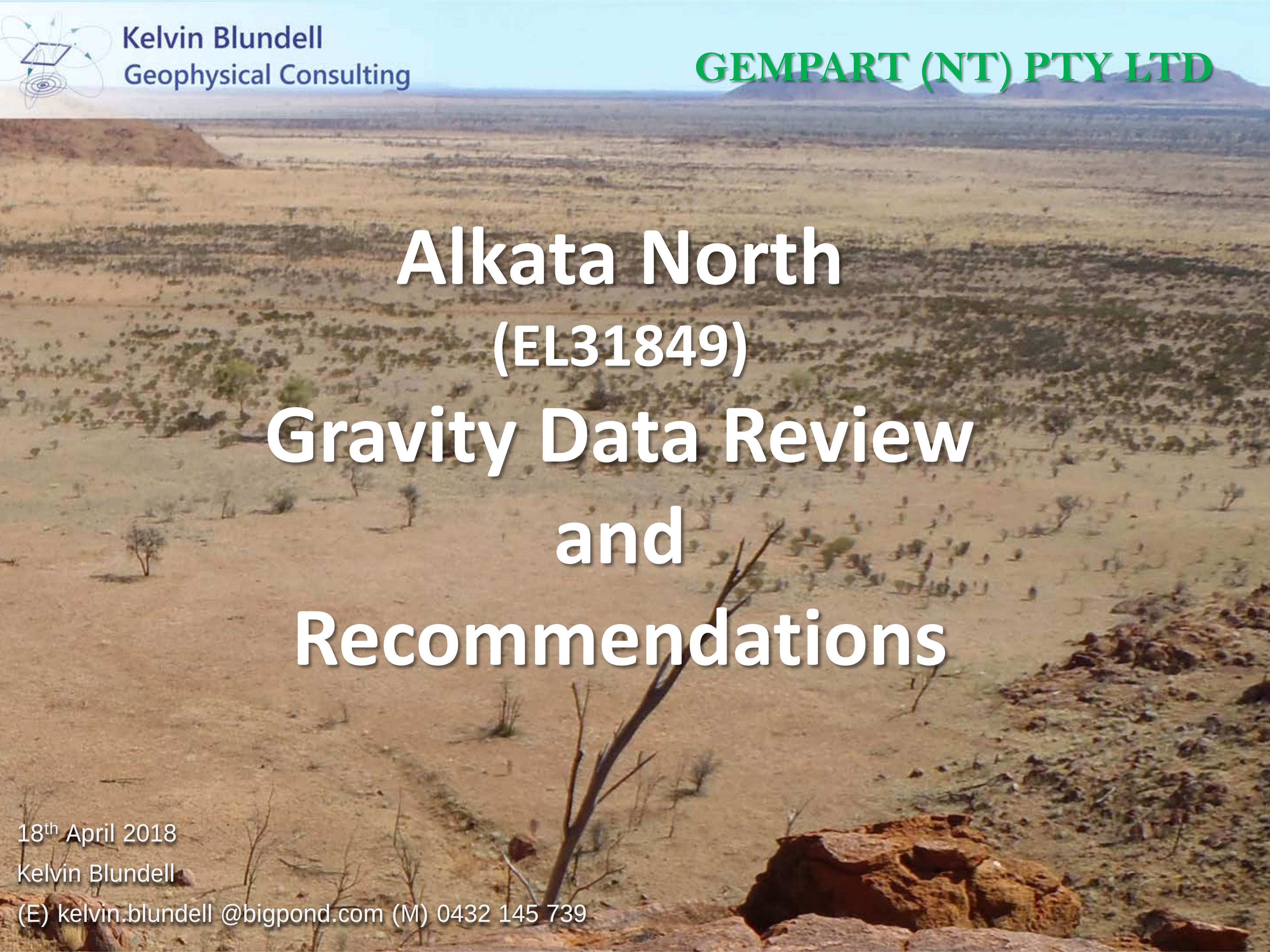
APPENDIX.2.

EL25566-Alkata Nth Gravity Review.,K.Blundell 18th April 2018.



Kelvin Blundell
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GEMPART (NT) PTY LTD

Alkata North
(EL31849)
Gravity Data Review and Recommendations

18th April 2018
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Introduction

Review of the geophysics over the Petermann Project by Christine Lawley of Metalzoic Consulting (with some input from this author) in February 2018 revealed a gravity anomaly to the east of EL25566 within an area of possible Giles Complex under cover (Figure 1).

The gravity anomaly looks to be on the same trend and of similar character to the gravity anomaly to the west, which was followed up with semi-detailed gravity surveying ("Claude Hills Extension" survey) in February 2017 (Figure 2).

GEMPART have applied for the ground surrounding this anomaly, which is now Minerals Exploration Application EL31849 (Alkata North).

This report outlines the initial assessment of this new target, with recommendations for follow-up gravity surveying to be carried out once the application has been granted.

This report also revisits the Claude Hills Extension gravity data.

Regional Geophysics Assessment

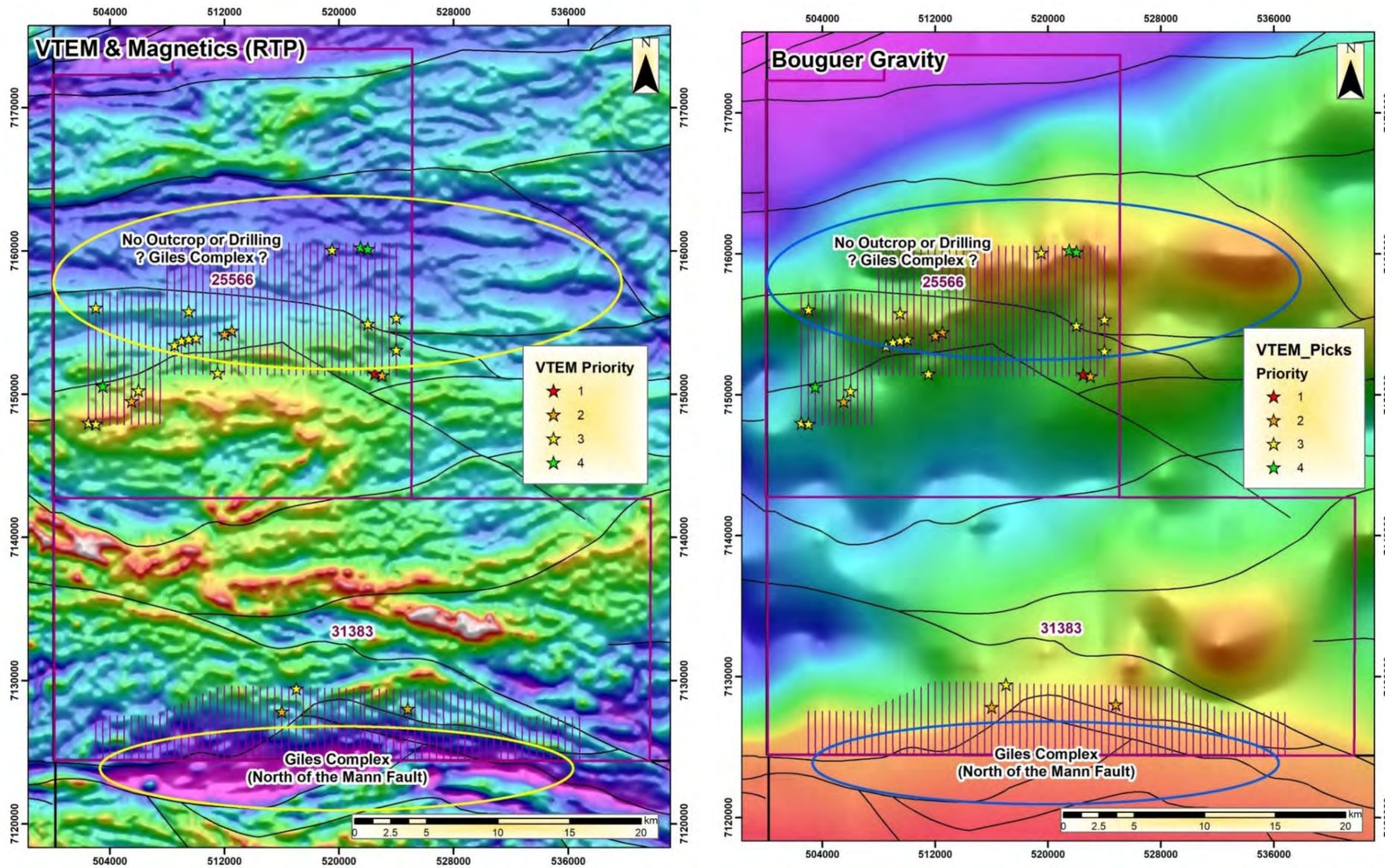


Figure 1. Regional magnetic and gravity images (from Metalzoic 2018 review)

Gravity data coverage

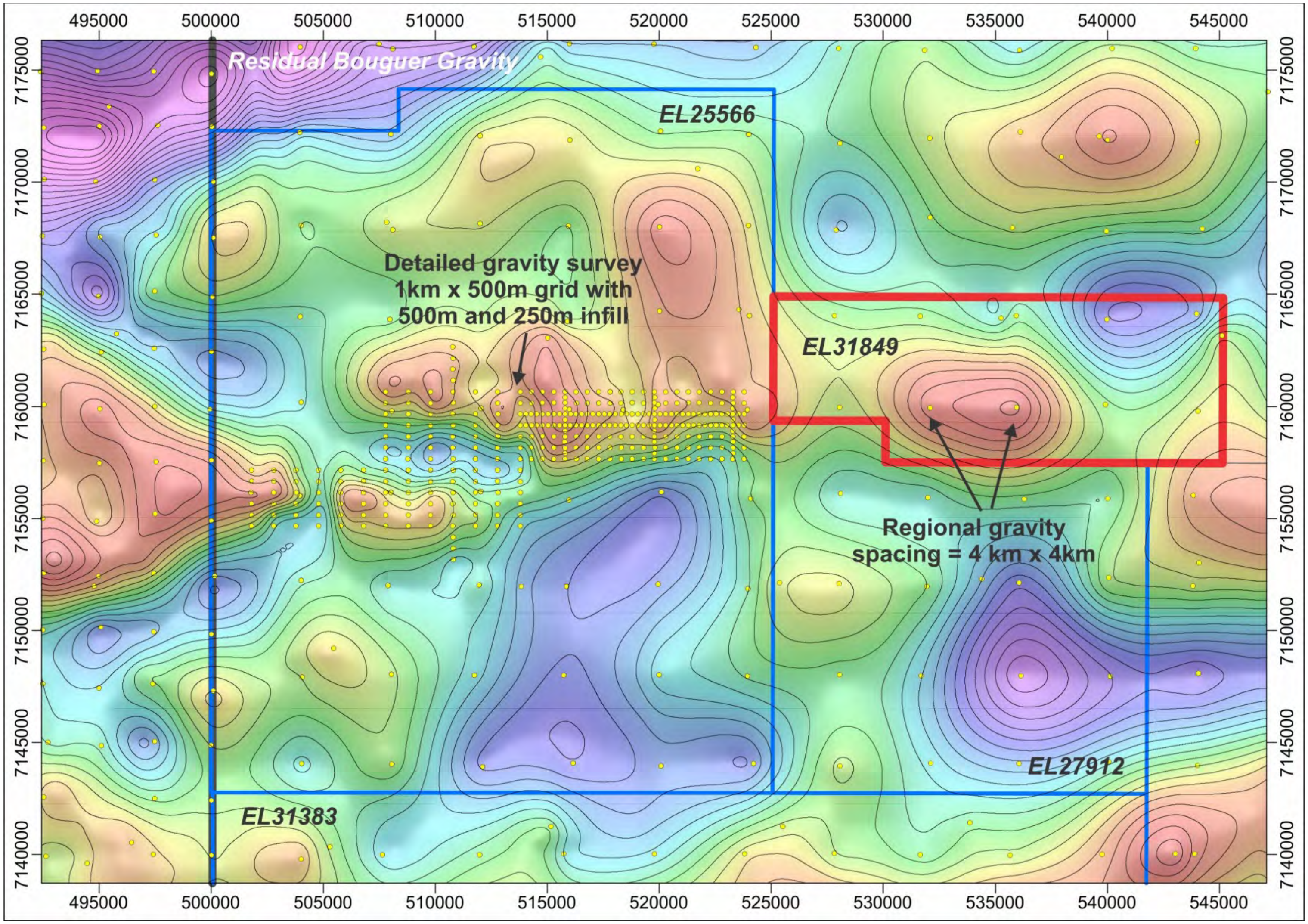


Figure 2. Residual gravity showing the spatial relationship between the gravity anomalies resolved by the Claude Hills Extension gravity survey and the new Alkata North target anomaly within EL31849

Data Coverage and Anomaly Resolution

It should be noted that the gravity anomaly within EL31849 is only defined by a single regional gravity station in the north-south orientation and two regional gravity stations east-west separated by 4 km (see Figs 2 and 3).

Therefore any local anomalism, as was seen in the detailed gravity survey to the west, cannot be resolved by the limited data within EL31849, and any inversion or modelling of this broad spaced data will produce an estimate of depth-to-source that is likely to be significantly greater than the true depth.

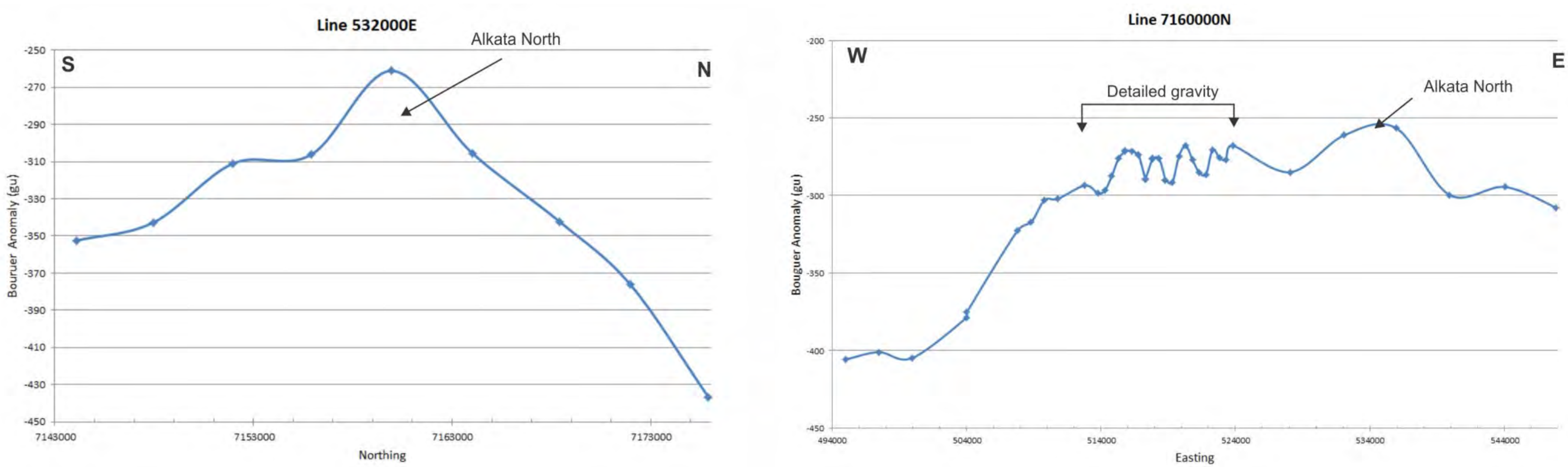


Figure 3. North-south and east-west profiles across the Alkata North gravity anomaly showing the limited data defining this anomaly. It is possible there are local anomalies within this broad gravity high as seen in the detailed gravity data to the west

Unconstrained 3D Inversion

A simple 3D inversion was run on the regional gravity (Figure 4) to get a feel for the relationship between the gravity anomalies spanning EL25566 and EL31849.

The resulting inversion suggests the source of the Alkata North anomaly is a depth-extensive intrusive body related to the interpreted Giles units to the west.

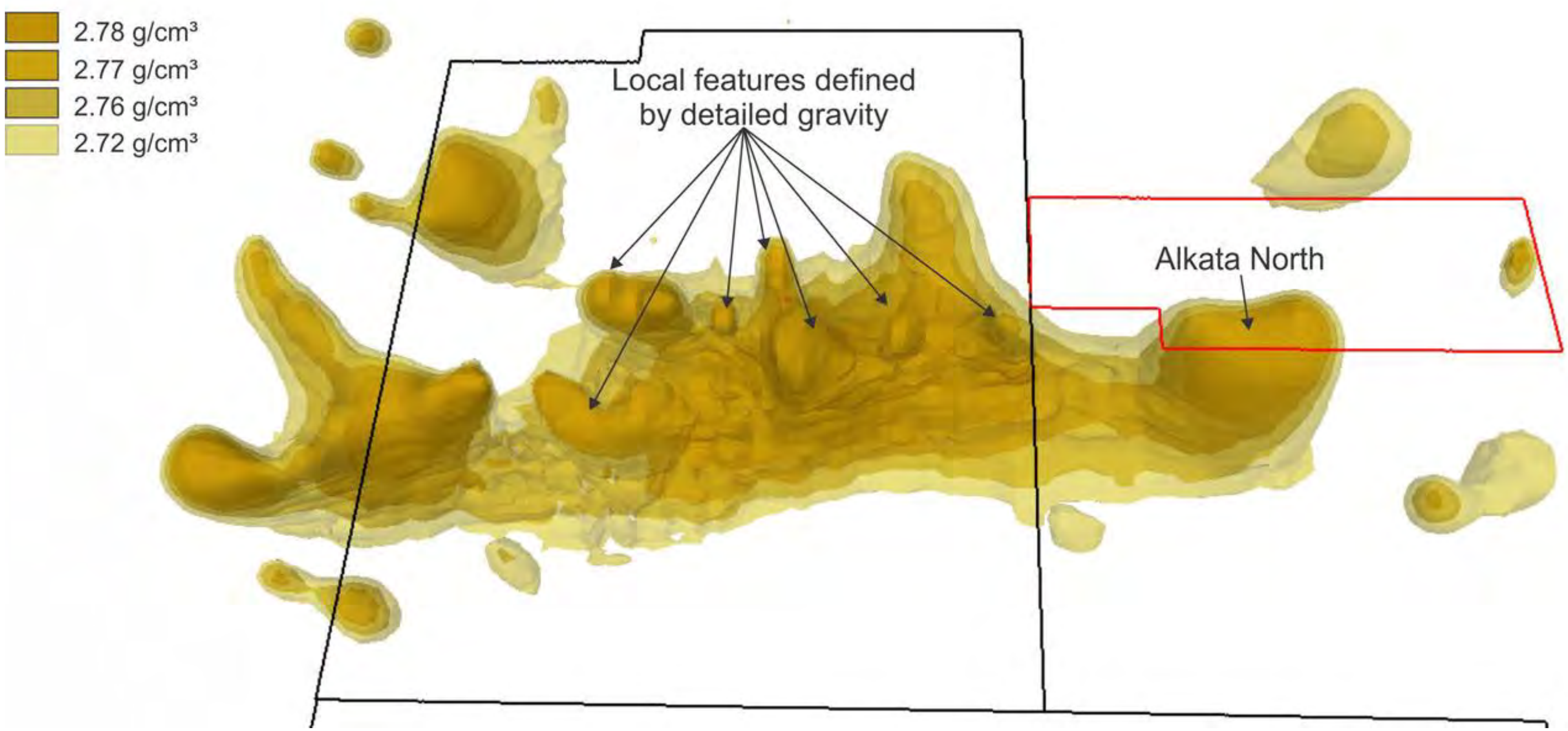


Figure 4. Perspective view of the 3D gravity inversion model. Note that modelled densities are based on the baseline background gravity used in the inversion and may be under-estimated

Unconstrained 3D Inversion

An east-west section through the 3D model shows the Alkata North gravity feature at a significant depth (Figure 5); however, it should be re-emphasized that the depth estimate is a function of anomaly wavelength, which in this case is determined by the broad spaced data.

It is also noted that there are apparent depressions in some of the detailed gravity data models to the west that could be representing altered ultramafic rocks and possible Ni-laterites analogous to Claude Hills (Figs 6 and 7).

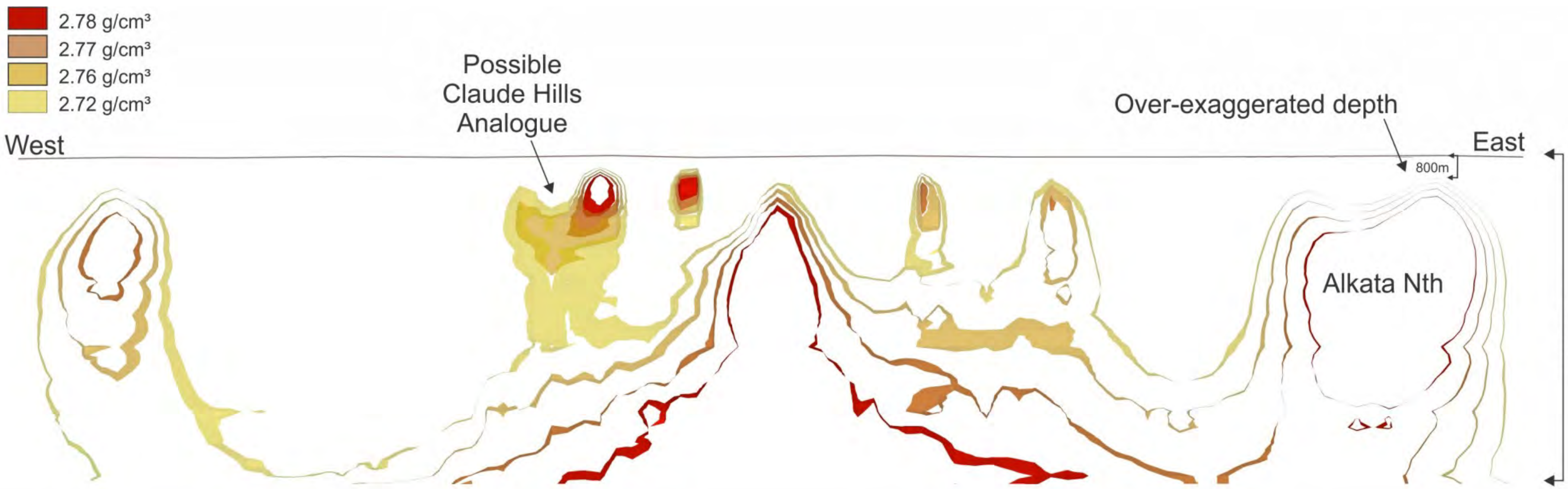


Figure 5. East-west section through the 3D inversion model at 7160000N

Claude Hills Gravity Response

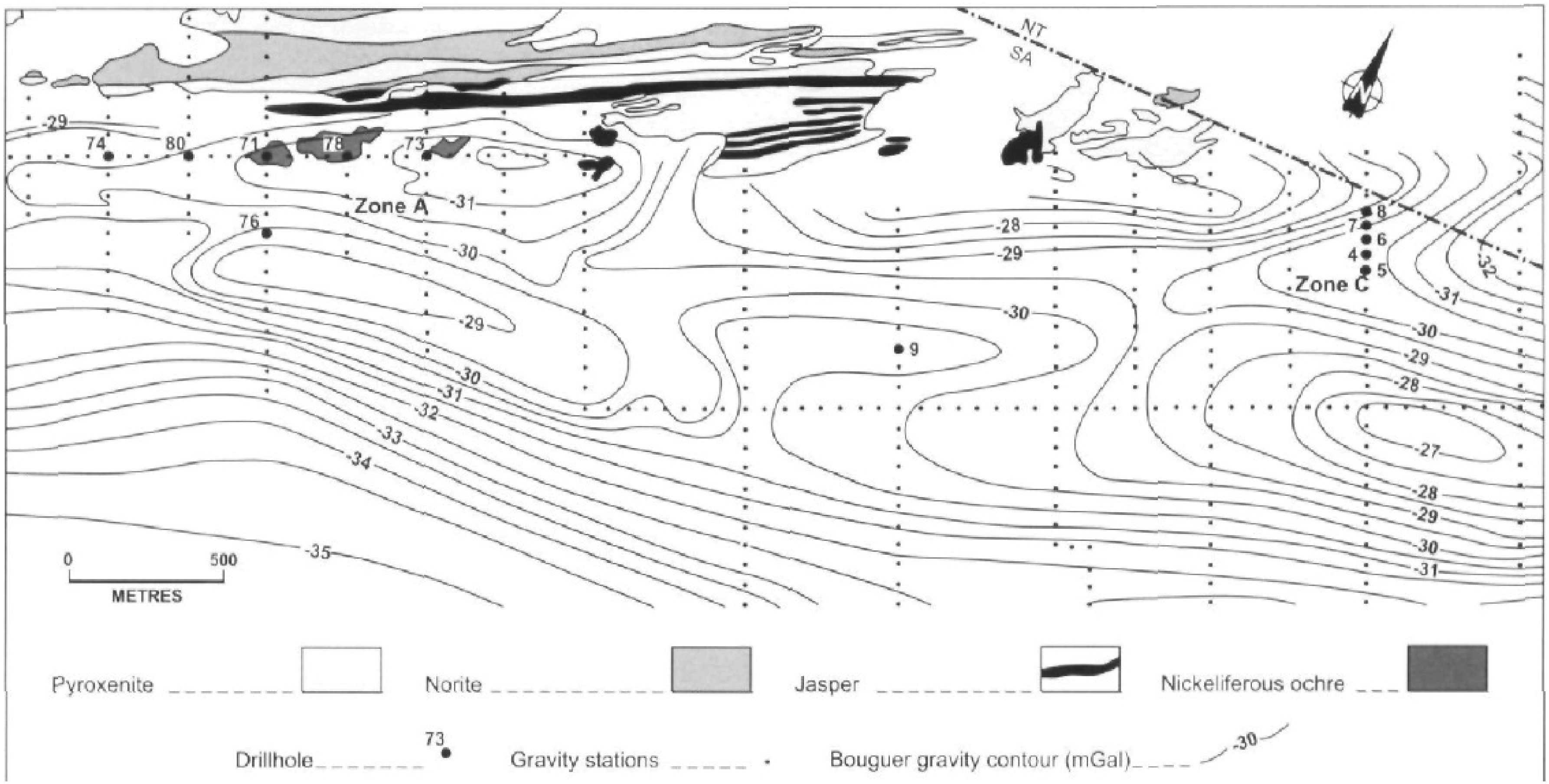
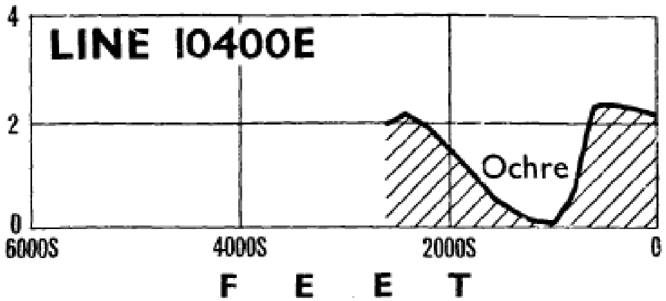
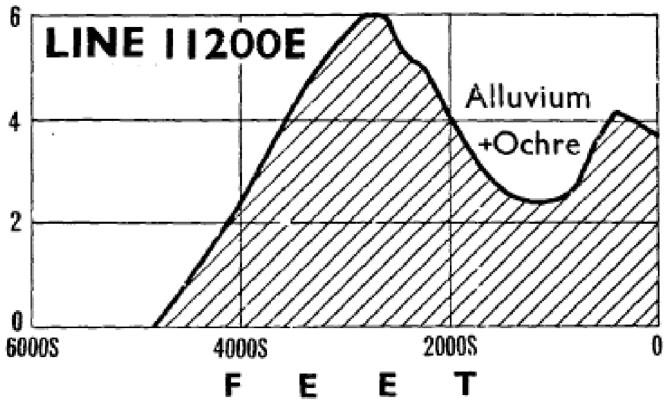


Figure 6. Historic gravity data over Claude Hills distribution of of "Ochre" laterite ore (from Dentith, 2002)

Claude Hills Gravity Response



Dentith (2002) noted that the typical response over the Ni-laterites (ochres) was a 2 mGal negative anomaly within the broader gravity high of the Giles Complex ultramafics due to a density contrast of around 1.4 g/ccm (3.0-3.2 g/ccm for the Giles vs 1.6-1.62 g/ccm for the ochres)



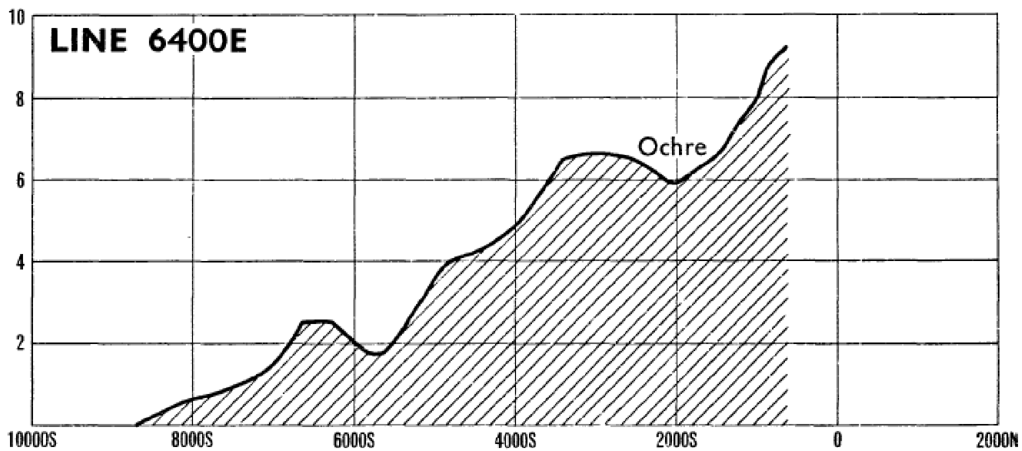


Figure 7. Historic gravity profiles over Claude Hills showing the typical anomaly over the "Ochre" laterite ore. Vertical scale on profiles are mGals. (from Miller & Brown, 1966)

Claude Hill Analogue

A closer look at the detailed gravity show 2 mGal negatives within the broader elevated gravity response over the interpreted Giles Complex (Figure 8)

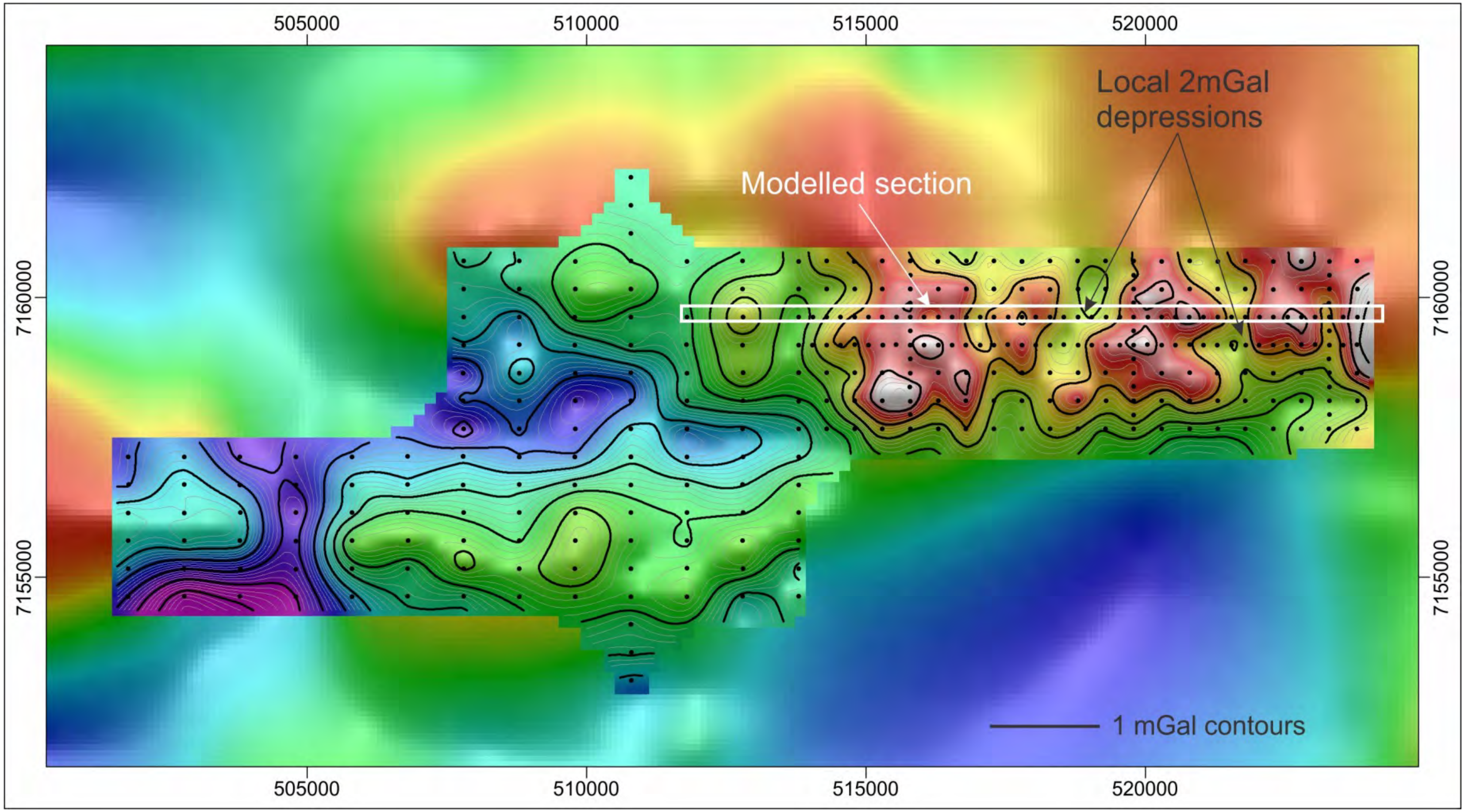


Figure 8. Local depressions within the elevated gravity consistent with local alteration and possible Ni-laterite development

Claude Hill Analogue

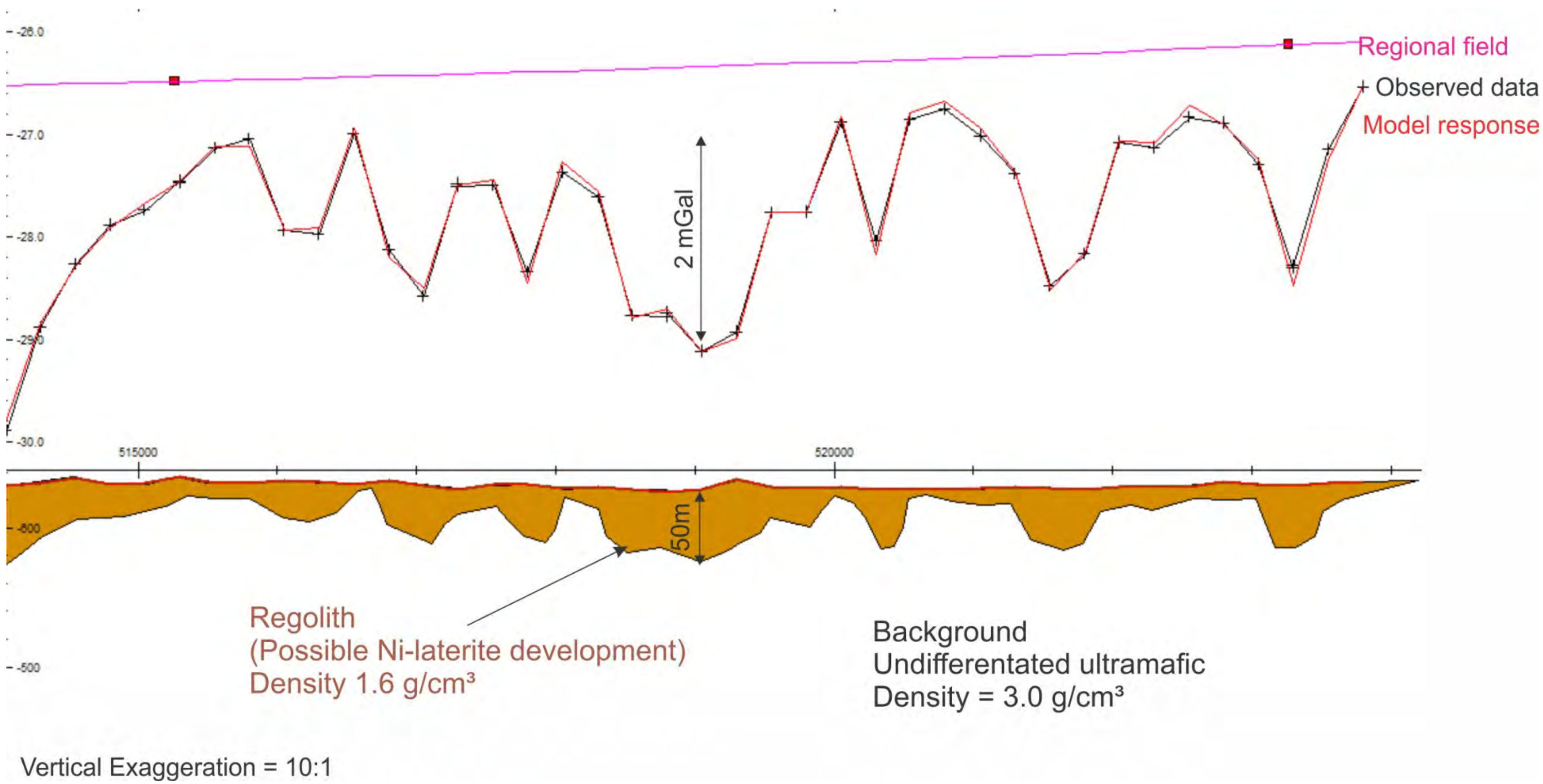


Figure 9. Modelled E-W section showing that the observed gravity data can be modelled as local zones of laterite development up to 50m in thickness. The position of this section is shown In Figure 8.

Recommendations

Infill Gravity Surveying – Alkata North

The Alkata North gravity anomaly can be covered with 250m stations along 1km spaced lines for a total of around 240 stns (similar sized survey to the 2017 survey to the west) – Figure 10.

The 250m station spacing would allow for accurate modelling/depth estimation of the source of the anomaly, and the 1km line spacing should be detailed enough to resolve lateral variations in depth along strike. If there are marked local lateral changes along strike, as noted over the Claude Hills Extension survey area to the west, then 500m like spacing may be required or selected detailed E-W sections if the budget allows.

Additional Gravity Surveying -- Claude Hills Extension

Figure 8 shows that the interesting local gravity highs (and "incising" local gravity depressions) extend to the north. Some additional gravity stations are recommended to close off these features (Figure 10) and provide enough data to produce a detailed 3D inversion of this area. At least two more detailed E-W profiles are recommended to enable accurate modelling of the extensions of the gravity depressions to the north.

Proposed Infill Gravity

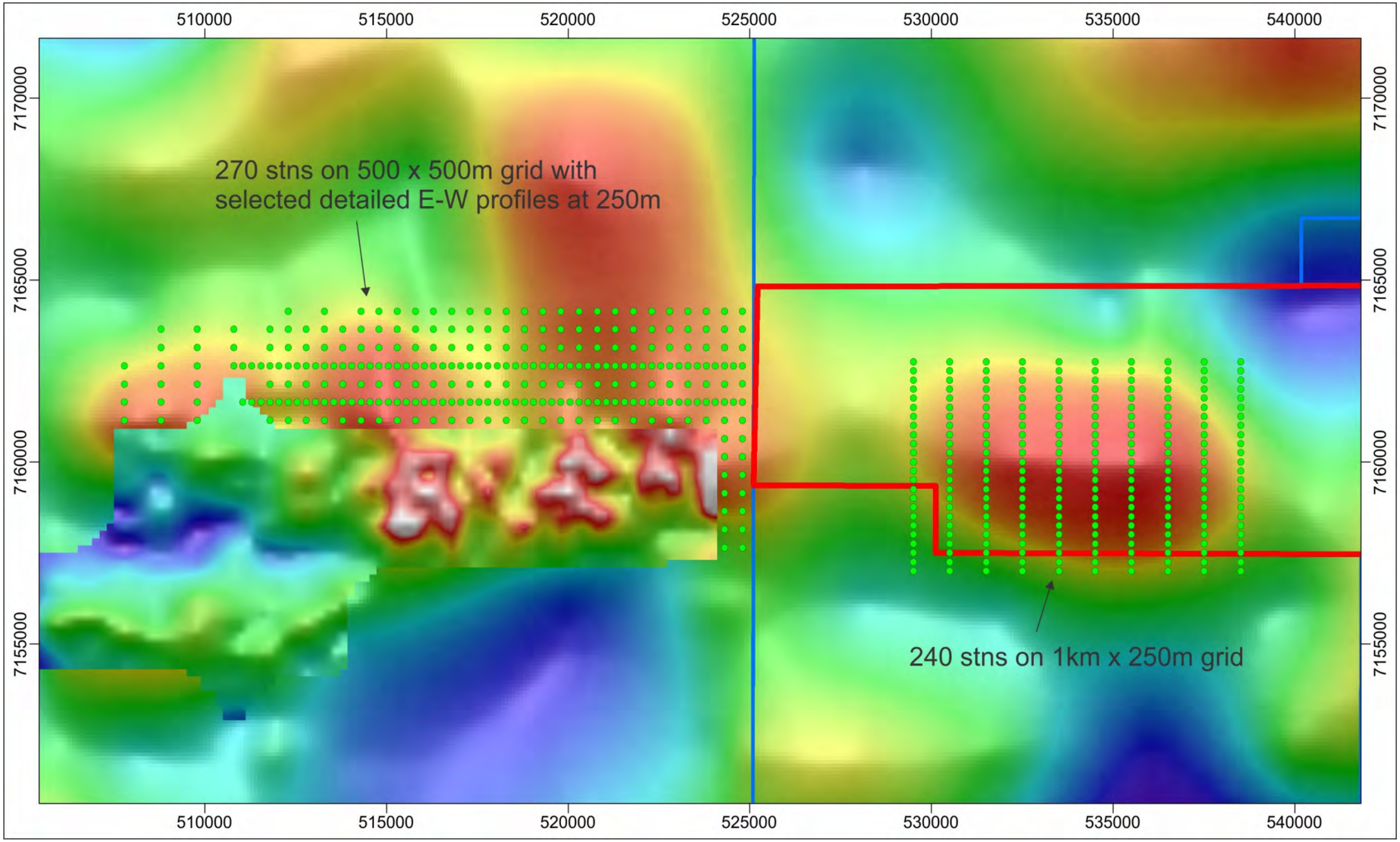


Figure 10. Proposed infill survey over Alkata North and possible extensions to the 2017 survey

References

Dentith, M., 2002, Geophysical signatures of South Australian mineral deposits; ASEG Special Publication No.12, p. 259-261.

Miller, P.G., and Rowan, I. S., 1966, Nickel Exploration, Claude Hills Extension, NT; Department of Mines South Australia, Report 62/119 .

APPENDIX 3.

EL25566,31383 Musgrave Geophysics Review.K.Blundell,15th February 2018.

Kelvin Blundell Geophysical Consulting

GEMPART (NT) PTY LTD

Musgrave Ranges
(EL25566, EL31383)
& Docker River
(EL27581, EL31531)
Geophysics Processing and Review

15 February 2018

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Scope of Work

Review of the VTEM survey data and recommendations for follow-up taking into consideration the geological context and relationship with regional magnetic and gravity anomalies.

- Ranked VTEM target summary
- Target shapefiles for ARCGIS
- Summary report

VTEM Imagery

Sets of imagery have been produced for the three individual VTEM survey areas.

Images have been produced using Linear (L) and Non-Linear (NL) colour stretches.

Linear colour images highlight the high-amplitude anomalies and show the true relative amplitude difference over the area

Non-Linear colour images evenly distribute the colours over the range of values, and as such highlights lower-amplitude features.

The background intensity in the imagery is sun-shaded to test highlight geological trends. In areas of large dynamic variation in amplitudes, a logarithmic stretch has been applied to the intensity to amplify subtle trends and features.

Regional Airborne Magnetic Imagery

To aid in the geological context of any VTEM anomalies, a comprehensive set of Geoimagery was produced over each area from the best available regional Government airborne data.

