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COMMONWEALTH OF AUSTRALIA

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**DEPARTMENT OF NATIONAL DEVELOPMENT  
BUREAU OF MINERAL RESOURCES  
GEOLOGY AND GEOPHYSICS**

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**RECORDS:**

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1945/68

Notes on Beach Sand Workings

at September 1st.,

1945

by

N.H. Fisher

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DEPARTMENT OF SUPPLY AND SHIPPING.

MINERAL RESOURCES SURVEY BRANCH.

NOTES ON BEACH SAND WORKINGS AT SEPTEMBER 1st, 1945.

REPORT NO. 1945/68.

Zircon Rutile Limited:

This Company has ceased working on Tallow Beach (east of Byron Bay), owing to labour shortage and are focussing all their attention on the Seven-Mile Beach to the south where their concentration plant is situated. They have ceased using tramlines from the beach workings to the concentrating plant and have replaced them by motor trucks with portable corduroy tracks.

The plant process has not altered essentially, but the metallurgist, Mr. Morgan, is carrying out research to discover why the zircon produced by flotation is unsuitable for use in ceramics. It is stated by Ferro-Enamels Limited that zircon so produced causes a brown stain. Mr. Morgan thinks this stain may be due to the slime and other impurities (which contain iron) reacting with the fatty acids of the flotation reagents. Ferro-Enamels Limited have definitely stated that the trouble is not due to the iron content.

Metal Recoveries Limited:

*W. B. Brighting N.W.*  
The above Company has installed an electrostatic separator, which consists of four rollers, one above the other, arranged somewhat similarly to the rollers of the Exolon electromagnetic separator. Beneath each roller is a charged electrode which exerts a pull on the rutile, but does not affect the zircon. Each electrode pulls out a little rutile, while the zircon falls straight through. Only their zircon-rich product, which contains about 90% zircon, has been treated so far and the resulting products obtained are zircon, varying from 93% to 98% pure, and a concentrate containing 33% to 45% rutile. There is no middling product. The capacity of the machine is low and does not keep up with the output of the electromagnetic machine even when treating the zircon-rich material. The performance also varies, as the arrangements for charging the electrode are not entirely satisfactory.

The electrostatic separator has not yet been tried on the rutile-rich product, which contains 45% to 50% rutile, although it is intended to include it in the circuit in future when the rutile-rich concentrate is being put through the electromagnetic separator. Although the capacity of the electrostatic machine is low, it may effect a partial concentration. This machine has only been operating for a month or so.

Mr. Barnes, Manager of the Company, stated that they have bored and pitted most of their leases and he considers they have accumulated sufficient data on which to base estimates of ore reserves, which are considered adequate for at least 8 years further work at the present rate of production.

Titanium Alloy Manufacturing Co. Ltd:

There has been no apparent change in the method of working or separation at this plant, except that an overhead conveyor has been added to carry off the ilmenite. The concentrate from the tables is still allowed to drain in heaps on the floor before being fed to the elevator which takes it to the rotary drier. After that, the process is entirely mechanical.

Tweed Rutile Syndicate:

This Syndicate's plant is situated about a mile north of Titanium Alloy Manufacturing Company's plant and is reached by

an extension of the road to that property. Their lease adjoins the inland boundary of Titanium Alloy Manufacturing Company's beach lease and extends for about two miles in length. The deposit occurs as a seam between the coastal dune and a higher dune at the rear, the width of the seam being about the same as that on the beach. It was stated by Mr. Murphy that they have also located other deposits farther inland. From workings about 100 yards in length they have taken out 3,000 tons of /concentrates. A tramline has been put in from the deposit to the plant, which is situated immediately behind the workings, but it is not at present being used, the sand being carted out by lorry. The plant consists of two concentrating tables fed by an elevator, but additional space is available within the building and an extension along one side is under construction to house electromagnetic machines. McLean electromagnetic separators have been purchased and are at present in Sydney, and they have a rotary drier in Brisbane. Power is being laid on from Tweed Heads municipal authority. They hope to import a Johnson electrostatic separator, which they declare to be superior to the type used by Porter & Derrick.

#### Rutile Sands Pty:

This Company is still working a very rich seam on Tugun beach. The plant is being reorganised; a rotary drier has been installed and has been in operation for about three months. They have installed a bin and a loading machine and have also put in a conveyer belt to carry the concentrate away from the end of the tables. McLean electromagnetic separators are in the process of being delivered and they expect their electrostatic separator to be ready by the end of September. This machine was designed by Mr. J. G. Hart of the Melbourne Ore-Dressing Laboratory and the parts were constructed mainly in Brisbane.

Leases held and estimated tonnages of concentrates remaining are as follows:-

D.C. 17 and 30	.....	5,400 tons.
D.C. 20	.....	4,000 "
D.C. 21	.....	4,500 "
D.C.'s 14, 21a & 28	.....	nil
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		13,900 tons.

Production up to the end of June, 1945 was as follows:-

4 months to 30/6/43	.....	1,100
30/6/43 to 30/6/44	.....	4,215
30/6/44 to 30/6/45	.....	4,285
		<hr/>
		9,600

All of this was obtained from D.C.'s 17 and 30.

Price received was £8 per ton f.o.b. Brisbane and has recently been altered to £8 per ton f.o.r. Currumbin. Average rutile content was just over 30%.

Information from London is that control over rutile will end early in 1946 and that British requirements are purchased until that date. Specification is 95%  $TiO_2$ .

Cost of delivering sand to the workings is placed at 7/8 per cubic yard and the cost of treatment £4/4/4 per ton of concentrates

#### Mineral Deposits Syndicate and Australian Titanium Company:

These two Syndicates are composed of essentially the same personnel. Australian Titanium Company has not produced any concentrates at its Tugun plant, which is now partly dismantled, since September, 1944. The lease which this Company held, M.L.171 at Tugun, was worked out between July, 1942 and May, 1943. Subsequently the Tugun

plant treated sand from the Burleigh workings of Mineral Deposits Syndicate.

The following production was given for the financial years up to June 30th, 1945, expressed as mixed concentrates.

<u>Year Ending</u>	<u>Mineral Deposits Syndicate</u>	<u>Australian Titanium Company</u>	<u>Total</u>
June 30th, 1942	2,663	-	2,663
" " 1943	2,336	1,875	4,211
" " 1944			7,423
" " 1945			8,000
			22,297

The reserves are estimated at 15,000 to 16,000 tons of mixed concentrates. This applies to the leases which have been held since 1941, but they have also acquired other leases since and no calculation of reserves is available for these.

The Syndicate is stated to have orders on hand for 500 tons per month for 12 months of zircon-rutile from Orefractions Inc., 200 tons per month for 12 months of rutile from Hoskin's Limited for the British Ministry of Supply, and 200 tons per month for 12 months of zircon from Orefractions Inc. These figures also represent the capacity for which the plant is being designed or reorganised. At present, the Company has on order a rotary drier, and an electrostatic separator by Sutton, Steele and Steele is on wharf in Brisbane and will shortly be installed. The present plant consists of three tables, a vibratory drier from which the concentrate is elevated to an ore bin, thence through four electromagnetic separators of the McLean type.

#### Southport Minerals:

This plant was not examined, but as far as could be ascertained there has been no installation of electrostatic machinery by J. Pinter. The leases worked by this Company near Broad Beach are thought to be almost exhausted and they have recently taken up ground at the rear of Zircon Rutile's Seven-Mile Beach lease south of Byron Bay.

CANBERRA, A.C.T.  
25th September, 1945.

*N.H. Fisher*  
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