TECHNICAL REPORT
ON GEOPHYSICAL INTERPRETATION OF AIRBORNE MAGNETIC AND RADIOMETRIC DATA, SOUTHERN CONCESSION and ADDITIONAL SOUTHEASTERN BLOCK, GUINEA

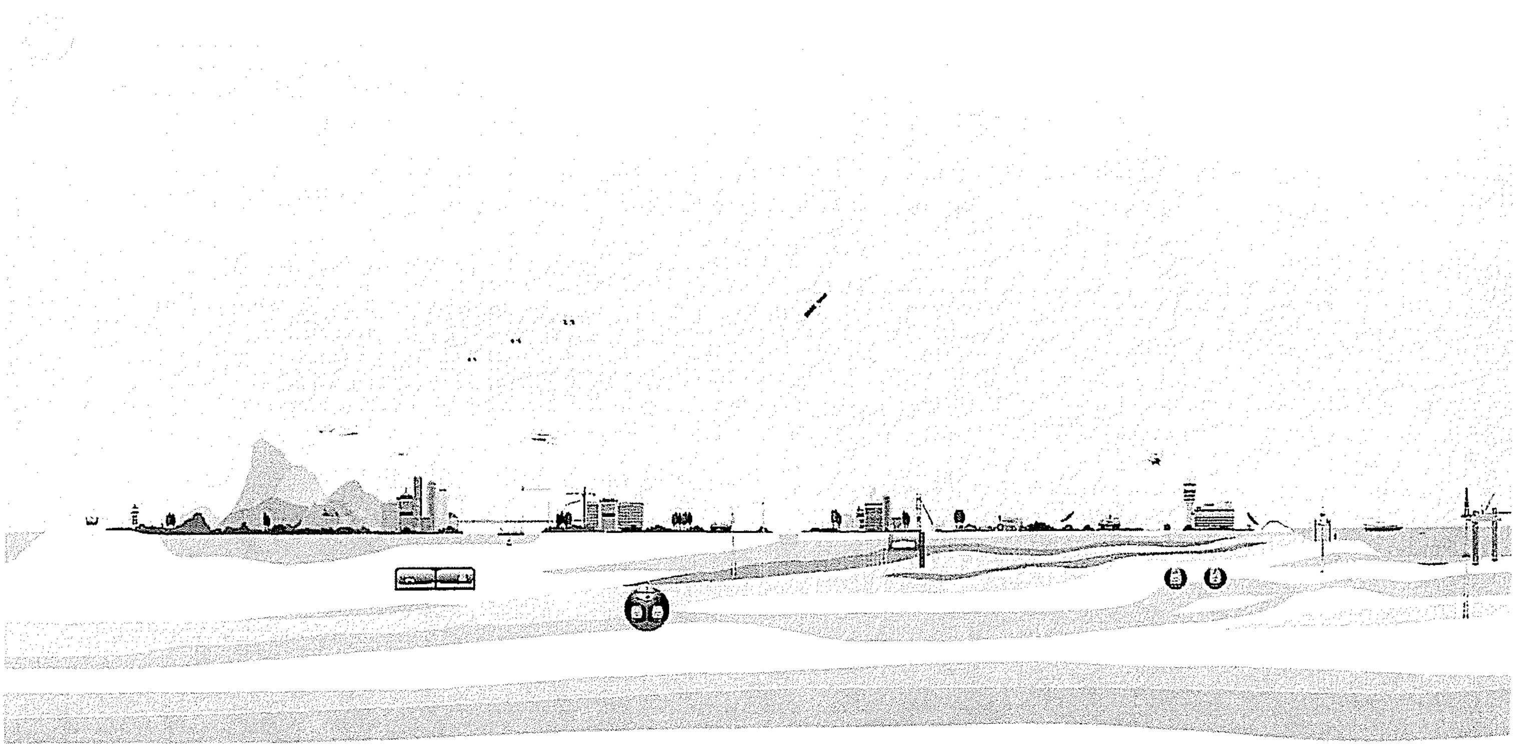
Prepared for

BSG RESOURCES GUINEA LTD

FAS Job Number 1883

September 2007

By: Caroline Jackson-Hicks



TARGET GENERATION FROM AN INTERPRETATION OF AIRBORNE MAGNETIC AND RADIOMETRIC DATA, SOUTHERN CONCESSION and ADDITIONAL SOUTHEASTERN BLOCK, GUINEA

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Executive Summary

Interpretation of the airborne magnetic and gamma – ray spectral data has resulted in the integrated geological/geophysical interpretation of distinct units of the study area. The southern concession area illustrates the southern extent of the Simandou Formation and therefore in the targeting iron ore has been considered as a possible commodity for further exploration. However, the radiometric images indicate a relatively higher concentration of uranium in the southern concession and therefore this is the primary commodity for exploration.

The airborne data indicates a high strain environment with fold structures and ductile shear zones within a partially migmatised basement. A later brittle stage of deformation is evident from the NE-SW to E-W trending faults.

Targeting for uranium has been generalised to the several styles of deposit that could be present in the study area. Further techniques, such as electromagnetic surveys, have been included as suggestions for further work.

Iron ore mineralisation is identified as both haematite and magnetite. Magnetite is the dominant of the two and, having a higher magnetic susceptibility, is easily delineated from the airborne data. In this study area, disruptions in the magnetic character have been interpreted as areas for exploration interest for haematite. These are often spatially related to fold closures or as a series of anomalies thought to be of similar stratigraphic positions.

The additional area in the far southeast of Guinea has produced exploration targets for diamond. Three isolated dipole anomalies have been identified from the airborne magnetic data. These targets have been ranked simply on size of the anomaly and cannot be considered reliable for exploration without further work. Uranium may also be present in this area, although delineating palaeochannels was not possible in this study. Again, electromagnetic surveys have been suggested as further work for exploration of this commodity.

Contents

1. Introduction

Fugro Airborne Surveys - Perth (FASP) was contracted to interpret airborne magnetic and radiometric data from Guinea, Western Africa for BSG Resources Guinea Ltd. The location of the survey is provided in Figure 1. The main objective of the geophysical interpretation was to identify zones of exploration interest for iron ore, while potential for other commodities including uranium and gold was also to be investigated if possible. A solid geological interpretation of the area was integral to the exploration targeting process.

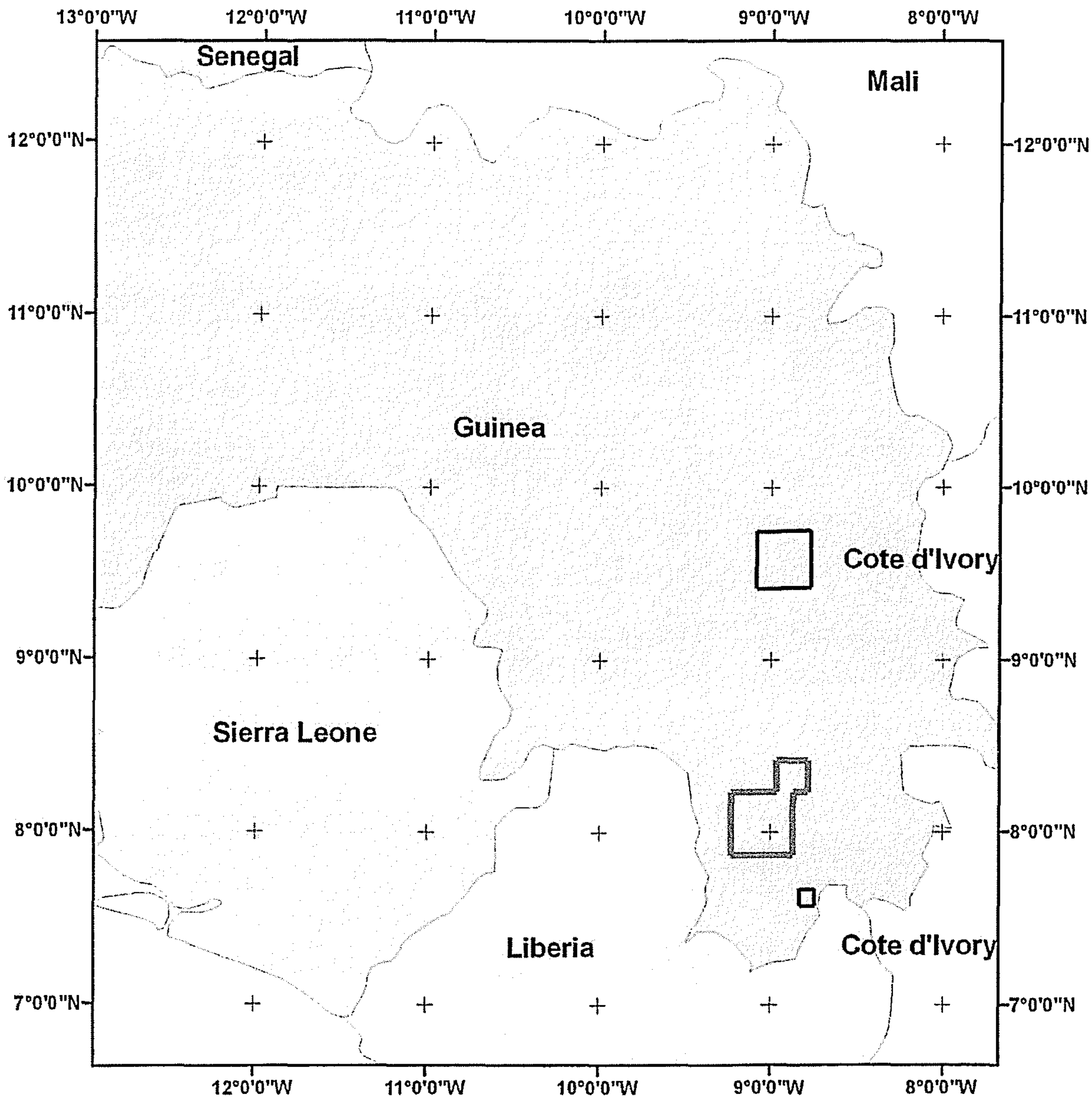


Figure 1: Location of the airborne geophysical survey (red outline).

The airborne geophysical survey acquired magnetic and gamma- ray spectrometer (radiometric) data. The data was collected along flight lines, at 200 metre spacing and oriented at 315°, and tie lines, at 2000 metre line spacing and oriented at 045°. The survey was performed with a nominal clearance of 15-25 metres.

Magnetic parameters at the centre of the project area are total magnetic field intensity of 31,565 nT, field inclination of -8.8° and a field declination of -6.8°.

Approximately fifty (50) working days were assigned for interpretation, generation of specific processing products, and reporting. The final products as displayed in this report include:

- A series of potential field (magnetic and radiometric) data map products.
- Solid geological interpretation map at 1:100,000 scale based on the airborne geophysical data, with explanation.
- Map of possible exploration targets based on the airborne geophysical data, with explanation.
- All data provided as a Geographical Information System (GIS).

2. Regional Background

The Northern concession area lies within the Kerouane region of southeastern Guinea, West Africa (Figure 1). Geologically Guinea lies within the West African Craton. This cratonic block is divided into the Reguibat and Man Shields, to the north and south respectively, with the Taoudéni Basin (Figure 2). The Kenema-Man domain of the Man Shield, bounded to the east and west by the Sassandra-Trou and Todi shear belts respectively, hosts both the Simandou and Nimba banded iron formations (BIF's) (Cope et al., 2005).

Rocks of the Kenema-Man domain are predominantly Precambrian. These are overlain by the Neoproterozoic sediments of the Taoudéni Basin and intruded by the Early Jurassic dolerite and gabbroic dykes produced with the opening if the Atlantic Ocean (Egal et al., 2002). Within the study area supracrustal rocks, which include the BIF ranges, occur within Precambrian granitic and gneissic basement lithologies. Contacts between the supracrustal rocks and the Precambrian gneisses and granites generally appear to be steeply dipping and tectonic. However, the supracrustal succession of BIF's, metavolcanics and metasediments are considered to have been unconformably deposited over the Archean gneissic and granitic units. To the north of the study area sedimentary rocks deposited in the Palaeoproterozoic Siguiri Basin are present, while to the East a linear belt of plutonic rocks in present (Egal et al., 2002).

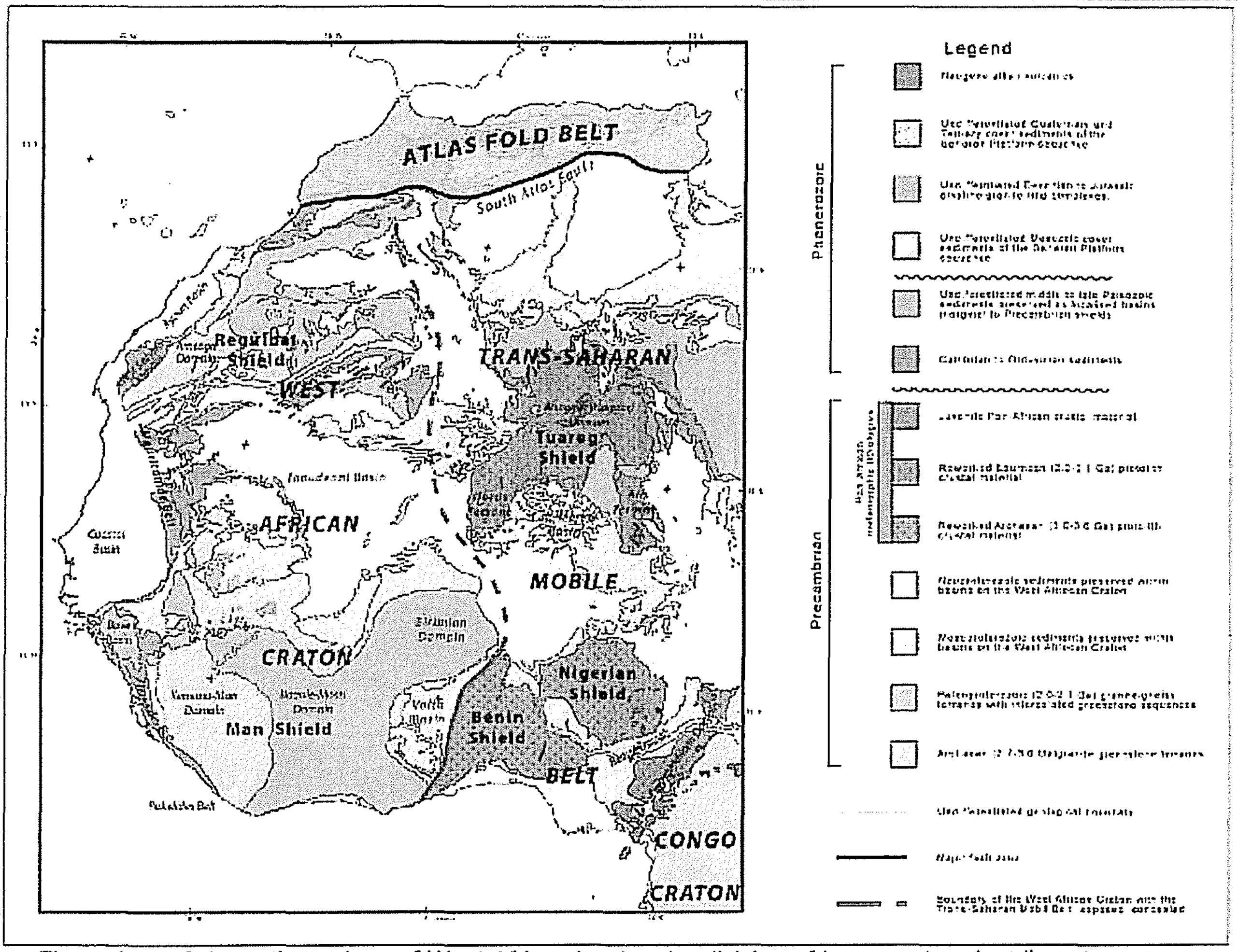


Figure 2: Schematic geology of West Africa showing the division of basement and sedimentary cover sequences.

The Archean rocks within the Kenema-Man domain have been divided into three chronostratigraphic units, which along with recent mapping, has enabled the clarification of previous interpretations.

1. Pre-Liberian: a succession of high grade amphibolite to granulite facies which has been partially overprinted by retrograde metamorphism. SHRIMP U/Pb dating on zircons from one granitic gneissic unit revealed emplacement ages of 3542 ± 13 Ma, and this is considered the evidence of Archean basement in the Leo Rise (Egal et al., 2002).
2. Liberian aged batholiths dated between 2900- 2800 Ma.
3. The Nimba and Simandou BIF's, metavolcanic and metasedimentary rocks are now considered to be unconformable over the Archean gneissic and granitic units. Because these have maximum ages of 2615 Ma and 2711-2871 Ma respectively determined from dating of detrital zircons from the succession (Egal et al., 2002; Cope et al., 2005).