Nomenclature for the supplied Magnetic Geoimagery is as follows:

TMI: Total Magnetic Intensity

RTP: TMI Reduced to Pole — calculated using magnetic inclination of -64.58° and declination 8.12°

1VD: First Vertical Derivative

2VD: Second Vertical Derivative

Tilt: Tilt Angle Derivative

AnSig: Analytic Signal of the TMI

VRMI: Vector Residual Magnetic Intensity

1VD/2VD_greysale: greyscale imagery using a non-linear histogram

RTP_on_1VD/2VD_lin: RTP linear colour image draped over greyscale 1VD or 2VD imagery.

NshadeL: Linear colour image draped over sun shaded intensity with sun at 45° inclination from the North

NshadeNL: Non-linear colour image draped over sun shaded intensity with sun at 45° inclination from the North

General Comments on VTEM

The 500m line-spacing for the Musgrave Ranges and Docker River VTEM surveys is considered a regional, broad spaced line spacing, and as such there is a high chance of missing significant local bedrock conductors. The AEM response of the Babel deposit in the West Musgrave is around 1200m, but the parts of the Nebo deposit that were detectable from the AEM system are around 500m in length. Thus, there is a chance that a Nebo-analogue could be missed with the 500-m VTEM surveys if it lies between the survey lines.

There are a number of interpretation pitfalls that need to be considered when picking VTEM anomalies of potential interest. These include:

- "diffraction-tails" or "lobe" anomalies often seen adjacent to zones of conductive cover,
- residual positive responses of broader fault anomalies,
- late-time super-paramagnetism (SPM) anomalies due to fine-grained maghemite at the surface,
- local elevated noise due to wind gusts.

Examples of each of these are shown in the following slides.

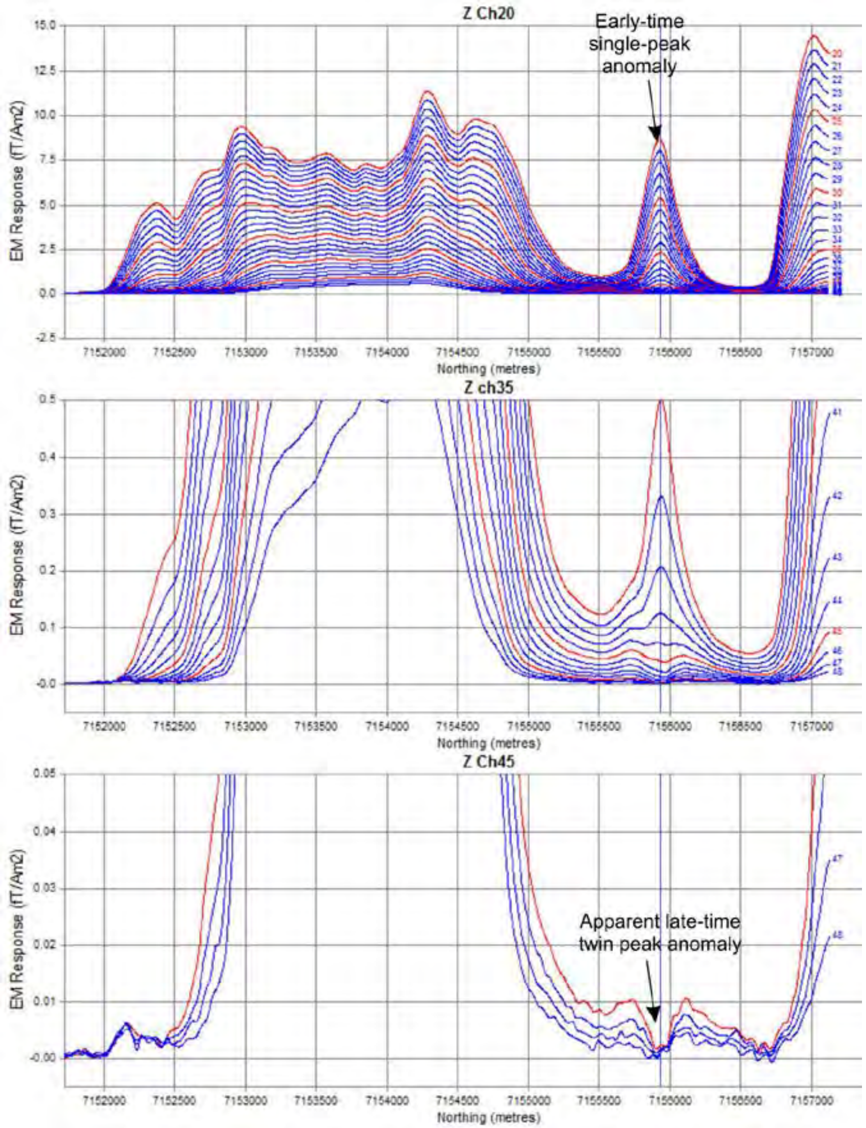
Anomaly picks have been made for both the dB/dt and B-field datasets. Generally there are more apparent bedrock responses in the B-field data that the dB/dt because the overburden response is less dominant in the former, and the amplitudes of larger time-constant anomalies are amplified relative to their dB/dt response. However, SPM anomalies and late-time noise is also amplified in the B-field data, so the confidence in an anomaly is dependent on its character in both the dB/dt and B-field datasets.

VTEM interpretation pitfalls

Fault response

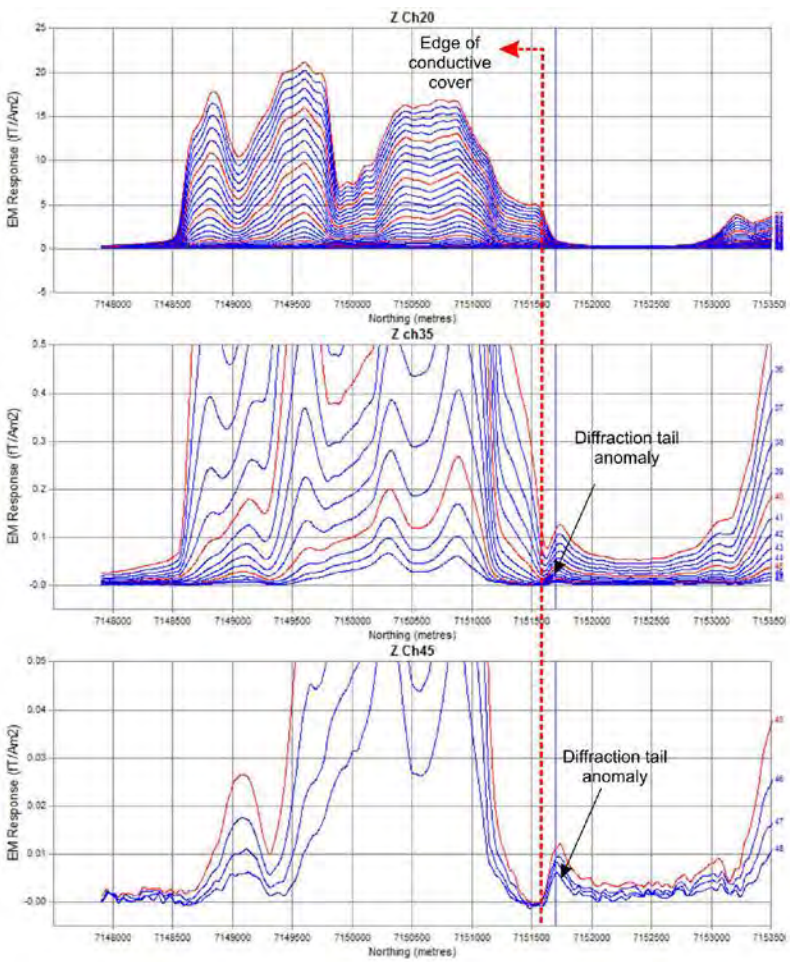
Often an early-time single peak due to weathering over the fault, migrating to a late-time negative IP effect.

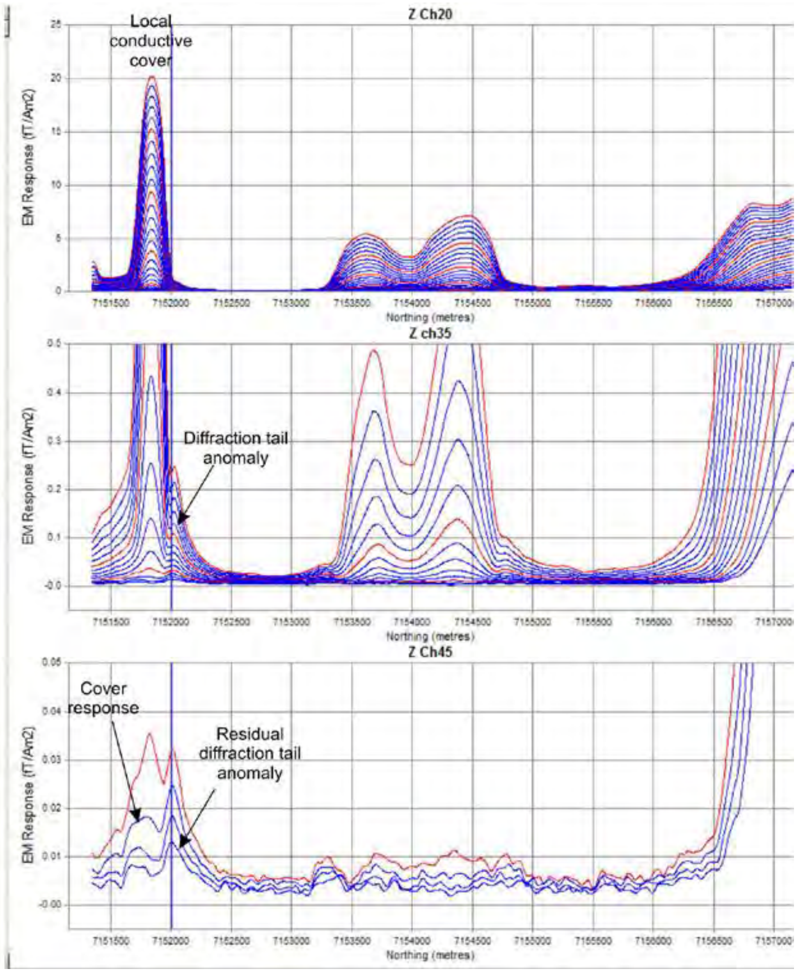
Where the IP response is not as strong as the enveloping EM response, it can produce apparent late-time twin-peak anomalies, or single asymmetric late-time anomalies on the flank of the early-time fault response.



VTEM interpretation pitfalls

Diffraction Tails -- always on the edge of early-time overburden response

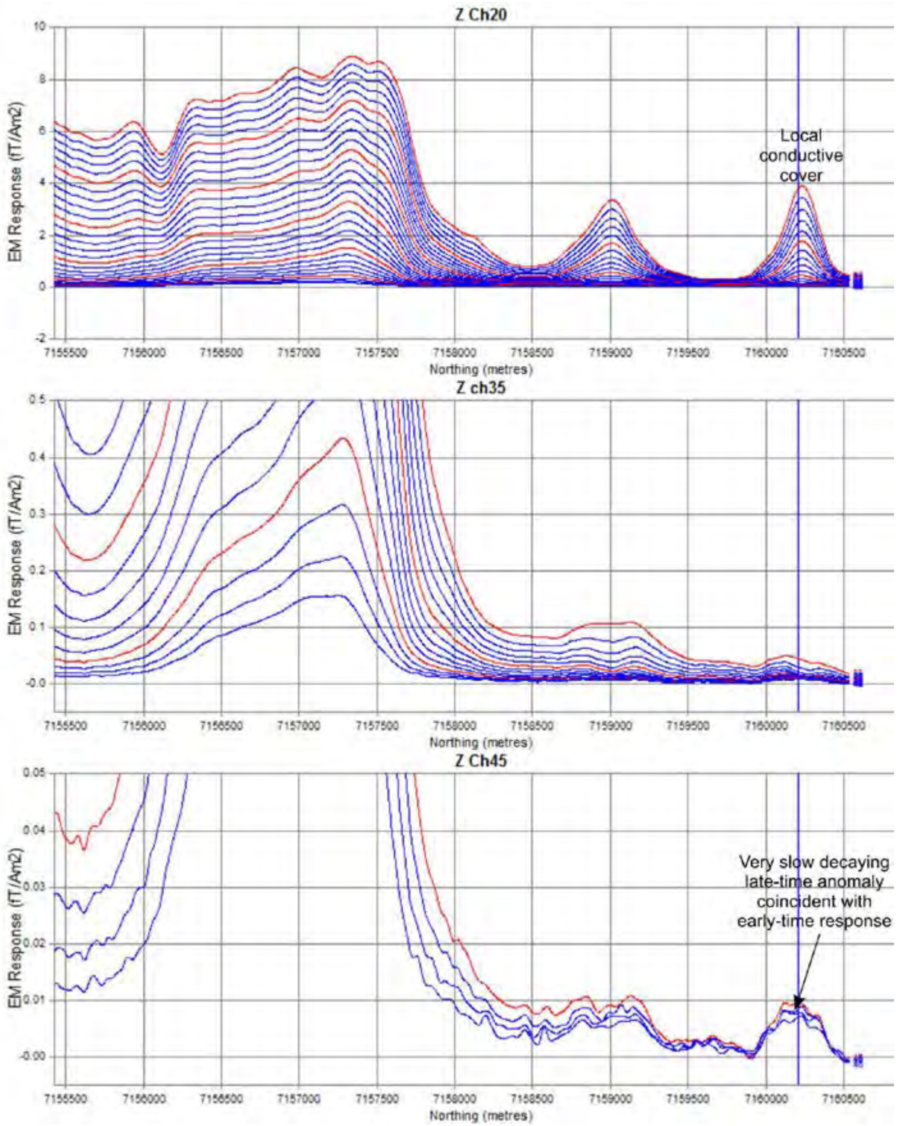




VTEM interpretation pitfalls

Late-time super-paramagnetism (SPM)

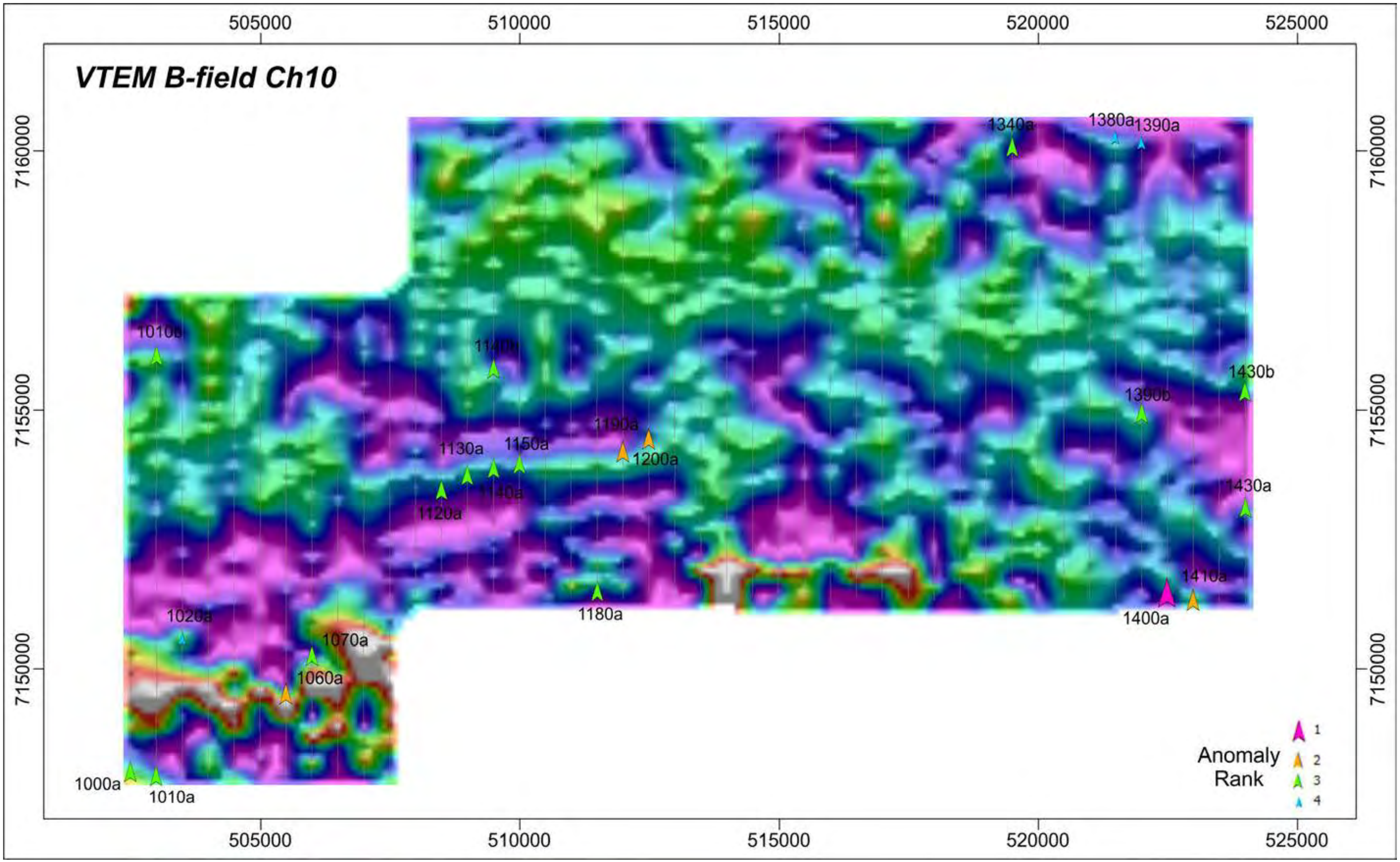
Often coincident with early-time cover response where fine-grained maghemite forms as part of the weathering process and accumulates in palaeochannels



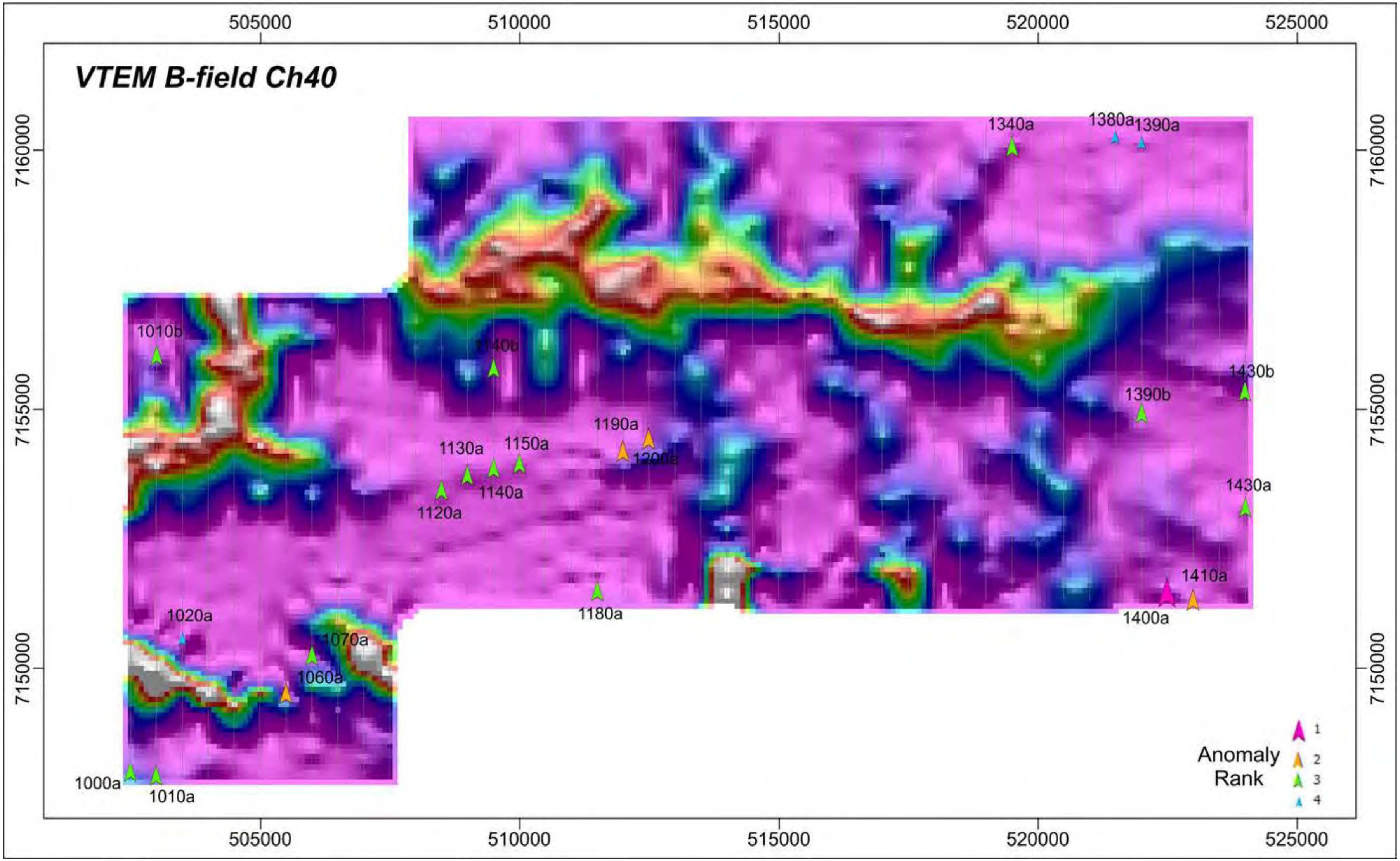
Musgrave Ranges Area 1

- The majority of the Area 1 of the Musgrave Ranges VTEM survey is masked by conductive cover (see Ch10 image on next slide). Fortunately by late times (Ch 40 image) the overburden response has attenuated except for around a broad east-west palaeochannel and it tributaries.
- Most late-time responses are located on the flanks of, or coincident with strong early-time responses, which suggests they are likely residual diffraction tails or SPM anomalies respectively.
- Only one anomaly appears to be a clear local bedrock conductor response (anomaly 1400a), but even this anomaly is adjacent to an early-time cover response -- i.e. in the position of a diffraction tail anomaly.
- Other moderately ranked anomalies (Rank 2) are in locations on the flanks of early-time cover responses, and could therefore represent diffraction tails; however the amplitude or wavelength of these anomalies is not typical of diffraction tail anomalies.

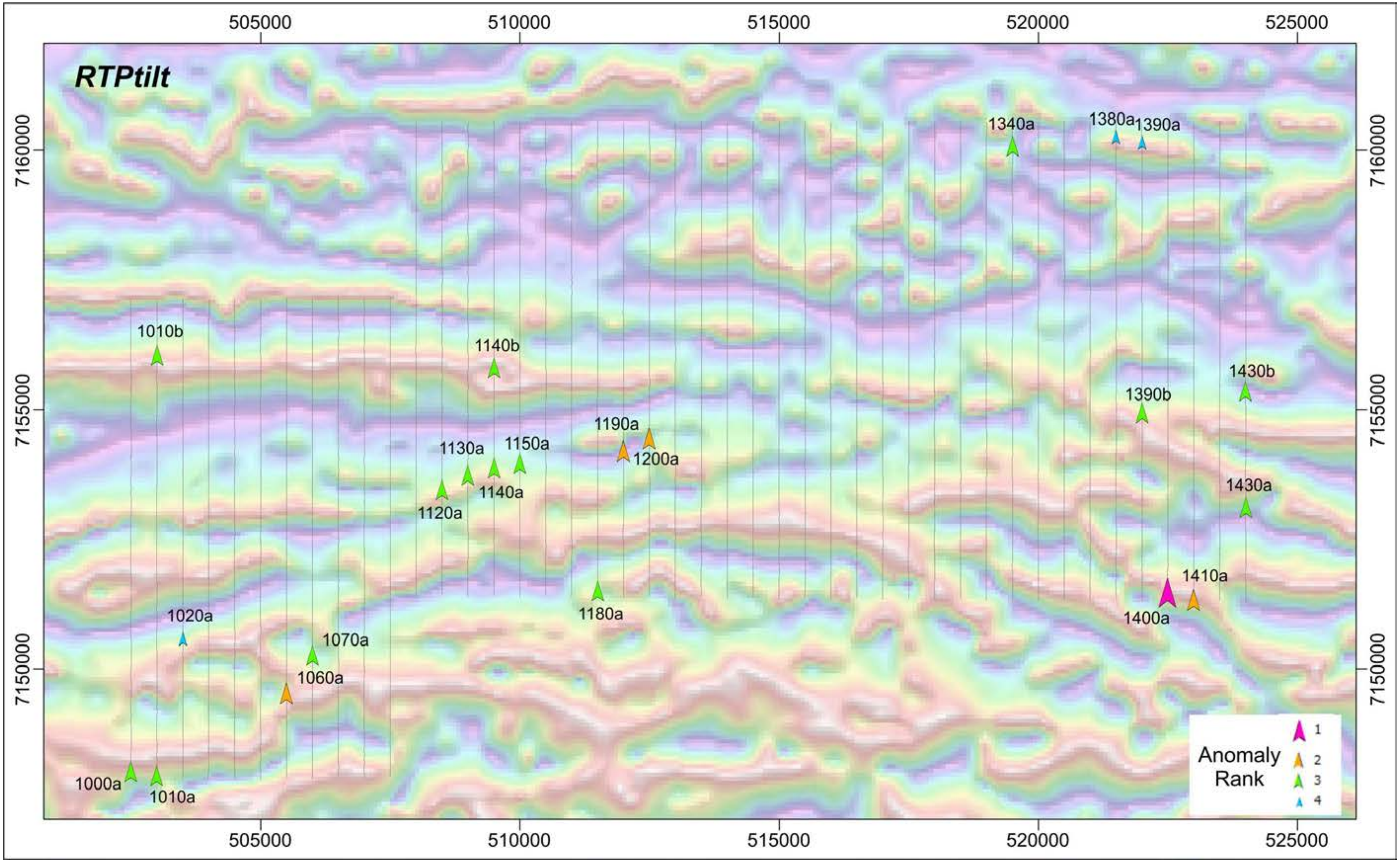
Musgrave Ranges Area 1



Musgrave Ranges Area 1



Musgrave Ranges Area 1

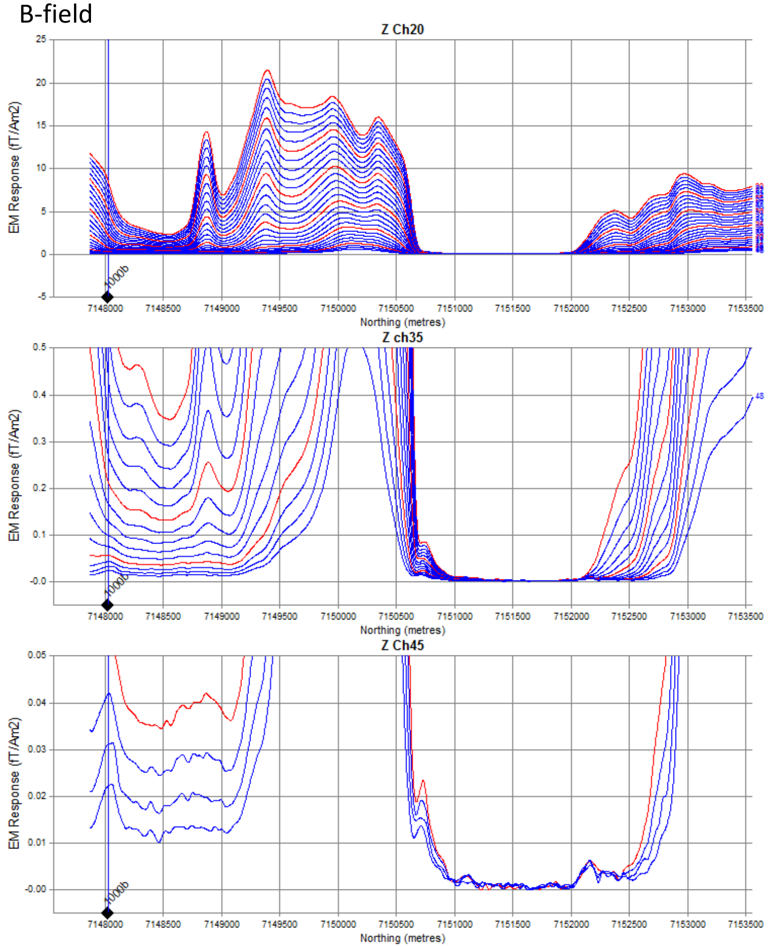


Musgrave Area 1 Anomalies

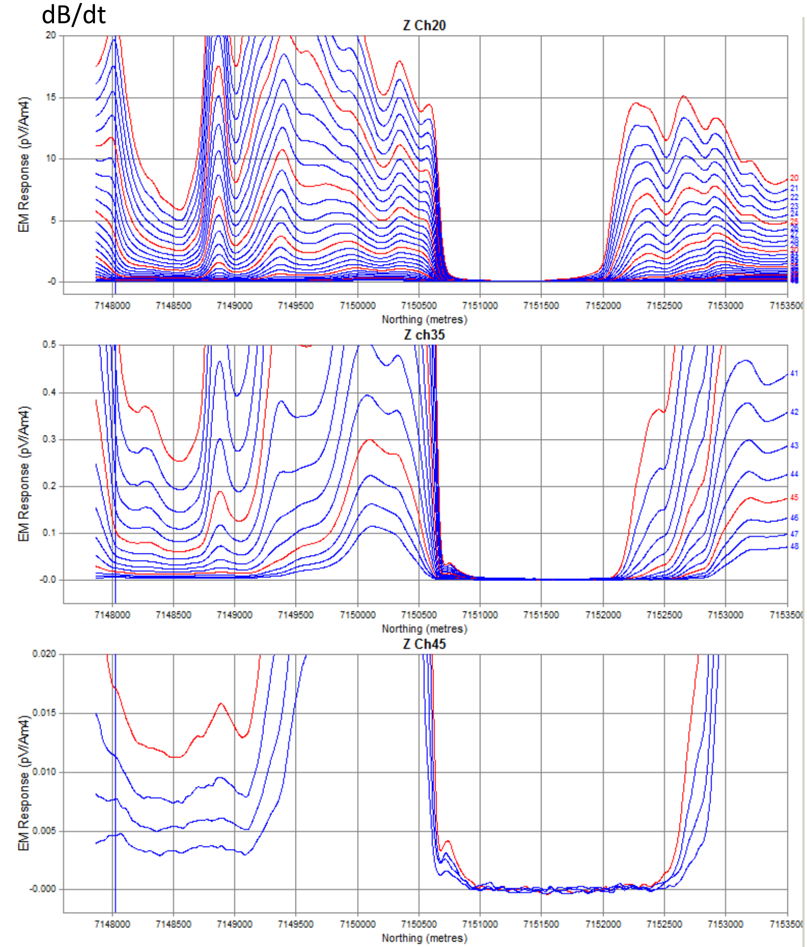
Anomaly 1000a

- Local late-time anomaly B-field anomaly
- Not a compelling anomaly in the dB/dt data
- On southern contact of magnetic body
- Tenuous anomaly = Rank 3

B-field



dB/dt

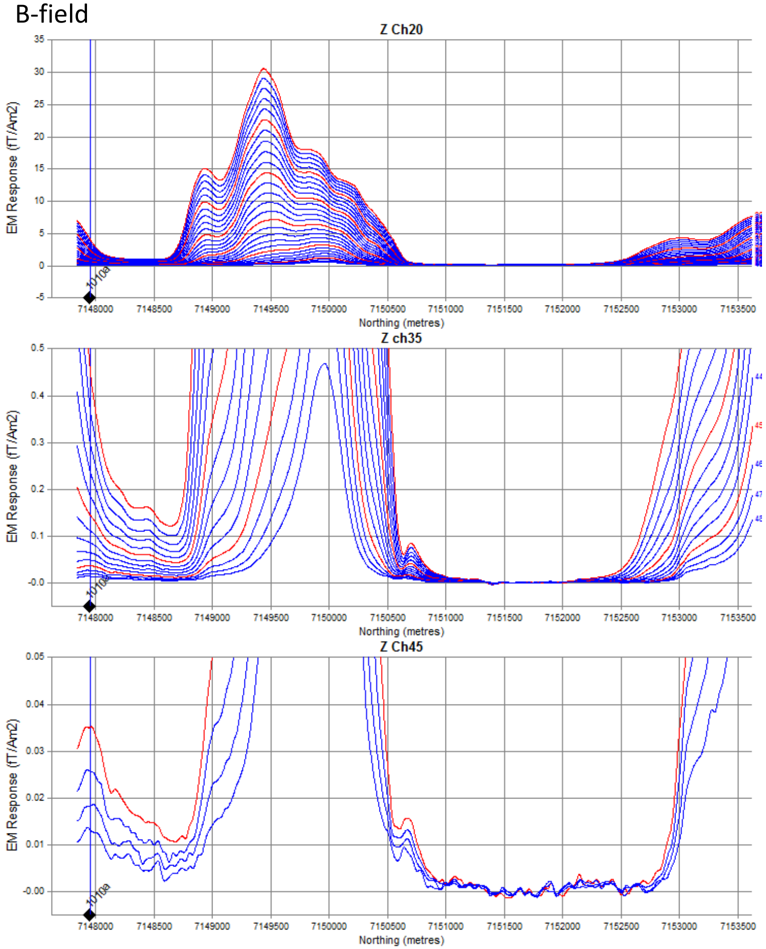


Musgrave Area 1 Anomalies

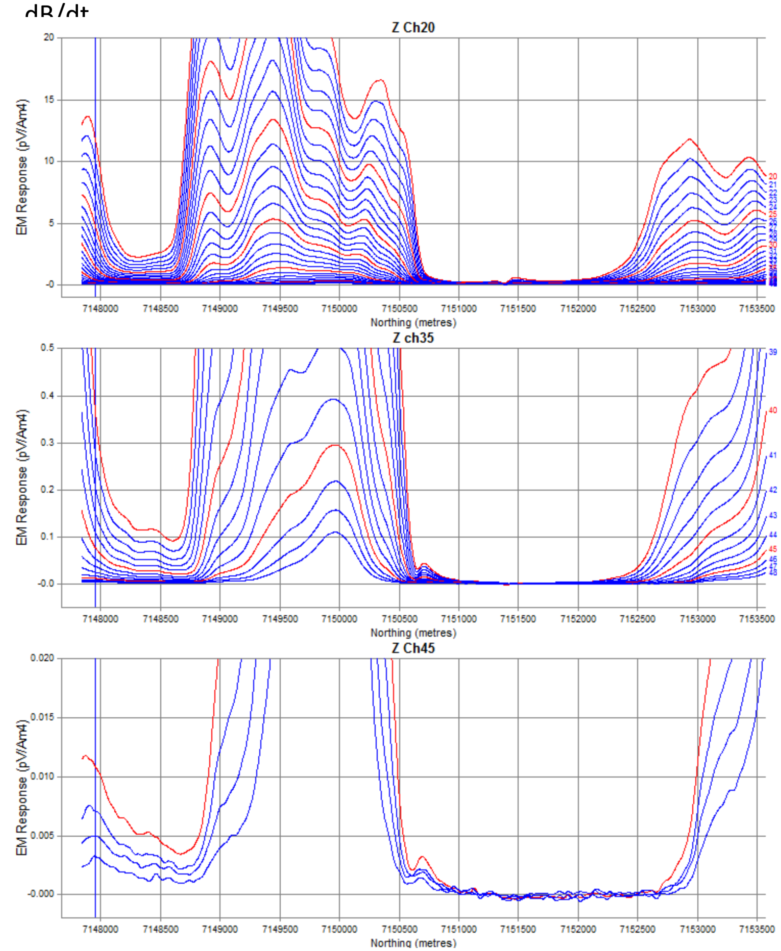
Anomaly 1010a

- Local late-time anomaly in B-field & dB/dt
- Possible residual diffraction tail
- On southern contact of magnetic body
- Tenuous anomaly = Rank 3

B-field



dB/dt

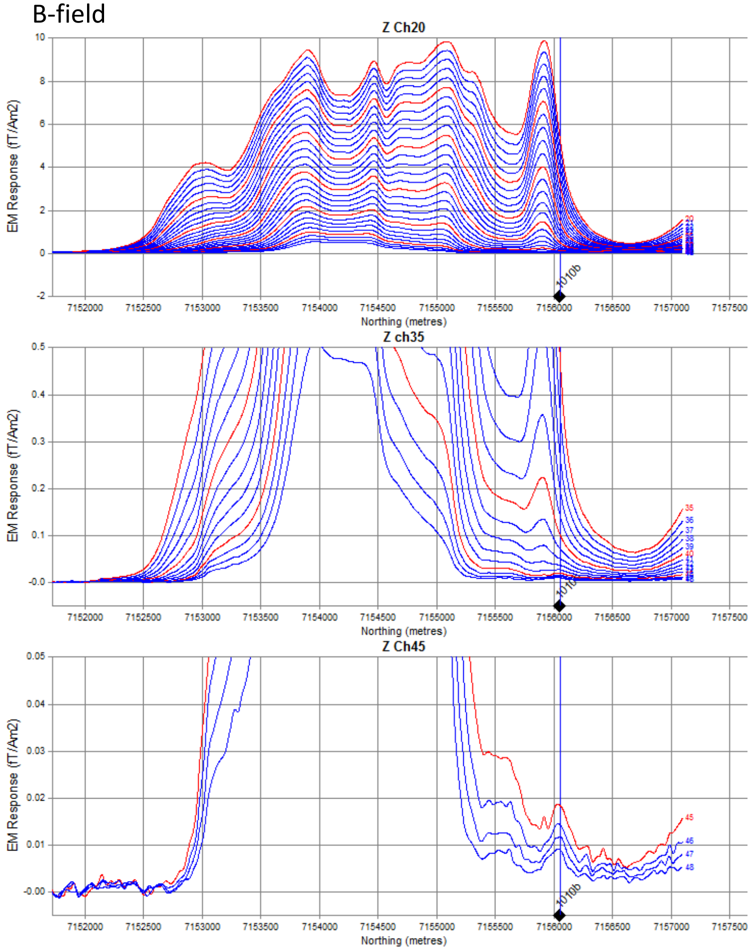


Musgrave Area 1 Anomalies

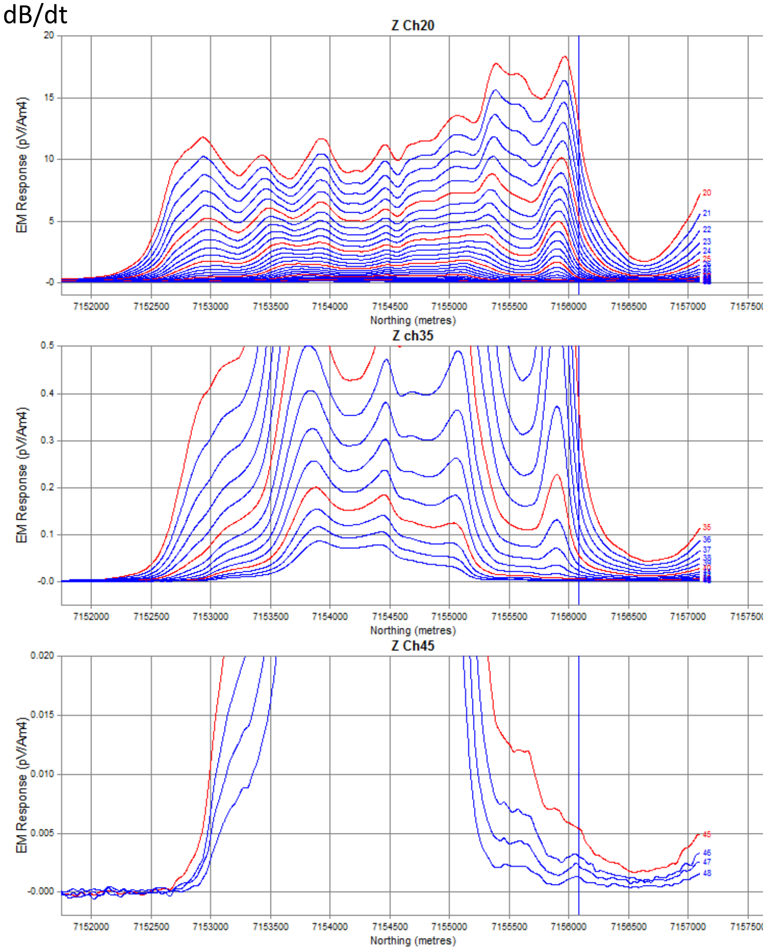
Anomaly 1010b

- Local late-time anomaly in B-field and dB/dt
- Possible residual diffraction tail
- On southern contact of linear magnetic anomaly
- Tenuous anomaly = Rank 3

B-field



dB/dt

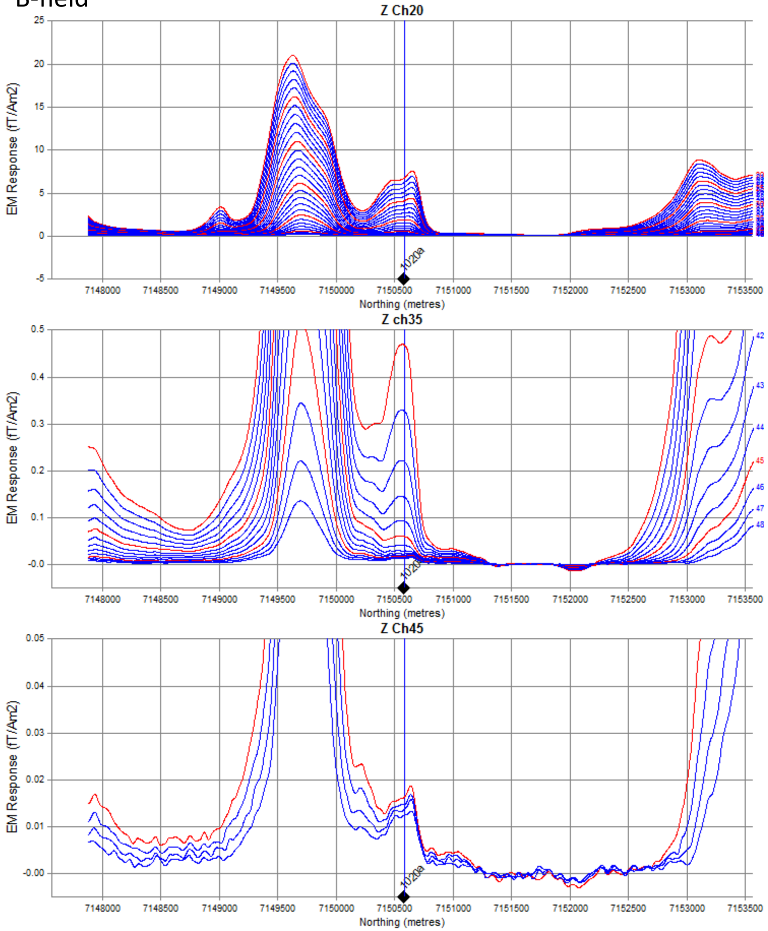


Musgrave Area 1 Anomalies

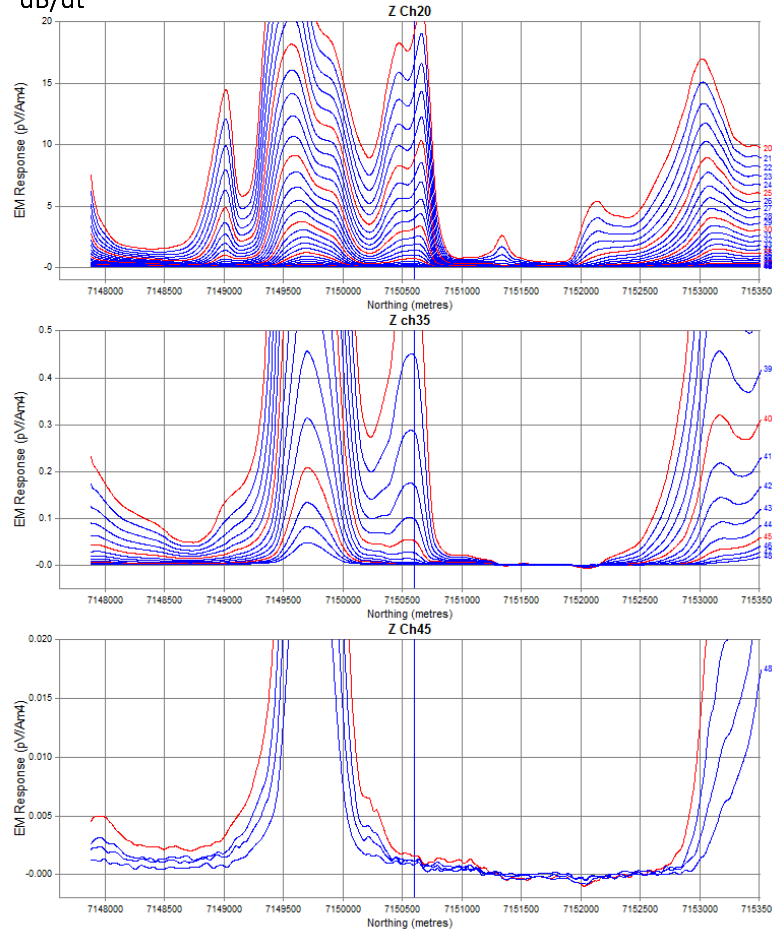
Anomaly 1020a

- Local late-time anomaly in B-field
- Suspicious decay -- possible SPM
- Not supported by dB/dt data
- Very tenuous anomaly = Rank 4

