OPEN FILE

1989 FINAL REPORT
RELINQUISHED AREA
EL 2155
BYNOE PROJECT
COX PENINSULA N.T.

DISTRIBUTION :
Perth Office
Darwin Office
NT Department of Mines and Energy

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Bynoe Joint Venture
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1. **INTRODUCTION**

The Final Report for EL 2155 has been prepared in two parts. This part relates to the portion of EL 2155 that has been relinquished. A second report under separate cover refers to the portion of EL 2155 retained under ERL 57 and EL 5271.

The report was prepared by geologist M. Hatcher on behalf of Bynoe Joint Venture participants Greenbushes Ltd and Barbara Mining Corporation a subsidiary of Bayer A.G. of West Germany.

The licence is located on the Cox Peninsula south-west of Darwin (Figure 1). It is one of a number of tenements that are jointly held by the Bynoe Joint Venture participants in the region for the exploration of tantalite and to a lesser extent cassiterite. The Bynoe Joint Venture has been active in the Cox Peninsula area for almost six years and has constructed a 400,000 t.p.a. processing plant near Observation Hill approximately 14 kms north of EL 2155 (Figure 2). Approximately A$5 million has been spent on exploration and development in the region.

2. **LOCATION AND LEASING**

EL 2155 is located south of the Finnis River Station Road approximately 30 kms SSW of Darwin. Access is via the Finnis River Station Road and then immediately after crossing the Charlotte River Crossing a bush track south (Figure 2). The Finnis River Station Road is a formed all weather dirt road, but the access track is a bush track only passable in the dry season (May - December).

Exploration Licence 2155 was granted on the 17th October 1984 and expired in October 1989. Originally it was a 4 graticular block licence area centred on the Annie River and the Annie Pegmatite deposit (Figure 3). Two titles still held by the Bynoe Joint Venture participants i.e. ERL 57 and EL 5271 now cover substantial proportions of the original tenement area (Figure 3).

3. **REGIONAL GEOLOGY**

The Bynoe Joint Ventures target for exploration has been tantalum mineralisation (with associated cassiterite) within pegmatites, which intrude Burrell Creek Formation sediments in the region. These pegmatites collectively known as the
Figure 1

LOCALITY MAP
COX PENINSULA
Finniss River Pegmatite Belt intrude a belt up to 50 kms long and 5-10 kms wide from Darwin Harbour in the north to the Finniss River in the south. Within the belt pegmatite swarms are concentrated in various locations probably reflecting the proximity of the basement Litchfield Complex. The Litchfield Complex is a poorly explored and mapped mass of granitoids west of the Finniss River Pegmatite Belt.

Within the relinquished portion of EL 2155 the Old Crusher pegmatite is the only pegmatite to be discovered.

Secondary accumulations of cassiterite and tantalite occur in braided stream systems within the broad mature drainages in the region. Within the relinquished portion of EL 2155 there is a 100 m wide section of the Annie River that has been relinquished.

Tantalite (Tantalite - Columbite) is the major tantalum mineral recognised in the region although tapiolite has been recorded.

The Burrell Creek Formation is part of the Lower Proterozoic Finniss River Group and consists of predominantly siltstones and shales, with lenses of coarser grained sandstones and conglomerates. Black carbonaceous shales have been noted in the south of the Finniss River Pegmatite Belt.

Laterite caprock has been well developed throughout the region particularly in the north. The Annie Pegmatite has a thick ferruginous laterite cap in the east. The weathering and kaolinisation of the pegmatite feldspars mean these deposits are soft to dig up to 10 m from the surface. This is an important factor in the economic exploitation of these deposits.

Locally the Annie Pegmatite is one of the largest known deposits with a strike length of approximately 300 m and widths up to 25 m. The pegmatite has two prominent massive quartz "cores". There is every indication these deposits are complex segregated rare element pegmatites.

4. EXPLORATION

This report relates only to the relinquished portion of EL 2155, not covered by subsequent Bynoe Joint Venture Tenements. The original title was pegged to cover the Annie Pegmatite and Annie River alluvials. A considerable amount of ground reconnaissance was carried out with the result that previously unrecorded pegmatites (Figure 3) the Vultan Cornwall and Old Crusher were rediscovered. All deposits had shallow pits. Of these only the Old Crusher was in the area the subject of this report.
FIGURE 3
BYNOE JOINT VENTURE - N.T.
EL 2155

Scale 1:50,000

- Original Area
- EL 2155
- Pegmatite Deposits
- Old Mines
A small 100 m wide section of the Annie River is within the relinquished portion of EL 2155 that is not the subject of other Bynoe Joint Venture Titles.

