FINAL REPORT E.L. 4534

16th January, 1985
to
7th January, 1986

Licensee: Design and Construction Pty. Limited
Operator: Ashton Mining Limited
Sheet Reference: Ranken (SE 53-16) 1:250,000
Submitted to: Department of Mines & Energy

NORTHERN TERRITORY GEOLOGICAL SURVEY

Ashton Mining Limited
444 Queen Street
Brisbane. 4000

CR 86/116A
April, 1986
ABSTRACT

During the period 18th January, 1985 to 7th January, 1986, Ashton Mining Limited as Manager of the A.D.E. Joint Venture carried out an exploration program in E.L. 4534 aimed at the location of kimberlite pipes.

Work undertaken included regional gravel and loam sampling and airborne thematic mapping.

Despite the fact that a number of microdiamonds were recovered from the sampling, the exploration program failed to provide encouragement in locating the presence of a kimberlite pipe within the licence.

It was therefore recommended by the Manager and the Licensee agreed that E.L. 4534 should be surrendered.
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1.00 INTRODUCTION

Exploration Licence 4534 covered an area of 1,449 square
kilometres (450 blocks) on the Ranken 1:250,000 sheet (refer
to Figure 1).

The licence, which was granted to Design and Construction
Pty. Limited on 16th January, 1985, was subject to an option
agreement signed with Ashton Mining Limited on behalf of the
A.D.E. Joint Venture. Partners to the Joint Venture
include Ashton Mining Limited, acting as Manager, A.O.G.
Minerals Limited, Aberfoyle Exploration Pty. Limited and
Australian Diamond Exploration N.L.

During tenure of the licence, a program of regional gravel
and loam sampling was undertaken. In addition an airborne
thematic mapper survey was conducted over the whole of the
licence area. The data generated from the survey was
evaluated in conjunction with a photogeological study. All
work was directed towards the location of kimberlite pipes.

This report gives a summary of the work carried out in
E.L. 4534 during the period 16th January, 1985 to 7th

A statement of expenditure covering this period is included
in the report.
2.00 REGIONAL SAMPLING PROGRAM

2.10 Field Phase

The gravel sampling program in E.L. 4534 was undertaken as part of a larger regional program in the Ranken area.

Prior to the commencement of field work, gravel sample locations were plotted in the office on the Alexandria 1:100,000 sheet so that sample sites tested the available drainage. As the drainages in the region are somewhat sparse, this resulted in only 17 gravel samples being taken in E.L. 4534. An additional 13 loam samples were collected to help test the area.

During the field program, individual gravel sample sites were selected on the basis of the quality of the available heavy mineral traps in the vicinity of the preselected site, care being taken to sample the most suitable trap site. Helicopter was the most practical mode of transport as it had the advantage of ease of access and navigation and enabled the geologist to scan the area for suitable trap sites.

Once a suitable gravel sample site was located, approximately 40 kg of gravel were gathered, sieved and the minus 4 mm fraction collected for laboratory examination. Generally the minus 4 mm samples weighed 30 to 35 kg. Loam samples, which are surface scrape samples usually weighed 15 to 20 kg.
All sample locations are given on Plan 1.

2.20 Laboratory Phase

The samples were processed at the Ashton Mining Limited laboratory in Perth where they were concentrated by Wilfley Table and heavy liquid separation techniques.

The heavy liquid used was tetrabromoethane with a specific gravity of 2.96. The concentrates were then screened into various size fractions, further concentrated, where required, by magnetic and electrostatic separation techniques and a comprehensive grain by grain examination carried out on the minus 1.0mm plus 0.4mm fractions.

Of the 30 samples collected within the licence, 25 contained no detectable kimberlite indicator minerals. Seven microdiamonds were recovered from the five remaining samples. In addition ten garnets were identified through laboratory examination but these were considered to be of non-kimberlitic origin.

A complete listing of the laboratory results of all samples is given in Appendix 1.
TABLE 1

SURVEY SPECIFICATIONS.

Instrument: Daedalus 1268 Scanner (11 channels)

<table>
<thead>
<tr>
<th>Channels available:</th>
<th>Channel</th>
<th>Wave length (μm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0.42 - 0.45</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.45 - 0.52</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.52 - 0.6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0.605 - 0.625</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0.63 - 0.69</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>0.695 - 0.75</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>0.76 - 0.9</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>0.91 - 1.05</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>1.55 - 1.75</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>2.08 - 2.35</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>8.5 - 13</td>
</tr>
</tbody>
</table>

Aircraft: Beech King Air
Flying Altitude: 8000 metres above ground level
Ground Element Size: 20m x 20m
Flight Times: 0930 hours to 1430 hours
Azimuth of Runs: North or South
Overlap between runs: 40%
3.00 AIRBORNE THEMATIC MAPPER SURVEY

An airborne thematic mapper survey, undertaken on behalf of the A.D.E. Joint Venture by the National Safety Council of Australia, Victorian Division ("NSCA"), was flown over the whole of the licence area. Specifications for the survey are given in Table 1.