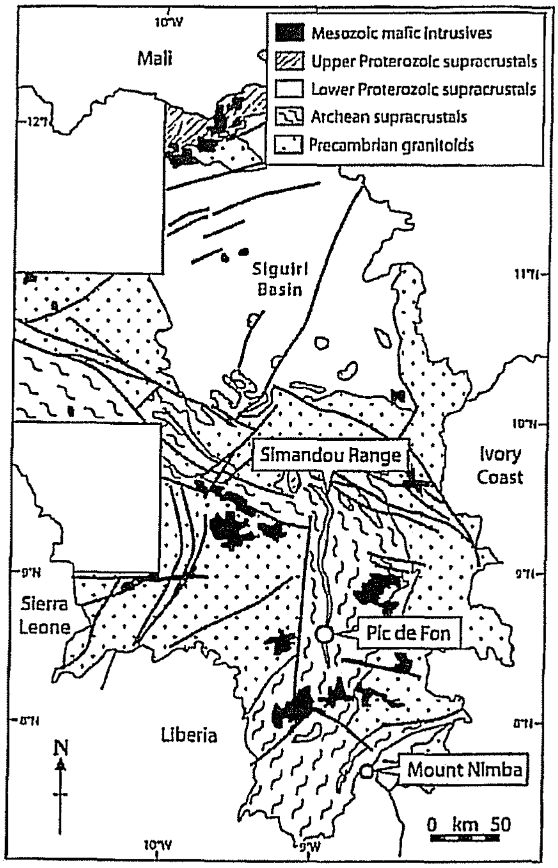


Figure 3: Simplified geology of the Kenema-Man domain around the Simandou Range and the Pic du Fon Iron Ore deposit which lies to the south of the study area (Cope et al, 2005)

The location of early Jurassic kimberlitic pipe and dyke clusters have previously been inferred in the Man Craton by Skinner (et al., 2004). The work has identified three kimberlitic clusters in the region; the Banankoro, the Bouro, and the Droujba clusters. The Banankoro and Droujba clusters have been dated as greater than 139 Ma, and 153 Ma respectively (Skinner et al., 2004).

Structurally, the region is dominated by a strong NE trending foliation in the south which rotates to the N-NW in the north. This foliation is folded by two subsequent deformations, which has produced subvertical to steeply dipping fold axes, ductile shear zones and later brittle faulting (Cope et al., 2005).

3. Airborne Geophysical Data

The geophysical data collected as part of the airborne survey has been interpreted to identify litho-magnetic domains, structural trends, faults, fractures and folding. The integration of the radiometric and magnetic data allows for the construction of a lithological interpretation, whereby the combination of characteristics can be used to correlate units. All geophysical images used are projected in WGS84, UTM zone 29N.

3.1. Magnetics

Several images of magnetic data have been employed in the interpretation. The most useful images were found to be the reduced to pole Total Magnetic Intensity (TMI) image (Figure 4) and the reduced to pole TMI Second Vertical Derivative (2VD) image (Figure 6). The following is a complete list of magnetic images:

- TMI
- Analytical Signal TMI
- Horizontal gradient TMI
- 1VD and 2VD horizontal gradient TMI
- All images also had a reduced to pole filter applied and sun-shade at 315° and 045°, as requested.

3.2. Radiometrics

Radiometric data was used in conjunction with the magnetic information to map lithological variations. The radiometric ternary image (Figure 7) was most used for this purpose. The U/Th ratio image (Figure 8) can be indicative of relatively high uranium concentration.

The following images were used:

- Radiometric (bands/RGB) Ternary (K, Th, U) Image
- Single band Potassium, Thorium and Uranium intensity images
- Uranium/Thorium ratio image.

3.3. Landsat

In addition to grid enhancements of the Magnetic and radiometric data we have also produced images of Landsat^{TM} etm7 using different bands and ratios. For the Landsat data images include:

1. Bands 741,
2. Bands 321
3. CSIRO: ratios of bands 5/7 4/7 4/2 (RGB).

The Landsat 741 image enhances linear structures, hydroxyl- bearing minerals, clays, carbonates, mica, chlorite, amphibole, water and iron-oxide features. The 321 image enhances visual red, chlorophyll absorption and iron features, visual green and visual blue. The Landsat CSIRO ratio discriminates between regolith units, phyllosillicates, clays, carbonates, iron-oxides and vegetation.

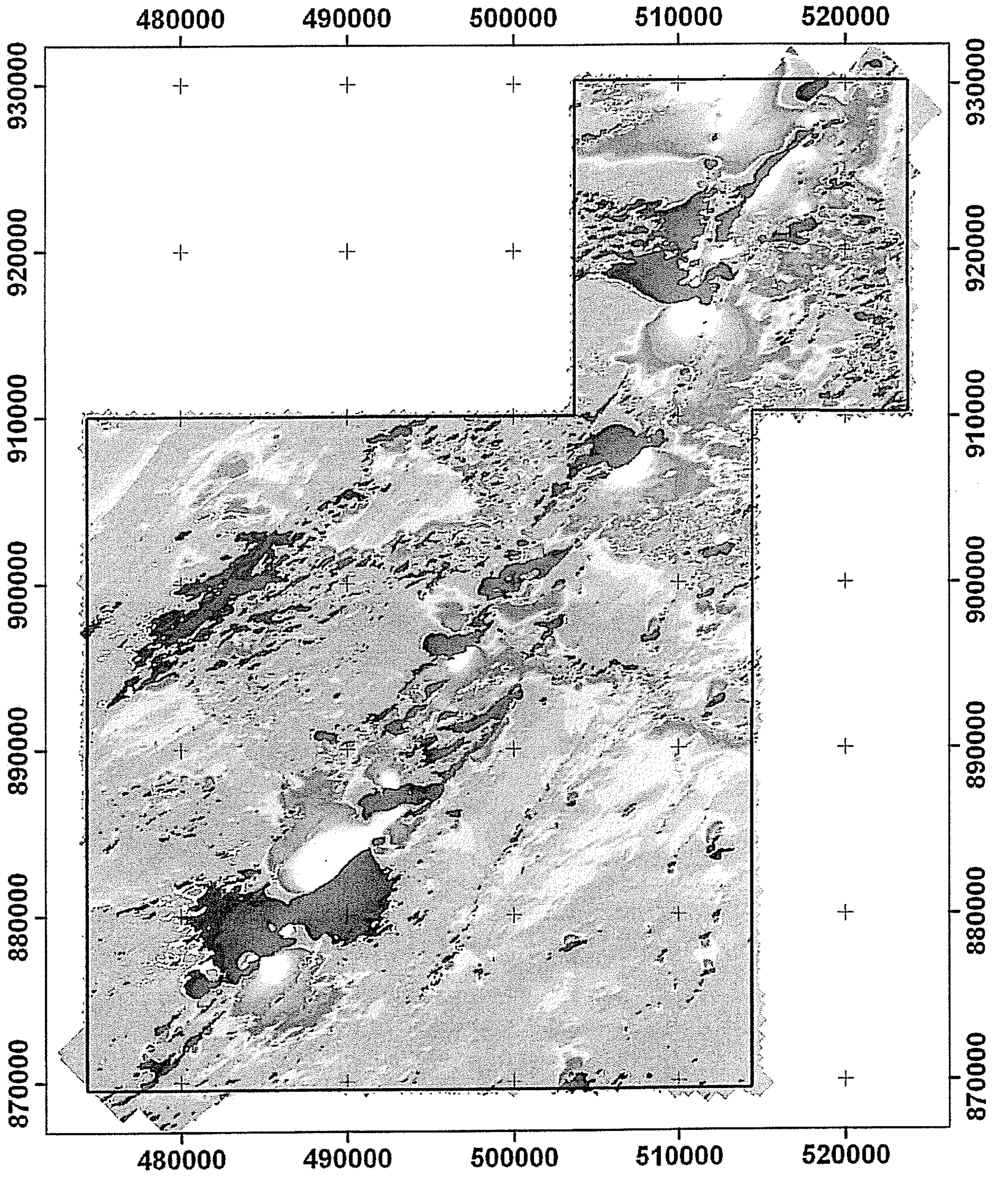


Figure 4: Total Magnetic Intensity image for the Southern concession area.

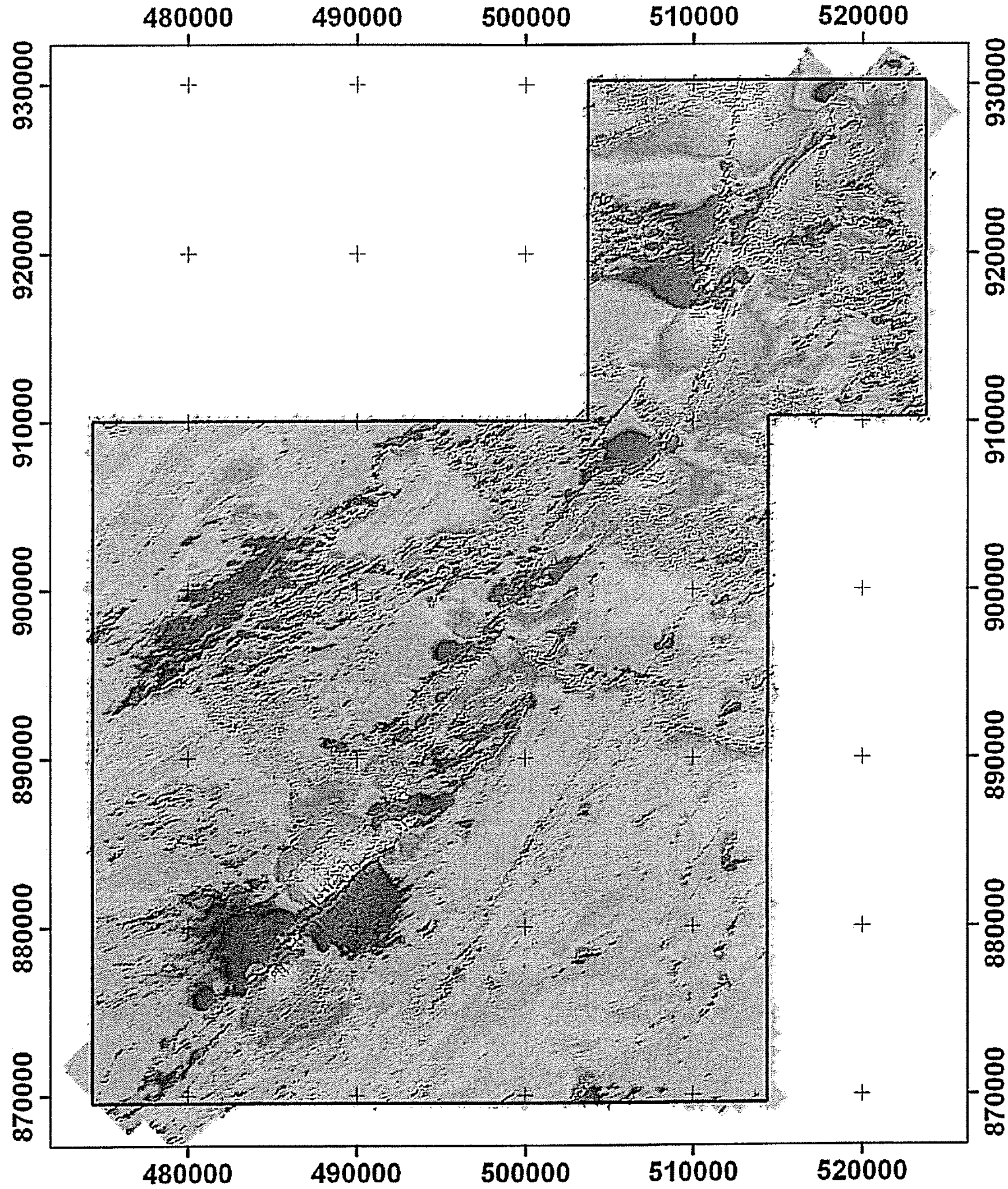


Figure 5: Total Magnetic Intensity transparently over the second vertical derivative magnetic image, showing more structural features.

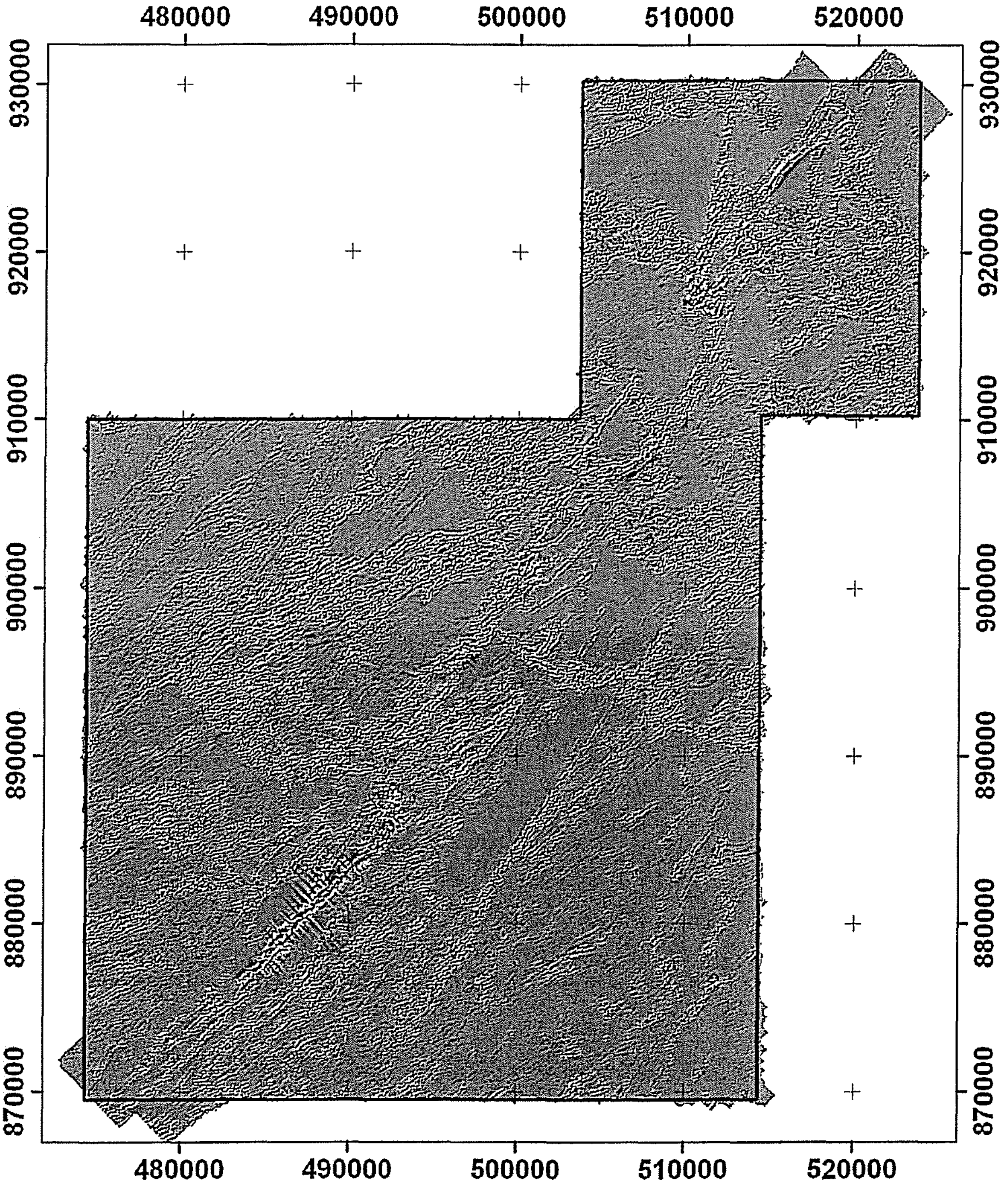


Figure 6: Second vertical derivative with greyscale colour scheme.

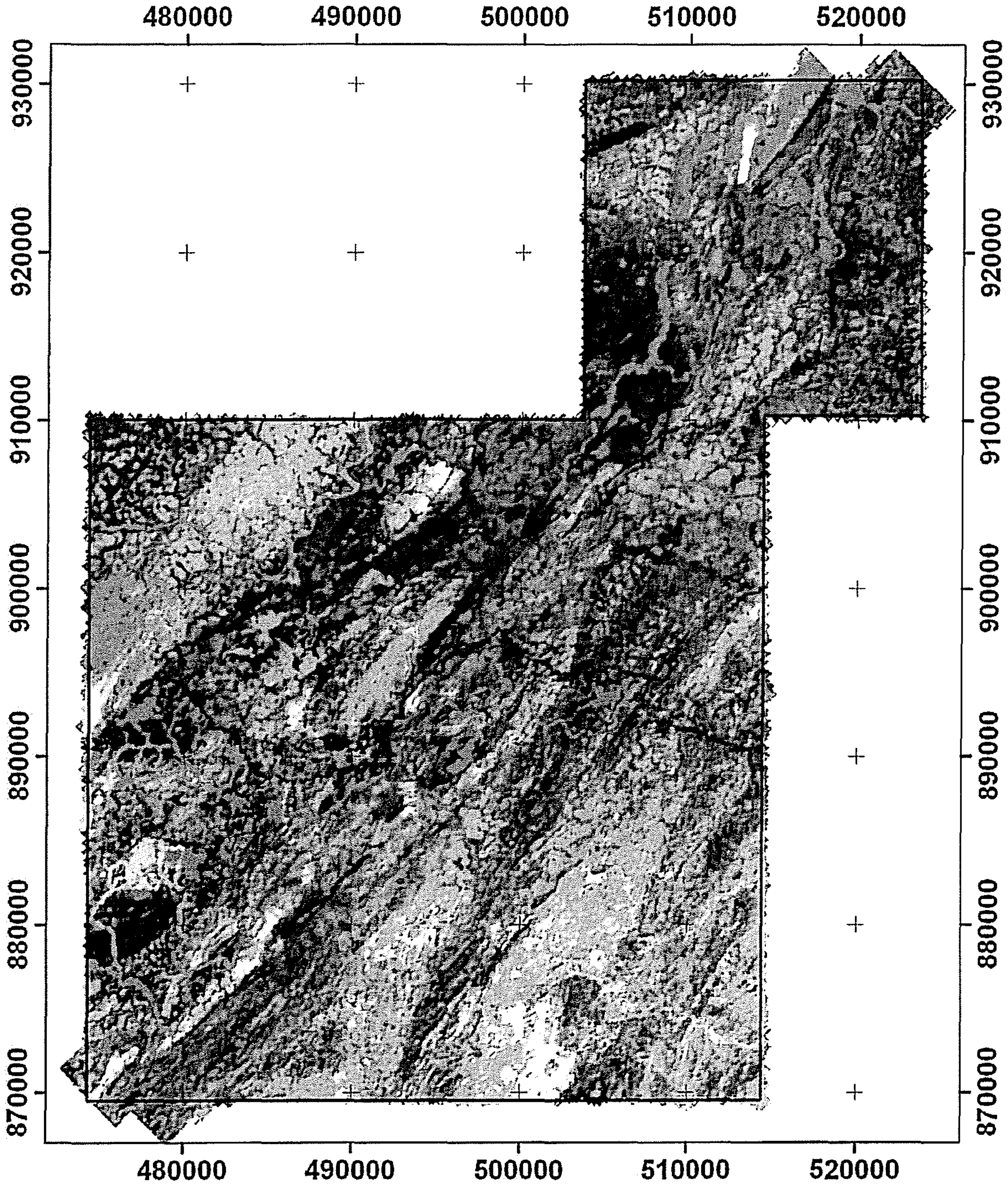


Figure 7: Ternary radiometric image (K, Th, U = red, green, blue).

