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# FINAL TECHNICAL REPORT

# EPM 18017 (COTSWOLD) QUEENSLAND

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**2014**

| | |
|---|---|
| 1:250 000 Map reference | SF 54-02 Cloncurry |
| 1:100 000 Map reference | 7057 Clonagh |
| Date of grant : | 23/12/2010 |
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# ABSTRACT

Exploration activities for Cu+Au IOCG-style mineralisation undertaken by Minotaur on tenement EPM 18017 (Cotswold) since the tenement was granted on 23rd December 2010 included dipole–dipole induced polarization surveys, ground EM surveys, regional and local detailed gravity surveys, ground magnetic surveys and diamond drilling of 2 holes at the Ballaghmore Prospect, 2 holes at Woolshed Waterhole Prospect and 3 holes at the Cotswold Prospect.

At the Ballaghmore Prospect, drilling revealed that targeted positive gravity anomaly and EM conductor were respectively due to a significant topographic high and abundant graphite rather than IOCG mineralisation.

At Woolshed Waterhole, magnetite +amphibole +pyrite +/-chalcopyrite IOCG-style alteration along with massive pyrrhotite-rich alteration are present in both drillholes. Major sulphide species are either pyrite (in association with magnetite) or pyrrhotite (magnetite low or absent) with only minor chalcopyrite. Best assay value was 0.4 m @ 1.44% Cu. Mineralisation appears to be structurally controlled along a NW-trending fault.

The Cotswold Prospect is characterised by twin-peak geophysical features with both peaks having coincident positive gravity and magnetic anomalies. The eastern peak has ~2 mgal gravity anomaly and 14,000 nT magnetic anomaly and was drill tested by holes MN12D28 and MN12D29. The western peak has a lower gravity amplitude of ~1.25 mgals and 8,000 nT magnetic anomaly and was drill tested by hole MN13D31.

Brecciation, alteration and mineralisation are best developed at the eastern and main geophysical anomalies (drill holes MN12D28 & MN12D29). Predominant lithologies are hydrothermally-brecciated felsic volcanics which have a matrix of magnetite, pyroxene and pyrite, consistent with an IOCG-style hydrothermal fluid. Pyrite is the main sulphide phase present. Combined with the presence of pyroxene (absence of amphibole and biotite) and lack of regional alteration, indications are that the hydrothermal alteration system was high temperature and relatively dry with there being minimal interaction and mixing with cooler meteoric-derived fluids. So though an IOCG-style breccia system is present at the Cotswold Prospect, discovery of economic copper mineralisation has been elusive.

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A *File Listing*

# 1 INTRODUCTION

This report summarises mineral exploration activities undertaken by Minotaur Operations (a wholly owned subsidiary of Minotaur Exploration) on tenement EPM 18017 (Cotswold) between the tenement being granted on 23rd December 2010 and conditional surrender on 10th March 2014.

The tenement is located ~55 km NNE of Cloncurry in the Proterozoic Mt Isa Inlier geological province of Northwest Queensland. Within the Eastern Succession (eastern portion of the inlier) are numerous world-class ore deposits including Ernest Henry Cu-Au, Cannington Ag-Pb-Zn, Tick Hill Au and the Selwyn area Cu-Au deposits. Several of the world's largest sediment-hosted base metal deposits occur in the western portion of the Mount Isa Inlier, including Mount Isa and Century.

Exploration is for copper and gold mineralization, either oxide-rich or sulphide-rich systems, in the region northwest of Ernest Henry Mine where basement units are not exposed due to overlying sequence of Mesozoic sediments being ~100 m thick.

# 2 LOCATION AND TENURE

Tenement EPM 18017, encompassing an area of ~90 $km^2$, occurs within the Cloncurry 1:250,000 topographic map sheet (#SF54-02) and on the Clonagh 1:100,000 sheet (#7057). The tenement is located ~20 km N of the Ernest Henry Mine (Figure 1). Access to the area from Cloncurry is via the Ernest Henry Mine and Sedan Dip roads.

| EPM | NAME | LICENCEE | SUB-BLOCKS | GRANT | EXPIRY |
|---|---|---|---|---|---|
| 18017 | Costwold | Minotaur Ops | 28 | 23/12/2010 | 22/12/2015 |

Table 1: Tenement particulars for EPM 18017

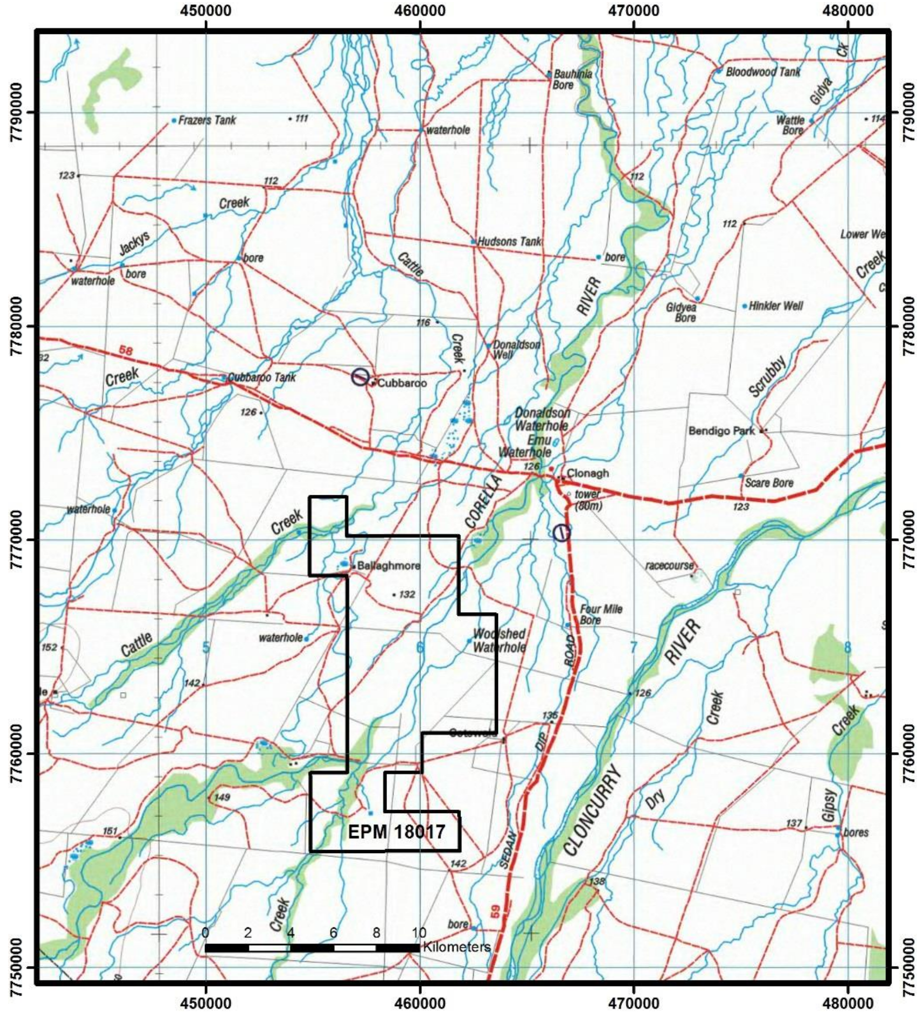


Figure 1: Location map for tenement EPM 18017

Tenement EPM 18017 (Cotswold), encompassing 28 sub-blocks, was granted to Minotaur Operations on the 23rd December 2010 (Figure 2). Sub-block listing is;

- CLON103 Z,
- CLON175 E,
- CLON176 A, B, C, F, G, H, L, M, N, O, Q, R, S, T, V, W, X, Y,
- CLON247 K, P,
- CLON248 A, B, F, L, M, N.

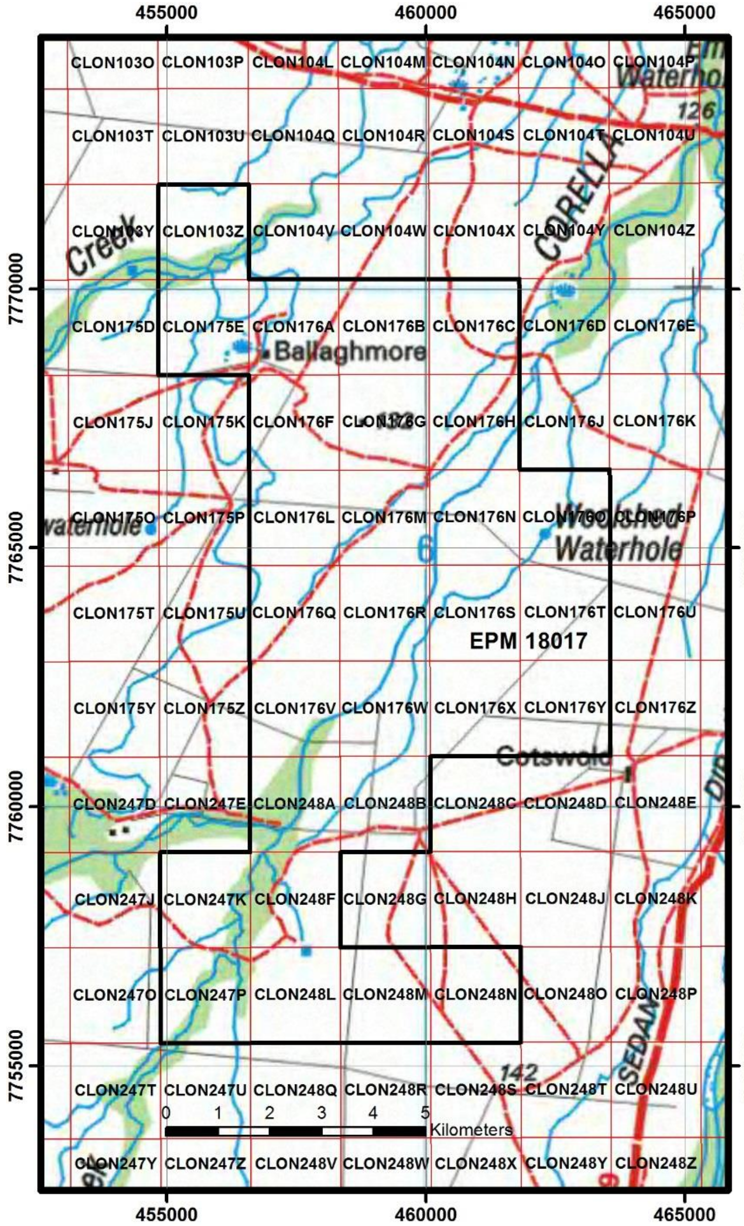


Figure 2: Sub-blocks for EPM 18017

Tenement EPM 18017 (Cotswold) is one of 17 tenements within the Cloncurry Joint Venture between Japan Oil Gas and Metals National Corporation (JOGMEC), Minotaur Operations and Minotaur Exploration. In order to simplify administration, administrative costs and technical reporting requirements, an application (EPMA 19530) was lodged to amalgamate 9 existing tenements within the Joint Venture, including EPM 18017. The amalgamation was approved on 10th March 2014, resulting in simultaneous conditional surrender of tenement EPM 18017.

