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# Unity Mining Limited

## Henty Gold Mine

# EL 8/2009 Red Hills
## Annual Report for Period
## 16 November 2013 to 15 November 2014

## Vol. 1 of 1

## November 2014

| | |
|---|---|
| **Held by:** | Unity Mining Limited |
| **Manager & Operator** | Unity Mining Limited |
| **Author:** | P.G. Stonestreet |
| **Date:** | November 2014 |
| **Map Sheets:** | Tasmania 1:25,000 Series Selina (3836)<br><br>Tasmania 1:100,000 Series Sophia (8014) |
| **Geographic Co-ordinates (GDA94):** | Min East: 381,000m<br>Max East: 384,000m<br>Min North: 5,363,000m<br>Max North: 5,368,000m |
| **Commodity(s):** | Base metals, gold, silver |

## 1.0 ABSTRACT

Work during the reporting period focused on defining a possible northern extension of the 'Lower Mineralised Horizon' as well as seeking to better define and understand the mineralisation and alteration at the historic workings referred to as the 'Northern Adits'.

Work undertaken during the 12-month report period, ending 15 November 2014, comprised:

- Compilation and review of historic exploration data.
- General field reconnaissance/mapping and rock chip sampling.

Total expenditure on the tenement during the reporting period was $9268. In June 2014, Unity Mining was granted a 12-month stay of expenditure on exploration leases adjacent to the Henty Mine Leases to focus on near-mine exploration, after the company had announced closure of Henty.

UML intends to continue exploration of EL 8/2009 in 2014-2015 (Year 6 of tenure), focused on gold and copper mineralisation targets hosted within altered rhyolitic lavas of the Central Volcanic Complex at the north end of the lease.

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# 2.0 INTRODUCTION

This report details exploration completed by Unity Mining Limited (UML) on EL 8/2009 Red Hills over the past year.

UML intends to continue exploration on the EL in the next 12 months, principally with diamond drilling to test at depth the 'Northern Adits' Cu-Au mineralisation.

Preliminary planning to conduct a 3D Induced Polarisation Survey across the northern portion of the Red Hills Tenement has commenced but is yet to be completed. The planned survey would extend into the Tullah Tenement (EL11/2010) also currently held by UML enhancing coverage of the inferred prospective stratigraphic horizon.

EL 8/2009 Red Hills is due for relinquishment on 15 November 2014. A 12 month extension has been submitted to Mineral Resources Tasmania.

## 2.1 Location & Access

EL 8/2009 Red Hills is centred approximately 25 km north of Queenstown in western Tasmania. The western boundary of the EL abuts UML's Henty Gold Mine Lease 7M-1991 (Figure 1).

Access to the EL 8/2009 area from the south is via the Anthony Road (B28), the unsealed Howards Road to the Henty mine site, then by mine service road and formed 4WD tracks. The main 4WD track from the Henty mine crosses from the west over Moxon Saddle into the central section of the EL. Alternative access to the eastern section of the EL is possible on foot from a departure point along the Anthony Road (B28) north of Lake Plimsoll.

## 2.2 Tenure

EL 8/2009 Red Hills, covering 11.0 sq km, was granted to Bendigo Mining Ltd (BML) on the 16th November 2009 for a period of five years. The company submitted a successful bid to explore the tenement in accordance with Mineral Resources Tasmania's Exploration Release Areas process. Application for the EL was lodged shortly after BML's acquisition of the Henty gold mine in July 2009. BML announced a change of company name to Unity Mining Ltd (UML) effective from 6 December 2010.

Recent amendment of the Land Tenure classification has resulted in the entire EL area being located within the Mount Murchison and Lukes Knob Regional Reserves. All exploration activity proposed on the tenement requires assessment by and approval from the Mineral Exploration Working Group (MWEG) prior to commencement. Approval of exploration programs is conditional upon UML meeting the requirements of the Mineral Exploration Code of Practice and all site specific conditions.

