V12 Anomaly – Radiometric Reconnaissance, D3 Prospect, EPM 14827

Walter Herrmann
Mega Georgetown Ltd,
14th August 2007

Walter Herrmann Geoscience P/L
wherrmann@iprimus.com.au

Summary

The V12 area encompasses several small low order radiometric anomalies of up to twice background radioactivity, apparently related to a variety of lithofacies in Proterozoic-Palaeozoic granitoid basement rocks, and the overlying Gilberton Formation sandstones. Although the Gilberton lithofacies, and possible basement linear 'crack' structures in this area are empirically similar to the Maureen setting, the apparent structural complexity imposed by more intense deformation, and lack of stand-out radiometric or geologic targets, combine to give it only moderate prospectivity diminished by moderate to low findability. It can't be written off as non-prospective, but it's difficult to confidently formulate a program for the next stage of exploration.

Introduction

The V12 prospect centres on a string of three airborne uranium-channel radiometric anomalies straddling the northwest trending boundary between Mount Turner and Prestwood Stations, about a kilometre east of the old ESSO D3 prospect (Herrmann, 2007). It lies mostly in EPM 14827, close to the boundary of EPM 15294 (Figure 5).

The semi-connected anomalies are distributed along a northwest trend, over about 800 m strike. They have moderate intensities in the uranium and thorium channels (Figure 1 & Figure 2), and hence only moderately favourable U/Th ratios (Figure 4). A brief reconnaissance last year indicated the presence of favourable Gilberton Formation lithofacies and 'windows' of granitoid basement.

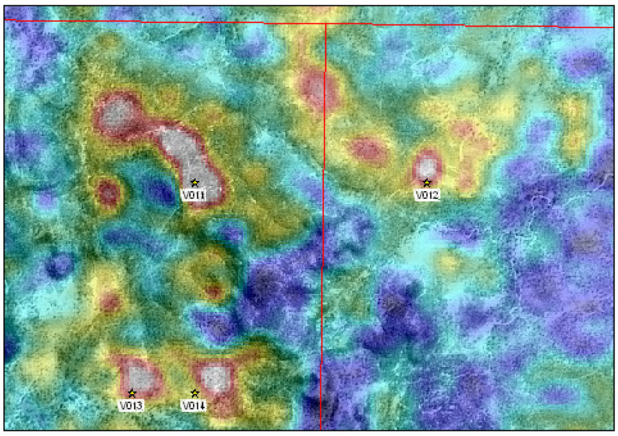

Figure 1 Coloured image of U-channel airborne radiometric data, superimposed on greyscale SPOT satellite image.

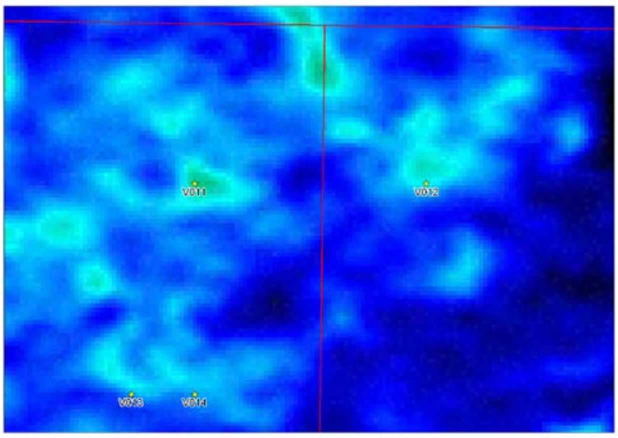

Figure 2 Coloured image of Th-channel airborne radiometric data.

Access

This area is best accessed by 4 wheel drive vehicle from the Prestwood Station side, via the track to Top Darcy Dam, and then eastwards across the D3-V11 prospect area to a rough old graded track that runs along the boundary fence.

