NEDEX PTY LTD
GEOLOGICAL CONSULTANTS ABN 11 064 889 827
1 Eastern Street, CHILLAGOE, QLD, 4871, AUSTRALIA
Tel: +61.7.4094 7128, 4094 7165, 4094 7270 Fax: +61.7.4094 7028,
E-mail: nedex@bigpond.com
Manager: John E Nethery *FAIG, FAusIMM, FSEG, MGSA, CP (Geo)*

MAY RIVER EL 1441 – REMOTE SENSING STRUCTURAL GEOLOGY INTERPRETATION

J E Nethery (22 January 2014)

SUMMARY

- A 7 kilometre long corridor of alteration extends south-easterly from Iku (The Knob) to Mountain Gate, Eserebe, Foya and Skirasia.
- An advanced argillic alteration assemblage of intense silica, alunite and kaolinite was recognised by previous explorers associated with a high sulphidation geological setting of diatremes and high level porphyry intrusive bodies.
- A strong and extensive gold signature was obtained from stream Pan Concentrate and Bulk Cyanide Leach, soil and rock chip sampling along the alteration corridor, and is focused on the perimeters of the diatremes.
- Two phases of gold-bearing veining are recognised: low-sulphidation epithermal colliform quartz - manganese carbonate veins appear to be overprinted by a stockwork of quartz – pyrite – base metal sulphide veinlets.
- The range of alteration, mineralisation and geological settings is very similar to the Frieda River deposits with Horse – Ivaal as a deeper porphyry system at one end of the spectrum and the Nena high-sulphidation system at the other.
- Drilling of 13 holes at Skirasia by Highlands Gold (HGL) produced very encouraging intersections in 3 holes of 96m at 0.89g/t Au, 54m at 1.83g/t Au and 109m at 1.53g/t Au, and modest intersections in other holes.
- Drilling of 10 holes at Foya by Highlands Gold (HGL) produced very encouraging intersections in 5 holes of 77m at 1.19g/t Au, 164m at 1.23g/t Au, 24m at 1.61g/t Au 2m at 37.00g/t Au and 10m at 1.00g/t Au, and modest intersections in other holes.
- Reprocessing of an HGL magnetic survey over the South May River - Frieda River area has highlighted 2 concentric elliptical ring structures with dimensions of 20km x 15km and 15km x 8km interpreted as caldera collapse structures.
- The elliptical structures are partly offset by several ENE and NW trending linear structures, interpreted as regional faults.
- Horse – Ivaal, Koki and Nena systems are all focused along the inner ring structure, near intersecting linear faults.
- Iku, Mountain Gate, Eserebe, Foya and Skirasia lie along the outer ring structure near the intersection with ENE - trending linear faults.
- Subsidiary smaller ring structures of between 2km to 4km diameter encompass Horse – Ivaal, Nena, Iku and an unnamed structure about 2km NE from Stolle Mount.

- A 4km diameter ring structure adjacent to the west of Eserebe, Foya and Skirasia is centred on the western lobe of the Frieda Intrusive Complex, and encompasses the Mountain Gate diatreme.
- VTEM anomalies defined from the 2013 survey form a 2km diameter annular ring around the Iku intrusive plug and potentially indicate untested sulphide concentrations. This is potentially an ideal porphyry gold target.
- The previous explorer HGL withdrew because it was considered that drill intersections were not of high enough grade, but drilling was tightly confined and it is questionable that in such a large alteration system that the optimal zones were tested.
- Geological mapping and geochemical sampling of this zone is still of a reconnaissance nature and previous mapping data needs to be refined and extended.

INTRODUCTION

This report is a more detailed examination of the airborne geophysical surveys, particularly the reprocessed Highland Gold Development Limited survey over the EL 1441 area as well as the Frieda River group of prospects than that reported previously.

A search of published literature and the available company database failed to locate a detailed structural interpretation of the area. Given that the known mineralisation ranges from deep porphyry style to higher level high-sulphidation diatreme style it was assumed that the concentric and radial fracture patterns commonly associated with such systems may be present. As I didn't have the required software to examine the detailed prospect scale mapping I decided to do a regional and local prospect area structural interpretation without initial reference to existing detailed geological mapping to be used as a comparative exercise in the future.

Mincor had commissioned re-processing of the existing HGL magnetic surveys but had not carried out detailed interpretation of that data. Google Earth Landsat imagery was also used to establish fracture patterns predominantly from drainage patterns.

The interpretation of structural geological patterns on remote sensing imagery is subjective and combines art with science. The mind is guided by what it wants to see, and by the experience of the interpreter.

