BYNOE JOINT VENTURE

1989 ANNUAL REPORT

EXPLORATION LICENCE

3490

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1. **INTRODUCTION**

This report describes the results of exploration effort undertaken within Exploration Licence 3490 during the period 16th July 1988 - 15th July 1989.

Greenex, the exploration division of Greenbushes Ltd, carried out the work on behalf of both Greenbushes Ltd and Barbara Mining Corporation Ltd - the partners making up the Bynoe Joint Venture.

2. **LOCATION AND LEASING**

EL 3490 is located on the Finniss River Station Road approximately 30 km SSW of Darwin (Figure 1). The licence initially covering an area of 42 sq km and 14 graticular blocks was granted on the 16th July 1984. It has subsequently been reduced to an area of 6.5 sq km and 2 graticular blocks for the 1988/89 field season.

3. **TOPOGRAPHY**

Gently undulating country makes up the area of EL 3490, and is comprised regionally of low laterite capped peneplains separated by broad mature drainages. Between the drainages and peneplains are gradual slopes.
4. HISTORY

Tin mining commenced in the Finnis River Pegmatite Belt in 1886. The Leviathan Mine, immediately to the west of EL 3490, was discovered in 1886 and finally abandoned in 1909 (Summers, 1956, p.17).

Old Bucks Mine (originally called Fords Claim) located 1.6 km north east of Leviathan Mine in the north west of EL 3940, was the main producer in the field in 1905 (Summers, 1956, p.22). Leviathan and Old Bucks Mines were mapped by Summers (1956, plates 7 and 11).

In 1984, G Clynick rediscovered and mapped Old Bucks Pegmatite and located Megabucks (formerly Old Bucks West) pegmatite. Project Geologist W Clayton discovered Bunbury (Prospect 1) and Enterprise (Prospect 2) pegmatites in 1985, and investigated an additional pegmatite exposure (Prospect 3) in a borrow pit east of the Finnis River Station Road in the same year. These prospects are discussed and mapped in previous reports.

Work in the 1986/87 field season found the above previously discovered prospects in EL 3490 to be generally low grade deposits, except for Enterprise pegmatite which graded 0.922 kg/LCM Sn O₂ and 0.047 kg/LCM Ta₂ O₅. However, the prospect is small and its potential is considered limited.

During 1987/88 a regional assessment of the five exploration licences comprising the south-western portion of the Bynoe Joint Venture tenement holdings, namely: EL 2088, 2661, 3490, 4083 and 5096 was made. This involved airphoto interpretation and ground reconnaissance, pegmatite discovery and follow-up trenching, sampling and auger drill evaluation. The result was the rediscovery of a total of 18 previously worked pegmatities, the Southern Pegmatite Swarm, 2 of which were within EL 3490, namely: Centaur and Welcome Surprise. All had been long abandoned, and were in various states of collapse when rediscovered.

5. 1988/89 WORK

During 1988/89 follow-up work was carried out at both Centaur and Welcome Surprise prospects, and exploration continued in pursuit of additional pegmatites. Work carried out including auger drilling and general ground reconnaissance.
5.1 **Centaur Pegmatite**

**Location:**

The prospect is located in EL 3940, approximately 650 m from the old Finiss Station boundary fence and 850 m south east of the junction of the Finiss River Station Road and Leviathan Creek (Figure 2). The Finiss River Station Road provides all weather access to the area, but the 850 m to the prospect form this road is on bush track accessible only in the dry season.

Centaur pegmatite is 14.25 km in a direct line from Observation Hill Project Camp and plantsite.

**Topography:**

Centaur pegmatite is located in the centre of a low, sloping partly laterite capped rise. To the north and west the partly laterite capped rise continues for some distance before becoming dissected and giving way to extensive alluvial flats.

In the south are alluvial flats abutting Leviathan Creek, and in the east elevation increases to a quartz scree covered ridge carrying other pegmatite veins and outcropping shales (see Welcome Surprise).

**History:**

There is no recorded production from the prospect nor is there any known record of location. Old workings consisting of one large open pit, 9 m wide by 10 m long and 1.5 m deep, and a number of smaller pits in the north of the prospect, suggest grades must have been good. Laterite caprock obscures much of the southern extremities of the prospect so little evidence of work is seen in this area.

There is no evidence of mining since the turn of the century, and Mines Department plans do not record the deposit.
1987 Work:

The prospect was rediscovered in 1987. A total of 315.5 m of trenching was carried out adjacent to the old workings. The open pits and trenches were entered and mapped. A total of 103 samples were taken from trenches and processed. Auger drilling totalling 15 m was undertaken resulting in 7 samples being collected and processed.