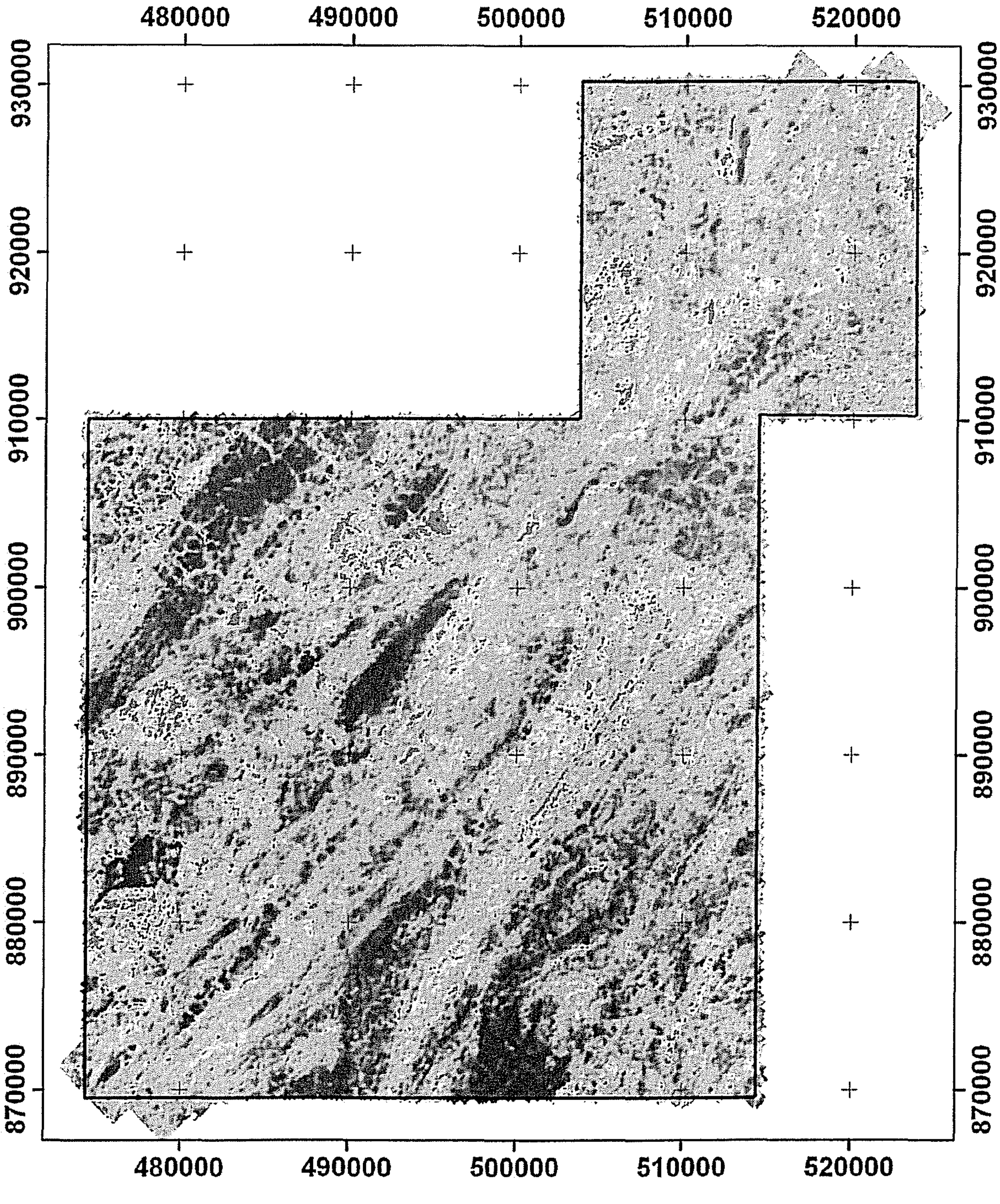


Figure 8: Radiometric Uranium/Thorium ratioed image created using NASVD corrected data.

4. Interpretation and Targeting

4.1. Integrated Geological Interpretation

Magnetic and radiometric images have been used to create an integrated geological interpretation of the southern concession. The interpretation of lithomagnetic domains, structural trends, faults, fracture and folding act as a framework for determining areas of further interest for exploration.

The map product, shown in Figure 9, indicates that the main features in the southern concession are:

- An overall NE structural and magnetic trend,
- Several large intrusions of mafic or ultramafic composition,
- An increase in the deformation and metamorphism with more ductile features observed in this area than the northern concession,
- Major ENE trending faults with vertical and lateral throw,
- The Simandou Formation here is also inferred as folded with fold axial planes bearing NE.

The same classification scheme has been applied to the Northern and Southern concessions for this project. Some lithologies appear in both areas. A consistent colour scheme has been applied. In this scheme the combination of magnetic and radiometric responses provides a unique classification for each rock type, Table 1.

Lithology sub-classification	*Magnetic Frequency*	*Magnetic Amplitude*	*Magnetic Texture*	*Radiometric Response (K, Th, U)*
Mesozoic Mafic/Ultramafic Lithologies				
mul1	m	h	linear	lK, lTh, lU
mul2	l	l	flat	lK, lTh, l-mU
Late Proterozoic Granites				
grn1	m	m	linear	hK, m-lTh, mU
grn2	l	l	linear- flat	hK, m-lTh, mU
grn3	l	l	flat	mK, lTh, l-mU
grn4	h	h	linear	hK, lTh, mU
grn5	l	l	mottled	hK, hTh, mU
Late Proterozoic Granodiorites				
grd1	l	l	flat	mK, mTh, hU
grd2	l	l	flat	l-mK, lTh, lU
Late Proterozoic Pegmatites				
peg1	l	l	flat	hK, hTh, hU
Archean Basement				
Granitic Gneiss				
mgn1	h	m	linear	hK, lTh, hU
mgn2	l	l	flat	m-hK, lTh, m-hU
mgn3	m	m	flat-linear	mK, lTh, l-mU
mgn4	m	m	flat-linear	mK, lTh, lU
mgn5	m	m	linear-undulose	hK, lTh, m-lU
mgn6	l	l	flat-sublinear	mK, lTh, l-mU
mgn7	h	h	linear	m-hK, m-hTh, m-hU
mgn8	l	l	flat-undulose	mK, mTh, mU
mgn9	l	l	flat-undulose	mK, m-hTh, mU
mgn10	l	l	flat	mK, hTh, mU
mgn11	l	l	flat-mottled	lK, mTh, m-hU
mgn12	h	h	linear- sublinear	hK, hTh, hU
mgn13	h	h	linear-sublinear	lK, lTh, mU
Granodioritic Gneiss				
mgd1	m	l	flat-undulose	mK, lTh, mU
mgd2	m	m	linear	mK, lTh, lU
Migmatite				
mig1	l	l	flat-undulose	hK, hTh, hU
mig2	l	l	flat	hK, mTh, mU
mig3	h	h	linear-sublinear	m-hK, hTh, mU
mig4	m	m	flat- sublinear	mK, hTh, hU
mig 5	l	l	flat	m-hK, hTh, mU
Simandou Formation				
sfm1	h	h	linear-sublinear	lK, lTh, hU
sfm2	m	m	sublinear	lK, lTh, hU
sfm3	l	m	flat-linear	lK, lTh, hU
sfm4	l	h	linear-sublinear	lK, lTh, hU

Table 1: Lithological sub-classification by magnetic and radiometric responses (l = low, m = moderate, h = high).

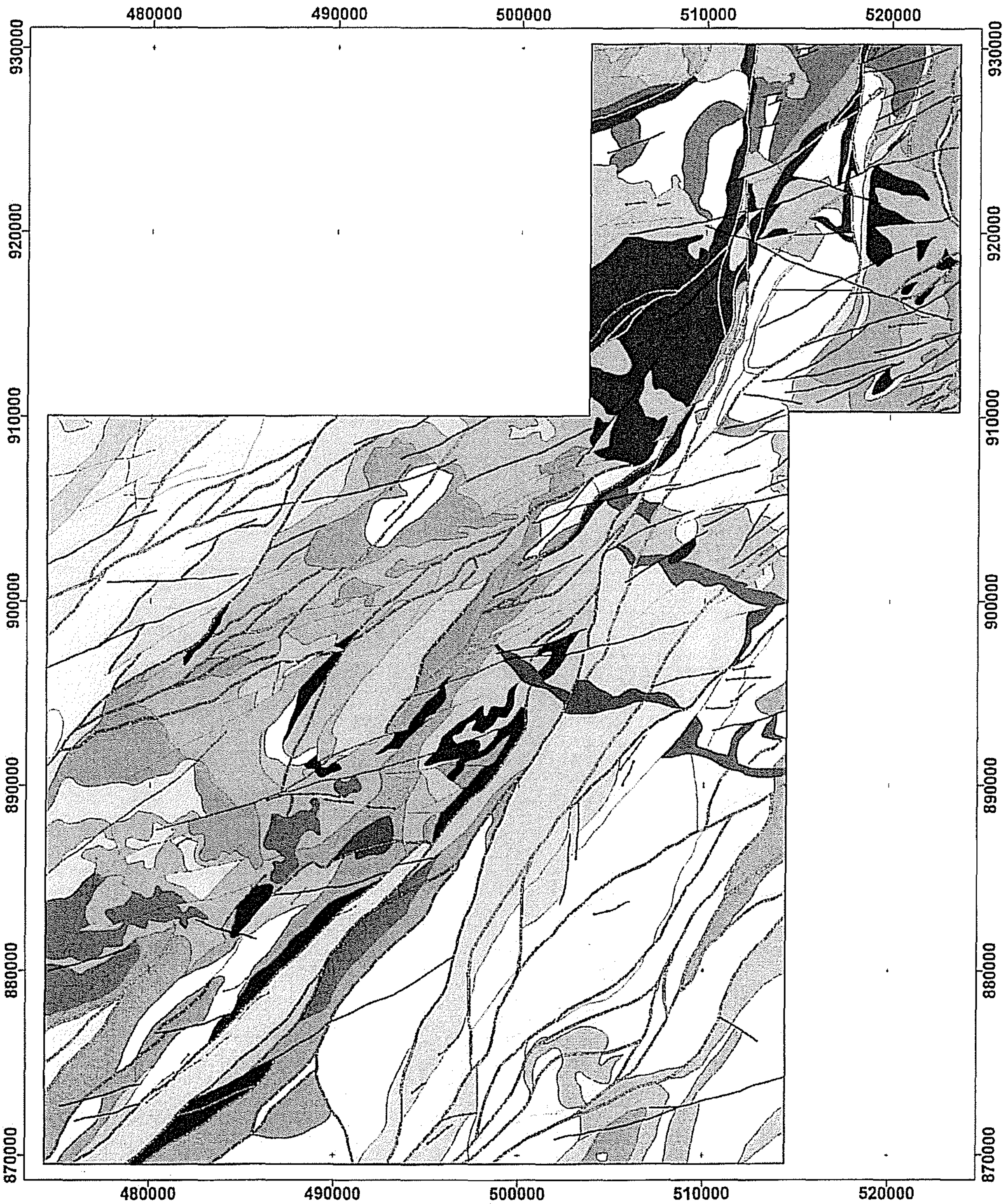


Figure 9: Integrated geological interpretation of the southern concession.

LEGEND

This legend is specific to the area and represents lithologies in this region alone. The same classification scheme has been used in the Northern and Southern concession areas.

Mesozoic Mafic/Ultramafic Lithologies

MVmul1 MVmul2

Basement Lithologies

Granodioritic Gneisses

BAmgd1 BAmgd2

Granitic Gneisses

BAmgn1 BAmgn2 BAmgn4
BAmgn5 BAmgn6 BAmgn7
BAmgn8 BAmgn9 BAmgn10
BAmgn11 BAmgn12

Migmatites

BAmig1 BAmig2 BAmig3
BAmig4 BAmig5

Simandou Formation

BAsfm1 BAsfm2

Intrusives; GRANODIORITE, GRANITE, PEGMATITE

LPgrd1 LPgrd2 LPgm5
LPpeg1

GEOPHYSICAL STRUCTURES

- Dolerite dyke
- Ductile shear - late - confident
- Ductile shear - late - inferred
- Dyke
- Fault - major
- Fault - major - inferred
- Fault - minor
- Fault - minor - inferred
- Geological boundary - confident
- Geological boundary - inferred
- Project boundary
- Litho-magnetic Trend

Figure 10: Legend for the integrated geological interpretation map.

Basement

Granitic Gneiss

Archean granitic gneiss forms the dominant magneto-lithological unit in this area with a generally moderate to high magnetic response. The gneiss generally shows a moderate to high radiometric response with some areas of relatively higher uranium content. These could be chemical differences within the gneissic units or possible concentrations of uranium which may be economically significant.

Granodioritic Gneiss

Zones of lower radiometric and magnetic response within this setting have been characterised as Archean granodioritic gneiss. This interpretation has been formed by the moderate to low, irregular magnetic response and low radiometric response from these units.

Migmatite

These units are identified by the very high radiometric response and low to moderate magnetic response. The formations often show ductile deformation features.

Simandou Formation

The magnetic units comprising the main Simandou Range appear to be more or less continuous around the rim of a major synformal feature with NW fold axis. The synform appears to be cut by NE-trending horizontal and vertical faulting at large and small scale. Confirmation of structural interpretation will require further field evidence. However, the Simandou formation appears fairly continuous and correlates to a very high magnetic response and high Uranium/Thorium ratio. Within this unit, lower magnetic responses are very significant in targeting Haematite.

Lower Proterozoic Granitoids

Granitoids generally contained a lower magnetic response than the other units in the study area. They also display irregular shape within continuous units of basement gneiss. The granites exhibited mostly high potassium and moderate to low thorium and uranium radiometric response.

Mesozoic Mafic/Ultramafics

These features have very low radiometric responses with a variable magnetic response, although the majority of units have a high response and sub-linear to linear texture. As the youngest lithological feature in the area the units have an irregular outcropping shape which cross-cuts older lithologies.

4.2. Iron Ore

The southern concession has been mapped and targets have been selected and ranked. Exploration targets are for iron oxide within the Simandou banded iron formation. The Simandou formation is identified as the host rock to the known BIF mineralization at Pic du Fon and therefore targeting for this commodity has been constrained to this lithological group. This formation has been observed along the extent of the concession following the structural trend (Pers comms. Bryson, 2007). Zones of targets have been selected from the geological interpretation (Figure 11). A common feature of these commodity types is the structural control of the formation. Many have been identified in extensional tectonic settings, although in higher temperature metamorphic terranes, such as this region, folding is seen as an important factor in their formation (Dalstra et al., 2003).

Targets have been chosen and numbered individually even where they are interpreted as a continuation of a stratabound unit, as it will be clearer from the ground exploration whether or not this is the case.