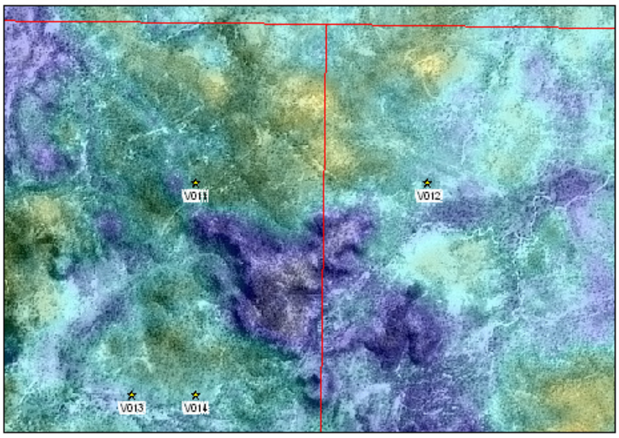

Figure 3 Coloured image of K-channel airborne radiometric data, superimposed on greyscale SPOT satellite image.

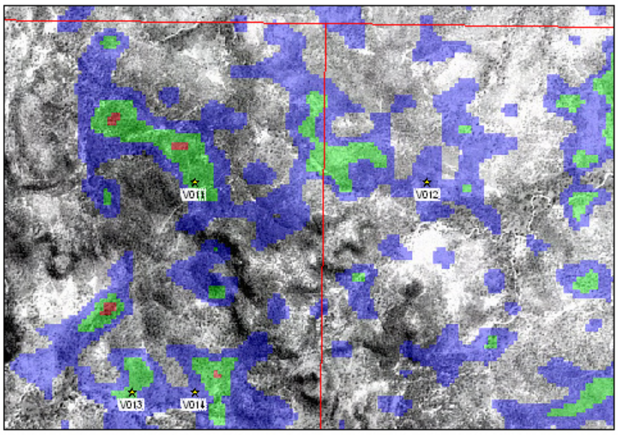

Figure 4 Coloured image of U/Th ratio data in airborne radiometric data, superimposed on greyscale SPOT satellite image.

