Drill Hole Logging Report – LMD01
Lake Margaret Project
EL35/2004 - Tasmania

By

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Introduction

This report details the logging of essentially one diamond hole (LMD01 and the redrill LMD01A) drilled from November 20th to December 8th 2006 for Copperstrike Limited on the Lake Margaret IP Anomaly. The report is considered interim until all assays are at hand. Also a re-log of alteration after the core is cut is desirable. The present report contains the factual record and 2D section interpretation only made at the drill site. Emphasis has been on logging structure and alteration. ALMAC Drilling of Zeehan, using an Onram 1000 with NQ and LTK60 core, drilled both holes. Down hole surveys were by camera shots every 30 metres and core orientation was made with an ACE core tool (www.acedrilling.com.au). The driller was Alan Harvey, a double shift was run. Work was professional and without major incident. Running sands in the glacial slope deposits stopped the hole at 32.5 meters requiring a redrill (LMD01A). The rig was positioned by Tasmanian Helicopters and daily shift changes were via a 40 minute walk along a cut walking track from the top of the penstock at the Lake Margaret power station. Water was pumped from nearby Lesley Creek, but the hole became artesian from about 80 metres. A work program permit was obtained from the Mineral Resources Tasmania Exploration Working Group before commencement and subsequently a site inspection during the progress of the hole was made by the group without incidence. Hydro Tasmania staff from Lake Margaret were helpful in providing access via locked gates to the top of the penstock. Ian Rogers is thanked for cutting the access track and Mike Phelan the core. Co-operation from Mt Lyell mine is acknowledged in making their core cutting facility available.

A full 3D regional modelling study (Linda Model) incorporating the 2D interpretation is a separate exercise, and not subject of this report. In breaks during the drilling a mapping traverse was made from the power station to the top of the penstock, and also along the road from Queenstown to Gormaston. Structural and lithological notes were made that have been helpful in understanding the regional geology as described in the literature. Roger Hill from Vedanta's Copper Mines Tasmania is thanked for showing the writer the main features of tehj Prince Lyell orebody.

Hole LMD01A (242.3m EOH) succeeded in locating a wide zone of hydrothermally altered volcanics with pyrite - chlorite – sericite and quartz - siderite-veins, before intersecting the northern equivalent of the Great Lyell Fault (at 230m). The main difference between Lake Margaret and Mt Lyell is that Mt Lyell has more copper and pyrite. The host volcanic rocks are also much more deformed at Mt Lyell than the rocks in LMD01A.

Time permitting a review of the alteration log is recommended after the assays are in hand. This would also be a good time to invite the mapping group from Mineral Resources Tasmania (Mike Vikery – 62338452) to inspect the core as we are advised they have an interest in any new knowledge of this area.

Drill Hole Location and access

The Lake Margaret IP Anomaly is situated about 10 km north of Qeenstown township and the mines at Mt Lyell (Figure 1). Acess is via good gravel road to the Lake Margaret powerstation and then through a locked gate by steep 4x4 track to the top of the

penstock, where parking is very tight. Then by a cut walking track that heads easterly from the top of the surge tanks for 30-40 minutes through forest and then over button grass. Tasmania EL 35/2004. Collar details of the two holes subject of this report appear below. Please note that LMD01A was a redrill of LMD01 in essentially the same spot (1 m south).

The co-ordinates in Table 1 are as measured on the actual site by GPS at the time of drilling. For the record the hole position relative to the IP survey pegs on the line is also shown. Due to the rough terrane there is a difference between marked peg distances along the line and the GPS easting, e.g. on the line from 250E to 900 E the GPS measures 624m (a difference of 26m from the markings).

TABLE 1					
Hole No	E (MGA55)	N	Collar Declination	Collar Azmuth (true)	Total Depth
LMD01	0380984	5349144	-45	90	32.5
LMD01A	0380984	5349143	-45	90	242.3
	E (AGD66 z55)				
LMD01A	0380872	5348960			
	E peg	N peg			
	(0380) 900	(534) 9050			

Please note that the complete collar and survey files are located in Appendix 1 as .txt files.