B-field



dB/dt

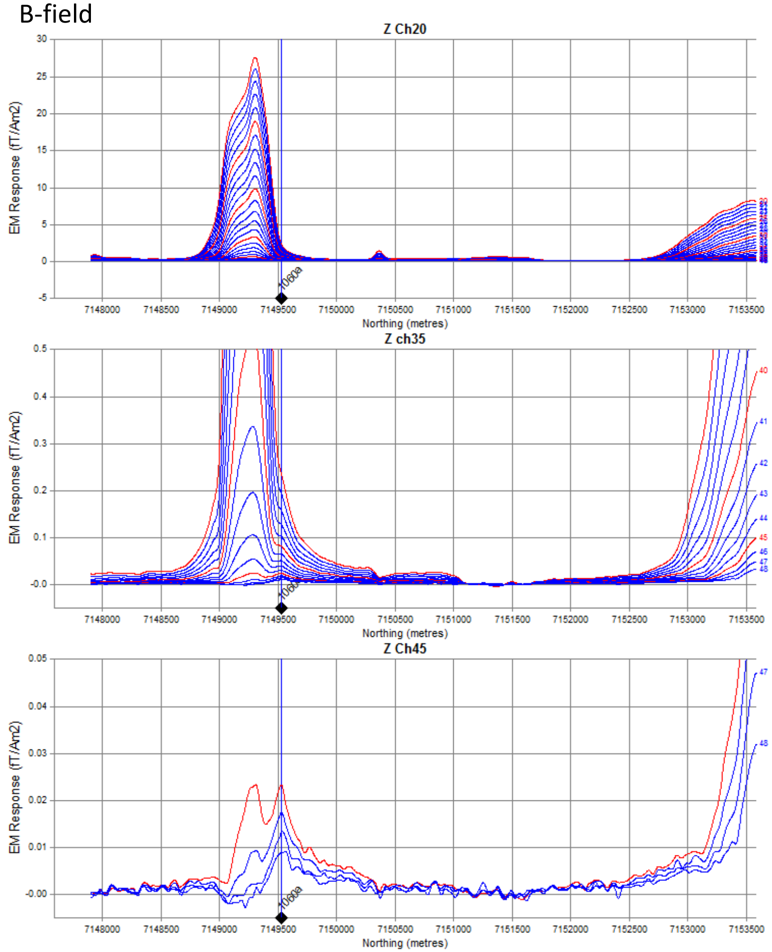


Musgrave Area 1 Anomalies

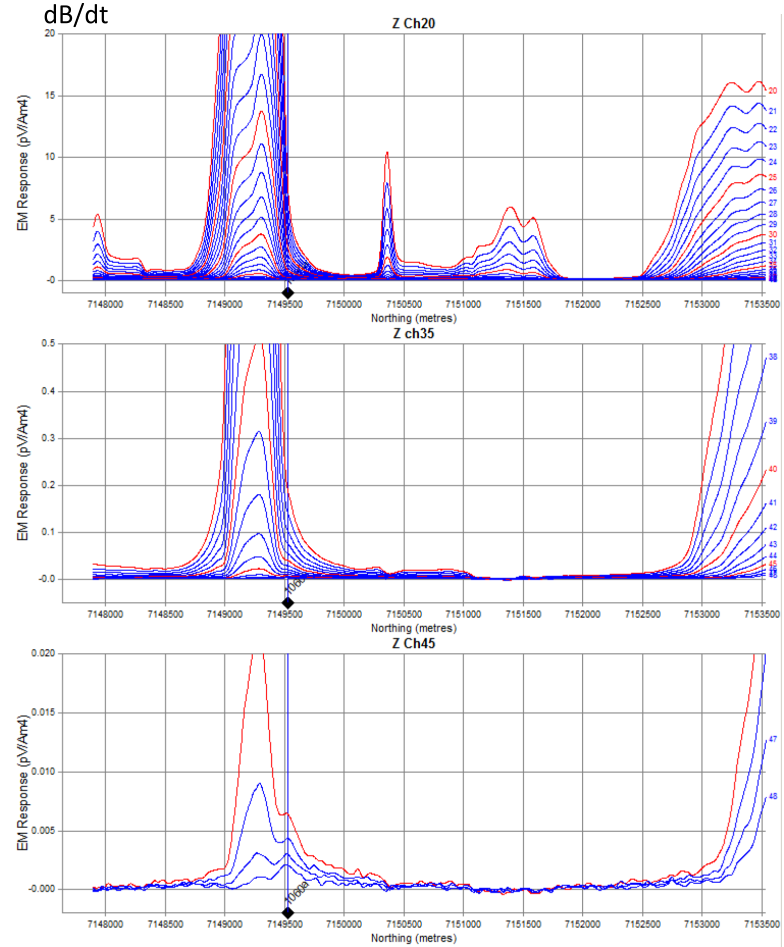
Anomaly 1060a

- Shielded late-time anomaly in B-field & dB/dt
- Possible residual diffraction tail
- On southern contact of magnetic body
- Possible valid bed rock response = Rank 2

B-field



dB/dt

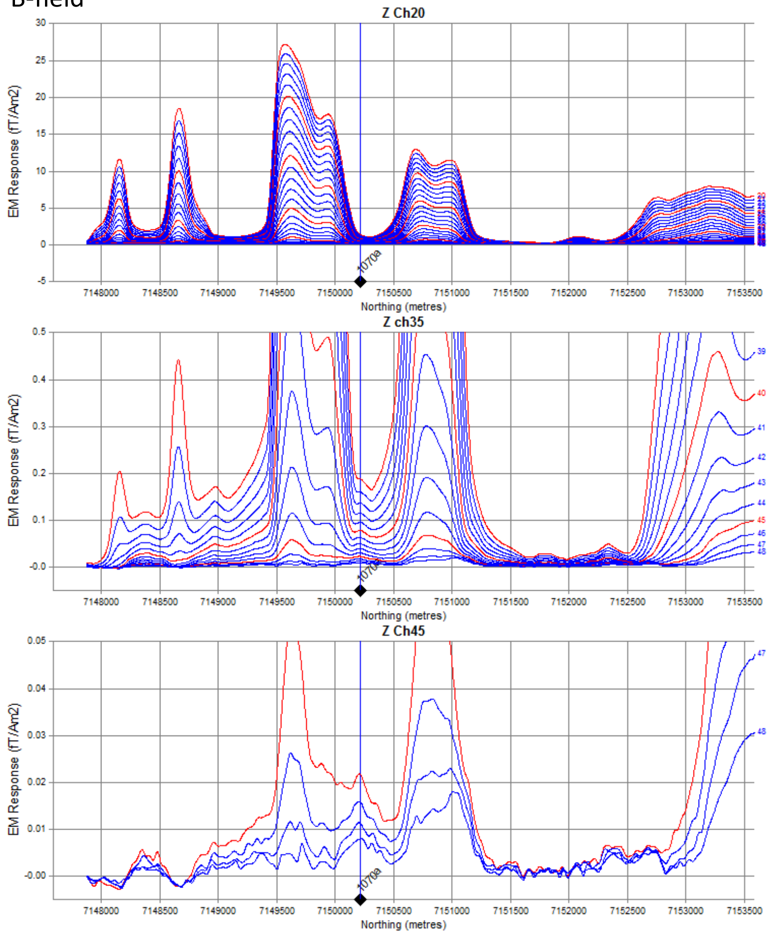


Musgrave Area 1 Anomalies

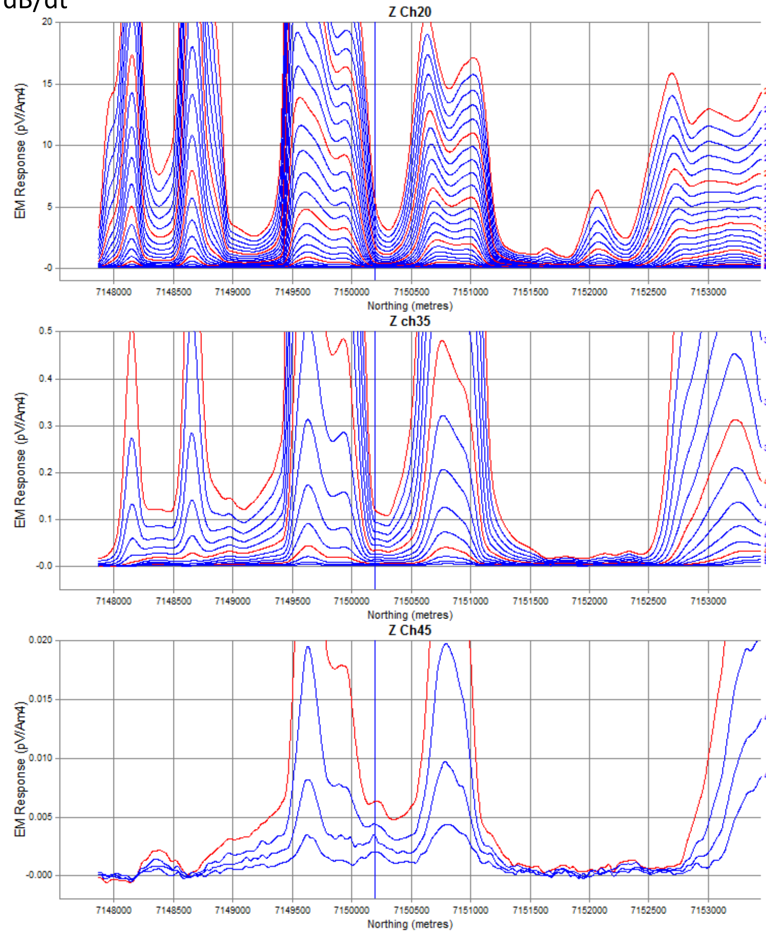
Anomaly 1070a

- Shielded late-time anomaly in B-field & dB/dt
- Possible residual diffraction tail
- On southern contact of magnetic body
- Tenuous anomaly = Rank 3

B-field



dB/dt

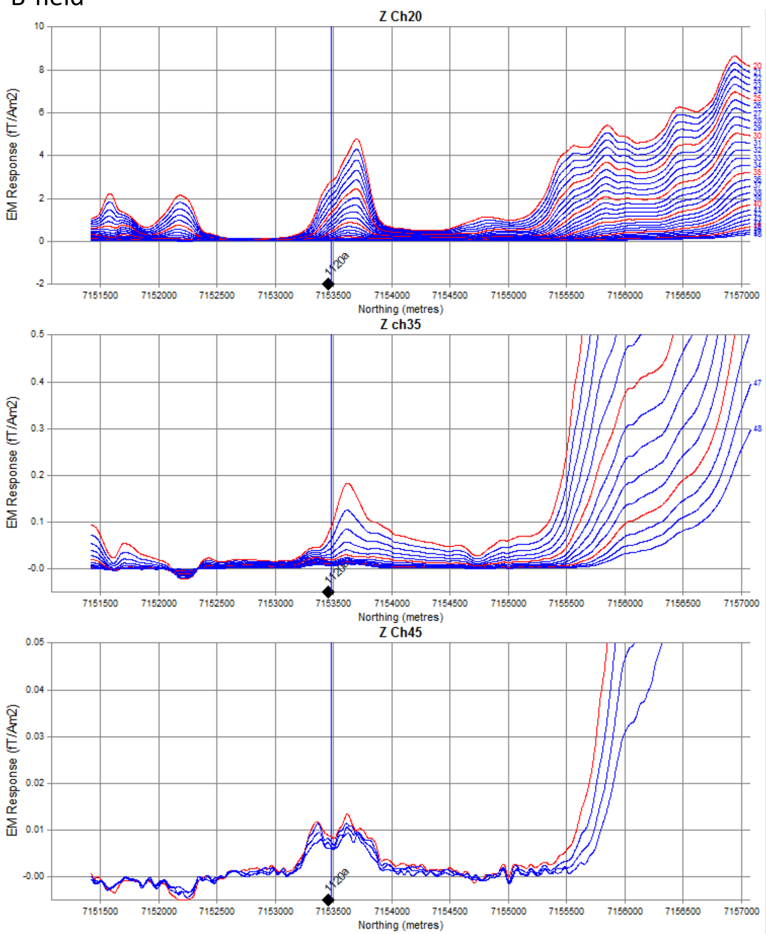


Musgrave Area 1 Anomalies

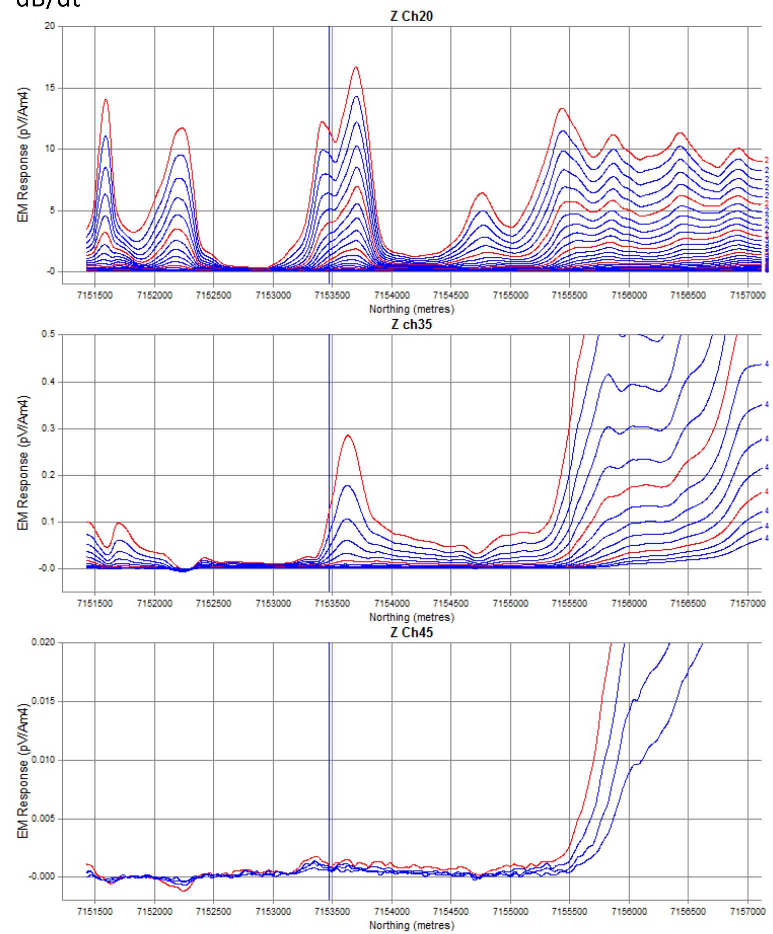
Anomaly 1120a

- Late-time twin-peak anomaly in B-field
- Suspicious decay -- possible SPM
- On southern contact of magnetic body
- Tenuous anomaly = Rank 3

B-field



dB/dt

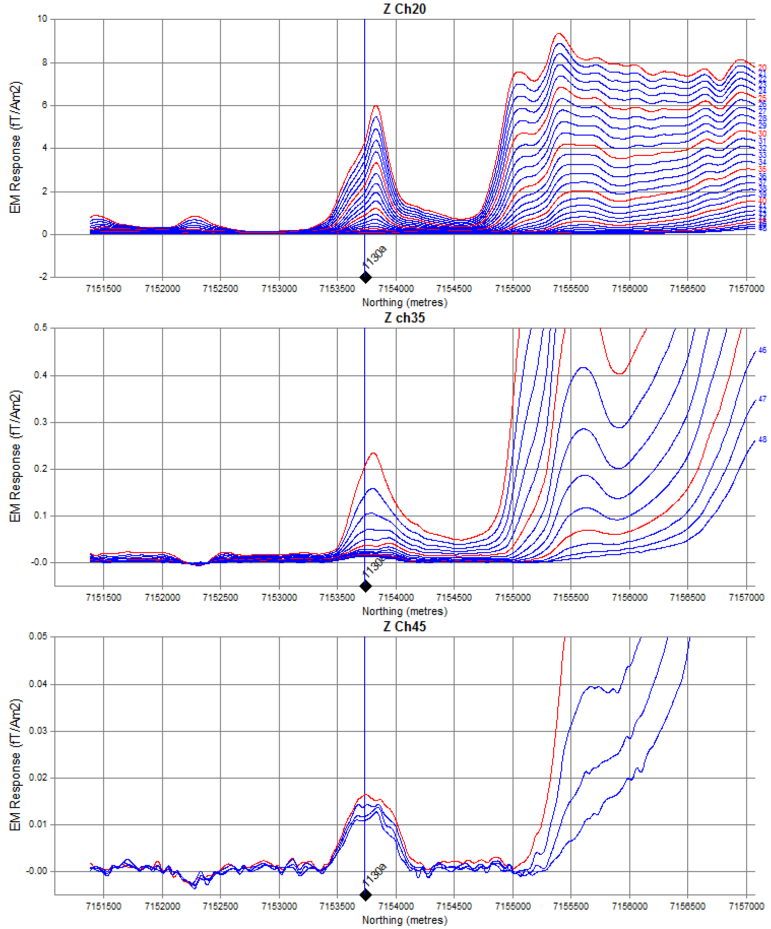


Musgrave Area 1 Anomalies

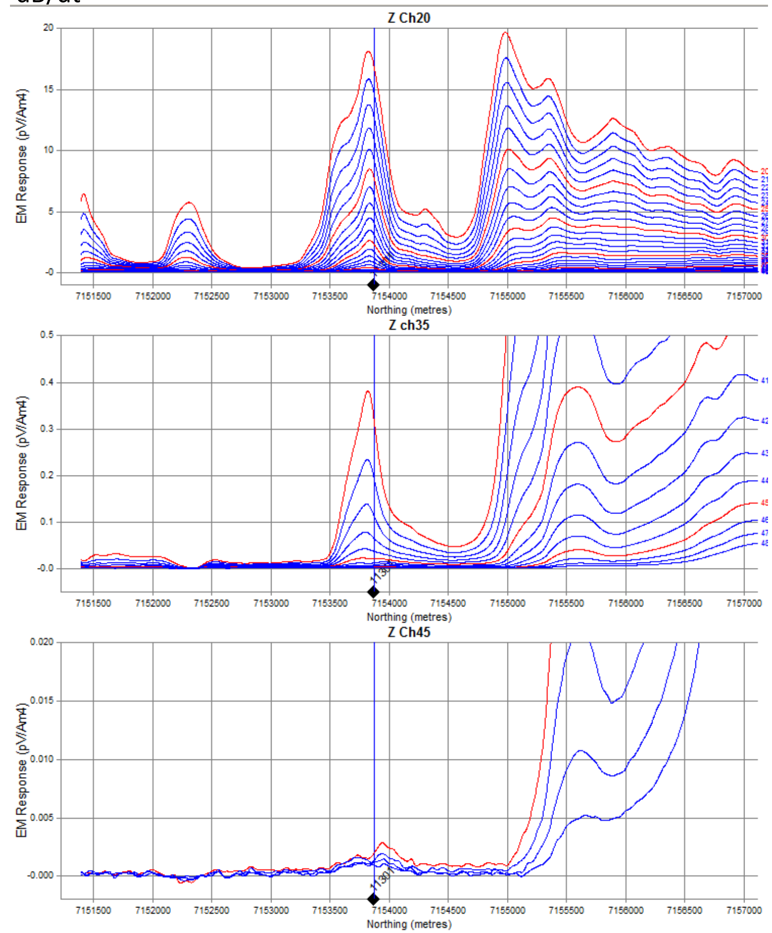
Anomaly 1130a

- Late-time anomaly in B-field & dB/dt
- Suspicious decay -- possible SPM
- On southern contact of magnetic body
- Tenuous anomaly = Rank 3

B-field



dB/dt

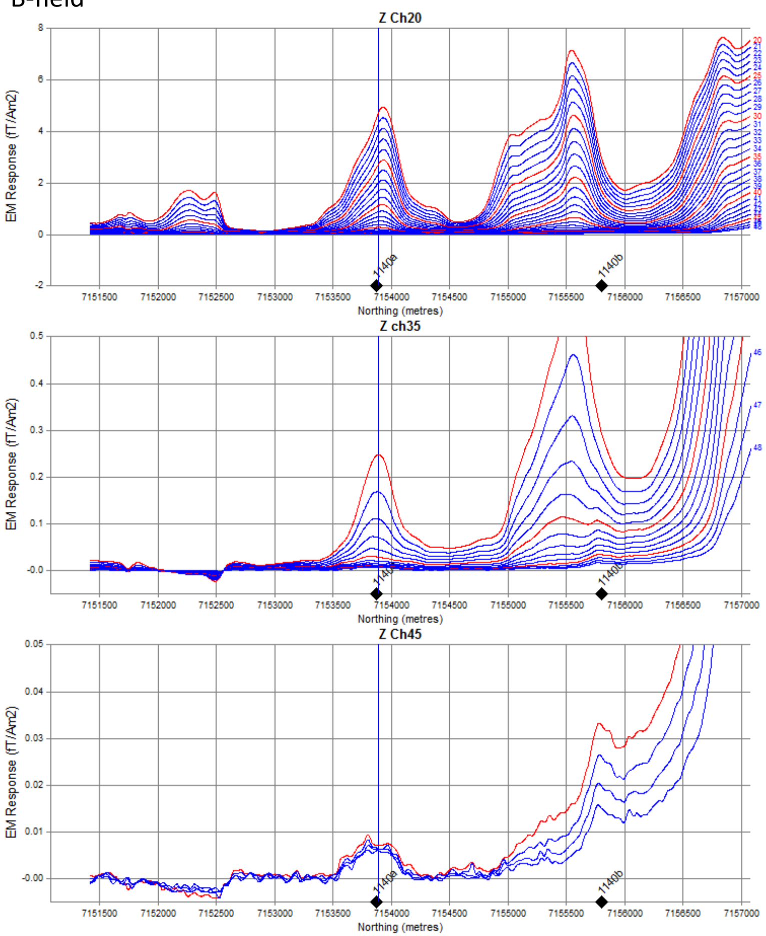


Musgrave Area 1 Anomalies

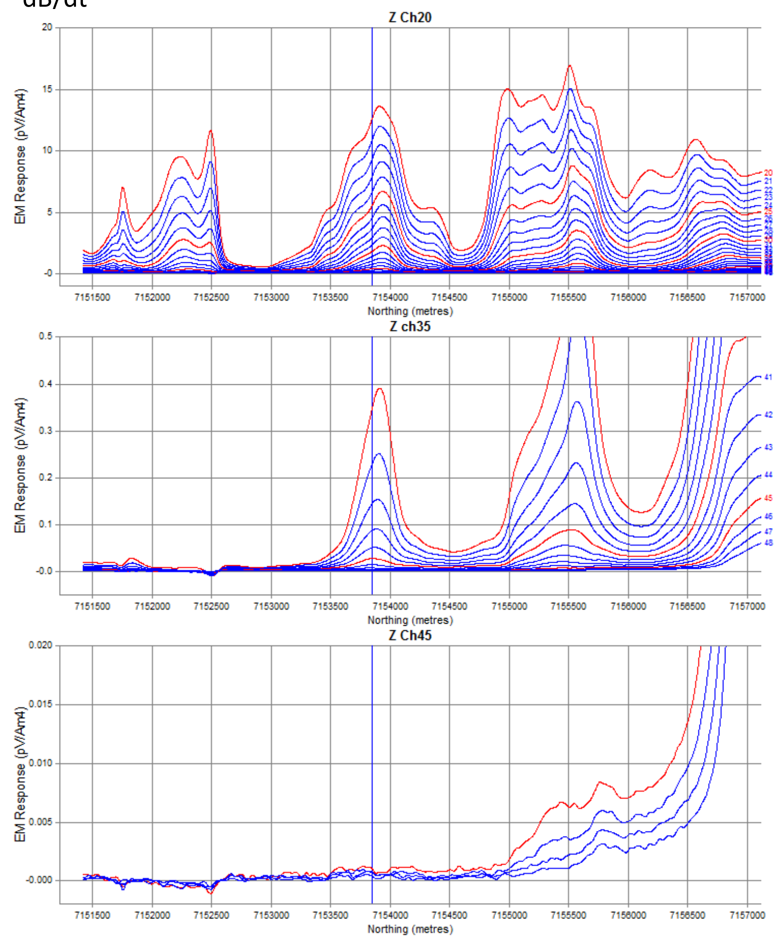
Anomaly 1140a

- Late-time anomaly in B-field. No dB/dt
- Suspicious decay -- possible SPM
- On southern contact of magnetic body (Giles?)
- Tenuous anomaly = Rank 3

B-field



dB/dt

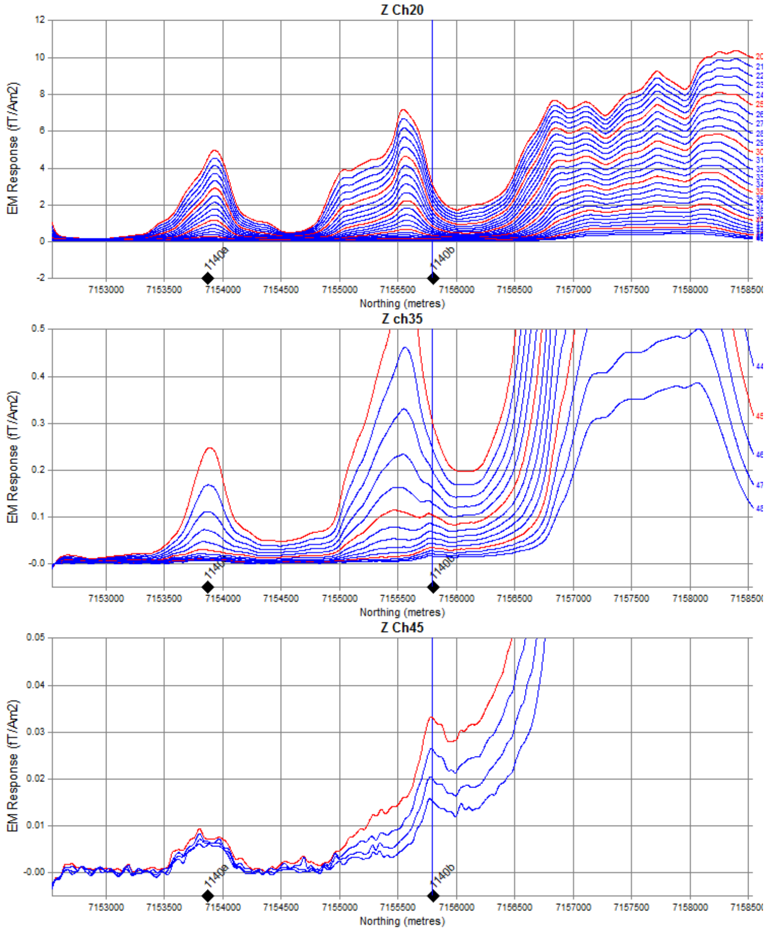


Musgrave Area 1 Anomalies

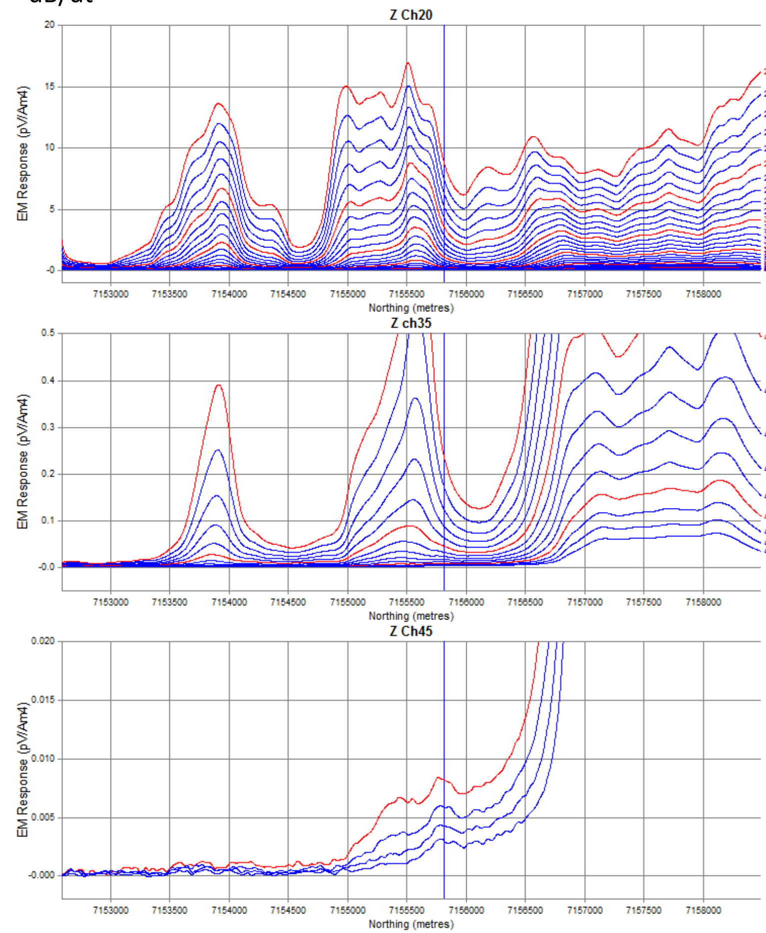
Anomaly 1140b

- Late-time anomaly in B-field and dB/dt
- Possible residual diffraction tail
- South of linear magnetic anomaly
- Tenuous anomaly = Rank 3

B-field



dB/dt

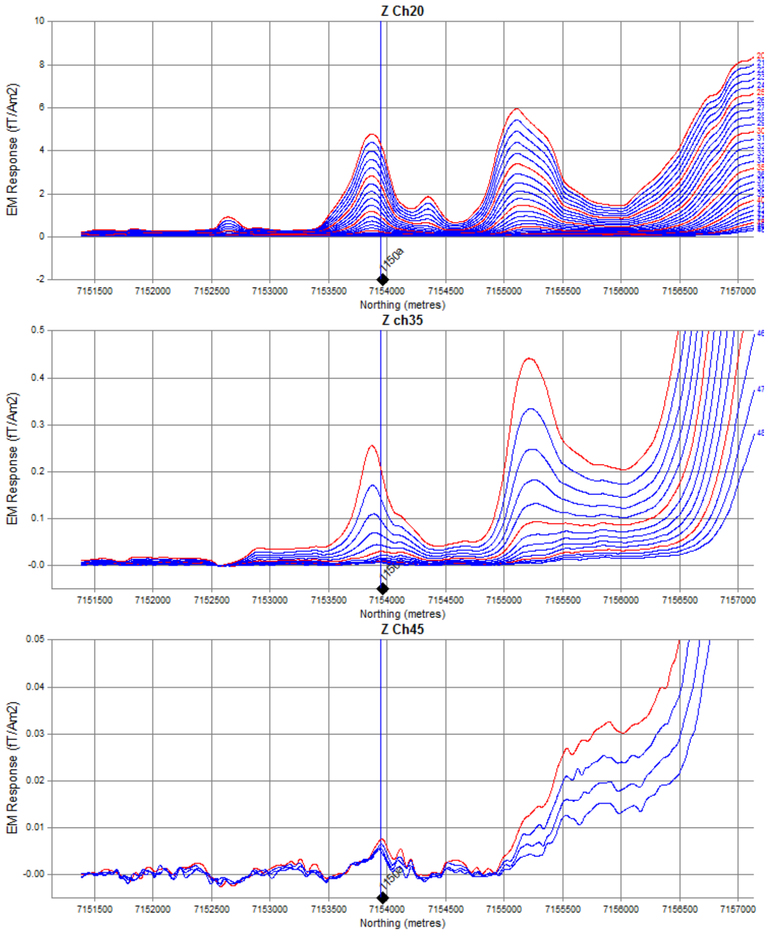


Musgrave Area 1 Anomalies

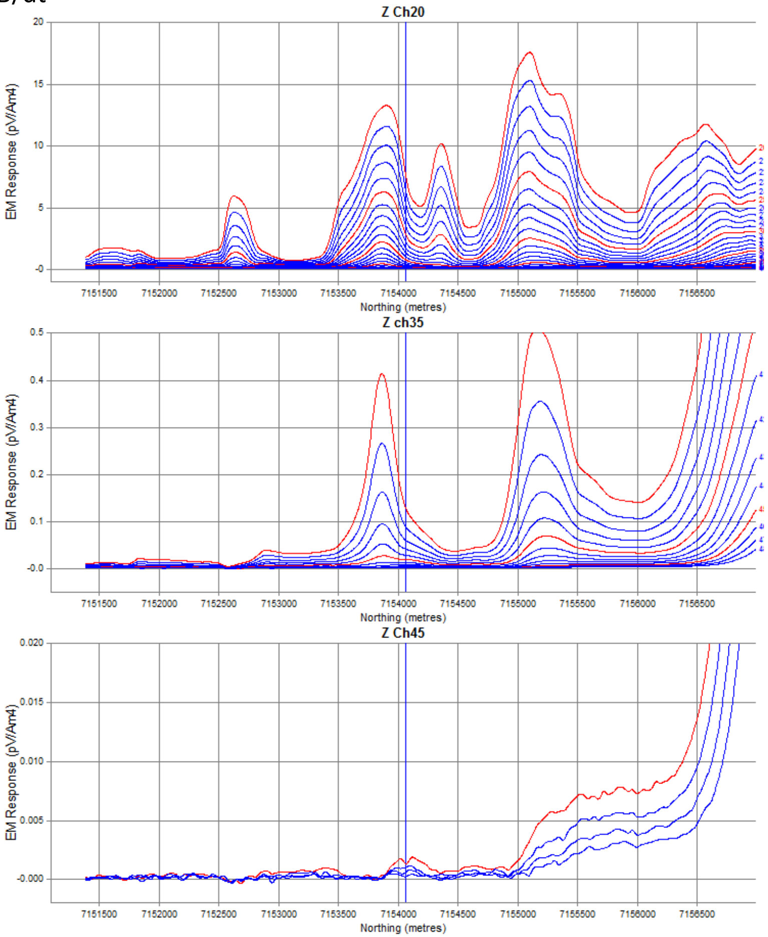
Anomaly 1150a

- Apparent late-time in B-field and dB/dt
- Suspicious decay -- possible SPM
- On southern contact of magnetic body
- Tenuous anomaly = Rank 3

B-field



dB/dt

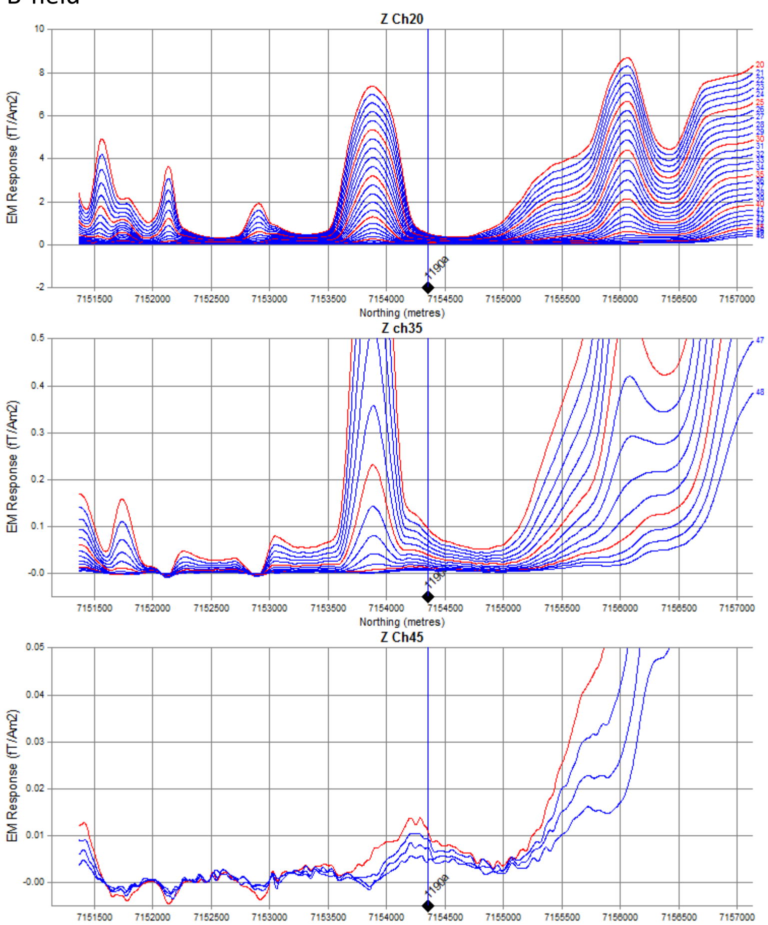


Musgrave Area 1 Anomalies

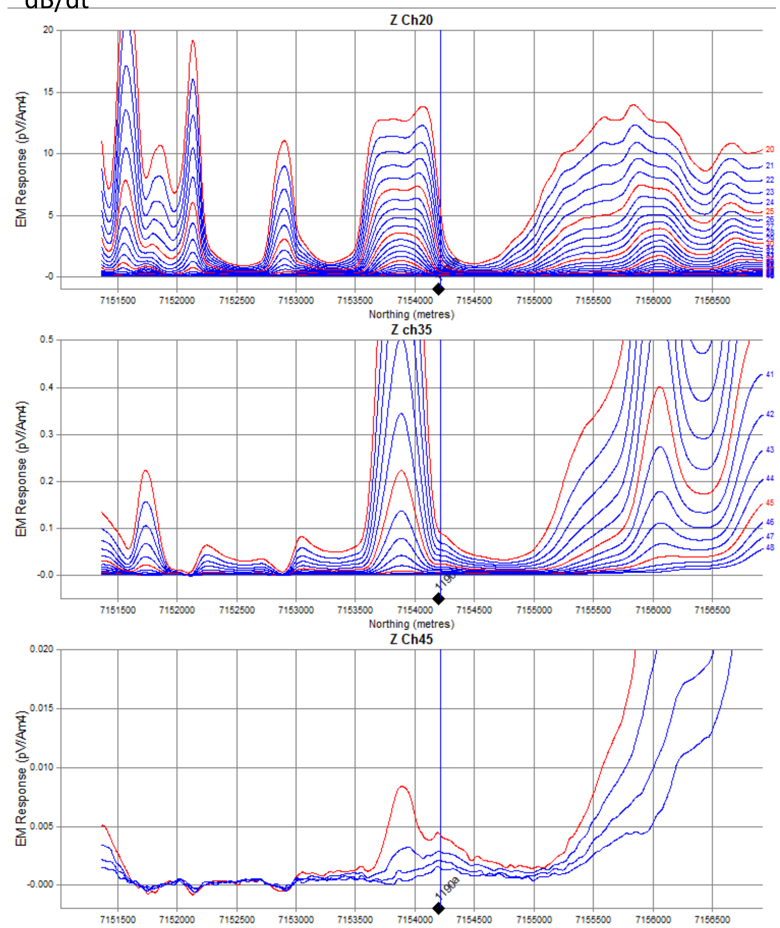
Anomaly 1190a

- Broad late-time anomaly in B-field and dB/dt
- In diffraction-tail position on flank of cover
- Not a typical diffraction-tail character
- Possible deep conductor = Rank 2

B-field



dB/dt

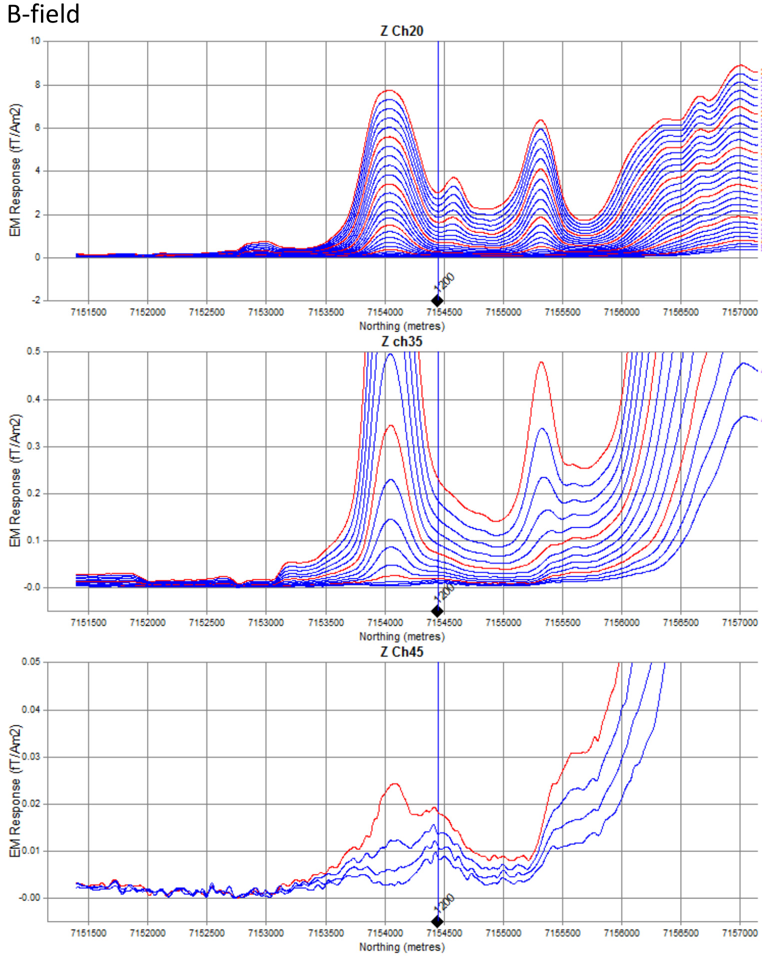


Musgrave Area 1 Anomalies

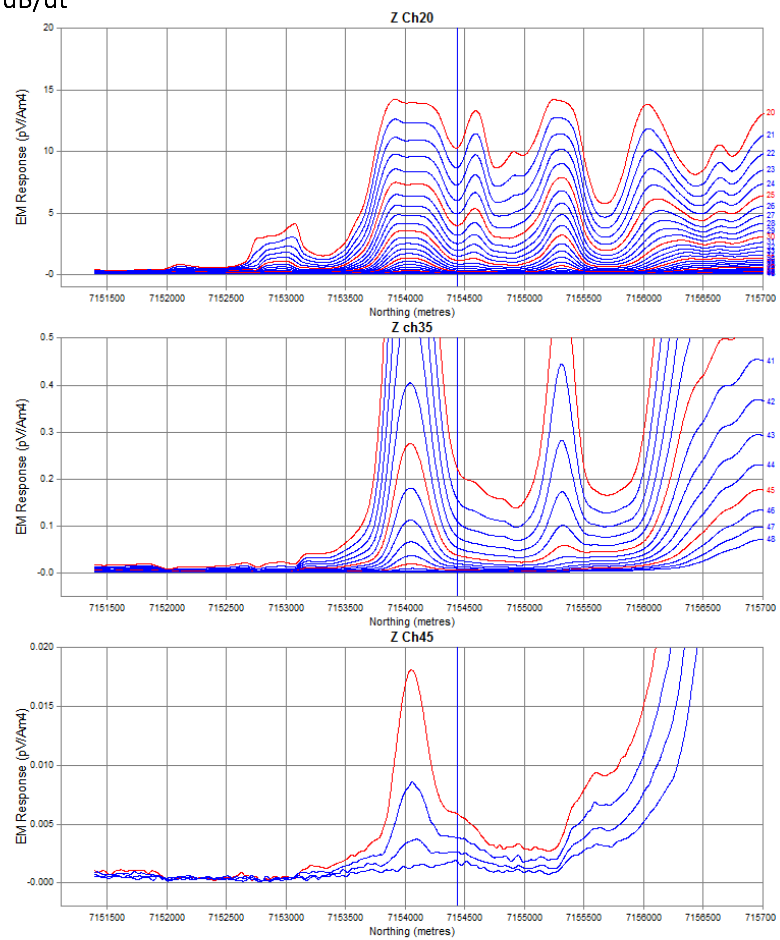
Anomaly 1200a

- Broad late-time anomaly in B-field and dB/dt
- In diffraction-tail position on flank of cover
- Not a typical diffraction-tail character
- Possible deep conductor = Rank 2

