

Pallawah Hill Relinquishment Report 2010 - EL 45/2006



Altered and mineralised examples of Dove Granite.

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Summary

The Pallawah Hill exploration licence (EL45/2006) was granted on April 16th 2007. This is the relinquishment report for Pallawah Hill and is submitted in a Mineral Resources Development Act (1995) compliant format by Pluton Resources Ltd. (Australian Stock Exchange Code: PLV, hereafter Pluton). Pluton held a 100% interest in the licence by way of it's subsidiary Dove River Pty. Ltd.

The Pallawah Hill exploration licence has a number of mineral occurrences, an unexplained gold occurrence noted on the regional inch to a mile Middlesex map sheet (Little Bell) and a number of sites with altered Cambrian rocks. The licence was cursorily examined for altered volcanics and Cambrian intrusives and the level of alteration was deemed of interest to the company.

Pluton Resources has focussed on the region because it is believed that there are many characteristics of the copper-gold porphyry districts in New South Wales, which includes the Cadia and Goonumbla deposits.

Recent reconnaissance scale sampling and interpretation of modern geophysics (previous to the application) by Pluton shows the Pallawah Hill area contains areas of alteration within and adjacent to the Dove Granite 'intrusive complex'. Rock chip sampling from the eastern part of the licence had identified better than expected alteration within the Dove Granite, however an assessment of previous data has downgraded the area.

Pluton identified four areas of interest within the licence: the Campbell River copper occurrence (a potential extension of the Devon Mine structural corridor); the strongly altered Mersey River 'Pluton' and granite margins; the Olivia Creek base metal occurrence; and the strongly altered intrusives on Gads Hill. These areas are considered to be less prospective for bulk tonnage copper-gold deposits than Pluton's current Tasmanian tenement portfolio. Pluton is voluntarily surrendering EL45/2006.

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Tenure

A tenement application (ELA 45/2006) was made for an area of 60km² immediately adjacent to the 100% Pluton owned Dove River exploration licence. The tenement was granted by the Minister for Resources on 16th April 2007. The exploration licence is located within the Mt Read Strategic Prospectivity Zone. This provides for security of exploration tenure by way of compensation of reasonable cost of work conducted (or resource defined) if a change in the tenement's land status results in the licence being revoked. The licence is held by Dove River Pty. Ltd. a subsidiary wholly owned by Pluton Resources Ltd.

Location and land classification

The licence is located south-west of the township of Sheffield (pop approximately 1000) and about 60km from port facilities at Devonport (figure 1). The licence land classification consists of State Forest, MDC Informal Reserves, Forest Reserve, Private Land, Regional Reserve, lakeside HEC controlled land.



Figure 1: EL45/2006 location, licences with green boundaries representing Pluton's other granted licences.

Topography

The licence traverses Gads Hill and the Mersey and Forth Valleys either side. The western part of the licence is dissected by the Campbell and Dove Rivers. The topography of the licence is variable with relatively flat areas on Gads Hill and adjacent to Middlesex Plains (defined by basalt plateaus) and deeply incised valleys below them. Contours vary from

230m at the edge of Lakes Cethana to >700m on Olivers Plains. The slopes above the Dove River and Mersey River are steep with areas west of Pallawah Hill particularly rugged. Despite the variable topography the access is quite good (see below).

Access

The level of access to the broad (east – west) licence is good with only the major rivers having incised valleys that are not easily traversed.

Access to the Western Part of the Pallawah Hill licence is via the Cradle Mountain Link Road (C132) by way of gravelled forestry track that runs southerly from the Middlesex Plains area. Access to the central part of the licence south of the Dove River is via Lemothyme Road (C139) then a bridge over the Forth River above the Lemonthyme Power Station. This forestry access has a locked gate and the tracks contour westward around Pallawah Hill. Access to Gads Hill is via the Lemonthyme Road and Gads Hill Road (an easterly turn off). The eastern most access is via the Mersey Forest Road, this is connected to Gads Hill by way of Olivers Road via Liena.

Vegetation and Soil

Vegetation comprises wet and dry eucalypt forest typically dominated by Eucalyptus Viminalis, Obliqua and Amygdalina spp. On wetter south facing slopes and near river banks there is dogwood scrub and Acacia Dealbata forest. Rainforest is occasionally present adjacent to creeks and on elevated basalt plateaus. Undergrowth is dependent on how dry the site is, but typically consists of spiky heath or ferns.

The soil profile is extremely variable with deep soils over both granite and basalt. In areas of deep incision the soil profile is almost non-existent with exposed weathered bedrock and significant talus slopes.