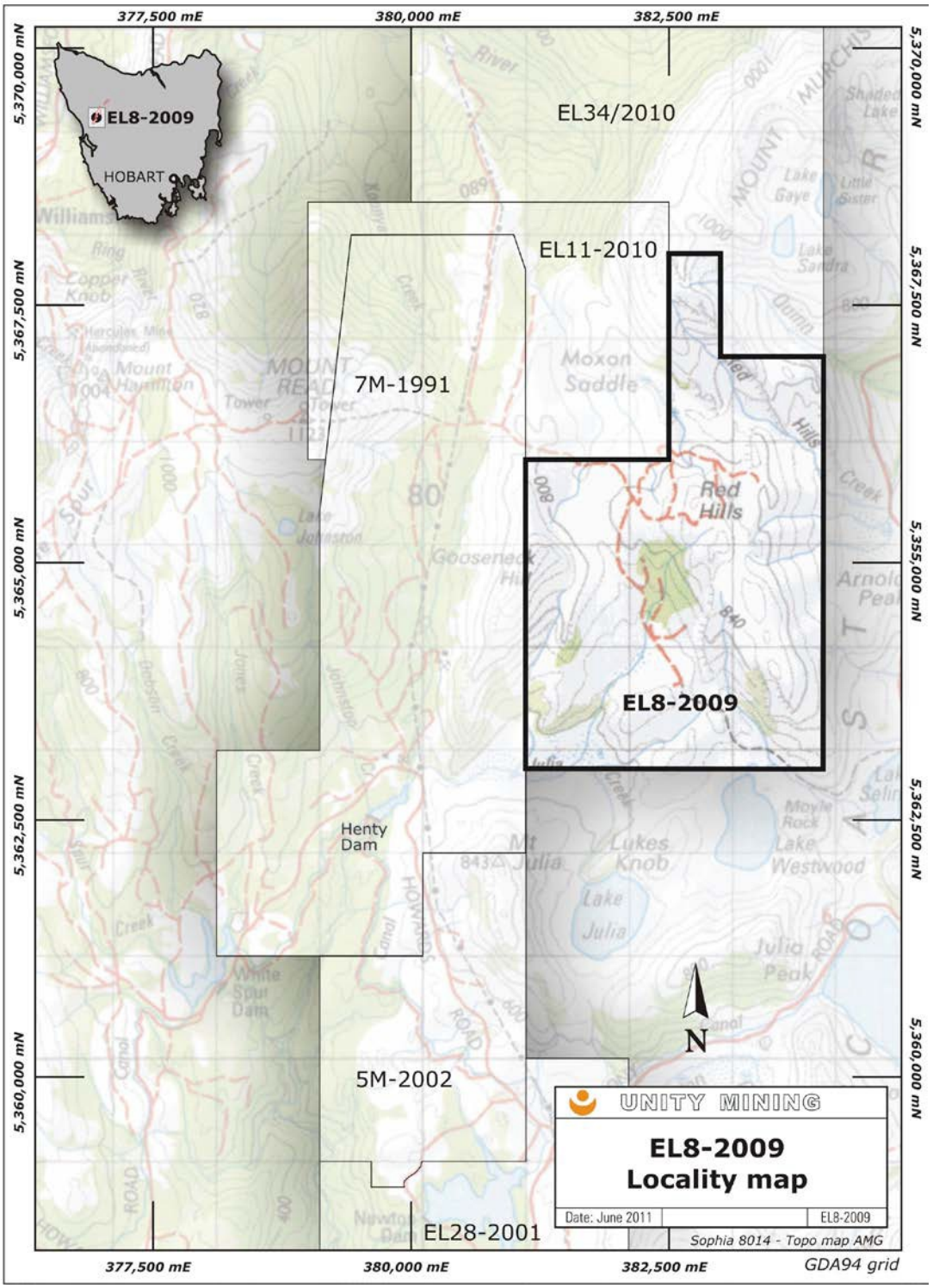


**Figure 1: EL8/2009 Red Hills location map. Other UML tenements in the Henty mine area and adjacent to EL 8/2009 are also shown. Projection is UTM Zone 55 MGA94 co-ordinate system.**

## 2.3 Topography Climate and Vegetation

The EL 8/2009 Red Hills area is located at the northern end of the West Coast Range. Elevations range from 607 m AHD at Lake Westwood, immediately to the south of the EL, up to 1275 m AHD at Mount Murchison, north of the tenement area. The distinctive Red Hills in the central section of the EL are up to 850 m AHD in elevation. Snowfall is frequent during winter months and the area receives very high rainfall. Average rainfall calculated from

observations at nearby Mount Read weather station, over the period from 1996 – 2009, is 3086 mm per year.

Low-growing montane vegetation is dominant throughout the EL area. Buttongrass moorland, typical of blanket bog terrain in western Tasmania, is extensively developed on the poorly drained soils of the area. Some scattered stands of low scrub, mainly banksia, teatree, bauera and eucalypt occur in relatively sheltered and fire resistant areas. Rainforest vegetation, including Myrtle Beech (Nothofagus cunninghamii), Deciduous Beech (Nothofagus gunnii) and King Billy Pine (Athrotaxis selaginoides), is preserved in sheltered gullies in the headwaters of Julia Creek.

# 3.0 GEOLOGY

## 3.1 Regional Geology

A major portion of the EL 8/2009 Red Hills area is underlain by the Cambrian Mount Read Volcanics (MRV), apart from the eastern section of the tenement which covers a thin strip of Late Cambrian - Ordovician Owen Group.

The MRV comprise a package of massive, feldspar-phyric lavas and volcaniclastics, which passes upwards into a mixed sequence of basaltic to rhyolitic lavas, intrusives and volcaniclastics, with intercalated shale and siltstone. In general, there is a transition from feldspar-phyric to strongly quartz-phyric lithologies from the bottom to the top of the sequence. On a regional scale the MRV is divided by the north-northeast – trending Henty Fault. Red Hills EL 8/2009 is located to the east of this major structural feature (Ref. Figure 2).

The Owen Conglomerate consists of siliciclastic sediments, including large volumes of very coarse siliciclastic conglomerate, which unconformably overlie the MRV. Clasts within the conglomerate are dominantly metaquartzite, derived from the Proterozoic Tyennan basement further to the east, with little or no material from the MRV.