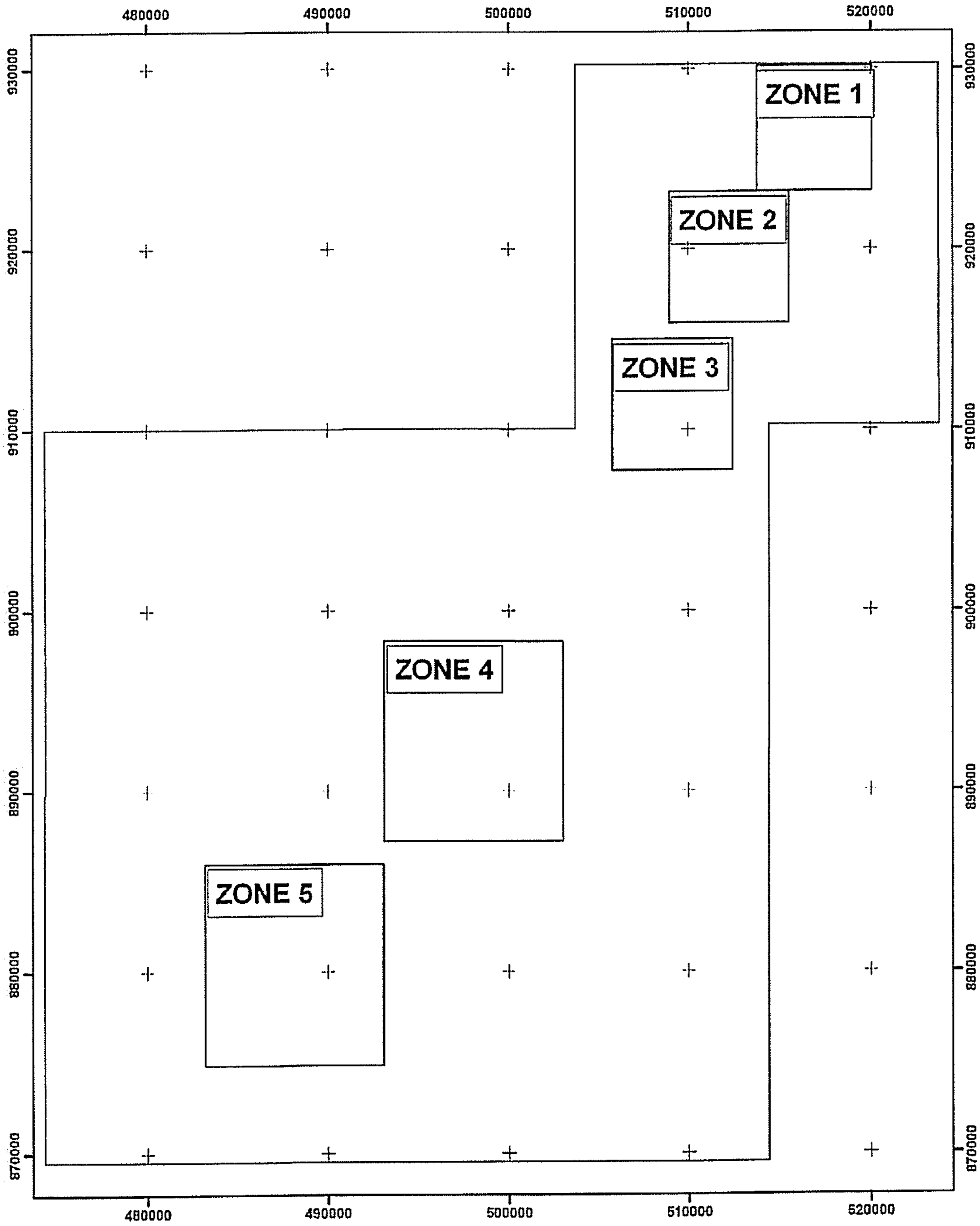


Figure 11: Locality of Iron Ore target zones in the southern concession.

Zone 1

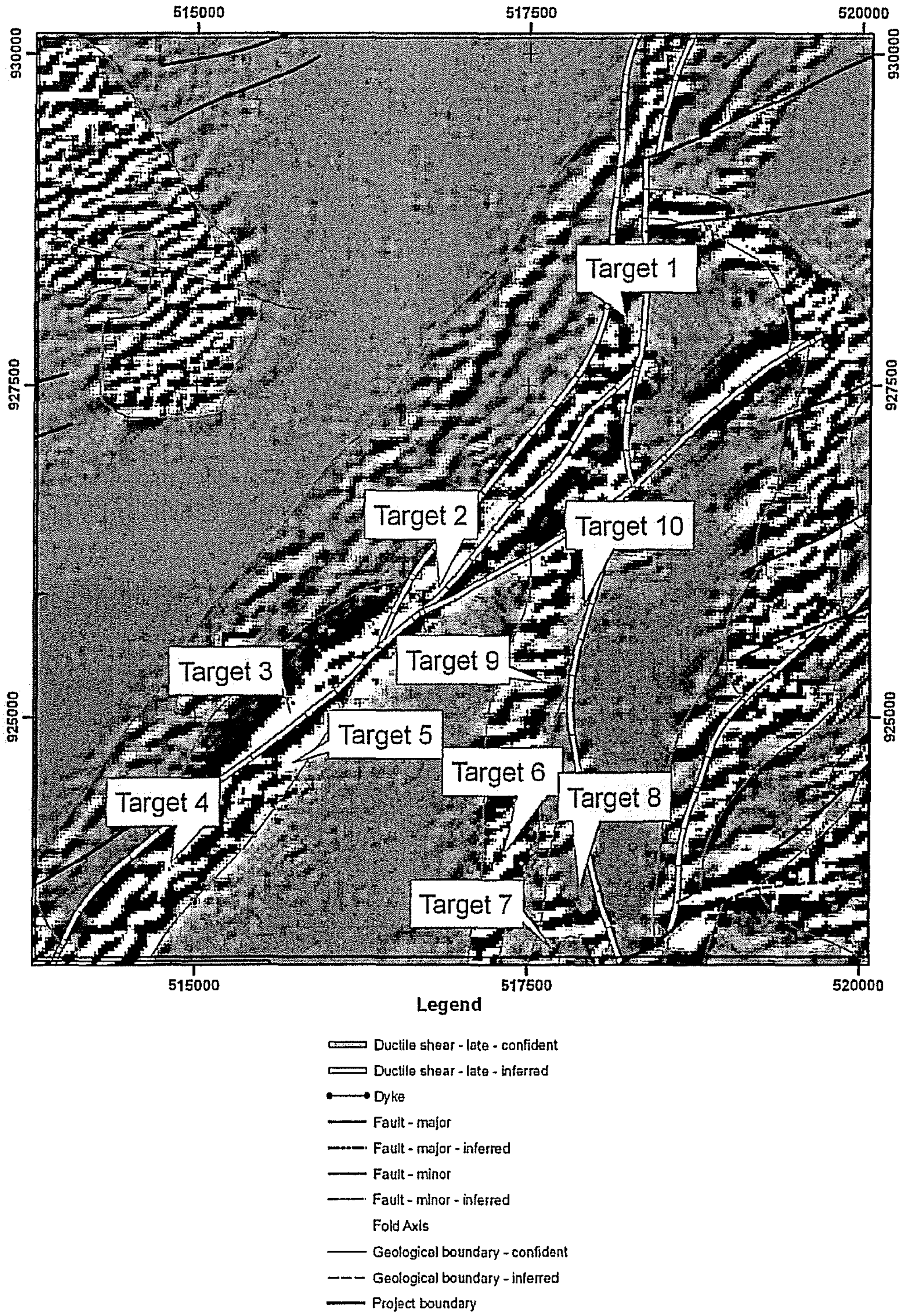


Figure 12: Second Vertical Derivative image of zone 1 with geophysical structures and target labels.

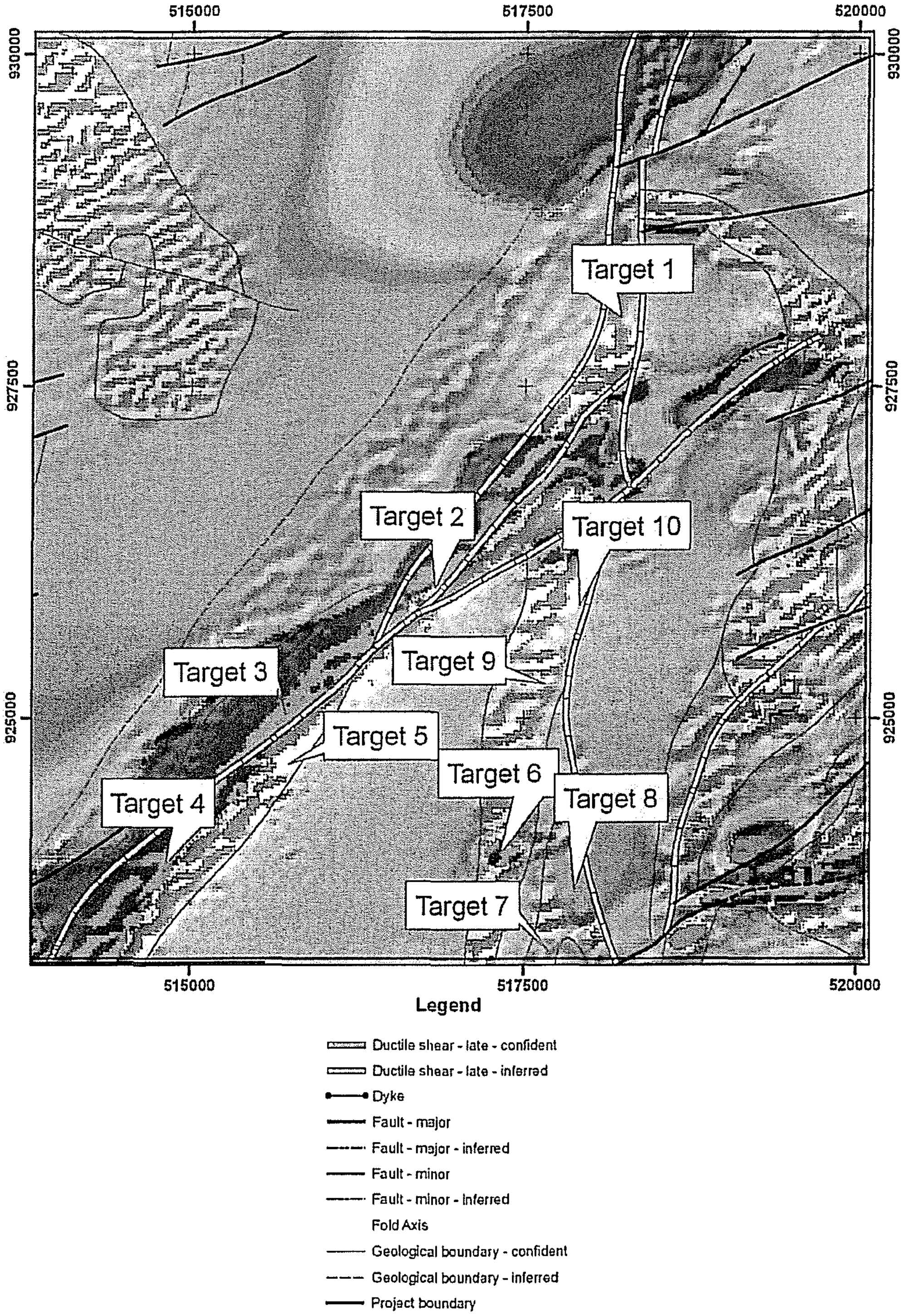


Figure 13: Reduced to Pole Total Magnetic Intensity (RTP_TMI) image of the same zone.

Priority	**Target**	**Selection Criteria**
High	2, 3, 4	Structural control of ductile features may have focused mineralizing fluids. Although the magnetic texture does not appear disrupted the magnetic intensity is much lower and could be an indication of haematite alteration.
Moderate	1	A disruption in the magnetic texture, although the intensity is high, could be an indicator of haematite enrichment. Structurally the target lies at the nose of a tight fold in a ductile region.
Low	5, 6, 7, 8, 9, 10	A slight disruption in the magnetic texture although the intensity remains high. These targets do NOT appear stratigraphically related and have little potential.

Table 2: Priority of iron ore targets in Zone 1.

Zone 2

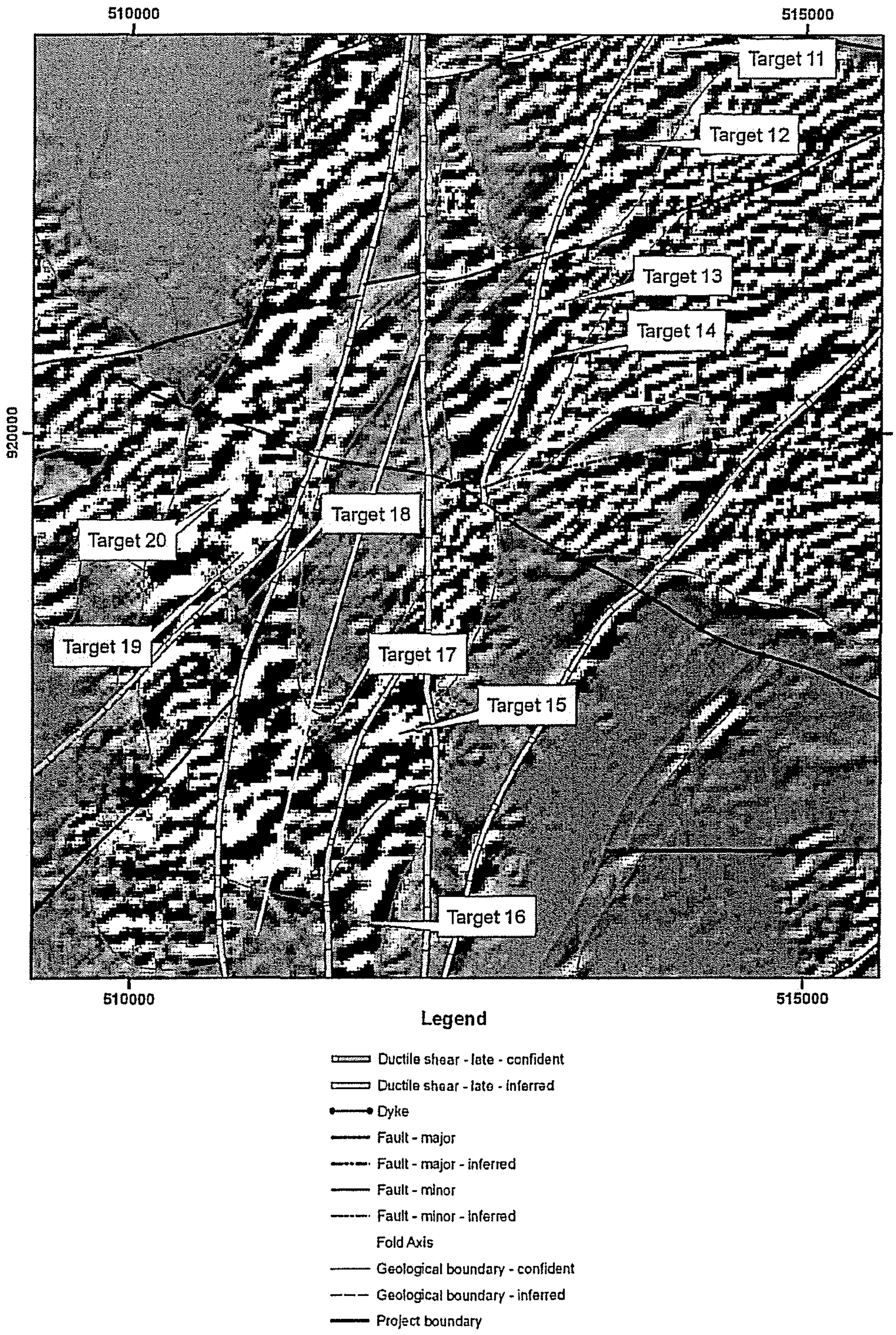


Figure 14: 2VD image of the magnetic texture, frequency and amplitude for the target zone 2.

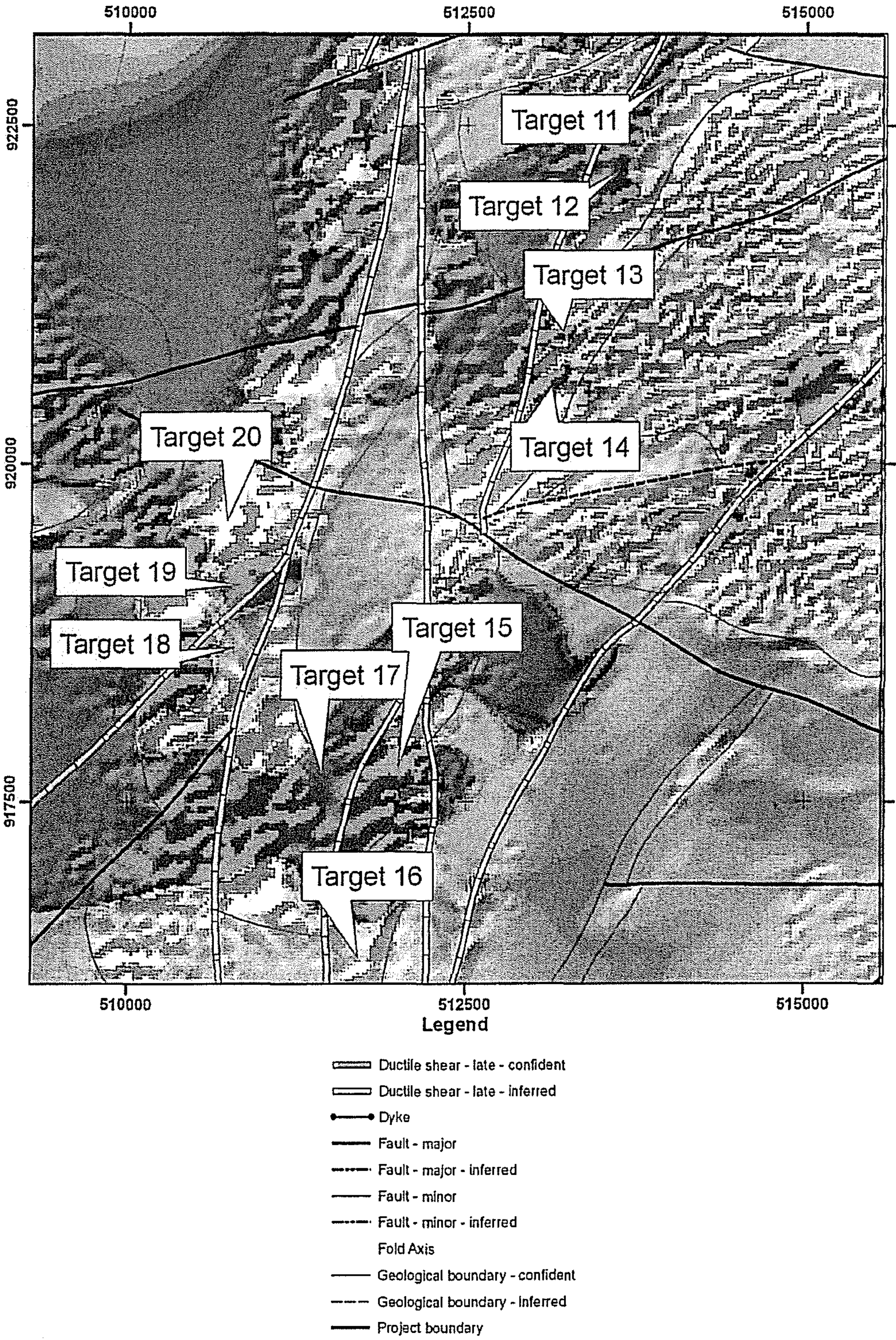


Figure 15: RTP_TMI image of the target zone 2.

