BYNOE JOINT VENTURE
ANNUAL REPORT
MLN 16

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1. INTRODUCTION

This report describes the work carried out in 1988/89 on the Bynoe Tantalite Project Mineral Lease N 16 on Cox Peninsula. The programme was carried out by Greenex the exploration division of Greenbushes Ltd on behalf of Greenbushes Ltd and Barbara Mining Corporation, a subsidiary of Bayer AG of West Germany.

The work carried out during 1988/89 comprised a number of facets, including:

* limited ongoing exploration aimed at expanding the "soft rock" alluvial and pegmatite hosted Sn-Ta deposits
* feasibility study of the Bynoe Tantalite Project in the light of current market trends of the two major commodities of tantalum and tin
* site preparation for commencement of mining operations on the basis of the feasibility study and periodic reviews in the light of fluctuating market conditions
* plan preparation for mining commencement including delineation of major ore zones of significant alluvial and pegmatite deposits proposed as areas to commence mining
* plan preparation for essential vegetation clearance to enable mining to proceed, subject to rehabilitation measures in documents submitted under the heading of PROJECT DESCRIPTION AND ENVIRONMENTAL ASSESSMENT and subsequent correspondence.

MLN 16 is located approximately 30 km south west of Darwin (Figure 1). The area has a tropical monsoonal climate. It consists of broad flats which may be up to 300 m wide. The pegmatites are usually found on the upland plains or the surrounding transitional areas. The alluvial deposits occur in the mature drainage systems, generally conforming with the present streams.

2. PREVIOUS MINING AND EXPLORATION

Greenbushes Ltd has been active in exploring the Finnis River Pegmatite Belt (including MLN 16 area) since 1977.
2.1 History

Tin mining commenced on the field in 1886 and although many attempts were made over the years, invariably the projects closed down within a couple of years. Within the last 10 years, associated with an improvement in the tantalum price, there has been a resurgence in mining activity. Mining operations with small plants have worked Hang Gong, Mt Finniss, Wiggs, Picketts and Welcome Extended pegmatite deposits.

2.2 Greenbushes Ltd Exploration

The following work was carried out by Greenbushes Ltd:

1979 - 33 line km of survey grid
        900 holes and 2,593 m of auger drilling
        490 m of trenching
        140 individual pegmatites mapped
        1,815 samples collected and processed

1980 - 57 line km of survey grid
        2,560 holes and 6,950 m of auger drilling
        955 m of trenching
        5,249 samples collected and processed

2.3 Bynoe Joint Venture

2.3.1 During 1984 the Bynoe Joint Venture carried out:
        59.44 line km of surveying; drilled 18,113.3 m of auger drill
        holes; cut 306 backhoe trenches totalling 1,825 m and
        processed 5,321 exploration samples.

        In 1984 a water storage dam was constructed to supply process
        water for the project.

2.3.2 In 1985 the Bynoe Joint Venture carried out a pilot
        mining and processing programme. A 100 tonnes per hour pilot
        plant was constructed with feed bin, trommel, three stage jig
        for concentration of coarse mineral and two stage spiral for
        concentration of fine mineral. A total of 80,000 tonnes of
        ore from nine pegmatite and two alluvial areas was processed
to produce 27 tonnes of jig concentrate assaying 43% Sn, 18% Ta₂O₅, and 3.4 tonnes of spiral concentrate assaying 9% Sn and 6.8% Ta₂O₅. During 1985 a total of 20 pegmatites were mapped, 4,150.6 m of backhoe trenching, and 832 m of excavator trenching were carried out. A total of 446.5 m of auger drilling was carried out. This work was carried out for grade control purposes, not to increase ore reserves.

2.3.3 During 1986/1987 the Bynoe Joint Venture carried out the following:
• A total of 14 pegmatite areas were gridded
• A total of 14 pegmatite deposits were mapped
• A total of 4,718.5 m of backhoe trenching of 17 pegmatites was carried out
• 12 pegmatite deposits were drilled for a total of 3,679 m
• 4 alluvial channels were gridded
• A total of 3,675 m of excavator trenching was carried out. These trenches were 3 - 6 m deep.

2.3.4 During 1988/89 the Bynoe Joint Venture carried out the following:
• A total of 8 pegmatite prospects were gridded
• A total of 8 pegmatite prospects were mapped
• A total of 1,977 m of trenching (1,595 m of backhoe trenching and 382 m of excavator trenching) was carried out on pegmatite deposits
• 2 pegmatite deposits were drilled for a total of 2,199 m
• 10 alluvial channels were gridded
• A total of 3,025 m of excavator trenching was carried out in exploration of alluvial channels.

3. 1988/89 PROGRAMME

3.1 Pegmatite Exploration

During 1988/89 the Bynoe Joint Venture carried out exploration on Kettle Pegmatite.
3.1.1 Kettle Pegmatite

Location:

This prospect is located in MLN 16, 25 m north of the Mandorah Road, immediately NE of the junction between the Mandorah Road and the track to Mammoth pegmatite.