Geology

EL 45/2006 is contained within the northern portion of the arcuate Mt Read Volcanic belt which wraps around the Precambrian Tyennan basement. This belt comprises Cambrian c500Ma Mt Read Volcanics and associated intrusive rocks, unconformably overlain by Cambro-Ordovician siliciclastics and limestones. The Mt Read Volcanic belt is highly mineralised, containing numerous polymetallic VHMS-style deposits (e.g. Hellyer, Que River, Rosebery) and volcanogenic copper-gold deposits (eg. Mt Lyell, Henty). Parts of the Palaeozoic sequence are covered by Tertiary basalt.

Very little detailed work has been undertaken in the current licence area. A description of the known lithologies and observed variations within the licence are summarised below.

Precambrian Schist

The oldest rocks in the area are Proterozoic schists. The schists are strongly deformed and have a well developed foliation, they are typically light grey with a dark grey spotting or banding with mica rich and quartz rich alternating bands. Reid (1967) describes these rocks as quartz-sericite schists and quartzites. The schists occupy the southern margin of the lease and are intruded by the Dove Granite and are probably unconformably overlain by the Cambrian Volcanics

Cambrian Volcanics

The Cambrian volcanics within the licence area have not been assigned a formal correlation with the Mt Read Volcanic stratigraphy, however the volcanics appear to be scarce within the licence. The Cambrian sequence is dominated by the intrusive Dove Granite.

Dove Granite

The Dove Granite is regionally mapped as three occurrences, one in each of the Mersey, Forth and Dove valleys with exposures known on Gads Hill and as dykes within the Precambrian Schist. The Dove Granite is of variable composition with many workers attributing the associated porphyritic units to marginal phases of the main 'stocks' (eg: Herrman in Fleming and Castro, 1989). The granitic rocks are tentatively subdivided into felsic (Monzogranite), three phases: biotite granite felsic biotite-hornblende granite/granodiorite and intermediate hornblende granodiorite/quartz-diorite. These descriptions are from recent petrological work and initial hand specimens and drill core descriptions including some from the adjacent Dove River licence and are not definitive.

The variability in granite samples collected from the Mersey Forest Road show a range of alteration styles, particularly evident is the strong sodic (albite) alteration which produces an apparent leucogranite by way of ferromagnesian mineral replacement. Similarly, on Gads Hill, specimens with strong potassic alteration appear to be almost pure orthoclase in hand specimen. Further mapping and study of the geochemistry would determine the true composition and classification of the phases of the Dove Granite.

Ordovician Sandstones

The area west and north of the Dove Granite exposed on Gads Hill Road is typical of the Moina Sandstone regionally with blocky grey pebble sandstone and orthoquartzite the main lithologies noted in float and at a single quarry exposure.

Tertiary Basalt

The Tertiary Basalt is a fine-medium grained vesicular dark rock with occasional zeolites and calcite veins. It is commonly underlain by Tertiary sediments. Herrmann in Fleming and Castro (1989) estimated Tertiary Basalt flows south of the Post Office Tree are likely to be only a few tens of metres thick. No attempt has been made to further assess the thickness of basalt cover.

Quaternary Glacial and Fluvial Deposits

Although not prominent in the main part of the licence there are surficial deposits of known glacial origin on the flanks of the Mersey River valley.

Exploration Philosophy

Exploration within EL45/2006 was focussed on locating alteration characteristic of Porphyry copper-gold mineralisation. The licence was applied for to cover extensions of mineralisation and alteration mapped on the adjacent Dove River Licence (EL14/2006) and to cover historical stream sediment anomalism mapped in the Olivia Creek area (west of the Dove River EL14/2006). Also the idea was cover eastern and western extensions of the Dove Granite.

Exploration undertaken

A regional assessment of the Western Tasmanian Regional Minerals Program data was made and this identified areas of high radiometric response associated within and adjacent to known Dove Granite occurrences.

To locate alteration of the preferred target style regional sampling was done on the eastern portion of the Dove Granite outcrops. Mapping of the area has been observed at a reconnaissance scale only, with the focus being on Gads Hill where known outcrops of Dove Granite have been investigated. The area contains boulders of breccia which contains quartz veining, this was originally interpreted to be a diatreme breccia which could have indicated a high level of intrusion near a porphyry, however further consideration suggests it is a deep hydrothermal breccia within a 'batholith like' granite margin.

The surrounding Granite is strongly potassically altered and contacts with the diatreme breccia preserved in boulders are sharp. Pluton originally considered that this area which includes the Little Bell gold prospect should be the focus of a soil survey and more detailed mapping. A visit by an independent geologist suggested that the breccia was of little exploration interest due to an obvious lack of sulphide.