Priority	**Target**	**Selection Criteria**
High	15, 17, 18, 19, 20	These targets appear to be related stratigraphically and show a disrupted magnetic texture and low intensity. The structural features are also encouraging as a pathway for mineralizing fluid.
Moderate	16	This area shows a disrupted texture, although the intensity remains high. This could be stratigraphically related to the targets above and therefore is of interest.
Low	11, 12, 13, 14	These sites appear as lows in the intensity image and within the shadows of the magnetic texture in the 2VD image. However, I believe these relate to faults in the area, as they cross-cut the structural trend of the body. Therefore these are ranked as low priority targets.

Table 3: Priority of iron ore targets in Zone 2.

Zone 3

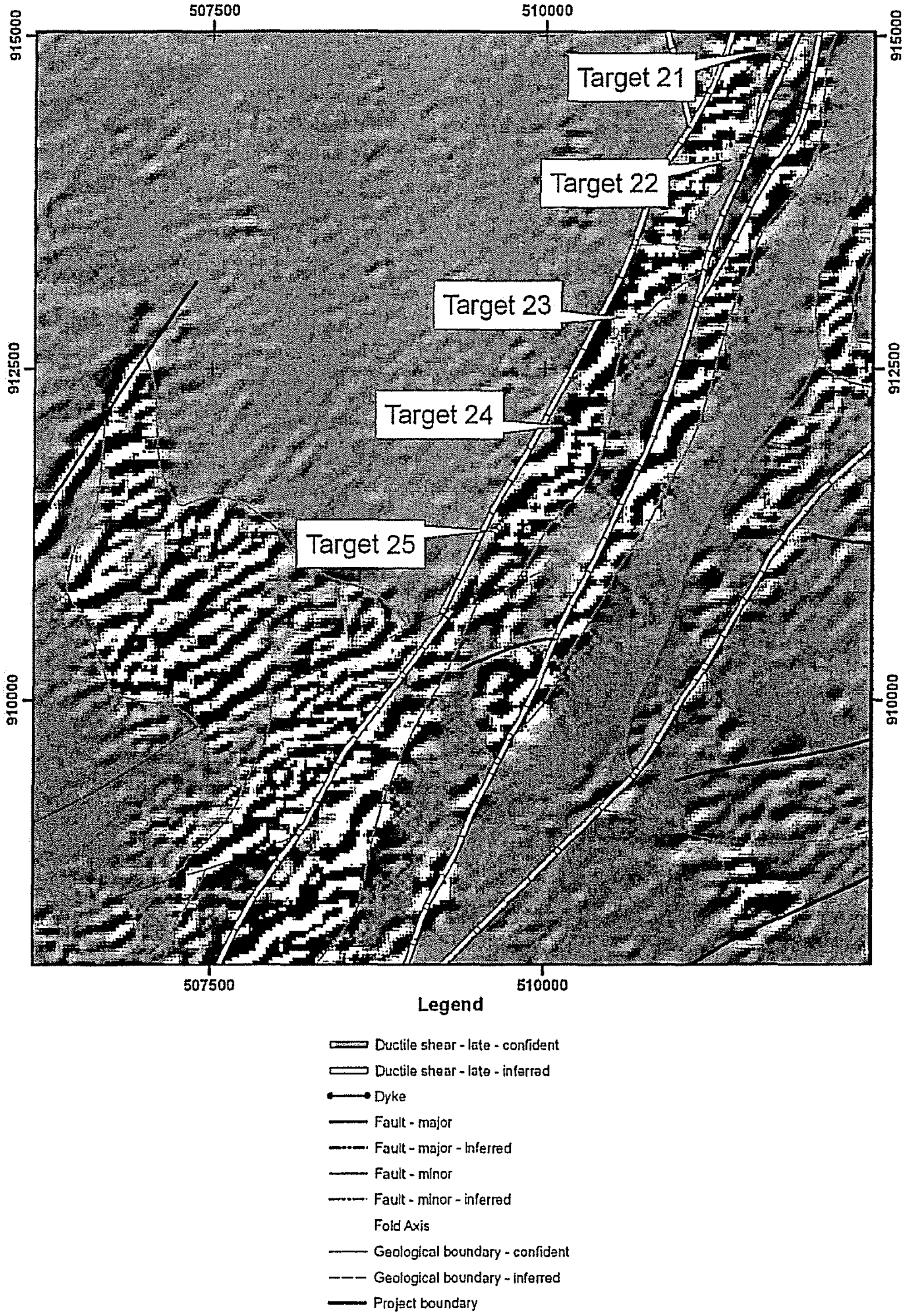


Figure 16: 2VD image of the magnetic texture, frequency and amplitude for the target zone 3.

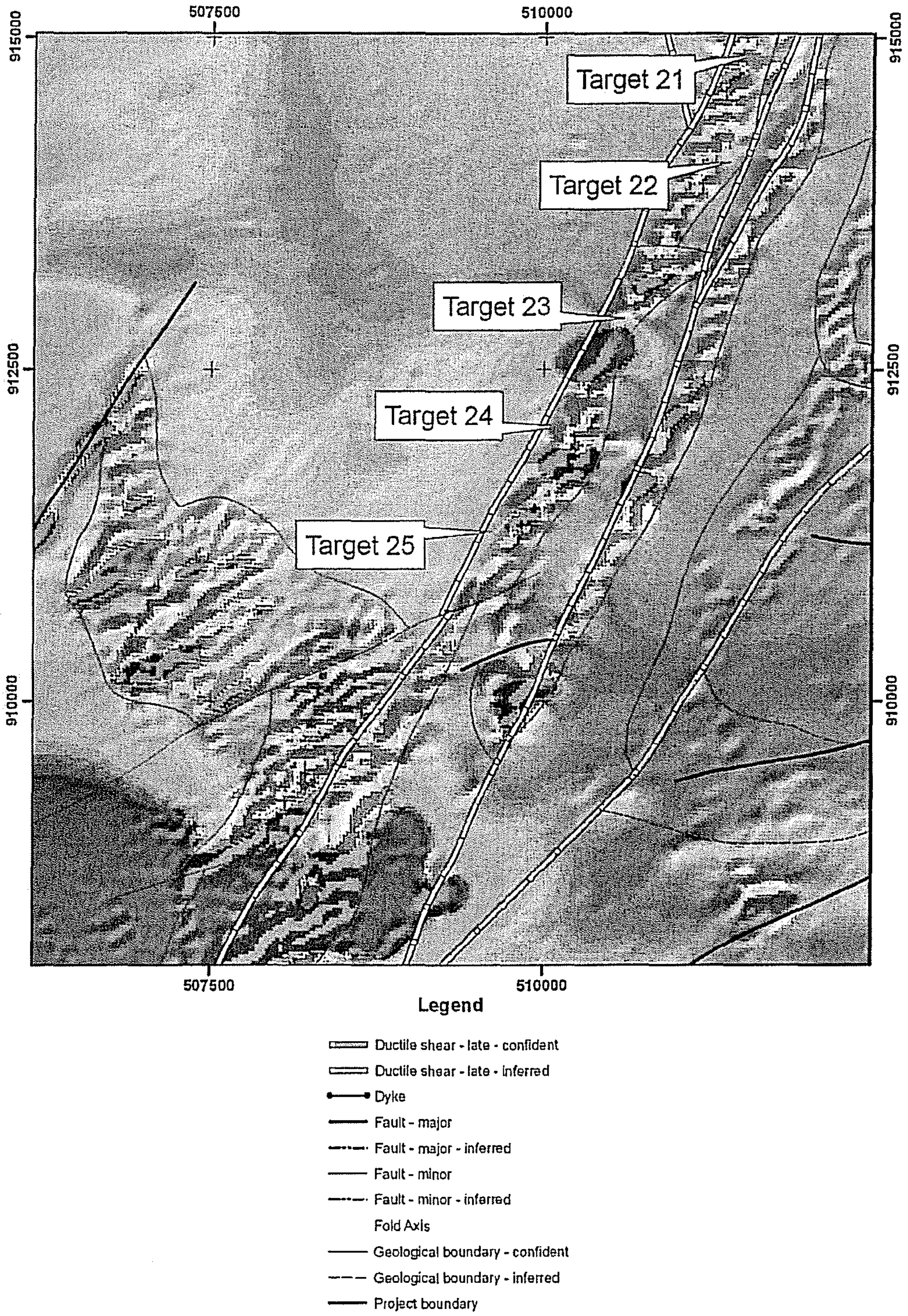


Figure 17: RTP_TMI image of the target zone 3.

Priority	Target	Selection Criteria
High	23, 25	Both show a breakdown of the magnetic character and a reduction in the intensity of the response.
Moderate	24	Between the two high priority targets and could possibly be related stratigraphically.
Low	21, 22,	These targets show minor disruption in the magnetic texture and intensity, but they show no continuity and are of a relatively small scale.

Table 4: Priority of iron ore targets in Zone 3.

Zone 4

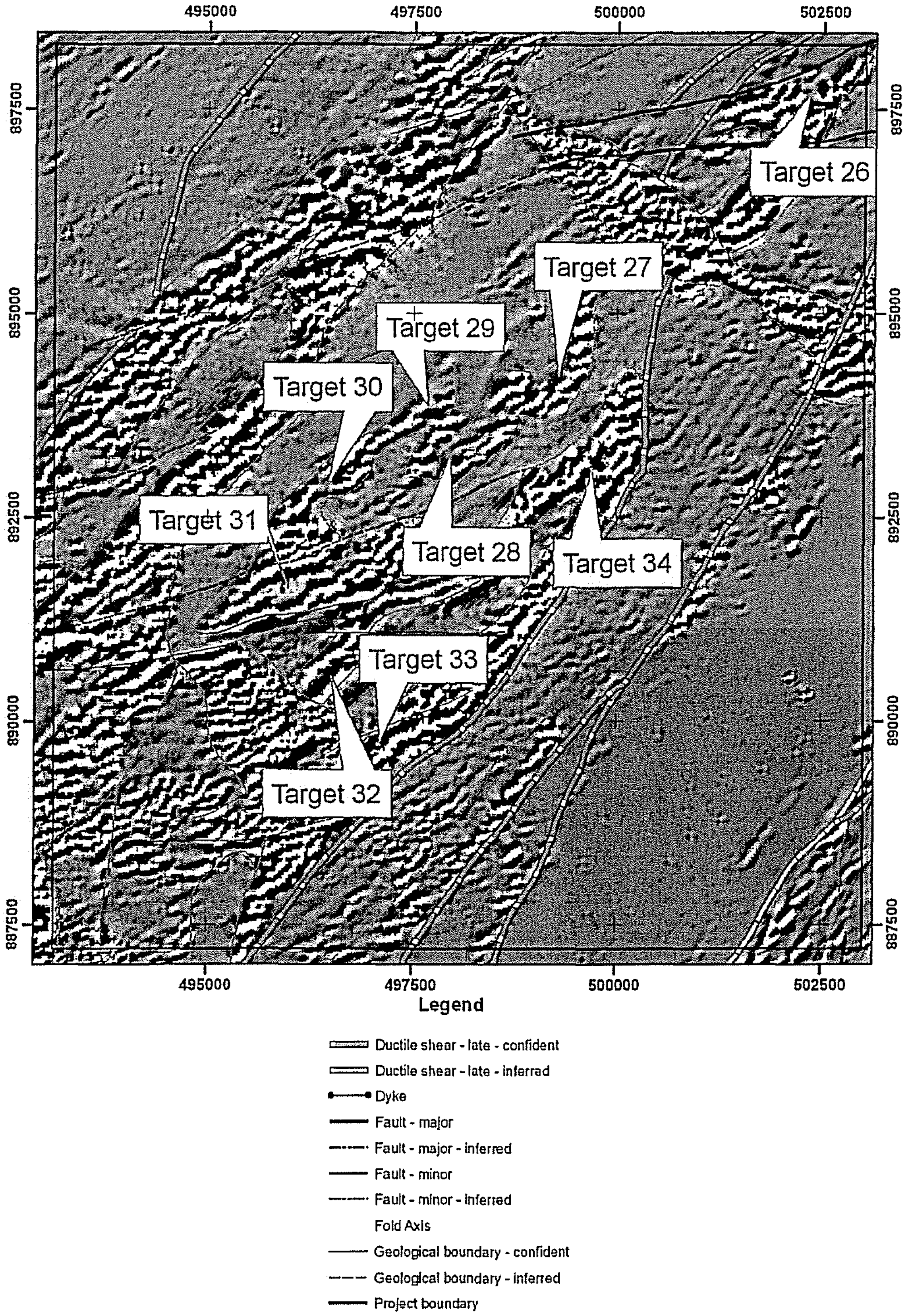


Figure 18: 2VD image of the magnetic texture, frequency and amplitude for the target zone 4.

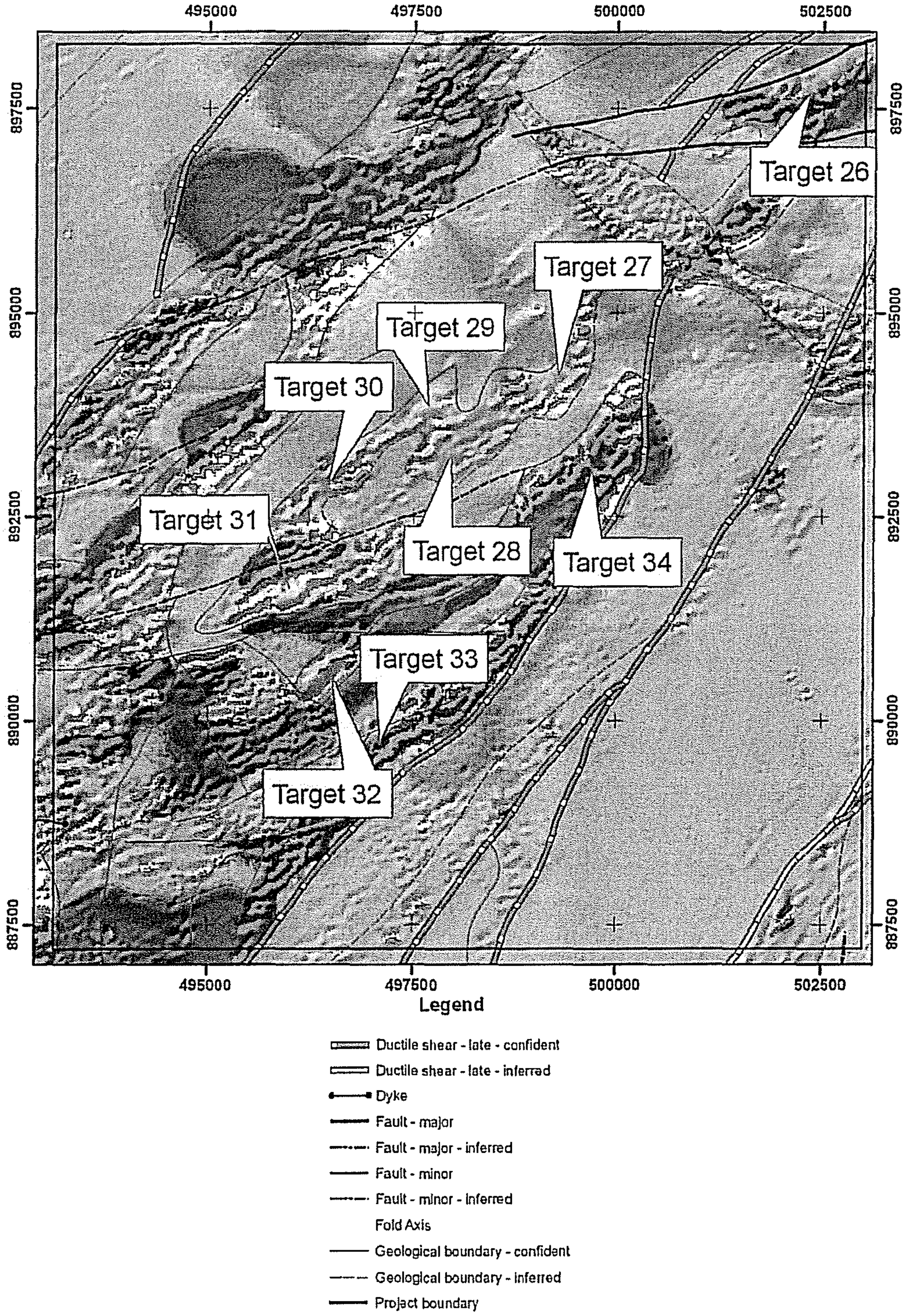


Figure 19: RTP_TMI image of the target zone 4.

