Report to the Department of Regional Development, Primary Industry, Fisheries and Resources on:

RC/Diamond Drilling of the M1 Magnetic Anomaly, Marqua Project (SEL24769)
Uramet Minerals Limited and NTGS Collaborative Drilling Program

Date: September 2009
Author: Paul Penna
Map Sheets: 1:250,000 Tobermory
           1:100,000 Marqua
Map datum: GDA 94, Zone 53
EXECUTIVE SUMMARY

The Marqua area has previously been targeted by other companies for base metal and diamond exploration, and more recently by Uramet Minerals Limited (Uramet) for phosphate (as well as base metals).

Because of the contrasting oxidised and reduced sedimentary rock packages present in the Marqua project area together with the presence of major fault systems that could act as feeders for hydrothermal fluids, it is considered that the area is prospective for shale-hosted Kupferschiefer style base metal mineralisation within both the Neoproterozoic and Cambrian strata.

The M1 anomaly was originally detected from regional aeromagnetic data, subsequently better defined by ground magnetics conducted by Elkedra. The ground gravity survey, and a subsequent detailed ground gravity over the anomaly indicated that it was likely to be a granitic intrusion.

Uramet’s target therefore was base metal, gold, and silver mineralisation associated with a granitic plug. It was considered that the granite may have acted as a heat source, possibly re-mobilising and concentrating base and precious metals at the margin of the intrusive.

Modelling of the magnetic data indicated that the plug was approximately 600 metres long and approximately 500 metres in diameter, with the top of the plug likely to be at a depth of around 200 to 250m below surface.

As part of the DRDPIFR Geophysics and Drilling Collaborations program, Uramet was awarded 50% of the direct drilling costs (up to $31,950) of drill testing the M1 magnetic anomaly.

Drill testing of the M1 anomaly comprised 240 metres of RC pre-collar, followed by 24 metres of diamond drilling. The drilling confirmed that the anomaly was a granitic plug, but analysis using a portable Niton XRF analyser revealed that the drilling failed to encounter any significant base metal mineralisation. Ten samples covering the granite-sediment contact were also analysed by a Perth laboratory for Au, Ag, Cu, Pb, and Zn. The laboratory analysis revealed no significant gold or base metal values.

Uramet does not intend to do any further work on the M1 Anomaly.
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1 INTRODUCTION

The M1 anomaly occurs within SEL 24769, being part of Uramet’s Marqua Project (Figure 1).

As part of the DRDPIFR Geophysics and Drilling Collaborations program, Uramet was awarded 50% of the direct drilling costs (up to $31,950) of drill testing the M1 magnetic anomaly.

This report details the work carried out by Uramet in relation to the identification and drill testing of the M1 anomaly.

Figure 1. Plan showing the Georgina Basin, with major roads and other infrastructure surrounding the project area
2 SITE ATTRIBUTES

2.1 Location

The Marqua project area is located approximately 550 km east of Alice Springs, NT, directly southeast of Marqua Station Homestead with good road access 40 km off the Plenty Highway (Figure 1) and a network of established minor roads and station tracks.

The project area lies within the Tobermory and Hay River 1:250,000 map sheets (and Hay River-Mount Whelan Special Sheet).

2.2 Climate

The Marqua area is part of the Central Australian Desert climate zone with variable wet season from November to March.

The closest meteorological station (recording both temperature and rainfall) is at Jervois 150 km west and Urundangi 170 km northeast.

The climate of the project area can be loosely divided into a dry season generally from April to October, and a wet season from November to March. Unseasonal rain can however occur at any time. Maximum daily temperatures exceed 35 between October and April. The normal exploration field season runs from April to October.