Rocks in the region have been subjected to at least two major polyphase deformations, one in the Cambrian and the other in the Devonian (the latter probably equivalent to the Tabberabberan Orogeny). Evidence of the Devonian deformation is apparent in a regional NNE - striking cleavage and development of west-over-east thrusting on pre-existing, NNE structures and synchronous NW striking structures.

## 3.2 Local Geology

The oldest rocks in the EL 8/2009 Red Hills area are rhyodacitic lavas of the MRV, with intercalated black siltstone and shale (correlated with the Central Volcanic Sequence). These volcanic and volcaniclastic sequences are exposed on the eastern limb of an interpreted south - plunging syncline. Massive, quartz-phyric lavas (Mt Julia Rhyolite) and quartz-phyric volcaniclastic sediments, correlated with the Tyndall Group, occur stratigraphically above the CVC rocks in the keel of the interpreted synclinal structure. These younger rocks are also exposed along
the overturned western limb of the syncline, truncated by the Henty Fault in proximity to the Henty mine.

### 3.2.1 Alteration and Mineralisation

Two principal styles of mineralisation have been identified in the Red Hills area:

- Stratabound base metal sulphides+gold+silver VMS mineralisation hosted by CVC mass flow units (Lower Mineralised Horizon). Modern exploration has mainly focused on testing for this style of mineralisation following the discovery intersection in hole RH5. Based on isotopic data, metal ratios and analysis of the alteration assemblages this

mineralisation has strong similarities to the Rosebery VHMS system (Purvis, 2010).

- Vein and disseminated copper+gold+magnetite mineralisation associated with chlorite+feldspar alteration of the Red Hills lava. Earliest prospecting and small scale mining activity was concentrated on this type of mineralisation, as at the Northern Adits area.

Thin zones of base metal sulphides+gold mineralisation hosted within black shale and siltstone units in the CVC comprise the Upper Mineralised Horizon (UMH). Recent drilling has also intersected gold mineralisation associated with pyrite veining in CVC dacitic volcanics, located between the LMH and UMH.

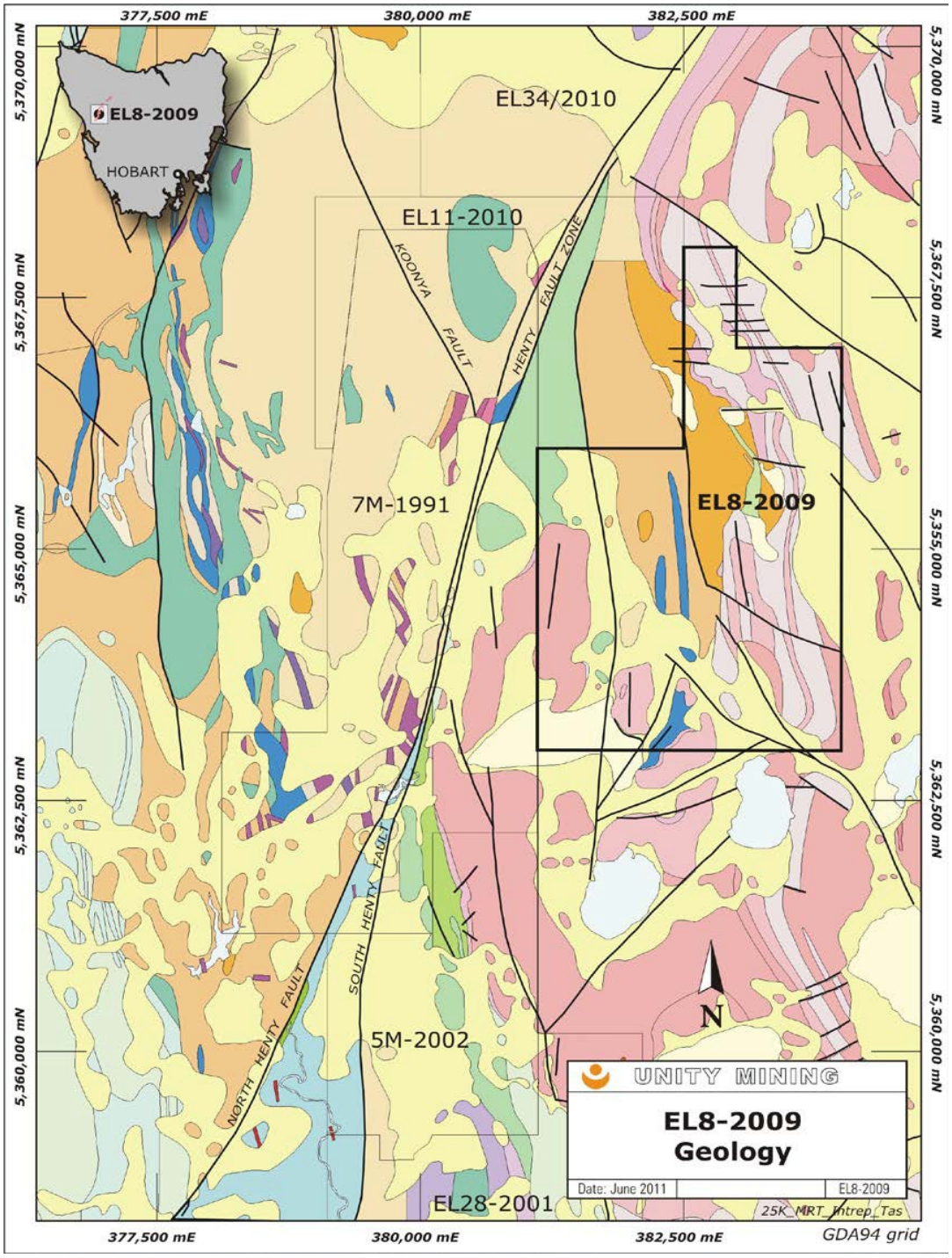


**Figure 2: EL 8/2009 Red Hills interpreted geology map (from 1:25000 MRT). Projection is UTM Zone 55 MGA94 co-ordinate system.**