In the case of May River, as with Bolobip, two major controls on structure are apparent and are well established elsewhere in the region and in porphyry systems generally:

- A regional transpressional regime is well established, which involves (a) SSW-verging shallow-dipping thrusting (i.e. north over south compression) with the direction of thrusting varying from S to SSW and (b) SE-oriented dextral strike slip (i.e. a right-handed twist wrench of the entire Papuan Belt region).
- Intrusive porphyry systems in a homogeneous host rock setting tend to initially form a pattern of radial linear fractures as the magma forcefully intrudes, followed by a pattern of concentric circular to elliptical collapse fractures as the magma cools, crystallises and loses its volatile fluid and gas components.

Dextral Transpressional regime

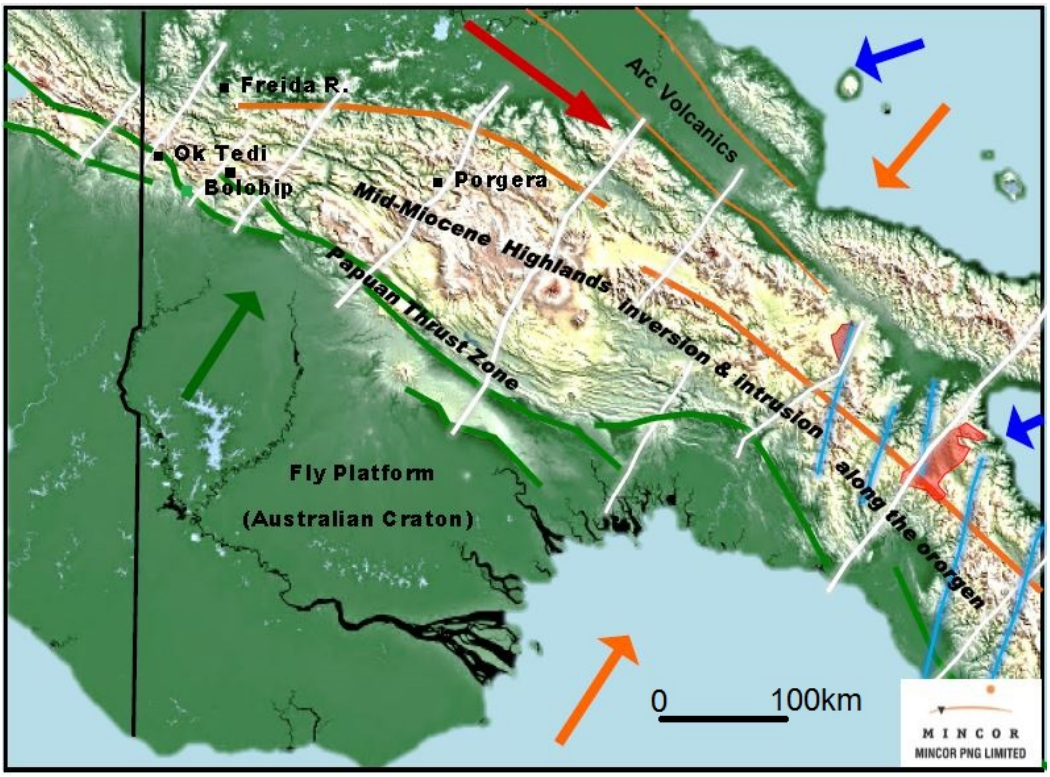

Figure 1: NW PNG showing dextral transpressional parameters

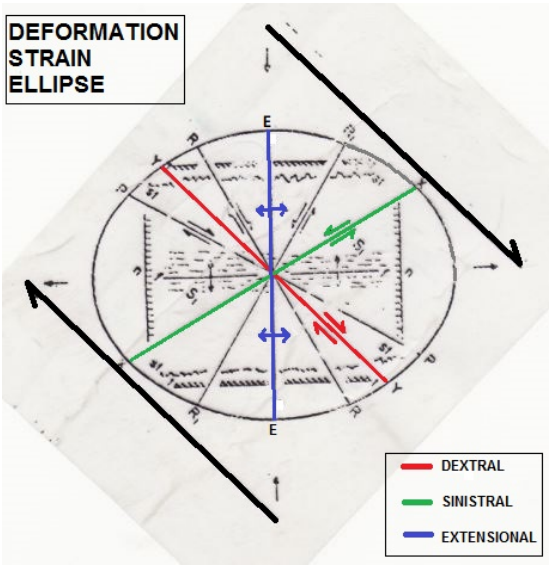

Figure 2: Strain ellipse showing orientation of dextral and conjugate sinistral slip components and extensional dilation structures