## 3 REGIONAL GEOLOGY AND TECTONICS

The Eastern Succession of the Mount Isa Inlier broadly consists of three Proterozoic domains bounded by major N-trending shear zones /faults — the oldest Mitakoodi Domain, Canobie Domain and the youngest Soldiers Cap Domain (Figures 3–4) (Betts and Giles., 2006; Hutton et al., 2012).

The Mitakoodi Domain (1760–1750 Ma) is highly magnetic and includes felsic volcanic strata (Bulonga Volcanics), mafic volcanic strata of the Magna Lynn and Marraba Volcanics rocks, overlying siliceous Mitakoodi Quartzite and uppermost Overhang Jaspilite.

The Canobie Domain, which hosts Ernest Henry Cu+Au deposit, is a narrow north-south trending (260 x 60 km) zone strongly magnetic sequence of Mount Fort Constantine Volcanics (1745 ± 9 Ma), calc-silicate (Corella Formation) and granitic rocks within the various plutons of the Williams Igneous Event. The domain is fault bounded and bordered to the east and west by the Soldiers Cap Domain.

The Soldiers Cap Domain contains various units of the ~1700–1650 Ma Lower and Upper Soldiers Cap Groups, which are regionally characterised by low degrees of magnetisation. The Lower Soldiers Cap Group (LIewellyn Creek Formation and Mount Norma Quartzite) consists predominantly of psammitic and pelitic rocks along with dolerite sills whereas the Upper Soldiers Group consists of basalt (Toole Creek Volcanics). Units within the Soldiers Cap Domain were deformed and metamorphosed during the Isan Orogeny.

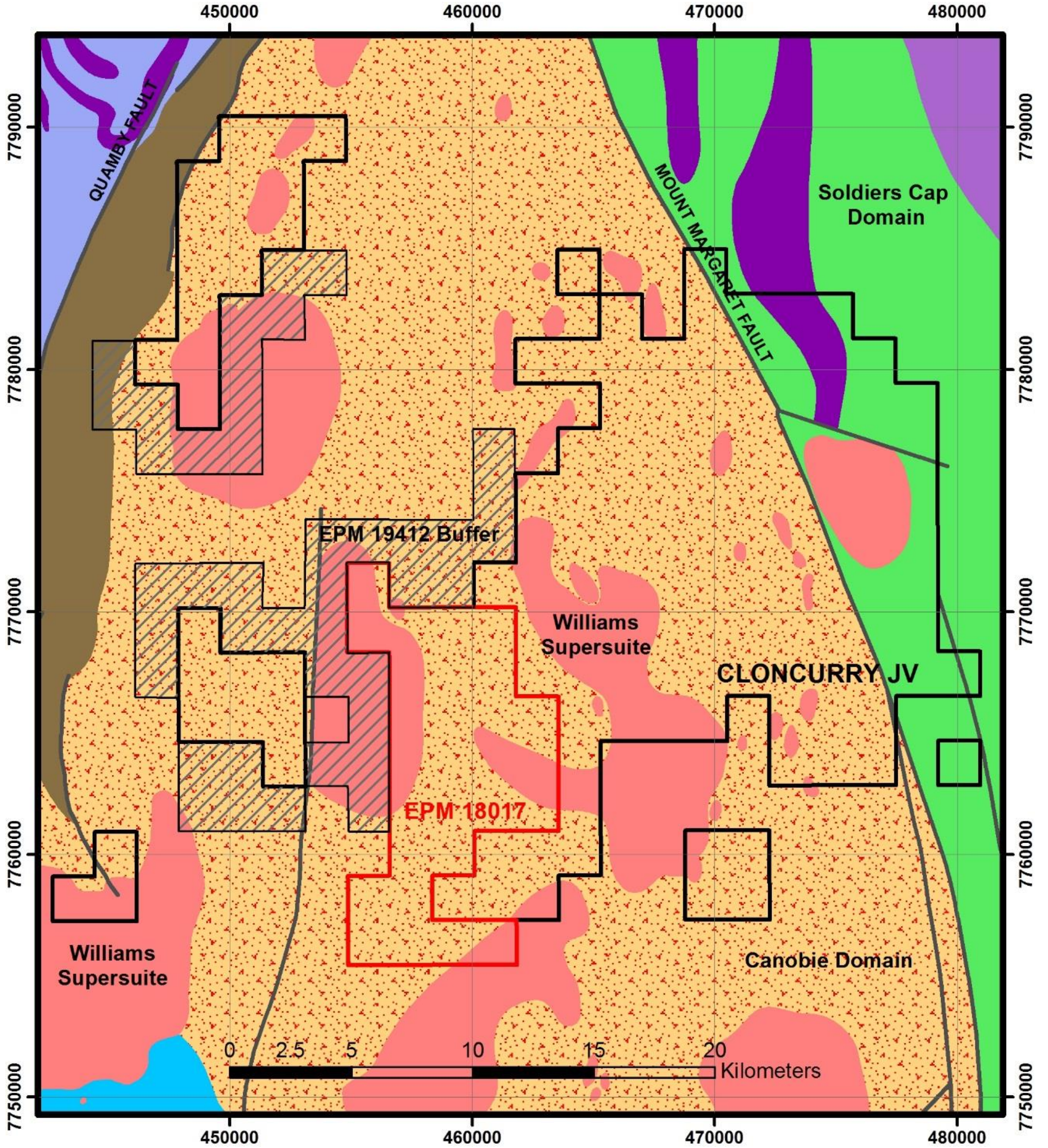


Figure 3: Regional tectonic map for tenement EPM 18017 and the Cloncurry JV (GSQ, 2011)

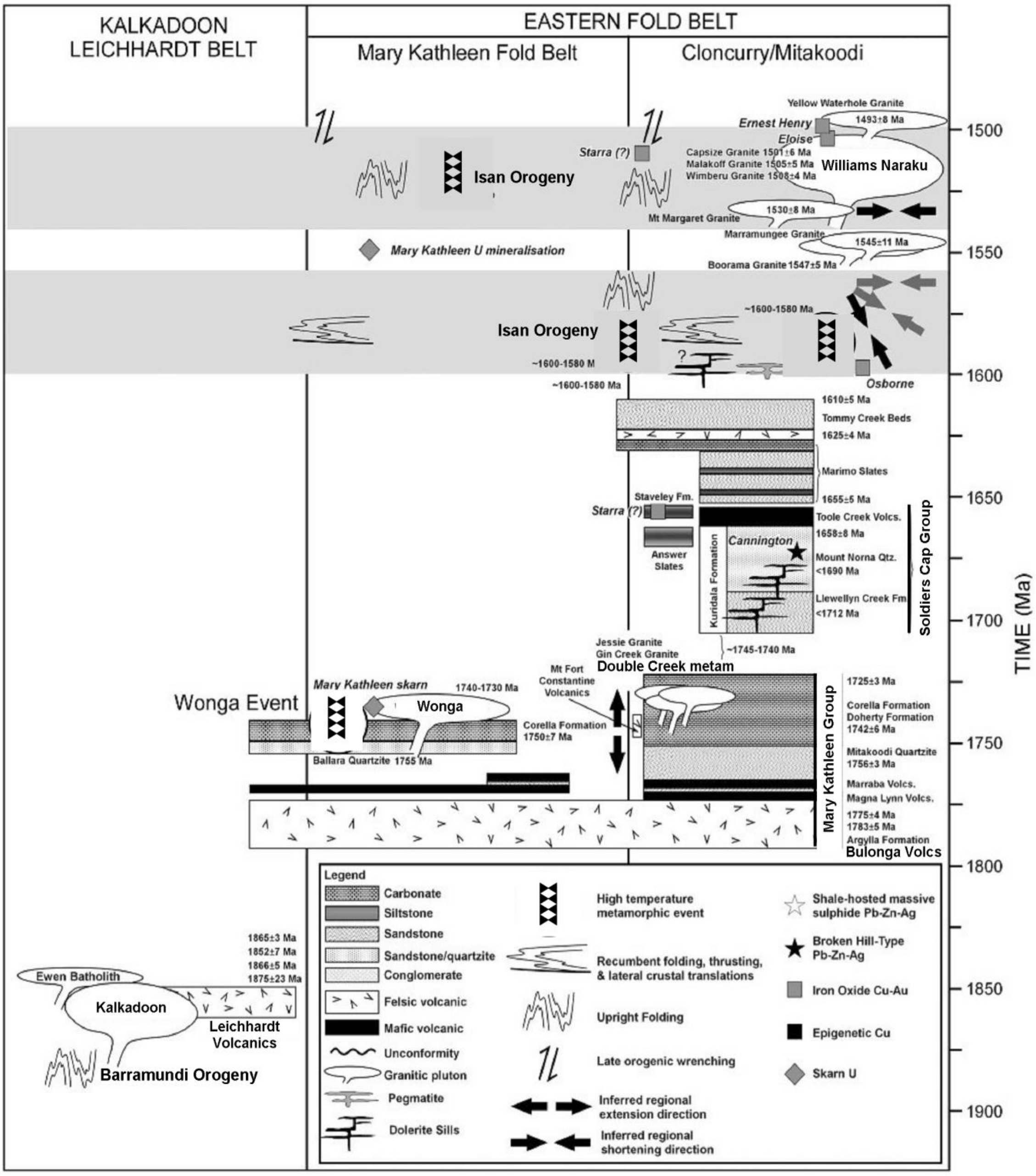


Figure 4: Proterozoic event stratigraphy for the Eastern Fold Belt (Betts and Giles, 2006)

Major IOCG-style mineralising events in the Cloncurry and Osborne region occurred during the Isan Orogeny; however, mineralization occurred at different stages though predominantly spatially and temporally associated with the granitoids of the Williams and Naraku Batholiths (Figure 3). IOCG mineralization at Osborne Mine is dated at ~1600 Ma, whereas Fe-rich hydrothermal fluids at Ernest Henry Mine are dated at ~1500 Ma. Despite the age differences, all the IOCG deposits are structurally controlled and occur within dilatational sites along N- and NE-trending splays off larger shear zones and faults.

## 4 HISTORICAL EXPLORATION

The Cotswold Prospect, comprising coincident significant gravity and magnetic anomalies, had been the focus of exploration by Ernest Henry Mining (ML 2669) for many years, but the nature of technical exploration activities undertaken are not publically available.

The area surrounding ML 2669 was formerly part of tenement EPM 8648 where exploration was initially undertaken by Western Mining Corporation (WMC) and then Mount Isa Mines (MIM, now Xstrata) who undertook extensive IP surveying along with drill testing of select geophysical features (includes TP series of drill holes).