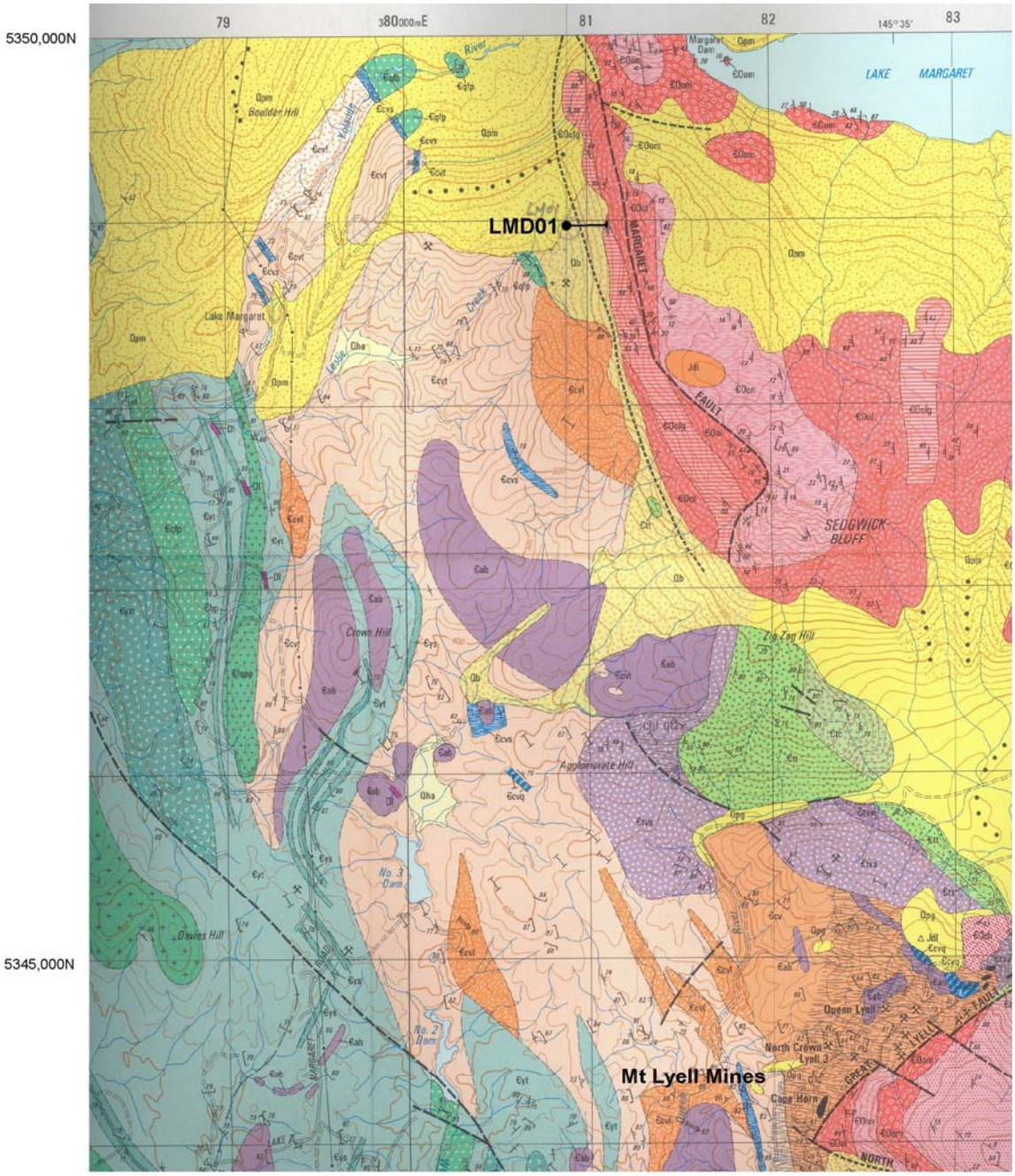

Figure 1. Plan of hole trace LMD01 shown on the Qeenstown Geology map (1989). Not the Prince Lyell open cut is about 2km south of the area pictured above.

HoleTarget

The target for Hole LMD01 was the centre of an IP anomaly estimated to lie between the surface and about 250m down hole (Figure 2).