Assays and petrology did not define features of specific interest to the target mineralisation type. The petrological descriptions by contract petrologist Paul Ashley of seven samples from previously collected rock chips are presented in Appendix 1 of the 2009 annual report. The Dove Granite samples are described as a suite of granodiorite, monzonite (syenite?),monzogranite and quartz diorites with incipient to strong alteration. Propylitic alteration is the most common with best development in the adjacent (intruded) volcanics. Albitic alteration is limited to quartz poor intrusives.

Rock samples were collected during reconnaissance mapping traverses on Gads Hill and the Mersey Forest Road for geochemical analysis. Initial results for selected hand samples have not revealed any strong anomalism and are consistent with values reported by Shell in 1982. Some of the granites collected from Gads Hill and the Mersey Forest Road are strongly altered with orthoclase and albite dominated alteration, photographs of this strong type of alteration can be found in Appendix 2 of the 2008 annual report. Assay files for all rock chips are also appended in Appendix 1 the 2008 annual report and their locations in an addendum to that report

No further exploration apart from the review of the Exploration History (below) has been conducted in this period.

Exploration History

James 'Philosopher' Smith discovered alluvial gold in the Forth River in 1859 near Golden Point approximately three kilometres north of Lorinna (Jennings 1963). The Campbell brothers opened the first hard rock mine in the early 1880's on the east side of the Forth River. In 1887 a gold discovery at Five Mile Rise was made by J Aylett at the "Great Caledonian" Mine (Reid, 1919). The proximity of these deposits to the Dove Granite has prompted minor interest n the Pallawah Hill area and no significant hard rock workings have been reliably identified in the tenement, regionally workings have been confined to the adjacent Dove River tenement. No systematic exploration has been recorded for disseminated copper-gold mineralisation within the tenement, however several regional stream sediment surveys provide limited coverage of the area. The known company reports on the area are recorded below in chronological order with supplementary information below this from Mines Department reports.

Cataract Mining Syndicate

Larsen (1939) reported on a chalcopyrite lode from "Cataract Creek". The 18 inch wide lode produced a hand picked piece of ore that assayed 10.6% copper. The location of the deposit is not exactly known due to the vague nature of the location of the Welcome home prospect (see Mines Department reports below).

Mt Lyell Mining and Railway Company Ltd

Reid (1967) conducted an aeromagnetic survey and a regional -80# stream sediment survey for tin, copper and zinc. Several anomalies were found including a copper and zinc anomaly in Olivia Creek. No table of assays accompanies the report, however the map indicates a 64ppm copper anomaly on the northern fork of Olivia Creek and a peak zinc anomaly of 182ppm near the confluence with the Dove River. The strongest copper value in Campbell River was followed up by Comalco (see section below). Foster (1969) reported on a VHEM and soil geochemistry survey over "Aeromagnetic anomaly D" immediately east of Carruthers Creek. A VHEM anomaly coincident with the ground magnetic anomaly was found to parallel the schistosity of the Precambrian rocks and possibly represents small pyrite-pyrrhotite lodes. Soil geochemistry only recorded background values of <50ppm for Cu, Zn, Ni and Co on this grid. The grid is referenced on one 1970 map as the "Dove River Grid" which may be helpful if further reports are located.

Freeport

Austin (1973) conducted a regional stream sediment sampling program centred on the Dove River to the north and east of the western lobe of the current licence. Freeport located significant copper anomalism regionally in stream sediments using -40# and -80#. Although only one of these samples was taken inside the current licence on a basalt capped plateau above the Dove River (west of the Devon Mine), it is worth noting minus 80 mesh stream sediment sampling was found to be a reliable method for identifying areas of known anomalism. The single sample (No.17) assayed 69ppm Copper and 5ppm Molybdenum which was considered only weakly anomalous.

Comalco

Askins (1980) reported on all activities within EL7/1974 from granting in 1974 to March 1980. Comalco conducted stream sediment sampling in the Campbell River area in 1976. Stream sediment copper anomalism was defined in the Campbell River (to 375ppm Cu) using -80# samples. The source was probably attributable to weathered dykes intruding the Precambrian schists that contain up to 340ppm in rock chip. These samples were taken less than 500m north of the central portion of the current licence.

The regional -20# stream sediment sampling from 1975 also highlighted copper values to 1185ppm in associated rock chip sampling from the headwaters of Olivia Creek, this was later found to be road material transported from an old mine dump.