## 5 MINOTAUR EXPLORATION ACTIVITIES

The exploration target on EPM 18017 is IOCG-style mineralisation within host rocks that are rich in either magnetite (Fe oxides) or pyrrhotite (Fe sulphides).

During 2011 and the first year for tenement EPM 18017, Minotaur undertook an extensive geophysical program, as documented by Morris et al (2011), which included;

- Detailed gravity survey over much of the tenement,
- Dipole-Dipole IP survey at the Ballaghmore South target,
- Ground magnetic surveys at Ballaghmore, Ballaghmore South, F7 and Woolshed Waterhole targets,
- Ground EM survey Ballaghmore, Ballaghmore South, Cotswold, Cotswold North, F7 and Woolshed Waterhole targets,
- One diamond drill hole at each of Ballaghmore (MN11D19), Ballaghmore East (MN11D20) and Woolshed Waterhole (MN11D24) targets (Figure 5).

During 2012, Minotaur's exploration activities, as documented by Morris et al (2012), included,

- Small ground EM survey near Ballaghmore,
- Drilling of 2 diamond drill holes (MN12D28 and MN12D29) into the main eastern, coincident gravity and magnetic anomalies at the Cotswold Prospect (Figure 5).

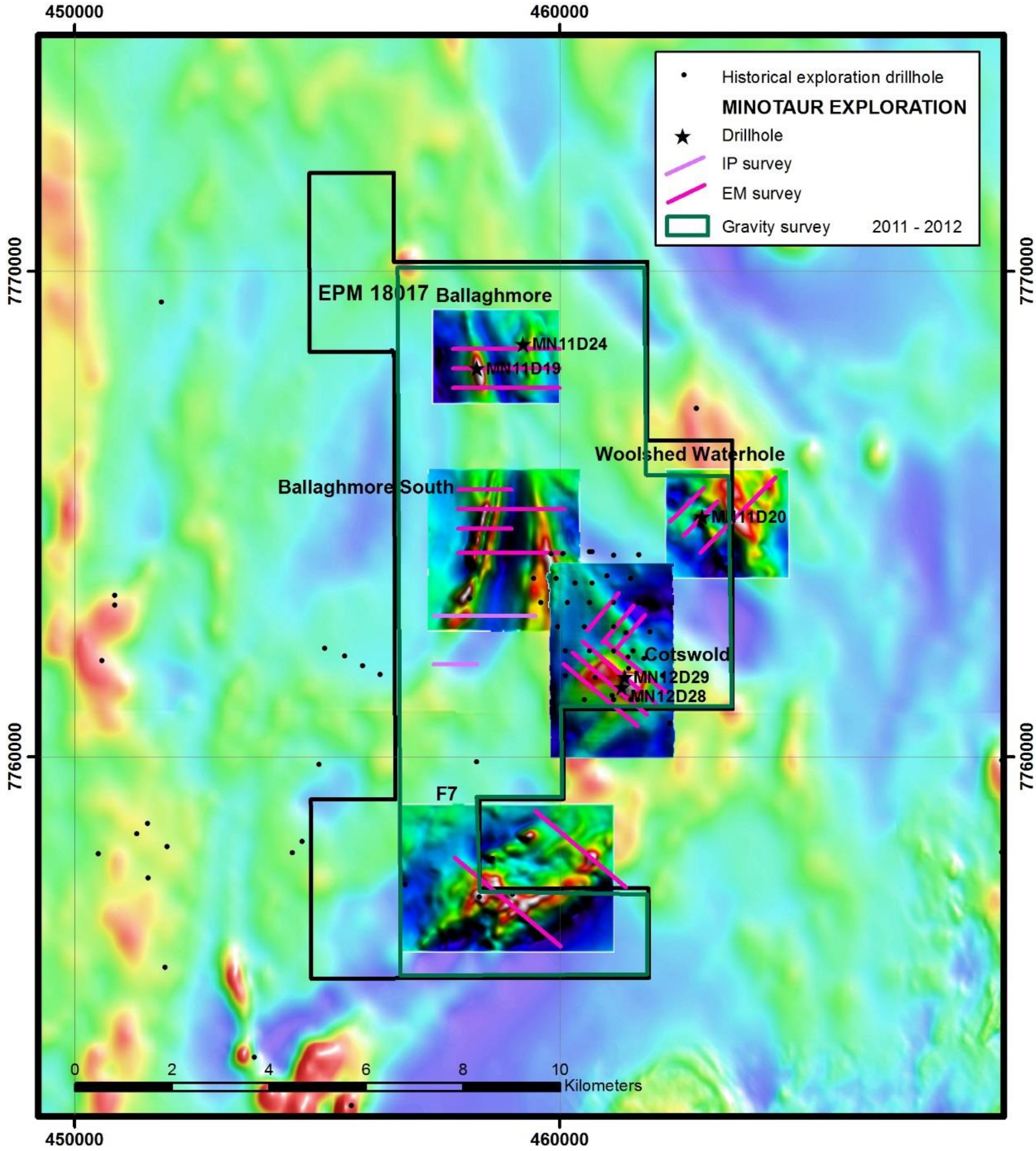


Figure 5: Extent of exploration activities by Minotaur during 2011 and 2012 with respect to regional TMI-RTP magnetic image and detailed 2010-2011 ground magnetic surveys (inset images)

During the 12 month period to 22nd December 2013, exploration activities on EPM 18017, as documented by Flint et al (2013), included,

- Down-hole IP survey in hole MN12D29 at the Cotswold Prospect,
- Dipole-dipole IP survey at the Woolshed Waterhole Prospect,
- Detailed gravity survey at the Cotswold Prospect,
- Diamond drilling of holes MN13D30 (Woolshed Waterhole) and MN13D31 (Cotswold) (Figure 6).

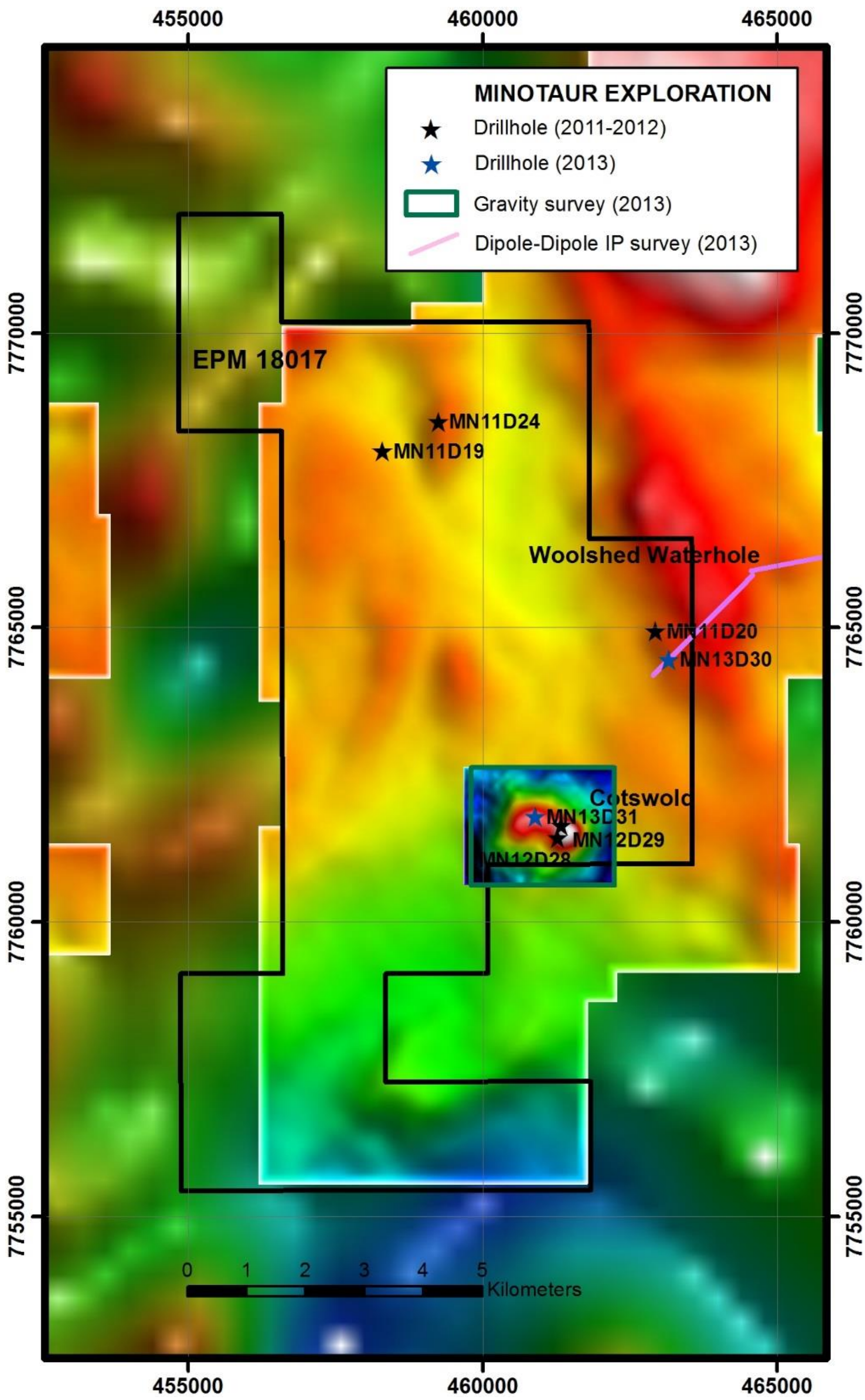


Figure 6: Extent of exploration activities by Minotaur during 2013 with respect to residual gravity image and detailed 2013 ground gravity survey at the Cotswold Prospect (inset image)

No new technical investigations were undertaken on EPM 18017 between 23rd December 2013 and conditional surrender of the tenement on 10th March 2014.

Full details of nature, extent, geophysical data, modelling and interpretation of various geophysical surveys are provided within the three previous annual technical report compilations by Morris et (2011, 2012) and Flint et al (2013). Also documented are results of 7 diamond holes drilled at the Ballaghmore Prospect (2 holes), Woolshed Waterhole Prospect (2 holes) and Cotswold Prospect (3 holes) (Table 2).

| HOLE ID | LOCATION | TARGET | GDA94mE | GDA94mN | DIP | AZ | DEPTH |
|---|---|---|---|---|---|---|---|
| MN11D19 | Ballaghmore | EM | 458300 | 7768000 | -56 | 75 | 463.9 |
| MN11D20 | Woolshed Waterhole | EM | 462942 | 7764941 | -60 | 45 | 201 |
| MN11D24 | Ballaghmore East | Gravity | 459250 | 7768500 | -60 | 90 | 240 |
| MN12D28 | Cotswold | Gravity, magnetic | 461278 | 7761432 | -60 | 120 | 408 |
| MN12D29 | Cotswold | Gravity, magnetic | 461341 | 7761639 | -65 | 120 | 438 |
| MN13D30 | Woolshed Waterhole | EM, IP, magnetic | 463162 | 7764459 | -60 | 45 | 452 |
| MN13D31 | Cotswold | Gravity, magnetic | 460899 | 7761785 | -60 | 325 | 402 |

Table 2: Drill collar information, coordinates in GDA94 Zone 54

### 5.1 BALLAGHMORE PROSPECT

Geophysical surveys carried out in the Ballaghmore area included gravity, ground magnetic and ground EM surveys (Figures 5–6).