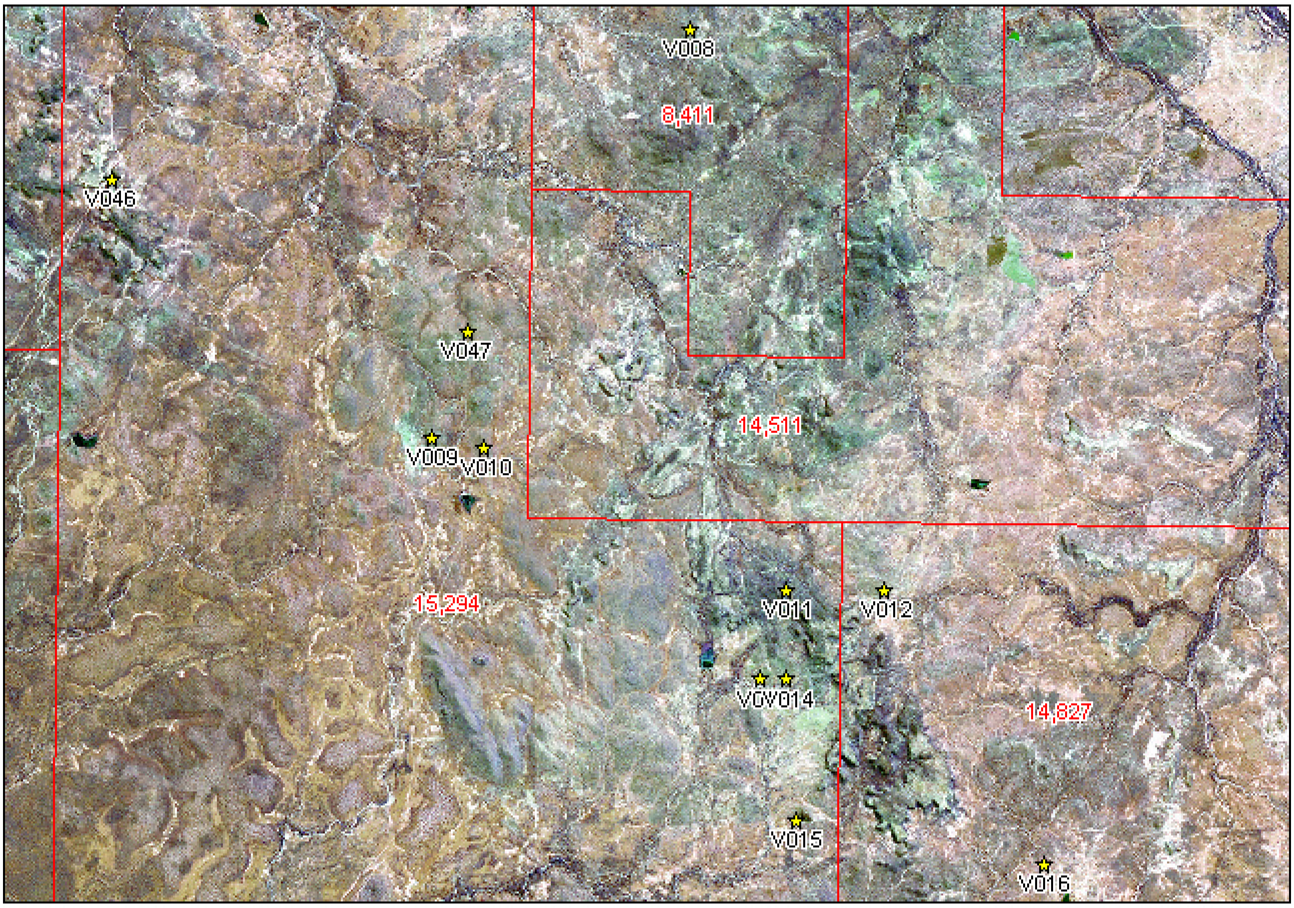

Figure 5 EPM and anomaly location diagram superimposed on SPOT satellite image.