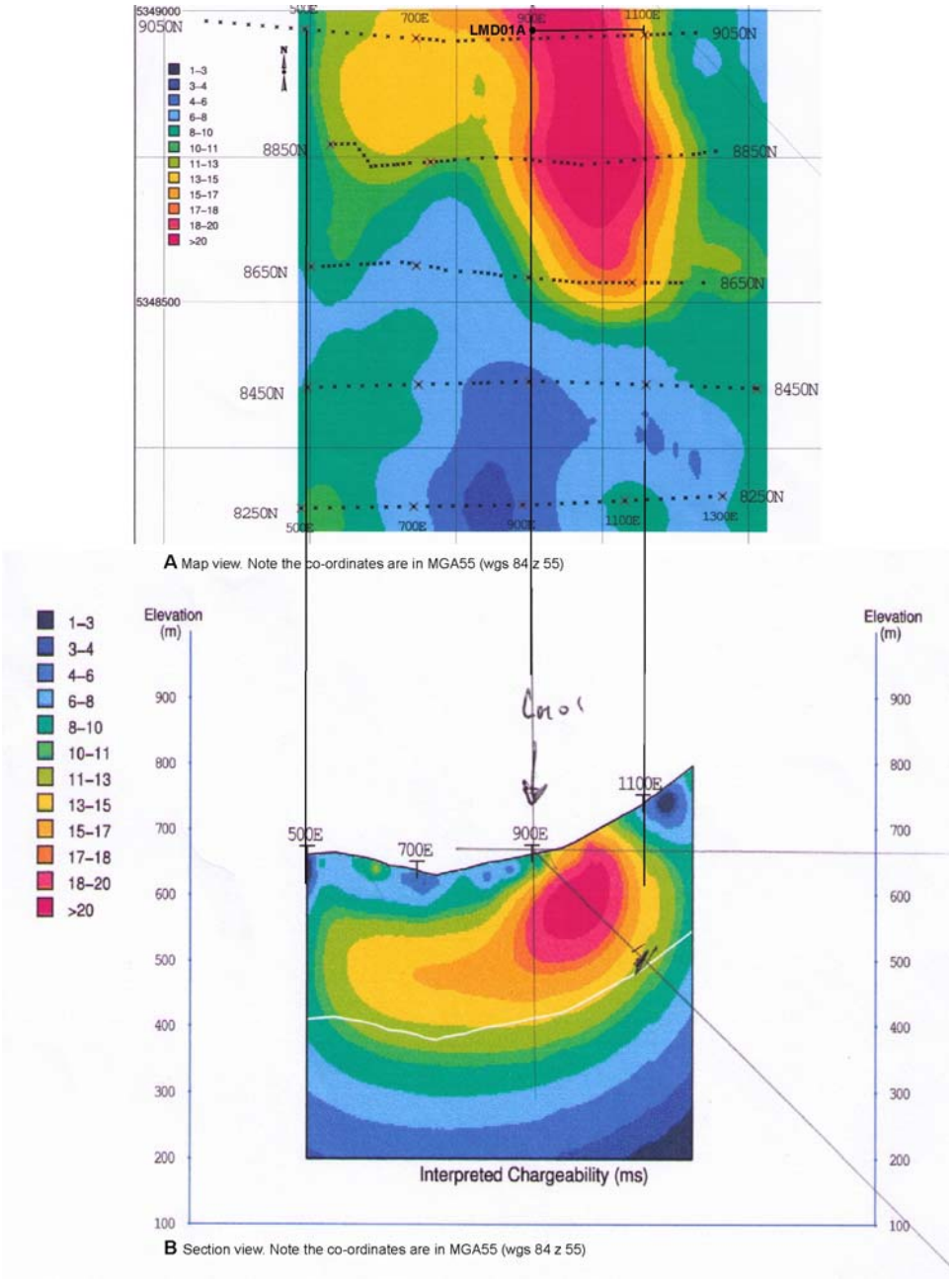

Figure 2. (A) Plan (100m below surface) and (B) section view (line 9050N) of hole trace LMD01 shown on the IP chargeability model (by SJ Geophysics March 2006).

Site Geology

The Lake Margaret IP Anomaly is at least 300 m long, oriented N-NW and open to the north (Figure 2). The immediate area is mask by glacial Holocene boulder slope deposits derived from the Owen Conglomerate on Sedwick Bluff towering over the site (Figure 3).

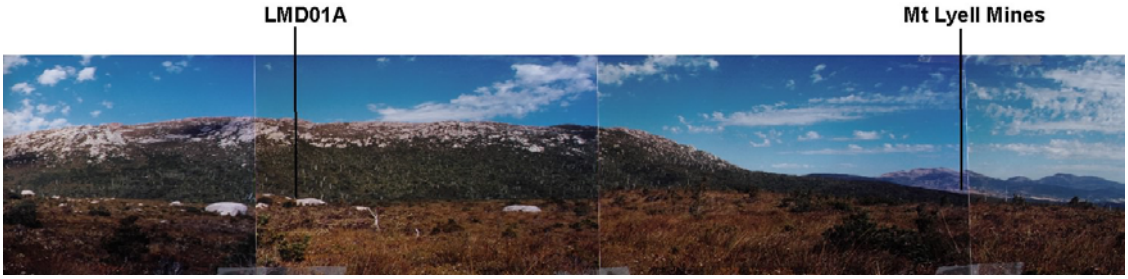

Figure 3. Panorama view to the east southeast towards Mt Lyell from the Lake Margaret area. Note frontal range (Sedgwick Bluff) capped by Owen Conglomerate. The base of the range is marked by the northern extension Great Lyell Fault. The foreground is on the central volcanic complex.

Mapped outcrop with 500 meters suggests the anomaly is hosted by Cambrian Central Volcanic complex (Figure 1) unit Ccvl (felsic – phyric lava) and unit Cqfp (quartz feldspar biotite porphyry.