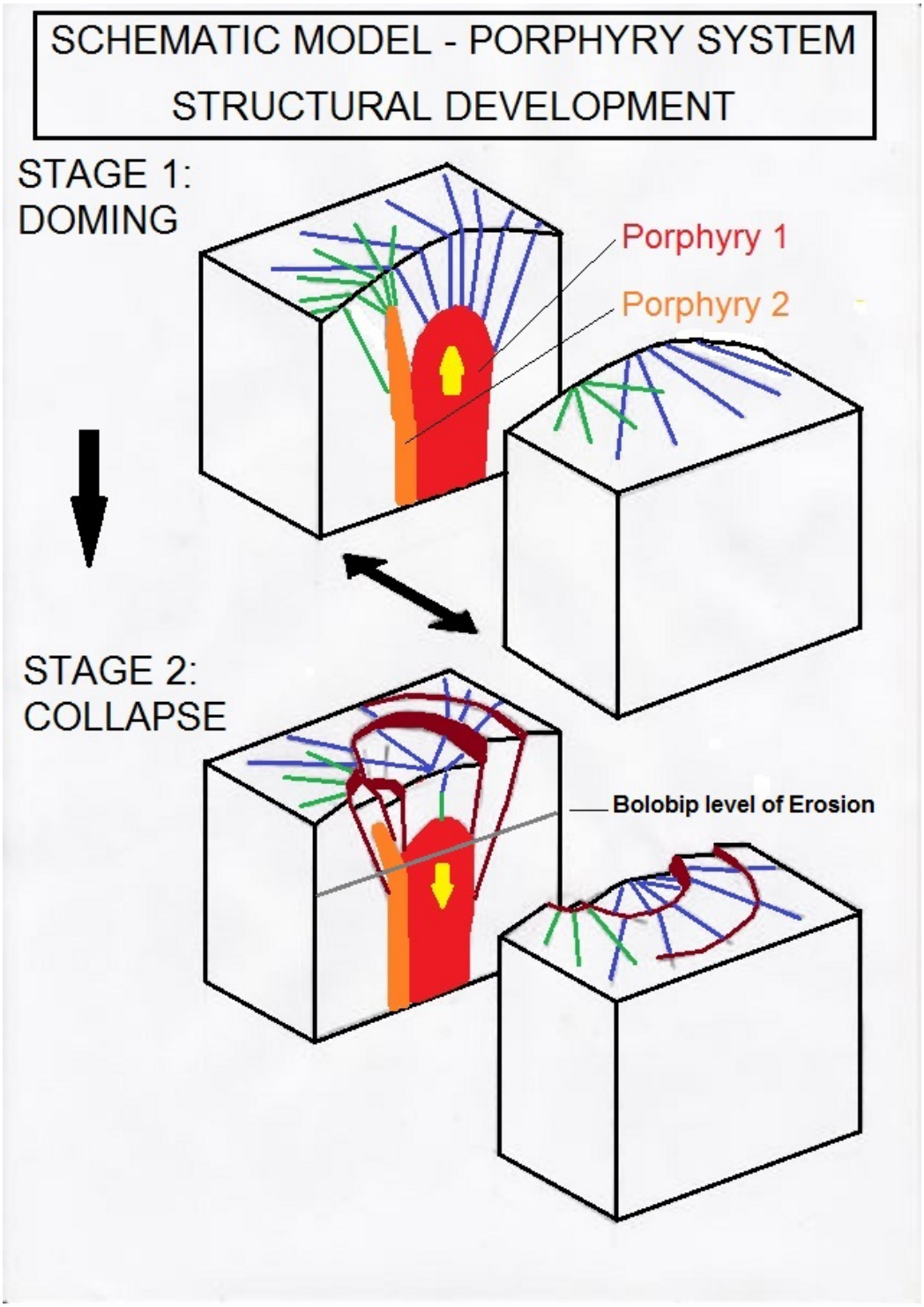

Figure 3: Schematic block model showing development of initial radial fracture pattern then later elliptical, arcuate and circular collapse structures.

REGIONAL REMOTE SENSING STRUCTURAL INTERPRETATION

As noted above intrusive porphyry systems in relatively homogeneous host rocks tend to initially form a Stage 1 pattern of radial linear fractures as the magma forcefully intrudes. This is followed by a Stage 2 pattern of concentric circular to elliptical collapse fractures as the magma cools, crystallises and loses its volatile fluid and gas components (Figure 3). Multiple intrusive phases will produce overlapping patterns of structures, and this complexity is exacerbated under a regional strike slip regime such as occurs at May River.