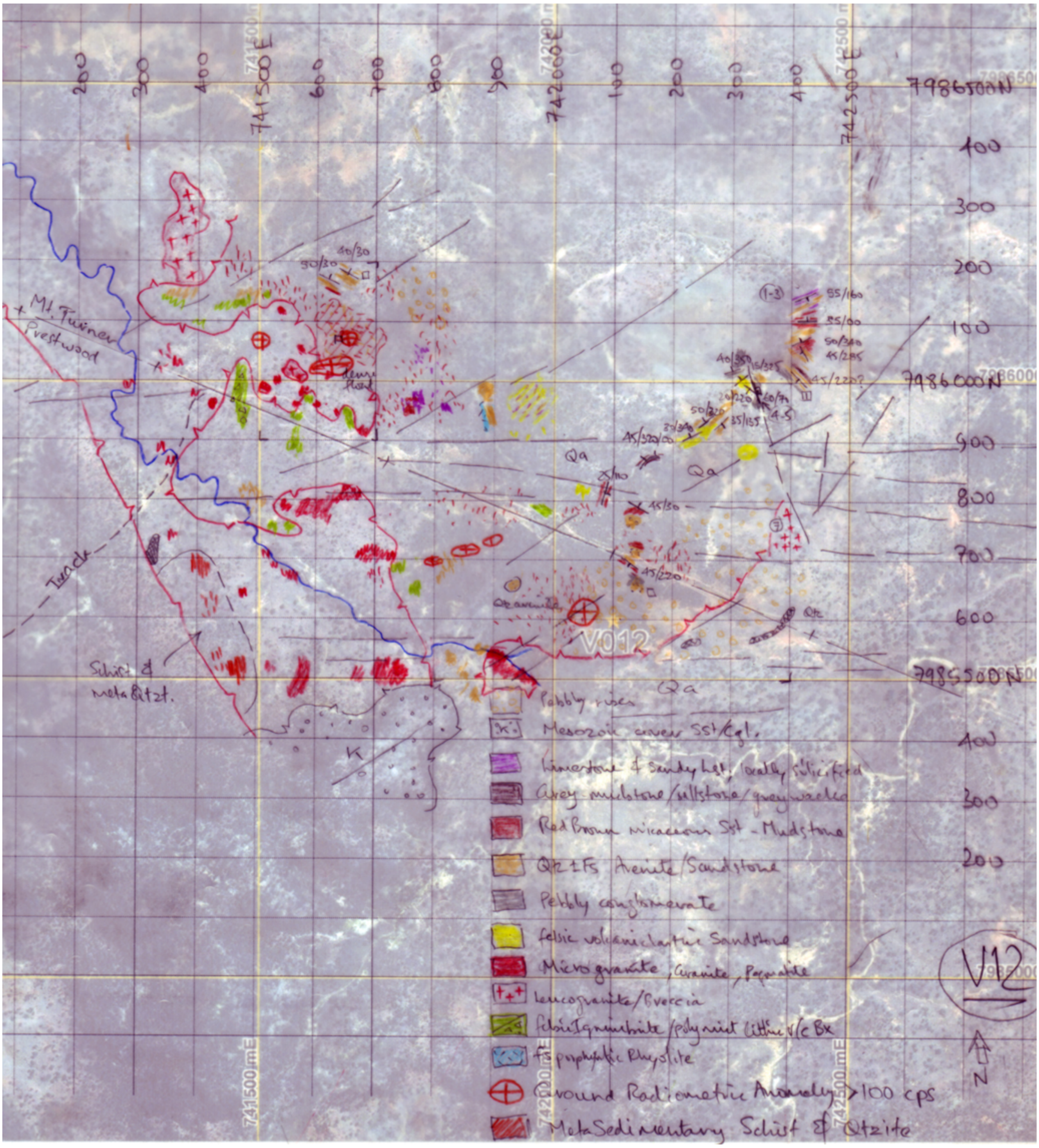

Figure 6 Geological sketch map of V12 area; scan of 1:10,000 translucent overlay on IKONOS satellite image.

Previous Exploration

None known

Geological Observations

Geologic exposure is generally poor in the relatively flat and low-lying V12 area; it's mostly restricted to small outcrops along gullies and on low rises or scattered floaters. Much of the landscape is covered by either alluvium or cobbly-pebbly unconsolidated gravels, which appear to represent erosion resistant rounded clasts weathered directly out of the pebbly conglomerate facies of the Gilberton Formation (Figure 7).

Massive granite, pink microgranite, leuco-granite breccia (Figure 8), and minor pegmatite dominate the basement rocks exposed on the western, southern and eastern fringes of the V12 area. The 1:100,000 QLD Geological Survey mapping classifies this as part of the Brandy Hot Granodiorite, of possible Silurian age. There are at least two or three granitoid textural and compositional types, and I suspect that the massive granite and pegmatite types may be Proterozoic - part of the Forsayth batholith. This notion is supported by scattered outcrops of white quartz veins, and a couple of hectares of schist and meta-quartzite around 741400E 7985600N, which are quite typical of the Proterozoic Lane Creek Formation. The boundary between the basement rocks and adjacent Gilberton Formation clastic succession is convoluted, at least partly controlled by palaeo-topography on the basement surface.

Sparse outcrops through the central and eastern sectors of the area mapped reveal a complex assemblage of typical Gilberton Formation lithologies including pebbly conglomerate (Figure 9), arenaceous quartzose to arkosic sandstone (Figure 10), limestone and impure volcaniclastic-sandy limestone (Figure 11), red-brown micaceous sandstone-wacke mudstone and grey mudstone-wacke (Figure 12), fine-grained felsic volcaniclastic sandstone-siltstone, and polymictic volcano-lithic felsic breccia-ignimbrite (Figure 13 and Figure 14). All except the last (polymictic breccia-ignimbrite) appear to be interbedded and complexly folded, with dips varying between 15° and 60°, to virtually all points of the compass.

The polymictic volcano-lithic felsic breccia-ignimbrite is distributed along the western flank of the airborne anomaly zone, generally close to Proterozoic basement granitoid outcrops, evidently resting directly unconformably on the basement, and representing the basal unit in the Palaeozoic (Gilberton) sequence here. QLD Geological Survey maps refer to it as the ‘Huonfels Rhyolite member’. This is further evidence that the Gilberton Formation clastic deposition and felsic volcanism were essentially contemporaneous – not separated by a significant time interval, or following each other in strict succession (see also: Herrmann, 2006).