Methods

The LMD01 and LMD01A holes were logged for structural and lithological data. Quantitative estimates of alteration, pyrite, chlorite and sericite and veining was recorded. Structural measurements were made on veins (mostly type V1, quartz – siderite – pyrite + chlorite). Only trace amounts of chalcopyrite and galena were logged. Given the difficulties of logging on a helipad site the simplest thing to do was to log in run intervals as drilled and marked. This also suited the repetitive lithology and pervasive alteration.

Drilling Result Summary

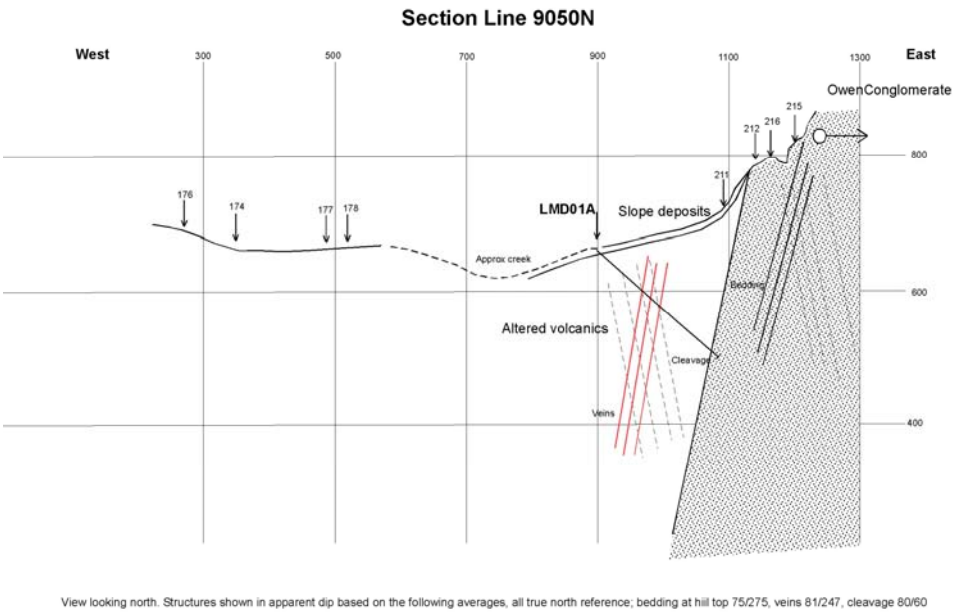

Figure 4. crosssection of line 9050N showing the major outcome from hole LMD01A. The fault is defined by the intersection in the hole and the western most outcrop on the hill (locality 212). That outcrop is part of the fault scarp alignment on the hill slope, and is a reasonable approximation of the fault position. The interpretation discussed later is that the fault is here reverse and probably an overturned reactivated normal fault (the Great Lyell Fault). Fold vergence is measured to the east.

Explaining the "Target" anomaly

Hole LMD01A explained the IP anomaly predicted to lie from surface to 250 metres down hole principally as 1-2% pyrite altered volcanics on average. Pyrite is the main conductor present. A quantity of pyrite was recorded from 12.1 to 229.9 m averaging 2% but locally to 8% (visual estimate).

Economic discovery

No ore grade intersections were made, nor was any significant amount of metal logged, however a large distinct hydrothermal system overprinting a rhyolite was found. This resembles the regional alteration at Mt Lyell. LMD01A contains small amounts of chalcopyrite and galena (noted in the interval from 137.3 to 144.9). Preliminary petrology suggest the presence of sulphosalt minerals in the veins containing As and Sb. Typically the veins contain mostly pyrite-sericite and chlorite plus traces of other metals like galena and chalcopyrite. The writer identified siderite as a common addition to quartz in many white veins (a brown tarnish forms quickly in the field believed to be siderite). There is a hint of heamatite staining of feldspar throughout the hole, giving the rock a pink-redish colour, particularly well marked at 221m. It is unclear if this is a form of alteration.

