



Rio Tinto Exploration Pty. Limited

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A member of the Rio Tinto Group

Annual and Final Report for the
Period Ending 13 July 2003,
SEL 8630 Boomerang Creek,
Bauhinia Downs 53-03,
Northern Territory,

Exploration Report No. 26456

Tenement Holder:	Rio Tinto Exploration Pty Limited
Date:	March 2004
Author:	S R Bishop
Submitted:	D C Palmer
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LIST OF PLANS

	<u>Title</u>	<u>Scale</u>
NTd6951	Tenement Location Plan	1:500 000

1 SUMMARY

SEL 8630 Boomerang Creek completely surrounds ML 1154 that encompasses the Merlin diamond mining operations and kimberlite field, Georgina Basin, Northern Territory. SEL 8630 was granted to Ashton Mining Limited on 14th July 1995 for four years. The tenement was originally 110 sub-blocks but was reduced to 55 sub-blocks in 1997. It was renewed in 1999 and 2001 and expired on 13th July 2003. SEL 23899 was lodged by Ashton Mining Limited on 8th May 2003 over SEL 8630 and EL 9893.

The Merlin kimberlite field contains twelve diamond-bearing kimberlite diatremes that have intruded along a N-S alignment. Only the Emu 1 and 2 pipes are located within SEL 8630. The diatremes have intruded the Bukalara Sandstone and are dated as Devonian.

During the term of SEL 8630, Ashton Mining Limited, BHP Minerals and Rio Tinto Exploration Pty Limited ("RTE") completed geological sampling, geophysical and drilling programs exploring for diamonds and base metals. No additional kimberlites were discovered within the tenement. Exploration activities within SEL 8630 for the period 14th July 1995 to 13th July 2002 are summarised in this report.

During the final tenure year from 14th July 2002 to 13th July 2003, RTE compiled historical exploration data and sought to divest the tenement.

2 CONCLUSIONS AND RECOMMENDATIONS

SEL 8630 remains prospective for diamond-bearing kimberlites that could augment any further mining operations within ML 1154.

No remaining exploration targets within SEL 8630 are considered likely to fulfill RTE exploration objectives.

SEL 8630 is being divested along with neighbouring tenement holdings.

3 INTRODUCTION

SEL 8630 Boomerang Creek was granted to Ashton Mining Limited (Ashton) on 14th July 1995 for four years. The licence replaced EL's 6424, 7267, 7581, 7859, 7860 and 7861. The tenement was originally 110 sub-blocks but was reduced to 55 sub-blocks in 1997. The Australian Diamond Exploration Joint Venture, that included

Aberfoyle Resources Ltd, Australian Diamond Exploration Pty Ltd and Ashton (as managers), funded and implemented exploration activities within the tenement. The McArthur River Joint Venture that included Ashton Mining Limited and BHP Minerals (BHPM) and with BHPM as managers, funded base metal exploration activities within the tenement.

On 13th February 1996 Exploration Retention Licences 141 and 142, which lie within the SEL 8360 boundary, were granted to Ashton. ML 1154, which replaced ERL 141 and 142 and parts of SEL 8630, was granted to Ashton on 15 June 1998 following resolution of native title issues.

SEL 8630 was renewed in 1999 and 2001 and expired on 13th July 2003. RTE acquired the SEL 8630 in late 2000 following the takeover of Ashton Mining Limited by Rio Tinto Limited. Ashton Mining Limited lodged SEL application 23899 on 8th May 2003 to replace SEL 8630 and EL 9893.

SEL 8630 is located 80 km south of the Borroloola township, Northern Territory, on the Bauhinia Downs 1:250,000 map sheet (Plan NTd6951). Access is via the Carpentaria Highway and the roads leading into the Merlin diamond mining operations.

SEL 8630 completely surrounds ML 1154 that encompasses the Merlin diamond mining operations and kimberlite field. Ashton discovered 10 of the 12 kimberlites in this field in 1993-94. SEL 8630 has been subjected to a substantial amount of previous exploration mainly for diamonds by Ashton and RTE but also for base metals by BHPM in JV with Ashton.