Drill hole MN11D19 at the Ballaghmore Prospect targeted a positive magnetic anomaly and EM conductor. However, the EM conductor was due to graphite hosted within a greywacke and the magnetic anomaly was due to primary magnetite within a banded metasediment rather than magnetite alteration (Figures 7–10). Portable XRF analysis and laboratory analysis of 10 core samples only returned background geochemical values (Morris et al, 2011).

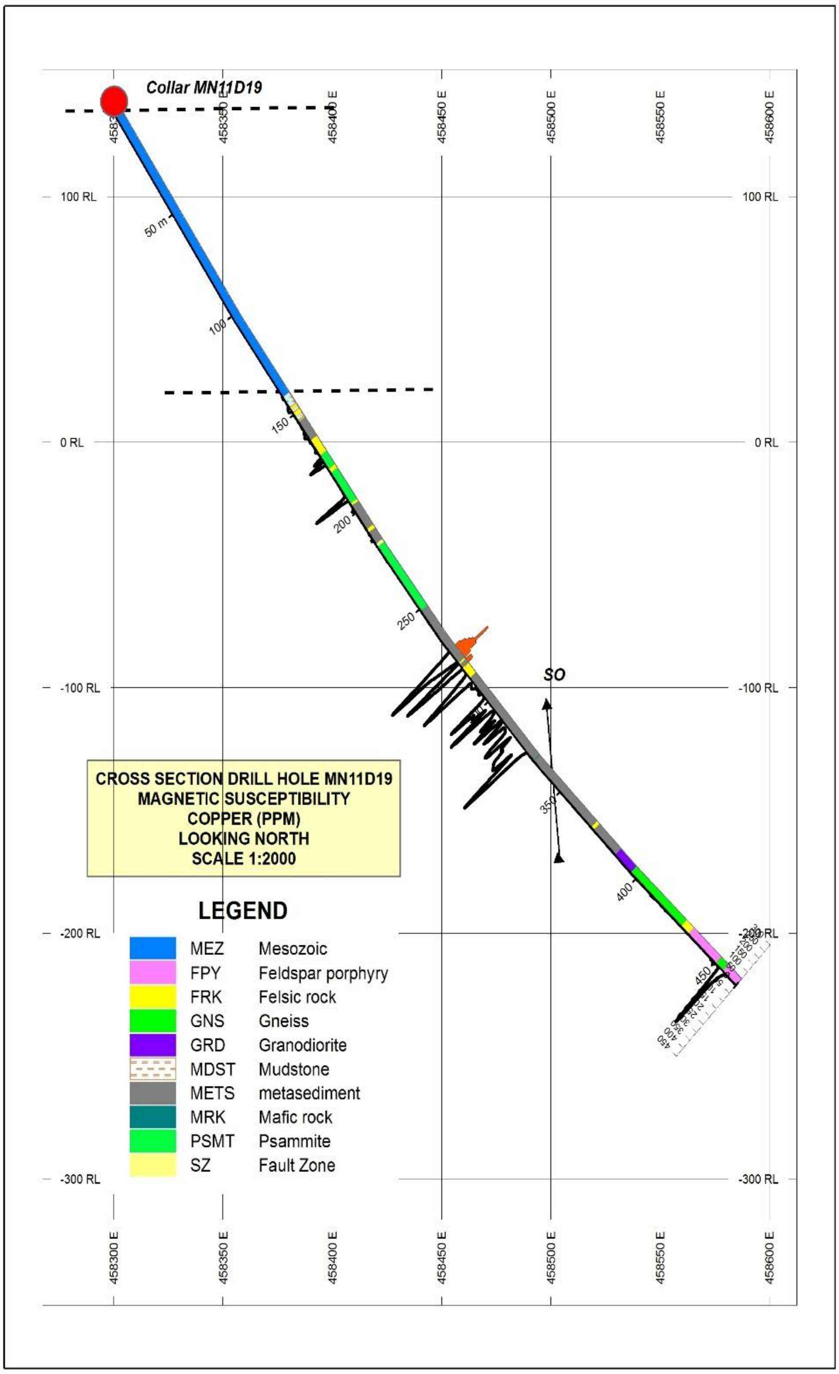


Figure 7: Lithological log, magnetic susceptibility and portable XRF Cu values for drill hole MN11D19

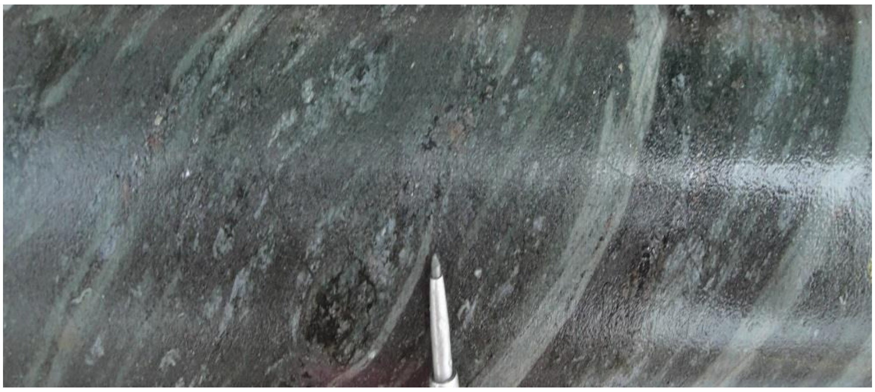

Figure 8: Garnetiferous schist and psammopelite at 161.25 m in drill hole MN11D19

Figure 9: Banded psammite at 211.80 m in drill hole MN11D19

Figure 10: Graphite-rich interval at 354.4 m in drill hole MN11D19

Drill hole MN11D20 targeted a discrete positive gravity anomaly. The drill hole intersected predominantly massive coarse-grained granite (containing abundant very coarse-grained feldspar phenocrysts to 3 cm) and lesser porphyritic granite (dispersed feldspar megacrysts in a fine-grained matrix). Average density for the granite is only 2.75 g/cc, suggesting that the positive gravity anomaly is due to a topographic high rather than lithological and density variations within the basement. No alteration or mineralisation was observed (Morris et al, 2011).

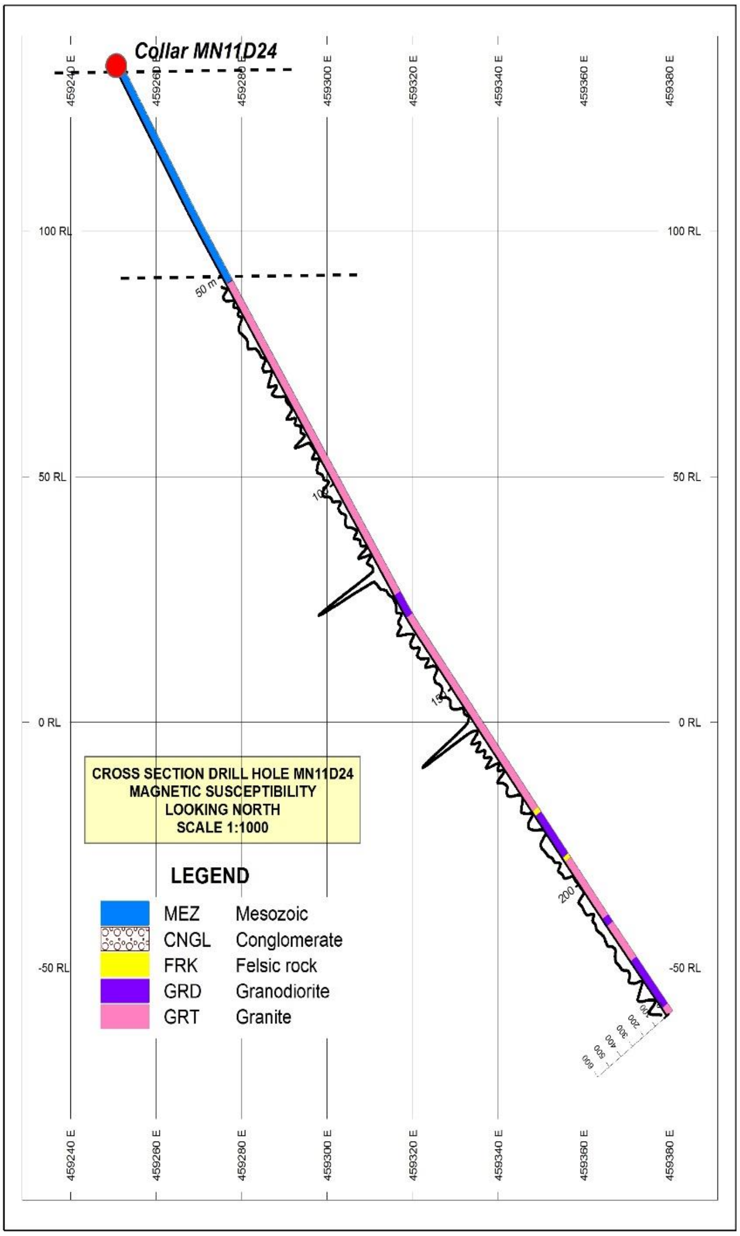


Figure 11: Lithological log and magnetic susceptibility for drill hole MN11D24

Figure 12: Coarse-grained granite at 60.9 m in drill hole MN11D24

Figure 13: Coarse-grained granite with red-rock alteration at 83.9 m in drill hole MN11D24

### 5.2 WOOLSHED WATERHOLE PROSPECT

Hole MN11D20 at the Woolshed Waterhole Prospect targeted a discrete positive magnetic anomaly and nearby positive EM conductor (Figure 18). The drill hole intersected an alteration zone containing abundant magnetite, pyrrhotite and amphibole, including a 7 m interval @ 0.3% Cu (87–94 m), within which the best intercept was 0.6 m @ 1.12% Cu (89.4–90.0 m) (Figures 14–17). This alteration and associated magnetite in the upper part of the drill hole are consistent with targeted IOCG-style mineralisation. However, the targeted EM conductor is believed to be due to massive pyyrhotite and amphibole intersected in the lower part of the drill hole which are associated with only slightly elevated Cu values (Figure 17).