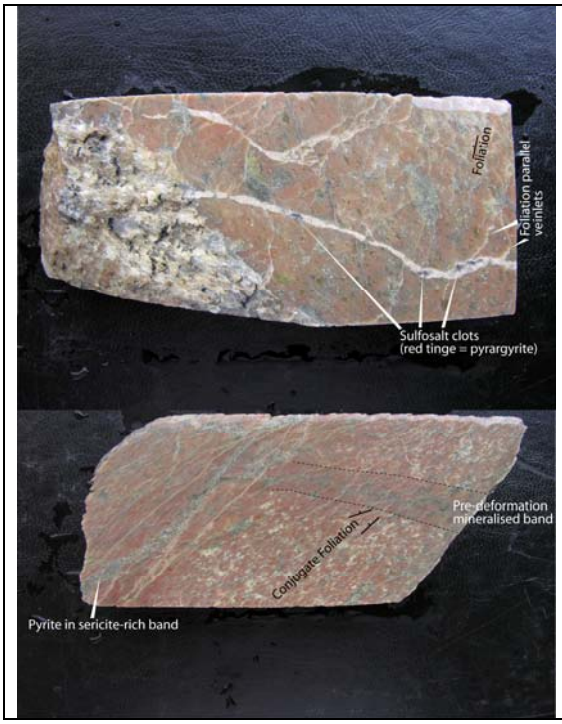

Figure 5. Preliminary petrology on samples from LMD01 ca 16.4m. These veins have small amounts of pyrite as well as a range of rarer sulfides including chalcopyrite, galena and what appear to be several sulfosalt minerals (containing As and/or Sb). One of these is very probably pyrargyrite (Ag3SbS3 - characteristic red translucence), another probably tetrahedrite (AgCuFeZn)10(AsSb)4S13), but its hard to tell when they are so fine-grained without a probe.

The veins appear to be pre- to syn-deformational: some are cut by foliation, some parts parallel the foliation, they don't look particularly deformed.

The alteration looks like sericite with hematite staining of feldspar (causing the red colouration). More detail awaits thin section preparation.

Picture and notes courtesy Dr Andy Tomkins.

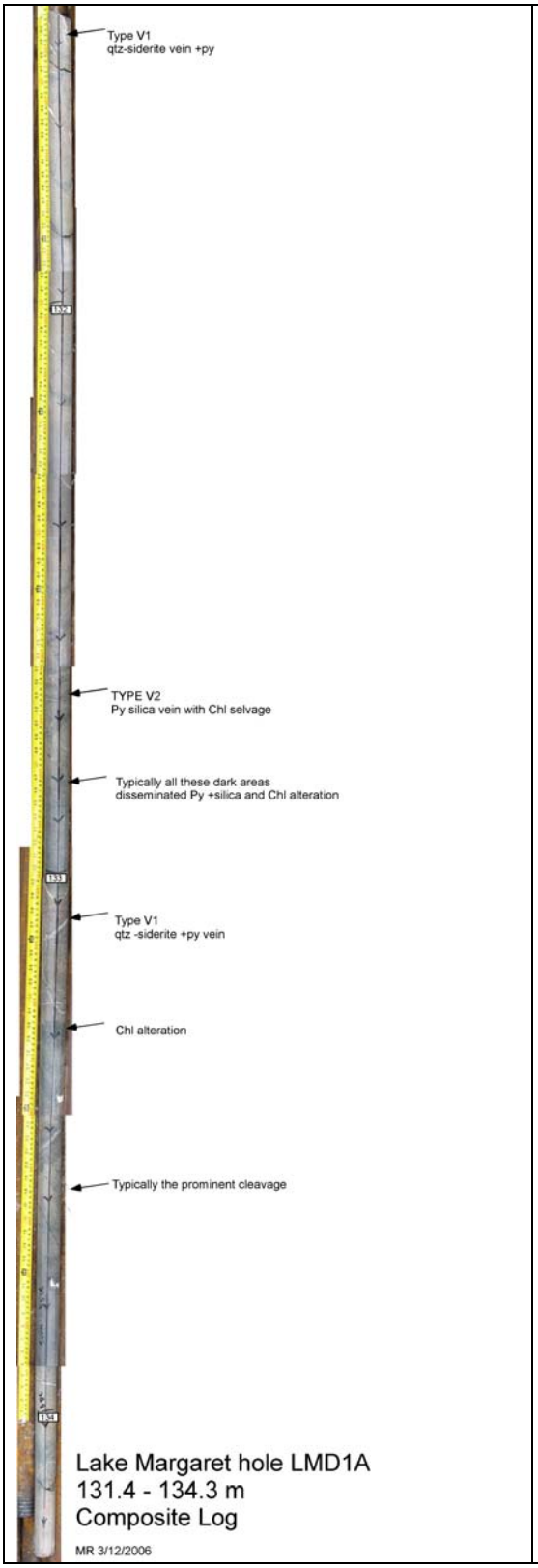

Figure 6. Composite pictorial log typical of the alteration and veining cutting the felsic volcanics; probably a rhyolite or dacite

Structural Geology

In the rhyolite the alteration veins appear to predate the deformation, defined by a prominent cleavage commonly with sericite well developed. Stereo plots of the cleavage (Figure 7 b and d) give the principal orientation at 80 to 60. The principal orientation of the veins is measured at 86 to 244 (Figure 7c). These measurements are relative to rue grid north and future holes should be orthogonal to this vein direction.

