Final Report on Relinquishment of Tenure

NORTHERN TERRITORY EXPLORATION LICENCES

2863, 2864, 3052, 3053, 3054, 3137

IMAGED

OPEN FILE

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1.0 INTRODUCTION

Following an initial involvement in a joint venture exploration programme over the old Bamboo Creek tin mine, approximately 75 kilometres south of Darwin, Pan d'Or Mining attempted to establish a title position over a broad zone considered to display a potential for mineralisation of a similar nature. The target area constituted the northern portion of an elongate region, which extends for approximately 200 kilometres from the West Arm of Port Darwin through Mt. Finnis to Fletcher's Gully in the south.

The location of numerous old mines, prospects and gouging operations within this zone demonstrates a wide distribution of pegmatite-related tin and tantalum mineralisation. Little is known about the mineralogy and origin of the host bodies and only limited exploration outside known occurrences has been effected. It was decided that a valid examination of the zone's potential could only be carried out by wide-based regional geological and geochemical surveying. This approach necessitated the acquisition of such scattered titles as were available. Unfortunately the impetus behind the intended programmes was largely destroyed by the lapse of considerable time between making the applications and licences being granted – in all cases, apart from one, in excess of twelve months. Over an extended period of time a total of six relatively small exploration licences were granted to the company. Their geographic distribution is illustrated by Text Figure 1, further details being supplied as follows:

<table>
<thead>
<tr>
<th>Licence No.</th>
<th>Area</th>
<th>Date Granted</th>
<th>Date Relinquished</th>
</tr>
</thead>
<tbody>
<tr>
<td>2863</td>
<td>7.72 sq. ml.</td>
<td>2.10.81</td>
<td>28.7.82</td>
</tr>
<tr>
<td>2864</td>
<td>26.0 sq. ml.</td>
<td>2.10.81</td>
<td>28.7.82</td>
</tr>
<tr>
<td>3052</td>
<td>23.16 sq. ml.</td>
<td>30.12.81</td>
<td>28.7.82</td>
</tr>
</tbody>
</table>

...2
Ironically, it was only after a decision had been made to relinquish the licences already held, that the balance of the applications were granted. The company decided to cease exploratory activity in the area chiefly because the likelihood of being able to apply a regional approach to the investigation had become minimal. Resources held in readiness for the programme for over a year were allocated elsewhere.

Initial reconnaissance work, aimed at a more exact definition of targets for the regional work, was carried out over the titles granted prior to the above decision being made. This work, over exploration licences 2863, 2864 and 3052, was maintained at a preliminary level to allow a full concentration of resources for the regional programme once all titles had been acquired. However, it became apparent that the further applications would not be granted prior to expiry of the first term of tenure of the initial titles - as a consequence, it was unlikely that expenditure incurred on preliminary reconnaissance would reach covenanted levels. All titles, including those recently granted, were therefore relinquished prior to their anniversary dates.

As exploratory work was kept to a minimum, few of the aims behind title acquisition in this area were fully achieved. Results available for reporting are therefore relatively limited. Concepts behind the recognition of potential in this area remain valid and should be fully tested at some future date.

<table>
<thead>
<tr>
<th>Licence No.</th>
<th>Area</th>
<th>Date Granted</th>
<th>Date Relinquished</th>
</tr>
</thead>
<tbody>
<tr>
<td>3053</td>
<td>21.86 sq. ml</td>
<td>30.6.82</td>
<td>28.7.82</td>
</tr>
<tr>
<td>3054</td>
<td>20.58 sq. ml</td>
<td>30.6.82</td>
<td>28.7.82</td>
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<tr>
<td>3137</td>
<td>38.59 sq. ml</td>
<td>30.6.82</td>
<td>28.7.82</td>
</tr>
</tbody>
</table>
2.0 GENERAL GEOLOGY AND MINERAL POTENTIAL

Walpole (BMR, Bulletin 82) states that at least 90 separate mines and prospects are known within a 'pegmatite belt', lying chiefly between the West Arm of Port Darwin and Bamboo Creek. Figure 2 illustrates the frequency of such occurrences. Further to the south, tin has been worked at Mt. Tolmer and Fletcher's Gully (approximately 80 kilometres south of Bamboo Creek) where, again, the mineralisation is associated with small greisen or pegmatite dykes. Where available, records of production indicate only small scale working at individual localities, giving the impression that ore was high in grade but of limited volume. If the northern and southern areas are related, an area of potential of greater than 200 kilometres in length is indicated.

