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COMMONWEALTH OF AUSTRALIA.

**DEPARTMENT OF SUPPLY AND SHIPPING.
BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.**

**REPORT No. 1949/89
(Geol. Ser. No. 58)**

OCCURRENCE OF BLACK SAND AT PORT ESSINGTON
NORTHERN TERRITORY OF AUSTRALIA.

by

H.B. Owen
(Senior Geologist)

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Plan

Locality Plan. Scale -- 1" = 4 miles.

I. INTRODUCTION

Cobourg Peninsula
Black sand on beaches in Knocker Bay, near Black Point, and at Record Point, Port Essington, has been noticed from time to time by Captain F.E. Wells, Master of the N.T. Patrol vessel "Kuru", who mentioned these occurrences to the writer. (See accompanying locality map and Military Map 0457/- Four mile series).

Opportunity was taken during a recent visit to the locality to secure a sample from the beach at Record Point, but the other two localities were not visited. The presence of black sand on a narrow beach between Black and Reef Points was confirmed by observation from the ship through binoculars.

II. LOCALITY AND ACCESS.

Port Essington, the site of an early settlement on the north coast, forms a deep irregular embayment in Cobourg Peninsula at approximately lat. $11^{\circ}20'S$ long. $132^{\circ}10'E$. The Peninsula is joined to the mainland by a narrow neck at the head of Mount Norris Bay, 34 miles south-east from Port Essington.

Access to the locality is by sea, 130 nautical miles north-east from Darwin. There are no roads or habitation on the peninsula.

All of Cobourg Peninsula lying west of longitude $132^{\circ}20'E$ constitutes a Flora and Fauna Reserve, and the remainder of the peninsula forms part of the Arnhem Land Aboriginal Reserve.

III. GENERAL GEOLOGY.

The peninsula is occupied by Lower Cretaceous sediments - shale and sandstone, Tertiary laterite and Recent sediments including recemented detrital laterite.

Exposures of the Cretaceous rocks are not good except in sea cliffs at Adam Head (Victoria), Middle Head, Observation Cliff (north of Record Point) and near the mouth of Knocker Bay. The Cretaceous formation, which belongs to the Mullaman Group, consists of alternating beds of sandstone and shale, the former dark-brown to black and ferruginous, and the latter arenaceous in part.

At Victoria the cliffs are capped with ferruginous sandstone imperfectly lateritized, overlying argillaceous sandstone and shale. The beds are horizontal or nearly so, with possibly a very slight dip to the north or north-east.

Much of the shore-line, particularly near the head of Port Essington, is fringed with mangrove swamp and mud, but sand beaches occur.

IV. BLACK SAND AT RECORD POINT.

Record Point consists of a narrow sand spit, $1\frac{1}{2}$ miles long by a maximum width of less than half a mile, projecting in a south-westerly direction from the eastern shore of Port Essington, and partly closing the mouth of Barrow Bay. It has a maximum elevation of a few feet, probably not more than 10 feet, above high water and carries sparse vegetation and a brackish swamp.

Except for the landward connection the spit is flanked by a narrow sandy beach and protected by shallow water over surrounding sand-banks several hundred feet wide which are barely covered at low water. Black rock, probably ferruginous sandstone, occurs close inshore south of the point and is covered at high water.

Black sand was observed at high-water mark near the southern extremity of the spit on both eastern and western sides.

The two points where black sand was seen are about $\frac{1}{4}$ mile apart, measuring along the beach, and it is not known whether the heavy mineral sand occurs continuously for this distance.

The convex outline and nearly straight form of Record Point spit strongly suggests that it is being built up from both sides simultaneously, and if this is so, it is apparent that the black sand on the eastern shore comes from within Barrow Bay, and may be derived by wave action from the rock occurring off the point.

A sample was taken from a place on the western beach about 500 yards from the extremity of the spit where black sand was observed for a distance of about 200 yards but was not followed further. No black sand shows along the western beach for a distance of about one mile from the landward (northern) end of the spit.

The sample was obtained from a point at high-water mark where the black sand formed a small bank about 6 inches high and continued down the beach from the foot of the bank and passed below water.

Laboratory examination of the sample yielded 68.6% of concentrate containing -

| | | | |
|------------------------------|----|----|---------------|
| Ilmenite | .. | .. | 45.5 per cent |
| Zircon | .. | .. | 32.0 " " |
| Rutile | .. | .. | 14.8 " " |
| Magnetite | .. | .. | 7.6 " " |
| Other (Tourmaline, monazite) | .. | .. | Less than 1%. |

One specimen of the ferruginous sandstone which outcrops at numerous points on Cobourg Peninsula, notably on the slopes of Mounts Roe, Bedwell and Kuru, and at Victoria, Middle Head and Black Point, was examined in the laboratory and yielded rather less than 1 per cent. of heavy mineral composed of zircon, ilmenite, rutile and magnetite. It is considered therefore that this sandstone is the source of the heavy mineral concentrate observed at Record Point and reported elsewhere in Port Essington.