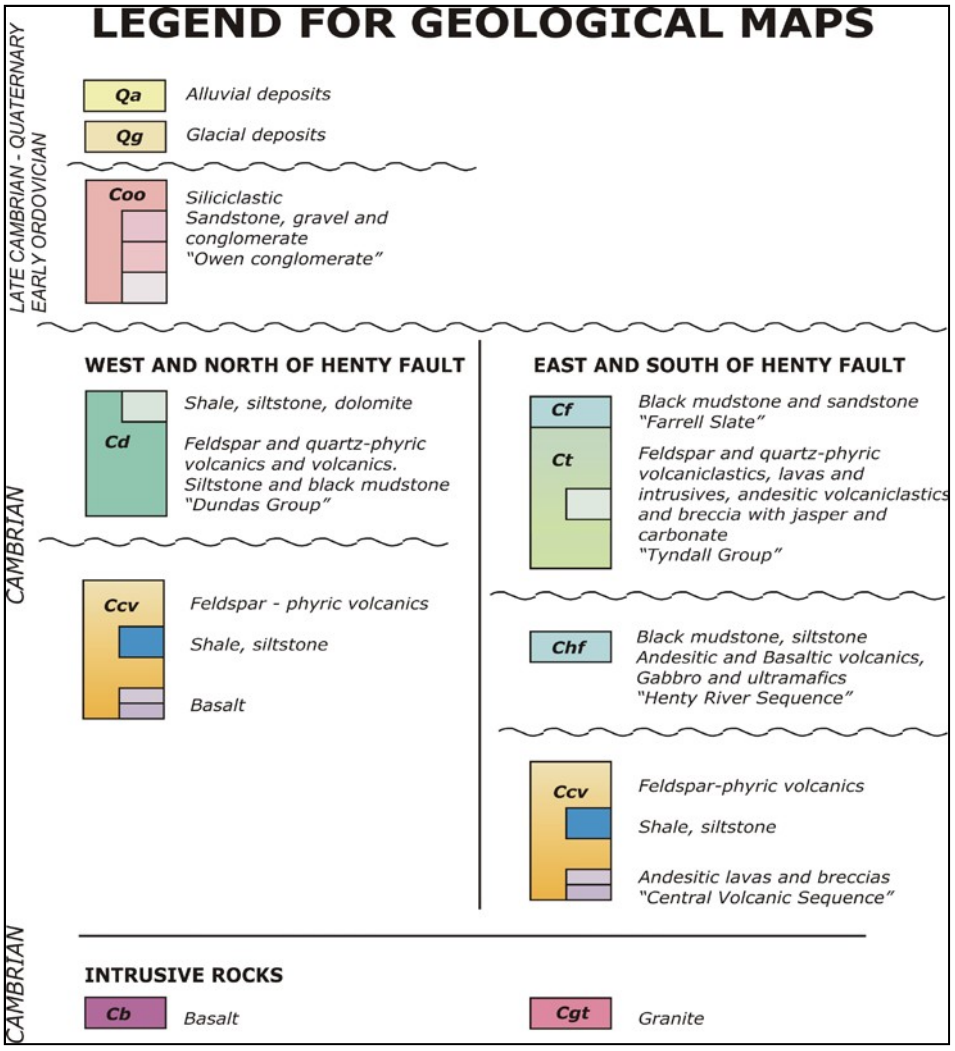


**Figure 3: Legend for geological map.**

| Henty Mine Area Stratigraphy | | | | |
|---|---|---|---|---|
| | **Group** | **Formation** | **Unit** | **Lithologies** |
| *Late Cambrian-Ordovician* | **Owen Group** | | *Owen Conglomerate (OC)* | Siliciclastic conglomerate and sandstone |
| | | | *Newton Creek Sandstone (NCF)* | Turbiditic micaceous siltstone, quartzwacke and conglomerate |
| *Cambrian* | **Tyndall Group (Suite 1)** | Zig Zag Hill Formation (ZZH) | | Rhyolitic volcaniclastic sediments |
| | | | | Bedded sandstone-siltstone units |
| | | Comstock Formation | | Syn-eruptive quartz-feldspar crystal rich sandstone. Massive quartz-phyric rhyolitic lavas, breccias and intrusions (Mt Julia Rhyolite) |
| | | | *Mt Julia Member (MJM)* | Quartz + feldspar-phyric lava and intrusives |
| | | | *Upper Howards Basalt Breccia (UHBB)* | Fine grained basaltic andesite dykes, lavas and lithic breccias (Howards Basalt). Commonly haematitic and carbonate alteration |
| | | | *Lynchford Member (LYM)* | Syn-eruptive feldspar crystal rich volcaniclastic sandstone. |
| | | | | Massive carbonate and marly sediments |
| | | | | Dacitic volcaniclastic sediments |
| | **Central Volcanic Complex (Suite II)** | Anthony Road Volcanics | *Suite II Porphyry* | Quartz-feldspar-hornblende porphyry. Intrusive sill. Peperitic top and bottom contacts |
| | | | *Anthony Road Andesite (CVC)* | Feldspar-hornblende phyric andesite and breccia, extrusive and intrusive |
| | | | *Lower Howards Basalt Breccia (LHBB)* | |
| | **Central Volcanic Complex (Suite I)** | Newton Creek Dacite | | Dacitic volcaniclastic pumice breccias |
| | | | | Dacitic, feldspar-phyric to aphyric lavas, breccias and intrusions. Peperitic contacts |
| | | | | Dacitic to andesitic volcaniclastic sediments\vitric tuff, minor shale, sandstone |
| | | | *Spillway Breccia* | Coarse polymict and dacitic massflows with some sulphide clasts |
| | | | *Spillway Basalt Breccia* | Massive to stratified clast-supported monomictic basalt breccia 'fire fountain' |
| | **Yolande River Sequence** | | *Footwall Pumice Breccia* | Rhyolitic-dacitic massflows, commonly graded |
| | | | | Bedded vitric siltstone and sandstone |

**Figure 4: Henty area stratigraphy.**

## 4.0 PREVIOUS EXPLORATION

Prospecting activity in the Red Hills area commenced in the late 19th Century. Several adits and shallow shafts were mined to work near surface copper mineralisation. Mount Lyell Mining and Railway Company acquired all mineral rights over the area in 1905, however this early phase of prospecting and mining activity ceased shortly afterwards.

Modern exploration techniques were first applied in the Red Hills area in the late 1950s. Work by Rio Tinto and Electrolytic Zinc Company, in joint venture, included various geophysical surveys followed up by drilling of four diamond drillholes.

