EL 24654 EXPLORATION ACTIVITIES REPORT
FOR THE 12 MONTH PERIOD TO 30TH OCTOBER 2006
TO
THE NORTHERN TERRITORY
DEPARTMENT OF PRIMARY INDUSTRY FISHERIES AND MINES

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ABSTRACT

EL 24654 is part of Redbank Mines Ltd Redbank Copper Operations located in the MacArthur River Basin near the Northern Territory and Queensland border (Figure 1). Initial evaluation of EL 24654 was completed within the first 12 months of tenure. It was concluded that sequences of Gold Creek Volcanics and Packsaddle Microgranites contained within the eastern part of the tenement have not been effectively explored for base metals. Record wet season rains prevented access to the tenement until the middle of 2006. A severe shortage of suitable geotechnical personnel and the scale of track re-establishment prevented the work being carried out in the latter part of the 2006 dry season.

Figure 1 Location and regional geological setting of Redbank Copper Operations
Redbank Mines Limited is the owner of the Redbank Copper Operations located on mining leases within the ERL94 and south of EL24564 (Figure 2). Redbank Copper Operations is currently producing copper by leaching stockpiled oxide and transitional (oxide/sulphide) ores left from mining operations by a previous owner in the mid 1990’s. The leach process is carried out by circulating acidic process waters over a heap leach pad and through a series of geomembrane lined vats. The copper pregnant liquors generated are then passed over scrap steel in an air agitated (‘Kennecott’ style) column to produce a powdered copper cement product containing >80% copper by dry weight. The product is considered a premium copper cement product due to its unusually high copper content and low impurities; it consequently has a ready market in the copper chemicals and smelting industries. Redbank Mines has recently concluded an off-take agreement with the major Swiss metals house Glencore International AG. Current production is at an annualised rate of 800 to 1,000 tonnes pa, and it is expected that the current stockpiles will support production at this rate until mid 2008.

Redbank Mines sees the project as having the potential to be developed in 3 phases. Phase 1 is the current stockpile leaching operation, which in addition to producing a significant cash flow is also improving the environmental status of the project area. The environmental status will be further enhanced when after April 2007 a resin column is used to progressively extract copper from the acid and copper laden waters in the pit left by the 1990’s mining operations. This will provide additional copper liquor containing around 300 tonnes of copper into the existing process recovery circuit. Removal of the copper from the pit water will after pH modification produce water compatible with the surrounding natural drainage, and enable a more effective water management regime to be maintained for the project.

Phase 2 of the project is the recommencement of mining of oxide ores from the nearby Bluff deposit commencing in late 2007. The ore will be treated using the existing treatment plant and infrastructure. In full operation the Phase 2 oxide leach operation scoping studies indicate an annual production of 3,000 tonnes per year of copper for at least 5 years. Phase 2 is subject to completion of a positive feasibility study and the securing of the necessary regulatory approvals. The form of the final product is yet to be decided but is likely to be as copper cement.

Phase 3 of the project is the recommencement of mining and treatment of sulphidic ore during 2008, first from the 1990’s Sandy Flat open pit once the dewatering and resin based copper recovery operations have been completed. This would be followed by mining of sulphidic ore from Bluff once the oxide ore has been mined and similarly for the Punchbowl Deposit. The sulphidic ore would be treated using conventional flotation to produce a saleable sulphide concentrate. Production would be the same as for the oxide leach side of the project, 3,000 tonnes pa for at least 5 years. The existing flotation plant from the 1990’s operation although incomplete would be refurbished for Phase 3 operations. Phase 3 is also subject to completion of a
positive feasibility study and the securing of the necessary regulatory approvals.

The Redbank Copper Operations therefore have the potential to develop into a 6,000 tpa copper producer, with revenues in excess of A$550m/year. The company sees the potential for exploration on the surrounding tenements to generate further discoveries of copper resources that would expand and or prolong the operations as currently envisaged in Phases 2 and 3. The most immediate and advanced targets lie within ERL94 (Figure 2) that surrounds the mining leases of the current operation, however initial evaluation of EL24564 located to the north using a revised model for the known Redbank copper mineralisation indicates that it has the potential to host copper mineralisation.

Figure 2 Local geological setting and EL 24654
2. GEOLOGICAL SETTING

Regionally the Redbank copper deposits lie within the Proterozoic sequences of the MacArthur River Basin (Figure 1). The basin hosts a number of world class base metal deposits. The Redbank copper mineralisation is hosted by the Lower Proterozoic Gold Creek Volcanics (Figure 2), a sequence of predominantly intermediate sub volcanic intrusions, extrusions, breccia pipes, and intercalated sediments. The copper mineralisation identified to date has been principally interpreted as being contained in volcanic breccia pipes, of which 30 to 50 have been recognised by various explorers. Only a minority of the breccia pipes are mineralised and only some of those contain potentially economic concentrations of copper.

The Packsaddle Microgranites locally intrude the Gold Creek Volcanics (Figure 2) and are present close to the known Redbank copper deposits.

3. EXPLORATION MODEL

The consensus of most of the modern era (post 1970) explorers in the Redbank area is that the mineralisation is contained in the approximately circular volcanic breccia pipes as the result of fluid circulation in the breccia. The breccia pipes development has also been interpreted as involving largely autochthonous brecciation of the trachyandesite host rock, with little displacement. There have been some suggestion that there has been post volcanic slumping in some pipes causing minor (<10m) vertical displacement of sediments overlying the Gold Creek volcanics into the pipes. Minor normal faults and jointing have been interpreted as exerting a control on the location and form of the pipes. A peculiarity of the more comprehensively mineralised pipes is the association of the mineralisation with pyrobitumen. The origin of the pyrobitumen has been variously speculated as resulting from intense reduction of carbonate to a high temperature derivative of an organic precursor.

