EXPLORATION LICENCE 22295
COX PROJECT
Final & Surrender Report
FOR THE PERIOD
5 February 2003 to 24 November 2008
BY
B. White

Date due: 23rd February, 2009
## TENEMENT REPORT INDEX

**OPERATOR:** Legend International Holdings  

**PROJECT:** Cox  

**TENEMENTS:** Exploration Licence: 22295  

**REPORT PERIOD:** 5 February 2003 to 24 November 2008  

**DUE DATE:** 23 February 2009  

**AUTHOR:** B. White  

**STATE:** Northern Territory  

**LATITUDE:** 134°19'26"E to 139°19'26"E  

**LONGITUDE:** 15°24'57"S to 15°55'00"  

**MGA easting:** 398,100mE to 427,700mE  

**MGA northing:** 8,240,100mN to 8,295,400mN  

**1:250,000 SHEET:** SE53-14 Hodgson Downs  

**1:100,000 SHEET:** 5766, Nutwood, 5767 Hodgson  

**MINERAL FIELD:** Merlin Diamond Field  

**COMMODITY:** Diamonds, base metals  

**KEYWORDS:**
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1. SUMMARY OF EXPLORATION ACTIVITIES

This report describes the exploration activities conducted over Exploration Licence 22295 (Figure 1) between the 5th of February, 2003, and the 24th of November, 2008. Exploration over EL22295 was conducted as part of the Cox Project and included a review of historical data and open file reports, as well as the purchase of LandSat imagery for target generation and to understand the nature of the tenement terrain.

2. TENEMENT STATUS

Exploration Licence 22295 was granted on the 5th of February, 2003, to Astro Diamond Mines N.L. Under Dealing 92370, effective on the 30th of July, 2007, the title of the tenement was transferred to Legend International Holdings. The tenement, which formed part of the Cox Project, was surrendered on the 24th of November, 2008.

3. LOCATION AND ACCESS

Exploration Licence 22295 is situated approximately two hundred and twenty (220) kilometres west of Borroloola, NT and one hundred (100) kilometres north east of Daly Waters NT (Figure 2). The Carpentaria Highway between Borroloola and Daly Waters serves as the main thoroughfare providing access to the tenement. Access to the tenement from the Carpentaria Highway is provided by unsealed roads and station tracks.
4. GEOLOGY

4.1. REGIONAL GEOLOGY

All the economic diamond deposits and other significantly diamondiferous occurrences in Australia occur on
the North Australian Craton (“NAC”). The NAC underlies the Kimberley region of northern WA, the
northern two thirds of the NT and the north western part of Queensland. It is also host to many significant
base metal, gold and uranium deposits. The NAC was formed at about 1850 Ma ago during the Barramundi
Orogeny by the amalgamation of Archaean and early Proterozoic rocks which now form the basement rocks
to the younger sequence. Proterozoic (1820-1600Ma ) platform cover sediments, Palaeozoic volcanics and
sediments, and Mesozoic sediments cover these basement rocks. The Palaeozoic volcanics comprise the
Lower Cambrian Antrim Plateau Volcanics (~550Ma) and its equivalents. The only volcanic activity that
has occurred on the NAC for the past 500Ma has been the intrusion of diamondiferous kimberlite at 367Ma
(the Devonian age Merlin kimberlite field), 179Ma (Jurassic age Timber Creek kimberlite field), and the
25Ma (Tertiary age) lamproite field in the Ellendale (West Kimberley) area.

The large time span for the intrusion of diamondiferous rocks makes the NAC very prospective for diamond
exploration. It is expected that kimberlites would occur in the central parts of the NAC and lamproites
would be favoured in the marginal areas and in cross cutting Proterozoic mobile zones.

The kimberlites and lamproites of the NAC tend to occur along major northwest and northeast trending
structures. These structures can be seen in the gravity data crossing the NAC and have a strike length of
many hundreds of kilometers. These structures are interpreted to be fundamental fractures in the NAC and
are potential channel ways for diamondiferous intrusives.

4.2. LOCAL GEOLOGY

The following description of local geology has been adapted from Dunn (1963) and Pietsch et al, 1991.

Exploration Licence 22295 is situated within the McArthur Basin, and the geology of the tenement is
dominated by rocks of the Roper Group (Figure 3). The Roper Group is a sandstone-siltstone sequence with
interbedded shales and minor carbonate rocks of Proterozoic age.
Sandstones of the Crawford Formation outcrop over a small area of the tenement and are the lowest geological units in the stratigraphy represented by outcrop on the tenement. The Crawford Formation is a sequence of blocky pink and white sandstone beds interbedded with micaceous siltstones and fine micaceous sandstone. The presence of glauconite is a characteristic feature of this unit. The Crawford Formation forms a gentle backslope to the ridges of the Abner Sandstone. The basal section is characterized by thin to medium bedded, finely laminated ferruginous and micaceous siltstone, fine grained sandstone with minor thin interbeds of purple and black mudstone. Low-angle planer, trough and hummocky cross-beds are common. Overlying the basal unit is a sequence of red-brown micaceous sandy siltstones. The upper most section consists of structureless, clean, white to light grey quartzarenite and thin interbeds of light grey siltstone. The occurrence of hummocky cross-beds and slumped siltstone beds and ripped up intraclasts in hummocky cross-beds indicates that the Crawford Formation was deposited in a storm dominated near shore environment.