1988 Work:

During 1988 the prospect was auger drilled to follow up areas of enhanced surface mineralisation along lines 2675 N and 2700 N. A total of 42 m of auger drilling was completed, resulting in 28 samples being collected and processed.

Number, Dimensions and Attitude of Pegmatites:

There appears to be one prominent direction of pegmatite intrusion. A single broad conformable vein striking 035 - 040 degrees with contacts which dip from 70 degrees west to 30 degrees east is the main pegmatite vein. This body appears to diverge into two separate veins in the SW and there is a single off-shooting vein in the north-east. The main exposure of pegmatite is relatively broad from 15 - 34 m and may extend for up to 270 m along strike. Exposures of pegmatite are a minimum of 6.5 m in the south west part of the prospect.

Centaur pegmatite is large and adjacent pegmatites are located as little as 250 m from the prospect. The trend in dip of contacts of this pegmatite is for them to be of high angle of either a subvertical or diverging nature. A number of associated pegmatites have comparable grades particularly of Ta₂O₅ (North Phoenix, Northern Reward, Welcome Surprise). All these factors together tend to suggest a subsurface connection between these bodies, perhaps with a single, larger body at depth.

General Geology:

Exposures of this pegmatite are confined to old workings and a number of trenches cut to expose the pegmatite. The pegmatite is kaolinised with kaolin and quartz the dominant minerals, and muscovite mica less-so. A harder quartz muscovite (greisen) zone is preserved on some contacts and makes up the off-shoot vein in the north east (Figure 3).
The pegmatite is partly lateritised so some contacts are obscured, whilst others are relatively sharply defined. Host rocks are mostly lateritised micaceous shales. The main foliation strikes 010 - 015 degrees and dips from 52 degrees west to 82 degrees east. A second north-south foliation parallel to the pegmatite intrusion direction was measured in one instance.

Cassiterite and Tantalite Mineralisation:

The cassiterite and tantalite grades are uniformly low in this pegmatite apart from a few areas of contact mineralisation (Figure 4 and 5). On the basis of the 103 trench samples collected the average SnO₂ : Ta₂O₅ ratio was approximately 2.4:1.

Mineralised Reserve Outlined:

The two drill holes on the prospect in 1987 confirmed the presence of low grade mineralisation at depth in Centaur pegmatite. The one hole to penetrate to depth in the prospect reached 12 m and was still in pegmatite so there is a significant body of pegmatite containing subeconomic mineralisation present. Drilling in 1988 generally confirmed these observations apart from one exceptional surface grade at 2700N, 2000E.

Potential Reserves:

A potential exists for a reasonable tonnage of mineralised eluvium associated with this pegmatite. Assuming eluvial grades are concentrated three times over and above pegmatite grades a reserve of 5 - 10,000 tonnes of mineralised eluvium could be expected to be associated with this deposit.
5.2 Welcome Surprise Pegmatite

Location:

This prospect is located in EL 3940, approximately 400 m from the old Finiss Station boundary fence, and approximately 1.1 km ESE of the junction of the Finiss River Station road and Leviathan Creek (Figure 2). The Finiss River Station Road provides all weather access to the area, but the 1.1 km to the prospect is on bush track accessible only in the dry season.

Welcome Surprise pegmatite is 14.0 km in a direct line from the Project Camp and Plantsite.

Topography:

Welcome Surprise is located on the western slope and northern end of a ridge of micaceous shales. To the north are dissected uplands, to the east a drainage area, and to the west a gradually sloping extensive laterite capped rise carrying additional pegmatites. In the south the ridge carrying this pegmatite continues for several hundred metres before giving way to alluvial flats abutting Leviathan Creek. Two additional pegmatites (Mackas Reward, Northern Reward) are exposed along the ridge.

History:

There is no recorded production from the prospect nor is there any known record of its location. The limited number of workings relative to the size of the prospect suggest it is generally of low grade, however, a few deeper open pits indicate some higher grade sections. This is also indicated by some extensive eluvial workings in the centre of the prospect.

There is no evidence of mining since the turn of the century, and Mines Department plans do not record the deposit.
1987 Work:

The prospect was rediscovered in 1987. A total of 340 m of backhoe trenching was carried out adjacent to old workings. The open pits and shafts were entered and sampled. A total of 40 samples were taken from old workings and trenches and processed.