The most prominent foliation in hole LMD01 (in volcanics) and up the hill in the Owen Conglomerate (termed Sp herein) is most likely the regional D2 foliation, the most widespread and prominent regionally. No primary bedding (S0) was measured LMD01. A reading of dip 75 to dip direction 275 was made on top of the hill in the Owen conglomerate. The Owen conglomerate is faulted against the central volcanic complex in LMD01 at 229.9m. The fault zone is marked by clay pug.

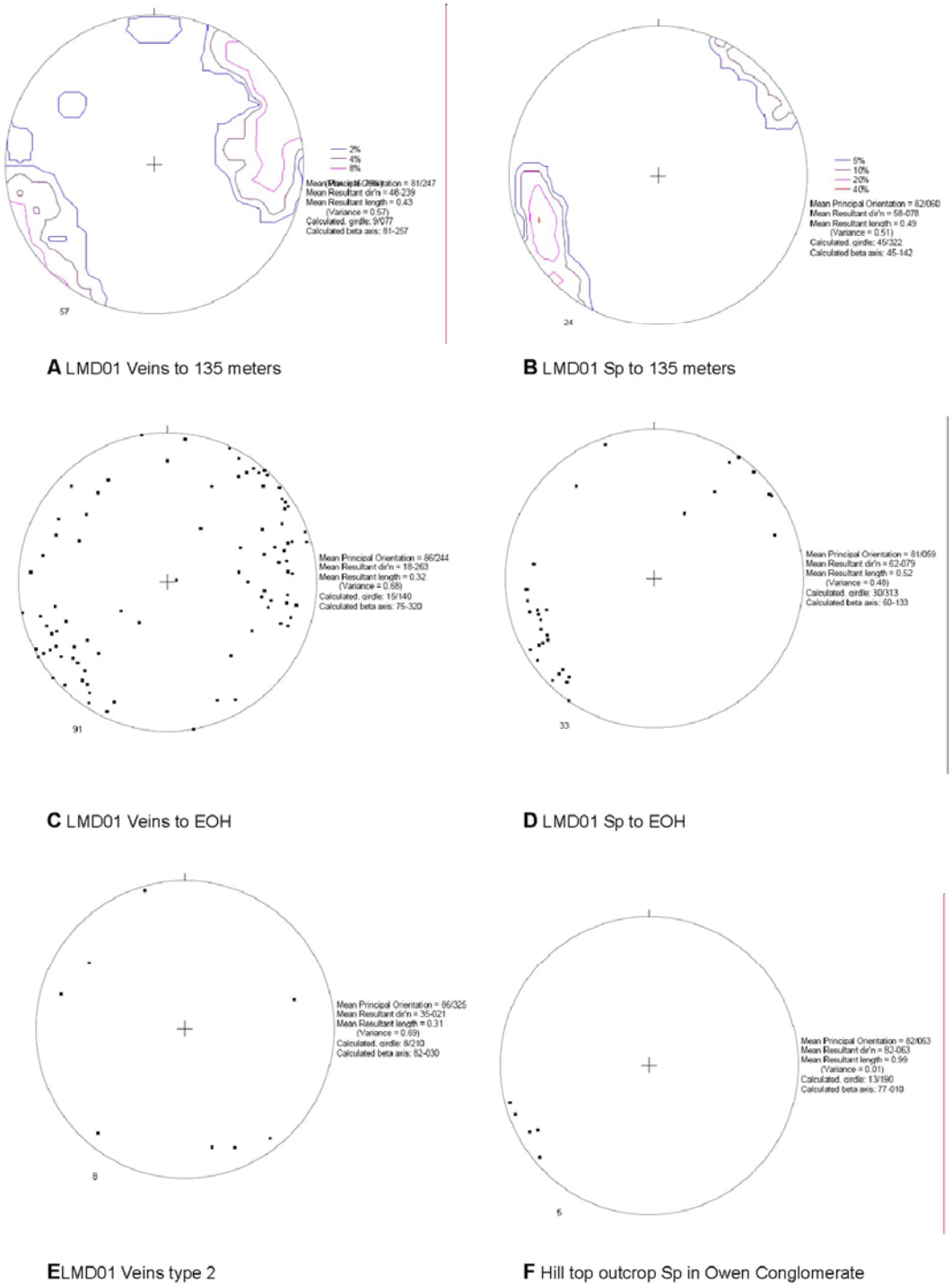

Figure 7. Structural plots equal area projections. Plots (A) and (C) are of veins in LMD01 86/244, principal orientation is 86 to 244; Plots (B) and (D) are of the most prominent cleavage in LMD01, principal orientation is 81 to 59. Plot (E)is of a few type 2 veins, these are too few to be important. Plot (F) is of 5 readings on the most prominent cleavage in the hill top outcrop of Owen conglomerate 82 to 63, a good match for the cleavage in the volcanics in LMD01. *All orientations are true north azmuth. (software used Rod Holcomb's program GEOrient).*