Exploration was undertaken semi-continuously from 1969 – 1985 when the area was included within EL 9/66 held by Mount Lyell Mining and Railway Company. Work was carried out in joint venture with Getty Oil Development Company from 1977. Numerous geophysical surveys were completed in this extended phase of exploration and drilling comprised 26 open hole percussion and 17 diamond drillholes. Massive base metals sulphides were intersected in drillhole RH5 completed by Mt Lyell in early 1977. A mineral resource of 1 Mt at 2 g/t gold, 37 g/t silver, 4.6% zinc and 1.3% lead was estimated based on intersections in this discovery hole and four step-out diamond drillholes. The mineralisation was considered to be open both above and below the intersection in drillhole RH5.

Geochemical sampling and additional geophysical surveys, including downhole EM surveying of RH5, were undertaken in 1985 – 1993 by CRA Exploration in joint venture with Aberfoyle. Limited diamond drilling follow up was completed. Four additional diamond drillholes were completed in the Red Hills area by Plutonic/Homestake, in joint venture with Goldfields Exploration (later AurionGold, then Placer Dome Asia Pacific).

Newcrest Mining acquired EL 9/2005 over Red Hills in mid 2005. Prior to relinquishing the EL area in 2008 Newcrest completed four deep diamond drillholes (NCT006, NCT007, NCT009 and NCT010). Maximum depth drilled was 792.1m in drillhole NCT 006. Three of these holes were designed to test at depth in areas of prospective stratigraphy for continuation of the stratabound gold-rich base metal sulphides discovered in drillhole RH5. One drillhole (NCT009) was aimed at testing a conceptual gold+copper rich footwall stringer zone within the Red Hills lava of the Central Volcanic Complex.

During the 2010-2011 reporting period, an appraisal of the Red Hills prospect was commissioned by BML and completed by J.G. Purvis, consulting geologist. Recommendations from this review formed the basis of an eventual six-hole diamond drilling program undertaken in the period. The holes were designed to test at 50 m spacing around the RH5 discovery intersection. Alternative drillhole collar locations were also proposed in the review to ensure that environmental impact of site preparation earthworks would be minimised. This program confirmed that the VHMS mineralisation in historical drillhole RH5 represents a small, irregularly shaped lens with limited potential as an economic mineral resource. Holes aimed at testing up dip from the RH5 intersection failed to intersect the target LMH host, due to faulting or localised changes in morphology of the adjacent CVC sequences. Drilling intersected several thin zones of gold mineralisation hosted in silica altered dacitic lavas located in the stratigraphic hanging wall of the LMH.

During the 2011-2012 reporting period, Outer-Rim Exploration was commissioned for downhole electromagnetic logging of drillholes RHD24-25 AND RHD27-29 (RHD26 was permanently sealed after drilling due to making water). RHD28 collar was not located and so logging of holes RHD24, RHD25, RHD27 and RHD29 was carried out using a Crone Pulse EM. Measurements were taken by time-domain EM or Transient EM. Results failed to identify any significant conductor.

