

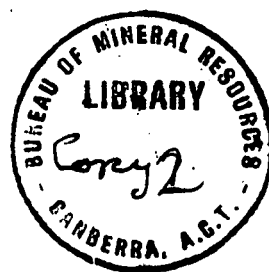
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MARANBOY TINFIELD - RECONNAISSANCE SURVEY 1950

by

K.W.B. Iten.

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TABLE - OF CONTENTS.

	Page.
SUMMARY	1
INTRODUCTION	2
SITUATION	2
CLIMATE AND VEGETATION	2
SURVEY AND METHOD USED	2
HISTORY AND GENERAL GEOLOGY	3
ECONOMIC GEOLOGY	3
THE MAIN LODE	4
Star of the West Lease	4
Osman Lease	4
Anaconda Lease	4
Ray Lease	5
West Eureka Lease	5
Eureka Lease	5
STANNUM KING LODE	6
The Stannum King Lease	6
ACKNOWLEDGEMENTS	6
REFERENCES	6

PLATES.

PLATE 1 : Portion of the Main Lode - Laranboy
Tinfield, Northern Territory.
Scale 1 inch : 100 feet.

PLATE 2 : Portion of the Stannum King Lode -
Maranboy Tinfield, Northern Territory.
Scale 1 inch : 100 feet.

SUMMARY

A brief examination was carried out at Maranboy from 1st to 7th October 1950, to assess the tonnage of ore which might be obtained per unit of depth from below the workings. Information concerning the grade of ore was obtained from the records of the Government Battery at Maranboy. These records express the grade in term of the percentage concentrate recovered by the battery from ore treated. Subsequent references in this report to grade of ore should thus be taken to refer to the percentage of concentrate recoverable by the present battery.

The production of the Maranboy tinfield to the end of 1949 totalled 45,921 tons of ore. The average grade of the ore was 2.74% tin concentrate.

The workings have been classified according to their productive importance into major workings, less important workings and exploratory pits and costeans. The grade of the field, as shown by battery recovery is largely a function of the production from the major workings. In the calculations of tonnage a factor of 13 cubic feet per ton has been applied.

The major workings on the Main Lode yielded 716 tons of ore per foot of vertical depth, but no information has been obtained by the survey to prove the continuance at depth of the known ore shoots. It is considered very likely however, that some of the shoots do continue in depth. If some cut out, others will no doubt make and replace them. The grade may be estimated to be approximately equal to the average recovered for the field, viz. 2.74%.

Shallow surface workings, exposing the lodes suggest that some 603 tons of lode material (mainly tourmalin bearing rocks) of unknown grade can be expected per vertical foot beneath these workings.

The tonnage per vertical foot for the Stannum King lease amounts to 43 tons for the portion of the lease worked recently and to 73 tons for the abandoned workings.

Table showing tonnage per vertical foot and grade of ore of the Main Lode and Stannum King Lease.

<u>Main Lode</u>	Tonnage per vertical foot.	Estimated grade % tin concentrate recovered.
Major workings	716	2.74
Less important workings	115	-
Lode exposed in shallow workings	603	-
Total tonnage from worked portions of the lode	1,434	-
Total lode material including unworked portions	2,447	-
Stannum King lease	-	-
Portion recently worked	43	2.3

Table contd...

<u>Main Lode</u>	Tonnage per vertical foot	Estimated grade % tin concentrate recovered.
Major openings unworked	73	3.0 ?
Total tonnage from worked portions of the lode.	116	-
Total lode material including unworked portions	242	-

INTRODUCTION

This report contains the results of a brief examination carried out from 1st to 7th October 1950 at Maranboy, Northern Territory, by the writer and Dr. J. Sleis, Geologist, who were assisted by the Inspector of Mines, Mr. W.A. McDonald. The purpose of this examination was to obtain the necessary data for a preliminary assessment of the tinfield based on the ore developed and won to date.

SITUATION: The Maranboy Tinfield is situated 42 miles south-east of the township of Katherine in the Northern Division of the Northern Territory. The field is connected by an all-weather road to the Stuart Highway and the Darwin-Birdum railway line. The Government Battery is situated in the centre of the field 14 miles east of Maranboy siding.

CLIMATE AND VEGETATION. The district has a typical monsoonal climate - a wet summer season and a dry winter. The annual rainfall of approximately 60 inches occurs in the form of monsoonal down pours mainly during December - March. The vegetation is dense and timber for mining purposes is available. Billabongs and the Beswick Creek contain water throughout the year.

