mN) Golden Eagle Claim Au: Shallow EM trend
(434,829 mE, 7,421,571 mN) Glancroil Pb: Deep EM trend
(437,029 mE, 7,418,671 mN) Pyritic Show Au: Deep EM trend
3.2 Magnetics

3.2.1 Processing

Processing of the magnetic data has involved generation of sunshaded enhanced images of TMI (Figure A2) and 1VD (Figure A3).

3.2.2 Interpretation

No quantitative interpretation of the magnetic data has been carried out as part of this preliminary interpretation. Shallow and deep magnetic trends have been picked and are shown in Figure 7. Geological structure interpreted from the identified trends is discussed in Section 3.4.

Some features evident in the magnetic data are as follows:

A change in the wavelength of magnetic anomalies suggests that magnetic sources are at greater depth within a zone trending WNW-ESE through the survey area. Magnetic sources appear to be deepest in the southeastern part of the survey area (Figure 7). The spatial correspondence between the zone of deep magnetic sources and topography suggests that the nonmagnetic cover comprises nappes of Heavitree Quartzite and Bitter Springs Formation.

The mapped magnetic trends are in places coincident with mapped faults, e.g., (436,970 mE, 7,420,820 mN) and (420,000 mE, 7,423,100 mN).

3.2.2a Association with known mineral occurrences

A number of known mineral occurrences are closely associated with shallow magnetic trends. These include:

(434,129 mE, 7,419,371 mN) Coorong Claim Au
(422,629 mE, 7,422,571 mN) Unnamed Au
(426,629 mE, 7,420,071 mN) Unnamed Au
(427,229 mE, 7,419,971 mN) Unnamed Au
3.3 Radiometrics

3.3.1 Radiometric data processing

The following radiometric images have been produced:
- Sunshaded enhanced images of Total count, eU, eTh and K
- Ternary Radiometric image (Red = K; Green = eTh; Blue = eU)
- Ratio maps eU/eTh; K/eTh

All enhanced images have been exported as located bitmaps compatible with MapInfo, and are provided on CD.

eU, eTh and K radiometric images were also draped on the digital elevation model derived by UTS Geophysics, in order to identify gamma ray responses most likely associated with bedrock and regolith (in-situ or transported). The gamma ray responses on the upper slopes of elevated areas are expected to be dominated by bedrock chemistry.

Figure 8 shows an image of total count draped on the digital elevation model.

Figure 9 shows areas where the radiometric response is considered likely to reflect bedrock chemistry.
Figure 8  Three-dimensional colour image of radiometric total count draped on the UTS digital terrain model. View is from the eastern end of the survey area, looking towards the west. Radiometric responses associated with the upper slopes of elevated areas are most likely to reflect bedrock chemistry.
3.3.2 Radiometric interpretation

Detailed interpretation of radiometric data involves correlation of gamma ray responses with chemistry of geological units present in the survey area, and has not undertaken as part of this study.

The radiometric interpretation has involved:
- Correlation of the major radiometric domains with regional geological maps and topography.
- Picking of eU, eU/eTh and K/eTh anomalies.
- Identification of any anomalous responses associated with known mineralisation.
- Identification of anomalies associated with structure, and magnetic and electromagnetic anomalies.

Radiometric anomalies originate within the upper 30 cm of the earth. Responses in low-lying areas are generally due to in-situ or transported regolith materials, which often mask the bedrock response and complicate interpretation.

3.3.2a Geological interpretation

The geological units associated with the major radiometric responses are:
Quartzites, sandstones, shales and dolomites of the Heavitree Quartzite and Bitter Springs Formation are generally low in all three radioelements and are represented in black on the ternary radiometric image (Figures 9 and A4).

Biotitic Ankala Gneiss (e.g., near 418,250 mE, 7,425,550 mN and 420,650 mE, 7,423,530 mN) ranges from K-rich to high in all three radioelements, and appears as pink-white on the ternary image.