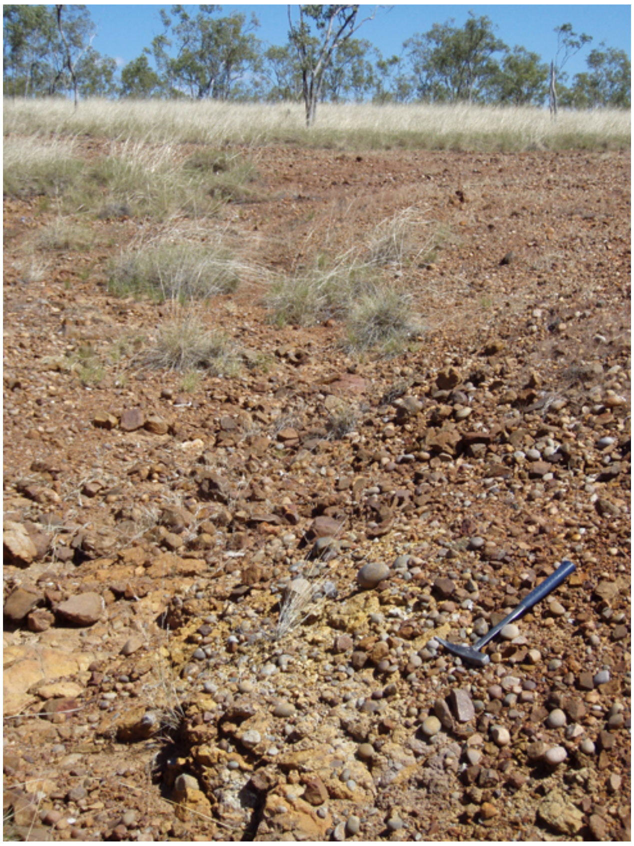

Figure 7 Typical degree of low-outcrop exposure at V12 area. The non-consolidated pebbly-cobbly gravel on the surface seems to be derived directly from rounded clasts weathered out of the underlying conglomerate exposed in the lower part of the frame.

Figure 8 Brecciated leucogranite at 742550E 7986000N. This centimetres-decimetre scale, monomict, angular breccia fabric is typical of many of the basement granitoid outcrops in the central-northwestern part of the V12 area; I’m

Figure 9 Pebbly conglomeratic quartz sandstone, 742420E 7986000N.

Figure 10 Quartz arenite facies of the Gilberton Formation at V12; note the relatively steep dip of ~50°.

Figure 12 Red-brown (hematitic) sandstone-wacke facies of the Gilberton Formation in northeastern sector at V12 anomaly.

Figure 11 Thinly-bedded, partly silicified limestone facies of Gilberton Formation, 742420E 7986150N.

Figure 13 Weathered surface of polymictic, pumiceous, volcano-lithic, felsic volcaniclastic breccia/ignimbrite typical of the basal unit of the late-Palaeozoic clastic sequence (Gilberton Formation?) that lies directly on granitoid basement rocks at V12.

Figure 14 View of the (poorly exposed) late-Palaeozoic unconformity at 741740E 7985700N. Prominent residual patches of polymictic, pumiceous, volcano-lithic, felsic volcaniclastic breccia/ignimbrite (in upper frame) cap the low outcrops of granitoid basement (at hammer, in the foreground).

Radiometrics

Ground scintillometer data from the V12 area shows it has a typical background radioactivity of around 70 cps with a discontinuous string of small anomalous zones of over 100 cps, peaking at about 130 cps (Figure 15). The anomalies are small, generally less than 50 m diameter, and peaking at roughly 2 times background radioactivity. The perspective view of the wire-frame radiometric model (Figure 16) displays a spiky-hummocky character, with no outstanding high magnitude anomalies.

These low-order anomalies are distributed along a northwest trend proximal to the granitoid contact; generally within about 100 metres either side of the contact, on areas of granitoid outcrops as well as areas of Gilberton Formation surface float (Figure 6).

Discussion and Conclusions

The V12 radiometric character is unspectacular. I suspect the complex pattern is merely due to the complex array of lithofacies, further complicated by variable degrees of soil, colluvium and alluvium cover. Most of the small anomaly peaks are on areas of Gilberton Formation surface float, dominantly of the medium-fine grained red-brown to olive-brown muddy sandstone-wacke facies, which we know from elsewhere to be slightly more radioactive than the typical arenaceous facies (e.g. the V11, V19-20, V22-24 and Tabletop anomalies). Their low magnitudes do not suggest the presence of any discrete, near surface, uranium-mineralized zones.