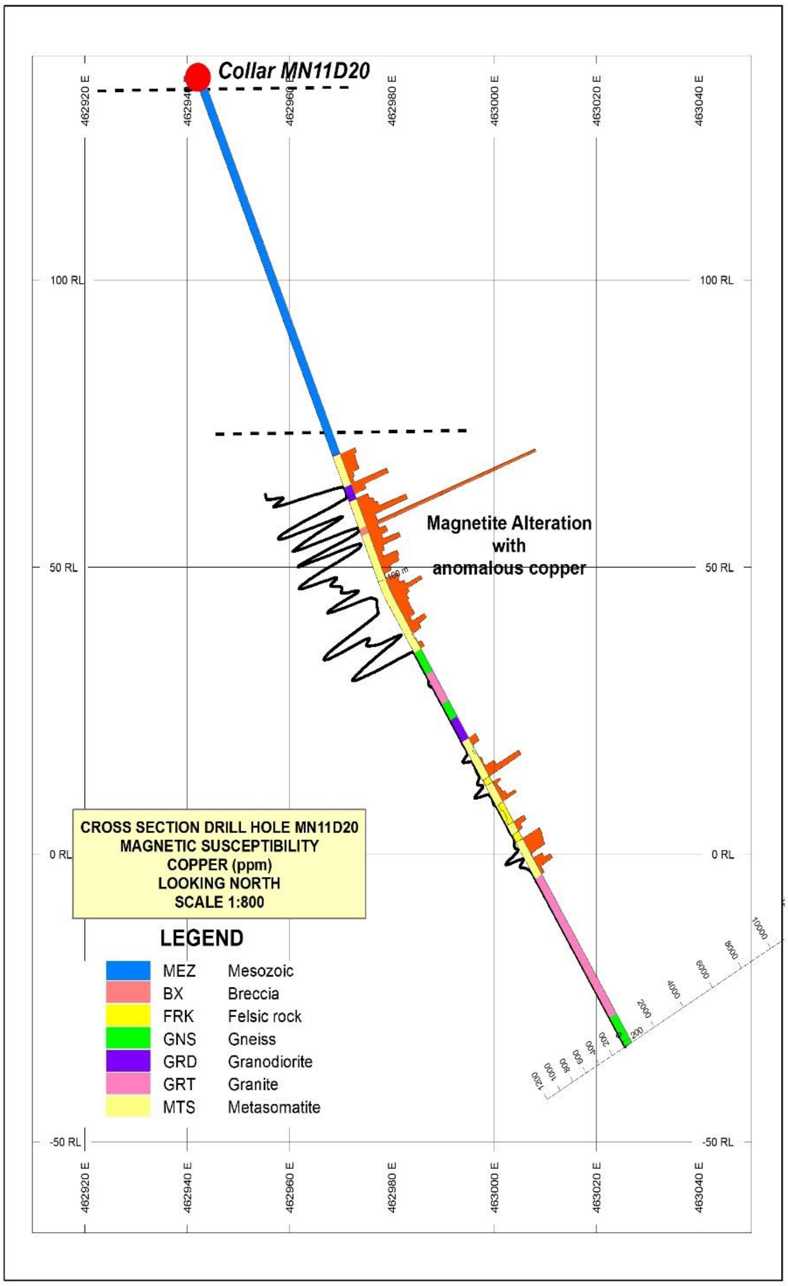


Figure 14: Lithological log, magnetic susceptibility and portable XRF Cu values for drill hole MN11D20

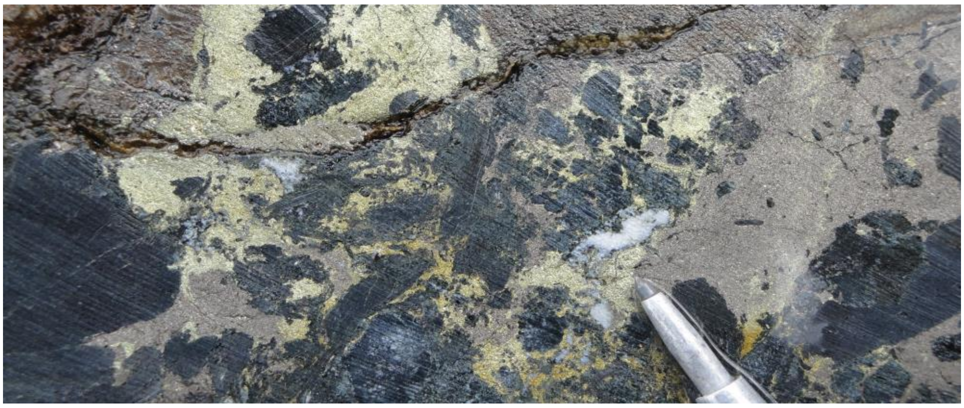

Figure 15:  Coarse-grained pyrrhotite +chalcopyrite +amphibole at 89.4m in drill hole MN11D20

Figure 16:  Magnetite- and amphibole-bearing alteration zone at 107.1 m in drill hole MN11D20

Figure 17:  Massive amphibole and pyrrhotite at 157.1 m in drill hole MN11D20

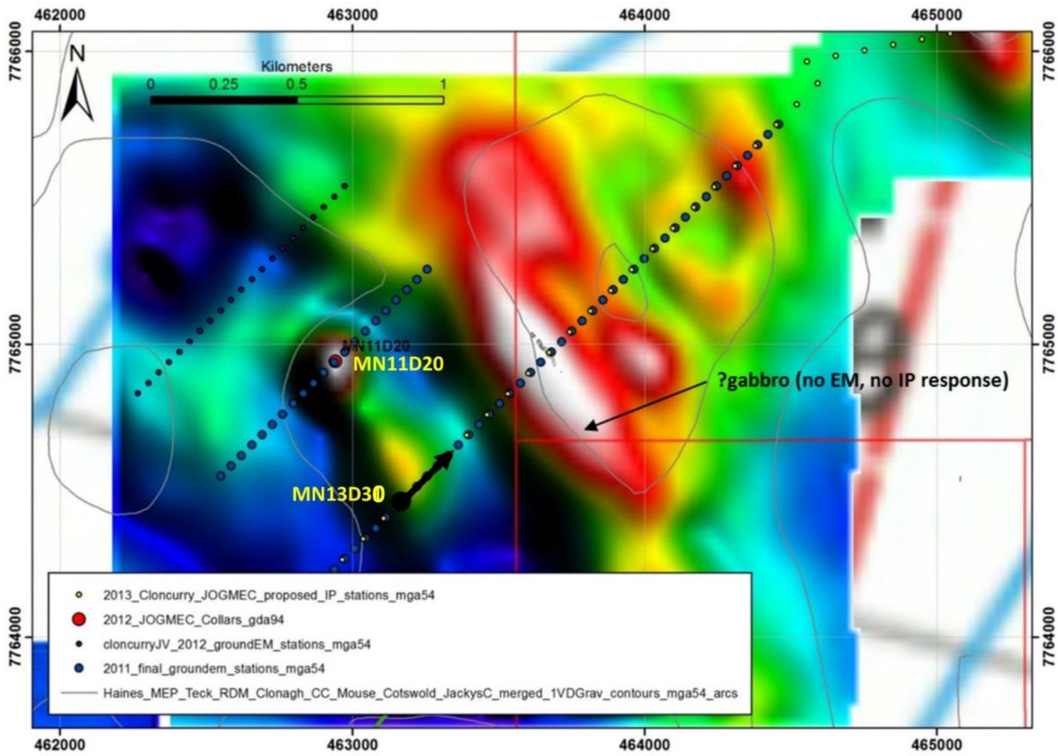


Figure 18: TMI-RTP image for Woolshed Waterhole showing location of Minotaur drill holes along with IP and EM survey lines

At Woolshed Waterhole, IP surveying had identified a very strong chargeability anomaly (40 mrads) coincident with a modelled EM conductor and the eastern margin of a positive magnetic anomaly (Figures 18–19). These geophysical features are 500 m along strike from Minotaur's 2011 drill hole MN11D20 which intersected a broad alteration zone rich in magnetite and sulphides, including a 0.6 m wide interval (89.4–90.0 m) @ 1.12% Cu. The EM anomaly (3000 S/m) increases in amplitude to the southeast and the coincidence of geophysical features along strike from known IOCG mineralisation was considered most encouraging. Drill hole MN13D30 tested a combination of these three coincident geophysical anomalies (Figure 20).

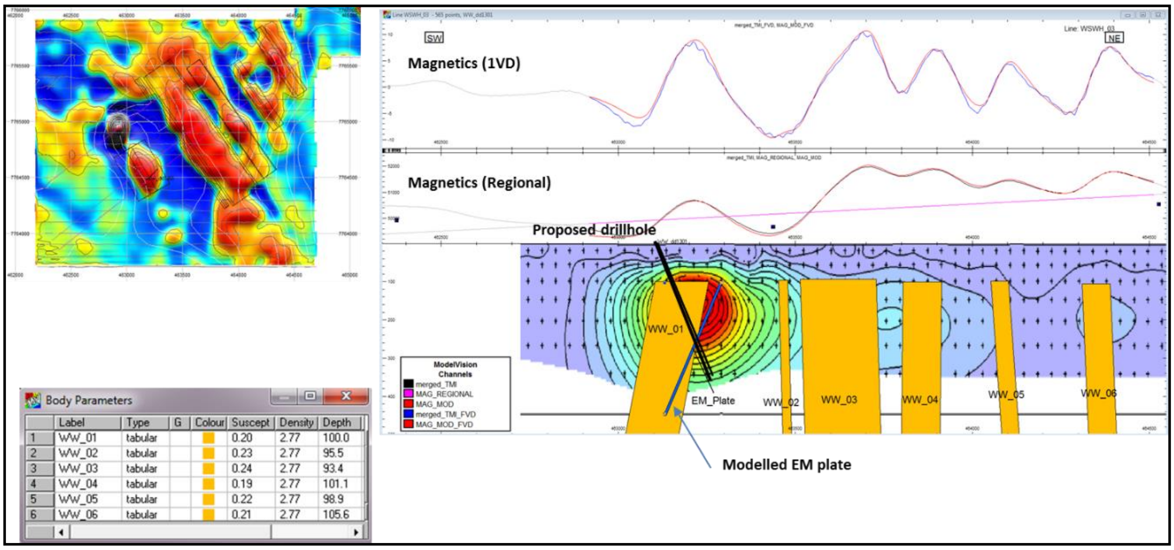


Figure 19: Drill hole MN13D30 (pre drilling) with respect to modelled magnetic bodies (khaki blocks), IP chargeability section and modelled EM conductor (blue line)

Drill hole MN13D30 intersected basement at 93.20 m and lithologies include metasomatite, granodiorite and felsic dykes along with pyrrhotite-rich, magnetite-poor breccia and metasomatite and also magnetite-rich alteration zones typical of IOCG-style alteration (Figures 21–29). Pyrrhotite is the dominant sulphide within breccia and metasomatite, but chalcopyrite is also present locally. Pyroxene and/or amphibole crystals and aggregates are also common. Within the magnetite-bearing alteration zone, the mineral assemblage is magnetite +pyroxene and minor chalcopyrite.