B-field



dB/dt

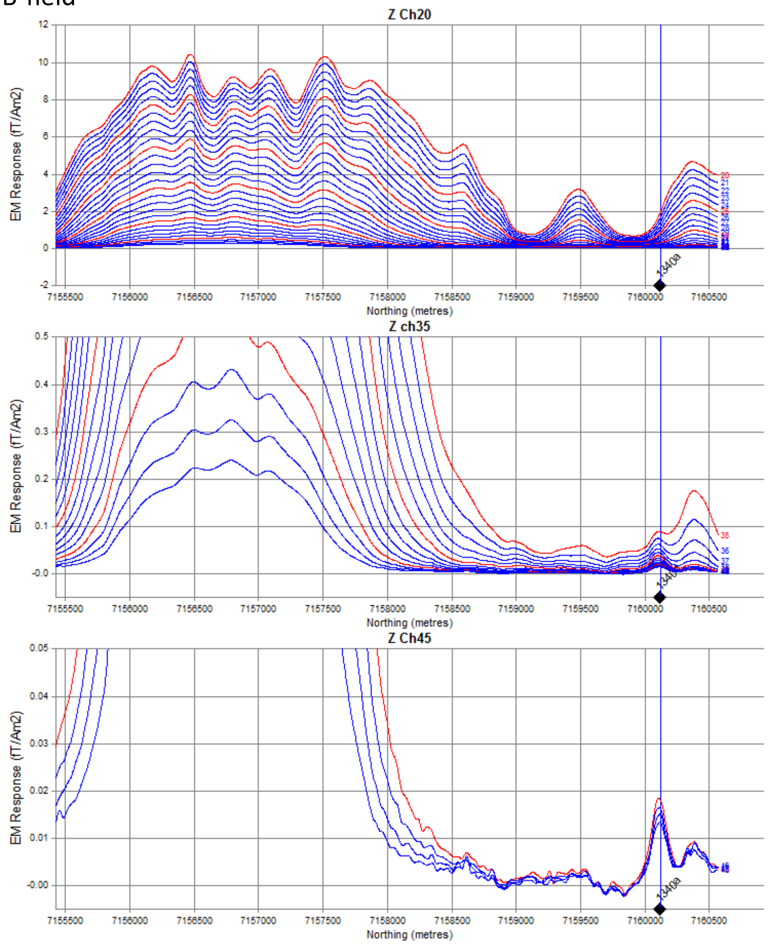


Musgrave Area 1 Anomalies

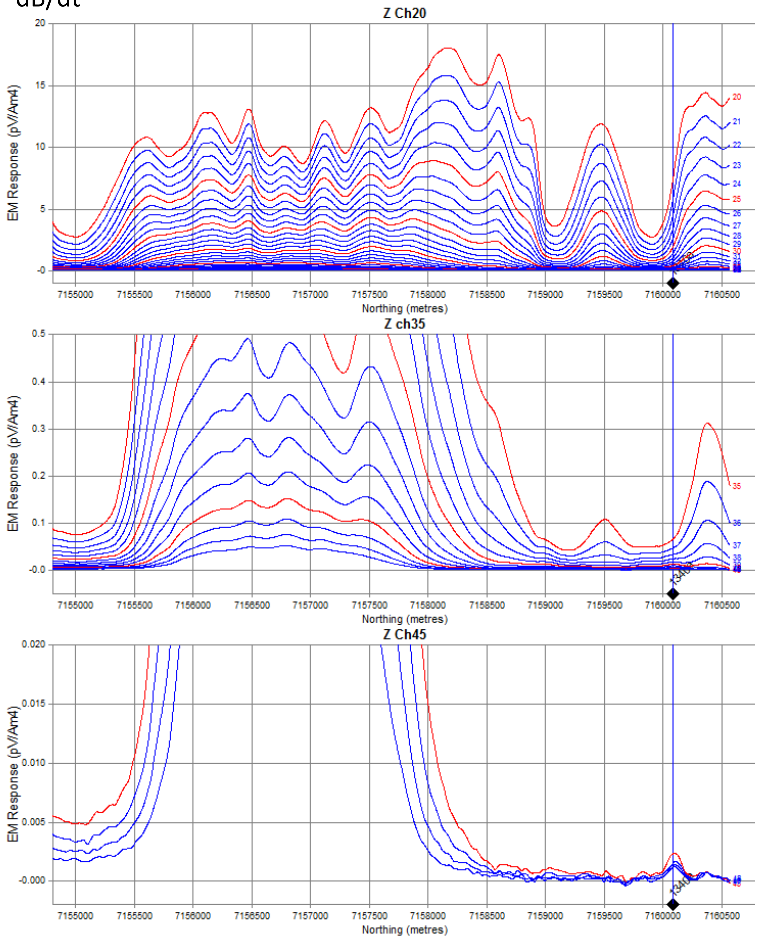
Anomaly 1340a

- Local late-time anomaly in B-field and dB/dt
- Possible wind-related noise
- No compelling support from magnetics
- Tenuous anomaly = Rank 3

B-field



dB/dt

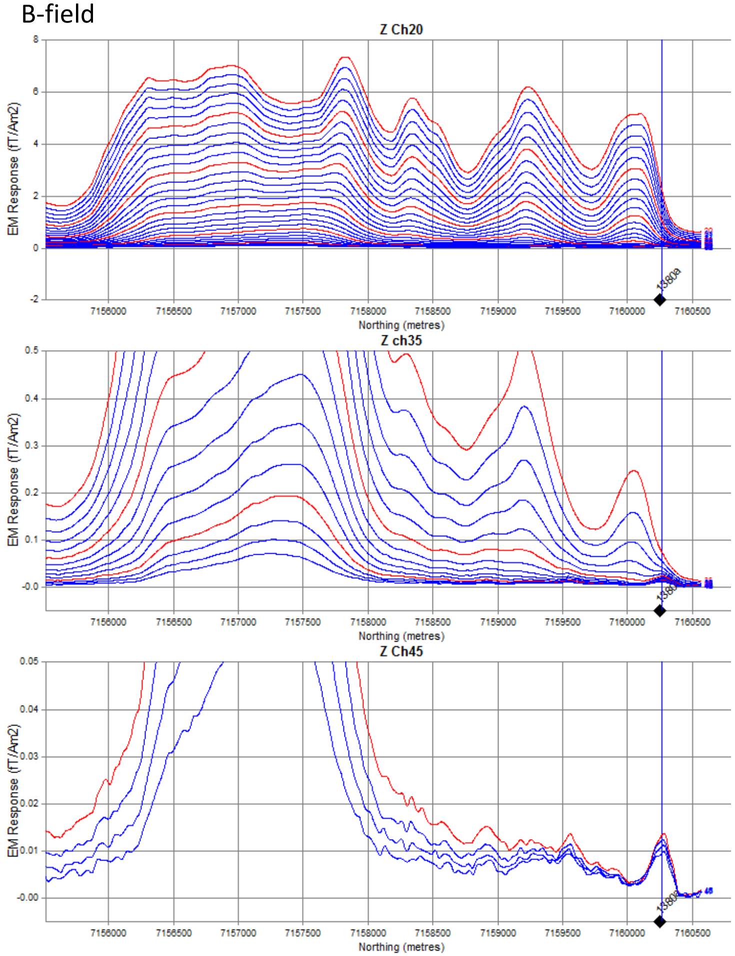


Musgrave Area 1 Anomalies

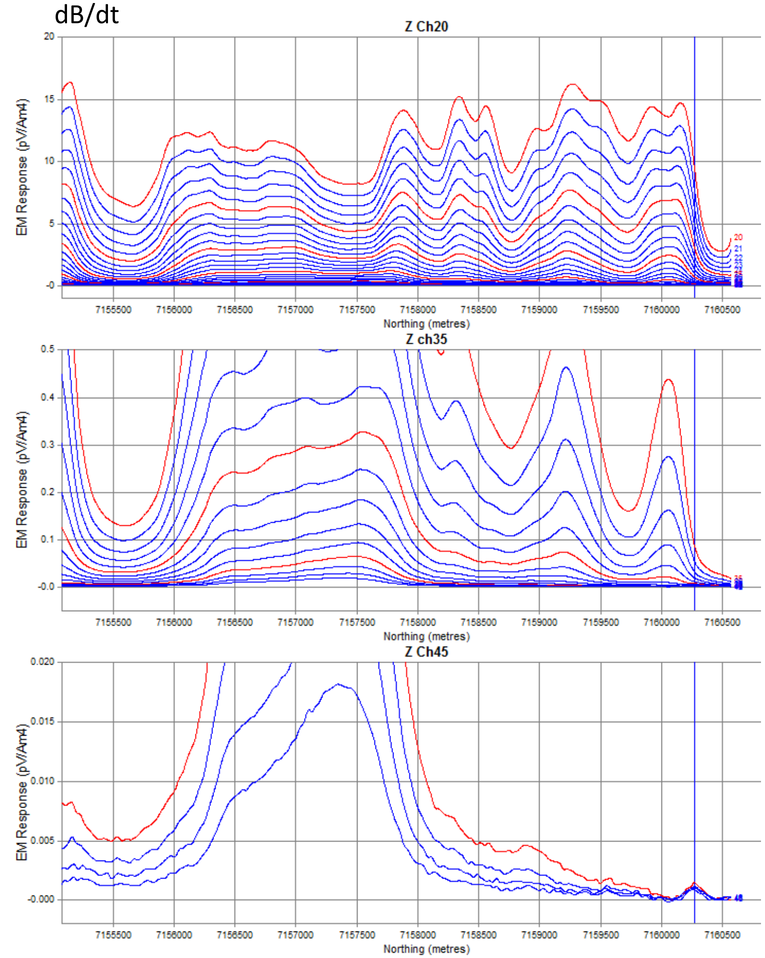
Anomaly 1380a

- Local late-time anomaly in B-field and dB/dt
- Possible wind-related noise
- No compelling support from magnetics
- Very tenuous anomaly = Rank 4

B-field



dB/dt

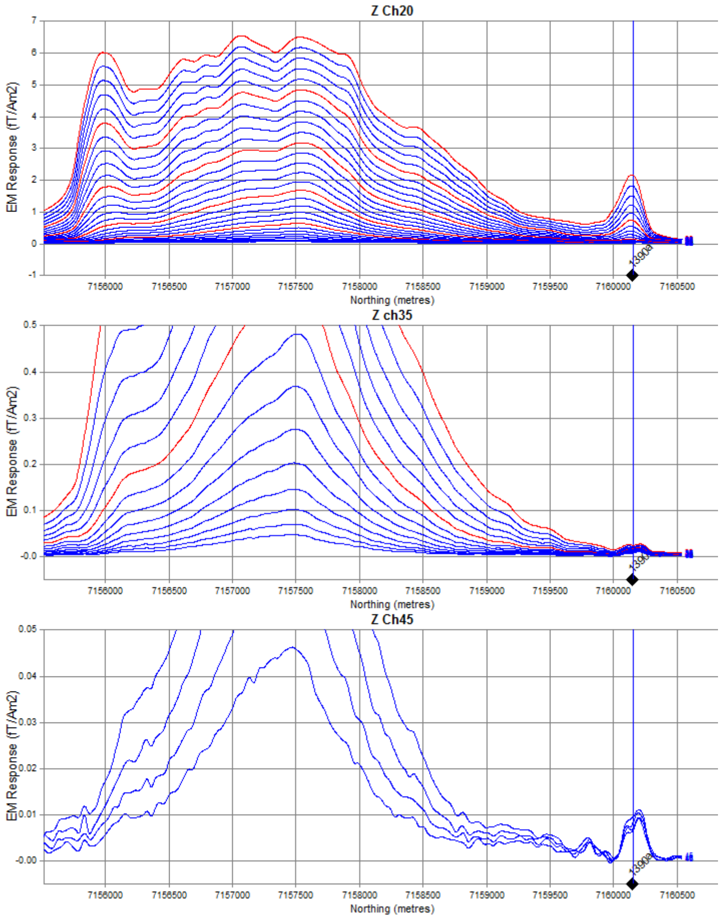


Musgrave Area 1 Anomalies

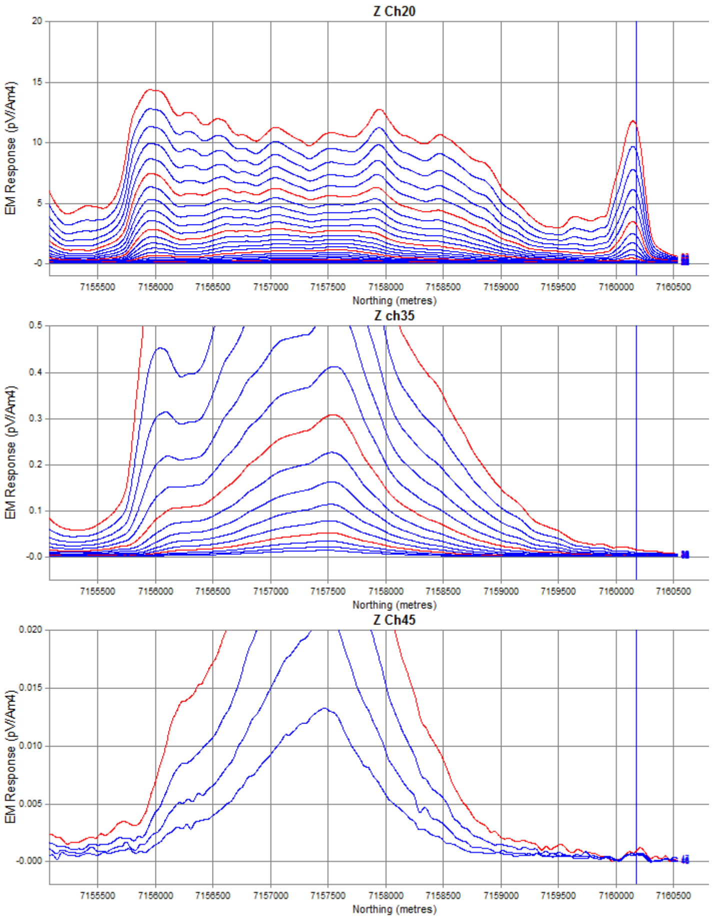
Anomaly 1390a

- Local late-time anomaly in B-field and dB/dt
- Possible wind-related noise or SPM
- No compelling support from magnetics
- Very tenuous anomaly = Rank 4

B-field



dB/dt

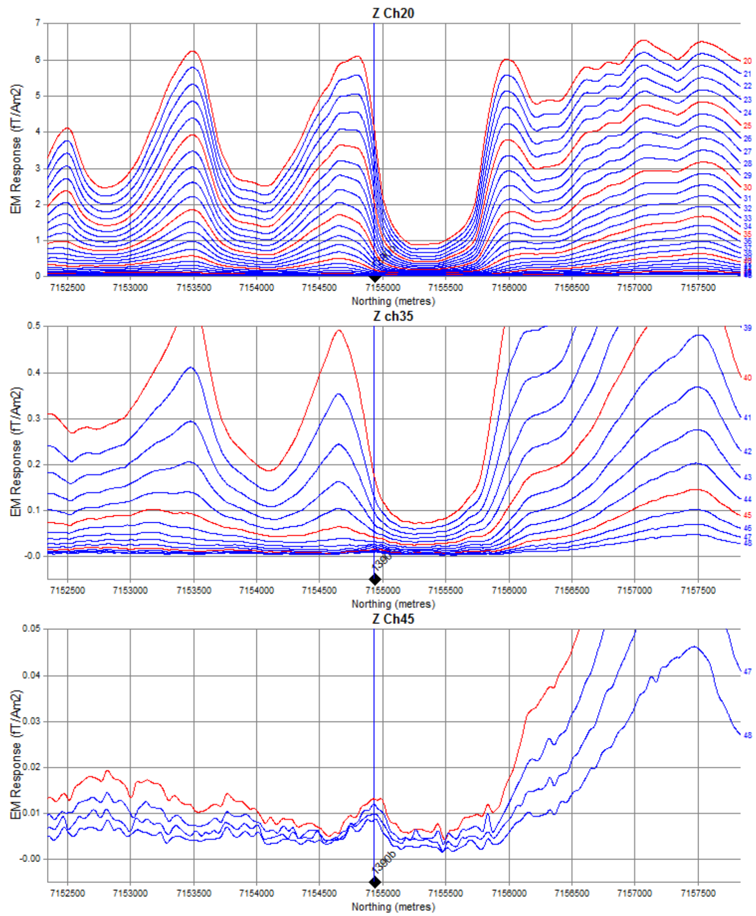


Musgrave Area 1 Anomalies

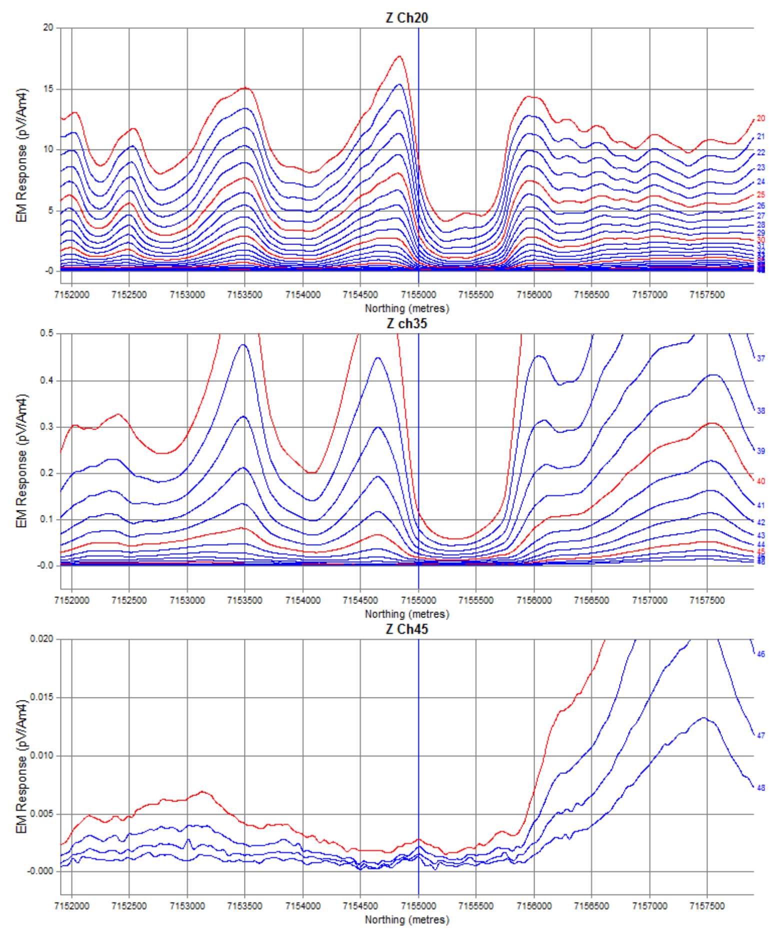
Anomaly 1390b

- Local late-time anomaly in B-field and dB/dt
- Possible diffraction tail or SPM
- On possible fold closure in magnetics
- Tenuous anomaly = Rank 3

B-field



dB/dt

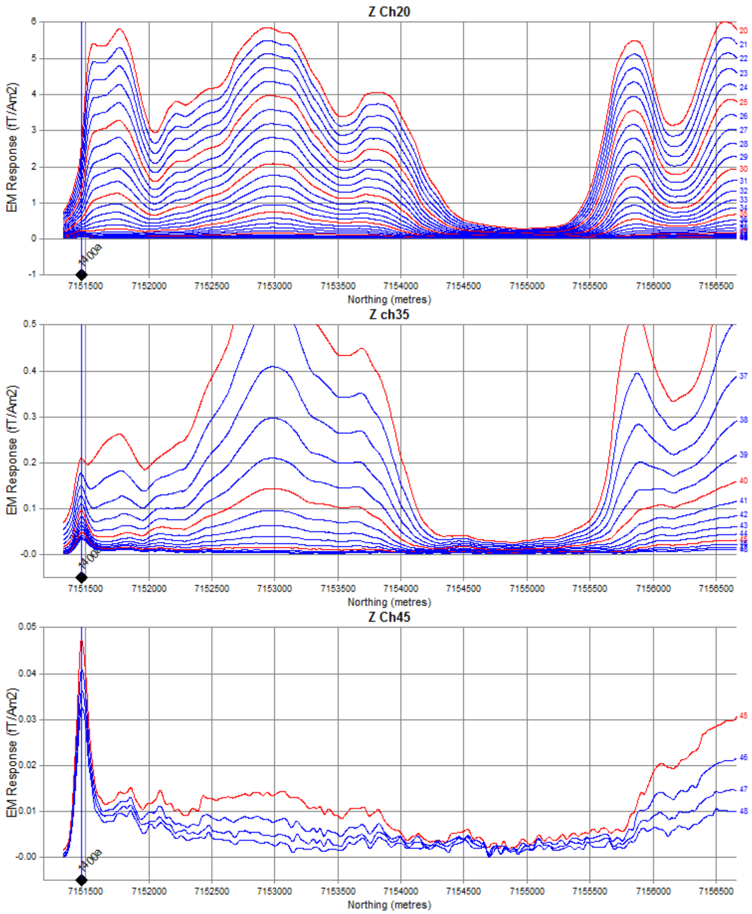


Musgrave Area 1 Anomalies

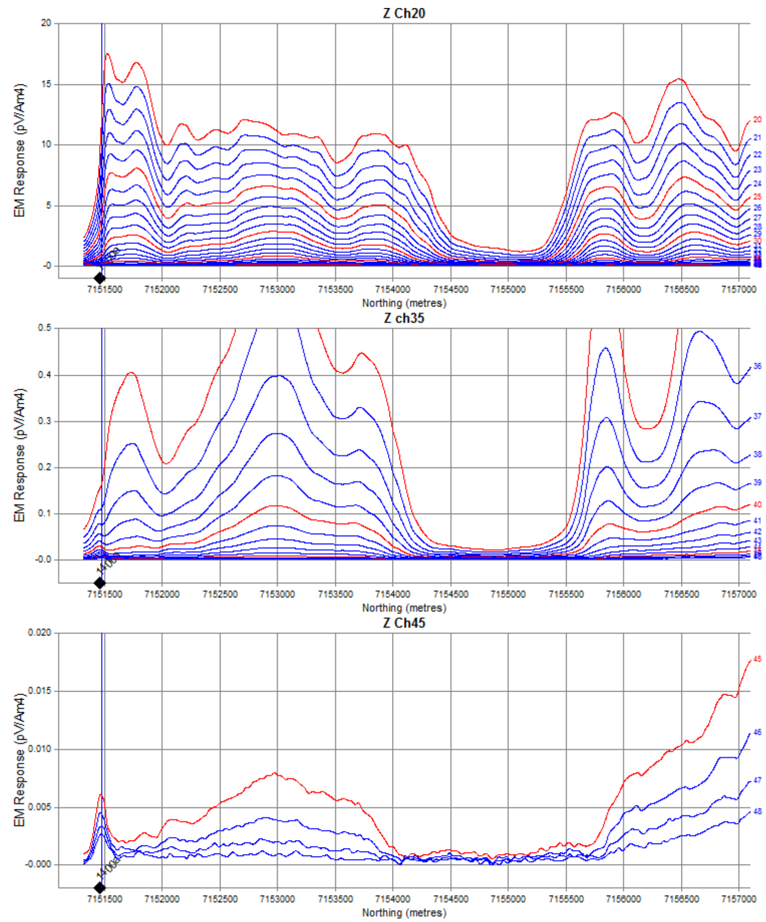
Anomaly 1400a

- Local late-time anomaly in B-field and dB/dt
- In DT position, but clearly not a DT anomaly
- On subtle NW-SE magnetic trend
- Good local late-time anomaly = Rank 1

B-field



dB/dt

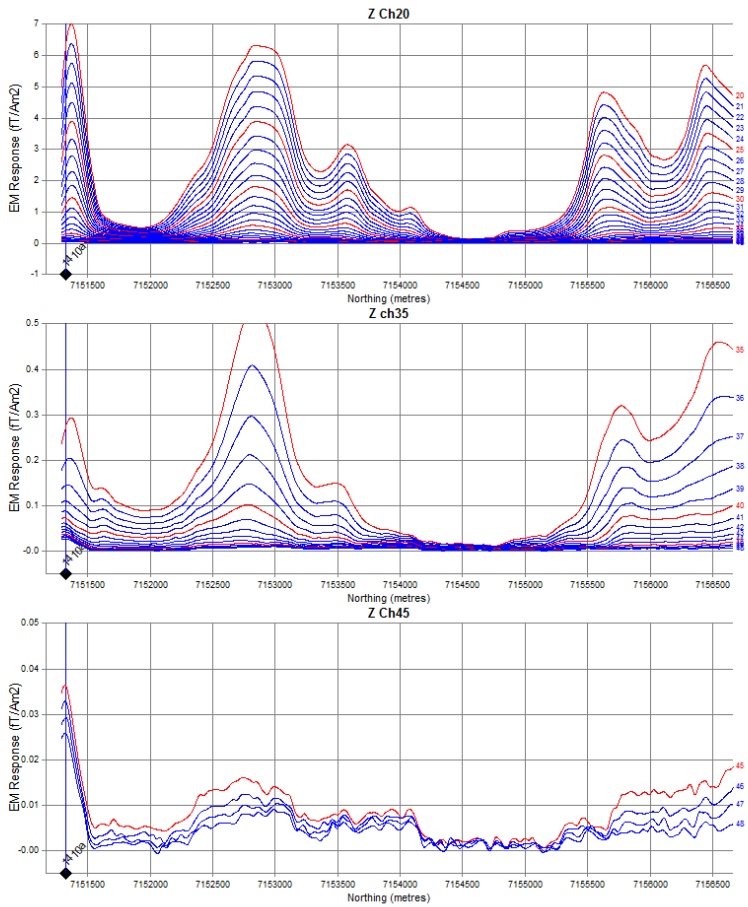


Musgrave Area 1 Anomalies

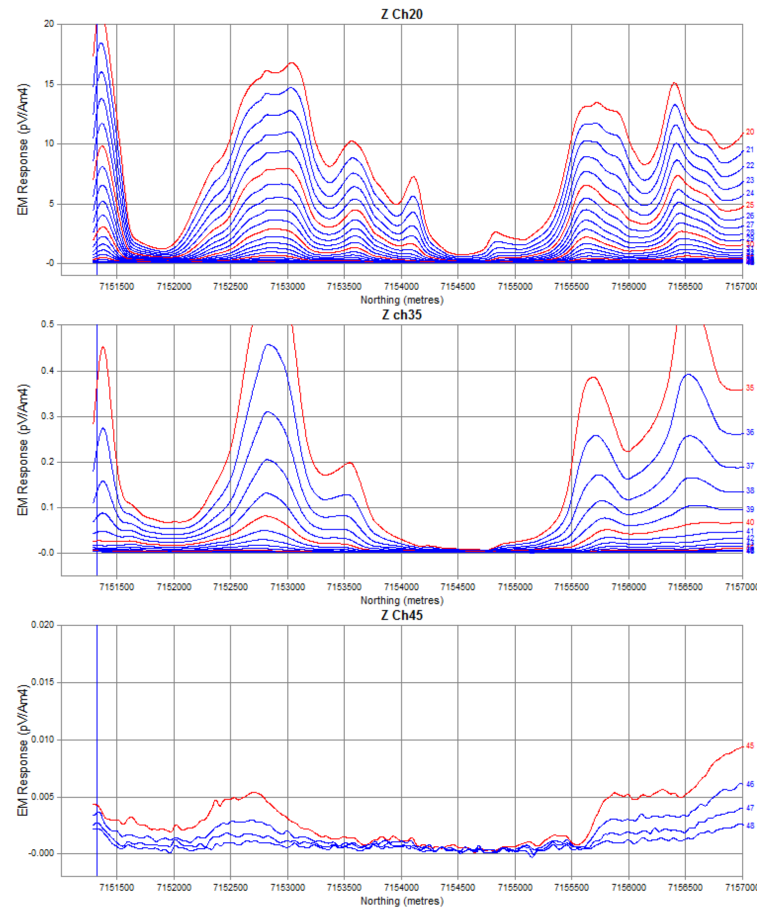
Anomaly 1410a

- Local late-time anomaly in B-field, but weak dB/dt
- Possible diffraction tail
- On subtle NW-SE magnetic trend
- Possible bedrock response = Rank 2

B-field



dB/dt

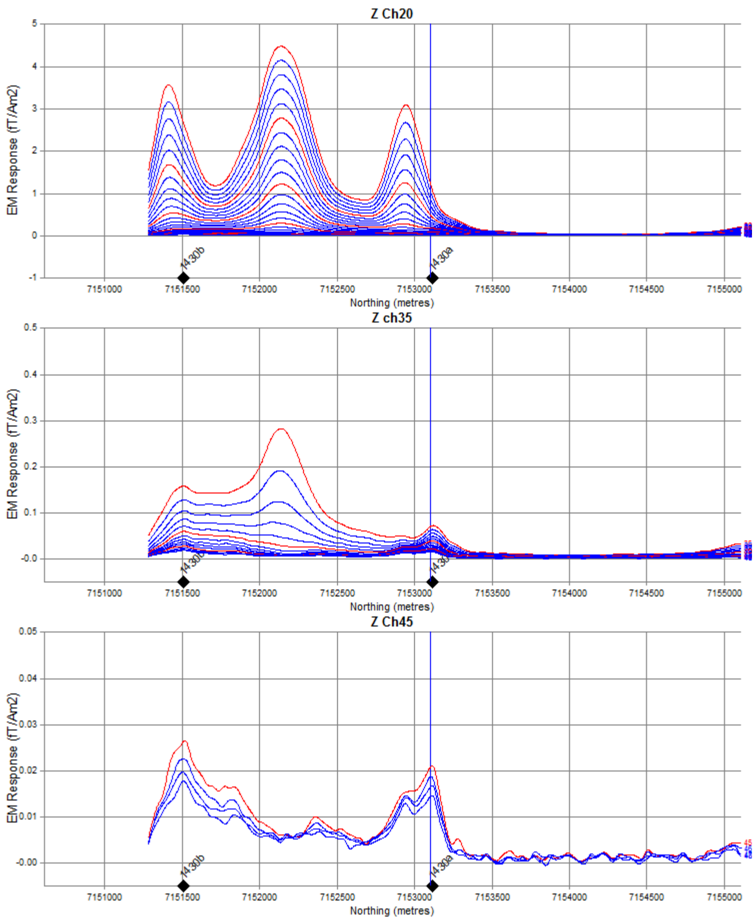


Musgrave Area 1 Anomalies

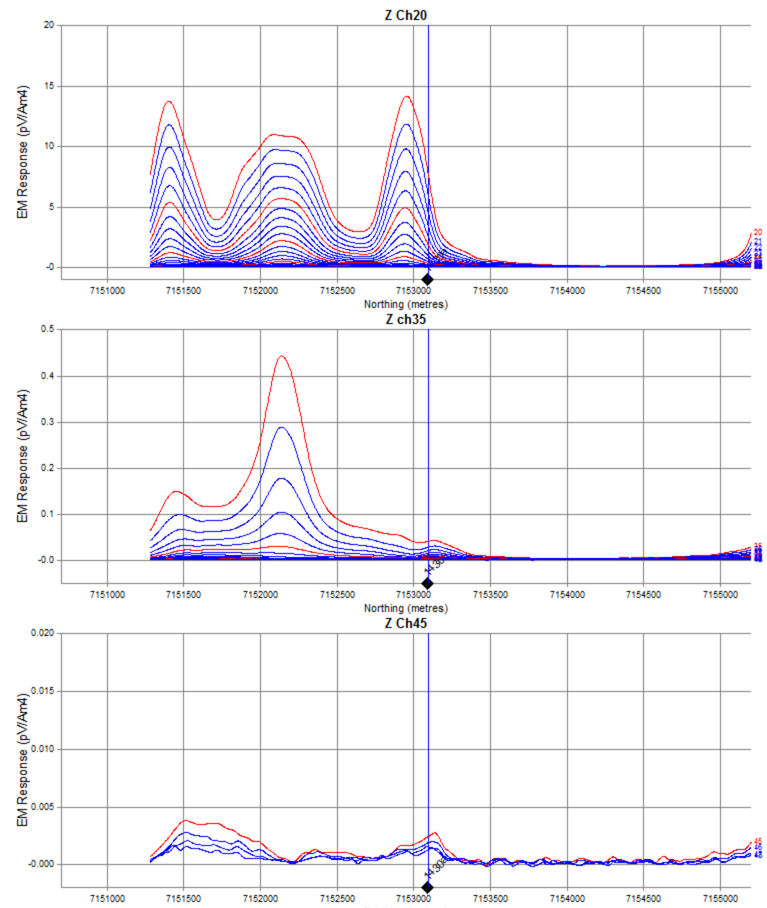
Anomaly 1430a

- Local late-time anomaly in B-field and dB/dt
- Possible diffraction tail or SPM
- On south edge of subtle ENE-WSW magnetic trend
- Tenuous anomaly = Rank 3

B-field



dB/dt

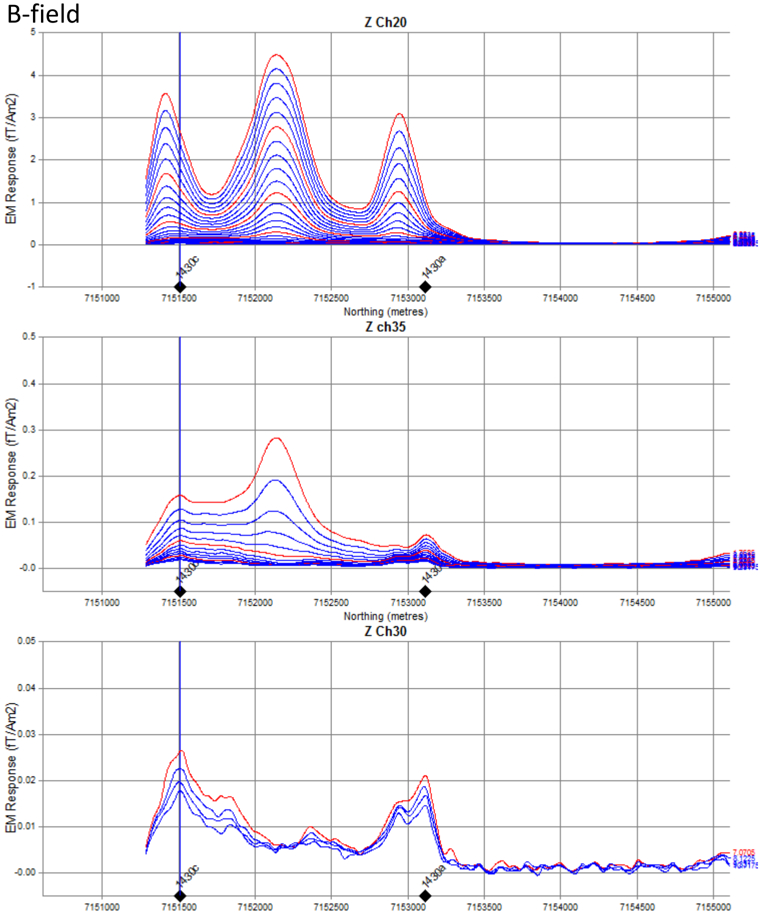


Musgrave Area 1 Anomalies

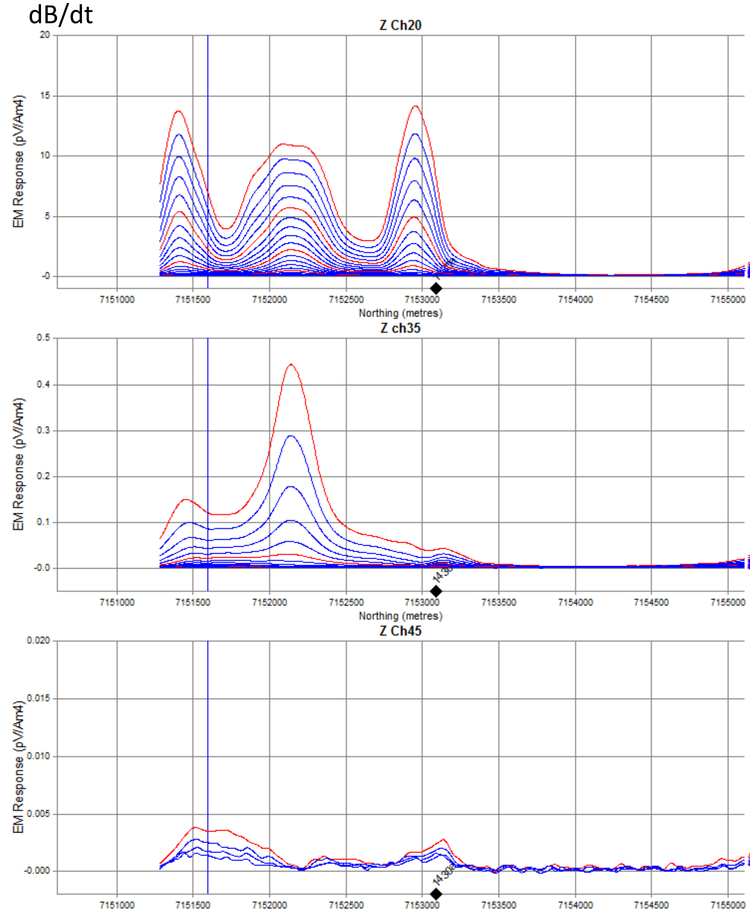
Anomaly 1430b

- Broad shielded late-time anomaly in B-field and dB/dt
- Possible SPM or persistent OB response
- On south edge of subtle E-W magnetic trend
- Tenuous anomaly = Rank 3

B-field



dB/dt



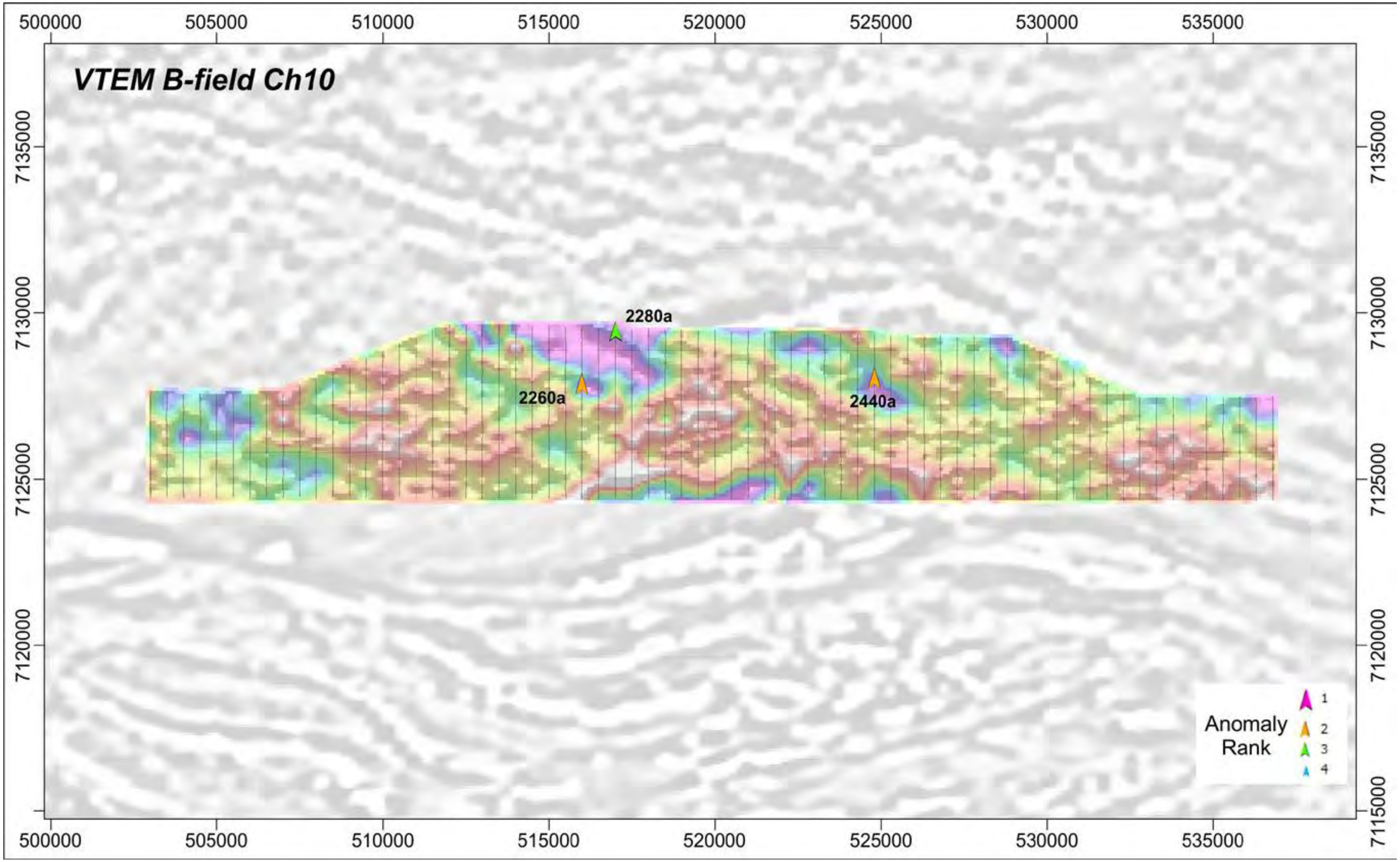
Area 1 Anomaly Summary

Anomaly	East	North	Priority	Note
1000a	502500	7148016	3	Shielded late-time near edge of line. Possible diffraction tail
1010a	502998	7147947	3	Shielded late-time near edge of line. Possible diffraction tail
1010b	502998	7156047	3	Shielded late-time. Possible diffraction tail
1020a	503496	7150576	4	Early to late-time. Late-time decay is suspicious
1060a	505498	7149526	2	Shielded late-time on flank of overburden response. Possible diffraction tail
1070a	505997	7150266	3	Shielded late time. Possible diffraction tail
1120a	508499	7153460	3	Suspicious shielded late-time. Likely SPM
1130a	508998	7153741	3	Suspicious shielded late-time. Likely SPM
1140a	509502	7153874	3	Suspicious shielded late-time. Likely SPM
1140b	509502	7155806	3	Shielded late time - likely diffraction tail
1150a	509998	7153962	3	Suspicious shielded late-time. Likely SPM
1180a	511500	7151505	3	Shielded flanking late-time. Possible diffraction tail
1190a	511998	7154201	2	Shielded flanking late-time. Possible diffraction tail
1200a	512499	7154444	2	Broad shielded late-time. Possible diffraction tail
1340a	519500	7160083	3	Shielded local late-time. Possible noise
1380a	521499	7160252	4	Suspicious shielded late-time. Likely SPM
1390a	522001	7160151	4	Suspicious shielded late-time. Likely SPM
1390b	521998	7154937	3	Shielded late time on edge of overburden response. Possible diffraction tail
1400a	522494	7151470	1	Very good local late-time
1410a	522998	7151328	2	Very good late-time. Possible diffraction tail
1430a	523998	7153113	3	Good local late-time on edge of overburden. Too strong to be diffraction tail, but possible SPM
1430b	523998	7155356	3	Shielded late-time. Possible SPM or locally thicker overburden

