FINAL REPORT E.L. 4530

25th 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

Ashton Mining Limited
444 Queen Street
Brisbane. 4000

April, 1986

ABSTRACT

During the period 25th 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. 4530 aimed at the location of kimberlite pipes.

Work undertaken included regional gravel sampling and airborne thematic mapping.

Despite the fact that several 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 recommended by the Manager and the Licensee agreed that E.L. 4530 should be surrendered.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PLANS

LIST OF APPENDICES

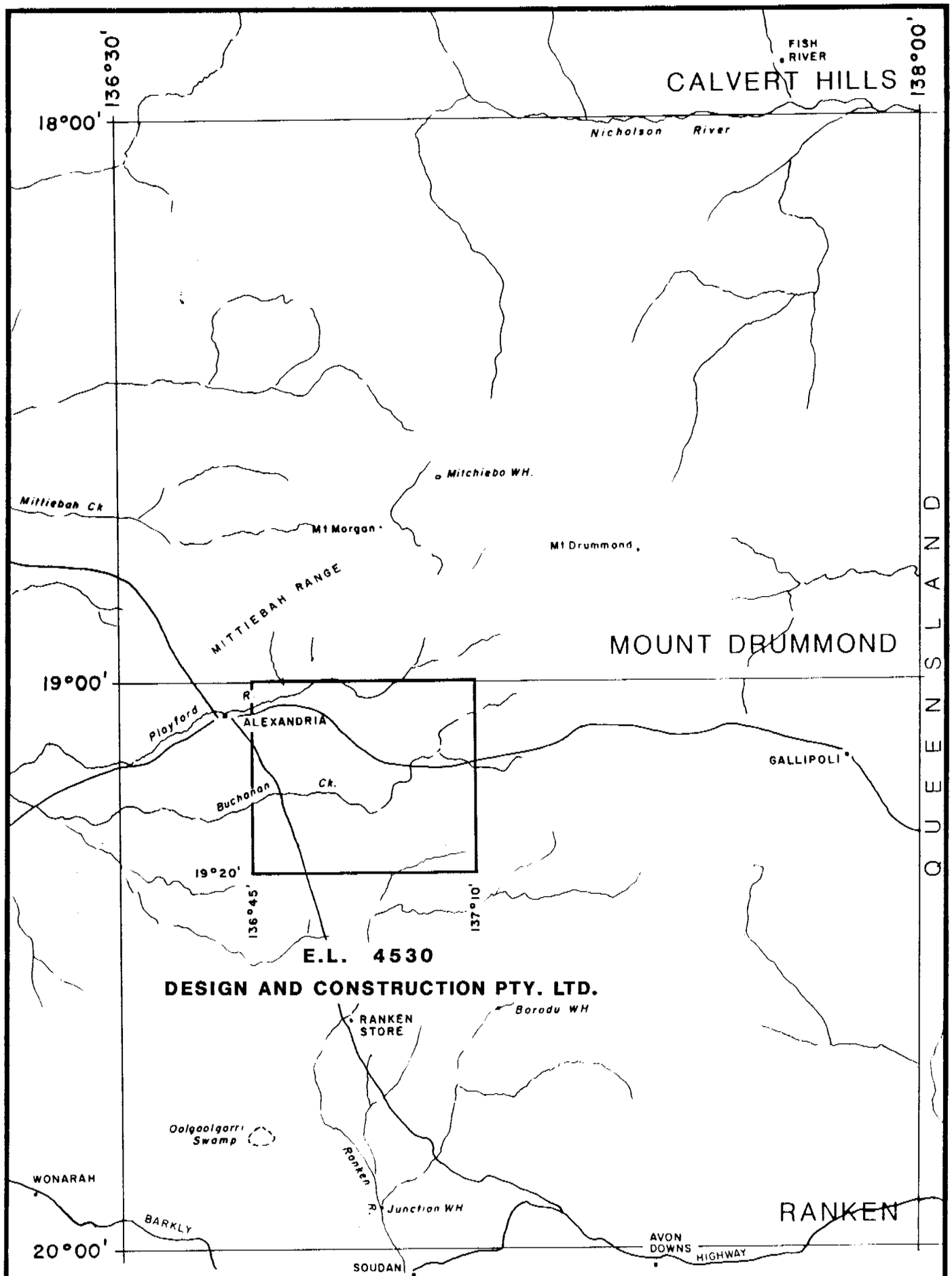

FIGURE 1
LOCATION MAP

A.D.E. JOINT VENTURE / ASHTON MINING LIMITED Scale 1 : 1 000 000 APRIL, 1986

1.00 INTRODUCTION

Exploration Licence 4530 covered an area of 1,610 square kilometres (500 blocks) on the Ranken 1:250,000 sheet (refer to Figure 1).

The licence which was granted to Design and Construction Pty. Limited on 25th 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 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. 4530 during the period 25th January, 1985 to 7th January, 1986.

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. 4530 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 and Lulu 1:100,000 sheets so that sample sites tested the available drainage. As the drainages in the region are relatively sparse, this resulted in only 16 gravel samples being taken in E.L. 4530.

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 4mm fraction collected for laboratory examination. Generally the minus 4mm samples weighed 30 to 35 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 16 samples collected within the licence, 11 contained no detectable kimberlite indicator minerals. Six microdiamonds were recovered from the five remaining samples. In addition 17 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)

Channels available:

Channel	Wave length (µm)
1	Ø.42 - Ø.45
2	Ø.45 - Ø.52
3	Ø.52 - Ø.6
4	Ø.6Ø5 - Ø.625
5	Ø.63 - Ø.69
6	Ø.695 - Ø.75
7	Ø.76 - Ø.9
8	Ø.91 - 1.Ø5
9	1.55 - 1.75
1Ø	2.Ø8 - 2.35
11	8.5 - 13

Aircraft:	Beech King Air