On a larger regional scale, voluminous volcanic activity of acid to intermediate composition tends to produce circular to elliptical calderas commonly on a scale of 10 to 30 kilometres diameter after voiding of the magma chamber.

The extensive Wogamesh Formation extrusive andesitic volcanic sequence and associated shallow marine sediments have been mapped by Bureau of Mineral Resources on a reconnaissance basis and a broadly elliptical pattern of outcrop was evident in the immediate Frieda River area.

Mincor arranged for reprocessing of the Highland Gold Development Limited magnetic survey over the EL 1441 area as well as the Frieda River group of prospects and a series of images using various algorithms were produced.

It seems that no structural interpretation was done with this imagery. Several major structures are apparent. Two concentric elliptical ring structures with dimensions approximately 20km x 15km and 15km x 8km are elongate in a NW direction. They are partly offset by several ENE and NW trending linear structures, interpreted as regional faults. The regular shape and size of the ellipses suggest caldera collapse structures. Caldera collapse structures are an ideal location for focusing of later intrusive/extrusive bodies such as porphyries and diatremes, and where they are cut by offsetting linear faults is the optimal location. It is noteworthy that the Horse – Ivaal, Koki and Nena systems are all focused along the inner ring structure, near intersecting linears. It is of particular interest for Niuminco that the line of SE trending line of prospects from Iku, through Mountain Gate, Eserebe and Foya to Skirasia lie along the outer ring structure.

Subsidiary smaller ring structures of between 2km to 4km diameter encompass Horse – Ivaal, Nena, Iku and an unnamed structure about 2km NE from Stolle Mount. A 4km diameter ring structure adjacent to the west of Eserebe, Foya and Skirasia is centred on the western lobe of the Frieda Intrusive Complex.

This structural interpretation is subjective and has not been checked in the field so the original pristine images are displayed adjacent to the images with structural interpretation, so that the reader can assess for themselves.