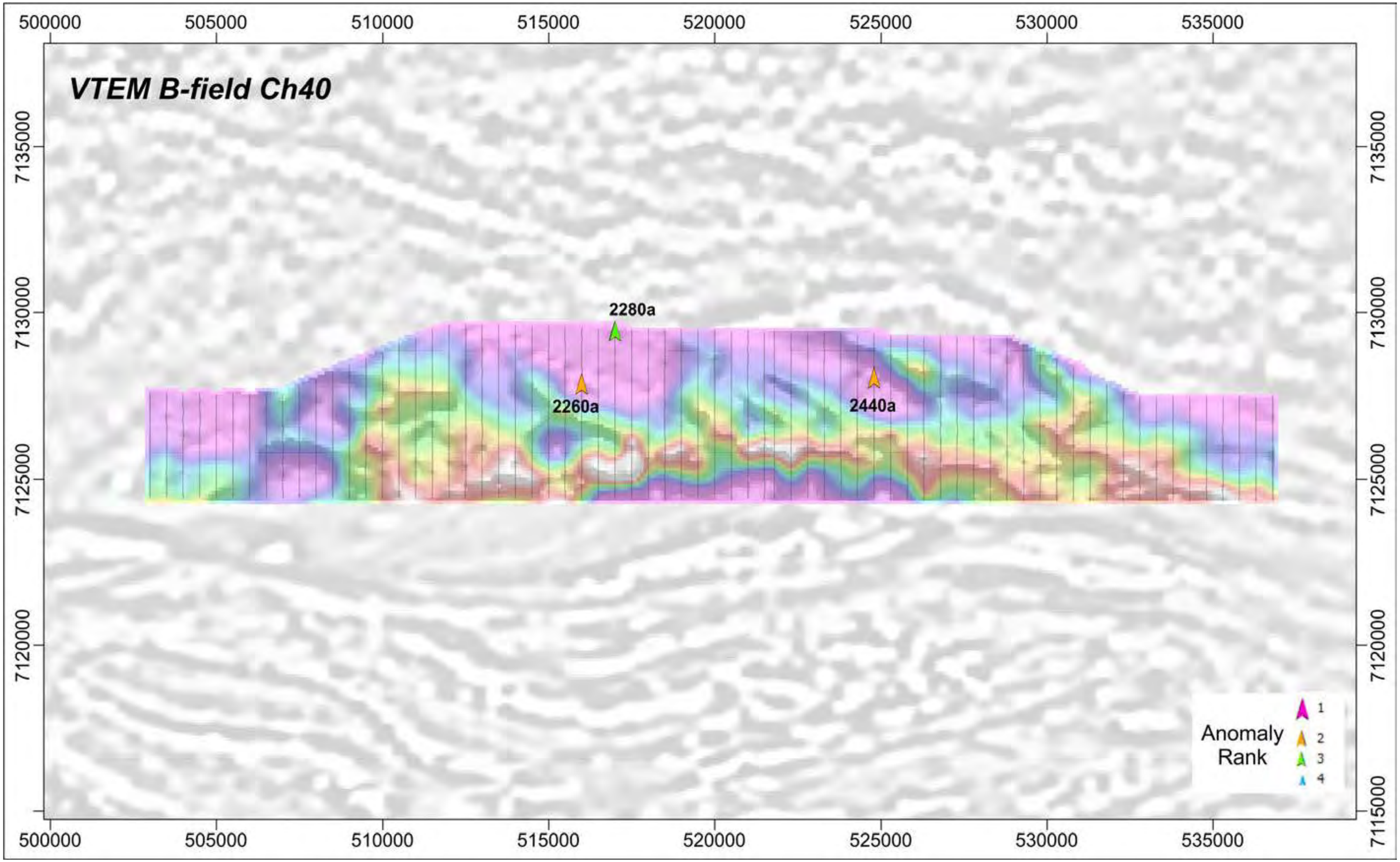
Musgrave Ranges Area 2

- The majority of the Area 2 of the Musgrave Ranges VTEM survey is masked by conductive cover (see Ch10 image on next slide). The late time data (Ch 40 image) are dominated by the response of preferential weathering over the Mann Fault.
- There are only three anomalies of interest in this area.
- Only Two anomalies (2260a and 2440a) are broad mid-time anomalies that could represent weak bedrock conductors.
- The third anomaly of interest (2280a) is the most interesting in terms of late time response, but is associated with a string of early-time anomalies within a linear magnetic low that looks to be due to a major WNW-ESE structure

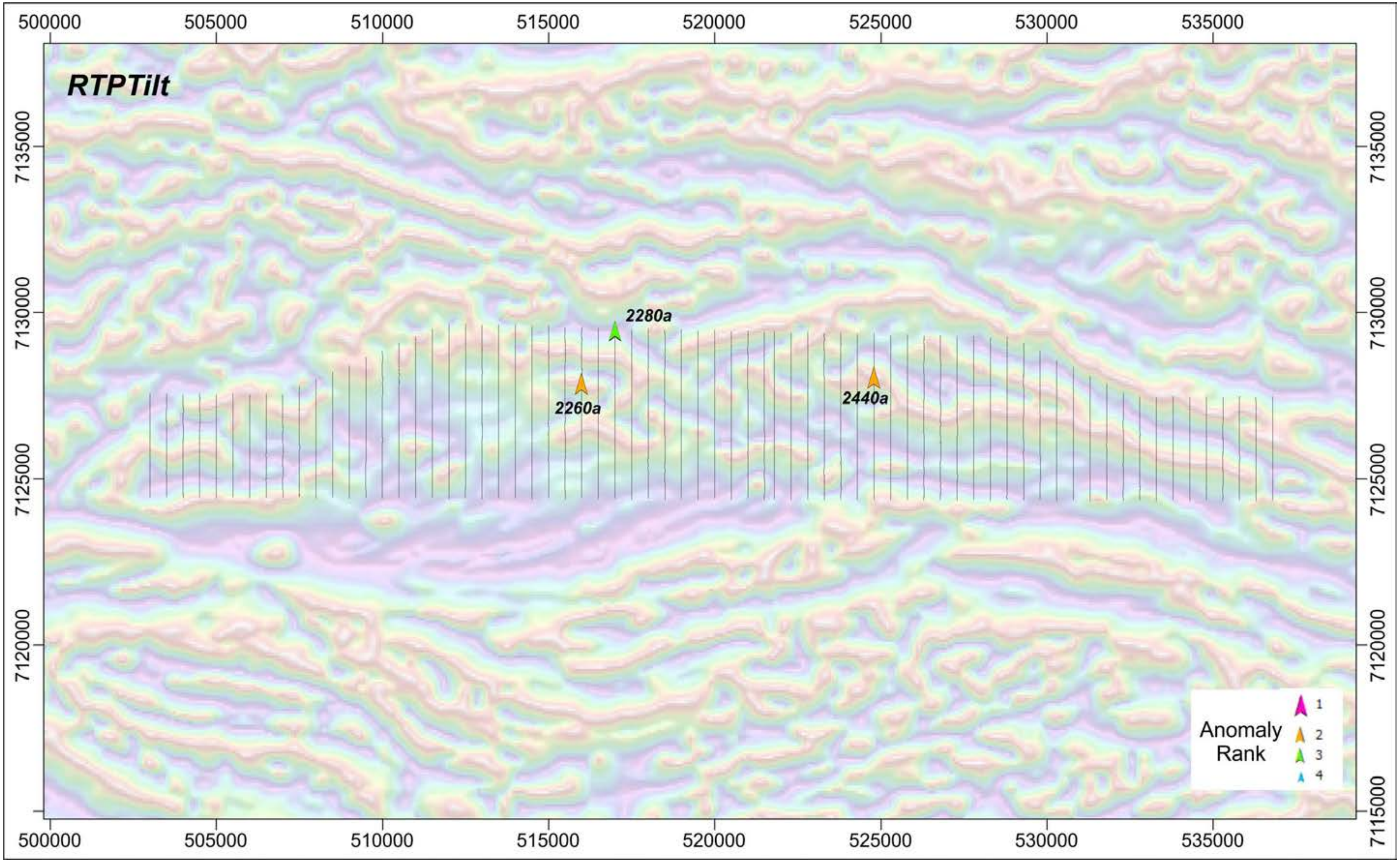
Musgrave Ranges Area 2



Musgrave Ranges Area 2



Musgrave Ranges Area 2

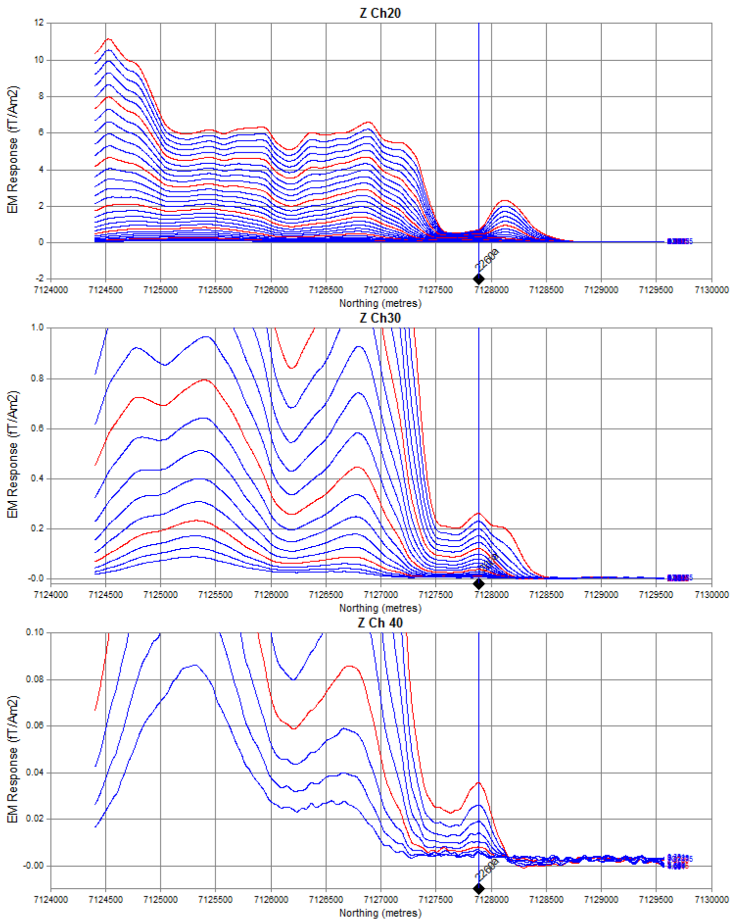


Musgrave Area 2 Anomalies

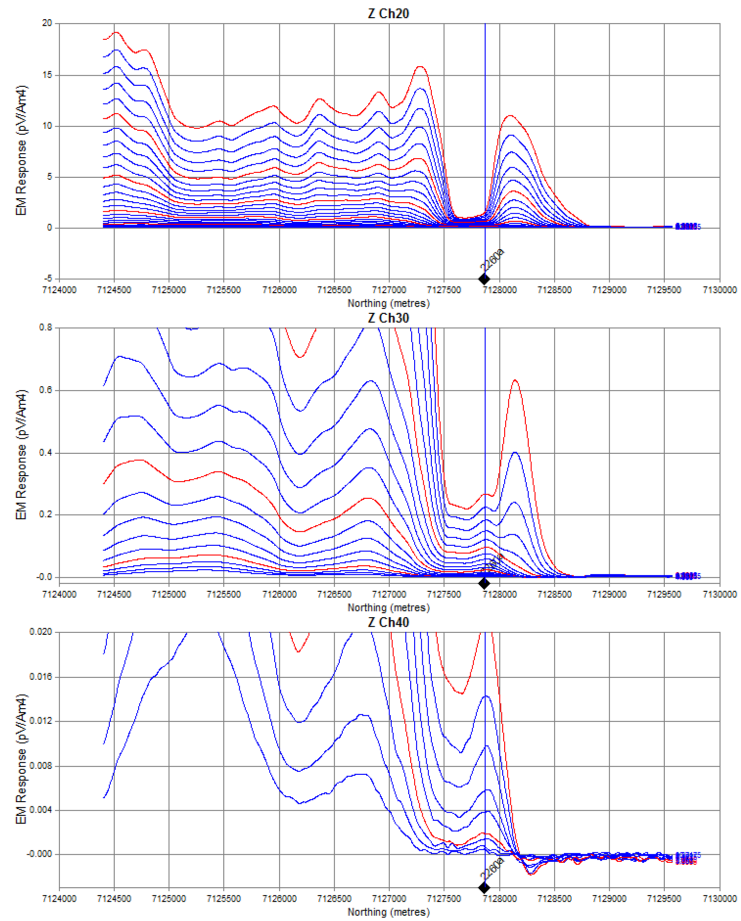
Anomaly 2260a

- Shielded mid-time anomaly in B-field and dB/dt
- Coincident with local magnetic anomaly
- Possible weak bedrock anomaly = Rank 2

B-field



dB/dt

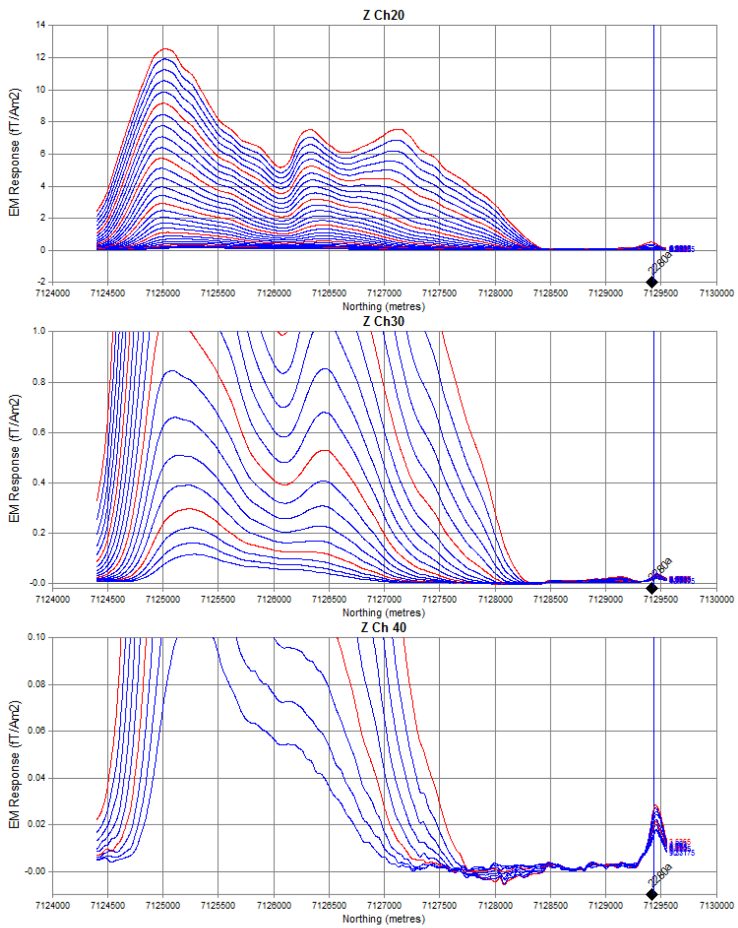


Musgrave Area 2 Anomalies

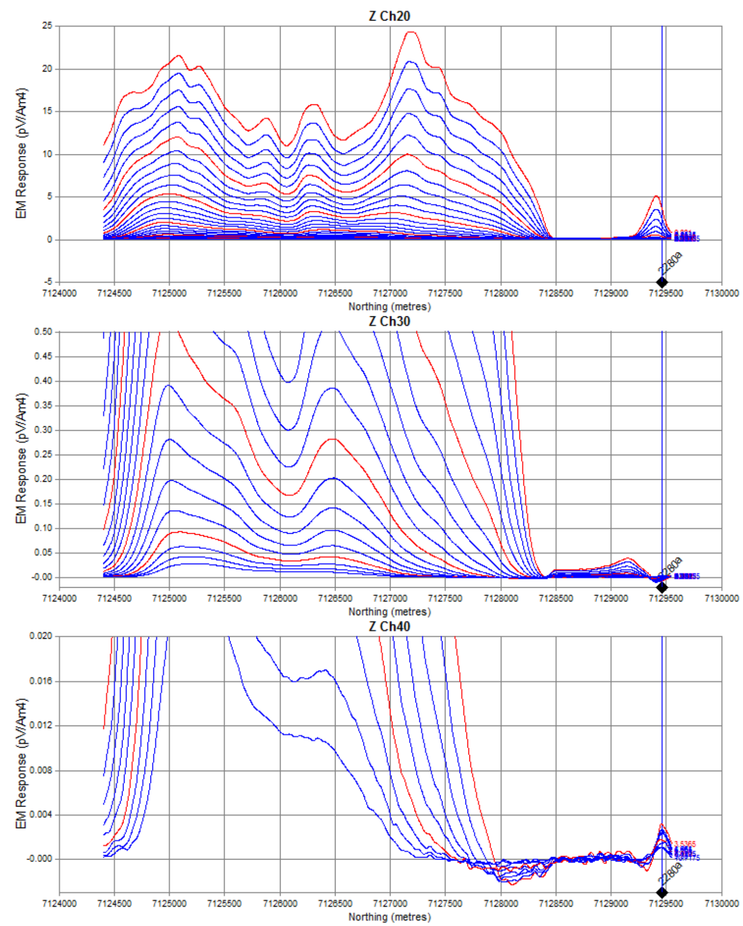
Anomaly 2280a

- Local late-time anomaly in B-field and dB/dt
- Adjacent to local early-time - fault related
- Coincident with magnetic low (structure)
- Likely fault response = Rank 3

B-field



dB/dt

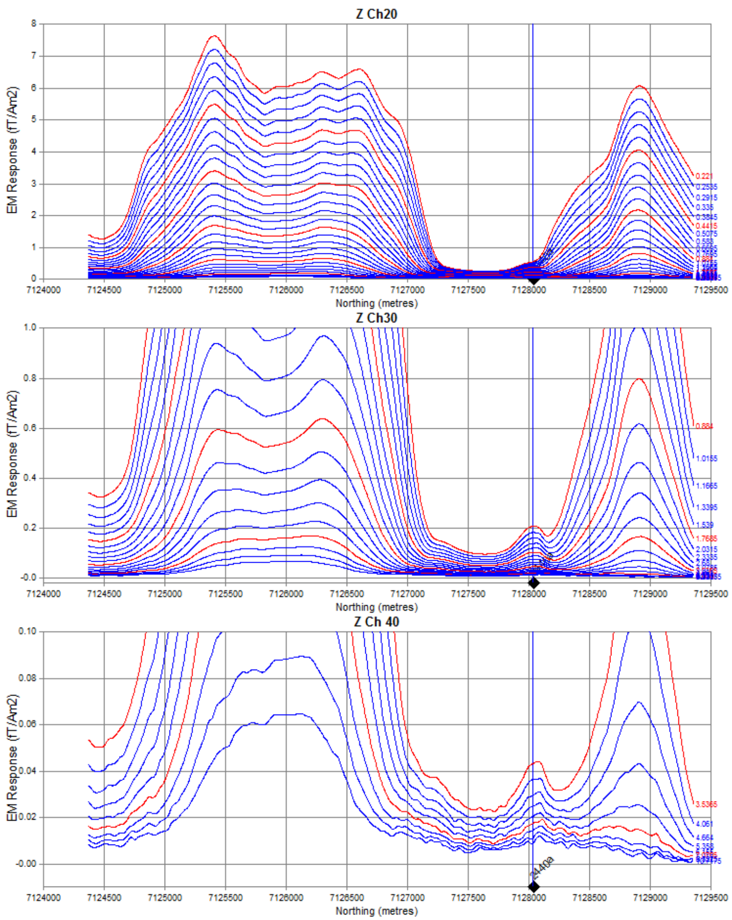


Musgrave Area 2 Anomalies

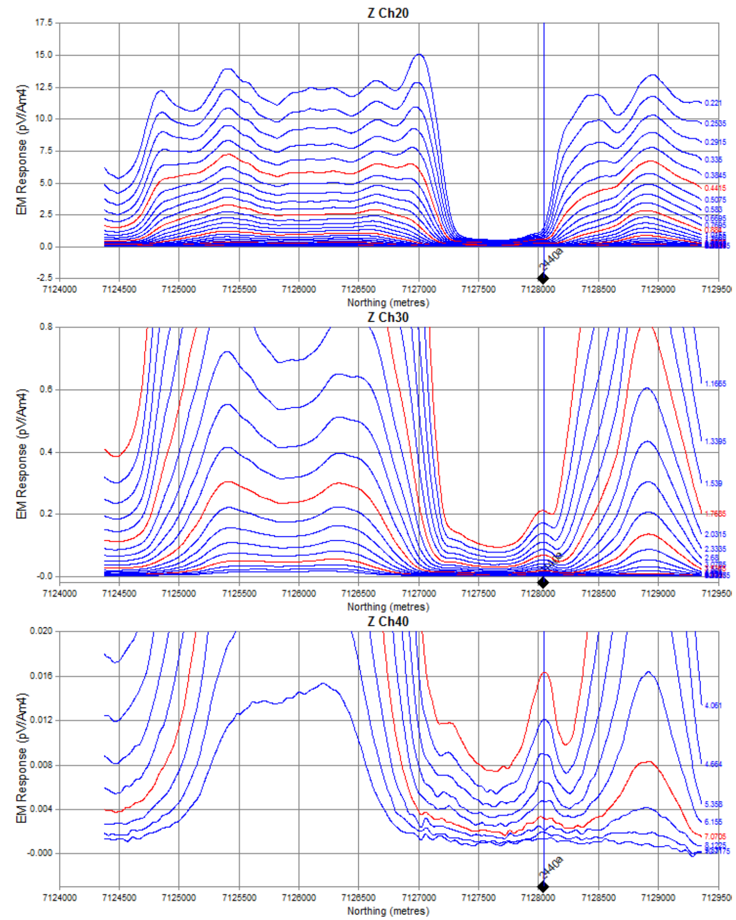
Anomaly 2440a

- Local mid-time anomaly in B-field and dB/dt
- Possible diffraction tail
- Coincident with magnetic high
- Possible weak bedrock conductor= Rank 2

B-field



dB/dt



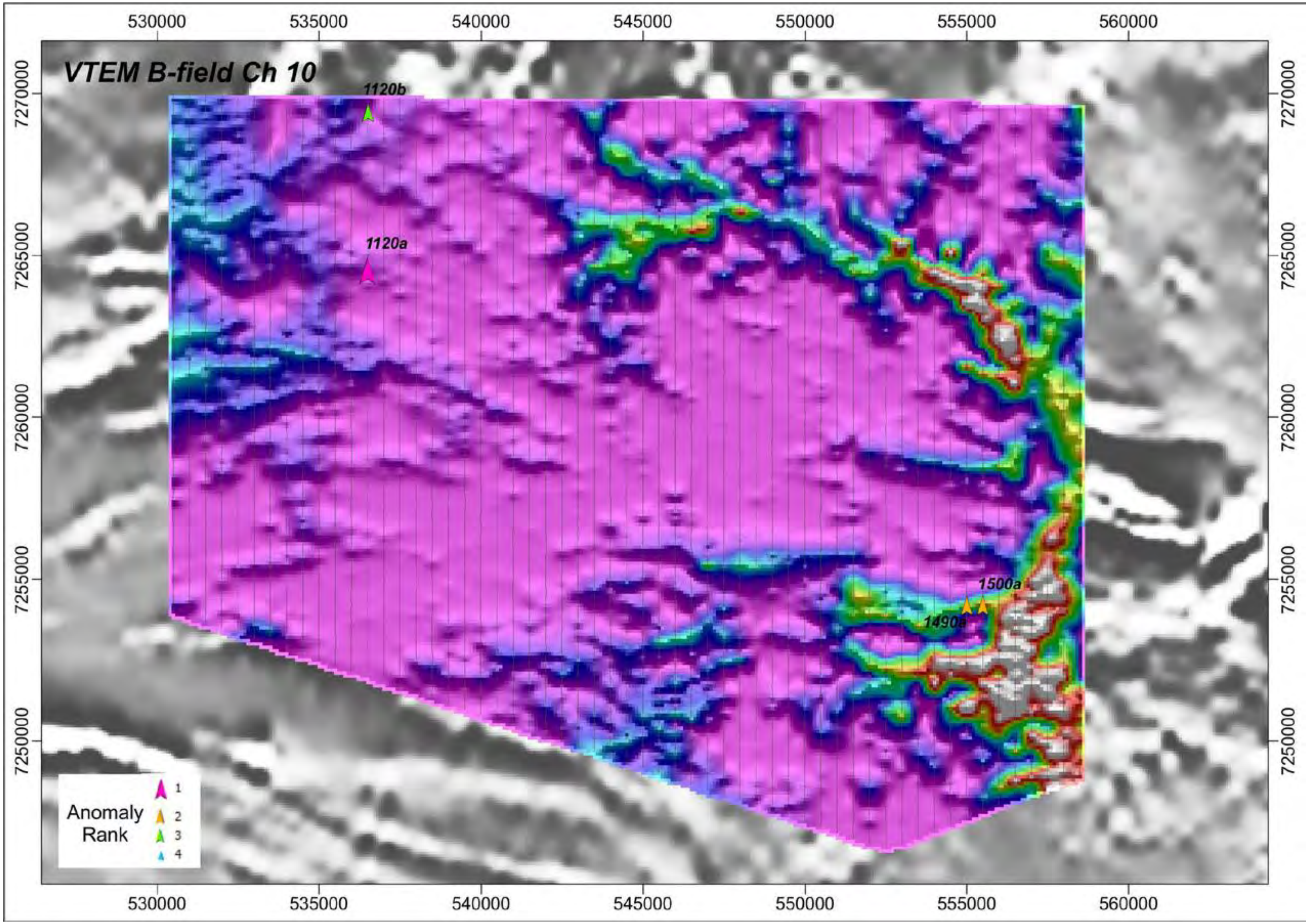
Area 2 Anomaly Summary

Anomaly	*East*	*North*	*Priority*	*Note*
2260a	515999	7127859	2	Broad shielded mid-time in diffraction-tail position
2280a	516999	7129460	3	Local flanking late-time in diffraction-tail position
2440a	524802	7128035	2	Broad shielded mid-time in diffraction-tail position

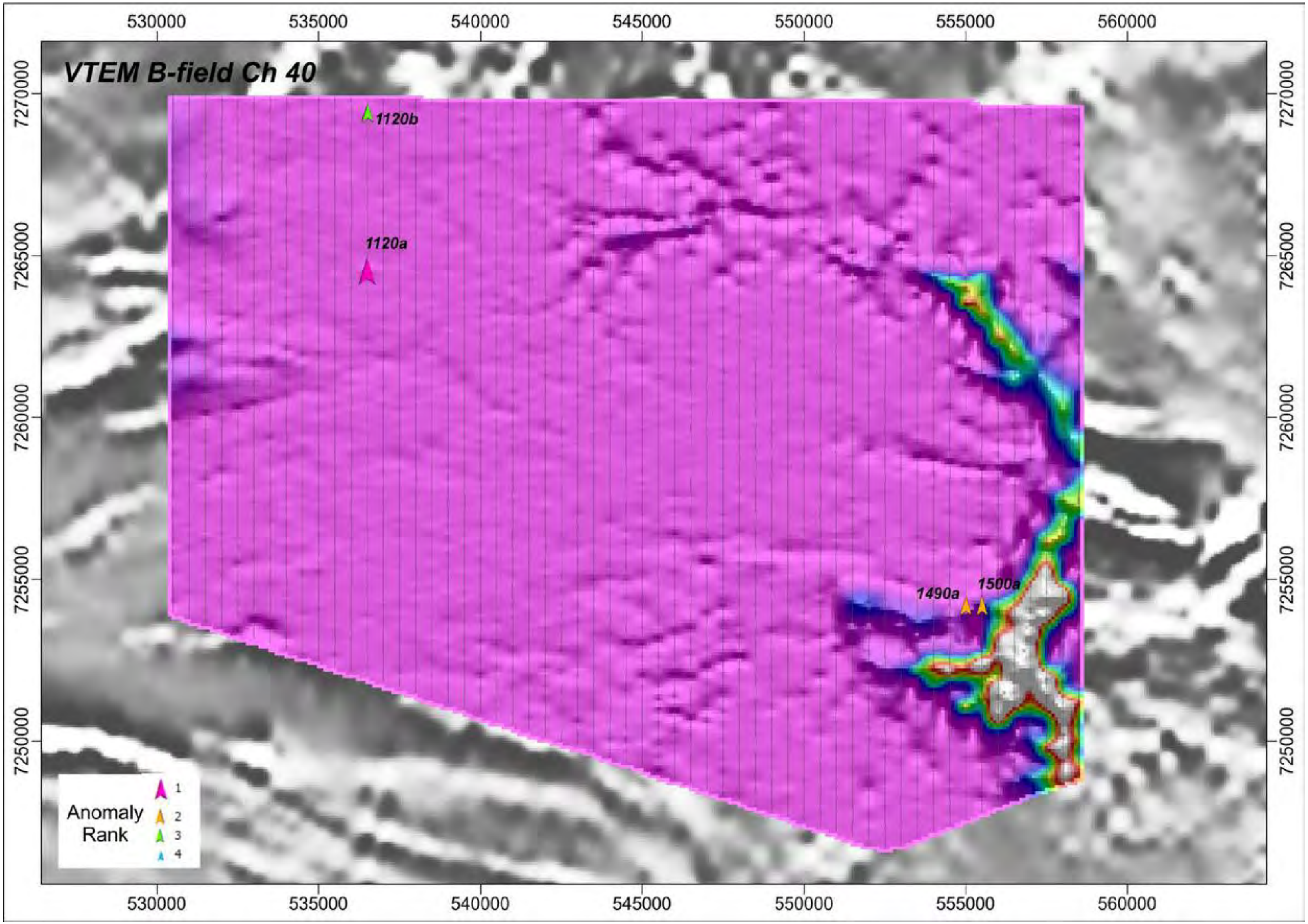
Docker River

- The majority of the Docker River VTEM survey is resistive and ideal for AEM methods (see Ch10 image on next slide). The late-time data (Ch 40 image) show that only the eastern edge of the area is affected by a N-S palaeochannel response.
- There are only four anomalies of interest in this area.
- Only Two anomalies (1490a and 1500a) are late-time responses on the flank of an east-west fault response and may not be bed-rock responses.
- The other two anomalies of interest are both on line 1120. Anomaly 1120a is a clear local late-time bedrock source, and 1120b is a broad late-time response that could be a deeper bed-rock source.

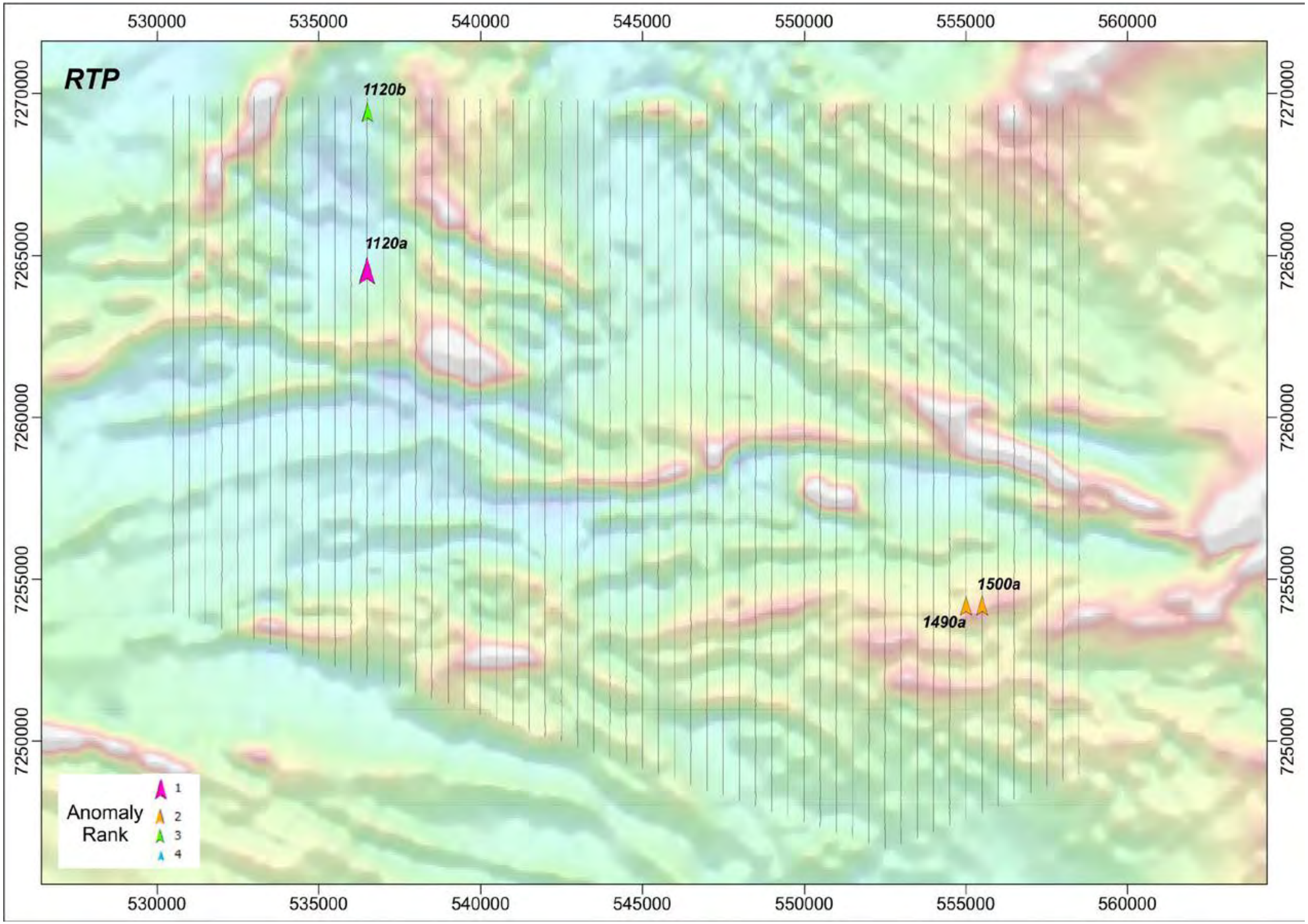
Docker River



Docker River



Docker River

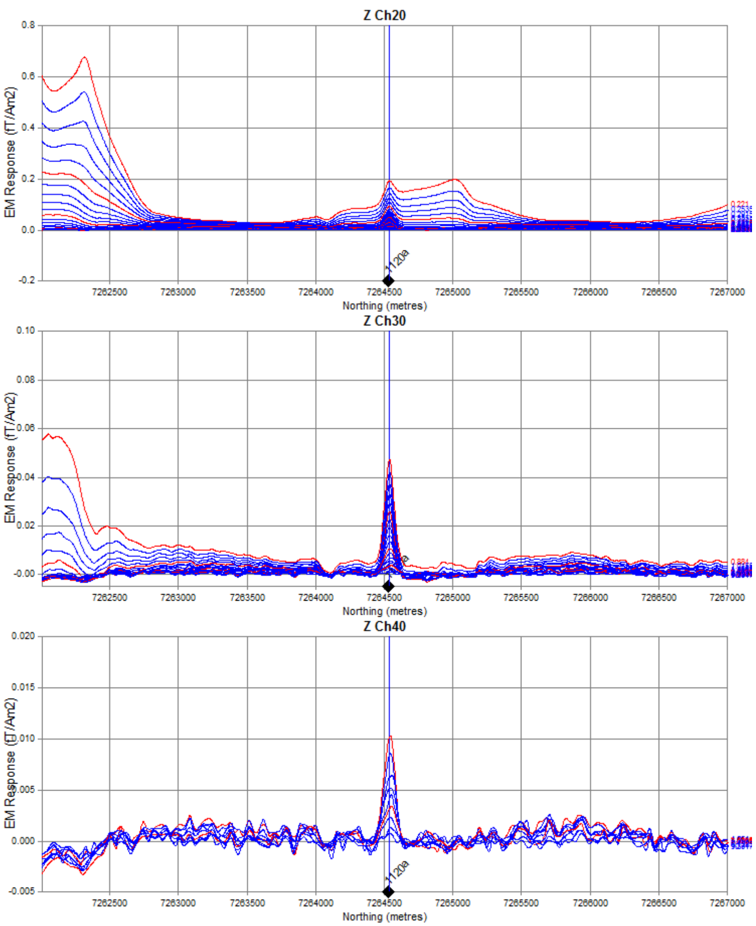


Docker River Anomalies

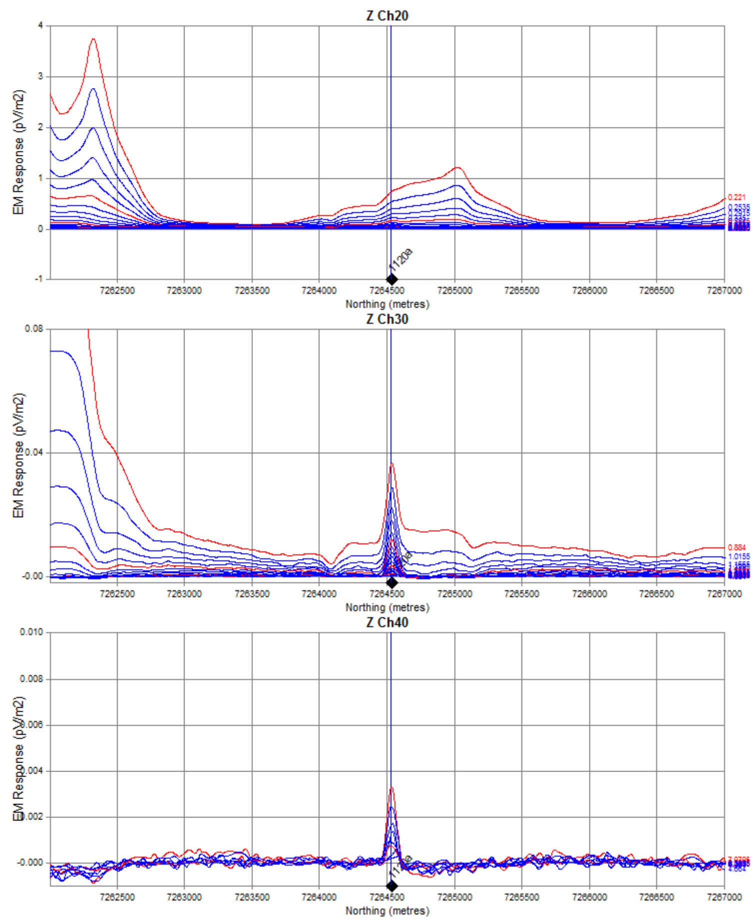
Anomaly 1120a

- Local late-time anomaly in B-field and dB/dt
- Good local late-time anomaly
- Within magnetically quiet area
- Clear local bedrock conductor = Rank 1

B-field



dB/dt

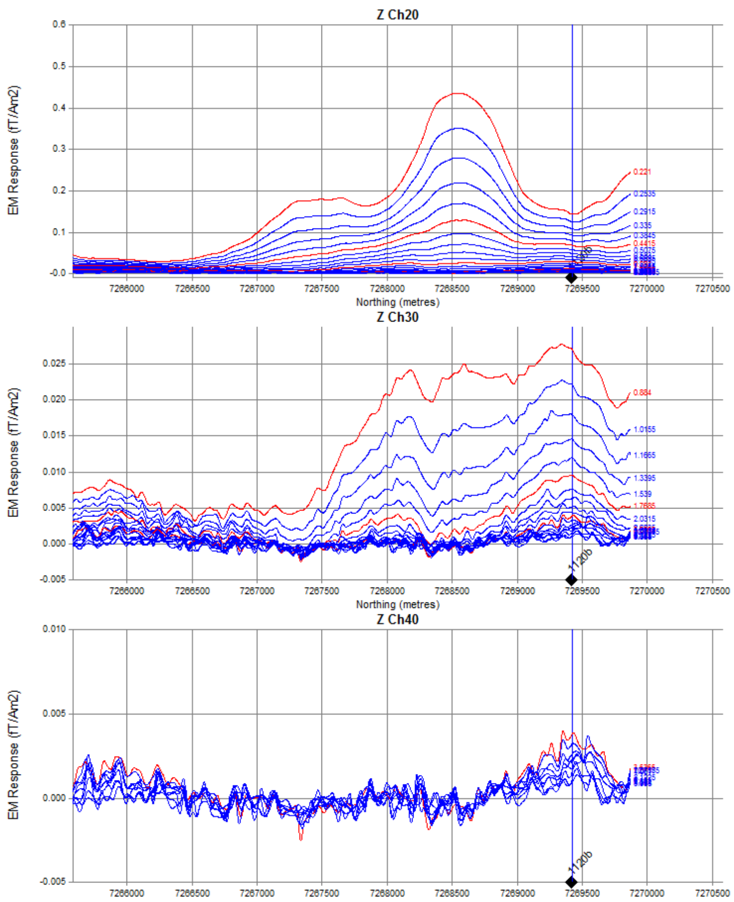


Docker River Anomalies

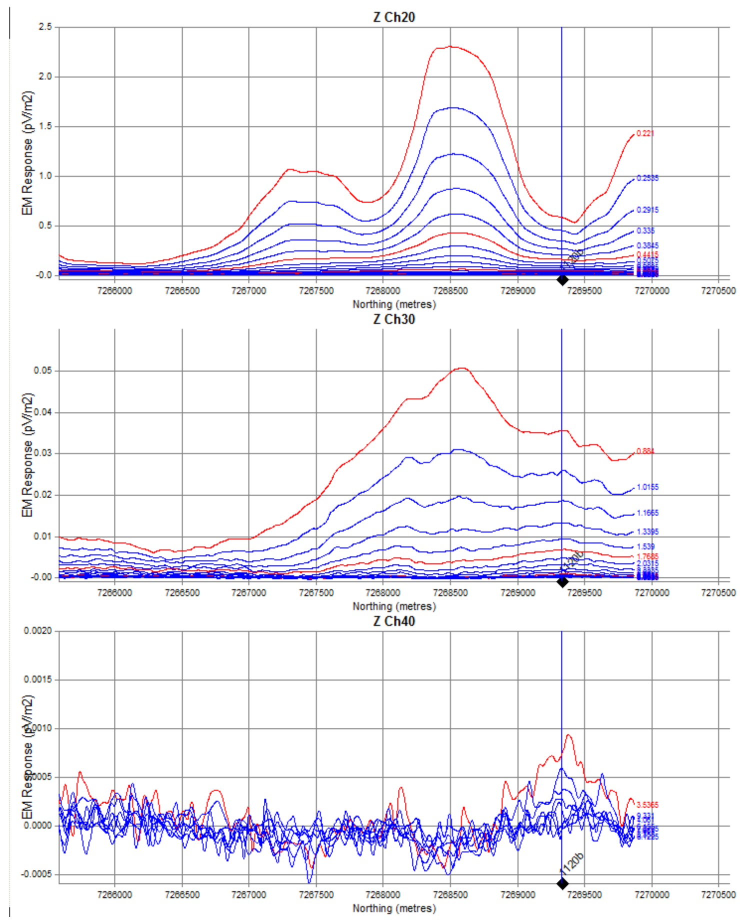
Anomaly 1120b

- Broad shielded anomaly in B-field and dB/dt
- Possible locally thicker regolith or SPM
- Within magnetically quiet area
- Tenuous anomaly = Rank 3

B-field



dB/dt

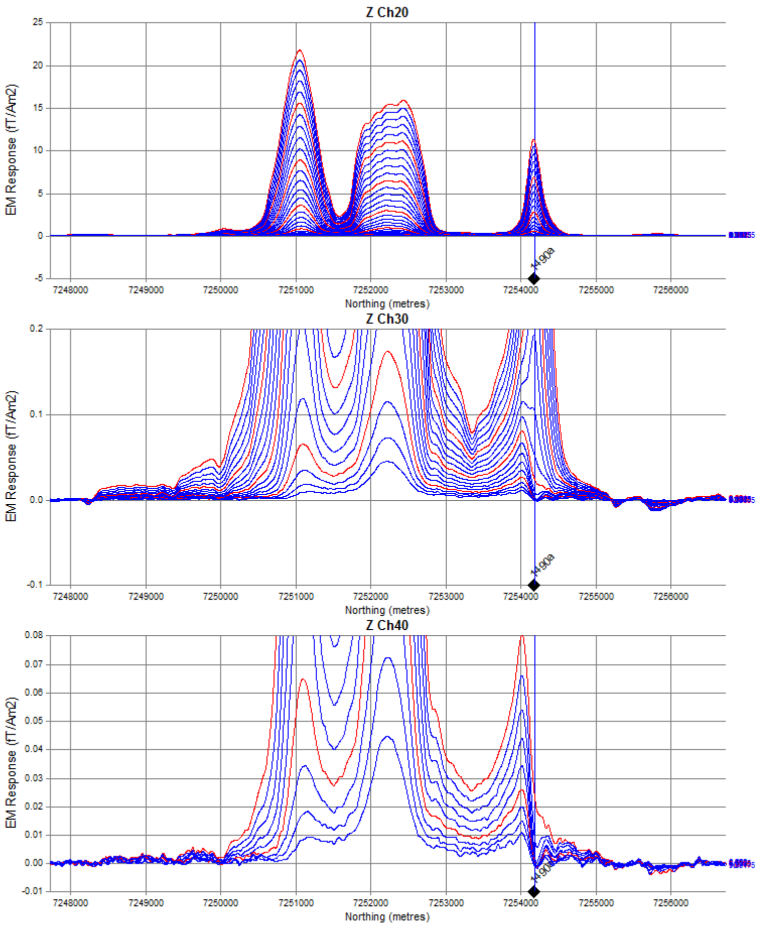


Docker River Anomalies

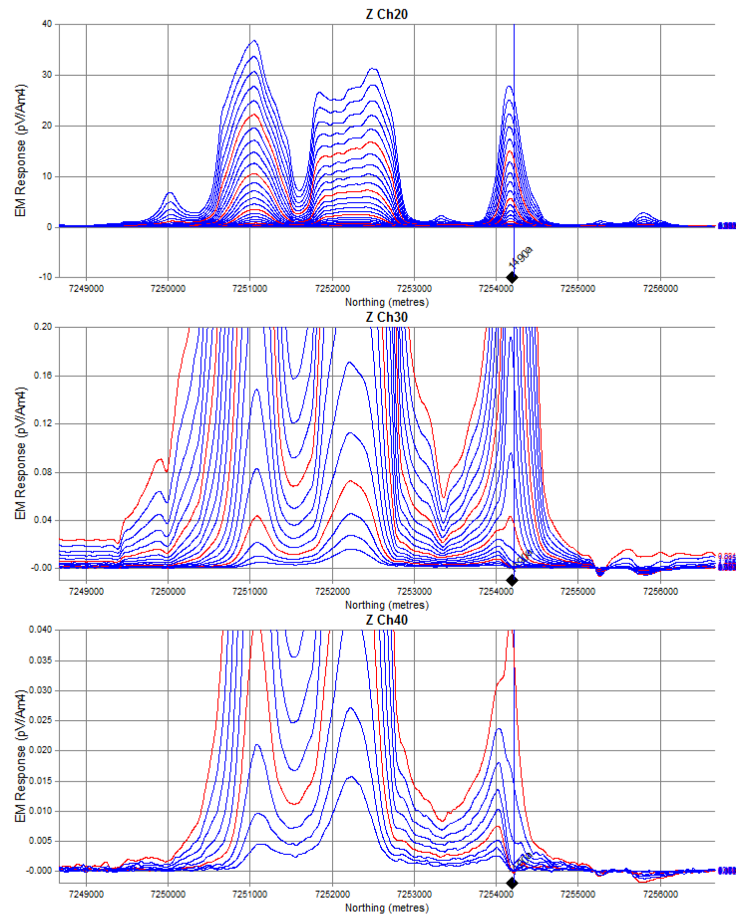
Anomaly 1490a

- Late-time anomaly on the southern flank of fault response
- Coincident with linear magnetic anomaly
- Interesting complex anomaly = Rank 2