On the other hand, the Gilberton Formation lithofacies represented at V12 are quite comparable to those in the Maureen area. The area is also transected by a number of subtle photo-linear structural features, dominantly with north-east and east-west trends, which may be similar to the basement ‘crack’ structures that appear to have focused mineralization at Maureen. To the contrary, the V12 basement rocks are dominantly granitoids, which differ from the mainly meta-sedimentary gneiss and amphibolite basement rocks at Maureen. Finally, the V12 Gilberton Formation bedded rocks are clearly quite deformed, with frequent strike changes, dip reversals, and relatively steep dips between 25° and 55°, which differ from the gentle dips of generally less than 20° in the host units at Maureen.

The relative importances of these criteria are still not fully understood but, on a strictly empirical basis, I regard the V12 area as having moderate unconformity-related uranium potential. Its deposit-findability factor is probably moderate to low, according to the probably shallow depth to basement under much of the area (?), but mitigated by the apparent structural complexity.

It has, like many of the other radiometric prospects in the Georgetown area, many of the right model parameters, but lacks obvious stand-out radiometric, or geologic-conceptual, targets. The same conclusion applies to the considerable area of poorly exposed Gilberton Formation to the north of V12. It would be interesting to core a ‘stratigraphic’ drill hole somewhere in this area – simply for comparative stratigraphic-lithofacies information on the full sequence - but even that would be difficult to site confidently, because of the probable structural complexity.

References

Herrmann, W., 2006, Maureen Prospect host-rock lithofacies: Georgetown, MegaGeorgetown P/L, p. 5.

Herrmann, W., 2007, V11 Radiometric Anomaly – Reconnaissance – D3 Prospect, EPM 15294: Mega Georgetown Ltd, , p. 6.