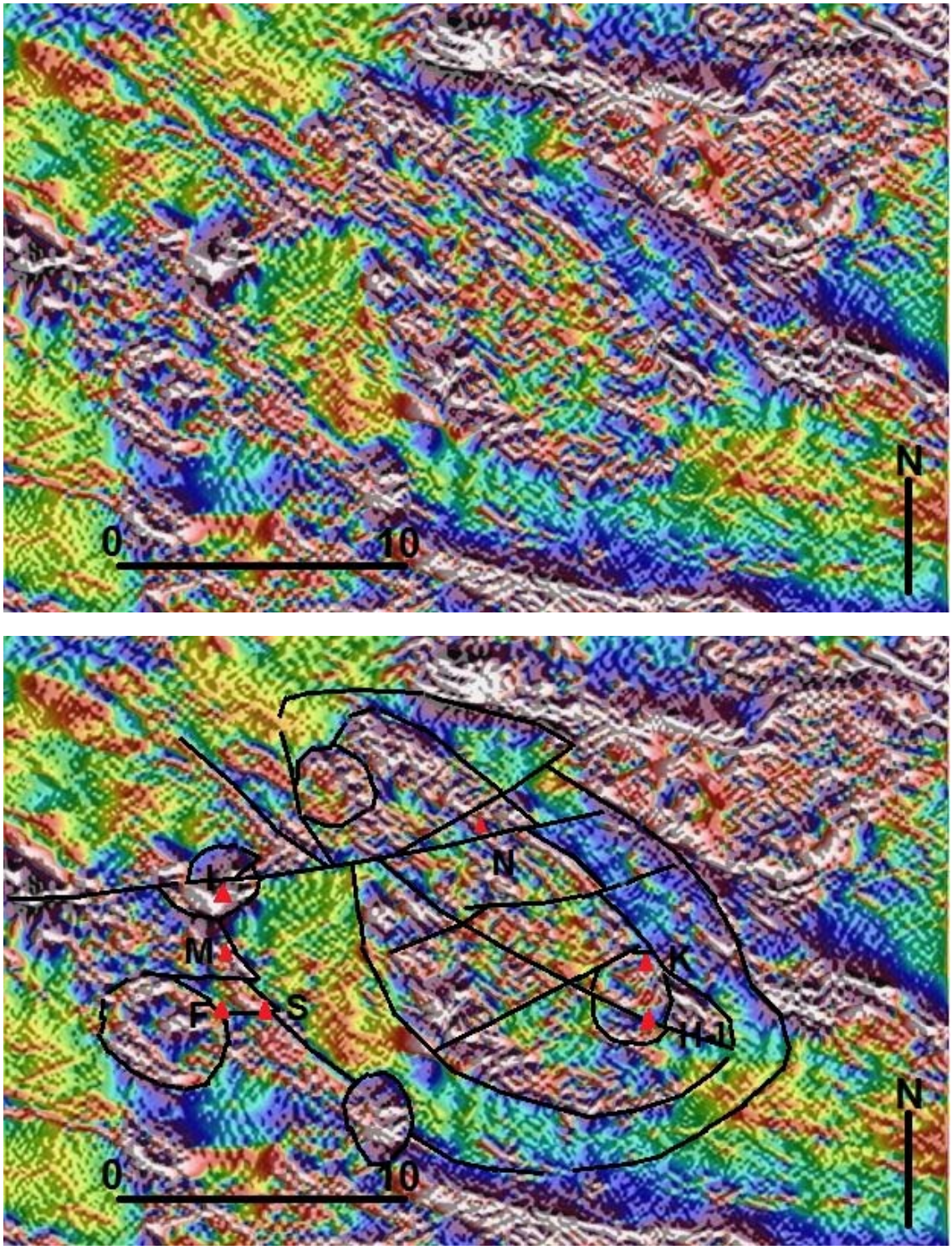

Figure 4: HGL Aeromagnetics. Reduced to Pole – EagcsNL.
Iku (I), Mountain Gate (M), Eserebe (E), Foya (F), Skirasia (S), Nena (N), Koki (K) & Horse–Ivaal (H-I).