B-field



dB/dt

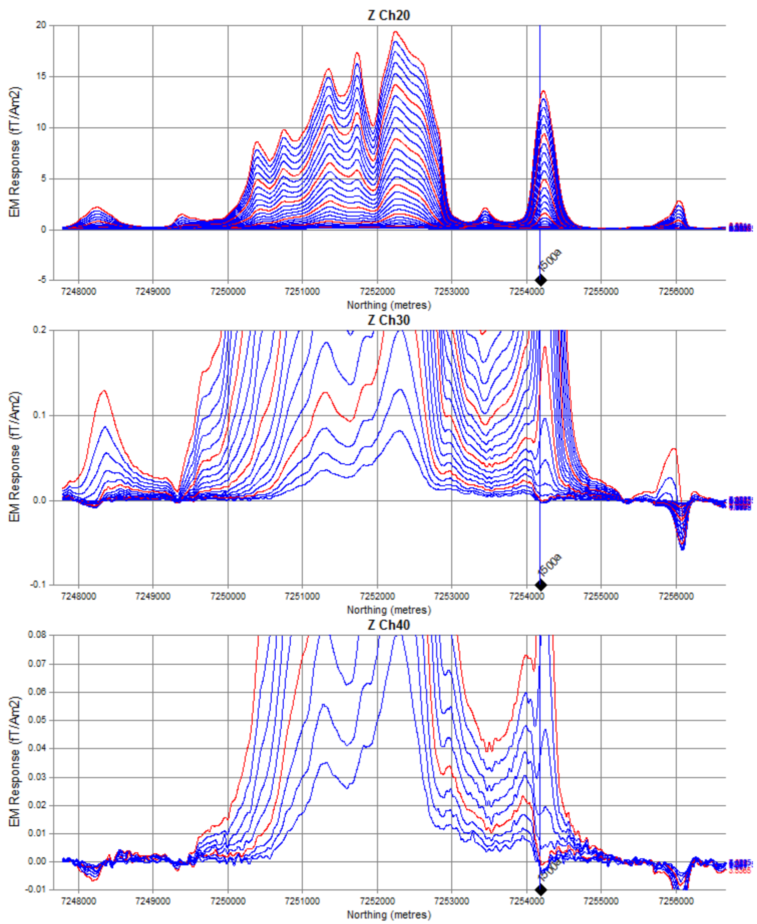


Docker River Anomalies

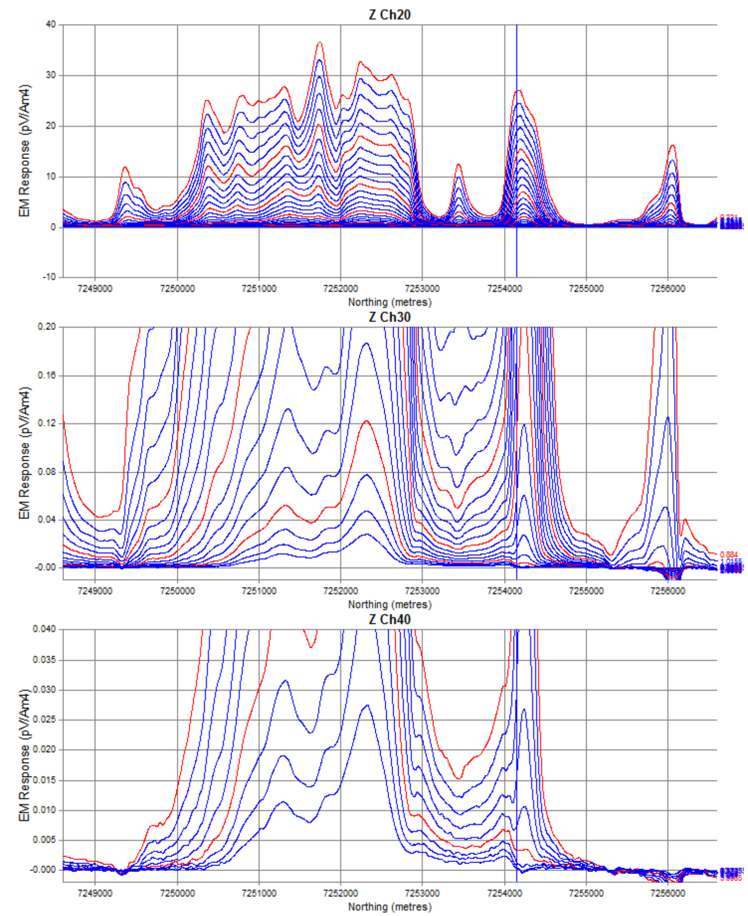
Anomaly 1500a

- Late-time anomaly on the southern flank of fault response
- Coincident with linear magnetic anomaly
- Interesting complex anomaly = Rank 2

B-field



dB/dt



Docker River Anomaly Summary

Anomaly	*East*	*North*	*Priority*	*Note*
1120a	536496	7264533	1	Good local late-time
1120b	536499	7269418	3	Broad shielded late-time. Possible SPM
1490a	555004	7254169	2	Early time fault response migrating to south-dipping late-time
1500a	555498	7254184	2	Early time fault response migrating to south-dipping late-time

Conclusions

- The majority of anomalies highlighted as possible bed-rock responses are ranked low or very low due to a consistent correlation with the edge of overburden responses, and it is likely that these lower-order anomalies are diffraction-tail effects caused by the sharp contrast in near-surface conductivity at the edge of palaeochannels and weathered fault zones.
- Some other lower ranked anomalies look suspicious and could be due to surficial SPM effects.
- Overall there are only two clear local late-time bed-rock conductor responses in the three areas surveyed -- anomaly 1400a in the Musgrave Ranges Area 1, and anomaly 1120a in the Docker River survey area.
- In addition to these, there are eight Rank-2 anomalies. It should be noted that these anomalies can also be explained by diffraction tail effects at the contact between resistive and conductive areas, but appear to also have characteristics of valid bedrock responses.

Recommendations

- Ground moving-loop TEM surveying is required to validate all VTEM anomalies. The VTEM system only reads the secondary field amplitude to around 10 msec, which is a very limited time from which to differentiate between valid bed-rock conductors and local shallow regolith effects. Surface TEM surveys operated at between 1 and 2 Hz (125 to 500 msec off-time) are usually sufficient to weed out the near surface effects from the true bed-rock conductors.
- There are too many Rank-2 anomalies to realistically follow-up with ground TEM. These should be re-evaluated after ground truthing and further assessment to select a few .
- SPM and IP effects are known to be common throughout the Musgraves, and can be problematic when the EM receiver is located close to primary field as in the in-loop array. It is therefore recommended that any follow-up ground EM be acquired using a slingram array, with the receiver located at least 100m from the loop edge.
- 500m spacing is considered very broad for a VTEM survey targeting magmatic Ni-Cu-Co-PGE sulphide mineralization. It is recommended that 200-250m line-spacing be considered for any future AEM surveys.

APPENDIX 4.

EL25566,31383 Musgrave Project Review.C.Lawley.February 2018.

Musgrave & Petermann Ranges Project Review

Review for
Gempart (NT) Pty. Ltd.
Musgrave & Petermann Ranges
EL25566, EL31383, EL27581 & EL31531

Review completed by
Metalzoic Geological Consulting
Christine Lawley
Exploration Geologist
February 2018

GEMPART (NT) PTY LTD

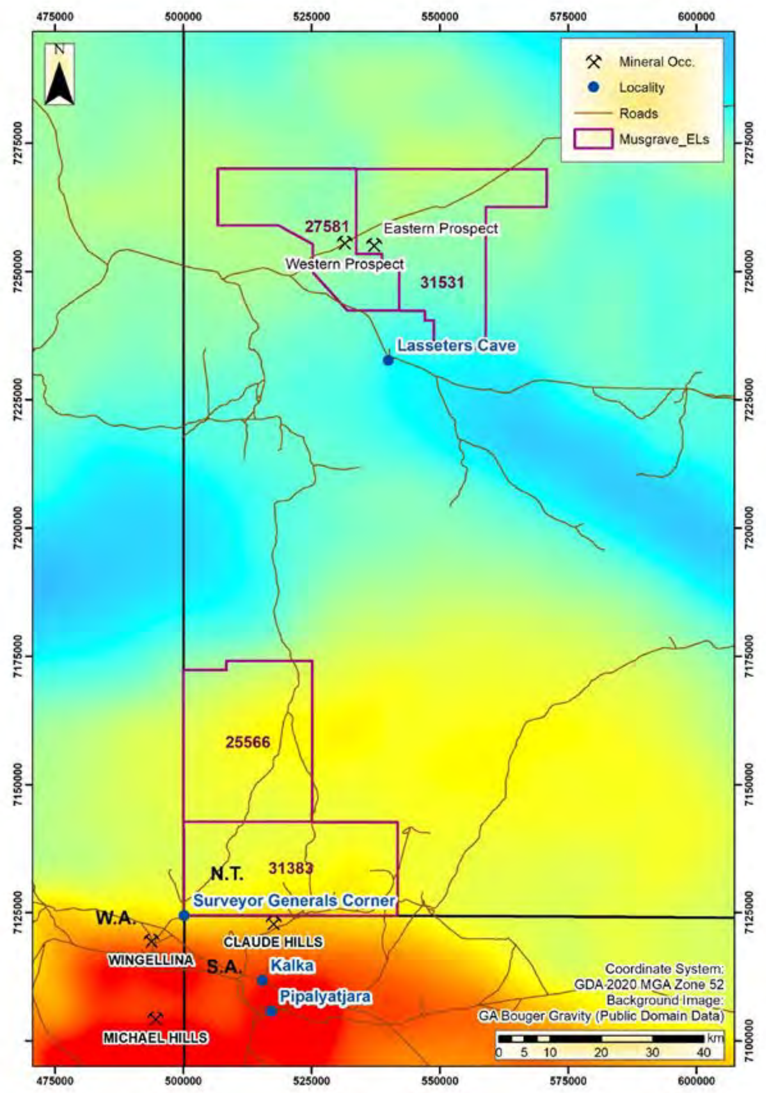
Metalzoic
Geological Consulting

Project Review Outline

- Location
- Regional Geology & Depth to Basement
- Previous Exploration
- Musgrave Ranges Review (EL 25566 & EL 31382)
  - Geology, Geophysics, Geochemistry
  - Deposit Model
  - Claude Hills Extension
  - Summary SWOT
  - Targets, Follow-Up & Budget
- Petermann Ranges Review (EL 27581 & EL 31531)
  - Geology, Geophysics, Geochemistry
  - Deposit Model
  - Summary SWOT
  - Targets, Follow-Up & Budget
- Recommendations
  - Tenement Retention & Acquisition
  - Corporate (Path to Market)

Metalzoic
Geological Consulting

Location – EL25566, EL31383, EL27581 & EL31531



Musgrave Ranges Project (EL 25566 & EL 31382)

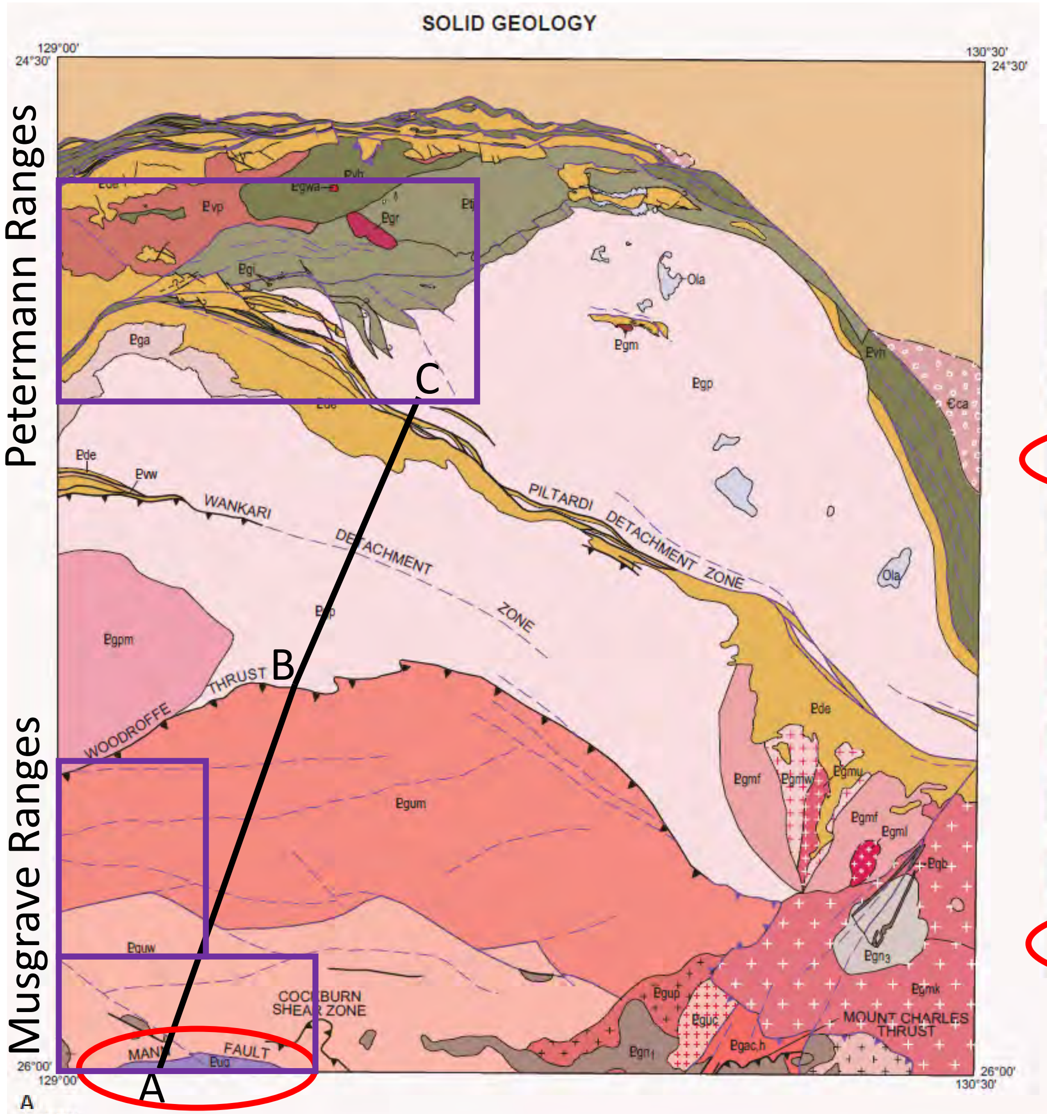
- Adjacent (NT) to the Surveyor Generals Corner (WA, SA, NT junction)
- Located north-east and north of known Secondary (oxide) Nickel-Cobalt mineralisation (Wingellina, WA & Claude Hills, SA)
- **Mapsheets:** 500K Musgrave Block Geological Special, 250K Petermann Ranges, Northwestern Musgrave Block Special 250K, 100K Cockburn

Petermann Ranges (Docker River) Project (EL 27581 & EL 31531)

- ~ 150km west of Yulara
- ~ 100km east of Giles Meteorological Station (WA)
- < 10km north of Lasseter's Cave
- **Mapsheets:** 500K Musgrave Block Geological Special, 250K Bloods Range, Northwestern Musgrave Block Special 250K & 100K Hull & Bloods Range

Metalzoic Geological Consulting

NW MB Special 250K Geology



	Geological boundary; approximate
--?--	Geological boundary; inferred
	Fault; mapped
	Fault; thrust
	Fault; interpreted
--?--	Fault; inferred
Ola	Larapinta Group
Ꞓca	Mount Currie Conglomerate
	Undifferentiated Neoproterozoic Amadeus Basin sediments
Ꝑde	Bloods Range Formation, Kulail Sandstone, Dean Quartzite, Pinyinna beds
Ꝑvw	Wankari volcanics
Ꝑvp	Puntitjata Rhyolite
Ꝑgwa	Walu Granite
Ꝑgr	Rowley Granite
Ꝑgm	Imbumbunna Granite
Ꝑgac,h	Angatja Granite
Ꝑug	Giles Complex
Ꝑvh	Mount Harris Basalt
Ꝑtj	Tjuninanta Formation
Ꝑga	Amputjuta Dacite
Ꝑgi	Ilyaralona Granite
Ꝑgpm	Mulyati Granite
Ꝑgp	Undivided Pottoyu Granite Suite
Ꝑgum	Mantapayika Granite
Ꝑgup	Puka Granite
Ꝑgw	Walal Granite
Ꝑguw	Walytjatjata Granite
Ꝑguc	Unnamed clinopyroxene granite
Ꝑgmw	Wala Wuru Granite
Ꝑgmu	Utanta Granite
Ꝑgmk	Kulu Granite
Ꝑgmf	Foster Cliff Granite
Ꝑgml	Unnamed leucogranite
Ꝑqb	Basement quartzite
Ꝑgn₃	Amphibolite facies felsic gneiss
Ꝑgn₁	Granulite facies gneiss

SCALE 1:1 000 000

0 10 20 30 40 50 Km

Project Area Solid Geology Description

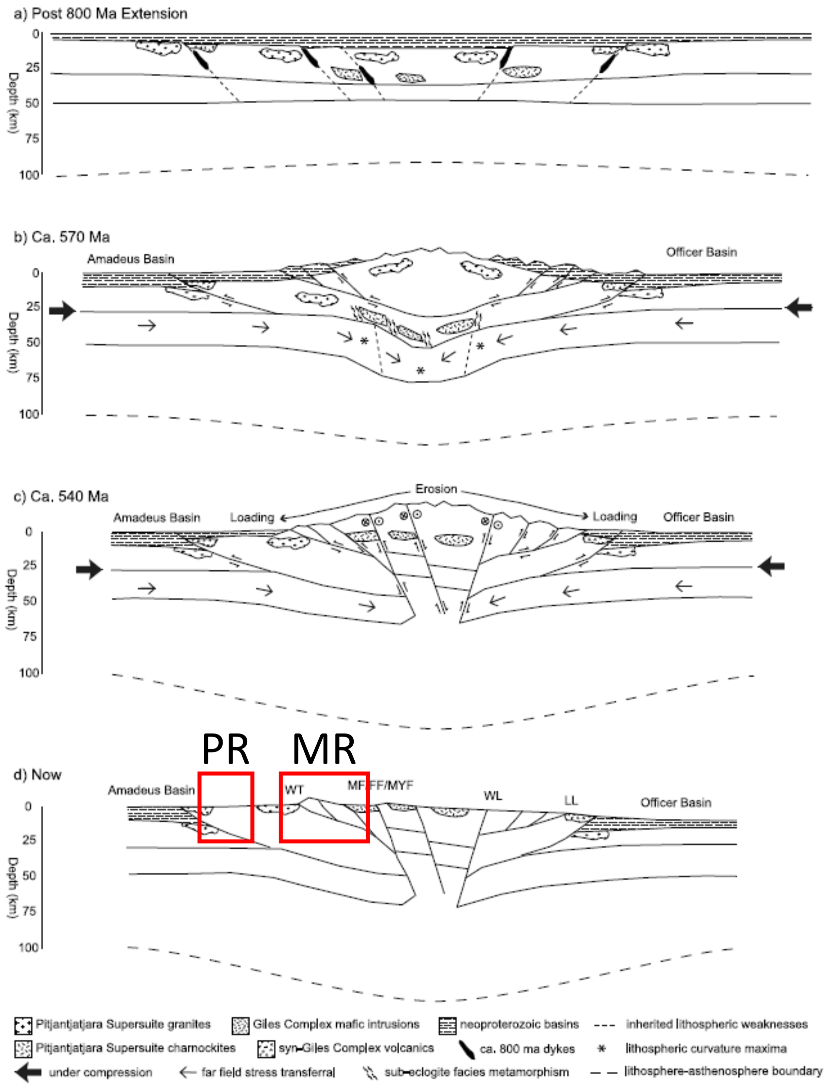
Musgrave Ranges Project (MR)

- Located north of the Mann Fault and south of Woodroffe Thrust.
- The northern half of the project area is dominated by Mantapayika Granite and the southern half by Walytjatjata Granite.
- Giles Complex intrusion and minor rafts of Birksgate Complex granulite/amphibolite gneiss mark the close proximity of the Mann Fault in the south.

Petermann Ranges Project Location (PR)

- Located ~ 40km north of the Woodroffe Thrust, ~10km south of the Amadeus Basin.
- Northern half of the project area dominated by felsic and mafic volcanics and interbedded rift sediments (Bloods Range Formation, Puntitijata Rhyolite, Mt Harris Basalt & Tjuninanta Formation).
- The south-west is dominated by Amadeus Basin metasediments (Pinyinna Beds & Dean Quartzite)
- The south-east is dominated by the Pottoyu Granite Suite.

Petermann Orogeny Evolution



Petermann Orogeny Evolution Schematic

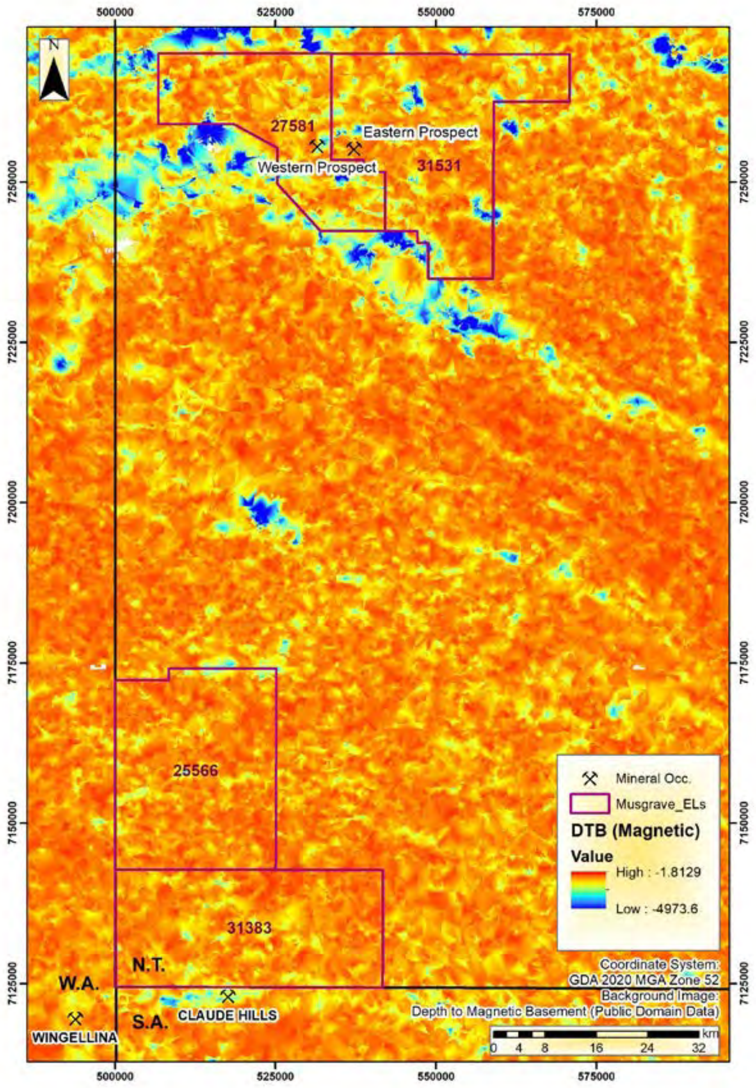
(a) Relict post extension architecture comprised of volcanics, sediments and intrusives, cross cut by dyke swarms.

(b) Lithospheric thickening.

(c) Uplift, erosion of upper crust and loading of marginal regions.

(d) Presently observed crustal architecture.

Depth to Magnetic Basement



Musgrave Ranges Project (EL 25566 & EL 31382)

- The only existing drillholes (4) located along the S.A. border (i.e. Claude Hills) have < 60m of cover.
- Depth to magnetic basement is fairly consistent across tenure. It can be assumed in most cases that cover will be < 100m.

Petermann Ranges (Docker River) Project (EL 27581 & EL 31531)

- The only existing drillholes (5) located in the centre of the tenure (i.e. Western & Eastern Prospect) were drilled directly into outcrop.
- Depth to magnetic basement is predominately < 100m, with some deeper zones associated with major structures.

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Previous Exploration

Musgrave Ranges Project (EL 25566 & EL 31382)

- Limited to government datasets only.
  - Broad spaced airborne magnetic survey (500m lines) and gravity survey (>7.5km stations).
  - 16 x rock chip samples taken during 250K mapping program (wholerock assays).
  - N.T. extension of S.A. Claude Hills (Ni-Co Laterite) including 4 x SADME drillholes.

Petermann Ranges (Docker River) Project (EL 27581 & EL 31531)

- Planet Metals Exploration (1966)
  - Photogeologic evaluation (structural interpretation and delineating outcrop distribution of the mineralised Pinyinna Beds).
  - Shallow rotary drilling & airborne mag, however no data was provided with report.
- Mines Branch Alice Springs (1972)
  - Shallow diamond drillholes (5) to test surface copper intersected malachite, chrysocolla and chalcocite occurring within quartz-orthoclase-calcite veining cross cutting chlorite schist (altered basalt).
- Independence Group NL & Goldsearch JV (2004 – 2006)
  - Surface geochemistry (rock chips, whole soil, mag lag and 75#). Identified Au, Cu, Pb & Ag mineralisation in rock chips. Assays suite limited to Ag, As, Au, Cu, Mo, Ni, Pb, Sb, Zn.

Note: Recent work by Gempart (NT) Pty. Ltd. includes Airborne EM and detailed gravity.

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Musgrave Ranges Project

- Geology
- Geochemistry
- Geophysics
- Claude Hills Extension

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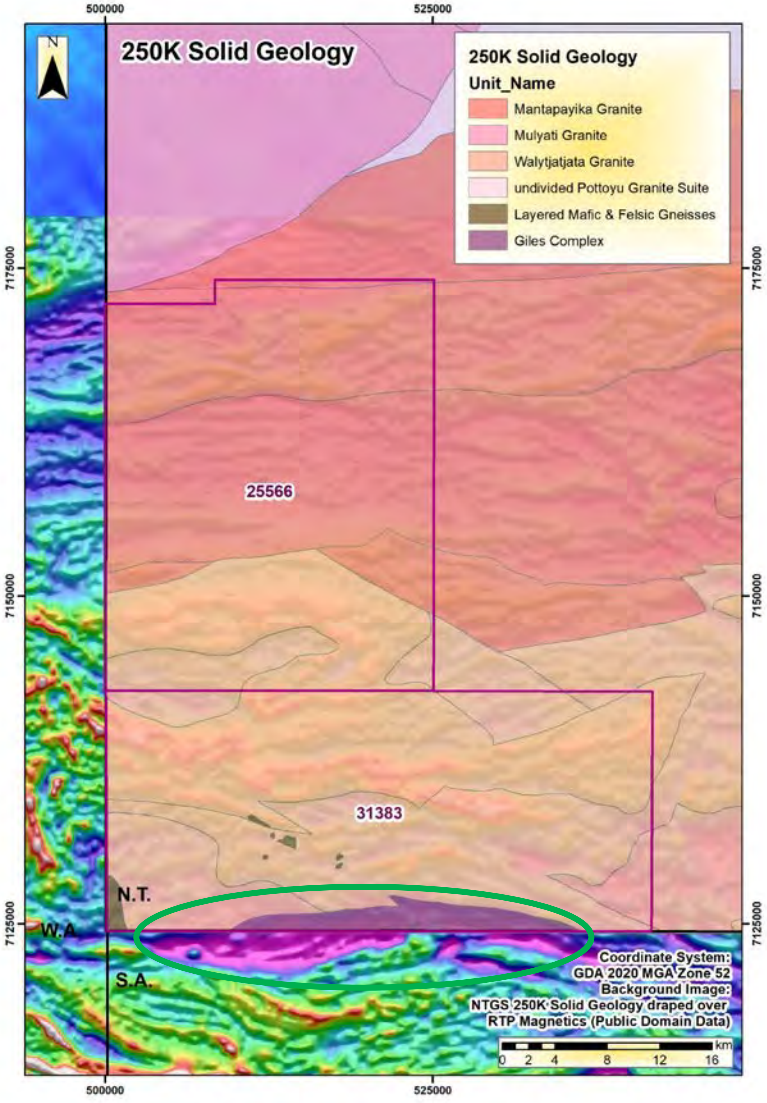
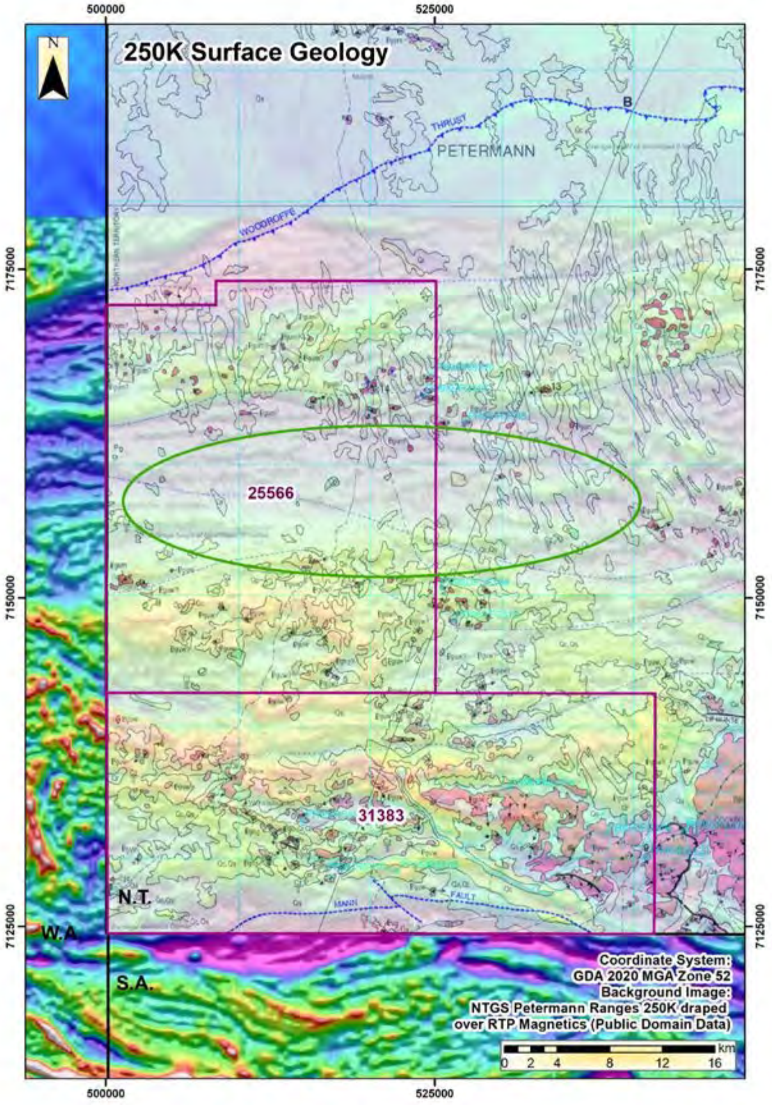
Geological Consulting

250K Geology - Musgrave Ranges Project





- Only limited Giles interpreted on the southern margin of EL 31383.
- Giles interpretation is based on a zone of remanent magnetism.
- Only Quaternary outcrop in the central section of EL 25566, which is associated with an untested geophysical domain (coincident magnetic low & gravity high).
- Granites in the region mostly exhibit mod-high magnetic response.
- Potential for secondary (oxide) Ni-Co along strike from Claude Hills.

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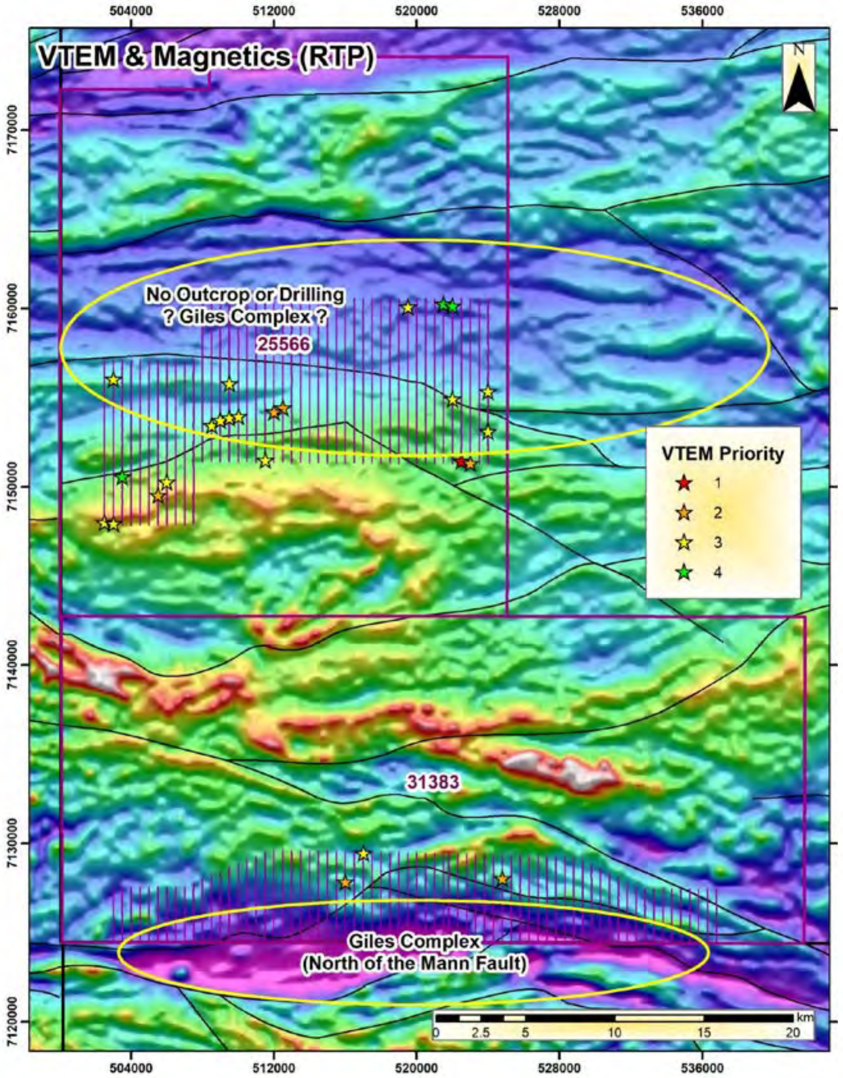
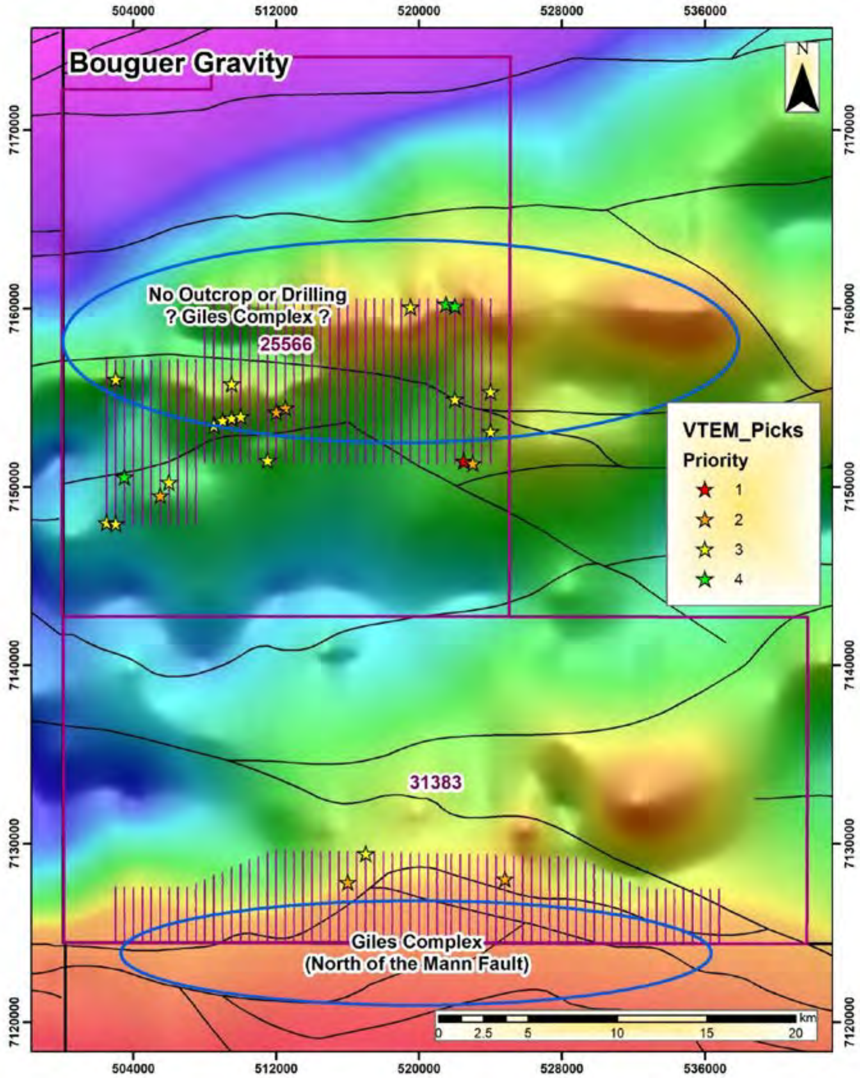
Geophysics – Musgrave Ranges Project

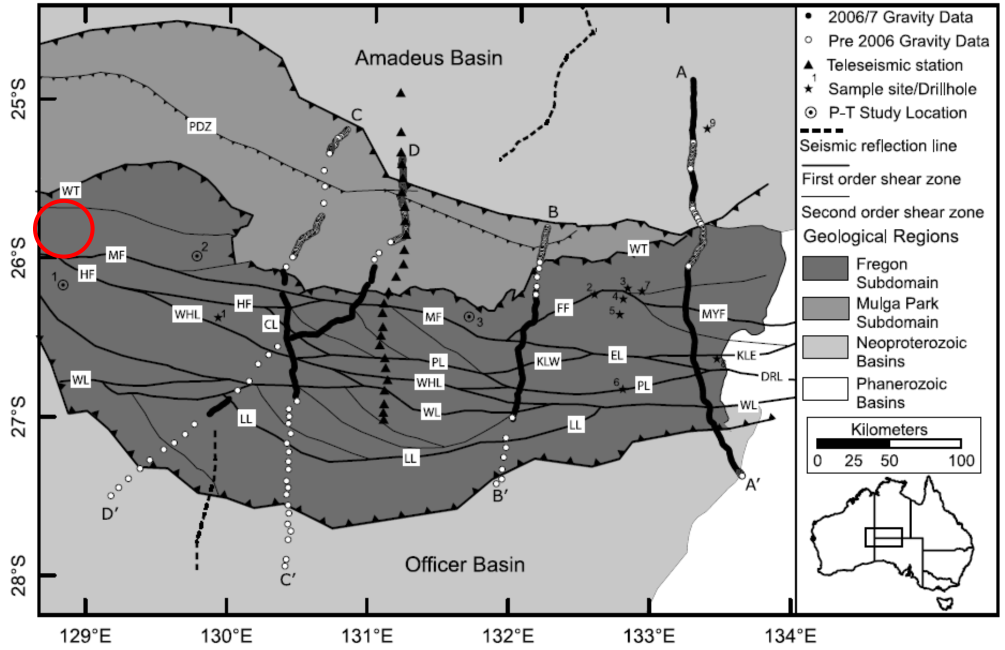


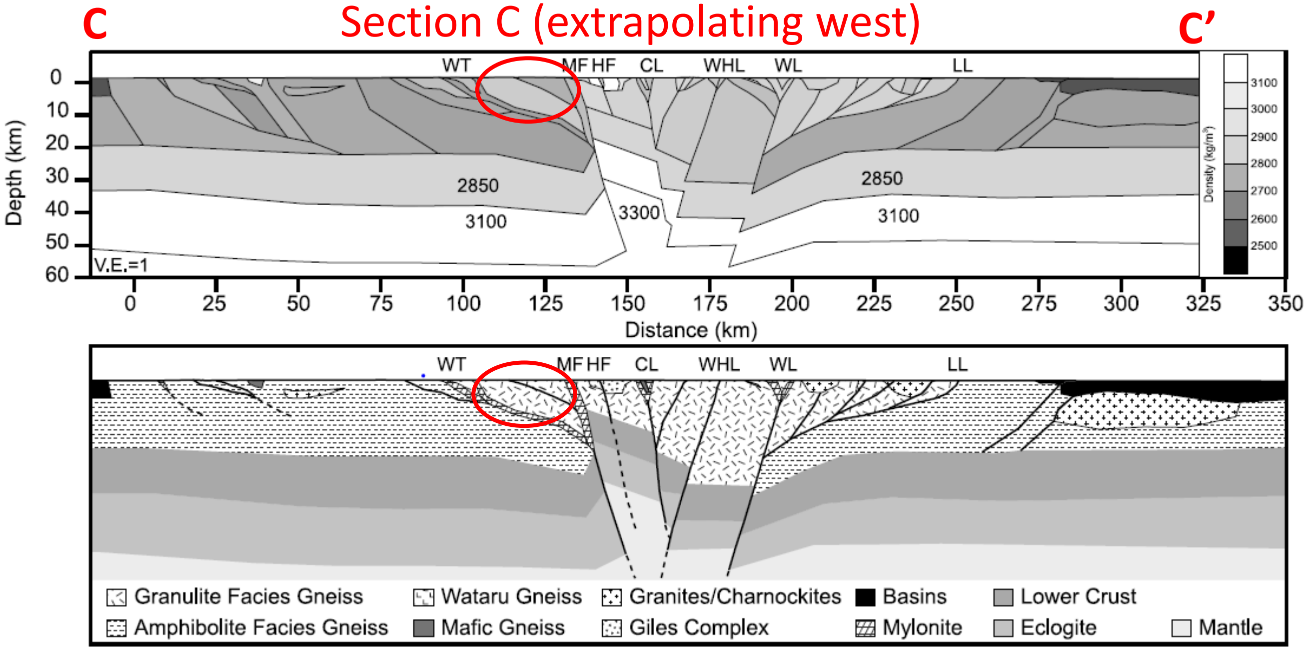


- Untested geophysical domain (no outcrop sampling, no drilling). Possibly Giles Complex under cover?
- Domain contains coincident magnetic low (remanent) & subtle gravity high. Similar to Claude Hills.
- Would expect a relative gravity low for a downward block offset.
- EL 25566 – Bedrock conductors within domain
- Cluster on edge of survey proximal to, but not coincident with mapped granite.

Structural Setting - Musgrave Ranges Project

- The mag low / grav high is located south of the Woodroffe Thrust and <30km north of the Mann Fault.
- Density contrast modelling suggests a Giles Complex intrusive would be feasible in this stratigraphic position.
- Although the gravity response is subdued north of the Mann Fault, density contrast modelling indicates that the crustal scale Woodroffe Thrust is shallowly south dipping, and links into the lithospheric scale Mann Fault at a depth of approx. 20 km (i.e. deep seated source south of the Mann Fault accounts for the density contrast).
- Inconclusive without stratigraphic drilling, but airborne EM picks and regional mag/grav support the model.