Lithology

The summary lithology log is:

0-12.1 metres, glacial slope deposits
unconformity
12.1 – 46.7 metres, Rhyolite, pink,
47.6 – 56.3 metres, Andesite, grey green
56.3 – 86.5 metres, Rhyolite, pink
86.5 – 90.8 meters, Andesite, grey-green
90.8 – 171.2 metres, Rhyolite, pink
171.2 – 174.2 metres, Andesite, green
174.2 – 229.9 metres, Rhyolite, pink, pink-red, buff occasionally grey
fault (clay pug)
229.9 – 231.73 metres, conglometate, grey – brown
231.73- 232.1 metres, shale, grey - brown
232.1 – 242.3 metres, conglomerate, grey

Detailed Log of Hole GFDD03

Please note the detailed logs are in files (appended); these include a lithology and alteration log (Appendix 1, log_LMD01.xls), and structure logs in Appendix 2 as .txt files.

Lithology codes and brief description

Lithologies encountered in diamond drill hole LMD01 were dominantly volcanic except for the slope deposits and the Owen Conglomerate in the end of the hole.

Slope Deposits
Overburden of probable glacial origin, derived from the Owen conglomerate and the Cambrian volcanics. A gravel of volcanic clasts and rounded quartzite conglomerate set in an unconsolidated sand matrix. Difficult to drill.

rhyl
Rhyolite, field term usually pink feldspar, siliceous rock slightly phyric in hand specimens. The red-pink colour may in part be alteration of feldspar by heamatite.

Figure 8. typical rhyolite.

Andesite
Field term for a green grey fine grained volcanic, at rare intervals in the core. May be just more chloritic altered volcanic. Some patches of darker material may be fragmental.

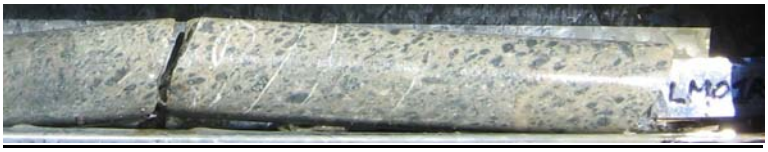

Figure 9. typical Andesitic variation. Note the patches that could be fragmentals.

Conglomerate
Owen conglomerate. Pebbles mostly well rounded pinkish quartzite. Matrix is a greenish sand of volcanclasitic origin.

Type 1 veins
These are the most common vein of white quartz and probably also siderite (as judged by the weathering tarnish). Normally a few percent pyrite disseminated, chlorite selvage and sericite. See Figure 6, above.

Type 2 veins
Less common a grey siliceous vein of silica-chlorite and pyrite.
See Figure 6, above

Mineralisation

Besides a few traces of chalcopyrite the only other metal was in a few places with galena. These were at in LMD01A at 144.7 (see Figure 10) and pervasive patches from 143.0 to 143.35 metres.

Figure 10. typical patches of galena.

Structure codes and brief description

Most prominent fabric Sp
The dominant fabric observed within LMD01 is a penetrative cleavage (designated Sp). The rocks are only of moderate strain. The fabric cuts alteration and veining and often is highlighted by sericite. It is not a crenulating fabric. It is widespread and of similar orientation in the core (LMD01) than up the hill in the conglomerate and through the fault. This suggest it is late and not re-oriented by the fault. See Figure 7 for the orientation study. The local Sp is probably similar to the regional S2. The cleavage can be seen in Figures 6, 8 and 9.

Figure 11. Bedding and cleavage as seen in the Owen Conglomerate up hill from the hole (loc 213). Measurements clearly show that the orientation cleavage on the hill is similar to that in the hole. View to the north similar to the section in Figure 4.

Fault

The Great Lyell Fault is here represented by the a fault close to the Margaret Fault (Figure 1). It was intersected in hole LMD01 at 229.9 metres. The contact was sharp and filled with 10 cm of gray clay pug. See Figure 12.

Figure 12. Fault intersection at 229.9, the probable equivalent of the Great Lyell Fault. Note the conglomerate is on the left and the volcanics on the right.

Discussion

The area of the IP anomaly at least on section 9050N is now confirmed alteration generally similar to Mt Lyell and the host rocks are also most probably part of the Central Volcanic Complex as at MT Lyell. The figure below outlines the main structural elements, the fault, the cleavage and the vein system. It is no surprise that the vein system may be cut off by the fault in the south but will trend away from the fault in the north.