Flying Altitude:	8ØØØ metres above ground level
Ground Element Size:	2Øm x 2Øm
Flight Times:	Ø93Ø hours to 143Ø hours
Azimuth of Runs:	North or South
Overlap between runs:	4Ø%

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 4530 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, Tertiary limestone, Middle Cambrian fossiliferous siltstone, chert and crystalline limestone of the Burton Beds and lesser Upper Proterozoic sandstone in the western half of the licence.

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 2.

THEMATIC MAPPER ANOMALIES - E.L. 4530

263	L	Lul	RN1/324 R16 ch 1-11	Dark tonal anomaly and possible depression. Better defined on scanner data. NSC. 400 x 650m.
264	X	Lul	RN2/376 R14 ch 1-11	Circular structure in ?uplifted sand-covered residual surface. NSC. 400m.
316	X	Alx	RN1/328 R17 ch 4-11	Part circular structure bounded by NNE to N-trending linears in Cambrian sediments. Looks more anomalous on some scanner channels. NSC. 300m.
345	L	Alx	RN1/328 R18 ch 3-8	Concentric structure in residual surface. 250m to 1.2 km.
345A			R18 ch 9-11	Seen as smaller anomaly with radiating fractures. NSC.
350	L	Alx	RN1/328 R18 ch 1-11	Small circular feature. Most sharply defined on thermal channel. Iron oxides at surface. NSC. 150m.
383	L	Alx	RN1/328 R19 ch 1-10	Subradial drainage at centre of circular residual outlier. NSC. 400m.

LISTING OF ANOMALIES

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

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

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
- Lul = Lulu

Air Photo Number
- RN = Ranken

Description
- NSC = No stereo coverage

TABLE 2.

THEMATIC MAPPER ANOMALIES - E.L. 4530

261	X	Lul	RN1/324 R15 ch 1-11	Circular ?depression in residual surface. NSC. 150m.
262	L	Lul	RN1/324 R15 ch 6-11	Elliptical feature in residual surface. Less distinct on scanner data. NSC. 500 x 700m.

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.
6. Grading of anomalies.

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. 4530 three lowest and five low priority thematic targets were outlined, details of these being listed in Table 2. Anomaly locations are given in Plan 1.