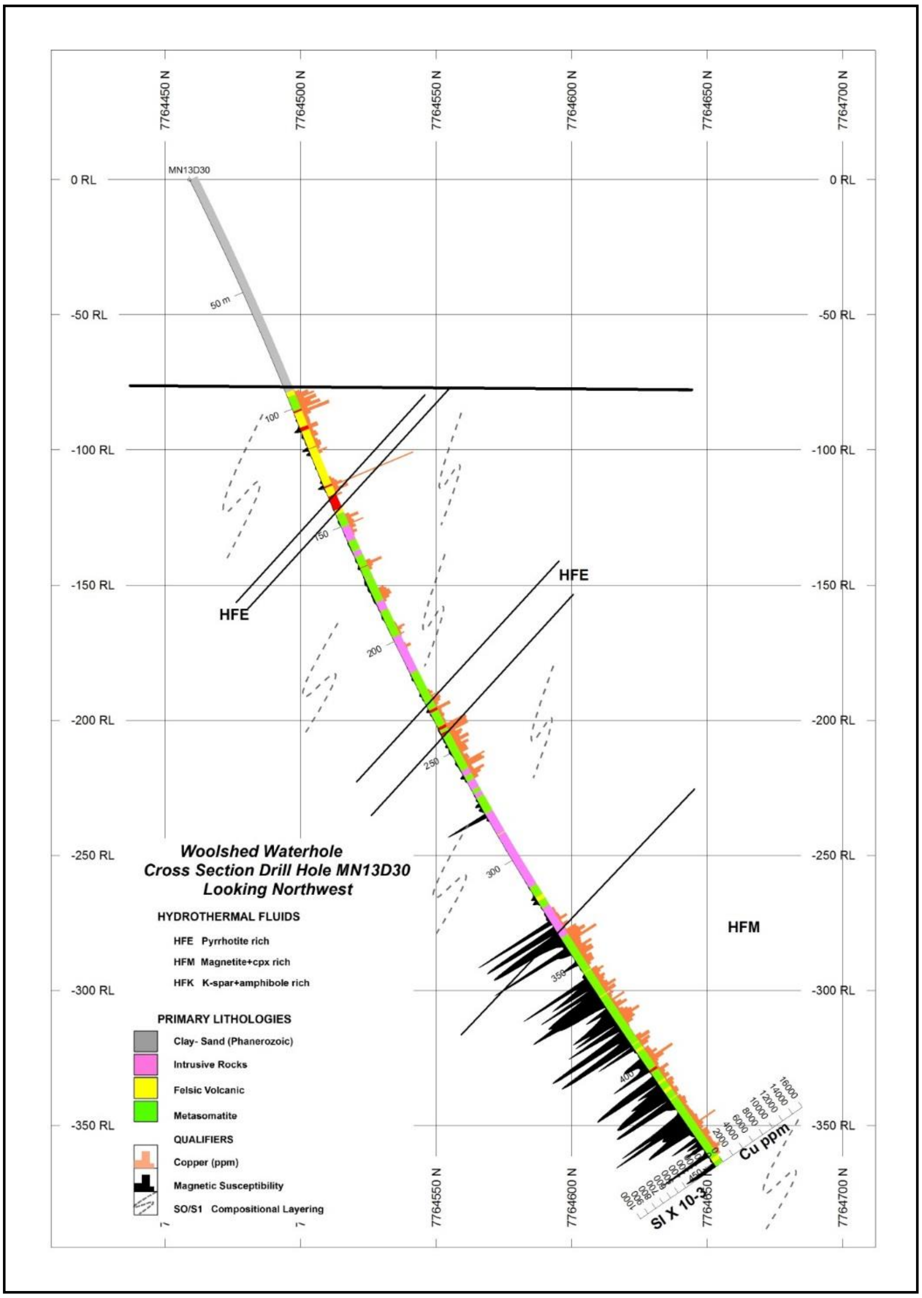


Figure 20: Geological cross section drill hole MN13D30

Figure 21: MN13D30 at 109.35m. Massive pyrrhotite breccia containing lesser chalcopyrite and pyroxene

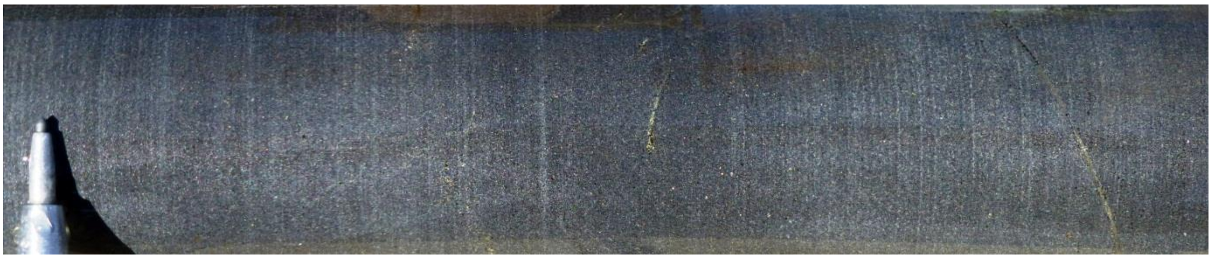

Figure 22:  MN13D30 at 123.40m.  Grey fine-grained dacite

Figure 23:  MN13D30 at 133.74m.  Chalcopyrite-rich vein within dacite

Figure 24:  MN13D30 at 168.30m.  Massive pyrrhotite-rich breccia with minor chalcopyrite, pyroxene and angular quartz clasts

Figure 25:  MN13D30 at 238.60m.  Pyrrhotite-rich breccia containing amphibole/pyroxene crystals

Figure 26: MN13D30 at 255.80m. Pyrrhotite-rich breccia with amphibole +chalcopyrite aggregates

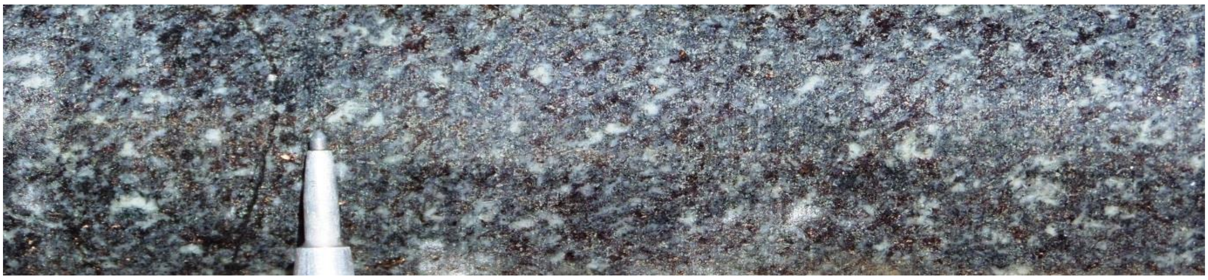

Figure 27: MN13D30 at 307.30m. Grey massive granodiorite

Figure 28: MN13D30 at 373.00m. Magnetite alteration zone also containing amphibole, pyrrhotite and trace chalcopyrite

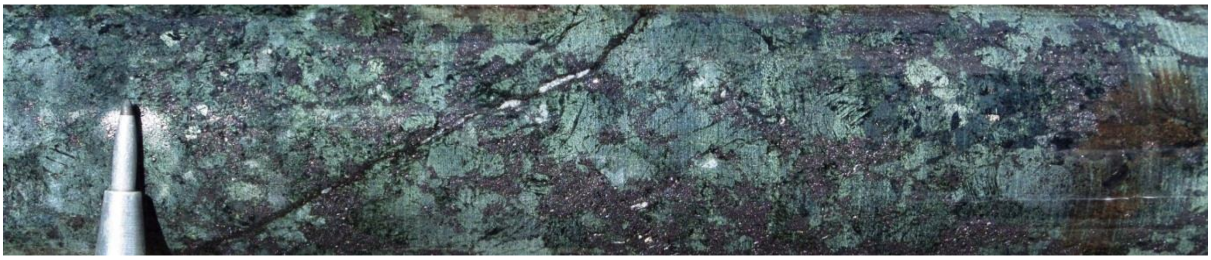

Figure 29: MN13D30 at 385.00m. Coarse-grained magnetite and pyroxene alteration zone

Laboratory results indicate anomalous copper values over wide intersections with the best copper assay of 1.44% from 133.60–134.00 m from a narrow, very chalcopyrite-rich vein (Figure 23; Table 3). Late cross-cutting pyrrhotite stringers hosted in metasomatite and pyrrhotite-rich breccia are generally associated with only low- to modest copper values and indicate widespread, but low, chalcopyrite contents.

| **DRILLHOLE MN13D30 Woolshed Waterhole** | | | **Cu** |
|---|---|---|---|
| **From** | **To (m)** | **Interval** | **%** |
| 97.7 | 103.00 | 5.30 | 0.31 |
| 133.60 | 134.00 | 0.40 | 1.44 |
| 238.60 | 241.21 | 3.63 | 0.35 |
| 255.46 | 257.90 | 2.44 | 0.31 |
| 337.70 | 341.00 | 3.30 | 0.32 |
| 399.00 | 401.00 | 2.00 | 0.32 |
| 432.00 | 432.60 | 0.40 | 0.38 |

Table 3: Best Cu assay values for hole MN13D30

Widespread magnetite alteration encountered below 327.00 m contains highly variable sulphide contents, but with only weak to moderately anomalous copper values.

Magnetic susceptibility measurements indicate the highest values (up to 950 x $10^{-3}$ SI) occur below 323 m within an alteration zone containing abundant magnetite and pyroxene. In contrast, pyrrhotite-rich breccia and metasomatite containing disseminated pyrrhotite have lower magnetic susceptibility values of <100 x $10^{-3}$ SI (Figure 30).