Pegmatites throughout the zone are generally intruded into variously metamorphosed greywacke and slate units, of the Lower Proterozoic Noltenius and Burrel Creek Formations. They often lie parallel to bedding or schistosity, possibly indicating fluid penetration along planes of weakness, or affinity with sediment type. Although only limited evidence is presented, it has always been inferred that the pegmatites derive from shallow granite cupolas. Most of the mineralised pegmatites described display a poorly developed mineral zoning.

Tin was originally discovered in the northern region, around 1886. An estimation of production, since that time until 1957, of 585 tons of tin concentrate and 15 tons of tantalum concentrate has been made (Summers 1957). All known prospects are associated with small pegmatite bodies that have some surface manifestation.
The following details of some of the more significant occurrences (extracted from Walpole et alia, BMR Bulletin 82) may aid in an assessment of the region's continued potential (location, Figure 2).

a) **Hang Gong**
Total recorded production of 189 tons of tin concentrate, produced largely from an extensive open-cut and a series of shallow shafts. It appears that all of the near-surface mineralisation has been worked out, but it has been stated that substantial amounts of eluvial material, containing both tin and tantalite, still remain (Crohn, 1963, BMR Aust. Rec. 1963/15).

b) **Bells Mona**
Total recorded production of 13.5 tons of tin concentrate, from two open-cuts and a number of relatively deep shafts. Government drilling, carried out in 1910 failed to intersect the mineralised pegmatite below the old workings.

c) **Leviathan**
Total recorded production of 170 tons of tin concentrate, primarily from open-cuts. The pegmatites were reported to be up to 15 feet wide and zoned, with most of the mineralisation occurring in marginal quartz-mica zones. The mine is stated to have been worked out.

d) **Mt. Finnis**
Total recorded production, to 1968, 19 tons of tin concentrate and 12 tons of tantalum concentrate. A large pegmatite was worked from a series of shafts and open-cuts. It is strongly zoned, but cassiterite and tantalite are scattered throughout — with only a slight concentration within a central kaolinised
FIG. 2

Geology and Mineral Deposits,
Pegmatite Zone

Adelaidean
+ Granitic rocks
| Lower Proterozoic

○ Gold
□ Tin
□ Thorium
□ Tantalite
□ Amblygonite

Golden Boulder
Bells
Mona

Old Bucks
Leviathan

Lucy
Pickets (L12)

Mr
Finiss

Goodwill
Extended

Bamboo Creek

0 2 4 MILES

N
feldspar zone. Although diamond drilling carried out in 1956 showed that the pegmatite bottoms out at a shallow depth, a relatively large elluvial resource was stated to remain (1944 - 50 000 yds$^3$ at 0.84 lb/yd tantalite).

e) **Goodwill**
Recorded production of 7.6 tons of tin concentrate from one open-cut. The pegmatite does not appear to have been mined out.

f) **Goodwill Extended**
No production records are available for this prospect, but several shafts and open cuts show that small irregular pegmatites have been worked in the past.

g) **Bamboo Creek**
Records show a production of 46 tons of tin concentrate and a small amount of tantalum concentrate from the old Bamboo Creek mine. Only one of a number of pegmatites in the area was worked to any major degree. Recent drilling shows in-depth extension to the pegmatites, with limited mineralisation. Results are however considered inconclusive and a further potential for limited high grade mineralisation may be present. Some $40 000 was expended on exploration, under a joint venture agreement with Stannite Pty. Ltd., by Pan d'Or Mining. If regional work was continued, it was the Company's intention to further this programme.

All of the data examined shows a pattern to the mineralisation exploited - of sporadic high grade pockets in small pegmatites. Although lower grades than originally worked would be amenable to treatment by modern methods, it remains unlikely that any pegmatite-confined orebody would individually constitute an
economically viable prospect. However, the possibility of locating a number of small close-spaced orebodies, especially with the wide distribution displayed by outcropping mineralisation, remains high.