Statistic for monthly and annual temperature and rainfall for Jervois (collected between 1967 and 2008) are given below in Table 1.

| TABLE 1. MEAN MONTHLY TEMPERATURE RANGES AND RAINFALL FOR JERVOIS |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                 | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual |
| Mean Temp Max   | 38.5 | 36.9 | 34.7 | 30.5 | 25.4 | 22.0 | 22.0 | 25.0 | 29.8 | 33.3 | 36.0 | 37.8 | 31.0   |
| Mean Temp Min   | 22.6 | 22   | 19.2 | 14.2 | 1.9  | 6.4  | 5.1  | 7    | 11.2 | 15.5 | 18.7 | 21.2 | 14.4   |
| Mean Rainfall   | 48.8 | 56.4 | 29.9 | 17.5 | 19.2 | 11.5 | 12.6 | 8.2  | 5.9  | 15.9 | 22.6 | 38.4 | 286.2  |
| Mean No of Days of rainfall > 1mm | 4.2 | 3.9 | 2.3 | 1.5 | 2 | 1.2 | 1.2 | 1 | 2.8 | 2.9 | 3.5 | 27.5 |

Source: Bureau of Meteorology, Climate Statistics for Australian Locations, Jervois (1 Dec 1967 to 30 Jun 2008)

Prevailing wind direction is from the southeast, with strong gusty winds not uncommon.

2.3 Environment

The project area falls within the Marqua Station, the primary land use being cattle grazing. Marqua Station owner is Charlie Chalmers, based at Mount Swan Station located approximately 350 km west of Marqua. His son, Malcolm Chalmers is based at Marqua Station.

A number of sacred sites occur within the project area and Uramet has always ensured that its exploration activities do not interfere with any sacred sites.
2.4 Infrastructure

Access from Alice Springs is via the sealed Stuart Highway (Figure 1), then east along the Plenty Highway (sealed from the Stuart Highway turn off to approximately 30 km east of the Gemtree Caravan Park, then gravel highway) until the Marqua Station turn off, then 40 km via good maintained station tracks to Marqua Station (Figure 2). Access within the project area is along well connected station tracks, which are may be degraded to bull dust cover and washed out by flash floods in certain locations.

![Location plan showing the Marqua Project tenement SEL 24769](image)

3 TENURE

The M1 anomaly occurs within SEL 24769. The tenement was originally held by Elkedra, with title being transferred to Uramet in 2007. Elkedra retains the rights to diamonds occurring within the tenement. The tenement currently comprises 123 sub-blocks, being 389 km² in area.

4 GEOLOGY

4.1 Regional Geology

The project area is part of the southern Georgina Basin (Figures 3 and 4), comprising Neoproterozoic to Cambro-Ordovician platform cover of sedimentary rocks (dominantly sandstone, shale, limestone, dolostone) overlying the Precambrian basement of the Northern Australian Craton. This Precambrian basement is exposed along major fault systems on the southern margin of the basin.
The Northern Territory Geological Survey (NTGS) has recognised the mineral potential of the southern Georgina Basin and recently prepared a comprehensive review of both government and private exploration undertaken, and has now developed from various authoritative sources applicable ore genesis models (Dunster et al., 2007).

Since the 1960’s, the basin has been considered prospective mainly for Mississippi Valley Type (MVT) lead-zinc mineralisation. More recently, however, the potential for other commodities in a variety of geological settings has been investigated, and the basin is now regarded as having potential for several styles of base-metal mineralisation.

The area is also considered to have potential for Cambrian limestone hosted phosphate. Prospective units within the Georgina Basin include the Middle Cambrian Beetle Creek Formation of the eastern basin, its stratigraphic equivalent in the south, the Arthur Creek Formation, and the underlying Thorntonia Limestone which is recognised basin-wide. Prospective ground for phosphate rock within these Middle Cambrian units occurs along the basin margins and adjacent to basement highs within the basin interior.

### 4.2 Local Geology

The Marqua project area is located in the structurally complex south-eastern portion of the Georgina Basin, which is comprised of basement granitoids, Neoproterozoic tillites and arkosic sedimentary rocks, overlain by Cambrian and Cambro-Ordovician limestone, dolostone, shale and clastic sedimentary rocks of the Toko Syncline. These units have been disrupted by multiple folding and faulting events. Faulting in the project area generally trends northwest and individual faults have been locally offset by later northeast trending faults.
Part of the regionally significant Toomba Fault Zone lies in the eastern tenement (Toko) and segregates a structurally complex zone dominated by arkosic sediments to the southwest from limestone, dolostone and sandstone of the Toko Syncline to the north. The Toomba Fault Zone is a reverse fault which dips ~45° towards the southwest and lies in close proximity to a number of parallel folds and faults including the Field River Anticline (Figure 4). A northwest trending fault zone in the Christmas Dam area represents a structural divide between gently north dipping sedimentary rocks to the west and vertical dipping sediments to the east (Figure 4).