4 LICENCE DETAILS

Table 1: Tenement Details

Name	Tenement No.	Grant Date	Expiry Date	Sub-Blocks	Area (km ²)
Boomerang Creek	SEL 8630	14 July 1995	13 July 1995	55	

5 GEOLOGY

SEL 8630 is located mainly within the Cambrian Georgina Basin close to its contact with the McArthur Basin. Major faults, that trend ENE-WSW (e.g., Calvert Fault) and N-S, traverse the area. The major N-S faults are associated with the western margin of the tectonically inverted, NS trending Batten Trough that lies to the west. The sediments are only gently folded.

A plateau of Bukalara Sandstone that forms the base of the Georgina Basin sequence dominates in outcrop. Localised eroded remnants of the Mullaman Beds, belonging to the Cretaceous Dunmarra Basin, overlie the Bukalara Sandstone. The Mullaman Beds infill localised depressions, mainly karstic sink holes, developed on the Cambrian unconformity erosional surface.

The SEL is centered on the Merlin kimberlite field that is a cluster of diamond-bearing kimberlite diatremes that have intruded along a N-S alignment. Most of the pipes are located within ML 1154 internal to SEL 8630. Only the Emu 1 and 2 pipes are located within SEL 8630. The diatremes have intruded the Bukalara Sandstone and are dated as Devonian. The kimberlite diatremes are small with the largest being 125m in diameter. They are obscured beneath Cretaceous sediment depressions developed within the Bukalara Sandstone surface.

6 PREVIOUS EXPLORATION WITHIN SEL 8630

1st Year Exploration Activities 14th July 1995 to 13th July 1996

Rogers (1996) reported the following diamond exploration activities within SEL 8630 by the Australian Diamond Exploration Joint Venture and base metal exploration activities by the McArthur River Joint Venture for the period 14th July 1995 to 13th July 1996. The report documents work completed within the areas covered by ERL's 141 and 142 prior to their grant on the 13th February 1996 but not after their grant.

- The Aboriginal Areas Protection Authority (AAPA) completed a site survey of a 5 km corridor along the access track through the tenement area.
- 1:10,000 scale colour aerial photography was flown over a part of SEL 8630.
- 11 gravel samples were collected and submitted to the Ashton's Perth Laboratory for indicator mineral analysis. One of two gravel samples processed contained indicator minerals.

- 100 loam samples were collected and submitted to the Ashton's Perth Laboratory for indicator mineral analysis. None of the 83 samples analysed returned positive for indicator minerals.
- Results were received from Ashton's Perth Laboratory for 1846 gravel, loam, RAB drill spoil and trench bulk samples collected within the tenement block that preceded the grant of SEL 8630. 40 of the samples contained indicator minerals.
- 951 soil samples and 14 drill spoil samples were sent for multi-element geochemical analysis. Some of the geochemical anomalies interpreted to be highlighting possible kimberlites were followed up with drilling.
- 43 RC holes were drilled into 11 kimberlite pipes and two mini bulk-samples totaling 270.07 tonnes (dry weight) were recovered from the drill holes. A total of 60.1 carats of diamonds were recovered from the bulk samples.
- Petrography on drill chip samples identified a range of kimberlite mineral compositions and textures.
- 128 RAB drill holes and nine diamond drill holes tested various kimberlite pipes and a range of geophysical, geochemical and indicator mineral anomalies.
- 55 RAB hole spoil samples were collected and submitted to the Ashton's Perth Laboratory for indicator mineral analysis. Only one sample returned indicator minerals (one microdiamond).
- A 1994 DIGHEM survey was reinterpreted. EM-34 surveying was carried out over various portions of the tenement area. A total of 32 geophysical targets were identified and listed.
- A winze was sunk on the Palomides pipe and 1000 tonnes of ore extracted. A total of 168.55 carats of diamonds were recovered.
- Front end loaders excavated a "slot" in the Sacramore pipe.
- BHP Minerals completed an airborne GEOTEM survey, flown by Geoterrex Pty Ltd, over the tenement.