4.00 CONCLUSIONS

During the period that Exploration Licence 4530 was explored by the A.D.E. Joint Venture a variety of techniques including classical gravel 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 E.L. 4530. This fact together with disappointing results in areas adjoining the licence, led the A.D.E. Joint Venture to conclude that work should be concentrated in more promising ground held elsewhere in the Territory. Consequently the Manager recommended and the Licensee agreed that E.L. 4530 should be surrendered.

APPENDIX 1.

RESULTS OF LABORATORY EXAMINATIONS

REGIONAL GRAVEL SAMPLES EL 4530

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

Sample No	Results	Comments
RAN 69	1 +0.4 GARNET	GARNET x 1 not of interest.
RAN 70	Nil	
RAN 78	Nil	
RAN 79	Nil	
RAN 80	1 -0.4 DIAMOND 1 +0.4 GARNET	1 +0.15 x 0.15 STONE turbid, cream, cube shaped, poor quality. GARNET x 1 not of interest.
RAN 81	2 -0.4 DIAMOND 1 +0.4 GARNET	2 STONES: 1 +0.30 x 0.25 STONE octahedral, clear, colourless. Many growth lines and triangular (octahedral) plates. 1 +0.30 x 0.30 STONE anhedral, turbid, mid green, rounded, little lustre from knobbly surface. GARNET x 1 not of interest.
RAN 82	1 -0.4 DIAMOND 3 +0.4 GARNET	1 +0.40 x 0.25 STONE clear, transparent interior and patchy brown areas near surface. GARNETS x 3 not of interest.
RAN 83	Nil	

Sample No	Results	Comments
RAN 84	2 +Ø.4 GARNET	GARNETS x 2 not of interest.
RAN 85	1 -Ø.4 DIAMOND 1 +Ø.4 GARNET	1 +Ø.13 x Ø.12 STONE clear, colourless, octahedral with small steps at apices, one piece broken off. GARNET x 1 not of interest.
RAN 86	4 +Ø.4 GARNET	GARNETS x 4 not of interest.
RAN 87	2 +Ø.4 GARNET	GARNETS x 2 not of interest.
RAN 92	Nil	
RAN 93	1 +Ø.4 GARNET	GARNET x 1 not of interest.
RAN 1Ø6	1 -Ø.4 DIAMOND 1 +Ø.4 GARNET	1 +Ø.1Ø x Ø.1Ø STONE anhedral, irregular, turbid, pinkish fragment with darker patches - cube related. GARNETS x 1 not of interest.
RAN 1Ø7	Nil	

APPENDIX 2.

A.D.E. JOINT VENTURE

EXPLORATION LICENCE NO. 4530

FINAL EXPENDITURE FOR THE PERIOD 25/1/85 - 7/1/86

	$
Salaries	6,723
Field and Laboratory Expenses	36,929
Miscellaneous	5,038
Expenditure:	$48,690

136°45'

19°00'

137°10'

19°00'

EL 4530 : D. & C.

383*

350*

316

262*

261

345*

263*

264

RAN 085
RAN 084
RAN 082
RAN 083
RAN 087
RAN 086
RAN 080
RAN 079
RAN 078
RAN 081
RAN 107
RAN 106
RAN 092
RAN 093
RAN 070
RAN 069

Buchanan Creek

Buchanan Creek

19°20'

136°45'

19°20'

137°10'

THEMATIC MAPPER ANOMALY

○	Approximate size and shape of anomaly
342	Anomaly number
***	Anomaly grading - high
**	- medium
*	- low
	- lowest
pa	Position approximate
———	Fracture or other linear feature
— — —	Weak linear
~~	Ridge
—o—	Dyke

SAMPLE SYMBOLS

- • GRAVEL SAMPLE
- \+ LOAM SAMPLE
- × ROCK SAMPLE

NORTHERN TERRITORY GEOLOGICAL SURVEY
CR86/111

DESIGN AND CONSTRUCTION PTY. LTD.
A.D.E. JOINT VENTURE
E.L. 4530
ANOMALY AND SAMPLE LOCATIONS
PLAN 1

0 1 2 3 4 5 KM
Scale 1:100 000

ASHTON MINING LIMITED APRIL, 1986