During the 2012-2013 reporting period, 34 rock chip samples were collected and analysed from the Northern Adits prospect of the tenement, and diamond drillhole RHD30 was drilled to test for an offset of the LMH to the east above the previously defined mineralised zone. RHD30 intersected the broken and faulted LMH at the up-dip projection calculated from previous

drilling. This confirmed the faulted and broken nature of the LMH up-dip from RH5, but discounted an offset of the horizon to the east of the projected position.

On 17th October 2013, Mineral Resources Tasmania approved the drilling of a drillhole of approximately 300m to test at depth the mineralisation in the Northern Adits area of Red Hills (WPA13/43). Due to company restructuring and financial pressures at Henty Mine, at the time of writing this drillhole was yet to be drilled.

# 5.0 WORK COMPLETED (2013 TO 2014)

## 5.1 Rock Chip and Grab Sampling

A total of 24 rock chip and grab samples were taken during the reporting period 2013-14 for EL8/2009. The prospective Red Hills stratigraphic horizon extends into the Tullah tenement EL11/2010 also held by UML, thus the subsequent 2013-14 rock-chip sampling encompasses a target area across the two tenements, EL11/2010 Tullah & EL8/2009 Red Hills. A further 49 samples located on EL11/2010 were reported in the September 2014 Annual Report for that lease. The spread of samples across the two leases is shown in Figure 5, with gold samples above 0.02g/t superimposed on the 1VD magnetic image in Figure 6.

All samples were sorted and re-labelled at the Henty Exploration core shed prior to dispatch to Burnie Research Laboratory (ALS) at Wivenhoe, Tasmania. Samples were analysed by Fire Assay and AAS, ICP-AES and XRF methods.

| | |
|---|---|
| Fire Assay/ AAS Method: | A prepared sample is fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents as required, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested in 0.5ml dilute nitric acid in the microwave oven. 0.5ml concentrated hydrochloric acid is then added and the bead is further digested in the microwave at a lower power setting. The digested solution is cooled, diluted to a total volume of 10ml with de-mineralised water, and analysed by atomic absorption spectroscopy against matrix-matched standards. |
| ICP-AES Method: | A prepared sample (0.25g) is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analysed by inductively coupled plasma-atomic emission spectrometry. Results are corrected for spectral inter-element interferences. |
| XRF Method: | A calcined or ignited sample (0.9g) is added to 9.0g of Lithium Borate Flux (50% - 50% Li2 B4 O7 – LiBO2), mixed well and fused in an auto fluxer between 1050 - 1100°C. A flat molten glass disc is prepared from the resulting melt. This disc is then analysed by X-ray fluorescence spectrometry. |