![Figure 4. Geological map (Geoscience Australia, Hay River-Mt Whelan Special Map 1:250 000)](image)

The Neoproterozoic Yardida Tillite, which comprises diamictite, siltstone, sandstone, and arkose, is exposed within the Field River Anticline core and the younger Black Stump arkose crops out further to the east.

Desert Syncline, towards the south of the Field River Anticline comprises a repetition of rock units found in the anticline. Sandstones of the latest Neoproterozoic Grant Bluff Formation and the early Cambrian Red Heart Dolostone are present within the core of the Desert Syncline. Desert Syncline is bound to the north and south by two significant curvilinear fault zones: the Adam Fault Zone in the north and the Gnallan-A-Gea Fault Zone in the south. Basement granitoids of the Mt Dobbie complex are exposed in the southwest part of the tenement.
Younger rock units that typically form hill capping plateaus and mesas include the Tertiary Austral Downs limestone, a partly silicified lacustrine limestone underlain by a lateritic palaeosol, and Cretaceous clastic sedimentary rocks. The Cretaceous beds are commonly associated with zones of silicification both within beds and penetrating the underlying Cambro-Ordovician strata. The prospective Cambrian Thorntonia Limestone is sparsely outcropping along an E-W trend and terminates against the Toomba Fault.

Uramet’s Marqua project area contains previously reported lead-zinc and copper mineralisation at the Boat Hill and Christmas Dam prospects as well as a number of unnamed occurrences in the western part of the Toomba Fault Zone and within the core of the Field River Anticline.

Ferruginous hydrothermal base metal mineralisation occurs within sheared granites at Christmas Dam, 2 km southwest of the Boat Hill base metal prospect, and at Mt Dobbie in the southern portion of the Marqua project area. Rock chip sampling by Elkedra in 2005 reported assays of up to 32 ppm U, 1.2% Cu, 9.6% Pb, 0.5% Zn and 35 g/t Ag at Christmas Dam and 83 ppm U and 1.34% Cu at Mt Dobbie.

The Boat Hill lead-zinc deposit is the best understood prospect within the project area. At Boat Hill, the lead-zinc mineralisation is hosted within the middle and early Cambrian Thorntonia Limestone and Red Heart Dolostone. Based on petrographic, isotopic and geochemical studies the Boat Hill prospect shows similarities with both Irish-style and MVT deposits (Dunster et al., 2007).

4.3 Geomorphology

Landforms within the Marqua area include the Simpson Desert distinguished by linear, spinifex covered dunes to the south, a mesa mulga and gidgee tree covered landscape in the centre, the Toko Ranges with barren nodule-paved plains to the east and a gently carbonate platform to the north (Figure 5). Locally basement rocks may form ridges or be deeply incised by rivers – the Marqua River and Hay River – both difficult to cross.

The vegetation ranges from savannah woodland near the creeks, to gidgee and acacia scrub to annual grasslands to rock and sand desert. The vegetation is consistent with a semi-arid to arid regime.
4.4 Geological Model

Results from an Elkedra ground magnetic survey conducted in 2005 delineated a discrete magnetic anomaly located approximately 15 km south-west of the Marqua Homestead, named the M1 anomaly (Figure 6).
Because of the contrasting oxidised and reduced sedimentary rock packages present in the Marqua project area together with the presence of major fault systems that could act as feeders for hydrothermal fluids, it is considered that the area is prospective for shale-hosted Kupferschiefer style base metal mineralisation within both the Neoproterozoic and Cambrian strata (Figure 7).

Figure 7. Kupferschiefer model for the Marqua project area

Little previous attention has been directed at the mineralization potential of the Proterozoic basement although the NTGS has recognised its IOCG potential. However just prior to the drilling program Uramet undertook a detailed ground gravity survey over the M1 anomaly. The gravity data indicated that the magnetic anomaly was in fact a gravity low, therefore making it unlikely to be an IOCG occurrence.

Uramet’s target therefore was base metal, gold, and silver mineralisation associated with what was interpreted from ground magnetics as being a discrete intrusive, likely to be a late stage granitic plug. It was considered that the granite may have acted as a heat source, possibly re-mobilising and concentrating base and precious metals at the margin of the intrusive.

