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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

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OCCURRENCE OF BLACK SANDS ON THE NORTH COAST OF MELVILLE ISLAND, NORTHERN TERRITORY.

by

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OCCURRENCE OF BLACK SANDS ON THE NORTH COAST OF MELVILLE ISLAND, NORTHERN TERRITORY

Introduction;

At the request of Central Uranium No Liability, black sand deposits on the north coast of Melville Island were examined in November, 1955. Two areas of possible economic interest were discovered, namely Kilu-Impini Beach and Cape Van Diemen. Samples were taken from both these areas. Small quantities of black sand occur at six other localities scattered along the north coast of Melville Island but the occurrences are far too small to be of any economic interest.

Locality and Access:

The north coast of Melville Island lies approximately 70 miles north of Darwin. The coast line runs from its north western tip, Cape Van Diemen, at latitude 11 degrees 5', longitude 130 degrees 20' in a curve towards its north eastern tip at latitude 11 degrees 10', longitude 131 degrees 20'. The whole of Melville and Bathurst Islands is an Aboriginal Reserve.

Access to Melville Island is by air to the airstrips at Snake Bay Government Settlement and Garden Point Mission, or by sea. A launch was provided by Central Uranium No Liability as access to the beaches along the north coast of Melville Island. Stormy weather prevented the launch from landing at many of the beaches and considerably hampered the work in general.

General Geology:

Cliffs are visible behind the beaches along the north and range up to 60 feet in height. The rocks exposed in those cliffs consist of flat-bedded argillaceous sandstone and shale, probably of Cretaceous age, overlain by 10 to 15 feet of Tertiary laterite.

The laterite is ferruginous and generally tubular in character. This ferruginous zone grades down into white and grey coloured sandstone and shale which probably form the mottled and pallid zones of the laterite profile.

Sediments of Recent age consist of beach sands, coral reefs and recemented detrital laterite and sandstone. These occur along the coastline above and below the water line.

Low-lying mangrove swamps occur immediately behind many of the beaches and cover extensive areas along the streams draining the northern part of Melville Island.

Black Sand Deposits:

Occurrences of black sand on the north coast of Melville Island are shown on Plate 1. The majority of occurrences are very small with no extent of beach behind them. Only two areas show any extent of black sand.

(a) Kuli-Impini Beach.

Kuli-Impini Beach is situated 12 miles south east of Cape Van Diemen and is on the east side of the mouth of Kilu-Impini Creek. Black sand occurs at the high water mark along the beach for a length of 5,000 feet. Beach sands extend for approximately 200 feet inland from the high water mark and further inland there are extensive mangrove swamps. No sand dunes occur behind the beach.

Plate 2 shows the grid lines on the beach along which augerholes were put down into the sand. Samples could not be taken below water level. The sections in Plate 2 show the extent of the black sands in the beach.

The only black sand present in the western half of the beach is a superficial layer, a few inches thick, lying on the surface of the beach near the high water mark. In the eastern part of the beach, black sand occurs along a length of approximately 2,400 feet above the high water mark.

It is considered that, between the 1500E and 3800E grid lines and above the water table, there are 26,500 cubic yards of heavy mineral bearing sand. The amount of heavy minerals is estimated to be 2500 tons. Assay results show the rutile content of the sand to average 1% and the heavy mineral content to be approximately 8%. Mining of the eastern half of the beach would probably yield 300 tons of rutile and 500 tons of zircon.

The extent of the black sand below the water table between the 1750E and 3750E grid lines and inland in the mangrove swamps would have to be ascertained before any estimation of additional deposits of black sand could be made.

Grain counts of some samples of the black sand were carried out using a microscope in the geological office at Darwin. The method was not very accurate but at least it gave a rough idea of the mineral composition of the heavy mineral portion of the black sand. The proportions were as follows: -

Ilmenite	50%
Zircon	25%
Rutile	12%
Other minerals	13%

Cape Van Diemen.