The Abner Sandstone forms four essentially arenaceous members, the Arnold Sandstone and Hodgson Sandstone Members and the Jalboi and Munyi Members.

The Arnold Sandstone Member is the lowest unit, and like the Hodgson Sandstone, forms prominent ridges of rough jointed sandstone. It consists of generally white to dirty white quartzarenite. The quartz grains in the sandstone are medium, subrounded to subangular and moderately well sorted with minor silty clay matrix in places. It is friable but weathering has silicified and hardened the exposed surface. The member can be up to two hundred and ninety (290) metres thick. Cross bedding and ripple marks are commonly present.

The Jalboi Member lies between the two sandstone members, and contains less resistant beds of micaceous sandstone, siltstone, and quartz sandstone. It consists of a fining upward cycle of interbedded conglomerate, sandstone, siltstone and mudstone. Where exposed, the member can be up to fifteen (15) metres thick. The Jalboi Member was deposited during periods of both alluvial outwash and flood plain deposition and subsequent shallow marine transgression.

The Hodgson Sandstone Member consists of white to dirty white, and in places, iron oxide stained quartzarenite. The quartz grains in the quartzarenite are mainly medium, subrounded to subangular and reaches granule- to pebble-size in bands that are scattered commonly throughout the member. The Hodgson Sandstone Member is a shallow platform sequence deposited in an intertidal to subtidal environment.

The Munyi Member is the upper most unit of the Abner Sandstone, comprised of ferruginous sandstone and siltstone and commonly appears as a dark capping on the dip slopes of the Hodgson Sandstone Member. The Munyi Formation is overlain by the Corcoran Formation, which does not outcrop on the tenement as the formation generally outcrops poorly due to the soft and fine grained nature of the sediments.

Proterozoic units that overly the Abner Sandstone in the regional stratigraphic sequence are not represented on the tenement.
The Cambrian Bukalara Sandstone unconformably overlies the Proterozoic sediments. The Bukalara Sandstone is a red-brown, thin to thick bedded, fine to very coarse grained feldspathic quartz sandstone. Cross-bedded layers two (2) to three (3) metres thick are common, occasionally bearing horizons of maroon shale pebbles or ripples at the upper part of the layers.

The Nutwood Downs Volcanics overlie the Bukalara Sandstone in the sedimentary sequence, however the unit is only sparsely represented by outcrop over the tenement. The volcanics are tholeiitic basalt, agglomerate and tuffs. In some instances the basalt contains numerous quartz, jasper and chalcedony filled amygdales. Sandstone dykes in the basal lava flow suggest that the lava was extruded before the underlying Bukalara Sandstone had lithified.

The majority of the tenement is covered by Cainozoic sediments, including sand, laterite, soil, rubble, travertine, freshwater limestone and alluvium. The lateritic units are often overlain by sand, covering much of the local area. Thin sequences of flat-lying Cretaceous conglomerate, sandstone, siltstone and mudstone of marine and non-marine origin are widespread in the area. The Cretaceous sediments rarely exceed twenty (20) metres thickness and form cappings on mesas, ridges and plateau or valley infill.

5. **EXPLORATION**

Exploration over tenement EL22295 during the period was conducted as part of the exploration programme across the Cox Project. The initial stages of exploration involved the purchase and processing of LandSat imagery to determine the nature of the terrain across the project area and to aid future target generation. Previously published reports were reviewed with a focus on past diamond exploration conducted in the area. Of particular interest were reports that described the location of macro and micro diamond occurrences and the presence and nature of diamond indicator minerals. The large spread of non-kimberlitic chromites listed in the reports appear to be the sourced from the weathering of Cambrian volcanic rocks to the south of the tenement. No micro-diamonds, and only one macro-diamond have been recovered from the tenement. In the absence of detailed geophysics, this tenement was not considered to be highly prospective for diamondiferous kimberlites, and the tenement was downgraded in priority with respect to other Cox Project tenements. No on-ground exploration was completed on EL22295, as work was focussed on tenements that were regarded as having a higher prospectivity.

6. **CONCLUSION**

The potential for this tenement to host Kimberlite rocks is considered to be low. The reports of micro- and macro-diamonds in the project area, although initially promising, have been interpreted as sourced from rocks to the south of the tenement. The lack of Kimberlite indicator minerals and locally sourced micro or macro diamonds suggests that the tenement is not prospective for diamondiferous kimberlites. A prioritisation of Cox Project tenements was undertaken in November, 2008, and the decision was made to
surrender the tenement.

7. BIBLIOGRAPHY