Quartzofeldspathic schists of the West Bore Deformed Zone are high in all three radioelements, and appear as white on the ternary image (e.g., near 432,670 mE, 7,420,710 mN).

A likely shaly unit within the Bitter Springs Formation (431,200 mE, 7,418,200 mN) appears as pink on the ternary image, in contrast to the low radiometric responses associated with the Bitter Springs Formation in other parts of the survey area.

The Sliding Rock Metamorphics in the southwest of the survey area show a variable radiometric signature, and are Th-enriched near (427,100 mE, 7,418,000 mN).

A prominent east-west boundary in the ternary radiometric image, which extends from (423,400 mE, 7,422,900 mN) to (430,100 mE, 7,422,900 mN) may represent a lithological variation within the Erontonga Metamorphics, as this radiometric boundary closely parallels a mapped contact within this unit. Soils to the south of this boundary are depleted in K compared with those to the north.

The source of the potassium highs near (425,900 mE, 7,421,600 mN) and (429,100 mE, 7,420,900 mN) has not been identified.

### 3.3.2b Anomalous responses

A number of eU and eU/eTh anomalies have been identified. These are shown in Figure 10, and listed in Tables 3 and 4. The amplitude of the anomaly (expressed as a multiple of the assumed background) has been estimated for some of the anomalies. eU/eTh ratios equal to or exceeding three times background are generally considered significant.
<table>
<thead>
<tr>
<th>Anomaly ID</th>
<th>× assumed background</th>
<th>Associated EM anomaly?</th>
<th>Associated U anomaly?</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT1</td>
<td>5</td>
<td>n</td>
<td>y</td>
<td>On mapped shear/topographic high</td>
</tr>
<tr>
<td>UT2</td>
<td>4</td>
<td>n</td>
<td>n</td>
<td>On mapped shear. Associated with Sloan’s Gully placer Au-PGE occurrence (421,529 mE, 7,422,071 mN)</td>
</tr>
<tr>
<td>UT3</td>
<td>4</td>
<td>n</td>
<td>y</td>
<td>Just S of mapped shear</td>
</tr>
<tr>
<td>UT4</td>
<td>3</td>
<td>n</td>
<td>n</td>
<td>Anomalous zone is partly coincident with mapped fault.</td>
</tr>
<tr>
<td>UT5</td>
<td>3</td>
<td>y</td>
<td>y</td>
<td></td>
</tr>
<tr>
<td>UT6</td>
<td>2</td>
<td>n</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>UT7</td>
<td>2-3</td>
<td>n</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>UT8</td>
<td>4</td>
<td>n</td>
<td>y</td>
<td></td>
</tr>
<tr>
<td>UT9</td>
<td>-</td>
<td>y</td>
<td>n</td>
<td>On mapped fault</td>
</tr>
<tr>
<td>UT10</td>
<td>-</td>
<td>n</td>
<td>y</td>
<td></td>
</tr>
<tr>
<td>UT11</td>
<td>-</td>
<td>n</td>
<td>y</td>
<td></td>
</tr>
<tr>
<td>UT12</td>
<td>-</td>
<td>n</td>
<td>n</td>
<td>On mapped shear</td>
</tr>
<tr>
<td>UT13</td>
<td>-</td>
<td>n</td>
<td>y</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Summary of eU/eTh anomalies.

<table>
<thead>
<tr>
<th>Anomaly ID</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1</td>
<td>400 m strike extent. Parallels mapped shear zone ~200 m to S.</td>
</tr>
<tr>
<td>U2</td>
<td>On mapped shear</td>
</tr>
<tr>
<td>U3</td>
<td>On fault interpreted from magnetics and EM</td>
</tr>
<tr>
<td>U4</td>
<td>70 m from fault interpreted from magnetics and EM</td>
</tr>
<tr>
<td>U5</td>
<td>On mapped fault</td>
</tr>
</tbody>
</table>

Table 4 Summary of eU anomalies. eU anomalies coincident with eU/eTh anomalies listed in Table 3 are not listed in this table. None of these eU anomalies have an associated EM response.
3.4 Structure

A large number of (largely NE – NNE trending) faults have been interpreted based on
- Dislocation/truncation of magnetic trends from TMI and 1VD images
- Dislocation/truncation of shallow and deep EM trends
- Lineaments in LANDSAT 742 image

The preliminary interpreted structure is shown in Figure 11.