Modelling of the magnetic data indicated that the plug was approximately 600 metres long and approximately 500 metres in diameter, with the top of the plug likely to be at a depth of around 200 to 250m below surface.

5 PREVIOUS WORK

The Marqua project area has been subject to lead-zinc exploration for over 30 years. Mapping of the Marqua area (Tobermory map sheet) was carried out by BMR 1959-1960 and subsequent re-mapping was done throughout the 1970’s and 1980’s. Exploration for base metals during that time was mainly focusing on rock chip and stream sampling. During 1977-1978 and 1983 BMR drilled four cored stratigraphic holes in the area. Anomalous zinc levels were found in these holes (BMR1979/36).

Subsequently Agip showed interest in base metal exploration in 1981 covering the tenement area (CR19830328). Reconnaissance mapping and rock chip sampling demonstrated that base metals are anomalous within the Late Proterozoic Wonnadinna Dolostone and Thorntonia Limestone. Sixteen holes were drilled during 1982 to test the zinc anomalies over a strike length of 8 km.
Saracen Minerals drilled nineteen percussion holes in 1988 (CR19880057) with the aim of detecting possible platinum-group element mineralisation. No platinum group elements were detected.

MIM explored the area in the early 1990’s to test for Pb, Zn and Carlin-style Au and Pt (CR19920506). Re-assays of Saracen Minerals percussion drill holes and ten additional drill holes within the prospective units concluded that mineralisation is structurally controlled.

In conjunction with regional re-mapping of the Tobermorey map sheet, NTGS drilled cored stratigraphic hole NTGS99/1 within the current tenement area.

The NTGS re-evaluated the area as part of the southern Georgina Basin Geology and Resource Potential Report in 2007 and concluded that the Marqua area remains prospective for base metals since the lithostratigraphy of the area was not fully understood until recently (Dunster et al., 2007).

6  URAMET/NTGS COLLABORATIVE RC/DIAMOND DRILLING PROGRAM

As part of the DRDPIFR Geophysics and Drilling Collaborations program, Uramet was awarded 50% of the direct drilling costs (up to $31,950) of drill testing the M1 magnetic anomaly.

6.1 Targeting

The M1 anomaly was initially identified from government aeromagnetic data, with more detail delivered by a follow up ground magnetic survey undertaken by Elkedra. Further modelling and interpretation of this data was conducted by consulting geophysicist Keith Jones. A number of models fitted the data, however a vertical cylinder model (Figure 8) seemed to fit the data best.

![Figure 8. Vertical cylinder model of the M1 anomaly](image-url)
6.2 Drilling

During June 2009, hole QDD01 was drilled to test the M1 magnetic anomaly, consisting of a 239.7m RC pre-collar, followed by a 22.7m NQ diamond tail, for a total hole depth of 264.4m. The hole was positioned to the south west of the anomaly and drilled at -60 degrees (the hole angle subsequently dropped to -74 degrees) towards 045 degrees, targeting the contact between the older sediments and the granite plug.

A UDR multi-purpose RC and diamond drilling rig mounted on a Man 8x8 wheel drive truck, owned and operated by United Drilling Services, was used to undertake the drilling (Figure 9). The rig carried a 350/900 Sullair compressor, and was supported by a 6x4 wheel drive Volvo water, fuel and rod truck, and a 4x4 wheel drive Toyota Landcruiser utility.

Drilling was conducted in a competent and efficient manner, with good sample recovery from the RC drilling, and relatively little core loss from the diamond drilling.

A mini excavator was hired from Top End Hire to dig twin sumps for the diamond drilling. The sumps were back filled at the end of the program.

Drilling intersected a sequence dominated by arkose, interbedded with shales and sandstone. Siltstones veined with granite occur adjacent to the granite contact.

It was planned to intersect the sediment-granite contact with diamond coring, unfortunately the contact was intersected in the RC pre-collar rather than in the diamond tail. This is partly due to the granite likely being slightly wider than expected, and partly due to the hole dropping significantly from -60 degrees at the surface, to -74 degrees near the end of the hole.
The diamond coring showed the granite to contain minor fine disseminated pyrite, particularly nearer to the contact, however no base metal sulphides were noted. Numerous xenoliths occur throughout the granite.