Shell

Smyth (1982) reported on regional work done in the Gordon Limestone around Liena, particularly focussing on the possibilities of skarns. Two anomalous (lead/zinc?) values in stream sediments were followed up by soil sampling and no anomalous values were found. A map appended to the report shows some stream sediment sampling inside the current tenement (see Figure 1 below). Tributaries of Mill Creek possibly where they cross the Lake McKenzie Road had the highest values of 85, 50 and 60ppm Copper. These streams drain a weak magnetic high in a unit mapped by Jennings (1963) as Moina sandstone adjacent to the Dove Granite. Details of the sampling program apart from the reference to -80# and the respective elements in the legend are poorly described in the report. Rock chips from the current licence area (none upstream of the higher Cu stream sediment samples) reported in the same series of maps are not anomalous for any of Cu, Pb, Zn, Ba, Sn or W.





Figure 2: Shell -80# stream sediment samples for the area south of Liena (results in ppm)

Smyth (1982) also followed up Comalco copper and silver stream sediment anomalies at Olivia Ck on Middlesex Plains. The samples were unrepeatable in follow up stream sediment sampling. It is not clear if these samples are -80# (which would be consistent with those taken at other prospects during 1982) or -20# which is suggested by the reference to a -20# tin anomalous sample in the re-sampling.

During the regional assessment of Precambrian Rocks, Smyth also located an isolated shear zone in a small quarry approximately 1km south of Olivia creek. Interestingly the pyritic zone assayed 260ppm molybdenum (presumably a grab sample). The shear was noted to cross cut foliation in the schist and to be steep and of a similar (north-westerly) trend to the Five Mile Rise veins.

Base Resources

Wood (1984) reported on the mineralogy of stream sediment samples taken for diamond exploration in the Lemonthyme exploration licence 29/1983. The samples contained variable amounts of garnet and diopside which are possible indicator minerals. No diamonds were found during the program. Several of the panned concentrate samples were clearly taken from Swift Creek, Carruthers Creek and Olivia Creek within the current licence and the descriptions may be of use to future explorers.

Rio Tinto Exploration

Madden (1997) reported on Rio Tinto's work to identify sediment hosted fine grained gold in the region. They collected regional stream sediments and panned concentrates, 3 of each from the current licence area (Sample numbers: 5474923-25 and 5852323-25) and a pair of samples immediately south of the licence (Sample numbers: 5474926 and 5852323). Copper, Molybdenum and gold values were all low with peak Au in panned concentrate 0.016ppm Au. The licence was relinquished after a negative assessment of the stream sediment program.

Mines Department Reports

Henderson (1941) describes the Welcome Home copper prospect, a chalcopyrite bearing sulphide vein in the Precambrian Schists southeast of Middlesex Plains, the nearest outcropping source for these was believed to be the 'granite porphyry' from near the Devon Mine. The inference was that the granite is Devonian, an age disputed by later literature that gives dates suggesting the Dove Granite is Cambrian.

Veins are said to occupy chloritised faults up to five metres wide. The veins are described as typically lenticular with a steep easterly dip, and are seldom exposed except in creek beds and the base of the Dove River. A bulk sample of material from the main workings is reported to have assayed 4.2% copper. The Welcome Home copper prospect is thought to occur just west of the tenement boundary.

Jennings (1963) reported on the Middlesex map sheet. A prospect located on the map sheet called Little Bell has no description in the accompanying notes. There is no other known description of these workings although they are likely to be similar to the fault controlled lodes of the Five Mile Rise goldfield if the prospect is a Moina sandstone hosted Au deposit or an alluvial gold prospect. The name Little Bell may have been a reference to the smaller

nature of a prospect similar to the Bell Mount prospect which was the most significant alluvial gold producing prospect in the region in the late 1800's.

Discussion and conclusions

The nature and distribution of mineralisation previously identified within the tenement is typically vein style. Petrographic work and lithogeochemical assessment have not precluded the target style of mineralisation (Porphyry copper-gold) from the area, however an assessment by an independent geologist and a consideration of intrusive textures identified in the region suggest the Dove Granite is 'batholith like' in the priority area of interest and is unlikely to have well preserved mineralised porphyry apophyses in the adjacent rock types due to a lack of broad magnetic character or metal anomalism associated with the observed alteration.

Pluton also intended to undertake mapping traverses on Forestry Roads, Campbell's River, Mersey River and Olivia Creek, this was not completed due to other exploration priorities.

Pluton was looking for a bulk tonnage copper-gold-molybdenum+-REE target on the licence and the possibility of such an occurrence has been downgraded relative to the prospectivity of such targets on Pluton's adjacent licences.

Environment

No environmental impact has occurred with the rock chip program and office/lab based continuation of the program.

References

(Complete bibliography of known reports covering EL 45/2006)

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Appendix 1 – Assay Data (complete digital data relating to EL45/2006)