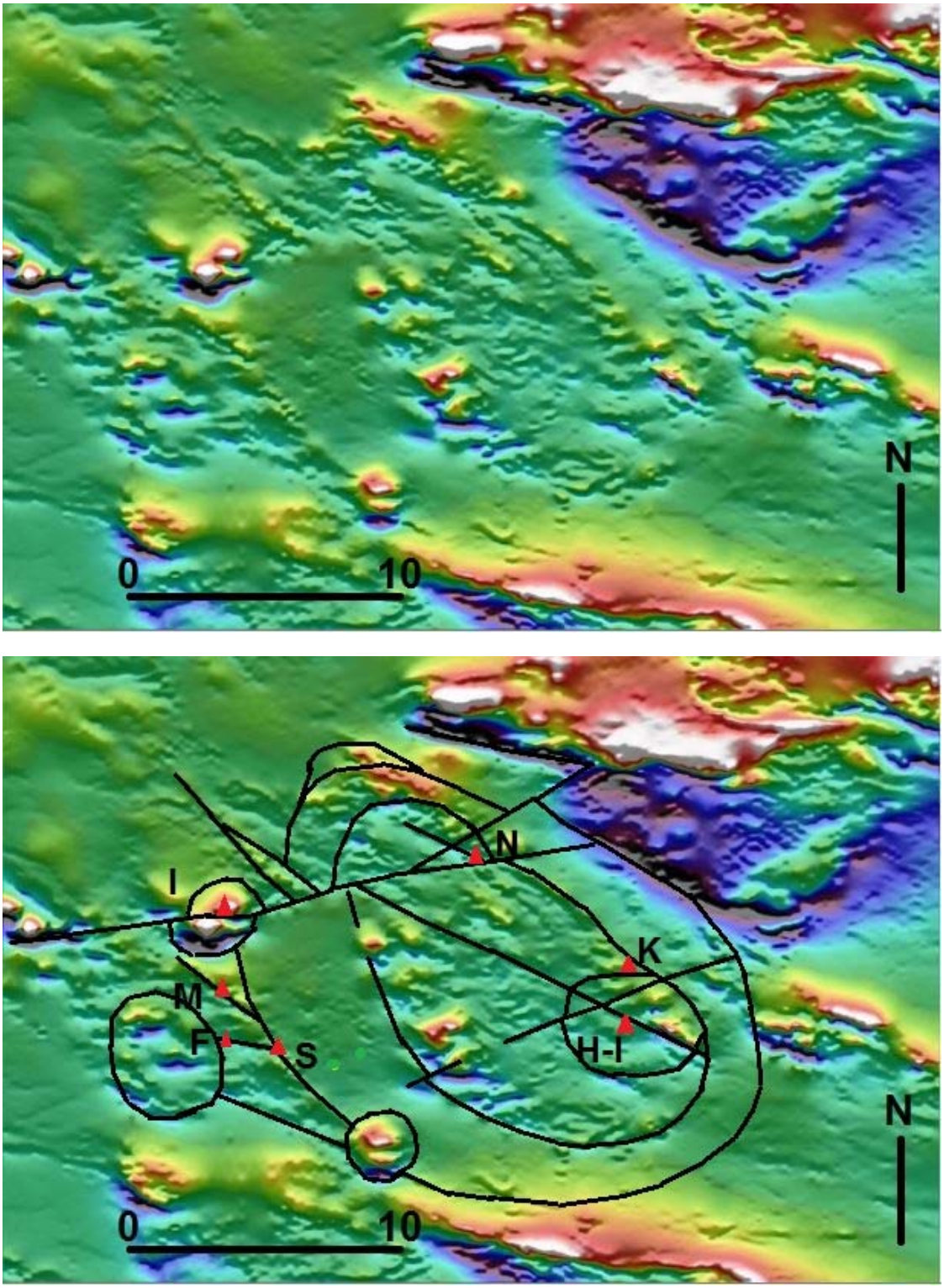

Figure 5: HGL Aeromagnetics. Total Magnetic Intensity – N shade-NL.
Iku (I), Mountain Gate (M), Eserebe (E), Foya (F), Skirasia (S), Nena (N), Koki (K) & Horse–Ivaal (H-I).