Cape Van Diemen forms the north westerly tip of Melville Island. It is a low-lying point consisting of extensive sand dunes with sandy hollows between them. A mangrove swamp lies between the sand dunes and the cliffs further inland. The dunes have been built up by the action of the sea and wind during the stormy wet season.

Dense black sand, ranging up to 18 inches thick, occurs on the surface at the high water mark along the beach that runs around the cape. Auger holes were sunk in the dunes and hollows. Although no black sand was intersected in the dunes, bands of black sand up to 18 inches in thickness were struck above the water table in the hollows.

Assay results of samples taken from the area showed the rutile content to range from 1.8% to 0.3%. It is apparent that no substantial deposits of black sand are present above the water table in this area.

Conclusions:

Most of the black sand deposits on the north coast have been built up during the heavy storms of the wet season when the wind blows consistently from the north-west. Small concentrations of black sand were encountered on beaches facing to the north-west.

A low grade deposit of black sand is present at Kuli-Impini Beach. The tonnage of heavy minerals proved to date is much too small to be worked economically. It is recommended that testing of this beach be carried out below the water table and in the mangrove swamps behind the beach. Proving of a substantial tonnage of heavy mineral bearing sand averaging at least 1% of rutile would be necessary for the deposit to be of economic interest.

Further testing of Cape Van Diemen below the water table should be carried out as there may be extensive hidden deposits of black sand in this area.

Geological Office,
DARWIN. N.T.

27/3/56.

N. J. MacKay

Senior Resident
Geologist.

PLATE I

MAP OF NORTHERN PORTION OF MELVILLE ISLAND, N.T.

0 1 2 4 8 12 16 miles

SCALE

Cape Van Diemen

Kilu-Impini Beach

Purumpinelli Point

ARAFURA SEA

Brenton Bay

Lethbridge Bay

Shark Bay

Snake Bay

Snake Bay Settlement

Garden Point Mission

Apsley Strait

BATHURST ISLAND

MELVILLE ISLAND

N.N.E.

REFERENCE

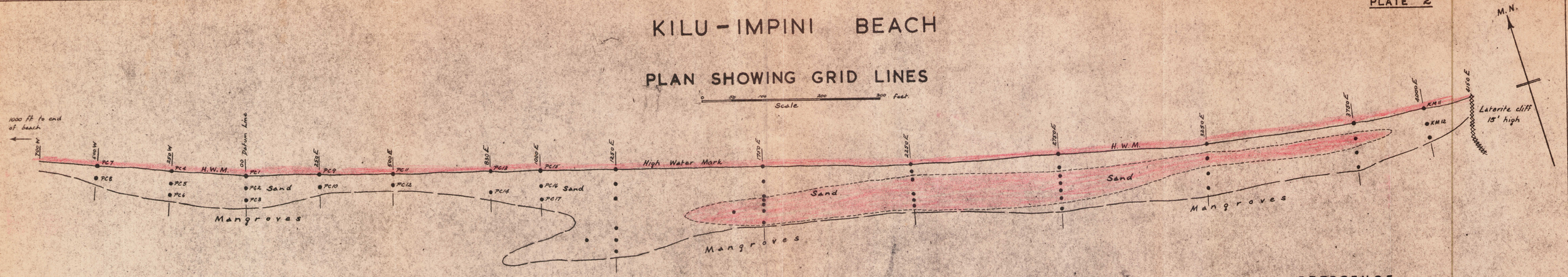
Mangroves.

Occurrences of Black Sand.