4.1 Pegmatite Exploration

It has been found that foot ground traverses are the best method of locating pegmatite deposits. The resistant quartz material often forms prominent ridges and further inspection often yields muscovite within the quartz. Other techniques including geochemistry are often not sufficiently subtle to distinguish discrete targets. The Old Crusher Pegmatite was a deposit found in this fashion. However, ground traverses in the area surrounding the Old Crusher failed to locate additional targets. Based on previous experience in the region other pegmatites would be expected to be found in the area.

Old Crusher Pegmatite

Location:

This prospect is located in EL 2155, approximately 1.75 km NNW of Annie Pegmatite and 13.25 km SSW of Observation Hill (Figure 2 and 3). The Finnis River Station Road provides all weather access to the area, after which dry season access only is gained via a track leading south from the Charlotte River crossing. This track is followed for a distance of approximately six kilometres, before turning onto a small side track to the west which is followed for some 600 m to the prospect.

Old Crusher Pegmatite is 12.1 km in a direct line from the Project Camp and Plantsite.

Topography:

Old Crusher pegmatite is located on the south-east end of a low rise of outcropping shales; this ridge continues to the north. To the west are further low rises with intervening drainages of broad character. South and east is a very broad drainage.
History:

There is no record of production from the prospect nor is there any known record of its location. Limited work has been carried out suggesting low tin grades. Old equipment evident on site suggests that mining took place during World War II. Mines Department plans do not record the deposit.

1988 Work:

Old Crusher was rediscovered in 1988 during ground reconnaissance to the north of Annie pegmatite. A total of 15 m of backhoe trenching was carried out in a NNE direction to cut across the apparent strike of the pegmatite. Six pegmatite samples were collected from the trench and larger open pit for processing.

Number, Dimensions and Attitude of Pegmatites:

There appears to be one direction of pegmatite intrusion comprised of a single discordant vein striking NW. Contacts dip from 70 degrees east to 70 degrees west. From the limited exploration carried out the pegmatite appears to be 9 m wide, and exposed striklength is 30 m (Figure 4).

General Geology:

Exposure is restricted to open pits, the trench cut to expose the pegmatite and areas of outcrop material. The pegmatite is partly kaolinised with areas of hardrock material evident. Kaolin is more common in the northern and eastern parts of the prospect, whilst quartz tends to predominate in the west.

Pegmatite contacts with the adjacent country rock are sharp. The country rock is comprised of grey-green laminated micaceous shales.

The main foliation strikes 350 degrees and dips 70 degrees to the west (Figure 4).

Cassiterite and Tantalite Mineralisation:

Cassiterite grades from this prospect are low while tantalite grades are moderate. On the basis of the 6 samples collected the average SnO₂ and Ta₂O₅ grades are 0.024 kg/tonne and 0.041 kg/tonne, respectively. The Ta₂O₅:Nb₂O₅ ratio is 0.64.

Potential Reserves:

Further follow up work is required at this prospect before an indication of reserves can be made.
4.2 Alluvial Potential

The Annie River has been trenched in the vicinity of the Annie Pegmatite and been shown to carry significant secondary SnO₂ and Ta₂O₅ grades close to the pegmatite. Limited exploration further downstream failed to locate additional mineralised wash, but the results were not conclusive. There is the possibility that the 100 m section of EL 2155 relinquished and not covered by subsequent Bynoe Joint Venture titles may contain secondary cassiterite and tantalite.

5. ESTIMATED EXPENDITURE

The following is the estimated expenditure on EL 2155 in the year ending October 1989. The work was carried out by Geologists Frans Mollemans and Ian Leslie and was centred on trenching the Old Crusher Pegmatite and ground reconnaissance in the area for additional pegmatites.

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TOTAL ESTIMATE $ 14,000
6. CONCLUSIONS

This report is the final report for EL 2155 and covers areas within EL 2155 that are not currently covered by other Bynoe Joint Venture Tenements.

The Old Crusher pegmatite is within the area under consideration. Exploration of this small pegmatite deposit during 1988/89 was by backhoe trenching and although the tantalum grades were encouraging the volume of pegmatite was restricted. Ground reconnaissance in the vicinity of the Old Crusher pegmatite and between this deposit and Annie Pegmatite has failed to locate additional pegmatite deposits. Based on previous experience in the Finnis River Pegmatite Belt it would be unusual to find an isolated deposit like the Old Crusher without other local pegmatite occurrences.