Thematic mapping was chosen over other remote sensing exploration methods as it had the advantage of using an eleven channel scanner giving a larger number of spectral bands which can be discriminated and because all data collected is digitized allowing for the greatest flexibility in manipulation of the data.

Within Exploration Licence 4534 the exploration method of thematic mapping was aimed primarily to enhance or distinguish between a possible kimberlite body and its surrounding overburden of Cainozoic black soil, alluvium and gravel, Tertiary white, nodular limestone and dolomite, lesser Middle Cambrian sediments of the Burton Beds and minor Upper Proterozoic Mittiebah Sandstone.

The scanner data in the form of 'quick look paper prints' collected from the airborne thematic survey, together with all relevant aerial photography, was forwarded to Hunting Geology and Geophysics (Australia) Pty. Limited for examination.
<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>394 X Alx RN1/336 R23 ch 1-10</td>
<td>Indistinct circular feature on NNW-trending linear defining margin of Cambrian outcrop. Less anomalous on scanner data. NSC. 200m.</td>
</tr>
<tr>
<td>412 L Alx RN2/384 R21 ch 4-11</td>
<td>Small bright tonal (and topo?) anomaly with dark surround, sitting on major NW-trending linear. Not seen on channels 1-3 due to poor contrast resulting from a widespread iron oxide absorption anomaly on the surrounding residual surfaces. NSC. 100 x 150m.</td>
</tr>
<tr>
<td>417 L Alx RN1/336 R22 ch 11</td>
<td>Small fill with surrounding radial fractures. 100m. Inside circular structure visible only on thermal channel. NSC. 750m.</td>
</tr>
</tbody>
</table>
LISTING OF ANOMALIES

The format used for the listing of anomalies is as follows:

Anomaly Grading Map Air Photo Scanner Run & Description Size
Number Ref. Number Channel No.

ABREVIATIONS

Grading  
H  = high (highest priority)
M  = medium (definitely worth checking)
L  = low (probably worth checking)
X  = lowest (of low interest unless supported by additional data)

Map Ref  Alx  = Alexandria
Air Photo  
Number  RN  = Ranken
Description  NSC  = No stereo coverage

TABLE 2.

THEMATIC MAPPER ANOMALIES - E.L. 4534

353 X Alx RN3/411  Small pale tonal anomaly. Possibly cultural. NSC. 100m.


393 X Alx RN1/336 R22 ch 1-9 Indistinct elliptical feature on NNW-trending linear. NSC. 150 x 350m.
The procedure used by Hunting in such an examination is listed below:

1. Monoscopic examination of aerial photography.
2. Identification of anomalies from Step 1 on scanner data.
3. Examination of 11 channels of scanner data.
4. Identification of additional anomalies from Step 3 on aerial photography.
5. Stereoscopic examination of all anomalies on aerial photography where stereoscopic coverage was available.

The targets selected by Hunting were rated on a lowest, low, medium or high priority scale. Grading was established solely on the appearance of the anomalous zones without consideration of their position in regard to regional tectonic structures, or their apparent age in relation to residual surfaces.

Within E.L. 4534 four lowest and two low priority thematic targets were outlined, details of these being listed in Table 2. Anomaly locations are given in Plan 1.
6.

4.00 CONCLUSIONS

During the period that Exploration Licence 4534 was explored by the A.D.E. Joint Venture a variety of techniques including classical gravel sampling, loam sampling and airborne thematic mapping were applied in the search for kimberlites.

Despite the fact that a number of gravel samples were found to contain microdiamonds, the exploration program failed to provide encouragement in locating the presence of a kimberlite pipe within the licence.

It was therefore decided by the Joint Venture that exploration efforts should be concentrated in more promising ground held elsewhere in the Territory. Consequently the Manager recommended and the Licensee agreed that E.L. 4534 should be surrendered.
APPENDIX 1.
RESULTS OF LABORATORY EXAMINATIONS

REGIONAL GRAVEL AND LOAM SAMPLES EL 4534

The following fractions of each sample were studied:

-1.0 mm  +0.8 mm;  denoted by +0.8
-0.8 mm  +0.5 mm;  denoted by +0.5
-0.5 mm  +0.425 mm; denoted by +0.4