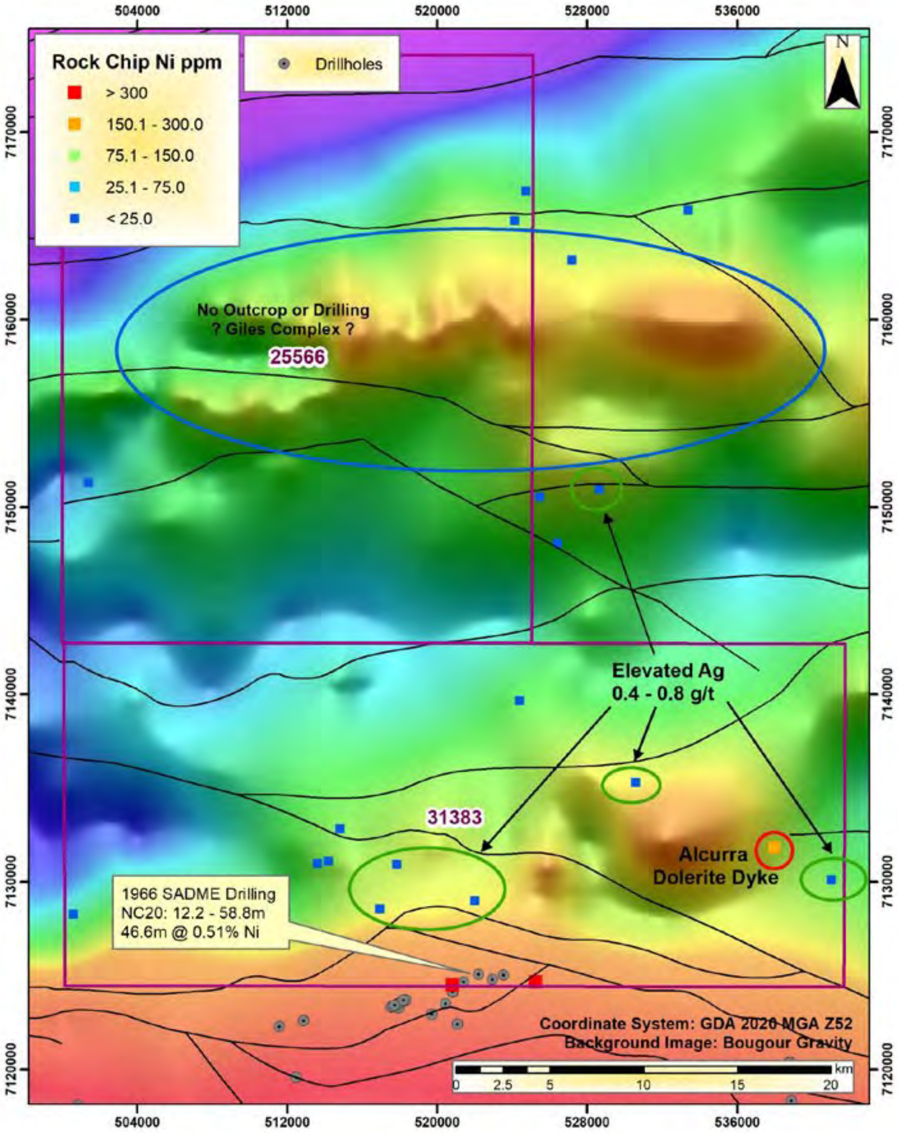




Major shear zones : **WT**, Woodroffe Thrust; **MF**, Mann Fault; **HF**, Hinckley Fault; CL, Caroline Lineament; FF, Ferdinand Fault; MYF, Marryat Fault; EL, Echo Lineament; KLW, Kaltjiti Lineament West; KLE, Kaltjiti Lineament East; PL, Paroora Lineament; DRL, De Rose Lineament; **WHL**, Wintiginna-Hinckley Lineament; **WL**, Wintiginna Lineament; **LL**, Lindsay Lineament; **PDZ**, Piltardi Detachment Zone.

Aitken et. al., 2009

Geochemistry – Musgrave Ranges Project



- There are no digital surface geochemistry or drilling results available on the STRIKE geochem database.
- However, the NTGS took multiple wholerock samples during the 250K Surface Geology mapping program.
- There is no anomalous Ni except for Giles Complex ultramafics outcropping on the border and within a single Alcurra dolerite dyke close to the western margin of EL 31383.
- Elevated Ag in granites is interesting. Recent work by the GSSA identified hydrothermal related Ag-Zn-Cu-REE mineralisation within granites in the eastern Musgrave Province (Tieyon station).
- This is significant, given the anhydrous nature of the Pitjantjatjara Supersuite granites, leading previous explorers to the conclusion they were non-prospective.
- There are only 4 drillholes, which straddle the S.A. border. Drillholes were targeting Ni-Co Laterite (Claude Hills extension).

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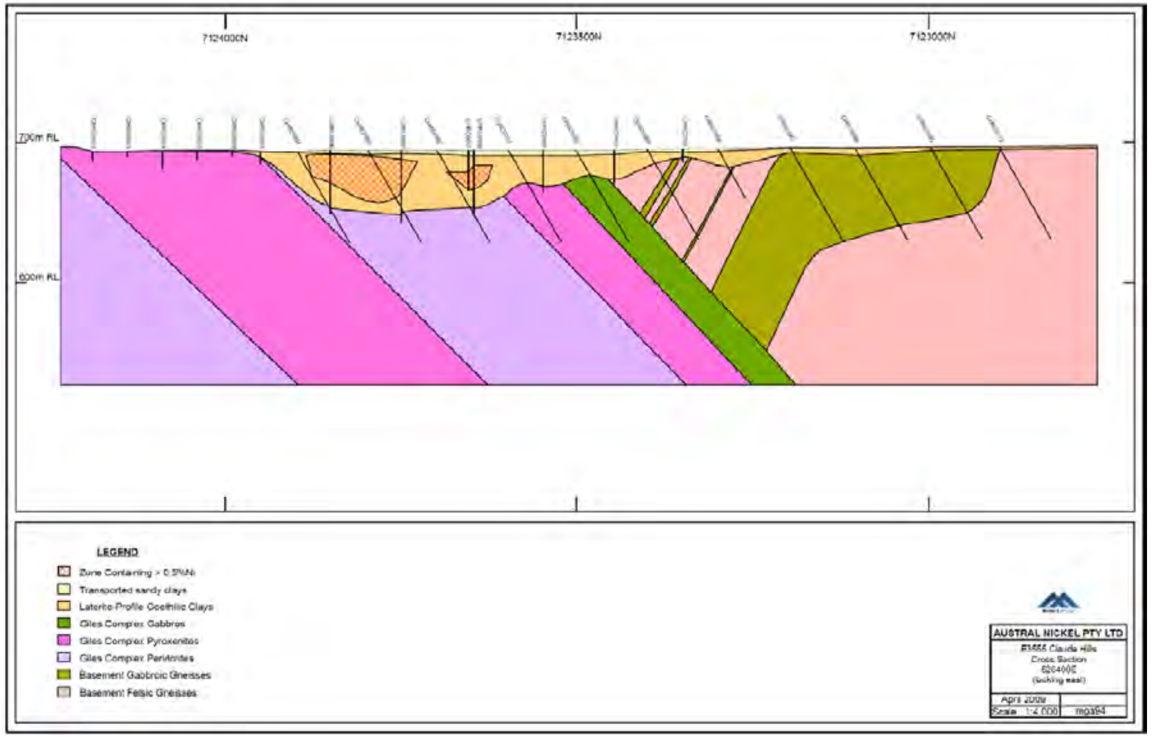
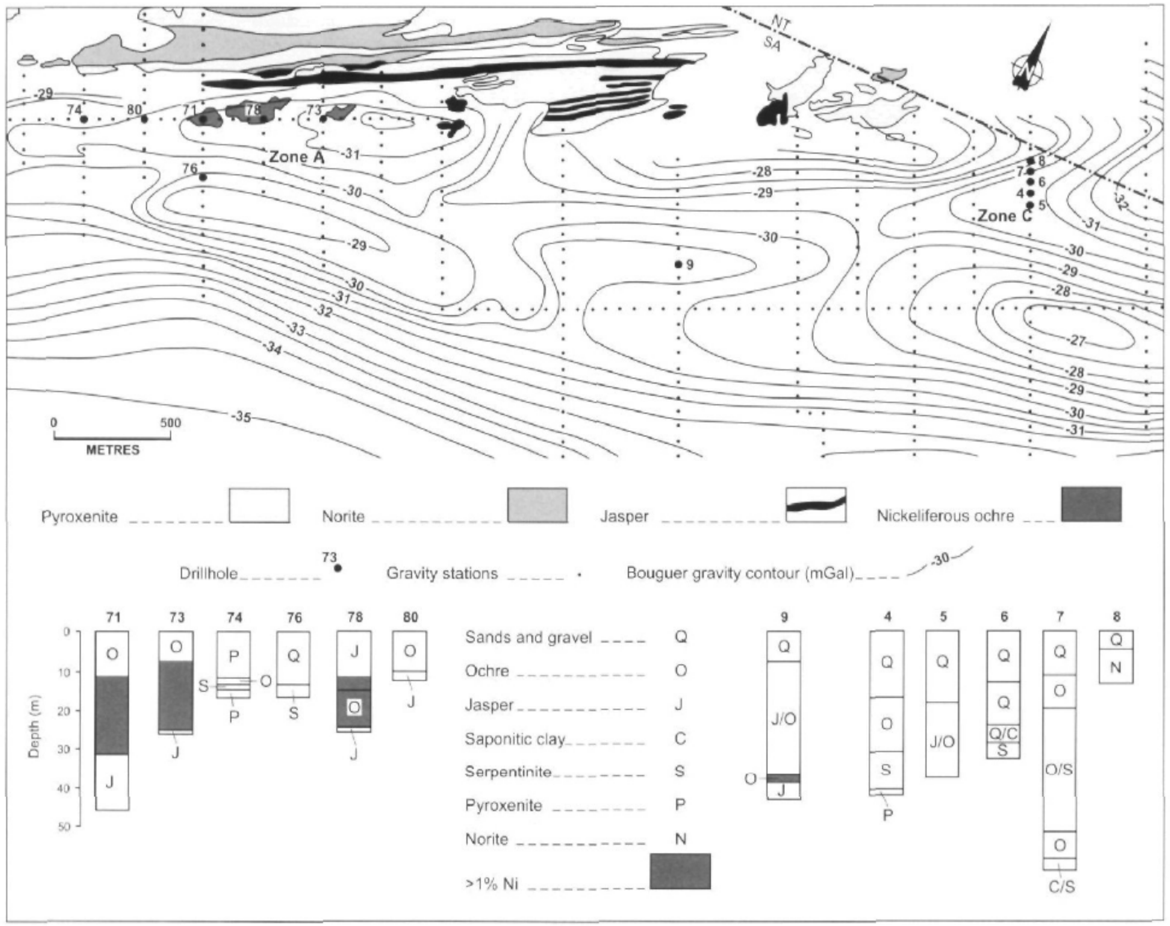
Claude Hills Ni-Co Laterite

Claude Hills is analogous to the Wingellina deposit and straddles the southern margin of the project area. Historic drilling identified enrichment over strike of ~1.6km x 200m wide x 30-40m depth. No resources figures released (SARIG, 2018).



Metals X drillhole section from Claude Hills



Gravity and drillhole data from Claude Hills (Dentith, 2003)

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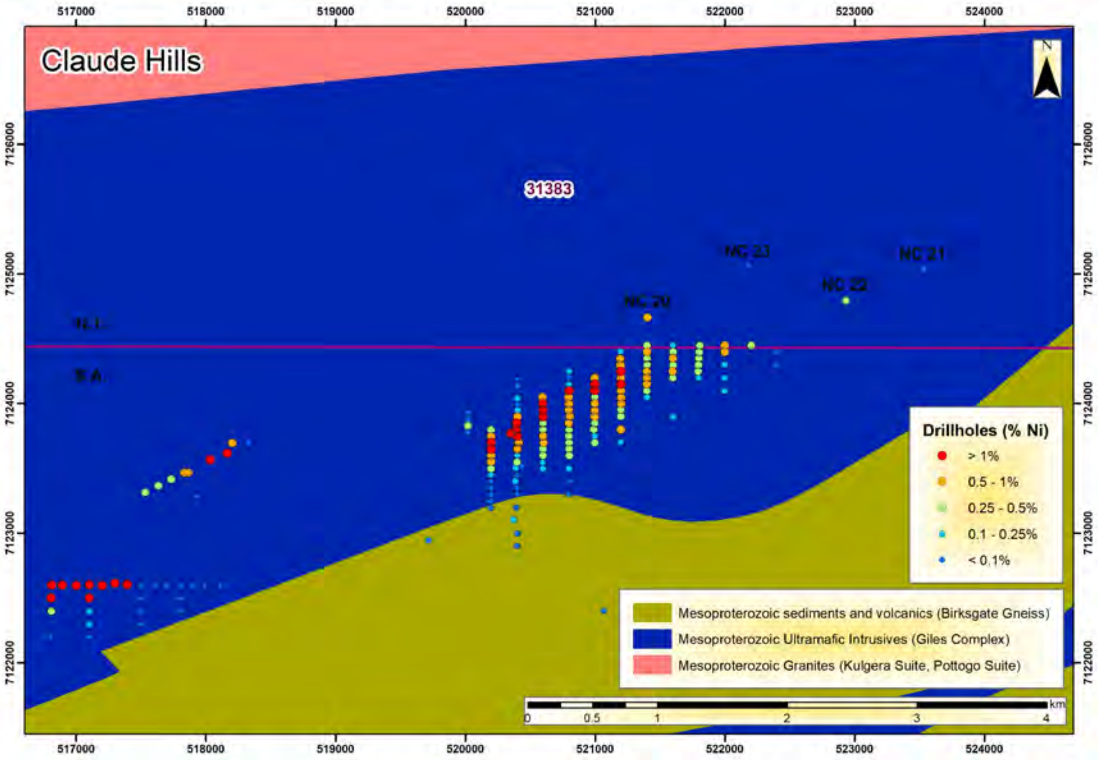
Geochemistry – Claude Hills

- There are only 4 historic drillholes (Rotary Percussion NC20 – 23) on EL 31383, which were drilled by SADME in 1966 (RB6300119) just north of the South Australian border.
- Much of the interpreted Giles intrusion has not been tested for Ni-Co Laterite.
- However, this interpretation was probably based on a mag low, assumed to be a zone of remanent magnetism and contrast to this the VRMI shows it to be relatively neutral.

Note: The VRMI filter converts the perceived "low" magnetic responses, due to remanent magnetism to reflect the actual relative magnetic response (i.e. mafic bodies would be highs once the magnetic field direction is factored in).



Hole ID	Target	Significant Intercepts	Logging Description
NC 20	Zone C – Gravity Low	46.6m @ 0.51% Ni from 12.2m (including 3m @ 0.91% Ni from 35.7m)	Quaternary Sediments from 0 – 12.2m, secondary oxide from 12.2 – 58.8m terminating in saprolitic clays.
NC 23	Zone C – Gravity Low	-	Quaternary sediments from 0 – 49.7m.
NC 21	Zone D – Gravity Low	-	Quaternary Sediments from 0 – 47.5m.
NC 22	Zone D – Gravity Low	4.9m @ 0.3% Ni from 36.9m	Quaternary sediments from 0 – 30.5m, saprolitic clays 30.5-42.0m.

Deposit Model - Musgrave Ranges

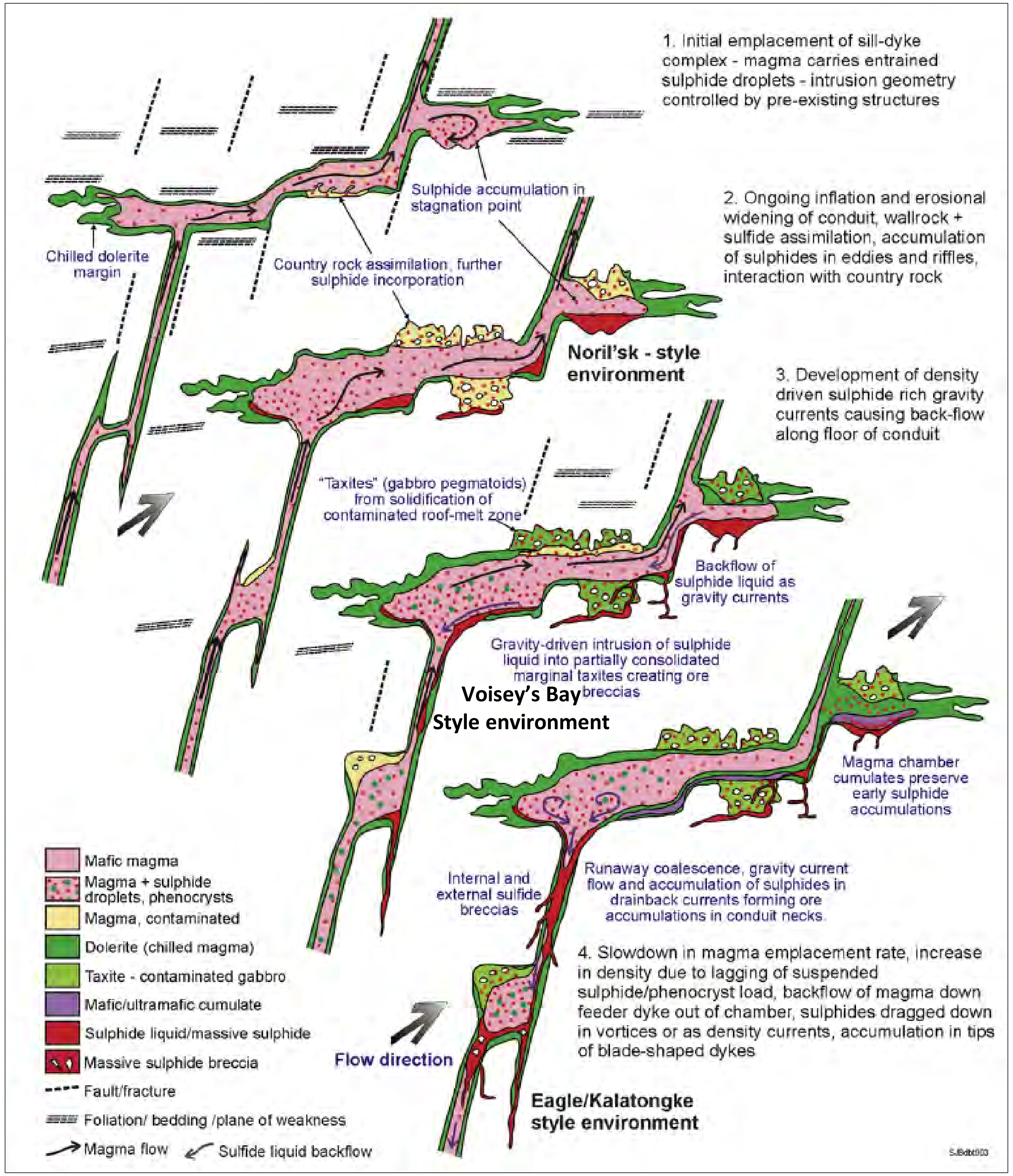
Magmatic Ni-Cu-Co-PGE Sulphide Deposits

The primary exploration focus within the Musgrave Province is on the Giles Complex intrusions & Alcurra dolerite dykes (1080-1040Ma), and the younger mafic/ultramafic dyke swarms (1000Ma Kullal Dyke Suite and 825–760Ma Amata Dolerite), which are considered highly prospective for magmatic Ni-Cu-Co-PGE sulphide deposits.

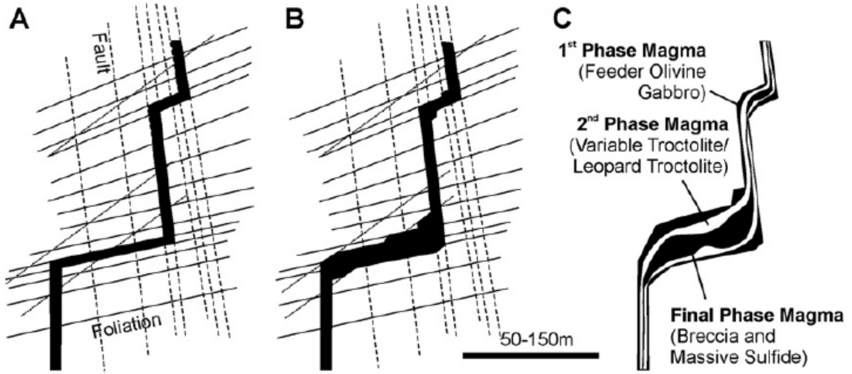
Geometries of known mineralised mafic-ultramafic intrusions, which have a high potential to form within the Giles Complex and subsequent mafic dyke swarms include: feeder dykes linking vertically separated small tabular intrusions (e.g. Voisey's Bay), tube like conduits (e.g. Nebo-Babel), boat-shaped flares in cumulate-rich dyke-sill transitions (e.g. Eagle, Kalatonge), sword-blade shaped dykes with ultramafic cumulates at the bottom edge (e.g. Savannah) (Barnes et. al., 2016).

The Nebo-Babel project is a JORC 2012 compliant Resource of 203Mt @ 0.41% Ni and 0.42% Cu for 821kt contained Ni and 844kt of contained Cu. The Succoth Deposit Inferred Mineral Resource totals 156Mt @ 0.60% Cu at a 0.3% Cu cut-off grade and is located 13km north-east of Nebo-Babel. Both the Nebo-Babel and Succoth projects are currently held by Cassini Resources (ASX: CZI website).

Deposit Model



(**Left**) Schematic illustration of components of the crustal portion of an idealised magmatic plumbing system, showing a hypothetical sequence of events leading to the development of Noril'sk style, Eagle–Kalatongke style and Voisey's Bay style settings for mineralisation.



(**Above**) Model for structurally-controlled emplacement as exemplified by the Discovery Hill Dyke at Voisey's Bay

(**A**) vertical cross section of a dyke that has propagated through a pre-existing fracture network. The ideal orientation of the dyke is vertical but it is locally reoriented with fractures and foliation planes.

(**B**) thermo-mechanical erosion of dyke walls leads to preferential widening of gently dipping sections.

(**C**) Sketch cross section of intrusive phases and mineralisation within the Discovery Hill Dyke, Voisey's Bay.

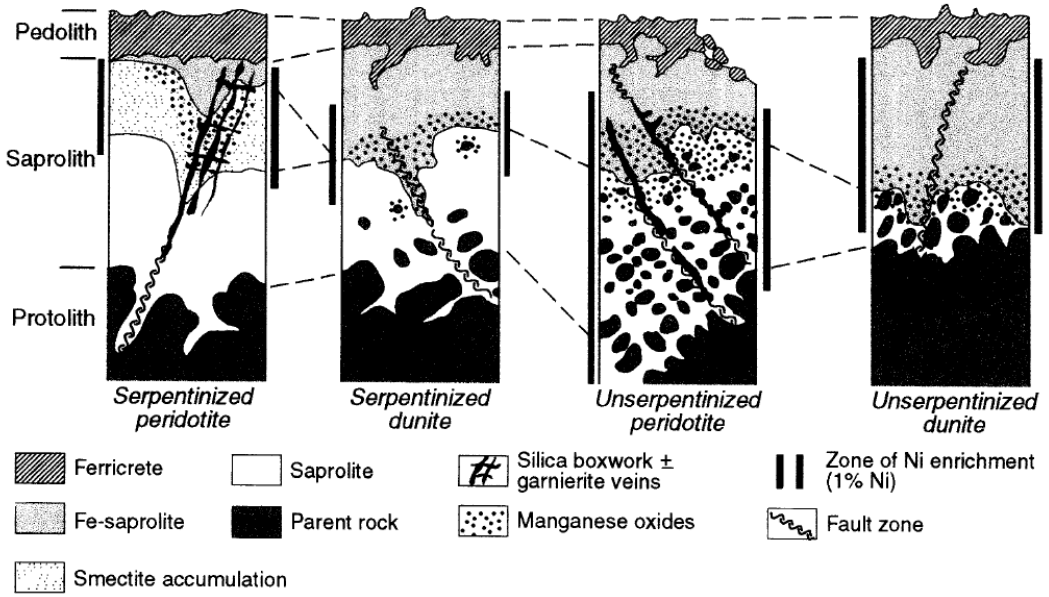
(Barnes, et. al., 2016)

Deposit Model - Musgrave Ranges

Ni-Co Laterite Deposits

Secondary (oxide) Ni-Co mineralisation that is associated with the weathering of ultramafic rocks of the Giles Complex. This style of mineralisation is best developed at Wingellina.

The Wingellina Project is currently held by Metals X Limited and consists of 187M tonnes of ore at 1% nickel and 0.08% cobalt. Over 167M tonnes or 90% of this resource is classified as a Probable Mining Reserve (ASX: MLX website).



These deposits form due to the removal of silica and magnesium from ultrabasic (primary Ni content > 0.2%) rocks during Tertiary weathering, leaving a residual zone of ‘ochre’ enriched in Ni (i.e. nickeliferous laterites).

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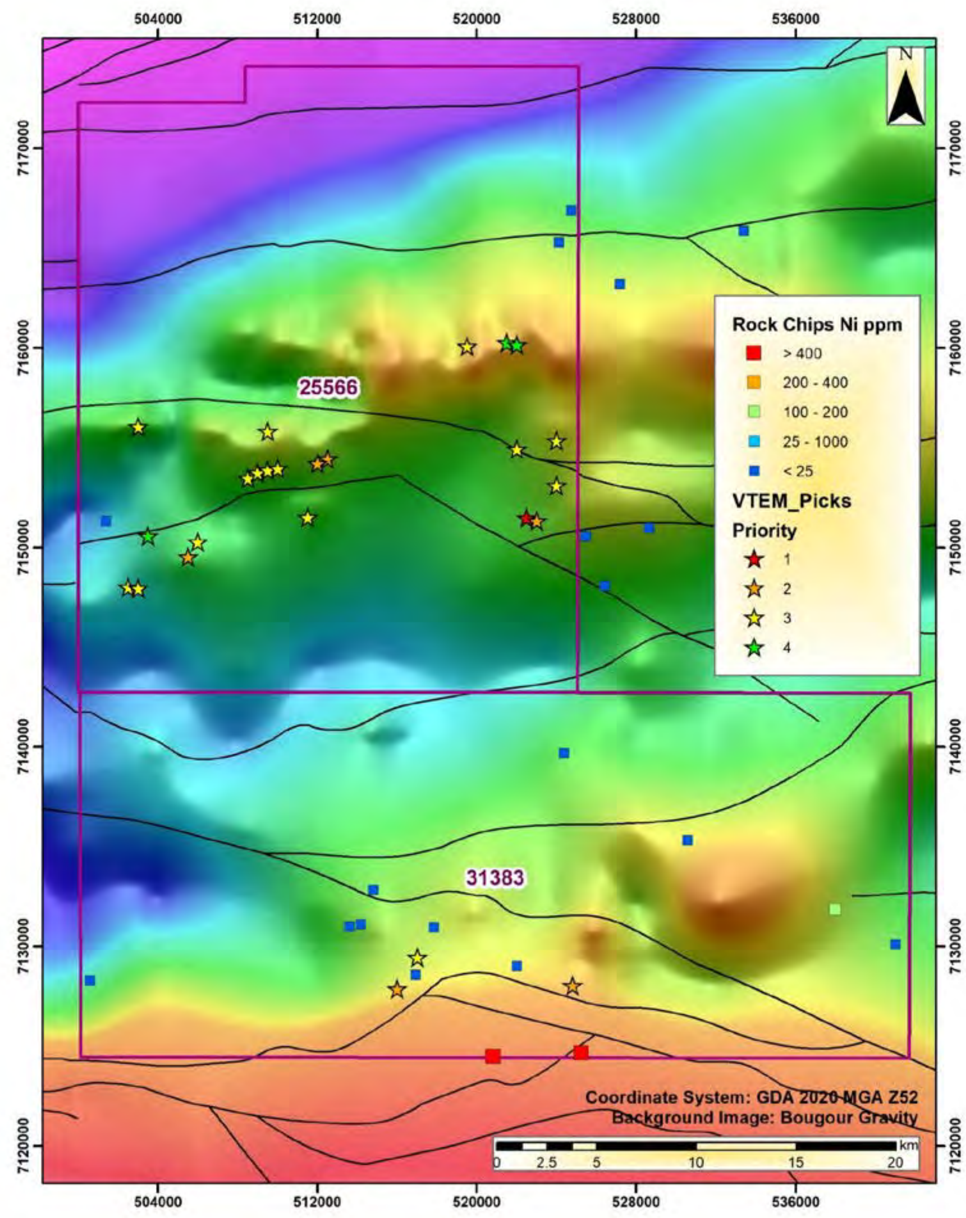
SWOT – Musgrave Ranges

Strengths	Opportunities
• Known large magmatic sulphide occurrences within Giles Complex (Nebo-Babel & Succoth located 130km west of southern tenure). • Known lateritic Ni-Co deposit at Claude Hills. • Late time conductors present within tenure.	• Almost no previous exploration across tenure, therefore large gaps in geochemical sampling. • Large conceptual Giles Complex intrusion (zone of remanent magnetism with coincident gravity high). • Untested VTEM targets coincident with conceptual Giles intrusion. • Test the N.T. extension of Claude Hills. • Anomalous Ag in Pitjantjatjara Supersuite granite.
Weakness	**Threats**
• Limited Giles Complex and no historic magmatic sulphide occurrences within tenure. • Need closer-spaced AEM or ground EM to target narrow dykes effectively. • Typical footprint size of magmatic sulphide deposits relatively small (<200m).	• Indigenous Heritage (ALRA) • Unknown cover thickness - assumptions are based on DTMB modelling (no drillhole confirmation). • Limited thickness Giles block (conceptual) i.e. Mt Woodroffe area <1km width of intrusion preserved. • N.T. extension of Claude Hill intrusion based on a mag interpretation.

Exploration Target Summary



- All P1 & P2 VTEM targets and favourably located P3 VTEM targets should be followed up with ground EM.
- VTEM targets on EL 25566 are potentially associated with a blind Giles Intrusion (coincident gravity/remanent mag).
- EM response unlikely to be due to graphite given the Giles is more likely to have intruded granite (not metasediments) in this stratigraphic position.
- VTEM targets on EL 31383 on the periphery of the interpreted Claude Hill intrusion N.T. extension.
- The western targets are proximal to Birksgate Complex mafic granulite outcrop. The eastern target is along strike to the Claude Hills laterite.

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Exploration Recommendations & Budget

Musgrave Ranges

Tenement	Method	Description	Expenditure
EL 25566 & EL 31383 (Ni Sulphide & Hydrothermal Ag)	Reconnaissance Trip	Ground Truth EM targets and check for Ag veins in granite. Assess need for Ground EM. Rock chip where suitable.	$5,000
EL 25566 (Ni Sulphide)	Ground EM	Define geometry for drill testing.	$50,000
EL 25566 (Ni Sulphide)	RC/Diamond	Test EM targets.	$120,000
		Total	$175,000

Metalzoic Geological Consulting

Petermann Ranges Project

- Geology
- Geophysics
- Geochemistry

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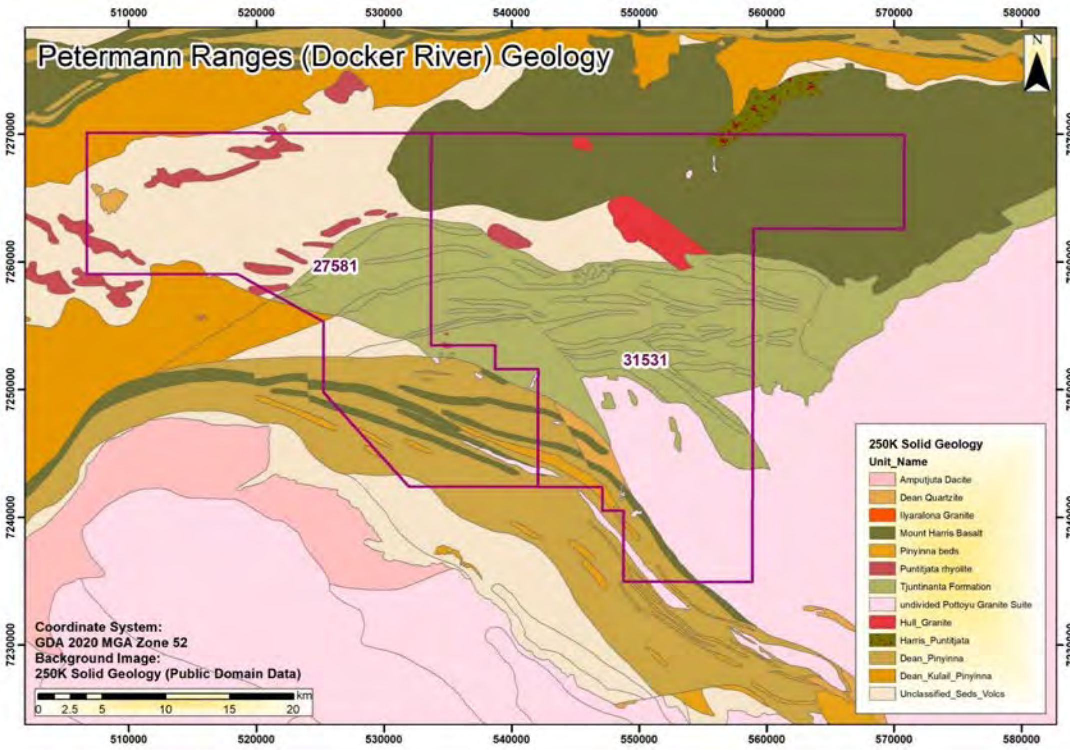
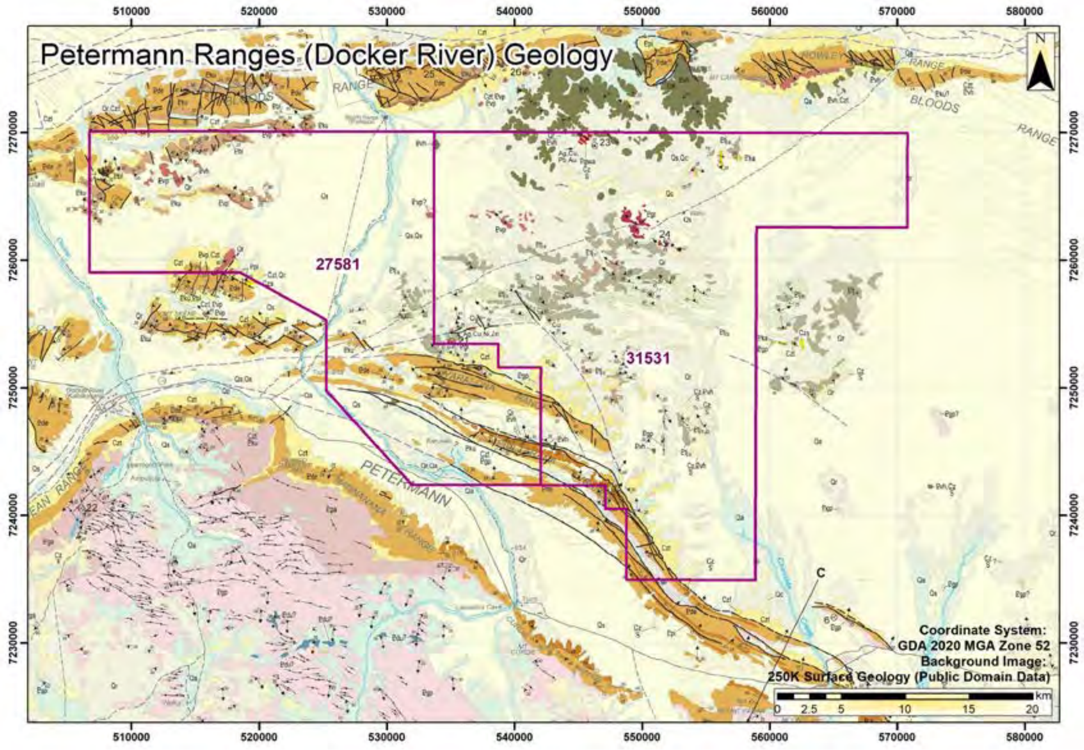
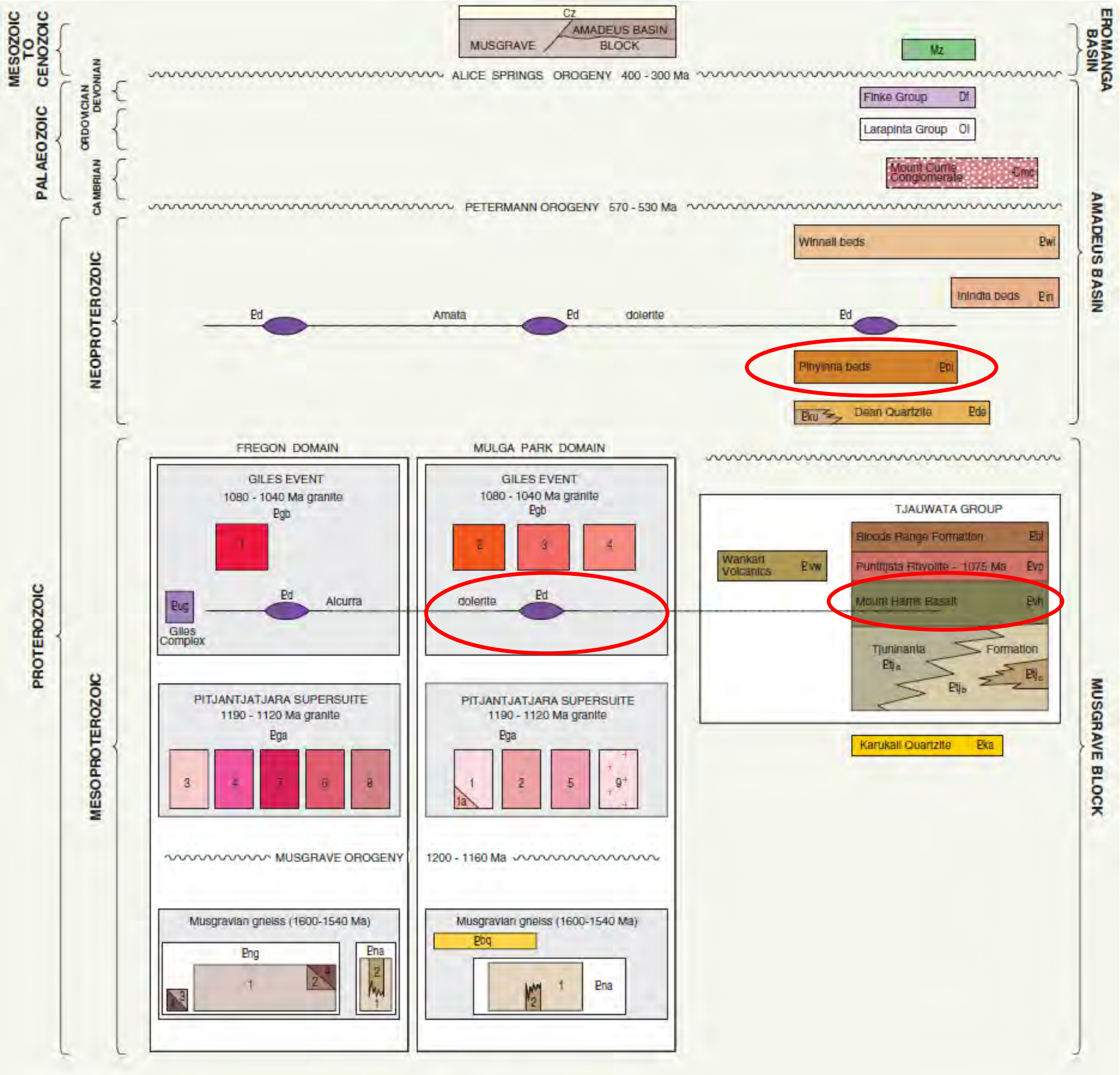
250K Solid Geology - Musgrave Ranges Project





- The Mt Harris Basalt is interpreted as the extrusive equivalent of the Giles Complex and crops out in the NE region of the project area. Given the large volume of the Giles Complex, it is likely these flood basalts were once equally voluminous, but have since been heavily eroded. Considered prospective for massive Ni-Cu-PGE sulphides.
- The project area is structurally complex, having undergone significant deformation during the Petermann Orogeny. The project area is marked by a series of shallow dipping recumbent folds (50 ° → 330°), which are cross cut by major NW to NNW structures (possibly mantle tapping). Considered prospective for orogenic Au.

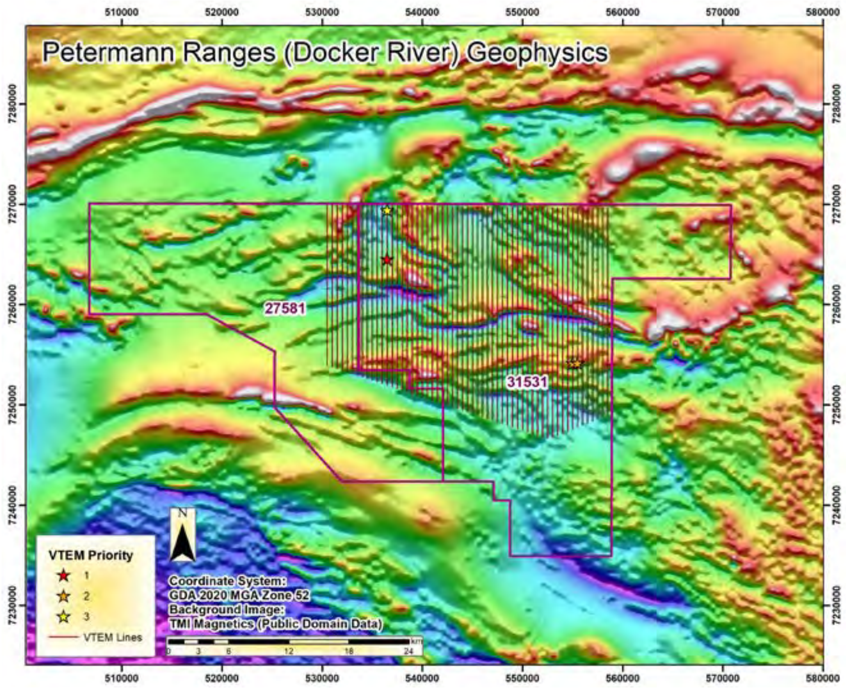
Stratigraphic Targets

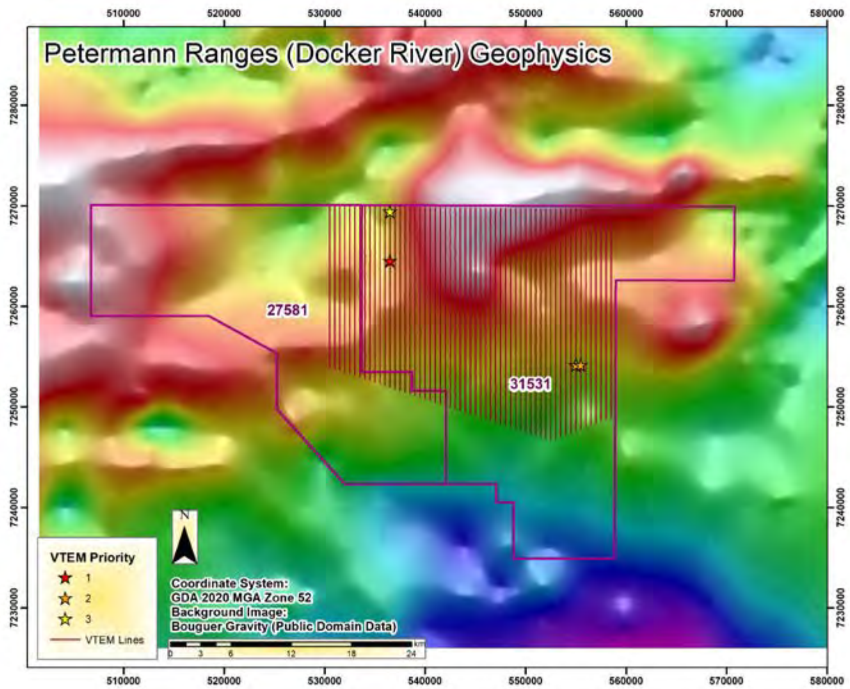


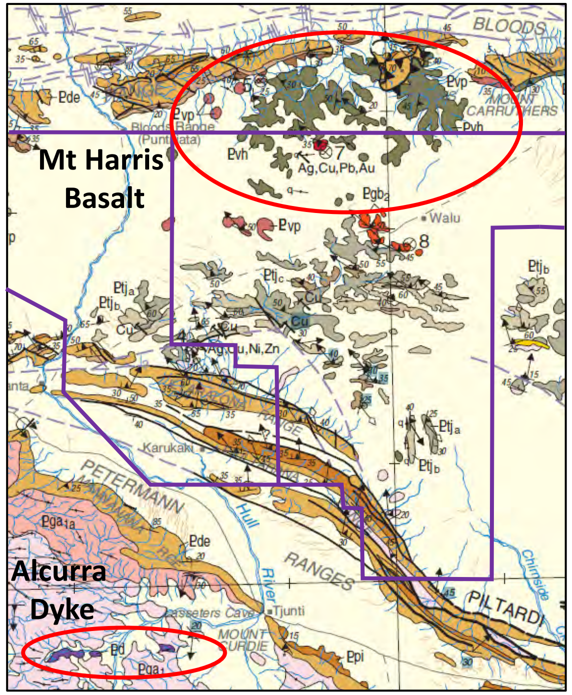
- Mount Harris Basalt forms part of the Tjauwata Group, where is conformably overlies the Tjuninanta Formation (including basalts, schistose metasediments and volcaniclastics).
- The Mound Harris Basalt is overlain by the Puntitjata Rhyolite & Bloods Range Formation The Bloods Range Formation includes red shales, polymictic conglomerates, volcaniclastics and tuffaceous horizons).
- Also present in the project area are post Giles Event Amadeus Basin sediments including the Pinyinna Beds and Dean Quartzite. The Pinyinna beds are comprised of phyllites, dolostones, sandstones, fissile siltstones and dolomitic siltstones.
- Mesoproterozoic Tjauwata Group and Neoproterozoic Pinyinna Beds contain geochemically reactive units (i.e. carbonates) and are considered prospective for sediment hosted base-metals sulphides.

