EXPLORATION LICENCES: EL23383

"BARROW CREEK PROJECT"

ANNUAL REPORT

FOR THE PERIOD

29 APRIL 2003 TO 28 APRIL 2004

BY

C.A. WASHBURN
## TENEMENT REPORT INDEX

**OPERATOR:** Astro Mining NL  
**PROJECT:** Barrow Creek  
**TENEMENTS:** Exploration Licences: EL23383  
**JOINT REPORT PERIOD:** 29 April 2003 to 28 April 2004  
**DUE DATE:**  
**AUTHOR:** C. A. Washburn  
**STATE:** Northern Territory  
**LATITUDE:** S21°22’ – S21°37’  
**LONGITUDE:** E134°15’ – E134°50’  
**MGA mN:** 7611700 - 7635500  
**mE:** 425600 - 482700  
**1 : 250,000 SHEET:** SF53-06 Barrow Creek  
**1 : 100,000 SHEET:** 5754 Home of Bullion, 5755 Taylor, 5854 Lurapulla, 5855 Murray Downs  
**MINERAL FIELD:**  
**COMMODITY:** Diamonds  
**KEYWORDS:** Diamonds, aeromagnetic survey, Landsat Interpretation, data review, geology
TABLE OF CONTENTS

1 SUMMARY OF EXPLORATION ACTIVITIES 1
2 TENEMENT STATUS 1
3 LOCATION AND ACCESS 1
4 GEOLOGY 1
  4.1 LOCAL GEOLOGY 1
5 EXPLORATION 2
  5.1 DATA REVIEW 2
  5.2 PREVIOUS WORK 3
  5.3 GEOPHYSICS 3
  5.4 LANDSAT7TM 3
  5.5 PROPOSED EXPLORATION 4
6 BIBLIOGRAPHY 5

LIST OF FIGURES

1. TENEMENT LOCATION PLAN
   1:1,000,000, A4, Landscape
2. GEOLOGICAL MAP
   1:300,000, A4, Landscape
3. OPENFILE DATA
   1:300,000, A4, Landscape
4. AEROMAGNETIC DATA
   1:500,000, A4, Landscape
1 SUMMARY OF EXPLORATION ACTIVITIES

Exploration carried out over the EL23383 during the reporting period included the acquisition of geological, topographic and geophysical data, GIS compilations and data reviews, compilation of openfile data.

2 TENEMENT STATUS

Astro Mining NL applied for EL23383 on 2 October 2001, the tenement was granted on 29 April 2003 covering an area of 490.3 km².

3 LOCATION AND ACCESS

Figure 1

Exploration Licence 23383 covers the Barrow Creek 1:250,000 map sheets. Access to the area is via the Sandover Highway, which turns off the Stuart Highway 80 km north of Alice Springs, and runs to the south of EL23383.

4 GEOLOGY

Figure 2

The oldest units in the area are comprised of metamorphic and igneous rocks of the Arunta Inlier of Early-Middle Proterozoic age. Late Proterozoic sediments are essentially flat-lying except near faults where they may be upturned.

The southwestern extremities of the Late Proterozoic to Paleozoic Georgina Basin are exposed in the eastern portion of the Barrow Creek 1: 250,000 geological map. The basin is one of several sedimentary basins that developed over older Proterozoic basement in central Australia.

Block faulting along major northwest trending faults in the basement controlled the deposition of the basin in this area. Paleocurrent directions in the basal units indicate consistent flow from the west and northwest.

Deposition of the Dulcie Sandstone followed in the Devonian. The fault influence has persisted with northwest trending contacts and axes of shallow folds. The youngest sediments are restricted to silcretes, ferricretes, and colluvium of Cainozoic age.

4.1 LOCAL GEOLOGY

The tenements dominantly cover Paleozoic basin sediments with slight overlap of Late Proterozoic sediments in the south. The Paleozoic sediments represented are the Cambrian Tomahawk beds followed by Dulcie sandstone.

The Tomahawk beds consist of medium to coarse grained, cross-bedded quartzarenite with thin interbeds of micaceous siltstone, shale and minor quartz-rich dolostone in the north. There is
increasing dolostone and limestone in the south of the Dulcie Range. These outcrops consist of medium to thick beds of limestone or dolostone, commonly with poorly sorted quartz sand, accessory glauconite and traces of tourmaline.

The Dulcie Sandstone consists of prominently cross-bedded, medium to very thick-bedded quartz arenite, with rare beds of orthoconglomerate and calcareous silty quartz sandstone.

Significant portions of the northern part of the tenements are covered by aeolian sand plains and dunes, also trending to the northwest. Numerous discreet round outcrops and subcrops are preserved above the sand along these trends.

5 EXPLORATION

5.1 DATA REVIEW

The areas selected for exploration are based on a regional diamond prospectivity review carried out by Astro (Wright 2000), and in areas of moderate to high prospectivity, available open ground was covered by exploration licence applications. Open file exploration data were obtained from the Northern Territory Geological Survey (NTGS), a division of the NT Department of Business, Industry and Resource Development (DBIRD), formerly the NT Department of Mines and Energy (DME).