<table>
<thead>
<tr>
<th>Sample No</th>
<th>Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAN 13</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 14</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 15</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 16</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 17</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 18</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 19</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 20</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 21</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 22</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 23</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 24</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>Sample No</td>
<td>Results</td>
<td>Comments</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>RAN 25</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 88</td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
<tr>
<td>RAN 89</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 90</td>
<td>1 -0.4 DIAMOND</td>
<td>1 +0.10 x 0.10 STONE pale brown, translucent cube.</td>
</tr>
<tr>
<td></td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
<tr>
<td>RAN 91</td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
<tr>
<td>RAN 101</td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
<tr>
<td>RAN 102</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 103</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 104</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 105</td>
<td>1 -0.4 DIAMOND</td>
<td>1 +0.20 x 0.10 x 0.05 STONE flat, 'platy', cream, opaque, poor quality.</td>
</tr>
<tr>
<td></td>
<td>2 +0.4 GARNET</td>
<td>GARNETS x 2 not of interest.</td>
</tr>
<tr>
<td>RAN 108</td>
<td>1 -0.4 DIAMOND</td>
<td>1 +0.28 x 0.20 STONE white, subhedral, part of an octahedron, bubbly surfaces, some growth lines, many black inclusions.</td>
</tr>
<tr>
<td>RAN 109</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 110</td>
<td>1 -0.4 DIAMOND</td>
<td>1 +0.15 x 0.15 STONE cube shaped, pale green interior with dark green outer layer.</td>
</tr>
<tr>
<td></td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
<tr>
<td>RAN 111</td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
<tr>
<td>RAN 112</td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
<tr>
<td>RAN 113</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>Sample No</td>
<td>Results</td>
<td>Comments</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>RAN 114</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>RAN 115</td>
<td>3 -0.4 DIAMOND</td>
<td>3 STONES: 1 +0.22 x 0.22 STONE pale brown cube. 1 +0.15 x 0.15 STONE broken cube, turbid, cream. 1 +0.10 x 0.15 STONE turbid, pale cream fragment.</td>
</tr>
<tr>
<td></td>
<td>1 +0.4 GARNET</td>
<td>GARNET x 1 not of interest.</td>
</tr>
</tbody>
</table>
APPENDIX 2.
A.D.E. JOINT VENTURE

EXPLORATION LICENCE NO. 4534

FINAL EXPENDITURE FOR THE PERIOD 16/1/85 - 7/1/86

$8,203

Salaries

41,614

Field and Laboratory Expenses

5,309

Miscellaneous

$55,126

Expenditure:
REPORT TITLE: FINAL REPORT E.L. 4534
16th January, 1985 to 7th January, 1986

AUTHOR(S): ASHTON MINING LIMITED

PUBLISHER

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DATE OF PUB'N: APRIL 1986

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(1) PHOTOS 1
(2) DIAGRAMS 1
(3) TABLES 2
(4) PLANS 1
(5) GRAPHS 2
(6) LOGS 1

LICENSEE NO.(S): 4534
PROJECT YEAR(S): 1985

LICENSEE(S): DESIGN AND CONSTRUCTION PTY. LIMITED

JOINT VENTURE(S): A.D.E. JOINT VENTURE

OPERATOR(S): ASHTON MINING LIMITED

1: 1000000 map name(s) and No(s): NEWCASTLE WATERS SE 53
1: 250000 map name(s) and No(s): RANKEN SE 53-16
1: 100000 map name(s) and No(s): ALEXANDRIA 6259
1: 50000 map name(s) and No(s): 

PROSPECT NO.

** SITE LOCATION
LAT: ____________
LONG: ____________
EAST: ____________
NORTH: ____________

*** TECTONIC UNIT
GEORGINA BASIN

MAJOR TERM
□ METALS
□ NONMETALS
□ PETROLEUM

□ OTHER

**** MINOR TERMS
DRILLING
□ DIAMOND
□ PERCUSSION
□ AUGER
□ ROTARY

AERIAL/GRND GEOPHYSICS
□ MAGNETIC
□ RADICACTIVITY
□ E.M. SURVEY
□ IP SURVEY
□ SEISMIC

GEOCHEMISTRY
□ DRAINAGE TESTING
□ DRILL CORE ANALYSIS
□ ASSAYING
□ GEOCHEMICAL ANOM
□ SAMPLING

GENERAL
□ GEOL MAPPING
□ PHOTOGEOLGY
□ GRIDDING
□ METHODS
□ REGIONAL GEOL

COMMODITIES
□ U
□ Au
□ Ag
□ Pb
□ Zn
□ Geophysical Anom
□ Geophysical Anom
□ Resitivity
□ Gravity
□ Geophysical Anom
□ Resistivity
□ Geophysical Anom

□ Dmd
□ Water
□ Rock Chip
□ Soil
□ Stream Sediment
□ Stratigraphy
□ Reconnaissence
□ Logging

OTHER TERMS:
THEMATIC MAPPER SURVEY

NOTES

ABSTRACT ATTACHED: YES

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TEXT LOCATION

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