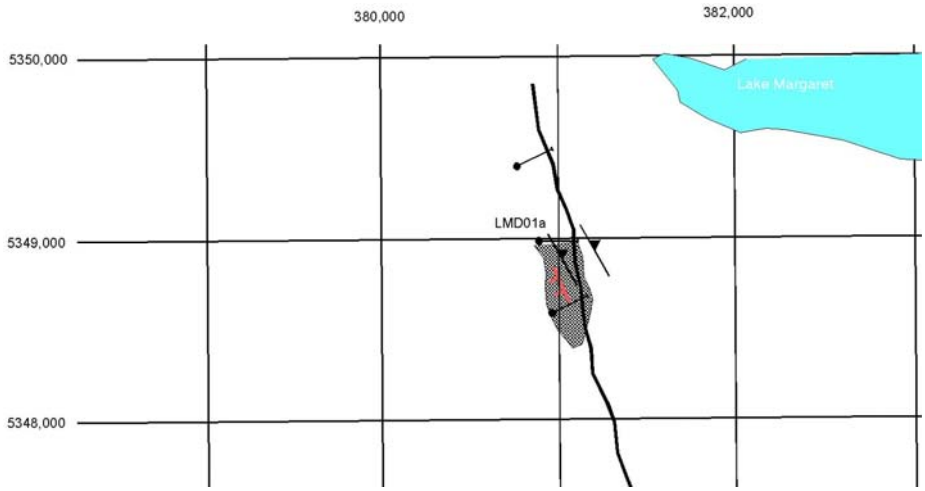

Figure 13. The interpretation map of the anomaly area. Cleavage shown as triangle (dip 80 to 60), red symbol shows dip of vein system 86 to 244. Therefore proposed future holes shown north and south orthogonal to vein system Az 64.IP anomally stippled.

The other similarity to Mt Lyell is the association with a fault that is analogous to the Great Lyell fault. If the interpretation of Noll and Hall 2005 is correct this fault represents a growth fault during the Owen Basin extension that has been deformed twice in the Devonian. It is likely that the cleavage we see is the second deformation and the fault has been folded and probably overturned locally on the section as illustrated in Figure 4. Prior to overturning of the fault the mineralisation would have been in the footwall. Note that the published section of Noll and Hall shows the fault as a reverse (reactivated

normal) east dipping fault (Figure 14). The interpretation made now (Figure 4 herein) with the benefit of the drill intercept is that the fault dips west, is reverse, and if a reactivated normal fault is also overturned.

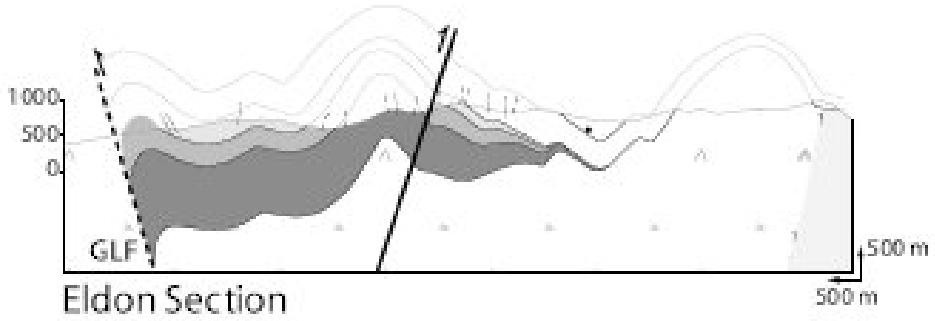

Figure 14. The published section from Noll and Hall 2005 in about the same area (view to north), shows the area we drilled at the western end. We now would have the fault west dipping as in the section in Figure 4, not east dipping as above. We agree with the fold vergence and also that this may be a F2 fold against the fault. The broad upright in the centre of the section is interpreted as a regional F1 fold by Noll and Hall.

Conclusions

A 200 metre wide vein system associated with pyrite and chlorite sericite alteration is orientated dip 86 to 244 true. The system will close on the fault to the south and open away from the fault to the north. Future hole design should aim at Az 64 degrees true and should be drilled both north and south of the first hole LMD01A.

Acknowledgement

We wish to thank Terry Lees of Copper Strike for tendering this job to PGN. All the various parties that helped make the job go well are thanked; ALMAC drilling, Tas Helicopters, Min Resources Tasmania, Tas Hydro, Rogers Exploration, Extended Minerals and Copper Mines of Tasmania.

References

Noll, C.A. and Hall, M. 2005*.* Great Lyell Fault, western Tasmania: a collage of Middle and Late Cambrian growth faults reactivated during Devonian orogenesis.

List of data appended to the CD version of this report

Appendix 1 Logs. And collar and survey files
Appendix 1A pictures
Appendix 1B movies

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Appendix 2 stereoplots
Appendix 3 crosssection
Appendix 4 petrology
Appendix 5 assays
Appendix 6 mapping notes
Appendix 7 permitting