RC and diamond core drilling by Redbank at its Bluff and Punchbowl breccia pipe hosted copper deposits in December 2006 and January 2007, has indicated that the mineralisation does not display all the characteristics that could be expected solely from the circulation of mineralised fluids through the prepared breccia pathways. While there are clearly veins of sulphidic copper mineralisation contained within the breccia they are typically fragmented. Also much of the primary mineralisation consists of chalcopyrite and chalcocite grains disseminated through the host trachyandesite. The oxide mineralisation retains the characteristics of the primary mineralisation structures and fabrics with cuprite largely replacing the disseminated chalcocite and chalcopyrite, with a minor amount of azurite and malachite vein formation following ground water migration along open weathering fractures.

More detailed studies of petrogenesis and ore formation are planned but the initial indications are that there may be a precursor disseminated style of mineralisation emplaced in the breccia pipes. The source of the precursor
mineralisation could represent a major target for large scale disseminated copper mineralisation. As a corollary exploration should not only focus on finding mineralised breccia pipes but should also be trying to discover the source of the precursor disseminated mineralisation which has the potential to be a much larger target.

Packsaddle Microgranite (or rhyolitic) intrusions occur in close association with the Redbankcopper Mineralisation. It is not yet apparent if there is any paragenetic significance in this spatial association. The Packsaddle Microgranites have interpreted as associated with a regional 1,725Ma felsic intrusive event in the Macarthur River Basin (Page et al, 2000).

4. GEOLOGY OF EL 24654

Figure 2 illustrates the geology of EL 24654. Gold Creek Volcanics are present in a significant portion of the eastern half of the tenement. Further east the Gold Creek Volcanics are obscured beneath surficial Cainozoic sequences. The Hobblechain Rhyolite, a member of the Masterton Formation overlies the Gold Creek volcanics to the west. The Packsaddle Microgranites intrude the Gold Creek Volcanics. Geological mapping indicates there are some small abandoned copper workings (Figure 2) within or close to the Packsaddle Microgranites. The source and nature of this mineralisation is not known.
5. PREVIOUS EXPLORATION ON EL 24654

Comprehensive searches have been completed on the Northern Territory Government tenement and exploration report data bases. The records indicate many generations of tenure over the area encapsulated by EL 24654 dating back to 1960. Exploration for base metals, uranium and diamonds has been carried out in the general area. However much of this has been either superficial or not progressed beyond initial regional geochemical or geophysical surveys. Uranium exploration has found only minor anomalies that did not warrant further evaluation. Diamond exploration by CRAE Ltd was more intensive and resulted in a number of macro and micro diamond finds (Figure 3). CRAE also conducted base metal exploration that resulted in several drill holes ostensibly to test stratigraphic relationships (Figure 4).

6. EXPLORATION DURING THE 12MONTHS TO 30-10-06 ON EL 24654

a. Exploration Plan

Planned exploration for the 12 months to 30-10-06 consisted of:

- Comprehensive review of previous exploration.
- Review and reconnaissance of the geology of EL 24654.
- Investigation of the abandoned copper workings apparently hosted by the Packsaddle Microgranites.
- Stream sediment sampling for areas draining the Gold Creek Volcanics.

Following a comprehensive review of previous exploration and the tenement geology it was concluded that exploration activities for copper would best be initially focussed on an unexplored area of Gold Creek Volcanics in the eastern portion of EL 24654 (Figure 5). Examination of the Packsaddle Microgranite hosted copper workings was planned, to be followed by a stream sediment sampling program. Understanding the nature of the copper workings and their relationship to their host rocks was considered important as this would implications for other occurrences in the area and possibly the paragenesis of copper mineralisation generally in the Redbank area. The stream sediment program was to be focussed on watercourses draining the Gold Creek Volcanics and the Packsaddle Microgranites.

b. Work Completed

The reviews of previous exploration and the geology of EL 24654 were completed. Attempts to gain access to the ground for reconnaissance purposes from March to June were thwarted by the after effects of the record 05/06 wet season rains experienced in this area. Even main road access to the Redbank area was not fully re-established until May. Old tracks that had previously been useable in previous dry seasons were washed out at even minor watercourses. Subsequently in the remainder of the dry season from
Figure 5 Proposed exploration focus within EL 24654
June to October it was not possible to secure additional geotechnical personnel to conduct exploration on EL 24654. A severe shortage of suitable persons is being experienced throughout the Australian minerals exploration industry. Establishment of access into the exploration area was not possible even in the dry season conditions due to destruction of access tracks.

Late in the dry season and into the onset of the 06/07 wet season conditions the major resource drilling program conducted by Redbank Mines in its operational area was also seriously hampered by personnel shortages and there was consequently no ability to divert personnel to the planned exploration on EL 24654.

7. PROPOSED EXPLORATION FOR THE NEXT 12 MONTHS

With the availability of personnel and logistic support from the expansion of operational activities at the Redbank Copper Operations it is anticipated that the work programs planned for EL 24654 can be completed during the 2007 dry season. Re-establishment of vehicular access to EL 24654 still remains a problem. Extensive track re-building is required or alternatively funds spent on helicopter supported exploration. There may be the opportunity early in 2007 to carry out the proposed work using a helicopter engaged in other routine activities in the area.
REFERENCES