In some places, interpreted structure agrees closely with location of mapped faults, e.g., (418,200 mE, 7,422,200 mN) and (432,100 mE, 7,419,200 mN).

Mineral occurrences closely associated with interpreted structures include:

- (418,929 mE, 7,421,971 mN) Sliding Rock Pb
- (433,529 mE, 7,419,571 mN) Golden Goose Au
- (433,829 mE, 7,419,671 mN) Junction Claim Au
- (437,029 mE, 7,418,671 mN) Pyritic Show Au

Figure 10  eU/eTh (red ellipses) and eU (pink triangles) anomalies superimposed on a pseudocolour image of eU/eTh ratio. Background is the LANDSAT Band 742 ternary image.
Figure 11  Greyscale image of first vertical derivative of TMI, with structure interpreted from magnetic and electromagnetic trends superimposed (yellow lines).
4. RECOMMENDATIONS

The highest-priority EM anomalies identified in this study are:

Conductor S2, Flightlines 21340-21360, ~7,426,218 mN.
Conductor S6, Flightlines 21150-21170, ~7,421,194 mN.
Conductor S7, Flightline 20930, ~7,419,487 mN.

Where possible, plate modelling of these (and other lower-priority) conductors should be undertaken, in order to provide a more reliable indication of dip and to provide detailed drill targets.

A number of possible EM anomalies are not recommended for follow-up until they have been confirmed by surface electromagnetic surveys or by other means. These include S3-5, S8 and S9. Should S8 prove to be a genuine conductor, it is highly-recommended for follow-up due to its high estimated time constant.

A number of radiometric anomalies have been interpreted, based on eU and eU/eTh ratio. One of these (UT2) appears to be associated with a placer Au/PGE mineral occurrence (Sloan’s Gully). Highest priority for follow-up should be placed on targets with coincident eU/eTh ratio and eU anomalies, where the anomalous response is at least three time background (anomalies UT1-5, 7 and 8) and those associated with mapped faults and shears or electromagnetic trends (anomalies UT5, 9 and 12, U1 – 5).

5. REFERENCES


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Reid, J. E., 2008, SkyTEM Survey Winnecke, NT: Survey acquisition report to Western Desert Resources, Geoforce Job Number SK799WD.

Rohde, C., 2006, Partial relinquishment report EL23630 Golden Goose Winnecke project: Tanami Exploration NL.

UTS Geophysics, 2008, Logistics report for a detailed airborne magnetic, radiometric and digital terrain survey for the Bluey’s and Winnecke projects: UTS Job number A943.
APPENDIX A – Survey images

This appendix contains images of the main datasets used in the interpretation.

Figure A1 Digital terrain model (UTS Geophysics).
Figure A2 Total magnetic intensity (UTS Geophysics)
Figure A3  First vertical derivative of total magnetic intensity (UTS Geophysics)
Figure A4 Ternary radiometrics (UTS Geophysics). Red = potassium (%); Green = Thorium (ppm); Blue = Uranium (ppm)
Figure A5 Uranium to thorium (U/Th) ratio. Linear colour stretch.
Figure A6 Potassium to thorium (K/Th) ratio. Linear colour stretch.
Figure A7 Uranium (ppm). Histogram equalised.
Figure A8 Conductivity (mS/m) in depth slice 50 – 57 m, derived from iTEM inversion of SkyTEM data.
Figure A9  Conductivity (mS/m) in depth slice 144 – 154 m, derived from iTEM inversion of SkyTEM data.
Figure A10 Conductivity (mS/m) in depth slice 253 – 268 m, derived from iTEM inversion of SkyTEM data.