Kettle Pegmatite is 3.8 km in a direct line from the Project Camp and Plantsite.

Topography:

Kettle Pegmatite is located on a gentle slope leading down to Johnstones drainage. In the general surroundings are low rises separated by broad mature drainages, which pass into tidal creeks of Port Darwin Harbour.

History:

There is no record of production from the prospect nor is there any known record of its location. The prospect is comprised of a number of small open pits over a strike length of 45 m, the largest being 4 m long, 1 m wide and 0.5 m deep. Only a narrow area of pegmatite appears to be present.

No further work has been carried out, and Mines Department plans do not record the deposit.

1988 Work:

This prospect was rediscovered in 1988. A total of 20 m of backhoe trenching was completed adjacent to the old workings. One sample was collected from the larger open pit and processed.

Number, Dimensions and Attitude of Pegmatites:

A single narrow pegmatite vein is evident, which is unconformable with an approximate north-south strike. No contacts were uncovered in trenching, and the pegmatite in the open pits is obscured due to erosion. The vein appears to be a subvertical dyke.
General Geology:

Exposures of the pegmatite are restricted to old workings. The pegmatite is kaolinised with quartz the dominant mineral. Host rocks are micaceous shales, which are lateritised through the northern three-quarters of the prospect. Host rock foliation strikes west of north and dips 68 degrees to the west.

Cassiterite and Tantalite Mineralisation:

The cassiterite grade is high and tantalite grade low from the one sample collected at this prospect (Figure 2). This sample gives an Sn$_2$:Ta$_2$O$_5$ ratio of 26.9:1, and a Ta$_2$O$_5$:Nb$_2$O$_5$ ratio of 2.58:1.

Potential Reserves:

The prospect is small so a reserve estimate is not warranted. It is of interest to note, however, that quite a number of pegmatites outcrop in the local area, which may suggest a larger subsurface body in the vicinity.

3.2 Bynoe Tantalite Project - 1988 Feasibility Study

A summary of the feasibility study is included below. Costing of the project is periodically reviewed on the basis of fluctuating market conditions.

The Bynoe project has the plant and water storage to process 500,000 - 525,000 tonnes per annum, on a 6 day per week, 3 shifts per day and 50 week per year processing schedule. Mining would be concentrated in the 'dry season' with the plant working from a stockpile for three months in the middle of the 'wet season'.

The plant would produce an average annual:

* 51,700 lbs of Ta$_2$O$_5$ in a high grade concentrate
* 87.2 tonnes of tin concentrate containing 61 tonnes of tin metal and 5,750 lbs of Ta$_2$O$_5$.

An additional A$653,000 of capital expenditure on plant and equipment would be required before commencement.

The plant would process proven recoverable reserves for 4.6 years, with additional probable reserves adjacent to proven reserves extending mine life to six years. There are untested possible reserves which are not considered in this study but could extend the mine life to at least eight years.
The operating costs were estimated from previous operations at Bynoe and from the Greenbushes Operation. Quotes were obtained from earthmoving contractors and plant and equipment suppliers for all major items.

3.3 Site Preparation

This involved general maintenance of equipment and site facilities required for mining start up. Maintenance of tracks and haul roads also occurred as required.

3.4 Plan Preparation for Mining

Summary ore reserve plans have been drawn up for Yan Yams and Highland Pegmatites and Lees Drainage Alluvial. Pit plans, cross-sections and haul road access have been prepared for Yan Yams and are nearing completion for Highland. Additional pegmatites are now being looked at with a view to mining, but are limited at the present time due to wet season inaccessibility. A longer term programme is being developed.

3.5 Vegetation Clearance/Rehabilitation Planning

Plans have been submitted and approved for clearance of minimal vegetation cover to enable successful mining of known pegmatite limits at Yan yams. Rehabilitation is to be carried out in accordance with measures included in documents submitted under the heading of PROJECT DESCRIPTION AND ENVIRONMENTAL ASSESSMENT and subsequent correspondence. Plans of a similar nature are in preparation for Highland Pegmatite. A longer term schedule is expected to be produced in due course.
4. **ESTIMATED EXPENDITURE MLN 16**

The Bynoe Joint Venture has a number of Exploration Licences, Mining Leases and Claims along with an Exploration Retention Lease on Cox Peninsula. During 1988/89 total expenditure on these tenements was $344,737 of which it is estimated that 14% was spent on MLN 16, i.e. $47,595.

5. **CONCLUSIONS**

The 1988/89 programme for MLN 16 was generally designed to prepare the tenement for the commencement of mining in 1989, as soon as weather conditions enable this to occur. Prices for both tin and tantalum have moved up from the historically low levels achieved in the mid-1980's, so the operations are being commenced with predictions of a longer term sustained price that will enable profitable operation at Observation Hill.

Tanco Mine in Canada, the largest single producer of tantalum opened again in 1988 after a shutdown of some 5 years and this points to a buoyant future in the tantalum market. The tin market has also shown significant gains in early 1989, so the maintenance in pricing of both tin and tantalum should see the Bynoe Tantalite Project turn into a longer term producer of both commodities.