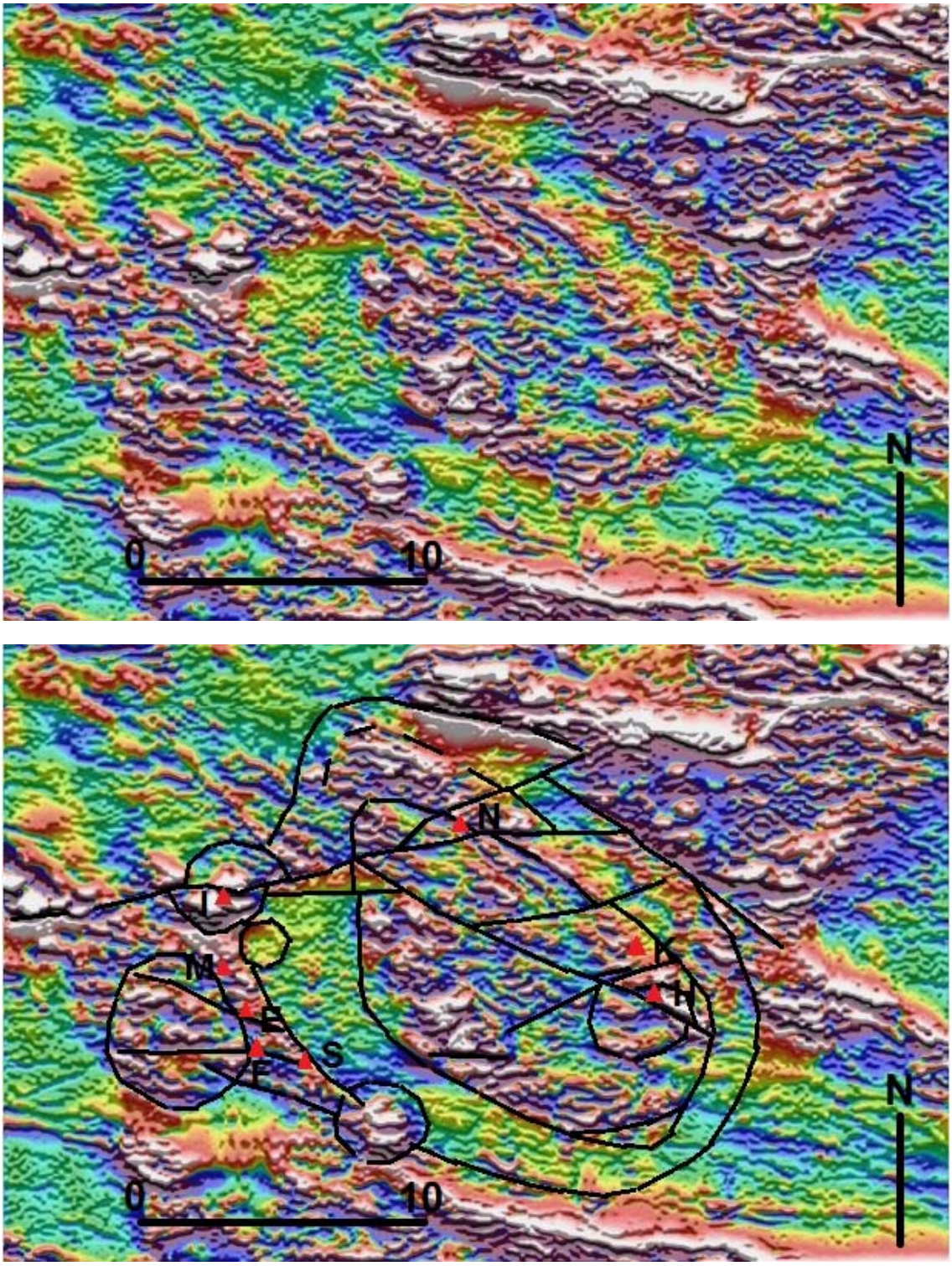

Figure 6: HGL Aeromagnetics. Total Magnetic Intensity - 1st Vertical Derivative_NagcNL.
Iku (I), Mountain Gate (M), Eserebe (E), Foya (F), Skirasia (S), Nena (N), Koki (K) & Horse–Ivaal (H-I).

GOOGLE EARTH - LANDSAT IMAGERY INTERPRETATION

Examination of Landsat imagery revealed a swarm of circular to elliptical structures. As these have not been compared to geological mapping apart from that shown in published literature, the origin of these structures is unknown but may relate to collapse structures above intrusives, surface exposed intrusive bodies and/or diatreme breccias.

Figure 7: Vertical view of Google Landsat imagery showing inner elliptical collapse structure with dimensions 8km x 12km, and numerous subsidiary smaller arcuate to circular structures. Iku (I), Mountain Gate (M), Eserebe (E), Foya (F), Skirasia (S), Nena (N), Koki (K) and Horse–Ivaal (H-I).