1988 Work:

During 1988 the prospect was auger drilled. A total of 126 m of auger drilling was completed, and this work produced a total of 84 samples for processing; 5 of these were discarded, because they were comprised of unmineralised host rock material.

Number, Dimensions and Attitude of Pegmatites:

There appears to be one main pegmatite vein, with a few smaller offshooting veins in evidence on the eastern side of this main vein. The vein strikes 030 degrees for most of its length, but then changes to a north-south strike before again changing to a strike of 350 degrees at the northern end of the prospect. This vein is unconformable in the south, but becomes conformable in the north of the prospect where the strike direction parallels that of the host rocks. Contacts dip from 50 degrees west to 20 degrees east, and the vein varies in width from 1.25 - 9 m. Overall strike length is 300 m.

Welcome Surprise along with Mackas Reward and Northern Reward prospects are arranged en echelon along the ridge upon which they occur. There common character, particularly of Northern Reward and Welcome Surprise, of having divergent dips, suggests some connection between these pegmatites perhaps with a larger deep seated body as their source. There generally high levels of tantalite in all three prospects tend to confirm this suggestion.
General Geology:

Exposures of this pegmatite are restricted to the open pits and trenches cut along its length. The pegmatite is kaolinised and in parts of the prospect is segregated to a quartz core or an interval up to 4 m wide in which quartz is the predominant mineral (Figure 6).

Pegmatite contacts are sharp. Host rocks are laminated micaeous shales, which are weathered to a red-buff colouration. The main foliation strikes north-south or nearly-so, but varies from 350 degrees to 010 degrees. A second foliation, parallel to the pegmatite intrusion direction is evident in some places.

Cassiterite and Tantalite Mineralisation:

Although the cassiterite in this prospect is of low grade the tantalite is of relatively high grade (Figure 7). On the basis of the 40 trench samples collected the average SnO₂:Ta₂O₅ ratio was approximately 1:2.03. The Ta₂O₅:Nb₂O₅ ratio was approximately 1.03:1.

Mineralised Reserve Outlined:

Drilling during 1988 (Figure 8) has proven a resource of 11822 tonnes of oregrading 0.024 kg/tonne SnO₂ and 0.071 kg/tonne Ta₂O₅ along section 2450N in this prospect. Ore within the remainder of the pegmatite is subeconomic.

Potential Reserves:

With the elevated location of the pegmatite and the relatively high tantalite grades there is a likelihood of between 2 - 3,000 tonnes of mineralised eluvium associated with this deposit.

The Bynoe Joint Venture has spent in excess of $5.0 million on its exploration licences on Cox Peninsular and in the Reynolds River area since 1984. Estimated expenditure on EL 3940 is as follows:

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<td>Power and Water</td>
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<td>Sample Analysis</td>
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<td>Sundries</td>
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ADMINISTRATION

Accommodation  560
Communication  100
Travel and Food  1,030
Insurance  430
Tech Materials  150
Tenement Administration and Charges  2,940
Office Overheads  2,220

EXPLORATION

Line Clearing  410
Auger Drilling  2,320
Cone Preparation  680
Geological  1,770
Drafting and Reports  430
Stores - Bags, Tags etc  590

ESTIMATED EXPENDITURE  $19,980
7. EXPLORATION PROGRAMME 1989/90

During 1989/90 exploration will concentrate on finding possible strike extensions of known pegmatites. Backhoe trenching, auger drilling and sampling will be used to evaluate the pegmatites found. The expenditure is expected to be minimum of $5000.00.

8. REFERENCES

LEGEND FOR ACCOMPANYING MAPS

GRADE PLAN

Grades

\[ \text{SnO}_2 \, / \, \text{Ta}_2\text{O}_5 \, \text{Kg} \, / \, \text{LCM} \]

CROSS SECTIONS

- KEY -

DRILL HOLE SECTIONS

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</tr>
<tr>
<td>per</td>
<td>.02</td>
<td>.03</td>
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<tr>
<td>L.C.M.</td>
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<td>.04</td>
</tr>
<tr>
<td></td>
<td>.09</td>
<td>.07</td>
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Note - \(<.004 = \text{Trace} ; \, >.005 = .01\)

L.C.M. = Loose cubic metre

Key is not to scale

ALLUVIAL TRENCHING

Scale

H - 1:250
V - 1:100

Grades

\[ \text{SnO}_2 \, / \, \text{Ta}_2\text{O}_5 \, \text{Kg} \, / \, \text{LCM} \]