Moreover, it is considered possible that further sites of concentration of the mineralisation may be located. For example, the granite cupolas, thought to constitute the source of mineralising fluids, would represent targets for exploration for large, low grade deposits - the low grade ore potential of massive greisens within roof zones of tin-associated granite cupolas being well known. The presence of deeply weathered granites to the east of the target zone, within the confines of which relatively large volumes of tin-bearing sediments have been discovered (albeit that the granites now display a low background tin content) may lend credence to this possibility. Mineralised roof zones may have been present prior to erosion in the latter area, the area under study possibly representing a region where related intrusions have failed to reach surface, thereby preserving the mineralisation.

3.0 EXPLORATION

As outlined above, it was proposed that on granting of the titles in question an initial investigation of the area be based around an examination of photography available, followed by regional stream sediment sampling, ground reconnaissance and geochemical research. The target for exploration was considered threefold: a) Local mineral enrichments in pegmatites. b) Source rock disseminations. c) Large, low grade alluvial or elluvial deposits.

Much of the preliminary work, aimed at establishing the nature and distribution of possible targets for further exploration,
was conducted over the areas in question. This primarily constituted a detailed examination of available aerial photography and of Earth Satellite Imagery purchased by the Company. It was found possible to outline areas underlain by relatively thick surficial cover, and to further subdivide into alluvial and eluvial profiles - essential factors for the planned reconnaissance for heavy mineral concentrations in recent sediments. Detailed study of enhanced ERTS imagery (several colour spectra being supplied) further allowed certain geologic interpretation to be effected. As the detailed ground investigation intended did not get under way, the information was not compiled into map form. The ERTS imagery purchased may, however, be supplied to the Northern Territory Department of Mines for use in further exploring this region, if requested by that organisation.

Detailed fieldwork in the region was limited to an examination of mineralised pegmatites in the Bamboo Creek area. Details of this work will not be supplied here, as titles remain held by Stannite Pty. Ltd. However, it may be stated that the true potential of the old Bamboo Creek mine remains to be fully assessed, and that it is possible that a small high grade orebody could be located in the future. The studies effected were of great value in enlarging the data base available for a regional exploration programme.

Several reconnaissance field visits were paid to the areas under title and application. The aim of these was primarily to establish geographical and topographic nature of the terrain involved and to check the validity of observations made from aerial photography and ERTS imagery. They were also intended to provide further information for planning of future detailed programmes. For the same reasons, a number of old prospects were briefly examined.
4.0 CONCLUSION

Due to the limited nature of the work undertaken, no definite conclusions concerning the continued potential of this region can be made. Concepts leading to moves to acquire title, however, remain valid and are not considered to have been adequately tested. The value of this attempt to further exploration of a large region of the Northern Territory lies primarily in the fact that a potential is in fact recognised. Some of the data acquired, especially the ERTS imagery, should prove of certain value to future explorers. Results of the detailed mapping, sampling and drilling at Bamboo Creek, when supplied by the title holders, will also aid in the local interpretation of mineralised bodies.

This report is intended both to demonstrate the regional approach used by the Company and as a final relinquishment report on titles briefly held. Individual reports are not supplied, primarily to avoid repitition of the text.

5.0 EXPENDITURE

1. Field reconnaissance
   a) 12 days, geologist + field assistant $ 4 800
   b) Vehicle maintenance & fuel. $ 960
   c) Field accomodation, meals $ 480

2. Acquisition of ERTS imagery $ 4 500

3. Interpretation of aerial photography + ERTS imagery $ 900
4. Interstate travel $1500 (est.)
5. Titles (administration and costs) $2000
6. Research and reporting $1200
7. Administration and overhead costs $2000

$18340

Under the Company's regional accounting procedures these costs have been apportioned over three exploration licences, 2863, 2864 and 3052 equally. Exploration expenditure of $6113 is allocated to each. As a further three licences were held for less than one month no expenditure allocation was made to those titles.

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