Priority	Target	Selection Criteria
Very High	26	The target is in the centre of a low intensity response with destruction in the texture, which is interpreted as a fold closure. This structural feature increases the exploration potential.
High	34	The target is in a low intensity zone and is interpreted as a fold closure. There is no difference in the texture which lowers the exploration potential.
Moderate	30, 31, 32, 33	These targets are based on low magnetic intensity and textural disruption, although they could relate to minor faults and are therefore of low priority.
Low	27, 28, 29	These targets appear to be in a similar stratigraphic position, although there is a slight depletion in the magnetic intensity, the effect is small, relatively.

Table 5: Priority of iron ore targets in Zone 4.

Zone 5

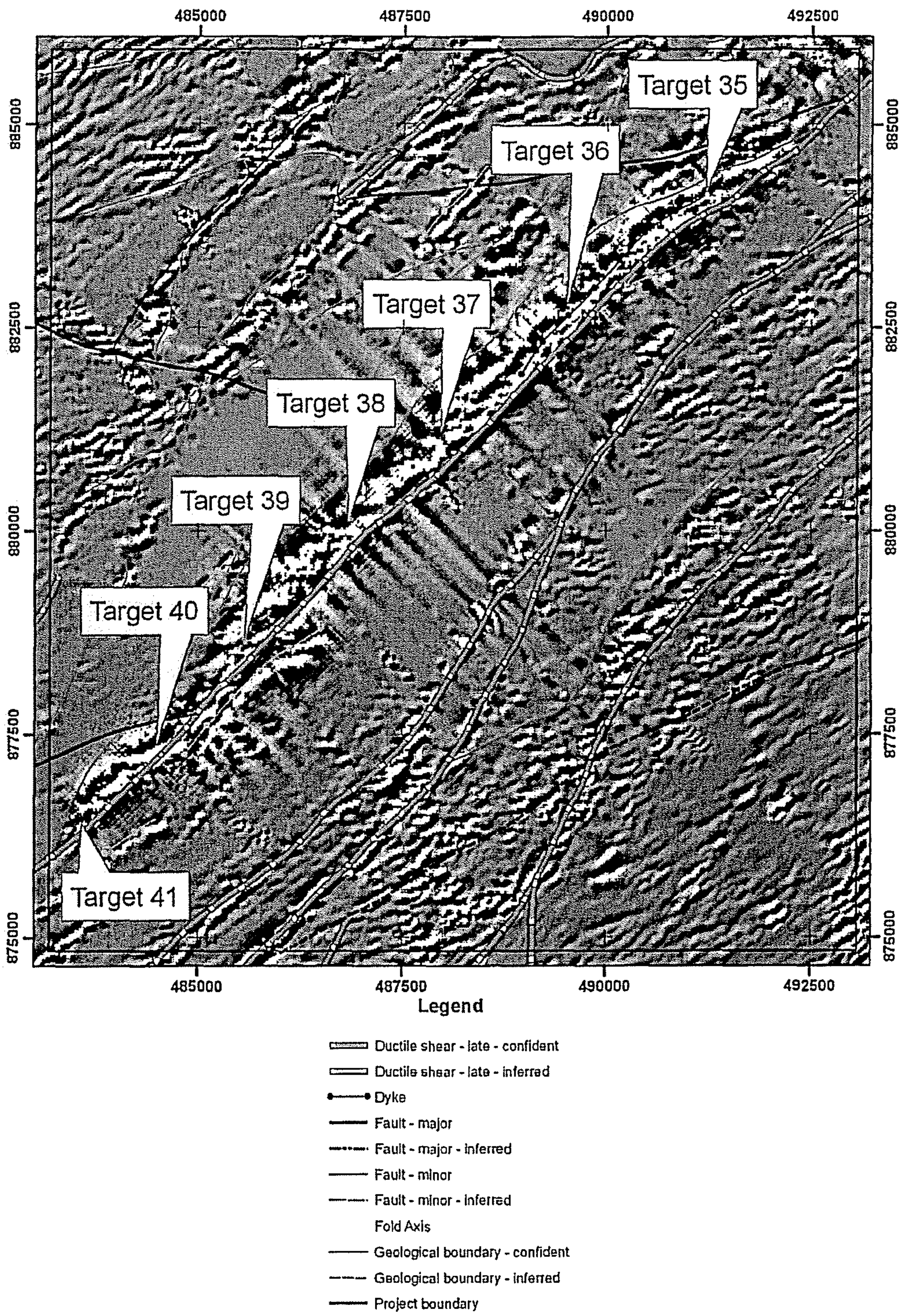


Figure 20: 2VD image of the magnetic texture, frequency and amplitude for the target zone 5.

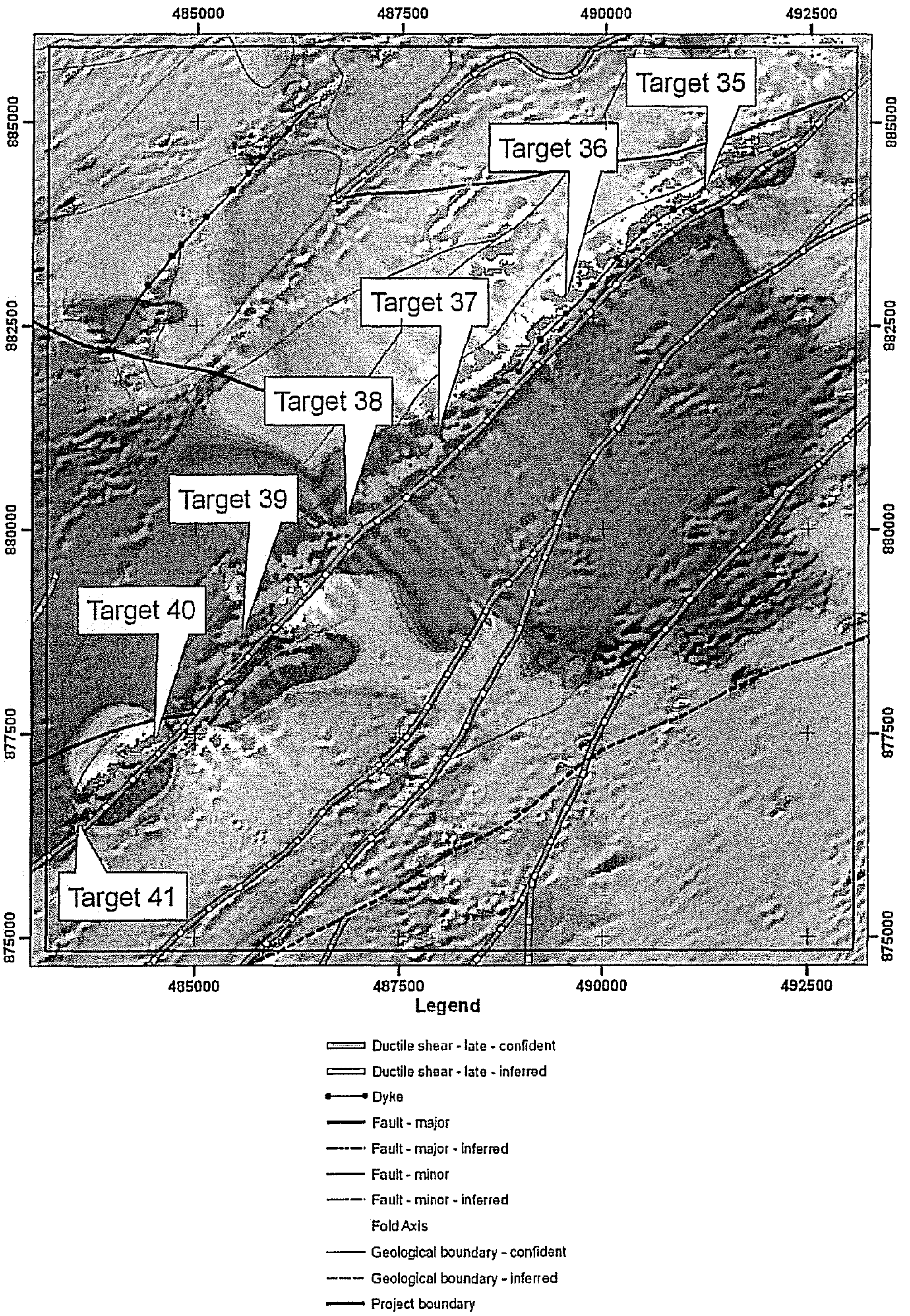


Figure 21: RTP_TMI image of the target zone 5.

Priority	Target	Selection Criteria
Very High	37, 38	Very low intensity and in breaks of magnetic texture these targets are considered highly prospective.
High	41	This target shows low intensity and destruction of texture. However, there is a large structural feature which could have caused a demagnetizisation.
Moderate	39	In a similar stratigraphic position to target 38, although there is a very clean break in the texture which indicates a minor fault. This faulting could be the factor for relative demagnetization.
Low	35, 36, 40	These targets appear in zones of high intensity but disrupted texture.

Table 6: Priority of iron ore targets in Zone 5.

4.3. Uranium

The southern concession indicates a higher prospectivity for uranium that the northern concession, as can be seen from the elevated U/Th ratio image (Figure 8). From this image and the interpretation of the geological structures, several areas have the potential for further exploration. There are four main targets for Uranium deposits in his region;

- Primary uranium hosted in high U- bearing Granitoids,
- Stratiform deposits of units with relatively higher uranium,
- Roll front type deposits in palaeochannels,
- Unconformity related.

Areas of interest are highlighted in Figure 22.

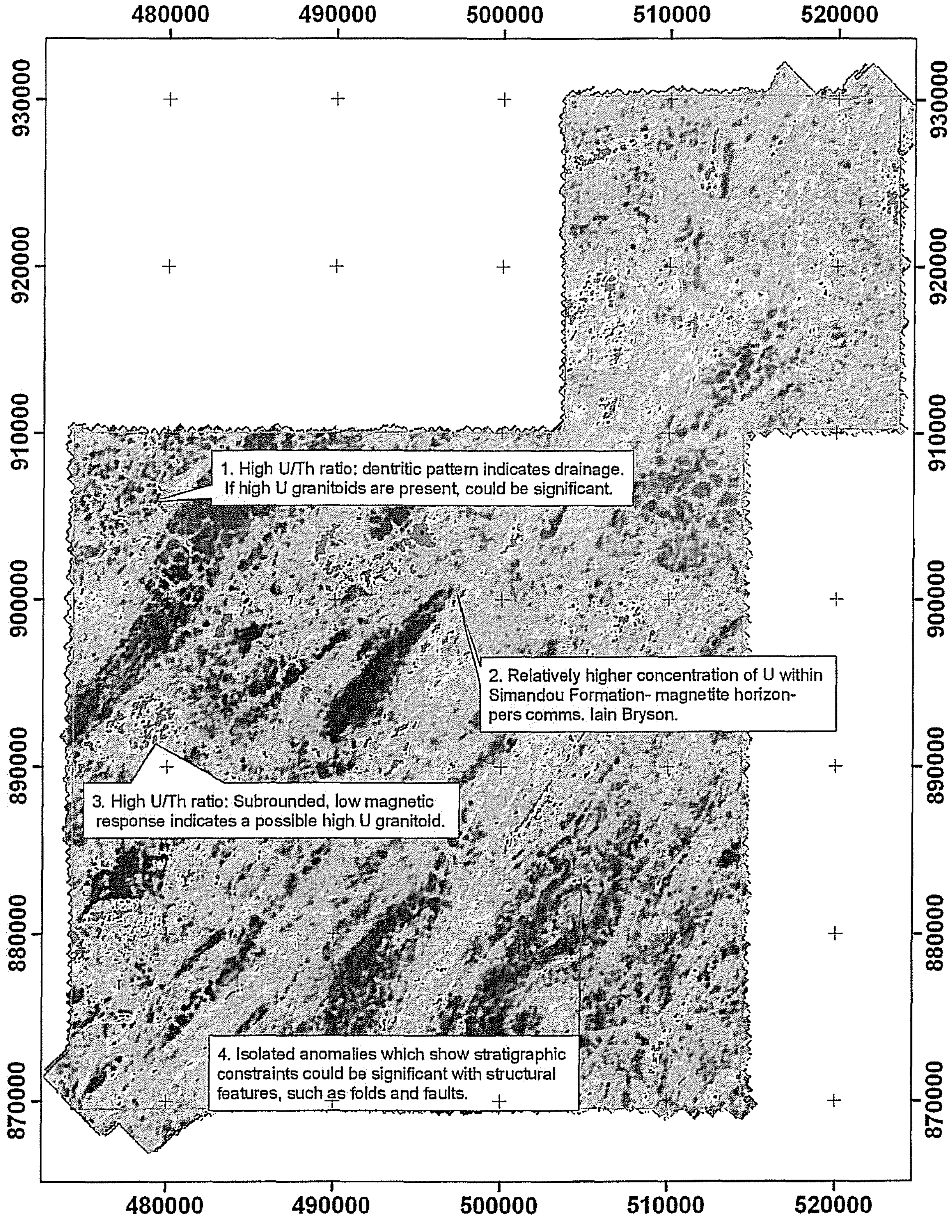


Figure 22: Areas for further uranium exploration in the southern concession on a U/Th ratio image.

5. Conclusions and Recommendations

Interpretation of the airborne geophysical data for the Southern Concession has provided a range of possible exploration targets for uranium and iron oxide. The continuity of the geological units of the Simandou Range is defined by the presence of layers of increased magnetic response, inferring that associated layers in the package have less magnetic response. The level of increased iron concentration cannot be directly quantified by the magnetic method. Targets have been ranked on the inferred volume of possible iron-bearing strata and structural influences at each location. Uranium targets are more abundant in the southern area and major areas of interest have been highlighted in Figure 22.

Further work may include:

- Field investigation to gain detailed geological/structural information and magnetic susceptibility readings for the inferred exploration targets, and the area in general,
- Incorporation of field data into geophysical modelling,
    - A given magnetic field profile may be produced by many different permutations of structure and magnetic susceptibility distribution. Detailed geological and structural information can be used to constrain models, reduce the variability in some variables and assist in producing a more accurate estimate of others (eg depth to magnetic source).
- Incorporation of field data into the solid geology interpretation.
    - Field information will assist in the development of a better structural/ tectonic explanation in the project area, and also help to construct an accurate time-line of geological events.
- Gravity map of the areas of higher interest will further constrain any magnetic bodies of interest.
- Electromagnetic (EM) methods, undertaken from airborne platforms may be useful when looking for palaeochannels that contain concentrated uranium in the region, but are not identifiable at the current landsurface, and therefore cannot be detected using radiometric responses or Landsat imagery interpretation methods. EM techniques measure the conductivity and thickness of rocks, and is capable of constructing a 3-dimensional model of the subsurface in terms of the conductivity variations. EM is the only geophysical method capable of deep 3-dimensional imaging. In addition, where some surface expression of buried drainage may exist, it may not be an accurate reflection of the location of drainage at the time that mineralisation was developed. This is because drainage can shift dramatically due to uplift and climate variations. Thus buried drainage systems at depth can deviate by several kilometres from the modern surface drainage, making EM imaging an important tool when evaluating the presence of possibly important palaeochannels. In this southern concession,

primary sources for uranium have been identified and modern drainage patterns are recognisable in the U/Th ratio radiometric image. This is encouraging for further exploration.

6. Additional concession area to South

The airborne geophysical survey acquired magnetic and gamma- ray spectrometer (radiometric) data. The data was collected along flight lines, at 200 metre spacing and oriented at 000°, and tie lines, at 2000 metre line spacing and oriented at 090°. The interpretation of the geophysical data was intended for the identification of areas of further interest for uranium and diamond exploration.