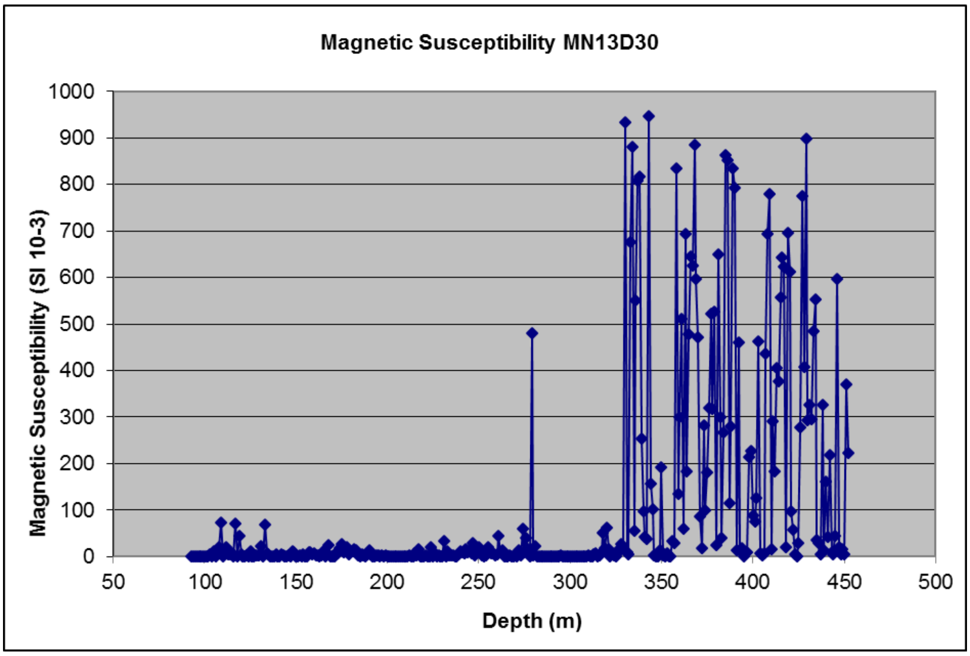


Figure 30: Magnetic susceptibility plot for drill hole MN13D30

Recorded magnetic susceptibility measurements (highly magnetic lower unit in the drill hole) are not consistent with the 2D magnetic modelling which had predicted the hole to intersect a magnetic unit (and its eastern boundary) in the upper portion of the drillhole rather than the encountered magnetic unit (and its western boundary) in the lower portion of the drillhole. The rationale for this discrepancy is enigmatic.

Intersected pyrrhotite-rich breccia, especially from 230.94–232.07 m, very closely corresponds with modelled positions for the IP chargeability anomaly and EM conductive plate (Figure 19).

Thus, the geophysical methodology utilised to generate the drill target worked reasonably well. Presence of positive magnetic anomalies indicates magnetite-bearing IOCG-style alteration and IP and EM surveys successfully revealed the presence of both disseminated and massive sulphides within nearby sulphide-rich and magnetite-poor zones. Unfortunately, pyrrhotite is the dominant sulphide and only minor chalcopyrite is present, resulting in widespread, but low-grade Cu values except in isolated veins and local concentrations.

### 5.3 COTSWOLD PROSPECT

During 2012, Minotaur drilled two holes at the Cotswold Prospect into the eastern, coincident magnetic and gravity anomalies. The drill holes intersected classic IOCG-style magnetite-bearing breccias with hole MN12D29 intersecting a very broad interval of 280 m @ 0.11% Cu (158–438 m). The western gravity and magnetic anomalies (1.25 mgal and 8,000 nT) are of lower amplitude than the eastern anomalies (2 mgal and 14,000 nT), and were the target for drill hole MN13D31. The nearest known historical drill hole to MN13D31 was Xstrata's TP005D ~250 m away to the southwest, but away from the peak of the coincident gravity and magnetic anomalies (Figure 32).

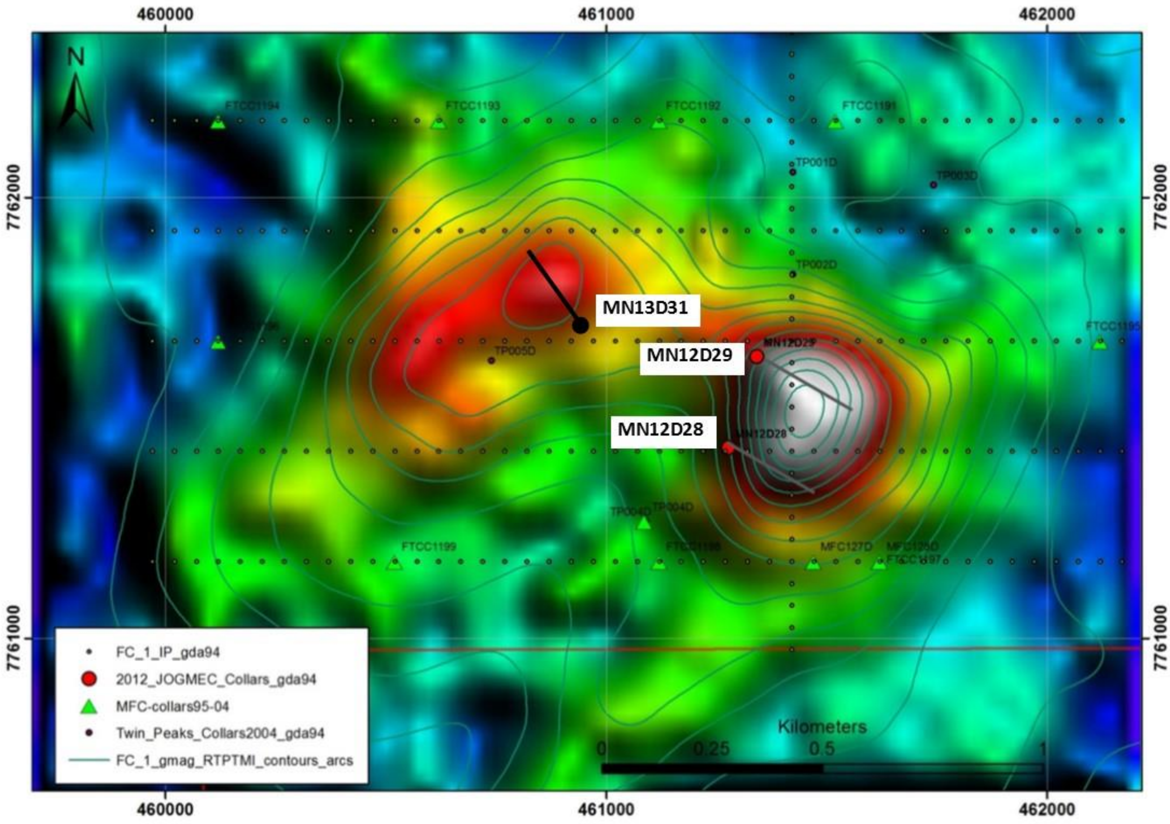


Figure 31: Detailed 1VD gravity image and TMI-RTP contours for the Cotswold Prospect

Drill hole MN12D28 intersected magnetite +clinopyroxene + pyrite alteration within felsic volcanics that contained anomalous copper and appears to have been drilled on the edge of the hydrothermal system (Figures 32–34). The highest assays from drill hole MN12D28 were 2 m @ 0.2% Cu (204–206m) and 1 m @ 0.24% Cu (247–248 m) (Table 4).

Figure 32: Light-grey, fine-grained weakly-foliated porphyritic dacite at 131.6 m in drill hole MN12D28

Figure 33: Magnetite, amphibole, pyrrhotite and chalcopyrite metasomatite at 131.6 m in drill hole MN12D28

Figure 34: Chalcopyrite +pyrrhotite vein within metasomatite at 168.9 m in drill hole MN12D28

MN12D29 intersected felsic volcanics (dacite), similar to drill hole MN12D28, containing abundant pyrite stringers and aggregates, which have subsequently been intensely altered, brecciated, and invaded by hydrothermal fluids rich in amphibole, magnetite, quartz, pyrite, chalcopyrite and pyrrhotite (Figures 35–40).

Figure 35: Pyrite and chlorite veinlets in fine-grained dacite at 165.9 m in drill hole MN12D29

Figure 36: Magnetite +clinopyroxene +chalcopyrite alteration at 166.9 m in drill hole MN12D29

Figure 37: Coarse nickeliferous pyrite, quartz, magnetite alteration zone at 173.6 m in drill hole MN12D29

Figure 38: Breccia with dacite clasts and matrix of magnetite, pyrite and clinopyroxene at 199.7 m in drill hole MN12D29

Figure 39: Porphyritic dacite with irregular sulphide veinlets at 273.5 m in drillhole MN12D29

Figure 40: Magnetite clasts within clinopyroxene matrix at 288.5 m in drill hole MN12D29

Magnetite breccia in drill hole MN12D29 is consistently anomalous in copper, gold, cobalt, nickel and vanadium with a large interval of the breccia complex (280 m interval, 158–438 m) returning an average grade of 0.11% Cu, 0.05% Ni and 0.05% V (Table 4). Highest recorded individual one-metre assays are 48.9% Fe (175–176 m), 0.99% Cu (392–393 m), 0.27% Ni (173–174 m), 0.12% Co (262–263 m), 0.09% V (175–176 m) and 0.14 g/t Au (166–167 m).

| | | | Cu | Au | Fe | Co | Ni | U | V |
|---|---|---|---|---|---|---|---|---|---|
| **From** | **To** | **Interval** | **%** | **ppm** | **%** | **ppm** | **ppm** | **ppm** | **ppm** |
| **DRILLHOLE MN12D28 Cotswold** | | | | | | | | | |
| 204 | 206 | 2 | 0.20 | 0.02 | 18.3 | 208 | 524 | 7 | 273 |
| 247 | 248 | 1 | 0.24 | 0.03 | 25 | 240 | 638 | 11 | 442 |
| **DRILLHOLE MN12D29 Cotswold** | | | | | | | | | |
| 123 | 135 | 12 | 0.15 | - | 28.9 | 269 | 789 | 8 | 451 |
| 158 | 438 | 280 | 0.11 | 0.01 | 27.9 | 194 | 549 | 7 | 450 |
| *incl. 173* | *192* | *19* | 0.15 | 0.01 | 33.5 | 253 | 664 | 9 | 545 |
| *and 214* | *219* | *5* | 0.16 | 0.01 | 29.6 | 289 | 908 | 5 | 451 |
| *and 252* | *275* | *23* | 0.19 | 0.02 | 33.4 | 365 | 1136 | 5 | 460 |
| *and 301* | *305* | *4* | 0.14 | 0.01 | 32.4 | 228 | 693 | 5 | 537 |
| *and 336* | *342* | *6* | 0.18 | 0.02 | 29.8 | 293 | 662 | 7 | 461 |
| *and 391* | *394* | *3* | 0.50 | 0.05 | 32.5 | 197 | 512 | 7 | 452 |

Table 4: Geochemical highlights for drill holes MN12D28 and MN12D29 at the Cotswold Prospect

Strong positive correlations exist between iron, copper, nickel and vanadium scatterplots, especially Fe and V (Figure 41) and typical for IOCG terrains.