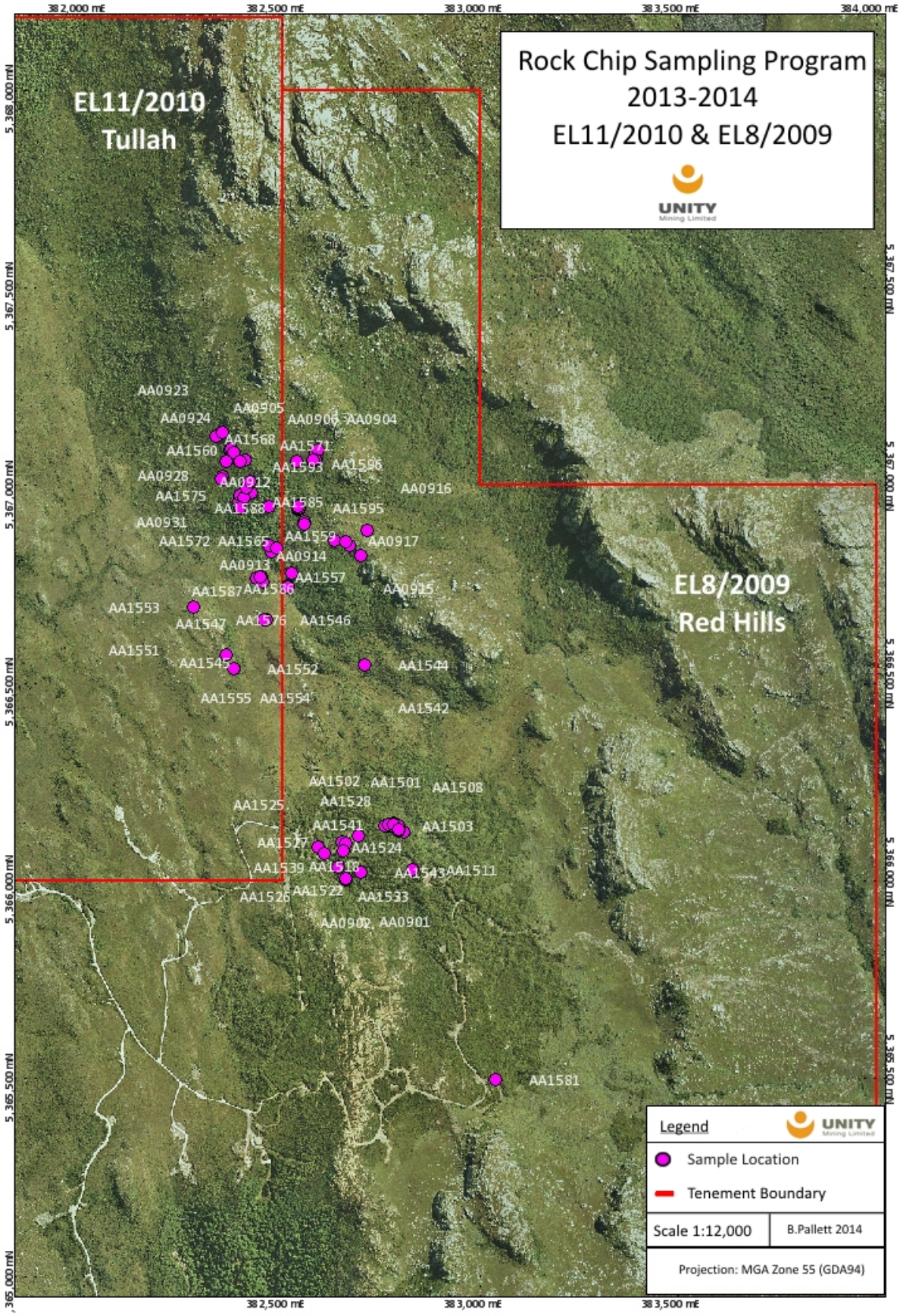


**Figure 5: Aerial view of the rock chip sampling program over the northern extent of the Red Hills terrain.**

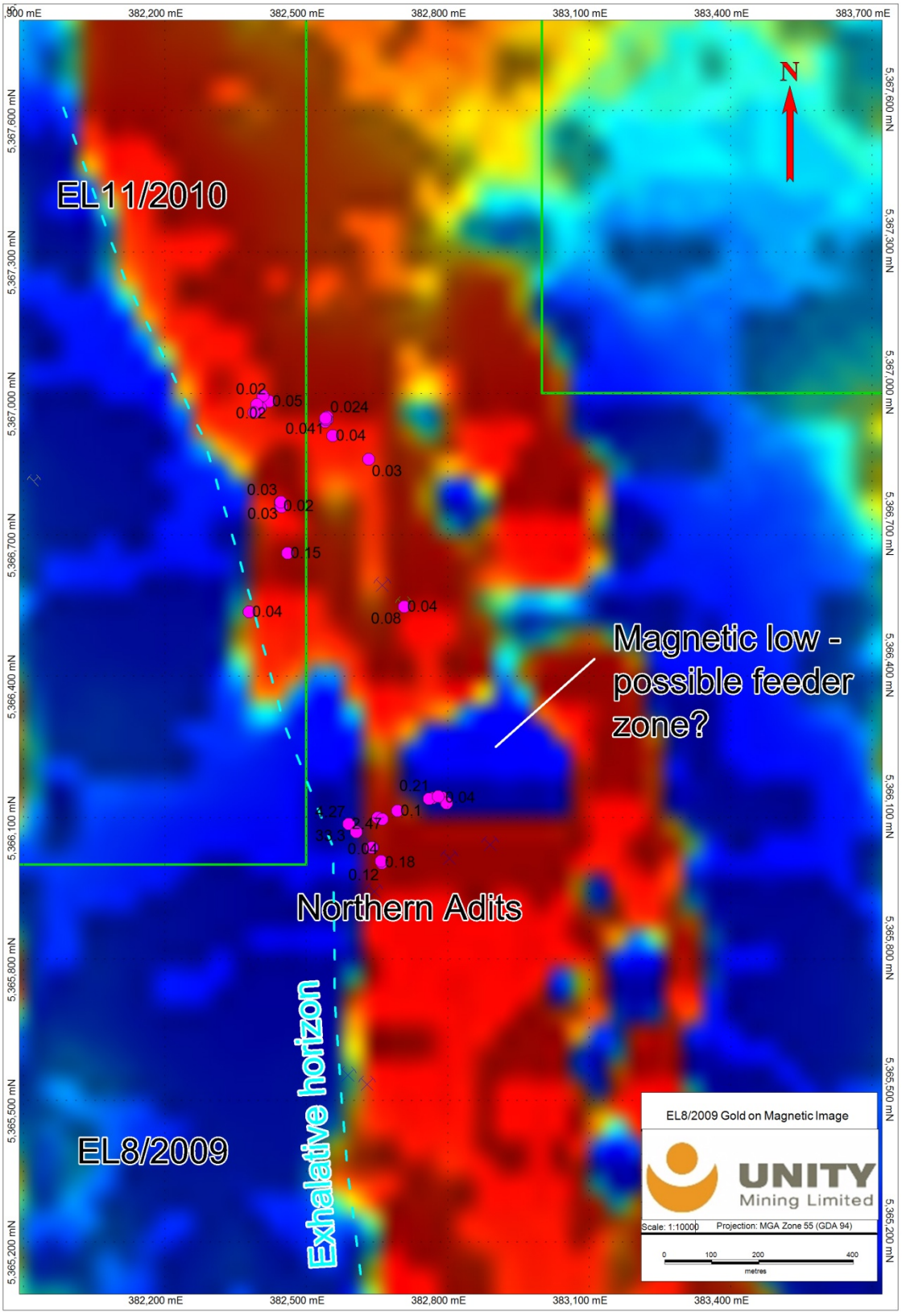


**Figure 6: Gold samples above 0.02g/t superimposed on the 1VD magnetic image for Red Hills.**

## 6.0 RESULTS

From 24 rock chip and grab samples collected, a number of samples were over 1g/t gold, with best results of 10.5, 6.43 and 3.98g/t gold. Best copper assay was 22.6%. The highest assays were all located within the Northern Adits area. North of the magnetic low in Figure 6, all but one sample (situated on the adjacent EL11/2010) showed gold grades less than 0.1g/t, and copper grades less than 0.2%.