SURVEY AND METHOD USED. The grade of ore, where mentioned in this report, is taken from records of the Government Battery at Maranboy. However, due to the incompleteness of these records (recording began about 1929) and the impossibility in many instances of relating production and grade figures to particular open cuts or stopes on the respective leases, it is necessary to classify the workings of the Main Lode and Stannum King lease into three groups, namely:

- (a) Major workings: deeper than 20 feet, forming the chief workings of the respective leases. Tonnage and grade from battery records can be attributed to some of the workings. It is assumed that in general the average grade of ore obtained from this group of workings equals the average grade of ore for the whole tinfield (2.74% tin concentrate). The grade of ore is calculated from the concentrates obtained. It therefore represents the percentage of recoverable cassiterite only.
- (b) Less important workings: depth between 10-20 feet. There is no indication of the grade of ore taken out. Where workings do not extend below 20 feet it is assumed that the grade of ore had fallen to approximately 1% tin concentrate or even below. Enquiries indicated that ore which yielded less than 1% tin concentrate would be

quite unprofitable under the conditions prevailing at Maranboy. However, although it can safely be assumed that the grade of ore obtained from these workings was lower than the average for the field, the actual grade is at present unknown. The miners are not likely to have considered ore yielding less than 1% tin concentrate.

- (c) Surface workings (costeans, shallow pits) less than 10 feet in depth. The lode (mainly tourmaline-bearing rocks) is exposed, but no information is available as to what extent the lode material could represent ore.

Mapping, which was confined to the principal workings of the field, was done by compass, tape and plane table surveys. The scale of mapping was 1 inch to 100 feet.

HISTORY AND GENERAL GEOLOGY. Tin mining at Maranboy began in 1913 when several claims were taken up. Dr. Jensen, Director of Mines, visited the field during the same year. His reports are published as appendices in G.J. Gray's comprehensive report (1915) on the Maranboy tinfield. The Government Battery commenced operations in 1916. In 1937 the Aerial, Geological and Geophysical Survey of Northern Australia carried out a geological and geophysical survey and the principal results were published in the Annual Report, 1937.

To the end of 1949 45,921 tons of tinstone ore which have yielded some 1,257 tons of tin concentrate have been produced from the Maranboy tinfield. The average percentage of concentrate of tin oxide recovered from the ore was 2.74%. Mines Department records suggest that the recovery rate was approximately 63%.

The basement rocks of the Maranboy field are Pre-Cambrian tuffaceous sediments. The partial erosion of the overlying Table Band Sandstone of possible Cretaceous age, exposed the tin-bearing lodes. Granites of different mineral composition invaded the Pre-Cambrian sediments and according to Gray (1915) and the report of the Aerial, Geological and Geophysical Survey of Northern Australia (1937) the tin-bearing lodes might be related to one of these periods of intrusion. However, it is possible that the different granites occurring in the Maranboy tinfield represent different phases of the same intrusion. The lodes contain tourmaline and chlorite within which cassiterite occurs in small fissures and as a replacement. The replacement took place along a system of fracture and along joint planes.

Gray (1915) classified the lodes into two types, based on their structure. The main lodes follow complex fracture systems and trend N.50°-70°W. The cross lodes strike N.20°W to N-S.

The Pre-Cambrian tuffaceous slates and sandstones are folded into an east-plunging anticline (A.G.G.S.N.A. 1937) and the tin-bearing formations are located along major joints on either side of the anticline. Enrichment of ore seems to be confined to competent beds, which were more favourable for fracturing.

ECONOMIC GEOLOGY.

Gray's main lode No.VIII (1915) (in this report simply called the Main Lode) is by far the most important producer of tin on the field. The lode extends from the Star of the West lease (see plate 1) to the east for approximately 2 miles. The survey was restricted to the portion between the Star of the West lease and the Eureka lease. The total length surveyed was 4,400 feet.

Second in importance is the Stannum King lode, south-west of the Main Lode with which it is parallel. The Stannum King lease and its western extension is the only important mine worked recently on this lode. The investigations on the Stannum King lode were restricted to the Stannum King lease and its extension.

THE MAIN LODE (PLATE 1.)

The portion of the Main Lode surveyed by this party comprises six leases, namely Star of the West, Osman, Anaconda, Ray, West Eureka and Eureka. The general trend of the lode is N60°W. A major cross fault on the Ray lease displaces the eastern portion of the lode to the south-west a total distance of 530 feet. The fault plane is well exposed in No.3 shaft of the Ray lease. It strikes N30°E and dips 65° to the east.

Star of the West Lease. This lease is not operated at the present time. The major workings include the No.1 open cut and underground development from Nos.3 and 4 shafts. Less important workings occur on the so-called "Little Lode" to the south-west of the Main Lode. In several places the lode has been opened by means of shallow surface workings.

Battery records show that 1,269 tons of ore were treated for an average grade of 2.6% tin concentrate. This tonnage, however, cannot be attributed to a particular working and the extent of the major workings suggests a total output of some 4,060 tons of ore. Under these circumstances no accurate assessment of the grade of ore can be made. However, it is probable that the ore averages 2.6% tin concentrate which would closely represent the average grade of the field.