A graphic log displaying geology and assays is included as Appendix 2.

6.3 Sampling

Drill samples were collected from the rig via a cyclone in one metre intervals, and were laid on the ground in rows of 20. Samples were geologically logged, and preliminary analyses of most of the RC samples were undertaken in the field using a Niton portable XRF analyser. A number of Niton readings were also taken of the core, Niton readings were taken every ten centimetres in the upper part of the core where fine disseminated pyrite was noted.

A total of ten samples covering the granite-sedimentary host rock cover were selected for laboratory analysis. Samples selected for laboratory analysis were “speared” using a PVC tube, with approximately 2kg of sample collected in calico bags.

6.4 Analyses

6.4.1 Niton Analysis

The portable Niton XRF analyser was used to determine a number of elements including copper, lead and zinc. No significant base metal values were encountered, with only weakly anomalous lead (up to 944 ppm Pb) and zinc (up to 1,734 ppm Zn). All Niton results are included in digital form in Appendix 1, with Cu, Pb, and Zn displayed alongside a lithological log of the hole in Appendix 2.

6.4.2 Laboratory Analysis

The ten samples selected for laboratory analysis were sent to UltraTrace Laboratory Services where they were assayed for Au, Ag, Cu, Pb, Zn using an Aqua Regia digest with an ICP-MS finish. No significant intercepts were obtained. Results are presented below in Table 2, and appended in digital form, with Cu, Pb, and Zn values are displayed alongside a lithological log of the hole in Appendix 2.

<table>
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<th>Sample</th>
<th>Au(AR)</th>
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<th>Cu</th>
<th>Pb</th>
<th>Zn</th>
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<td>ppm</td>
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<td>16</td>
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<td>5</td>
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6.5 Magnetic Susceptibility Readings

Magnetic susceptibility readings were taken over the 10m interval straddling the sediment-granite contact between 231 to 240 metres using a GMS-2 magnetic susceptibility metre. It was attempted to take measurements in the field, however highly spurious readings resulted. Measurements were subsequently taken from calico bagged samples containing approximately 2 kg of sample at the Perth office. Multiple measurements of each sample were taken. Results are presented in Table 3.

TABLE 3. HOLE QDD01 MAGNETIC SUSCEPTIBILITY READINGS IN OFFICE (10-5 SI UNITS)

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<th>Sample</th>
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<th>meas-2</th>
<th>meas-3</th>
<th>meas-4</th>
<th>meas-5</th>
<th>meas-6</th>
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</table>

While showing some variability the sediments (QDD1-231 to 236) generally show very low magnetic susceptibility values, with the granite (QDD1-237-240) generally showing considerably higher values. Samples QDD1-235 and QDD1-236 had 5 to 10% granitic veining, which may account for the relatively high magnetic susceptibility readings from QDD1-235.

The higher magnetic susceptibility readings from the granite would therefore explain the M1 magnetic anomaly.

7 CONCLUSIONS

The M1 anomaly was originally detected from regional aeromagnetic data, subsequently better defined by ground magnetics conducted by Elkedra. A ground gravity survey over the anomaly showed it to be a relative gravity low, indicating that this was likely to be a granitic intrusion.

Drill testing of the M1 anomaly by 240 metres of RC pre-collar, followed by 24 metres of diamond drilling confirmed that the anomaly was a granitic plug, but analysis using a portable Niton XRF analyser revealed that the drilling failed to encounter any significant base metal mineralisation. Ten samples covering the granite-sediment contact were also analysed by a Perth laboratory for Au, Ag, Cu, Pb, and Zn. The laboratory analysis revealed no significant gold or base metal values.
8 REFERENCES


Dunster JN, Kruse PD, Duffett ML and Ambrose GJ. 2007. Geology and resource potential of the southern Georgina Basin, Northern Territory, NTGS

Kruse PD, Brakel AT, Dunster JN and Duffett ML. 2002. Tobermory, Northern Territory (Second Edition), Sheet SF53-12, 1:250 000 Geological Map Series Explanatory Notes, NTGS


APPENDIX 1

Digital data (attached separately)
APPENDIX 2

Graphical log showing lithology and assay data