Further work was recommended. Exploration expenditure for the period amounted to \$3,017,401.

2nd Year Exploration Activities 14th July 1996 to 13th July 1997

Pang (1997) reported the following diamond exploration activities by the Australian Diamond Exploration Joint Venture and base metal exploration activities by the McArthur River Joint Venture for the period 14th July 1996 to 13th July 1997;

- GHD Engineering Consultants completed an Engineering Survey and Access Road Design on the access road traversing the tenement area.
- An AAPA survey was undertaken by the Aboriginal Areas Protection Authority to allow a certificate to be issued in respect to the proposed mining areas.
- Environmental consultants Dames and Moore Pty Ltd carried out baseline environmental monitoring and compilation of the Public Environmental Review (PER) report.
- Results from 214 gravel and loam samples collected prior to grant of the tenement were returned. A significant number of samples returned kimberlitic indicator minerals.
- Results from 152 gravel and loam samples collected during the previous reporting period were returned. A significant number of samples returned indicator minerals.
- 19 gravel and seven loam samples were collected and forwarded to Ashton's Perth Laboratory for indicator mineral analysis. One sample reported a microdiamond and nine samples reported chromite.
- 24 vegetation samples (spinifex) from the Northern Anomaly were submitted for geochemical analysis.
- 51 RAB holes, totalling 1045m, tested 12 geophysical targets across the "Northern Anomaly" area and one geochemical anomaly. No new kimberlites were intersected. The RAB drill hole spoils were submitted for routine microdiamond analysis and geochemical analysis.
- A review of geophysical datasets highlighted two "deep source" GEOTEM targets that were surveyed with EM-34 totalling 0.9 line km. No conductors were delineated.

- BHP Minerals interpreted the GEOTEM survey data acquired during the previous reporting year. No conductors of interest were identified and BHPM withdrew SEL 8630 from the McArthur River JV.

Further work was recommended. Exploration expenditure for the period amounted to \$263,486.

Pang and Nunn (1997) reported on the 50% partial reduction of SEL 8630 from 110 blocks down to 55 blocks. Pang (1998a) provided an addendum to the partial relinquishment report for SEL 8630.

3rd Year Exploration Activities 14th July 1997 to 13th July 1998

Pang (1998b) reported the following diamond exploration activities for the period 14th July 1997 to 13th July 1998;

- An access track, of which 5.5 km traverses SEL 8630, was constructed to connect the Merlin mining campsite with the Carpentaria Highway.
- A vegetation geochemical anomaly in the Northern Anomaly Area was highlighted for follow up. 16 vegetation samples were collected to the north and submitted for geochemical analysis. An additional 95 vegetation samples were collected in the area to the southwest of the Ector pipe and submitted for geochemical analysis.
- Vegetation anomalies were tested with nine RAB drill holes, totalling 268m in the Northern Anomaly area and 14 drill holes, totalling 366.5m, in the area southwest of Ector.
- A RAB drilling program, totalling 401m, tested seven magnetic targets and one EM target.
- Hole BH 608 was redrilled and included a diamond tail that extended the hole to 61m.
- Ground magnetic and EM-34 surveys were also completed.
- Eight lines of refractive seismic surveying was completed over the Northern Anomaly area. As part of the program 448 shallow RAB holes were drilled along eight traverses.

- As part of the Merlin mine development a sterilisation program of 106 holes, totalling 273.48m, was completed within the SEL.
- Four holes, totalling 334m, were drilled to test for water sources to supply the Merlin mine site.

Further work was recommended. Exploration expenditure for the period amounted to \$551,786.