The estimate of tonnage per vertical foot is :

Ore from major workings	61 tons
Ore from less important workings	78 tons
Lode material (see below).....	170 tons.

Lode material may represent very low grade ore but at this stage of the survey there are no indications as to whether the lode exposed in surface workings represents low grade ore or only barren lode material.

Osman Lease. The lease is worked at the present time by tributaries and mining activities are concentrated on No.2 open cut. From this portion of the lease 2,409 tons of ore averaging 3% tin concentrate have been extracted (Battery records).

The extent of open cuts Nos. 1, 2 and 3 suggests a total production of approximately 7,800 tons of ore. According to Mr. G. Fisher, the ore broken averaged 1.6% tin concentrate.

The major workings may yield 195 tons of ore per vertical foot. Its grade may average between 1.6% and 3% tin concentrate.

Lode material exposed in numerous shallow workings amounts to 99 tons per vertical foot. The grade of lode material is not known.

Anaconda Lease. This lease is not at present being worked. Battery records reveal that 1,684 tons of ore were treated for 2.5% tin concentrate, but this output cannot be attributed to a particular working.

The major workings comprising 4 open cuts might have yielded some 5,000 tons of ore of unknown grade. However, it is suggested that, for the extensive workings, the grade can be regarded as being near the average of the field (2.74% tin concentrate).

Tonnage per vertical foot is calculated to be 172 tons of ore for the major workings, 22 tons for less important workings and 96 tons for lode material.

Ray Lease. This lease has been the principal producer of tinstone on the Maranboy tinfield during the past few years.

Government Battery records show that 1,770 tons averaging 2.0% tin concentrate have been crushed. Three workings, namely the Tigershaft, Nos. 2 and 3 shafts have contributed to that production. In the early days an open cut west of Tiger shaft was worked to a depth of 50 feet.

Tigershaft: total depth 150 feet. Mr.H. Brennan reports that 4,000 tons of ore have been extracted from this shaft and yielded 1.5% tin concentrate.

From No.3 shaft 228 tons of ore have been put through the battery to the end of 1950.

The output from No.2 shaft was 190 tons, averaging 1.5% tin concentrate.

The total production from this lease, calculated from all workings, amounts to 6,516 tons, of this the grade of ore for approximately 2,000 tons is not known.

Tonnage per vertical foot :

Ore from major workings 112 tons.

The grade of this ore can be safely regarded as being 1.5% tin concentrate.

Lode material exposed in shallow workings... 50 tons.

West Eureka Lease. This lease has not been worked for the past few years. Apart from an old open cut, a shaft 45 feet deep is the only important working on this lease. The 177 tons of ore averaging 3.5% tin concentrate, which are recorded at the Battery, came from No.1. shaft.

Calculations, based on the extent of No.1 open cut, show an output of 937 tons of ore of unknown grade.

Estimate of tonnage per vertical foot :

Ore from major workings 38 tons
Lode material from surface workings 68 tons.

Of the 38 tons per vertical foot of ore, the grade is known only for the ore extracted from the No.1 shaft giving 7 tons per vertical foot. The grade for this ore was 3.5% tin concentrate.

Eureka Lease. This lease was worked again in 1950 after many years of idleness. Battery records show that 227 tons of ore (2.2% tin concentrate) have been extracted from No.1 shaft. However, the size of the old workings, including Nos. 1 and 2 open cuts, together with the recent developmental work on No.1 shaft indicates a total production of about 2,900 tons of ore, the grade of which is unknown. Judging by the battery returns of recently milled ore it can be assumed that the bulk of the ore taken out averaged 2.6% tin concentrate, which is close to the average grade of the field.

Tonnage per vertical foot :

Ore from major workings 138 tons
Lode material from surface workings ... 120 tons.

STANNUM KING LODE (PLATE 2)

This lode, situated to the south-west of the Main Lode, extends from the Government Battery to the south-east for almost 2½ miles. Small workings occur along the lode. The Stannum King lease is the only one which has been worked recently.

Stannum King lease (plate 2). From No.1 open cut some 904 tons of ore averaging 2.3% tin concentrate have been extracted during recent years (Battery records). Mr. W.A. McDonald, Inspector of Mines, reports that the ~~total~~ production of this lease totalled 2,300 tons of ore. The recovery was 72 tons of tin concentrate giving a yield of 3% tin concentrate.

The tonnage per vertical foot of the unworked portion of open cuts (Nos.2,3,4) is 73 tons of ore, but it is doubtful whether this ore would average 3% tin concentrate. On the other hand the total production of this lease would suggest that it does reach that figure.

ACKNOWLEDGEMENTS

The writer gratefully acknowledges the assistance of Mr.W.A. McDonald, Inspector of Mines and Mr.R. Foster, Battery Manager, Maranboy, Northern Territory.

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