

# Copper Mines of Tasmania Pty Ltd

RL3/2006

Copper Clays Exploration Report  
3<sup>rd</sup> Nov 2010 – 3<sup>rd</sup> Nov 2011



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## 1. Introduction

RL 3/2006 is a 2km<sup>2</sup> retention licence held by Copper Mines of Tasmania on the eastern boundary of mining lease 1M/95. The retention licence covers three known copper bearing mineralised deposits including the Lyell Consols, Lyell Blocks and King Lyell deposits. RL3/2006 is located within the land district of Montagu and in the vicinity of Linda (Figure 1).

The mineralised deposits are located within highly deformed and weathered limonitic clays and iron hydroxides derived from Gordon Group Limestone and shales. The deposits are located in tight Devonian synclines, underlying the Gordon Group Limestone/clays is the Pioneer sandstone which uncomfortably overlies the Late Cambrian early Ordovician Owen Conglomerate (W.J.D Godsall,2005)

The King Lyell deposit has been assessed as the only deposit of potential tonnage to be considered for future mining. Current exploration is focusing on generating increased drill coverage to increase the confidence in the resource for the King Lyell deposit.

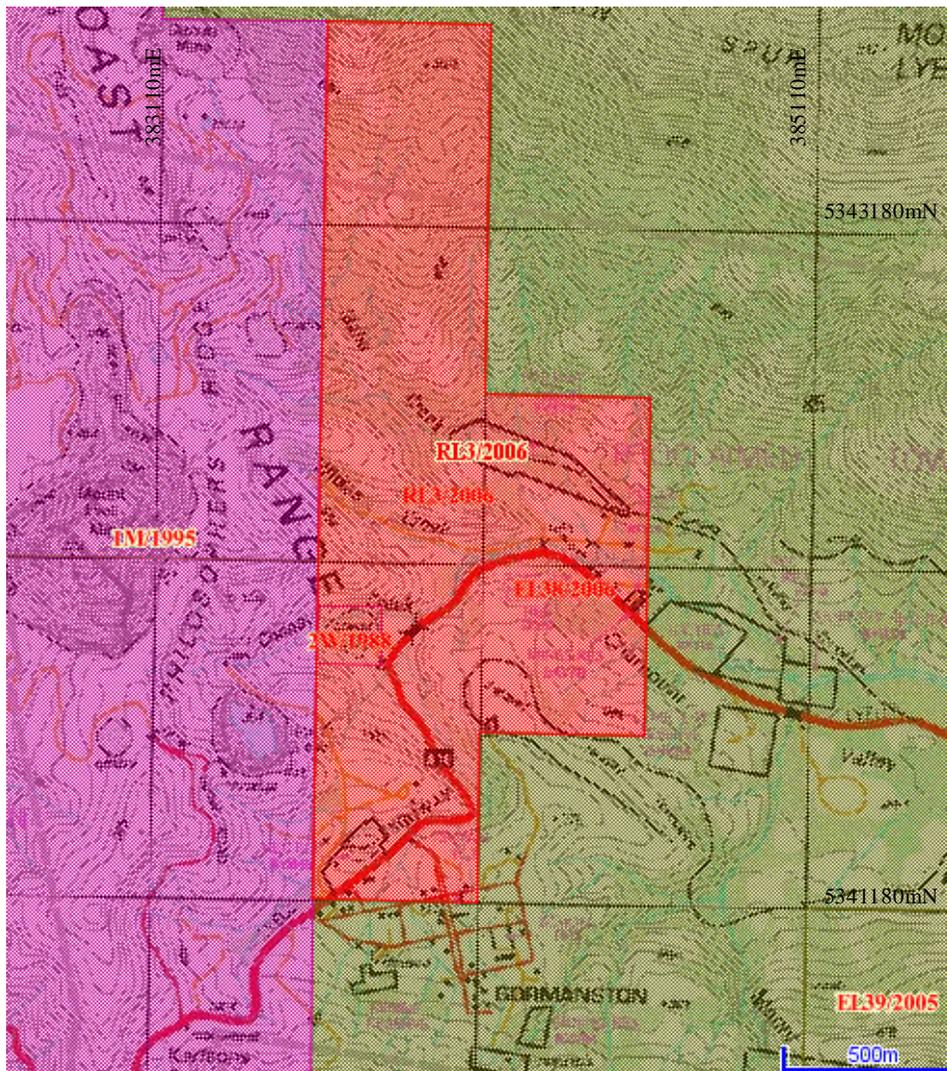


Figure 1, Retention Licence RL3/2006 location map.