2013 AIRBORNE VTEM & ZTEM SURVEY TARGETS

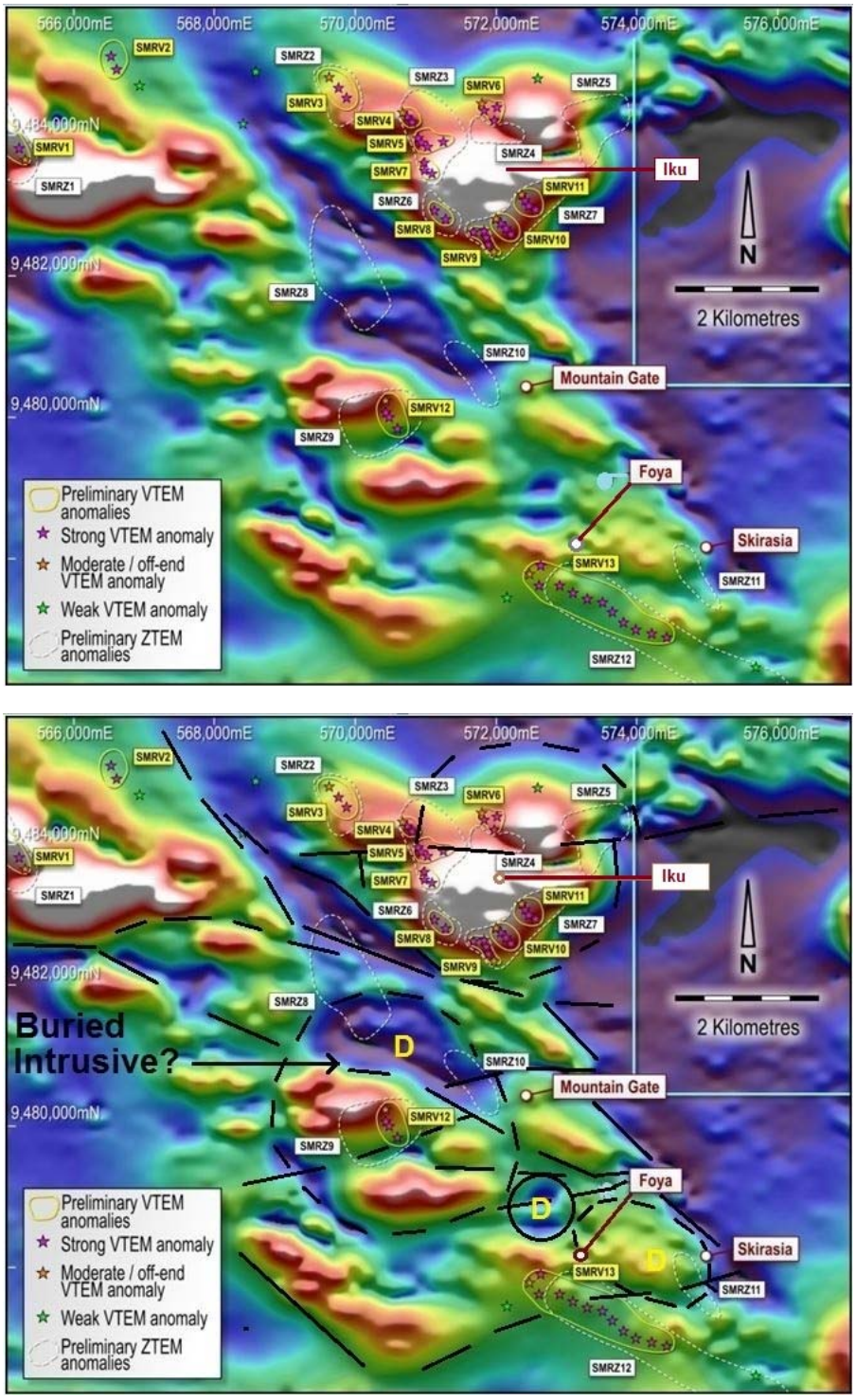

Figure 8: Preliminary VTEM anomalies in the South May River area superimposed on Total Magnetic Intensity image. Note ring of VTEM anomalies around strongly magnetic Iku intrusive, and low magnetic response from advanced argillic altered diatremes (D) and elliptical ring over buried (?) intrusive.

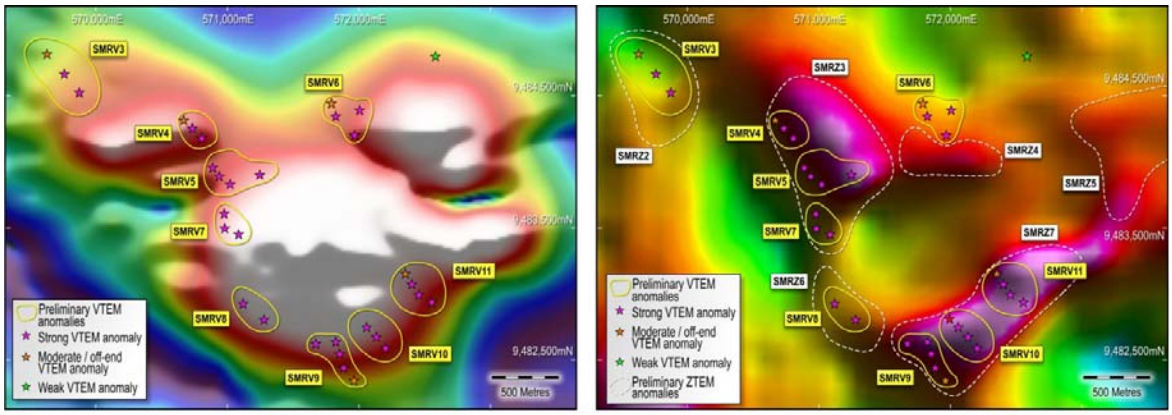

Figure 9: Left image of Iku shows the annular ring of VTEM anomalies superimposed on a regional magnetic TMI image, where the TMI high represented the central intrusive plug. Right image shows the same anomalies relative to the annular resistivity low derived from the ZTEM data, suggesting a concentration of conductive sulphides around the intrusive rim.

CONCLUSIONS AND RECOMMENDATIONS

The area contains a swarm of circular to elliptical structures on a scale ranging from 1km to 20km diameter / long axis which should be investigated further. My interpretation is that some of them relate to regional caldera collapse structures and that the smaller structures may relate to collapses above porphyry intrusive bodies, exposed intrusive borders or diatreme breccia bodies. The Horse – Ivaal to Nena trend coincides with the NE rim of the inner elliptical structure, while the Iku to Skirasia trend coincides with the SW rim of the outer elliptical structure

It is interesting that a number of these structures relate to the Frieda River project area and do not appear to have been noticed before as they do not feature in any published structural geology documentation. I recommend that some of the more relevant structures be checked in the field, and that I seek computer specialist assistance to open and examine the whole Mincor GIS database.

I recommend that high priority should be given to reconnaissance of the rim of the Iku intrusive plug in the areas of VTEM anomalies, coinciding with the annular ZTEM derived low resistivity zone.

Further field examination is required to establish the relationship of encouraging drillhole intersections at Foya and Skirasia to the diatreme edge. It seems from the geology compilation that many of the best intersections are actually within the boundaries of the diatremes, whereas it might be expected that the optimal mineralized area would be the periphery.