Available exploration data comprised open file reports of past exploration activity, NTGS and company open file airborne geophysical survey data and Landsat 7 thematic mapper (TM) data. The data was available on CD-ROM by request to the NTGS.

Open file exploration reports were examined and diamond exploration sampling data entered into Excel and a GIS database. Topographic and geological maps at a scale of 1:250 000 were acquired in raster format as a base for the plotting of the data (Figure 3).

The NTGS supplied the available geophysical data as located data files and processed grid images. Astro has acquired approximately 1 million line kilometers of geophysical over the Northern Territory. Stacked magnetic profiles of the first vertical derivative of the residual magnetics were processed from the located data and imported into the GIS. Images of total magnetic intensity and vertical derivatives were supplied by the NTGS. The stacked profiles were used to select pipe-like targets that may represent Kimberlite or lamproite intrusives (Figure 4).

Geophysical processing was conducted in-house and a number of anomalies defined. The examination of stacked profiles is considered essential in searching for pipe-like targets as the gridding routines used to prepare images, smooth the data and hence hide small targets. A pipe response may only occur on one line when using regional data and would be missed if only images are used.

Magnetic targets were numbered using the abbreviated 1:100 000 map sheet name and a sequential number. The line spacing of these regional surveys ranges from 300 to 500 m, and has been used to detect pipe-like responses on one or more lines. The aim is to detect a pipe field by finding at least one pipe with the regional data, and then to acquire more detailed geophysics to
identify other pipes in the field.

Landsat TM data was processed in-house using ERMapper and RGB colour images were produced comprising channels 321, 531, 741 and principle components (PC) 123. Thirty-three Landsat scenes have been acquired from the NTGS over the Northern Territory, covering all of the tenement areas.

5.2 PREVIOUS WORK

Elkedra Diamonds hold tenements immediately east of the Barrow Creek Project area and have confirmed the occurrence of indicator minerals reported in the open file reports, as well as locating a microdiamond.

CRA Exploration Pty Limited carried out regional loam and stream sampling, in the far north west of the tenement block. This is the only recorded sampling for diamonds on the Project area and they recovered a number of chromite grains from EL23383. It is probable that CRAE sampled the entire area as part of their open range exploration philosophy at that time. Rio Tinto currently holds tenements bounding the north western area of Astro tenement EL23383. Although CRAE recovered additional chromite in follow up sampling, they considered them not be kimberlitic. No information on microprobe results was indicated. The geology of the area comprises Cambrian, Ordovician and Devonian sediments and the origin of the chromite is therefore unexplained.

5.3 GEOPHYSICS

Three aeromagnetic surveys cover the project area; the Barrow Creek survey flown in 1981, the Alcoota – Alice Springs survey flown in 1997, and the Elkedra survey flown in 1999. Survey specifications are shown below.

<table>
<thead>
<tr>
<th>Survey</th>
<th>Direction (degrees)</th>
<th>Line Spacing (m)</th>
<th>Height AGL (m)</th>
<th>Sample Interval (m)</th>
<th>Resolution (nT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow Creek</td>
<td>180</td>
<td>500</td>
<td>100</td>
<td>50</td>
<td>0.1</td>
</tr>
<tr>
<td>Alcoota – Alice Springs</td>
<td>180</td>
<td>400</td>
<td>60</td>
<td>7</td>
<td>0.001</td>
</tr>
<tr>
<td>Elkedra</td>
<td>180</td>
<td>400</td>
<td>60</td>
<td>7</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The stacked magnetic profiles processed from the Barrow Creek survey were noisy compared to the survey data from the Alcoota – Alice Springs and the Elkedra surveys. A number of magnetic features were identified as being related to cultural features, e.g. bores. The location of magnetic targets from the Barrow Creek survey are only approximate due to the survey being controlled only by Doppler assisted aerial photography navigation. The other surveys are controlled by real time DGPS. No target areas were determined.

5.4 LANDSAT7 TM

Landsat TM data was processed in-house using ERMapper and RGB colour images were produced comprising channels 321, 531, 741 and principle components (PC) 123. Thirty-three
Landsat scenes have been acquired from the NTGS over the Northern Territory, covering all of the tenement areas.

5.5 PROPOSED EXPLORATION

Follow up of the chromite recovered on EL23383 is considered high priority and grains should be recovered for microprobe analysis. Examination of the Landsat TM data indicates a number of circular features in the area of the chromite occurrences and these require ground follow-up.

Fourteen targets were selected from the Barrow Creek aeromagnetic data. All of these targets lie in Palaeozoic sediments underlain by Proterozoic basement. No targets were selected from the Alcoota – Alice Springs or Elkeda surveys.
6 BIBLIOGRAPHY