## 2. Review of previous work

AMC consultants were engaged by Copper Mines of Tasmania during 2007 to undertake a scoping study of the Copper Clays deposits. The study evaluated the deposits and determined that the King Lyell deposit was the only deposit that justified further attention. The scoping study was completed in February 2008 and covered a geological review, geotechnical and metallurgical assessments, mining options and cost, LG optimization, conceptual designs for open pit, waste dumps and scheduling, financial and risk analysis. The main conclusions of the scoping study underlined that the King Lyell deposit had sufficient potential to provide a significant minable resource for Copper Mines of Tasmania. The high level of uncertainty associated with the project due to limited data availability would be required to be addressed so that a Pre-feasibility study could be undertaken.

McArthur Ore Deposit Assessments Pty Ltd, compiled the Cu Clay mineralogy report in September 2005. This report determined the mineralogy from 6 composite samples from the one drillhole. Only 3 of the samples contained sufficient mineralisation for an analysis with native copper being the most common copper bearing mineral. Also identified Cuprite (mainly rimming native copper, but also commonly liberated), Covellite, Chalcocite, Bornite and Chalcopyrite.

Six diamond drillholes were drilled during 2005, the drilling aimed at testing the reproducibility of historical drilling results and to help define the outer boundaries of the deposit. Two of the six holes intersected mineralised clay, 05KLD002 between 41-55m contained 0.51% Cu. These results were used to validate a nearby RC hole (96KLC001) which reported values of 14m @ 0.51% Cu and 8m @1.27% Cu.

Various desktop studies and reports have been compiled reviewing the Copper Clay deposits. Most significantly the report 'Open cut potential of the copper clays area Mt Lyell Tasmania' by K.J.A Wills, 1995 this report summarises previous work completed on the deposits and assesses the potential resource of the three known copper clay deposits. The King Lyell Copper Clays Resource Assessment compiled by K.Morrison and J. Knight (1997) further evaluates the King Lyell deposit and concludes with a modeled open cut and estimated resource of 1.2 million tonnes at 1.37% Cu is present with a stripping ratio of 2.3:1. This resource utilised wireframes created from cross-sections and a longitudinal section created from un-validated historical drilling and the 1996 CMT drilling results. Further evaluations of the resource potential was conducted by CMT's senior Mining Engineer Tony Weston with a review of preliminary mine economics in 1997.

### 3. Exploration completed during the report period

A resource drilling program consisting of 11 HQ vertical diamond drillholes was completed during the reporting period. Drilling totaled 857m, all holes were pre collared using a mud rotary drilling technique to maximize the drilling coverage through the mineralised clay with the available budget. The drilling programme (Figure 2) was designed primarily to increase the confidence within the central portion of the potential resource and to maximise recovery through the mineralised section to provide suitable samples for test work, specific gravity measurements and assays. Two of the drillholes were utilised for the installation of water monitoring bores.

The depth that each hole was pre collared using mud rotary drilling and HQ drilling depths is show in Figure 2.



Figure 2, 2011 Drilling programme design, drillhole name and drilling depths.

#### 4. Discussion of results

Drilling practices focused on ensuring the best possible core recovery was achieved. Before drilling commenced Gerald Spaulding Drillers engaged AMC consultants to design a mud programme suitable for drilling through the types of clays expected. Drilling practices included using a slow rod rotation rate and minimising water entering the hole for bit lubrication. This process was successful as recoveries through the mineralised clay were considerably better than previous drilling attempts. Previously drillcore was logged as whole core and split in half using chisels and hammers for sample preparation and assay. This programme attempted to dry the core over a period of three weeks to enable trial cutting of the core through an automatic core saw. The trial cutting was successful as the water required for saw operation was absorbed by the core and was not sufficient to start dispersing the clay. Depositional and or fluid flow textures are evident on the cut surface of the core as well as the cutting process polishing the surface of the native copper mineralisation. The native copper is only visible for a few hours after cutting before it oxidizes and is no longer recognizable. Due to the fast oxidization rates core is being re-photographed and logged immediately after cutting has occurred. At the time of writing this report five of the 11 holes have been geologically logged (appendix B) and are awaiting assay results, all core is being sent to Burnie Research Laboratory.

Preliminary drillcore logging discussed with K. Morrison by email on the 8<sup>th</sup> September 2011 suggested that the visible native copper mineralisation is hosted within highly oxidized limonitic polymitic debris comprising a clay matrix and displays a breccias texture. The debris is comprised of clay, sand and grit fractions with irregular angular fragments of concretionary limonite, mudstone, chert, sandstone, quartzite and volcanic shist. The host lithology is interbedded with Gordon Group limestone both fresh and decomposed, this unit grades down to the Pioneer beds from siltstone, sandstone and conglomerate.