4th Year Exploration Activities 14th July 1998 to 13th July 1999

Gunn (1999) reported the following diamond exploration activities work for the period 14th July 1998 to 13th July 1999;

- Laboratory results for drill spoils collected during the previous period became available, however, none of the samples contained indicator minerals.
- The refractive seismic surveying, undertaken over the Northern Anomaly area during the previous period, generated 27 targets. A program of 18 RAB holes, totaling 355m, tested 14 of the higher priority targets. No kimberlites were intersected. Eighteen samples were submitted for indicator mineral analysis. Single chromite grains from three samples were interpreted to have originated from the surficial loam environment.
- Nine gravel samples, nine loam samples and three rock samples were collected and submitted to Ashton's Perth Laboratory for indicator mineral analysis. Two contained microdiamonds while some others reported chromite.
- Two test traverses totalling 43 soil samples was gathered over the Northern Anomaly Area and the M14 anomaly in conjunction with samples collected over known kimberlite pipes to assess the effectiveness of Mobile Metal Ion technology to diamond exploration. Samples were submitted to MIM Technology for analysis. Several anomalous values were identified but ground investigations failed to produce a drill target.
- A total of 98.8 line km of ground magnetic surveying was completed over an area of 1.5 km by 1.3 km to test the Northern Anomaly area. Five selected targets were classed as being "lateritic". No follow up was undertaken.

- An infill EM-34 survey, totaling 23.8 line km, was completed over the Northern Anomaly area to close the existing 100m line spacing coverage down to 50m.

Further work was recommended. Exploration expenditure for the period amounted to \$268,104.

Thompson (1999) completed and submitted a Section 29A report for application for renewal of SEL 8630. The report discusses previous diamond exploration activities, results and proposed work.

5th Year Exploration Activities 14th July 1999 to 13th July 2000

Reddicliffe (2000) reported the following diamond exploration activities for the period 14th July 1999 to 13th July 2000;

- A review of sample data highlighted the presence of several areas that were inadequately sampled. Three loam samples were collected and submitted for indicator mineral analysis at Ashton's Perth Laboratory.
- Four infill loam samples were collected to the west of the Bedevere pipe and submitted for indicator mineral analysis.
- A helicopter-borne Hummingbird 5-frequency domain helicopter electromagnetic (HEM) survey was completed over a large portion of the SEL and was designed around three previous DIGHEM surveys. 17 HEM anomalies were highlighted for follow up. Seven of these were followed up with ground magnetic traverses totaling 6.2 line km. Twelve were located on the ground using GEM300 surveying, totaling 18.4 line km. Gravity surveys were completed over some the anomalies but failed to detect any favourable responses. None of HEM targets highlighted were recommended for drill testing following ground truthing and field checking.
- A group of 14 previously identified DIGHEM, GEOTEM and gravity targets were surveyed with gravity traverses totaling 11.9 line km. One target, DIG22, was tested with RAB drilling but did not intersect kimberlite.
- A surface chromite anomaly on the Northern Anomaly was tested with RAB drilling but no kimberlite was intersected.
- Ground Acoustic Profiling (GAP) surveying produced nine targets. Two anomalies, one of which was DIG22, were selected for drill testing. The hole

to test DIG22 failed to intersect kimberlite. Hole BH1833 drilled into a surface chromite anomaly failed to intersect kimberlite, however, two samples of drill spoil returned indicator minerals. A drill spoil sample from BH1833 was submitted for geochemical analysis.

- Four rock were collected and submitted for indicator mineral analysis but returned negative results.
- Rehabilitation of drill sites was carried out.

Further work was recommended. Exploration expenditure for the period amounted to \$238,548.

6th Year Exploration Activities 14th July 2000 to 13th July 2001

Reddicliffe (2001) completed and submitted a Section 29A report for application for renewal of SEL 8630.

Rheinberger (2001) reported the following diamond exploration activities for the period 14th July 2000 to 13th July 2001;

- The results for 4 loam samples submitted for analysis during the previous period were returned. None reported indicator minerals.
- Three 10 tonne bulk samples were collected to follow up selected gravel sample indicator minerals anomalies. The samples were submitted to Ashton's Perth Laboratory for indicator mineral analysis. None of the samples returned diamonds. All three samples returned indicator minerals - mainly chromite but also included one pyrope. Rehabilitation of the bulk sample sites was carried out.
- A reconnaissance field visit was undertaken by RTE and ex-Ashton Mining Limited employees as part of a geological orientation of the Merlin mine and near-mine environments. It included visits to the Emu kimberlite pipes and other areas of interest.
- RTE implemented a review of Ashton's exploration datasets.