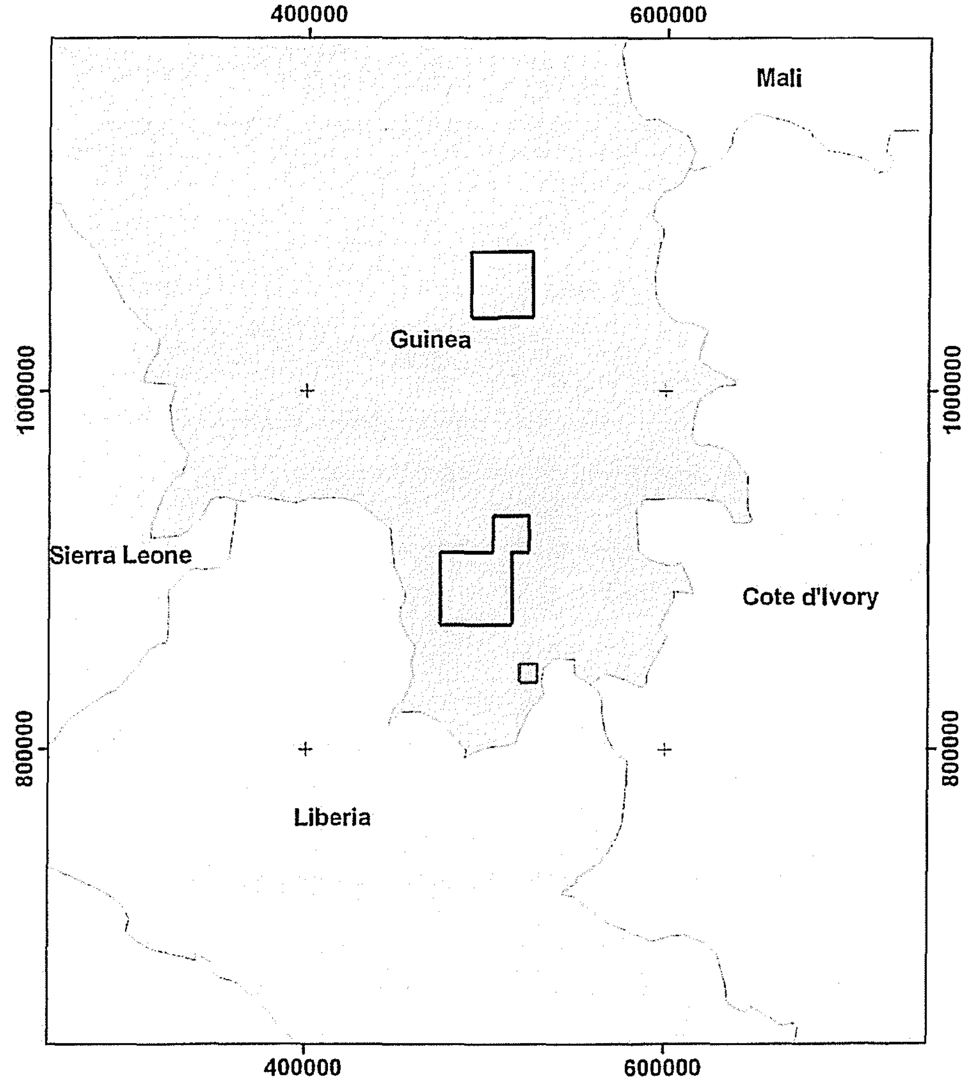


Figure 23: Location map of the additional concession in south-eastern Guinea marked in red, with the other concession areas marked for reference in black.

6.1. Airborne Geophysical Data

The geophysical data collected as part of the airborne survey has been interpreted to identify litho-magnetic domains, structural trends, faults, fractures and folding. The integration of the radiometric and magnetic data allows for the construction of a lithological interpretation, whereby the combination of characteristics can be used to correlate units.

6.1.1 Magnetics

Several images of magnetic data have been employed in the interpretation. The most useful images were found to be the inverted Total Magnetic Intensity (TMI) image (Figure 27) and the inverted TMI First Vertical Derivative (1VD) image (Figure 24). Inverted magnetic field data has been used in lieu of reduction to the pole (RTP). For areas near to the magnetic equator the inverted TMI image provides a reasonable qualitative approximation of reduction to the pole without the introduction of processing artefacts. The inversion allows for areas of higher magnetic response to appear as "hotter" colours (red/white), and areas of lower magnetic response to appear as "cooler" colours (blue/purple) when a rainbow colour scheme is used.

The following is a complete list of magnetic images:

- Inversed 1VD TMI
- Inversed 1VD and 2VD horizontal gradient TMI

6.1.2 Radiometrics

Radiometric data was used in conjunction with the magnetic information to map lithological variations. The radiometric ternary image (Figure 26) was most used for this purpose. In addition, the U/Th ratio image (Figure 28) was utilised as it can be indicative of relatively high uranium concentration.

The following images were used:

- Radiometric (bands/RGB) Ternary (K, Th, U) Image
- Single band Potassium, Thorium and Uranium intensity images
- Uranium/Thorium ratio image.

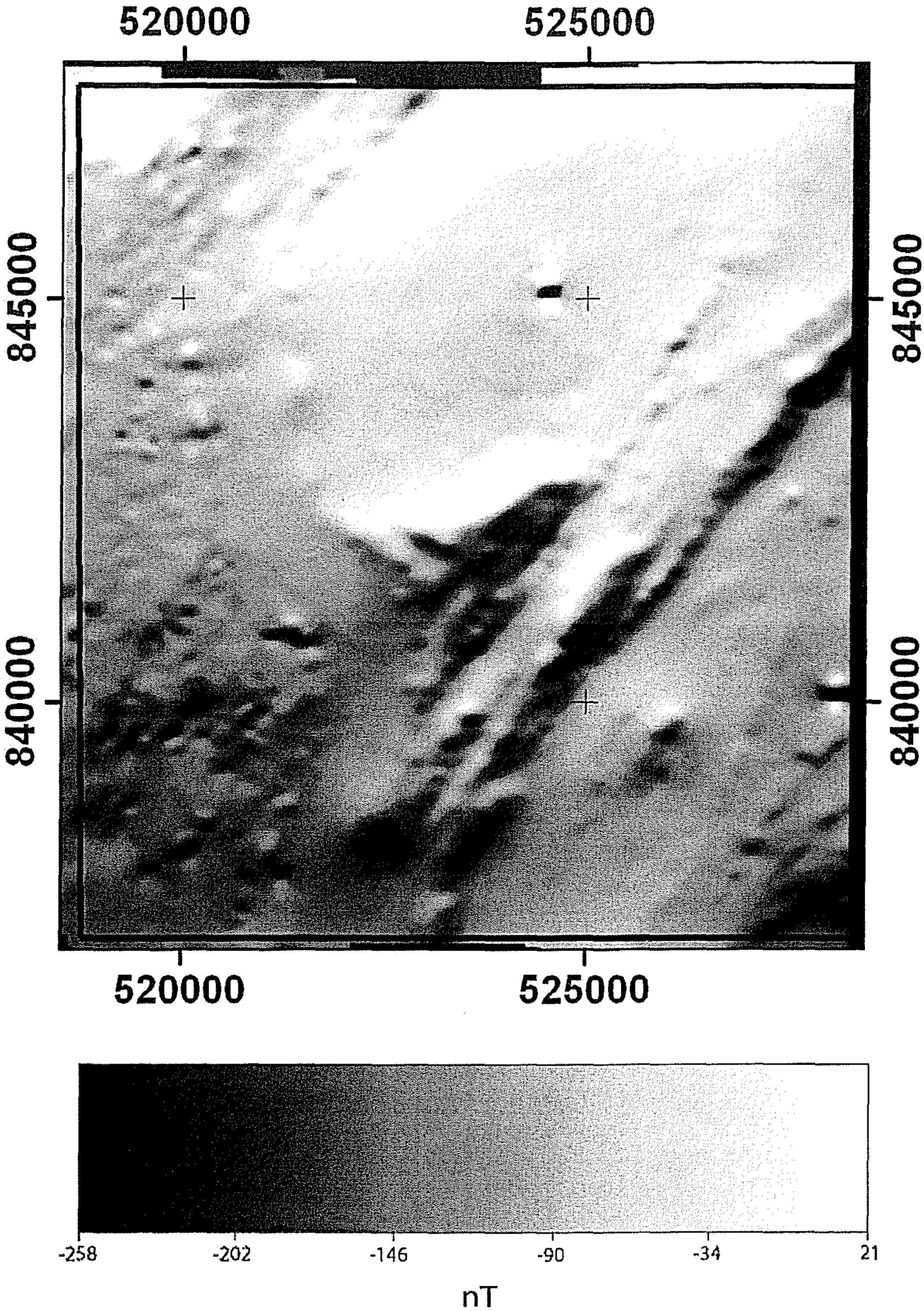


Figure 24: First order vertical derivative with greyscale colour scheme.

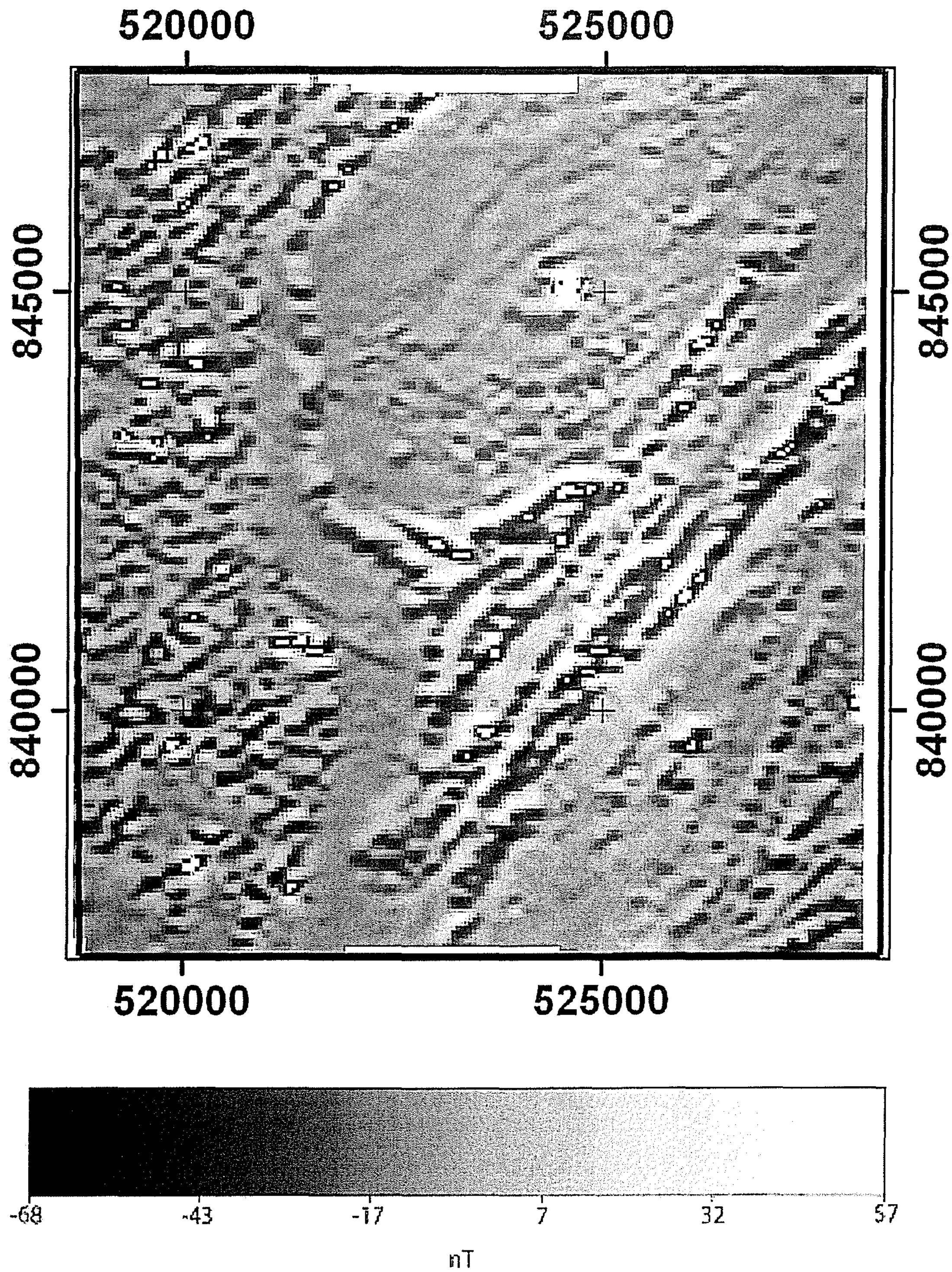
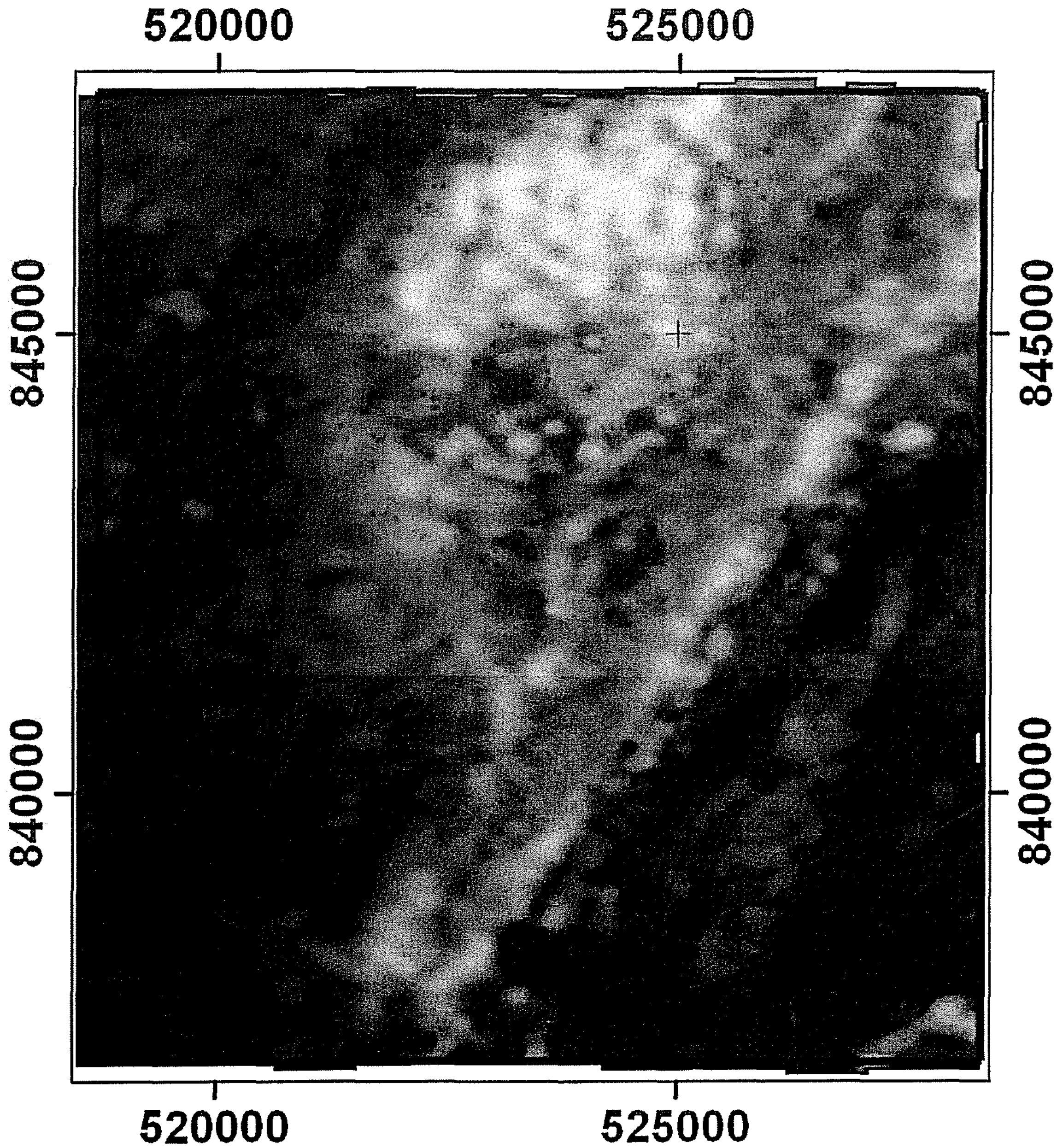


Figure 25: Second order vertical derivative with greyscale colour scheme.



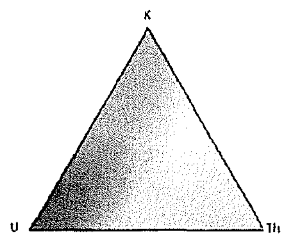


Figure 26: Ternary gamma-ray spectral image (K = red, Th = green, U = blue).