Specific Gravity measurements were trialed by CMT geologist using the water displacement method. It was deemed inappropriate as the time required for all pore space to be filled by water enabled the core to become too soft to handle and the clay began to disperse. Specific gravity measurements will be performed by Burnie Research Laboratory using pycnometer device to ensure the most accurate determination of SG for resource evaluation.

## **5. Conclusions**

Sonic drilling techniques was previously thought to be the only method to effectively drill the King Lyell deposit for resource purposes. The 2011 drilling programme demonstrated that diamond drilling was suitable ensuring that the correct techniques were enforced.

Preliminary geological logging suggests that the previous ideas of stratigraphic succession and deposit formation maybe more complicated than previously suggested. The presence of debris of sand sized polymitic material and core loss intervals may suggest a partially in filled karst environment with mineralisation occurring through a uniformly intensely oxidized horizon of the host rocks.

On completion of logging, core processing and receiving assay results an updated resource model should be completed. A new model with have significantly increased confidence on previous versions with the increased drill density through the deposit and accurate specific gravity measurements.

## **6. Environment**

Due to the site being a recently used gravel crushing and storage facility no environmental disturbance was necessary for drill pad construction. Drill sites were confined to the flat central portion of the King Lyell deposit with only drill cuttings sumps required to manage drilling fluids. The sumps have been backfilled to rehabilitate the area back to a pre drilling state. Water for drilling activities was trucked from the mine site and stored in three 10,000L water tanks as the surrounding nearby creeks recorded pH levels of approximately 2.3 caused by acid mine drainage.

Two Monitoring bores have been installed utalising drillholes DD11CMT008 and DD11CMT017 which provides a borehole at either end of the valley. Water monitoring bores can be used to establish baseline water monitoring of the area in anticipation for possible future mining activities.

## **7. Proposed works program pending successful renewal of RL3/2006**

After assay completion from the drilling completed during the current period an updated resource model and wireframe update will be completed. The three dimensional geological modeling of the King Lyell area will be reviewed based on the logging of the current drillholes to validate the geological interpretation of the central portion of the deposit.

Mineralogical assessment of the clays to determine any copper oxide mineralisation present this work may also include XRD evaluation of the mineralised clay.

Additional drilling will be required to identify the limits of the deposit, in particular the western side of the deposit. It is proposed that 16 additional diamond drillholes focused towards the western extents of the deposit would provide sufficient data to produce a JORC compliant resource. It is anticipated that this work could be completed within a two year licence extension period.

\$35,000 – Completion of assays for 2011 drilling program

\$5000 – mineralogical analysis of 2011 drillcore

\$250,000 – Additional 1000m drilling in the western portion of the deposit.

Total proposed expenditure \$290,000 for a two year licence duration, additional drilling would require approval from Vedanta Resources.

## **8. Expenditure**

Total expenditure on RL3/2006 for the reporting period totaled \$205,396 which is comprised of Drilling related cost totaling \$153, 245 site preparation and water supply for drilling \$8,683 consumables \$13,068 and geoscientific cost of \$30,400.

It is estimated that an additional \$35,000 will be accrued for sample preparation, SG and assays.

## References

W.J.D Godsall, Copper Mines of Tasmania Pty Ltd, Exploration Licence EL 52/1994 – Linda, Exploration Programme – March 2005

Morrison, K 2011, email, 8 September, [kcm@tassie.net.au](mailto:kcm@tassie.net.au)

**Appendix A - 2011 King Lyell drilling programme surveyed collar locations**

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19 Orr Street  
Queenstown Tasmania 7467  
Thu Sep 01 15:35:25 2011

Hole ID	Collar location AMG 66 (zone 55)		
	East	North	Elev
DD11CMT007	383619.138	5341806.845	306.836
DD11CMT008	383615.218	5341776.938	306.997
DD11CMT009	383598.546	5341813.88	307.028
DD11CMT010	383588.271	5341799.336	307.202
DD11CMT011	383592.676	5341783.991	307.087
DD11CMT012	383573.685	5341812.776	307.523
DD11CMT013	383563.573	5341793.047	307.779
DD11CMT014	383567.706	5341775.59	307.592
DD11CMT015	383538.248	5341796.118	308.269
DD11CMT016	383534.471	5341771.157	308.164
DD11CMT017	383518.25	5341778.321	308.367

**Appendix B – Geological core logging of the King Lyell 2011 Drilling programme**