Further work was recommended. Exploration expenditure for the period amounted to \$140,491.

7th Year Exploration Activities 14th July 2001 to 13th July 2002

Curtis and Rheinberger (2002) reviewed, reinterpreted and reported on the diamond exploration data available for the “Merlin Orbit” project. This project area consisted of a suite of tenements, including SEL 8630, centred on the Merlin kimberlite province. The assessment included reviewing gravel, loam, soil geochemistry and bulk sampling data, airborne geophysical datasets (magnetics and EM data), and ground magnetics, EM and gravity data. They highlighted 17 “kimberlitic” targets within SEL 8630 requiring additional exploration.

Curtis and Bishop (2002) reported the following diamond exploration activities within SEL 8630 for the period 14th July 2001 to 13th July 2002;

- A -1mm loam sample was collected from each of the 17 kimberlitic targets and processed for indicator minerals. Three recovered chromite grains were probed with SEM.
- A -2mm loam sample was collected from each of the 17 kimberlitic targets and assayed for multi-element geochemical suite.
- An -80# auger soil sample was collected from each of the 17 kimberlitic targets and assayed for multi-element geochemical suite.
- Each of the 17 EM kimberlitic targets were tested with gravity survey traverses (22 lines).

The work failed to identify any kimberlitic targets of interest to RTE. Some subtle geochemical and gravity anomalies were recommended for additional investigations.

Exploration expenditure for the period amounted to \$108,145.02.

7 ANNUAL EXPLORATION ACTIVITIES FOR PERIOD ENDING 13 JULY 2003

During the 2002-2003 reporting period RTE decided to divest SEL 8630 because the Merlin diamond mine, and its surrounding exploration potential, was unlikely to meet company objectives. During the year RTE carried out the following activities;

- Merging of the Ashton diamond database with RTE’s diamond exploration database.

- Quality control-quality assurance (QA QC) assessment of the Ashton diamond database.
- Data packaging and plan preparation for presentation to various diamond exploration companies interested in acquiring SEL 8630 and adjacent properties.
- Discussions and negotiations with various interested parties regarding the divestment of SEL 8630.

8 ENVIRONMENT

No ground-based exploration activities were completed during the reporting period.

9 EXPENDITURE STATEMENT

The exploration expenditure for SEL 8630 for the period 14th July 2002 to 13th July 2003 is provided in Table 2.

Table 2. Exploration Expenditure 14th July 2002 to 13th July 2003

Description	Expenditure \$
Computing Services	158.47
Cont Exploration- Ext	103.74
Field & Transport	9.7
Gen Office Supp & Comm	86.14
Indirect Costs	849.67
Payroll & Benefits	5482.54
Recoveries & Income	28.52
Rent & Property	315.32
Sundry Prof & Other	51.88
Tenement Payments	50
Travel & Accomodation	46.77
Grand Total	7182.75

The total exploration expenditure for SEL 8630, for the eight year period of the tenure extending from 14th July 1995 to 13th July 2003, totalled \$4,595,144.

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LOCALITY

Bauhinia Downs	SF53-03	1:250 000
Glyde	6164	1:100 000

DESCRIPTOR

Annual and final report for SEL 8630 Boomerang Creek, Northern Territory for the period ending 13th July 2003. The licence surrounds the closed Merlin diamond mining operations and contains the Emu 1 and 2 kimberlite pipes. During the final period no field-based exploration was completed as none of the remaining targets fulfilled RTE's exploration objectives. The exploration data for SEL 8630 was packaged for divestment and negotiations were held with various interested companies regarding the divestment.

KEYWORDS

Boomerang Creek, Bukalara Sandstone, Cambrian, Chromite, Cretaceous, Divestment, Dunmarra Basin, Georgina Basin, Kimberlite, Merlin diamond mine, Indicator mineral, McArthur Basin, Mesoproterozoic, McArthur Group, Mullaman Beds.