Assay results and geographical coordinates of these samples are given in Appendix 1.

## 7.0 CONCLUSIONS

The rock chip assay results confirm the area of highest gold and copper geochemical values in the northern part of the lease to be in the Northern Adits area. In his appraisal of the Red Hills Prospect, Purvis notes that only two drillholes have been drilled in this area and states:

*"The crucial point is that both holes were directed E-W at a mineralised zone that has the same orientation and is apparently centred north of them. The conclusion is neither hole was an effective test of it"*

-Purvis, 2010.

The best grades are hosted in mineralised shears proximal to historic mine workings that have assayed up to 33g/t gold and 22% copper. These shears are thin (up to 10cm thick) and would need sufficient repetition to bulk together a mineable resource. In October 2013, approval was granted for Unity to drill a more north-south hole targeting at depth the mineralised zone at the Northern Adits, but with financial pressures at Henty and a stay of expenditure on exploration leases adjacent to the mine leases, this hole at the time of writing remains to be drilled.

The Northern Adits sits on the margin of a significant magnetic low within the Red Hills Rhyolite that coincides with a boggy topographic low with little to no outcrop. It is postulated that this may be a feeder or source zone for the Northern Adits mineralisation, with magnetite-destructive fluids leaching gold and copper from the host rock (present elsewhere in the rhyolite at lower tenors) and re-depositing them on the upper margin.

Rock chip sampling farther north of the magnetic low showed many samples above detection for gold but of a low tenor (less than 0.1g/t)

## 8.0 EXPENDITURE FOR 2013/14

Expenditure by UML on EL 8/2009 for the year ended 15 November 2014 was $9268.

| Expenditure Item | $ |
|---|---|
| Personnel | 8500 |
| Rock chip assays | 768 |
| **Total** | **9268** |

## 9.0 PLANNED WORK AND EXPENDITURE FOR 2014/15

Historically only two drillholes have tested the "Northern Adits" area of EL8/2009, both to the south and at a similar angle to the shear zone which hosts the dispersed pyrite-chalcopyrite-magnetite ± gold mineralisation. Unity intends to follow up the rock chip and grab sampling results from this year and drill at least one hole on a more north-south azimuth to test at moderate depth the extent and mineralisation of the shear zone.

Estimated expenditure on EL 8/2009 Red Hills in the 12 month report period, ending 15 November 2015, is $135000.

## 10.0 REFERENCES

PURVIS, J. G. 2010. An Appraisal of the Red Hills Prospect Tasmania. Bendigo Mining Limited. Unpublished Company Report.

## 11.0 BIBLIOGRAPHY

EVANS, D. 2011. EL 8/2009 Red Hills Annual Report for the Period 16th November 2010 to 15th October 2011. Unity Mining Limited. Unpublished Company Report to Mineral Resources Tasmania.

KITTO, J. 2008. Annual Report EL9/2005 Red Hills for Period 1st July 2007 – 30th May 2008. Newcrest Mining Limited. Unpublished Company Report to Mineral Resources Tasmania.

McPHIE, J.; DOYLE, M.; ALLEN, R. 1993. Volcanic Textures: A Guide to the Interpretation of Textures in Volcanic Rocks. University of Tasmania. Centre for Ore Deposit and Exploration Studies.

SEYMOUR, D. B.; GREEN, G. R.; CALVER, C. R. 2007. The Geology and Mineral Deposits of Tasmania: a summary. Bulletin Geological Survey Tasmania 72.

STONESTREET, P.G. 2012. EL 8/2009 Red Hills Annual Report for the Period 16th November 2011 to 15th October 2012. Unity Mining Limited. Unpublished Company Report to Mineral Resources Tasmania.

TEDDER, I. J.; KITTO, J.; FITZPATRICK, N. J. 2008. Final Report EL9/2005 Red Hills for Period 1st July 2005 – 30th June 2008. Newcrest Mining Limited. Unpublished Company Report to Mineral Resources Tasmania.

VICARY, M.; CALLAGHAN, T. 2002. 2001 – 2002 Annual Report Tasmanian Gold Project Red Hills EL29/1994. Aurion Gold Exploration Proprietary Limited. Unpublished Company Report to Mineral Resources Tasmania.

VICARY, M. 2003. 2003 Final Report Red Hills EL29/1994. Placer Dome Asia Pacific. Unpublished Company Report to Mineral Resources Tasmania.

## APPENDIX 1 – ROCK CHIP ASSAYS

Digital File: EL82009_201411_02_SG_1