V. CONCLUSION AND ACKNOWLEDGMENT

Systematic prospecting of all the beaches in Port Essington at least would be necessary before any estimate of possible reserves and composition of heavy mineral sand could be made. Equipment for testing below water-level would be necessary to obtain complete information.

On the other hand exploitation of deposits below water by dredging should be relatively easy in the shallow and sheltered waters of Port Essington.

At present it is difficult to see how deposits of zircon-rutile-ilmenite sand at this remote locality could be profitably exploited in competition with the deposits now being worked on the Pacific coast.

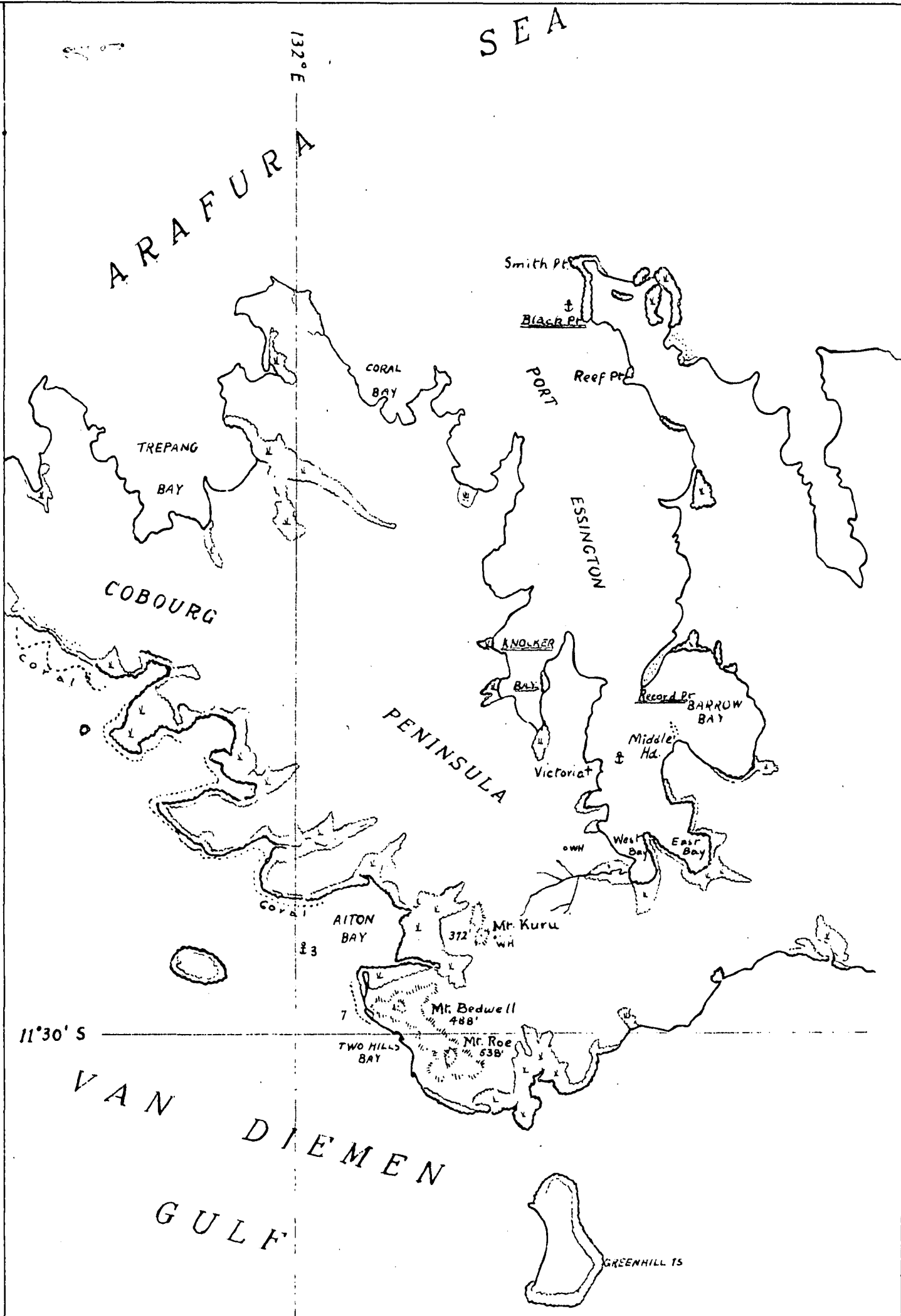
It is worth noting that the writer examined sand-beaches at Victoria and West Bay, in Port Essington, and Two Hills Bay (Van Diemen Gulf) and found no black sand at these places.

The laboratory work mentioned herein was conducted by Mr. J. Glover, Geologist of the Bureau of Mineral Resources.



H. B. Owen.

23rd August, 1949.



MAP OF PART OF
COBOURG PENINSULA. N.T.

3 2 1 0 2 4 miles