Geophysics – Petermann Ranges

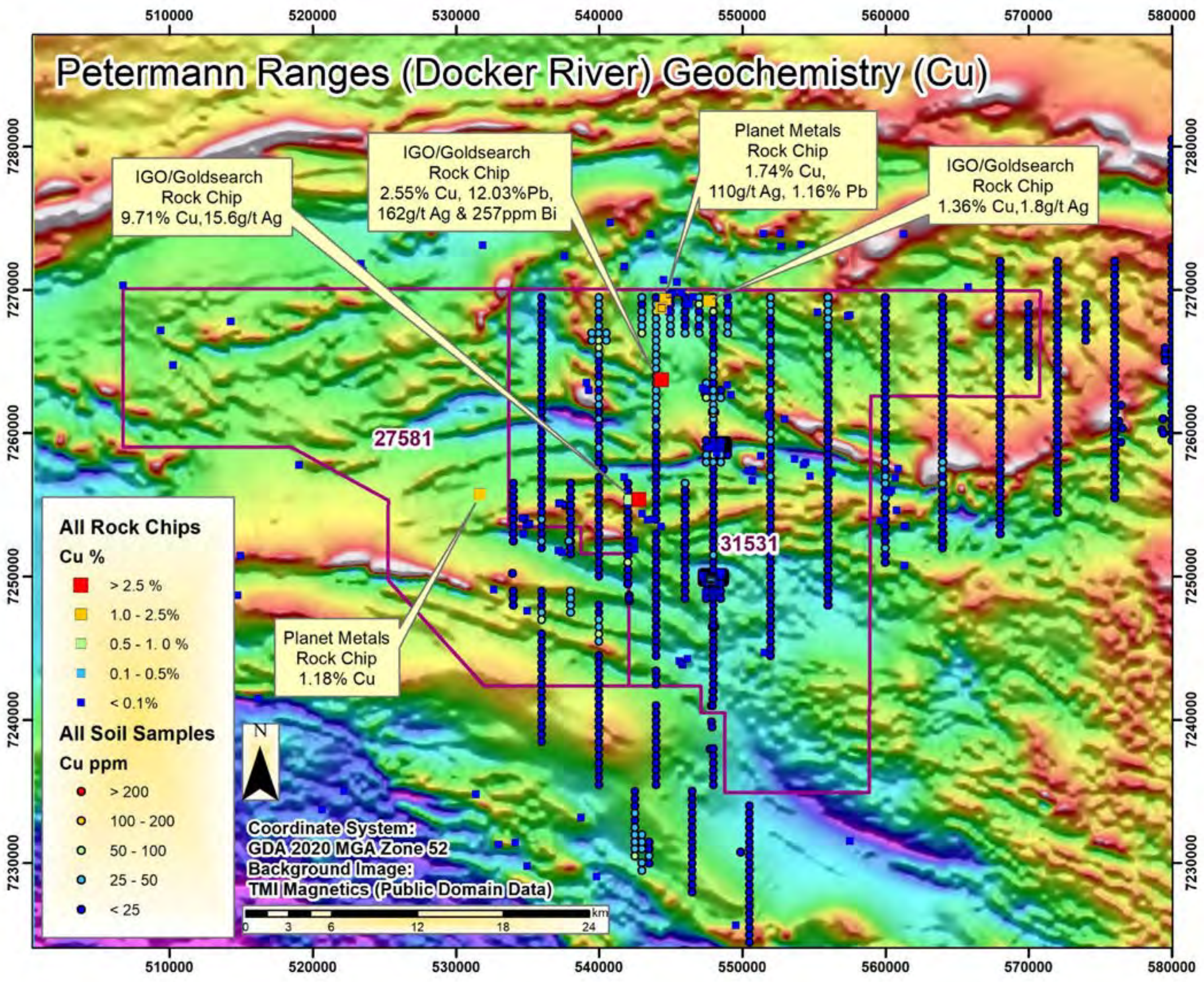
- Regional magnetics highlight major structures including major NW faults and recumbent folds plunging NNW.
- Zones of elevated density in the north corresponds with the Mt Harris Basalt unit.
- The highest priority Airborne EM anomalies occurs within the Mt Harris Basalt unit, within magnetic lows and along strike from outcropping Cu-Pb-Ag mineralisation. This VTEM targets could represent Red Bed base metals.
- Mt Harris Basalt outcrop is the remanent to the flood basalts related to the Giles Event. In this setting feeder zones are prospective for massive Ni-sulphides e.g. Noril'sk. An example of a possible feeder exists 12km south of the project area. This intrusion crops out over 14km strike length and with widths exceeding 550m (Alcurra Dyke?).







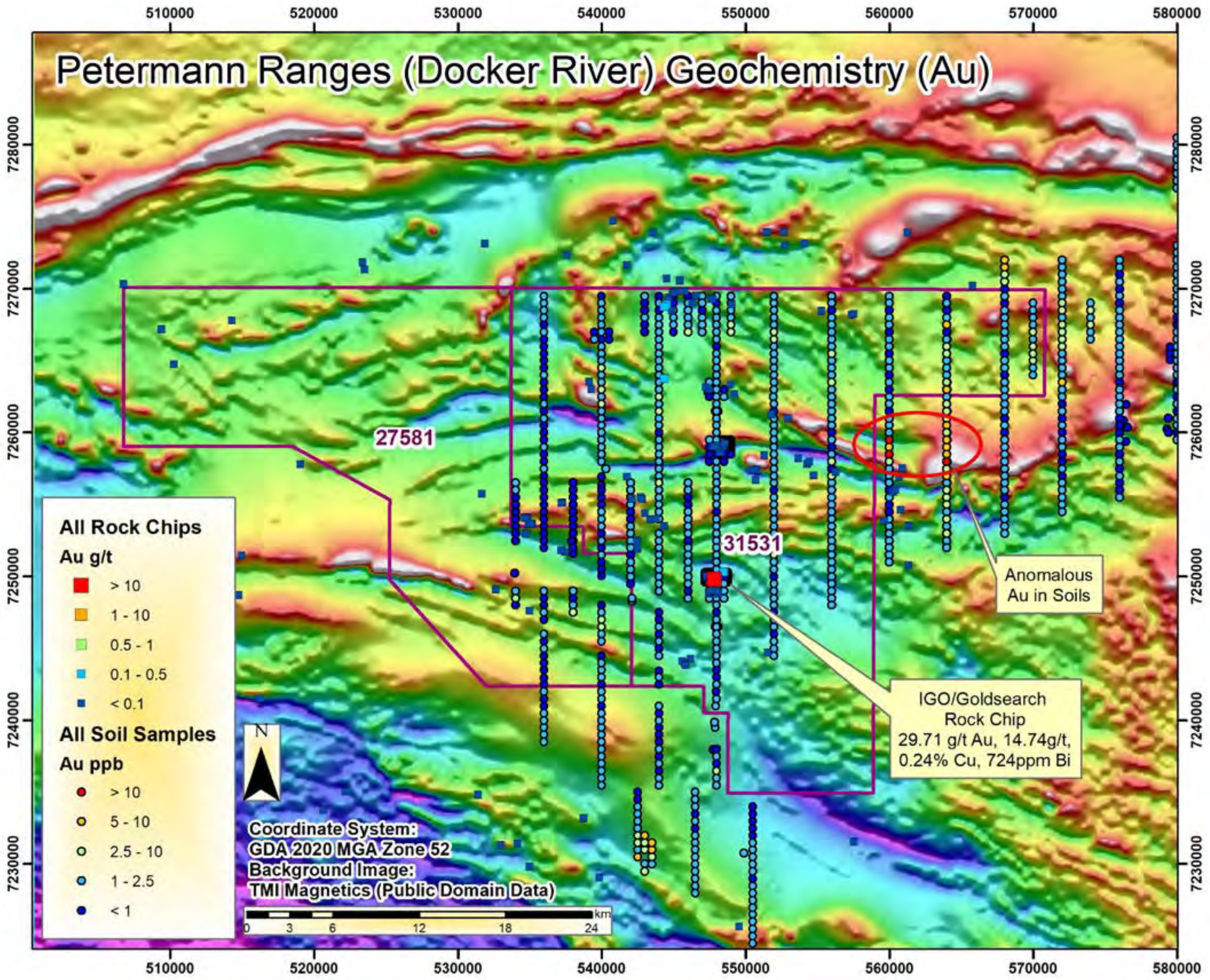
Geochemistry – Petermann Ranges Project



- Peak rock chip values include 9.71% Cu, 12.03% Pb, 162 g/t Ag & 257.3ppm Bi.
- Drill testing (5 x shallow DDH) of the SE target (1.18% Cu) by the Mines Branch Alice Springs (1972).
- Drilling intersected malachite, chrysocolla and chalcocite in quartz-orthoclase-calcite veins crosscutting highly sheared and altered basalt (chlorite schist).
- Mines Branch assessed this as local supergene occurrence with no depth extent. Analogous to the Moorilyanna prospect in the eastern Musgraves, S.A.
- Cu sourced from mafic host rock (i.e. basalt)?
- Cu targets with associated Pb and Ag & Bi could reflect primary mineralising process (Red beds???)

Cu %	Pb %	Ag g/t	Bi ppm
9.71	0.0024	15.6	1.9
2.55	12.03	162.4	257.3
1.74	1.16	110	260
1.36	0.0032	1.8	0.07
1.18	0.0043	4	7

Geochemistry – Petermann Ranges Project (Au)



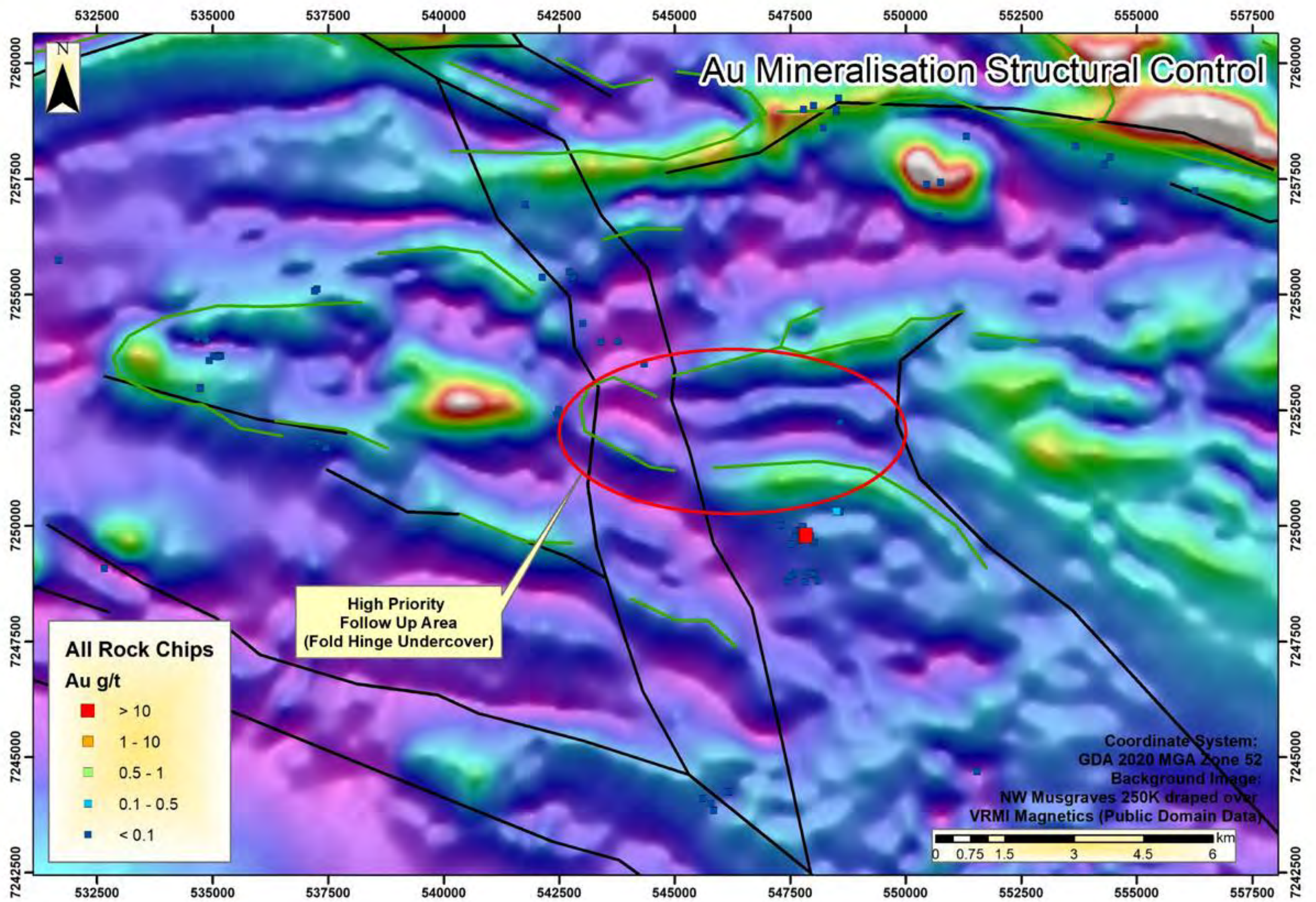
- High grade Au identified in rock chips by IGO/Goldsearch up to 29.71 g/t Au.
- Assoc. with anomalous Ag, Cu, Pb and Bi.
- Multi-element anomalism indicative of multiple mineralising events (often seen in larger deposits).
- Au hosted in quartz veins within the Tjuninanta Formation volcaniclastics (Ptj_c).
- 330° strike on quartz veins – parallel to major regional structures.
- Veins occur over a ~ 0.5m wide zone.
- Veins described as containing goethite/ haematite vughs, malachite and Pb staining
- Anomalous soils due east of tenure.

Au g/t	Ag g/t	Cu %	Pb %	Bi ppm
29.71	14.74	0.24	0.01	724
13.07	8.62	0.18	0.03	545
3.42	14.42	0.09	0.75	91

Structural Control On Au Mineralisation

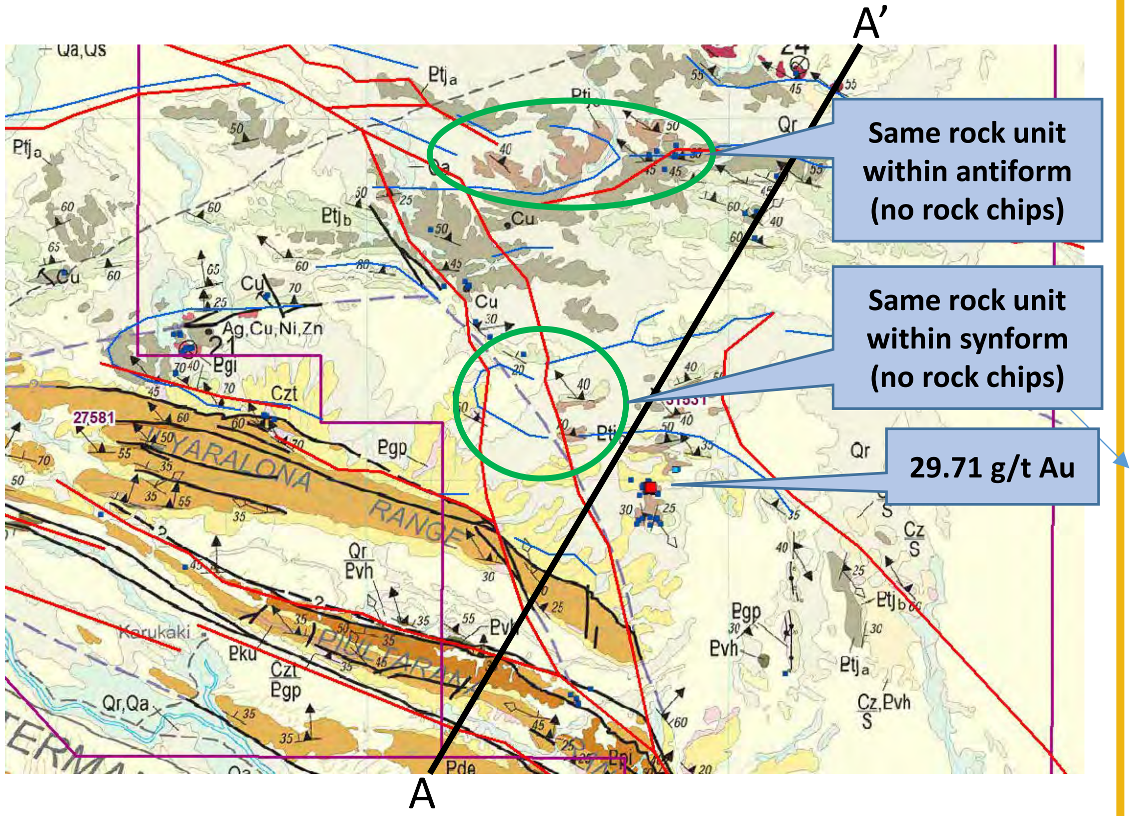
VRMI magnetic image highlights that the Au bearing quartz veins are located on the southern limb of a reclined synform (50 ° → 330°). The hinge of the synform has been offset by a major NNW structure.

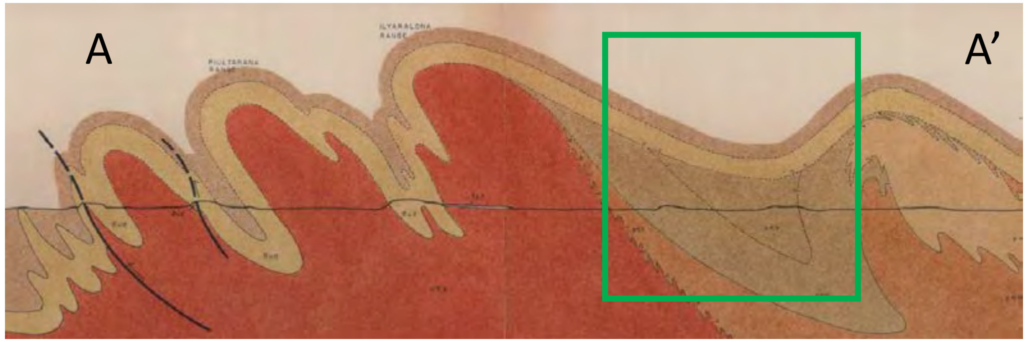
~330° strike on quartz veins



Structural Control On Au Mineralisation

- Au mineralisation is sitting within the southern limb of a fold (probably a synform? – see section below) and immediately east of a large scale dilational jog.
- The same rock unit crops out to the north and hasn't been sampled along the approximate axis of the fold (although multiple structural measurements). The unit crops out again in an antiform to the north.
- The closure to the west is undercover and therefore has no outcrop sampling (not surprisingly soils were dead).
- Further to the west in the same fold, there is an Ag-Cu-Ni-Zn occurrence in the hinge.
- Au bearing fluids came in along NW-NNW structures and the folds provide focal point for gold mineralisation.
- Possible metal zonation for fluids that travel further from the major structures (i.e. occurrences to the west), however more likely Cu has been stripped from basaltic host rocks (localised supergene occurrence).





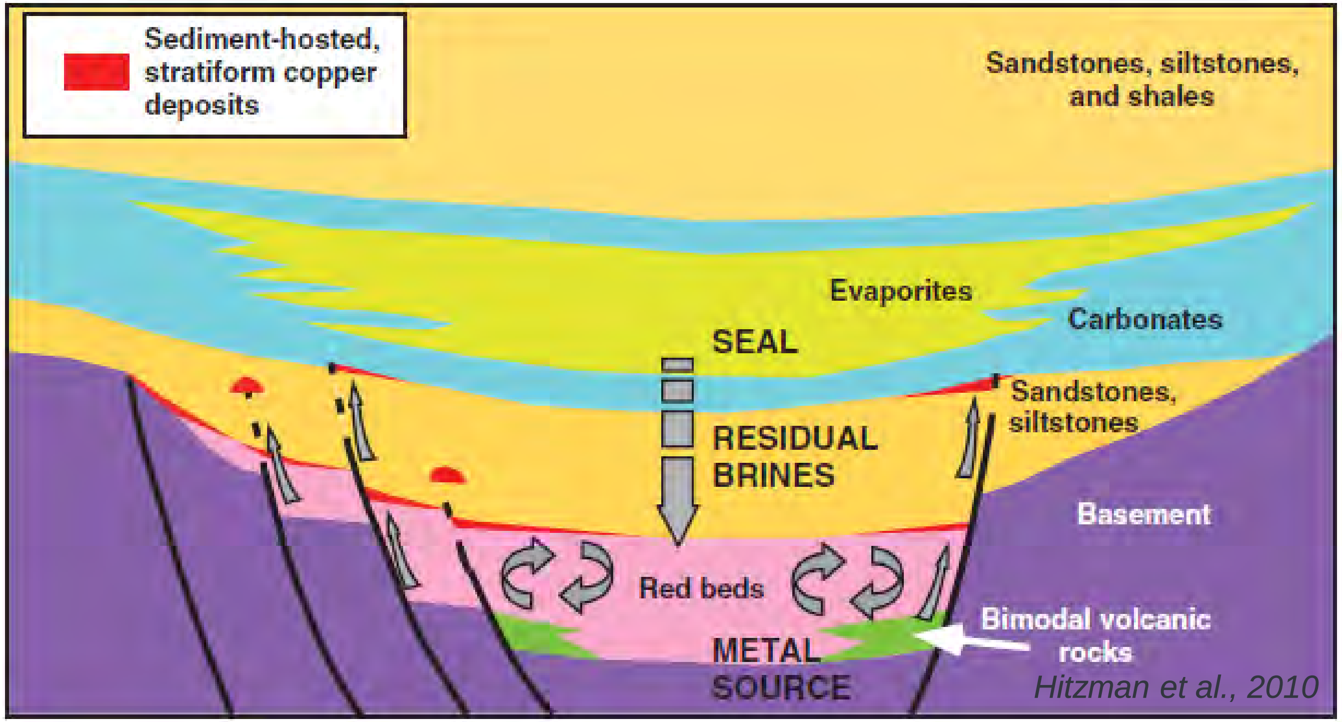
Deposit Model - Petermann Ranges

Sediment-hosted Stratiform Base Metals

- Form through the movement of oxidised, copper bearing fluids across a reduction front, resulting in the precipitation of copper sulphides. (Hitzman et al., 2010)
- Deposits occur in rocks from the Paleo-proterozoic to the Tertiary, with the largest known deposits occurring within sedimentary basins, generally at the contact between subaerial red-bed sequences. (Hitzman et al., 2010)

Ore Elements

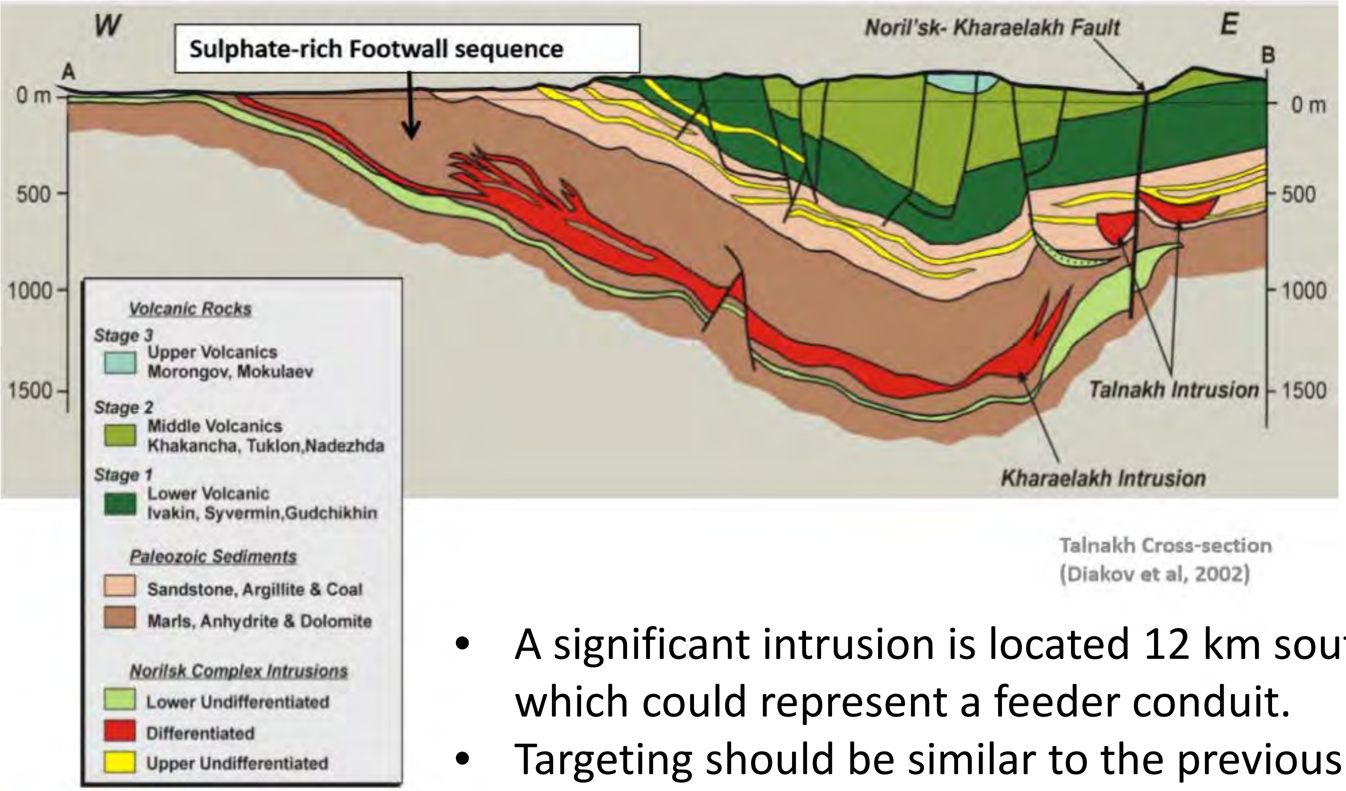
- Economic: Cu, Co, Ag
- Sub-economic: Pb, Zn, U, Au, PGMs
- Signature: Mo, V, Ge (As, Cd, Hg, Ni)



- They are stratabound, but do not follow sedimentary bedding as they formed after the host sediment is deposited and in most cases prior to the lithification of the host. (Cox et al., 2007).
- Targeting Mesoproterozoic Tjauwata Group and Neoproterozoic Pinyinna Beds, which contain geochemically reactive units (i.e. carbonates).
- Potential source of metal bearing fluids could be structures along Amadeus Basin southern margin. Fluid expulsion due to basin sedimentation, facilitated by seismic pumping along basin margin structures.

Deposit Model - Petermann Ranges

Noril'sk Style Magmatic Ni-Cu-PGE Sulphide Deposits



Talnakh Cross-section
(Diakov et al, 2002)

- Noril'sk style Ni-Cu-PGE sulphides are associated with the feeders to the Siberian Traps continental flood basalts.
- The Mount Harris Basalt is the extrusive equivalent of the Giles Complex (1080-1040Ma).
- Unlike the Siberian Traps, the Mt Harris Basalt has been extensively eroded.
- Prospective feeder zones will not necessarily be located directly below present day extent of Mount Harris Basalt outcrop.
- A significant intrusion is located 12 km south of tenure mapped as an Alcurra dolerite dyke which could represent a feeder conduit.
- Targeting should be similar to the previously mentioned Musgrave Ranges Ni-sulphide approach.
- Focus on dyke offsets i.e. offsets create thermal erosion focal points, which make excellent gravitational traps for sulphides.

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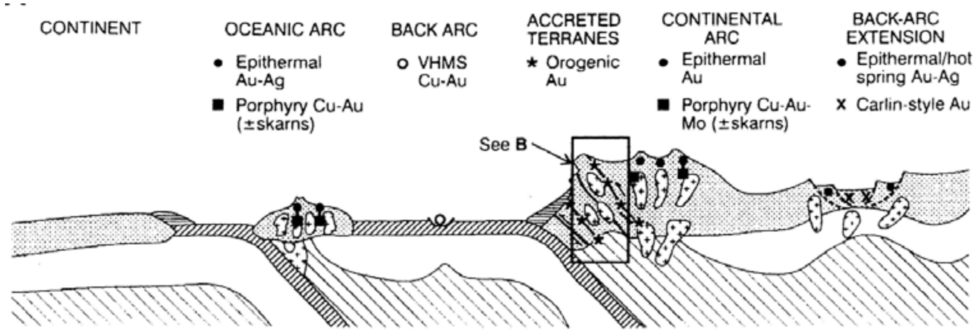
Deposit Model - Petermann Ranges

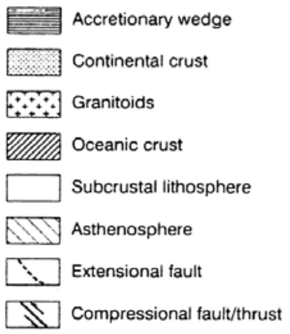
Orogenic Au

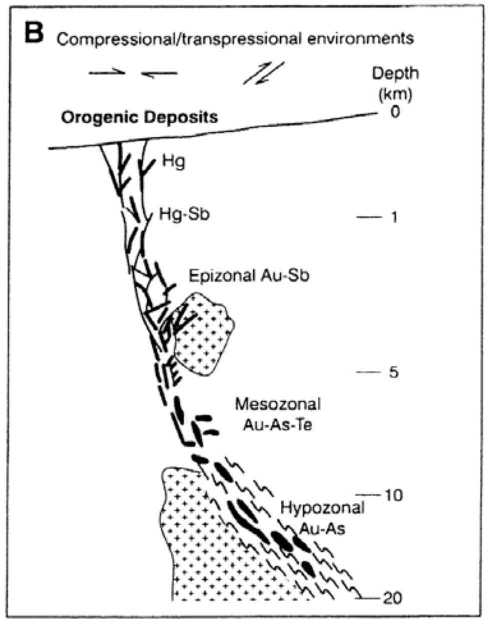
Orogenic gold ores are emplaced during compressional to transpressional regimes and throughout much of the upper crust, in deformed accretionary belts.

Features common to the majority of deposits (Groves et al, 1998)

- At or near terrane boundaries (or other crustal scale faults/ shear zones).
- Strong structural control related to mineralisation
- Large vertical extent with subtle vertical zonation
- Typically K-mica & carbonate alteration in greenschist facies
- Characteristic addition of SiO_2, K, Rb, Ba+Na+B
- Metals: Au+Ag+As+Sb+Te+W with low Pb-Zn-Cu

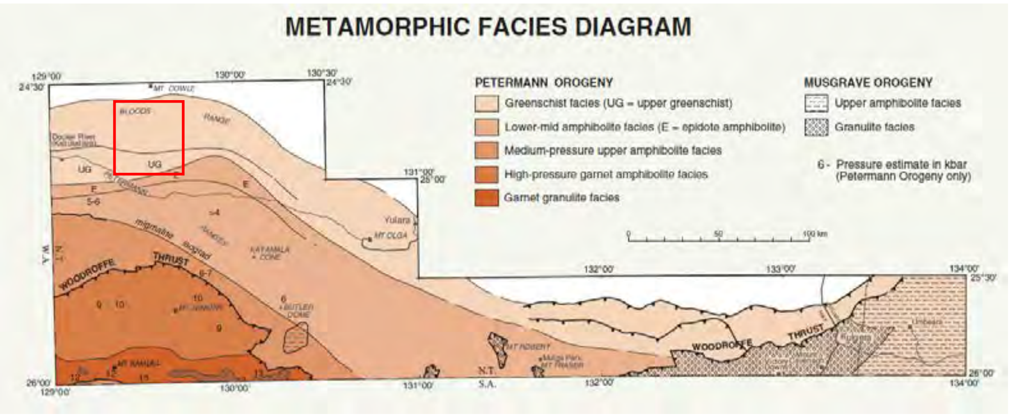






Model support within project area

- Musgrave Province terrain boundary
- Strong structural controls
- Greenschist facies metamorphism
- Addition of SiO_2 (quartz veining)
- Metals Au with low Cu-Pb-Ag



Goldfarb et al, 2001

SWOT – Petermann Ranges

Strengths	Opportunities
• Outcropping Au and Cu-Pb-Ag mineralisation. • Major structures proximal to mineralisation. • Chemically reactive metasediment host rocks (e.g. Bloods Range Beds & Pinyinna Formation). • Multi-element geochemistry – i.e. indicative of multi-stage or large scale mineralising event.	• Untested structural Au targets located undercover, proximal to surface Au mineralisation. • Ineffective surface geochemical sampling, apply RAB to target undercover. • Untested late time VTEM targets, which could represent base-metals mineralisation.
Weakness	**Threats**
• No large historic precious or base-metals occurrences. • Only drilling to date did not find significant Cu mineralisation a depth i.e. supergene occurrence only.	• Indigenous Heritage (ALRA) • Small sporadic occurrences - no large concentrations (i.e. plenty of smoke, no fire).

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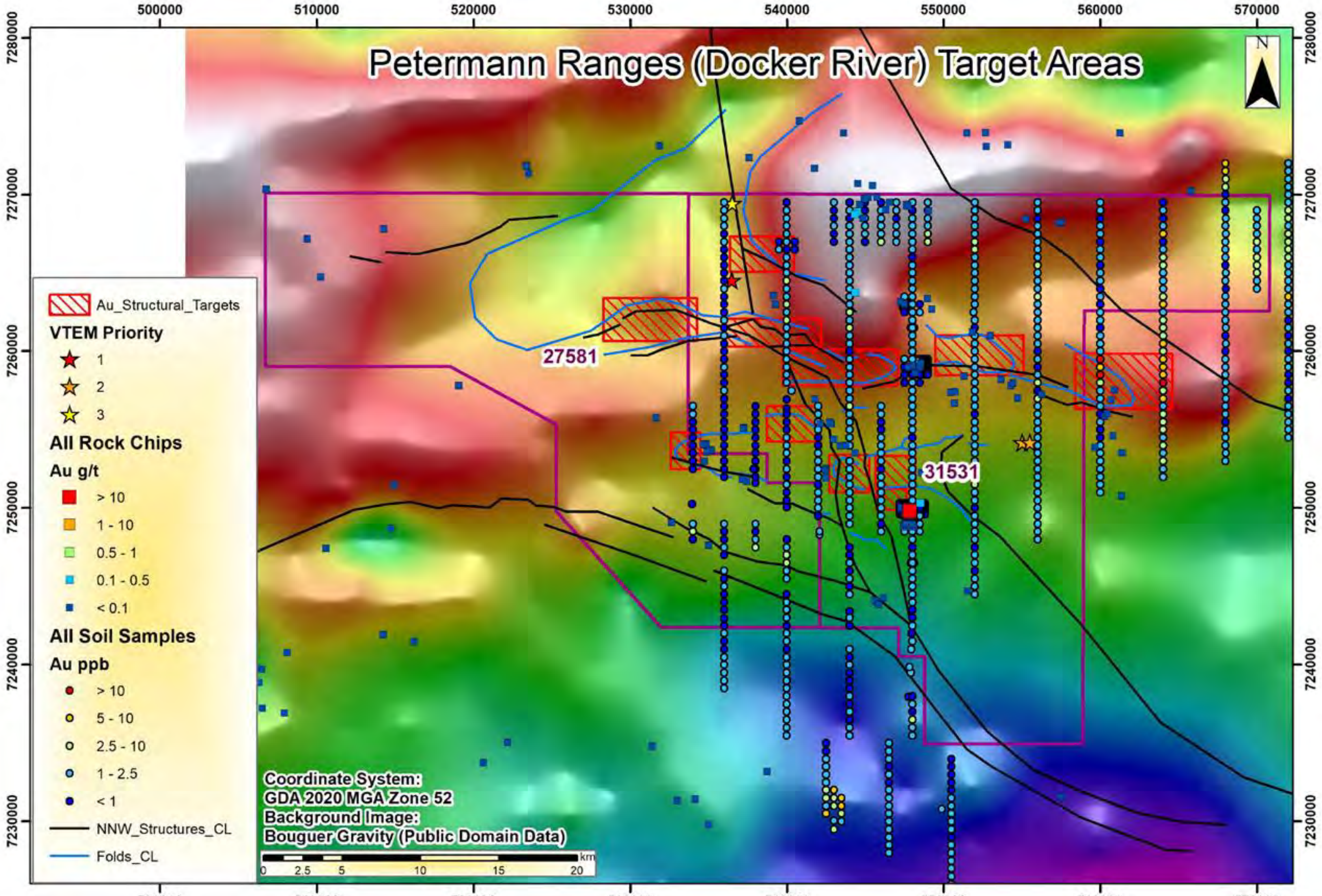
Exploration Target Summary



- Base-metals targets include P1 & P2 VTEM targets.
- The low mag/low grav position indicates the VTEM targets are hosted within metasediments (e.g. Pinyinna Beds or Bloods Range Formation) in favour of a basalt host rock.
- Au targets are based on structural traps on or proximal to the main NW-NNW structure.
- These should be prioritised based on structural complexity, proximity to the main structure and rock type.

Note: One Au target is off tenure (east) and includes a coincident soil Au anomaly.

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Exploration Recommendations & Budget

Petermann Ranges (Docker River)

Tenement	Method	Description	Expenditure
EL 31531 (Au & Base-Metals Targets)	Reconnaissance Trip	Ground Truth EM targets and structural targets. Assess need for Ground EM/RAB. Rock chip where suitable.	$10,000
EL 31531 (Au Targets)	RAB/AC/Vacuum (sample under cover)	Grid drilling across structures N & NW known Au mineralisation. Fence-lines across other structures considered prospective for Au.	$50,000
EL 31531 (Base-Metals Targets)	Ground EM	Define geometry for drill testing.	$35,000
EL 31531 (Au & Base-Metals Targets)	RC/Diamond	Test EM targets and extension to surface Au mineralisation.	$160,000
EL 27581	RAB/AC/Vacuum (sample under cover)	Fence-line across prospective Au structures.	$20,000
		Total	**$275,000**

Note: Soils have not been overly successful. Need to apply RAB, AC or vacuum drilling.
Also recommend a 36 element assay suite (cover more Au and Cu pathfinders as a minimum).

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Tenement Retention Recommendations

EL 31383

No follow up recommended at Claude Hills. Magnetics (Analytical Signal & VRMI) and residual gravity suggests NT extension is not there and that previously interpreted Giles (remanently magnetised domain) is actually due to a demagnetised fault (Mann Fault Zone).

Reconnaissance mapping/rock chipping could be worthwhile if heritage access is already in place to

- Follow up Ag in granite (check for mineralised veining).
- Ground truth VTEM targets, looking for evidence of mafic dykes.

Overall not much to go on (low priority). Recommend dropping the entire EL once EM potential is ruled out.

EL 25566

Retain central portion. Conceptual Giles Complex has VTEM and gravity support.

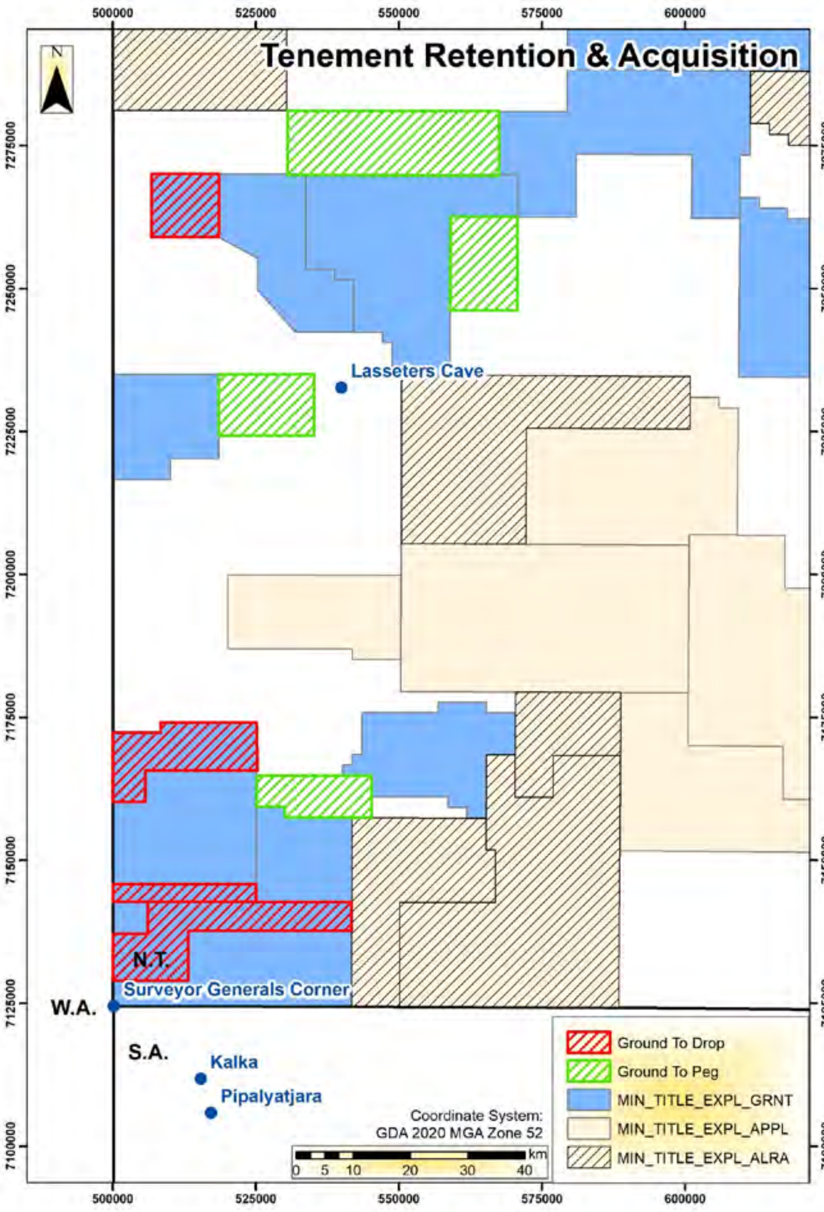
No compelling targets in the northern quarter. No compelling targets in the southern quarter. Could drop 50% of tenure.

EL 27581

Large fold closure under cover, which is prospective for Au (NE portion of the tenement). Nothing standout within the felsic volcanics across the western portion of the EL (consider dropping this section).

EL 31531

Retain all. Clear structural control on outcropping Au mineralisation within fold closure. Numerous untested Au and Cu-Pb-Ag targets.



Tenement Acquisition Recommendations

- Pick up ground east of EL 25566 – extension of conceptual Giles
- Pick up ground east of Docker River – Anomalous Au in soils, prospective fold closure & located east of VTEM targets.
- Pick up ground south of Docker River – possible feeder zone to flood basalts.
- Pick up ground north of Docker River - Mount Harris Basalt outcrop located north of VTEM targets and surface Cu-Pb-Ag mineralisation.

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Corporate Recommendations

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