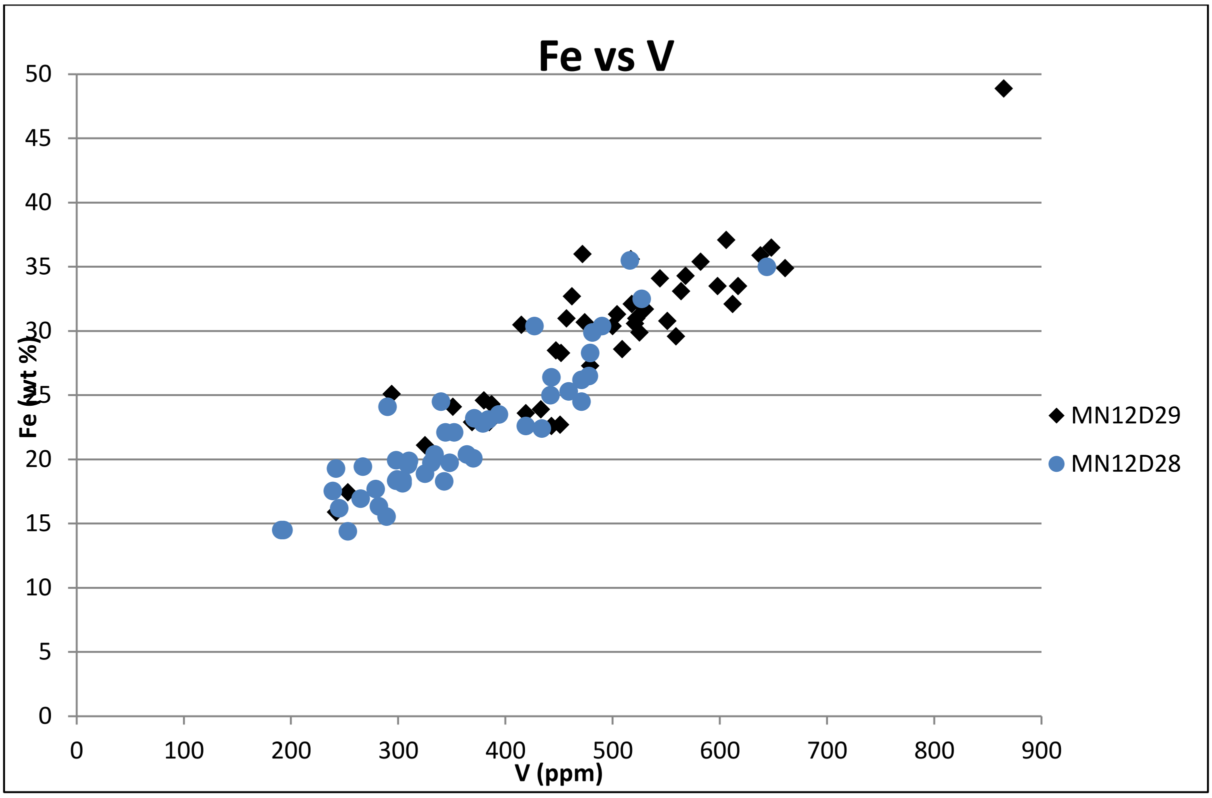


Figure 41: Fe versus V for drill holes MN12D028 andMN12D29

MN13D31, drilled to a total depth of 402 m into the western peak and coincident positive magnetic and gravity anomalies, intersected basement at 117.10 m (down-hole depth) consisting predominantly of dacite volcanics, felsic dykes, magnetite +chlorite +pyrite breccia and minor granodiorite. Only modest IOCG alteration and brecciation development occurs within host felsic volcanic strata (Figures 42–47). These lithologies and geological setting are similar to those previously encountered in drill holes MN12D28 and MN12D29 (Morris et al, 2012; Flint et al, 2013).

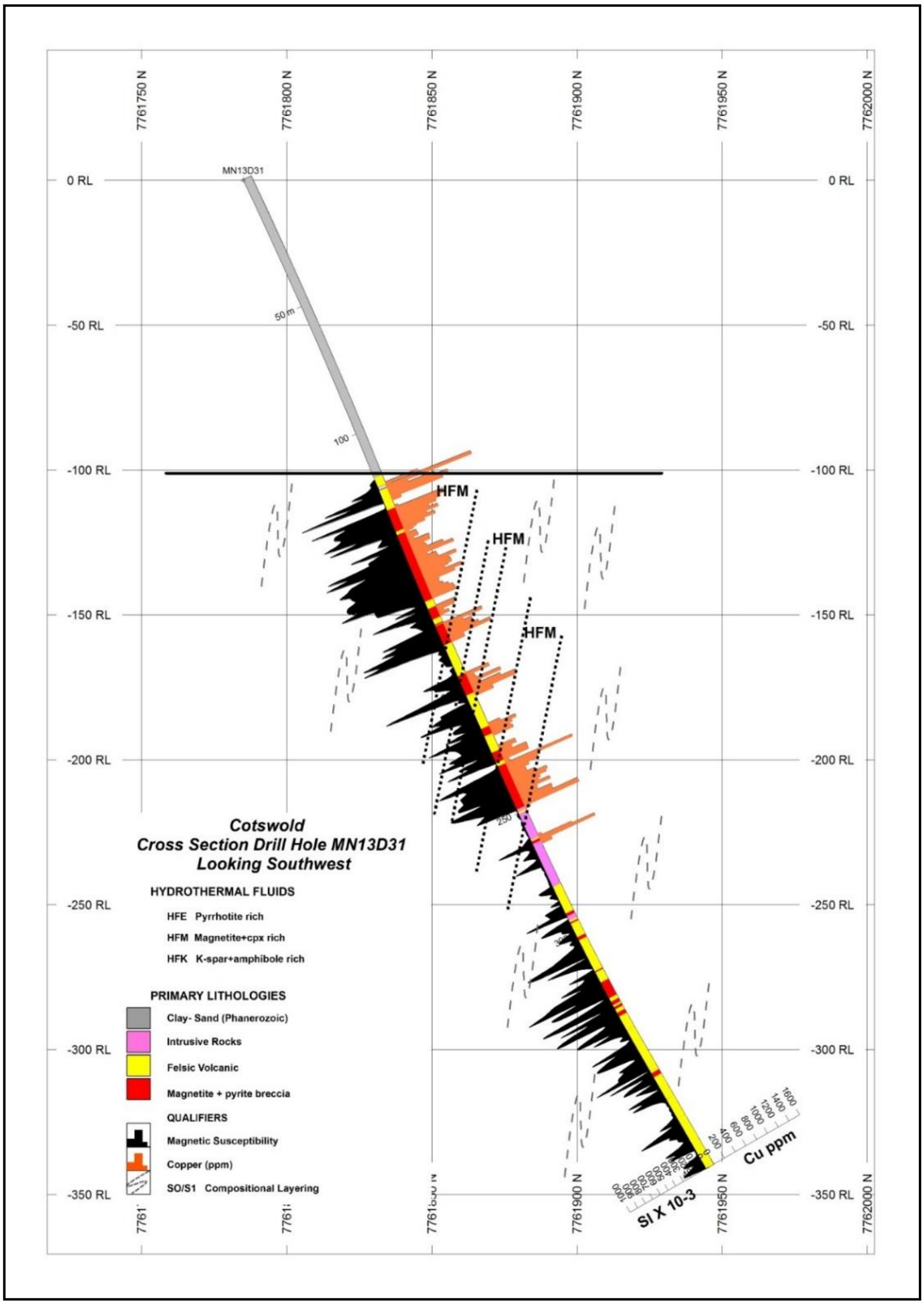


Figure 42: Geological cross section drill hole MN13D31

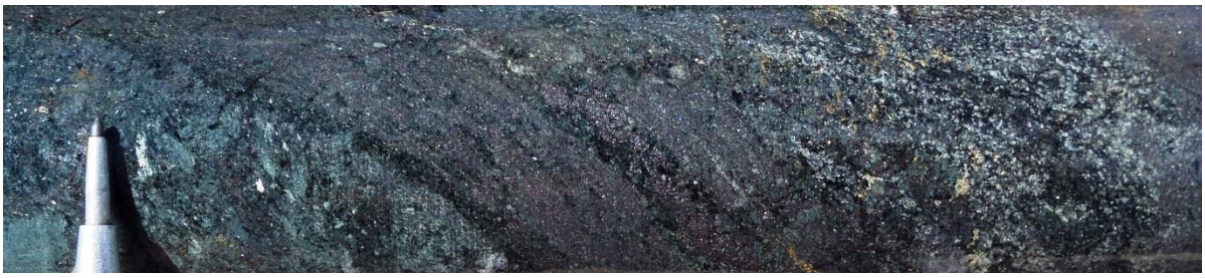

Figure 43: MN13D31 at 132.20m. Brecciated dacite containing matrix of magnetite and pyroxene

Figure 44:  MN13D31 at 188.50m.  Massive grey dacite

Figure 45:  MN13D31 at 197.00m.  Strong foliation (parallel to core axis) within magnetite-rich brecciated dacite

Figure 46:  MN13D31 at 229.00m.  Magnetite-rich brecciated dacite

Figure 47:  MN13D31 at 301.30m.  Massive dacite

Modest anomalous copper values of 1000–1600 ppm occur over a wide interval (down-hole depths 120–250 m) and are associated with magnetite +clinopyroxene +pyrite alteration.

High magnetic susceptibility values (1000 x $10^{-3}$ SI) and high specific gravity values (3.0–3.5 g/cc) are associated with breccias and magnetite +pyroxene +pyrite alteration zones, and are consistent with targeted coincident magnetic and gravity anomalies.

## 6 CONCLUSIONS

At the Cotswold Prospect, brecciation, alteration and mineralisation at the western geophysical target (MN13D31) were less than desired and less than that encountered at the eastern and main geophysical anomalies (drill holes MN12D28 & MN12D29). Predominant lithologies are hydrothermally-brecciated felsic volcanics which have a matrix of magnetite, pyroxene and pyrite, consistent with an IOCG-style hydrothermal fluid. Pyrite is apparently the main sulphide phase at the Cotswold Prospect. Combined with the presence of pyroxene (absence of amphibole and biotite) and lack of regional alteration indicate that the hydrothermal alteration system was high temperature and relatively dry with there being minimal interaction and mixing with cooler meteoric-derived fluids. So though an IOCG-style breccia system is present at the Cotswold Prospect, it is unlikely to host economic copper mineralisation.

At Woolshed Waterhole, magnetite +amphibole +pyrite +/-chalcopyrite IOCG-style alteration along with massive pyrrhotite-rich alteration are both present. Major sulphide species are either pyrite (in association with magnetite) or pyrrhotite (magnetite low or absent) with only minor chalcopyrite. Best assay value was 0.4 m @ 1.44% Cu. Mineralisation appears to be structurally controlled along a NW-trending fault.

At both the Cotswold and Woolshed Waterhole Prospects, discovery of economic concentrations of Cu have been elusive.

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## 8 APPENDICES

**APPENDIX A:**

Listing of digital files

Digital file only "EPM18017_2014_F_02_FileListing.txt"