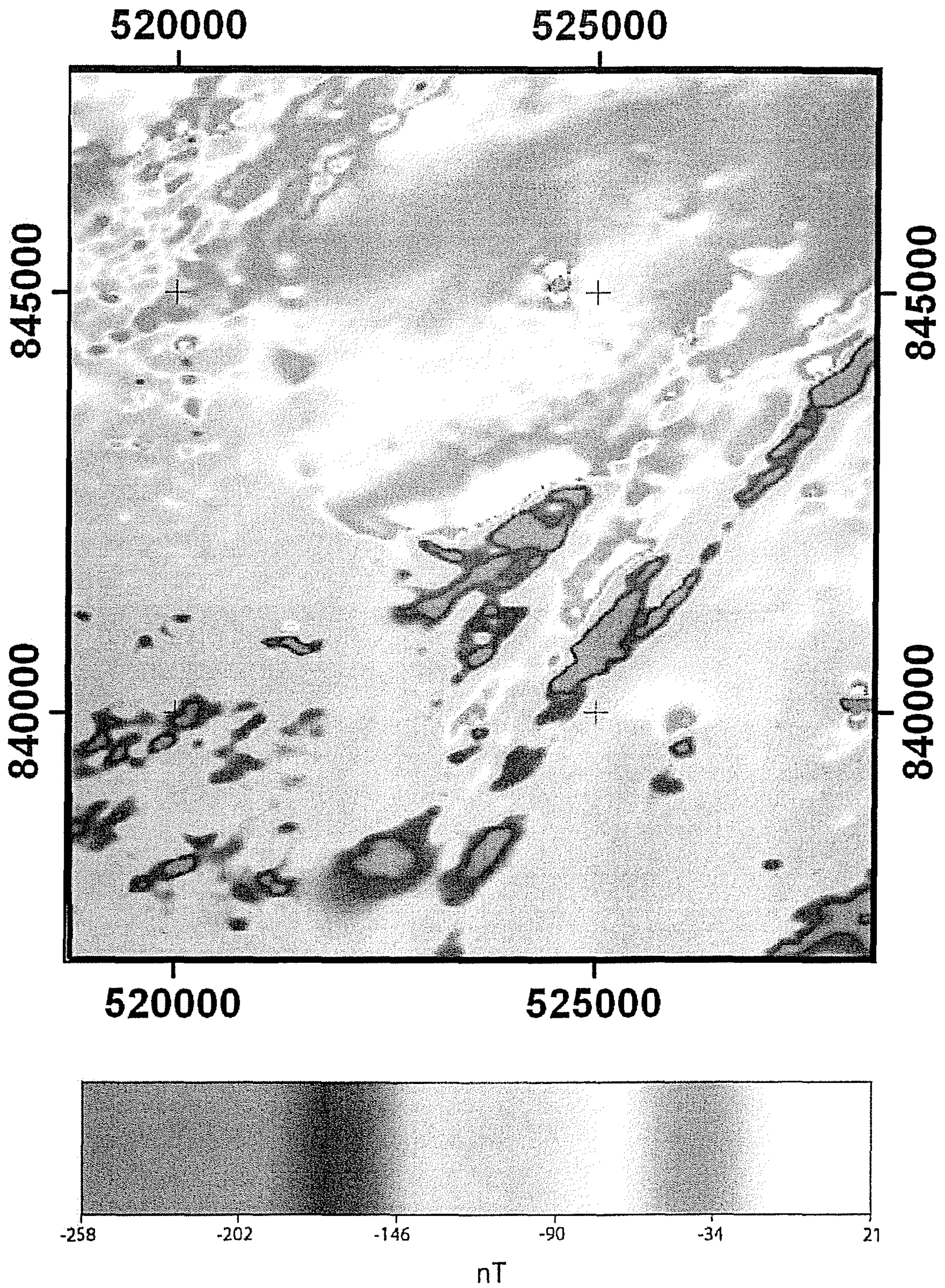


Figure 27: Total Magnetic Intensity.

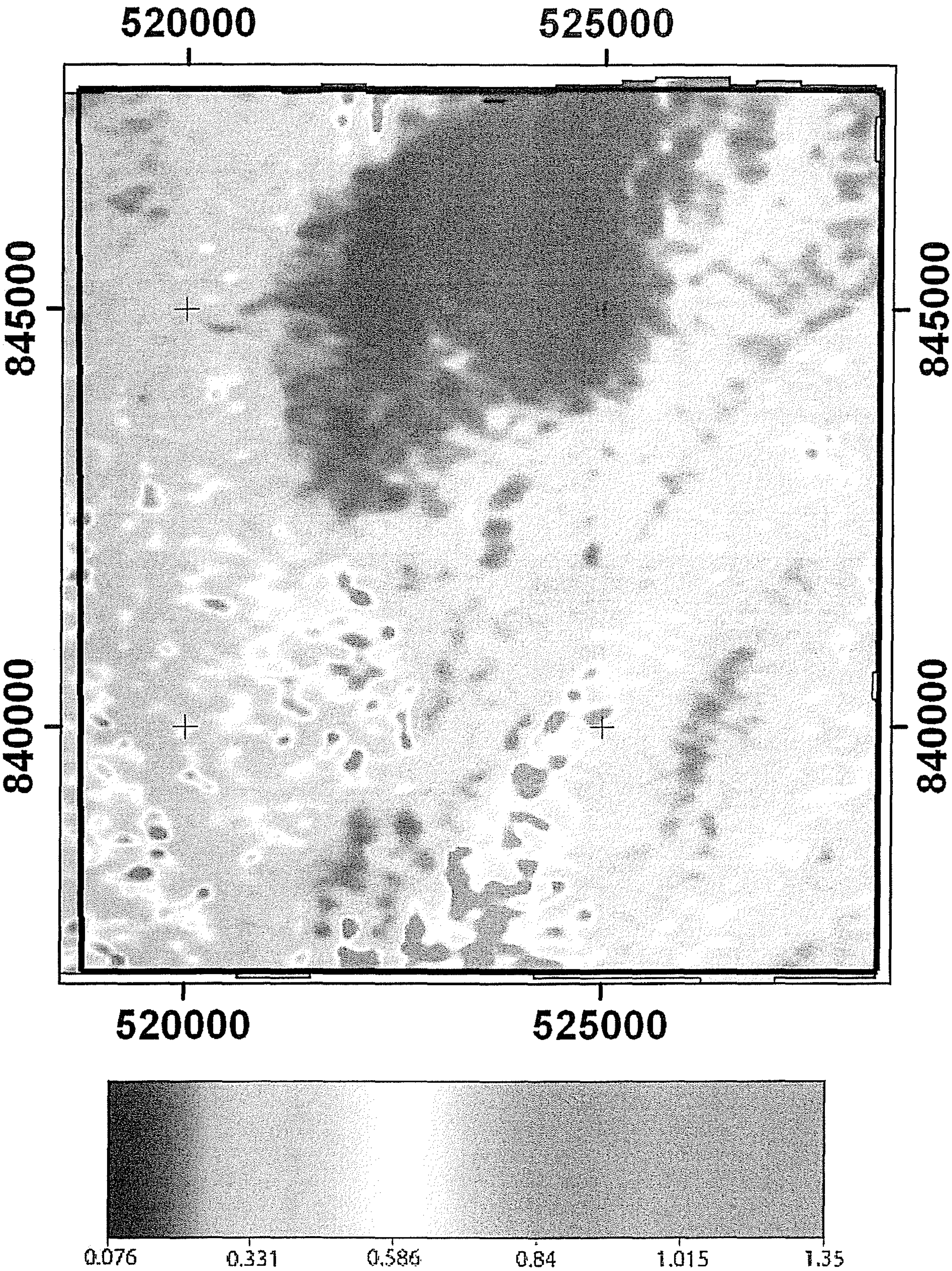


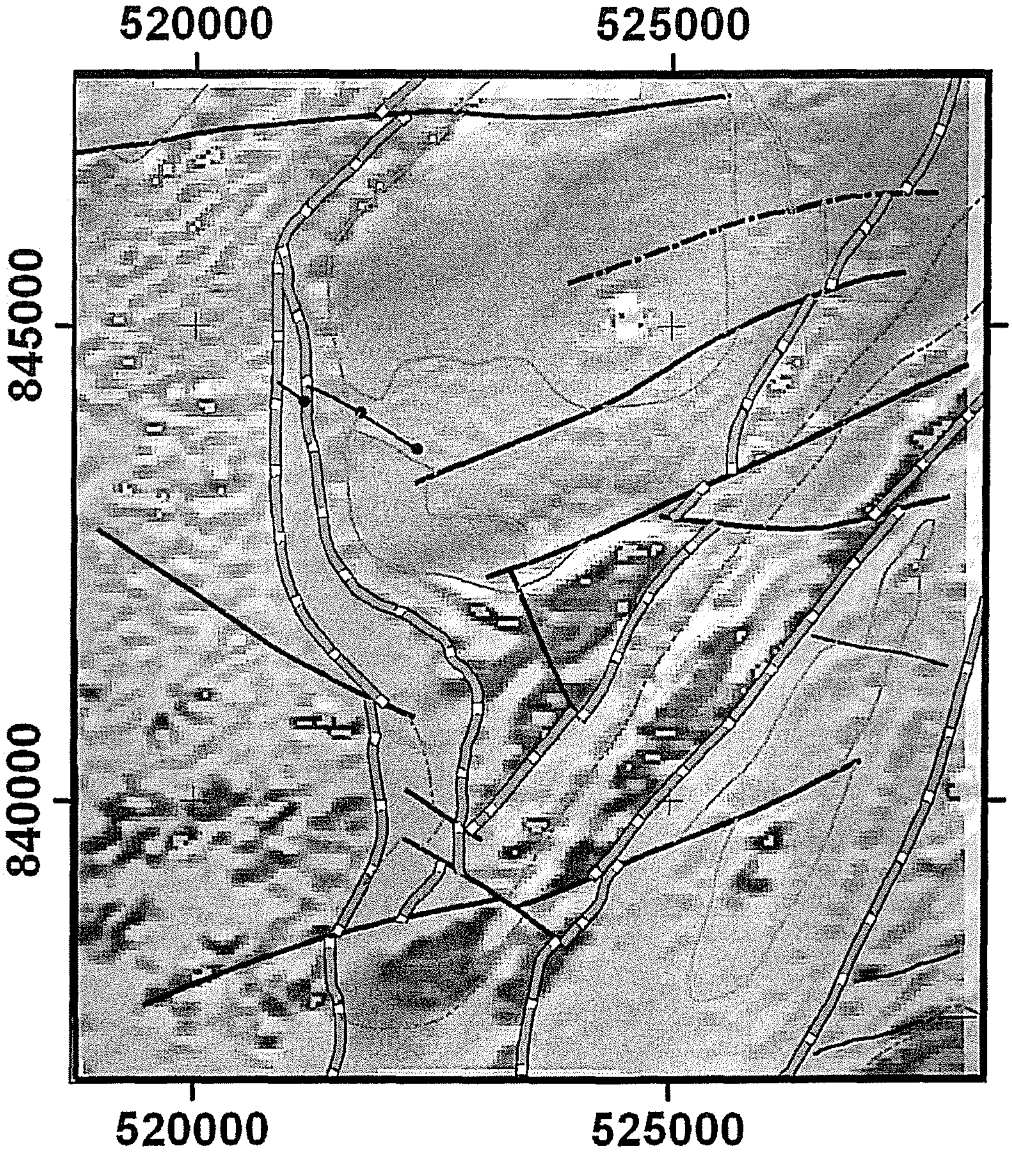
Figure 28: Uranium over Thorium spectral ratio image.

6.2. Interpretation and Targeting

Interpretation has been provided to form a basis for targeting areas for further exploration. A structural skeleton has been created to identify boundaries between different litho-magnetic domains, structural trends, faults, folds, and fractures. Many of the domain boundaries are structural and of these many are ductile. The main geological observations are:

- The dominant structural trend is NNE-SSW,
- There are two sets of late, brittle faults in NE-SW and NW-SE orientations,
- Both sets of brittle faulting show dextral strike-slip movement,
- A large sub-spherical body is present in the north of the area, and may be a granite pluton.
- At least three other litho-magnetic domains exist, all with NNE magnetic trends.
- The low radiometric response of the area indicates a high proportion of cover in the region.

An explanation of the chosen exploration targets is shown below:



Legend

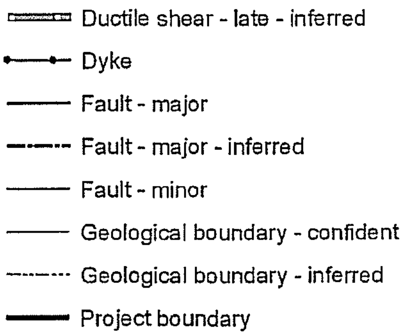


Figure 29: Structural skeleton over the second order vertical derivative and the total magnetic intensity as a transparent level.

6.2.1 Uranium

The U/Th image (Figure 28) was viewed qualitatively to identify areas of possible uranium enrichment. However, uranium appears to be strongly lithology-related rather than due to any potential economic enrichment. Identifying palaeodrainage for uranium deposits from these datasets is very difficult. Sometimes palaeochannels may contain other dense (magnetic) minerals if uranium is present; however in this dataset there is no evidence for this. In addition the area is located in a tropical environment and therefore palaeochannels are likely to be covered and may vary strongly from the drainage observed today. Therefore, in this dataset radiometrics may be used to try to identify any current drainage network, and any potential source rock for uranium. However, no palaeochannels could be identified in this study.

6.2.2 Diamonds

Possible diamond exploration targets have been placed where isolated dipoles exist and are out of character with the surrounding response.

Target	Ranking	Easting	Northing
D1	1	524482.9	845085.3
D2	3	527332.1	842598.2
D3	2	525938.1	839740.7

Table 7: Rank and co-ordinates of targets for further diamond exploration.

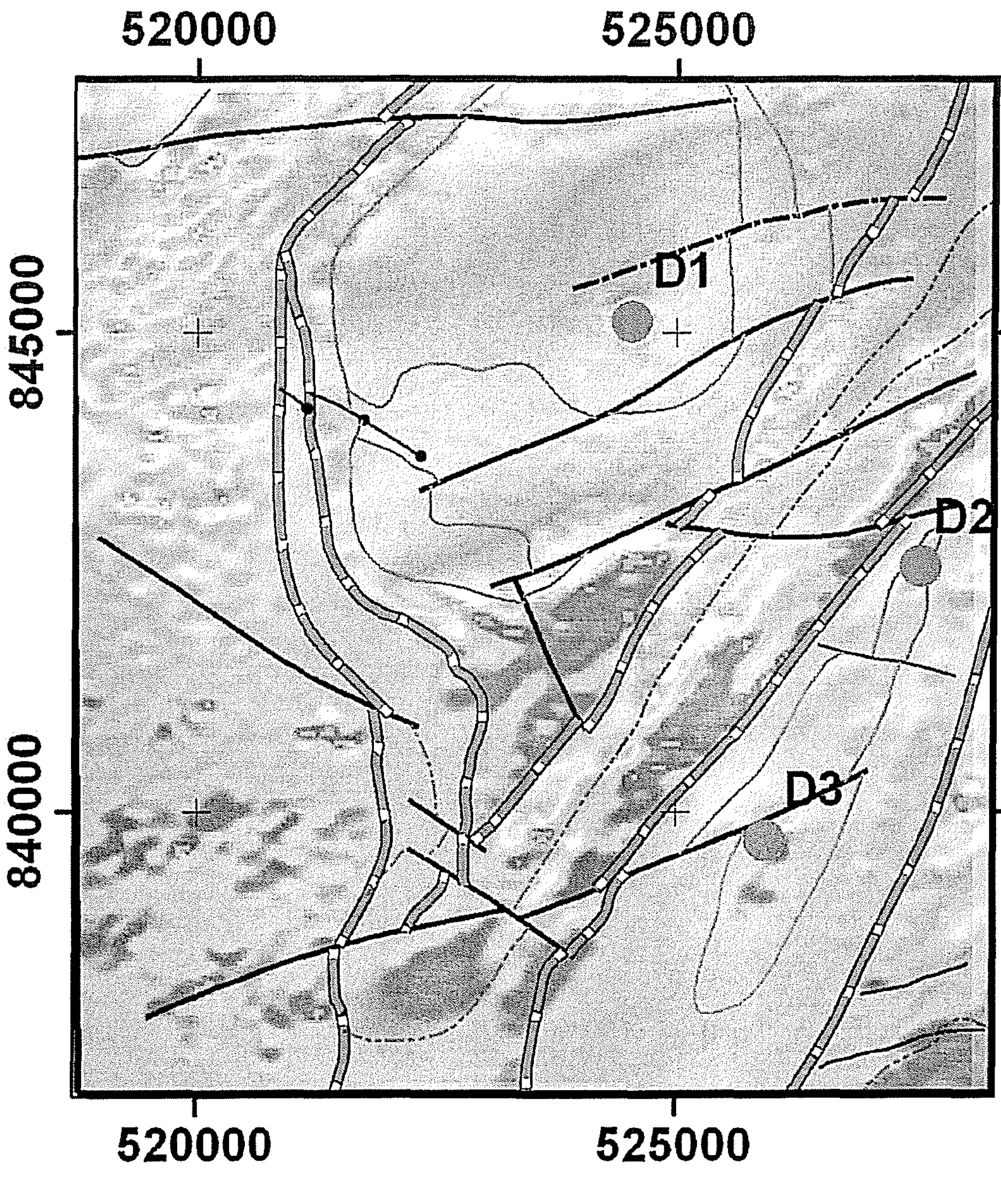


Figure 30: Location of the isolated dipoles chosen for further diamond exploration.

6.3. Results and Conclusions

Interpretation of the additional concession area to the south of the initial projects has identified three targets for possible further diamond exploration. These targets were based on the empirical and theoretical magnetic response associated with possible mafic-ultramafic pipes, i.e. an isolated dipole which appears out of character with the surrounding magnetic response. However, these cannot be ranked with any certainty and further fieldwork is recommended

In addition to this further work may include:

- Electromagnetic (EM) methods, undertaken from airborne platforms may be useful when looking for palaeochannels that contain concentrated uranium in the region, but are not identifiable at the current landsurface, and therefore cannot be detected using radiometric responses or Landsat imagery interpretation methods. EM techniques measure the conductivity and thickness of rocks, and is capable of constructing a 3-dimensional model of the subsurface in terms of the conductivity variations. EM is the only geophysical method capable of deep 3-dimensional imaging. In addition, where some surface expression of buried drainage may exist, it may not be an accurate reflection of the location of drainage at the time that mineralisation was developed. This is because drainage can shift dramatically due to uplift and climate variations. Thus buried drainage systems at depth can deviate by several kilometres from the modern surface drainage, making EM imaging an important tool when evaluating the presence of possibly important palaeochannels
- Incorporation of field data into the solid geology interpretation.
    - Field information will assist in the development of a better structural/ tectonic explanation in the project area, and also help to construct an accurate time-line of geological events.
- Field investigation to gain detailed geological/structural information and magnetic susceptibility readings for the inferred exploration targets, and the area in general.

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