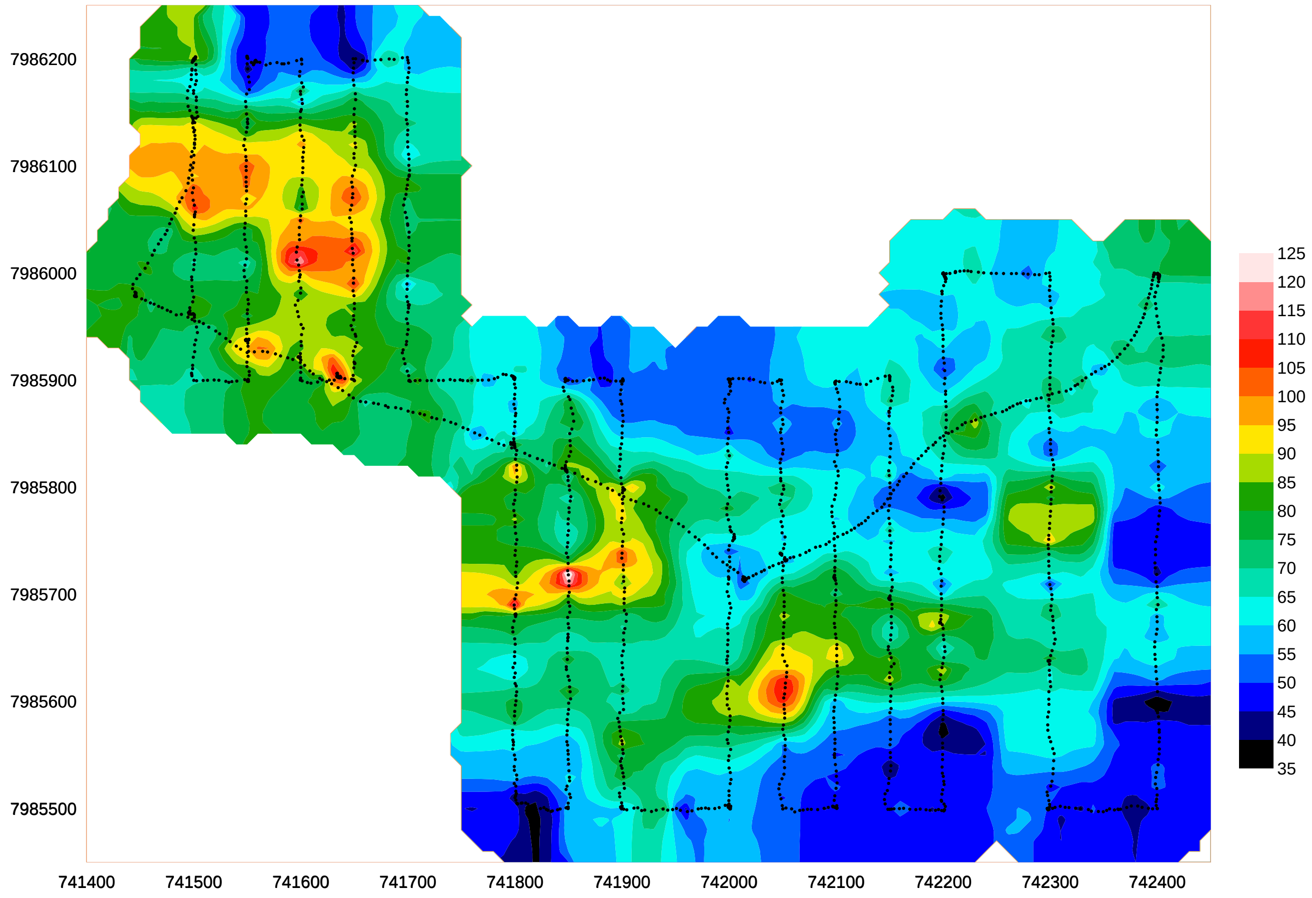

Figure 15 Colour contoured map of ground radiometric (Gamma Surveyor) dose rate data over the V12 airborne anomalies.

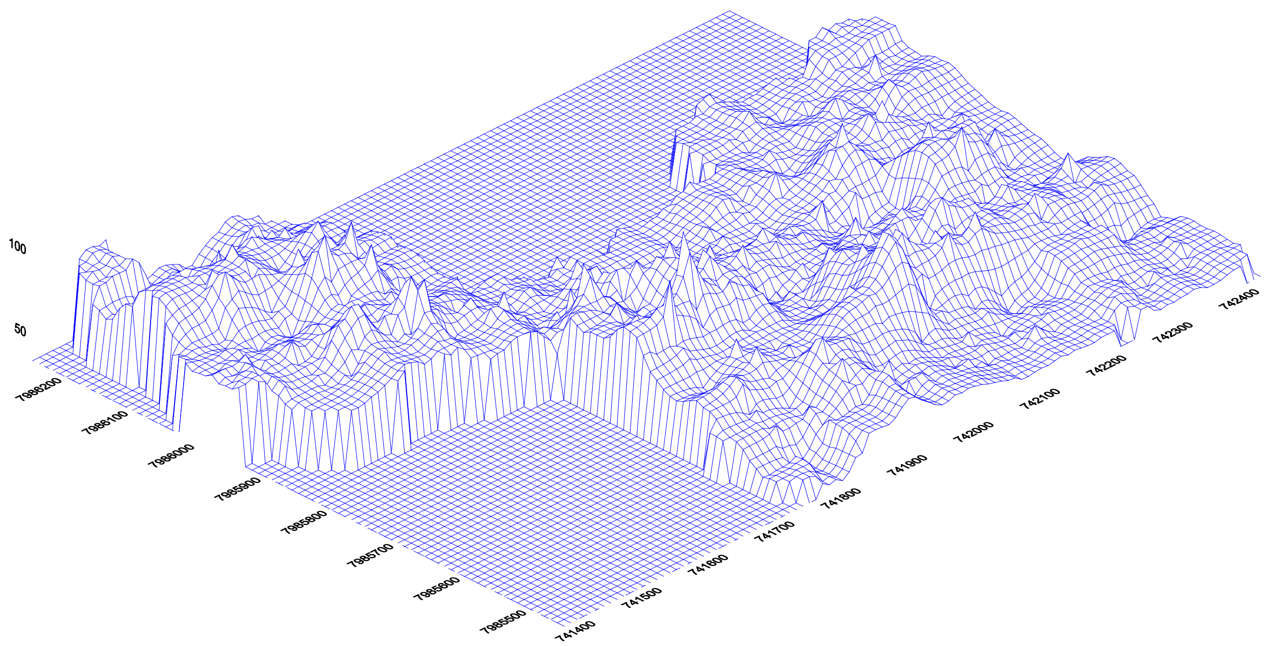

Figure 16 Wire frame model of ground radiometric data over the V12 area; viewed from the southwest.