PLATE 2

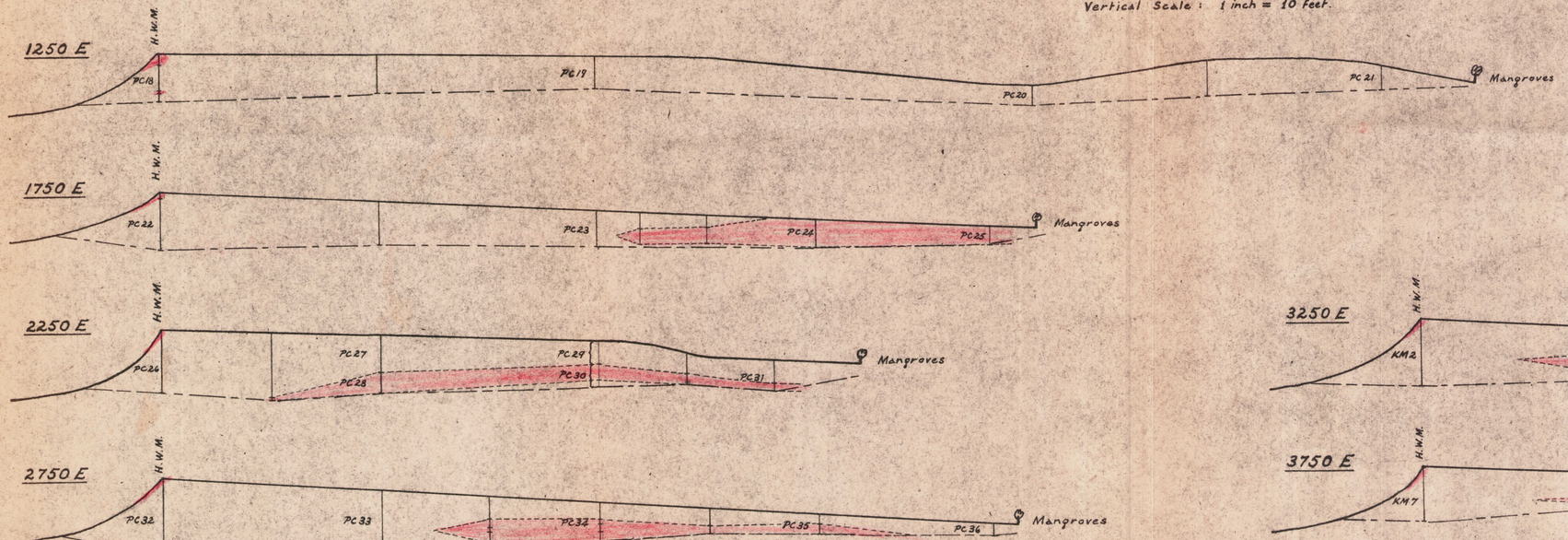
KILU - IMPINI BEACH

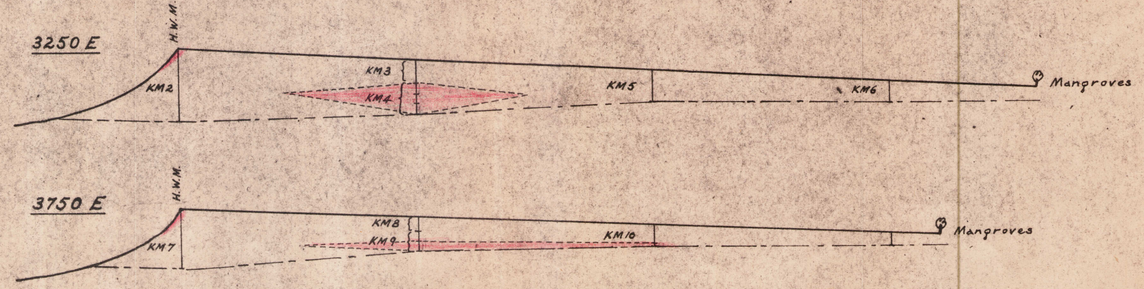
PLAN SHOWING GRID LINES



SECTIONS ALONG GRID LINES

Horizontal Scale : 1 inch = 20 feet.
Vertical Scale : 1 inch = 10 feet.





REFERENCE

All auger holes sunk to water level

- Auger hole (plan)
- Auger hole (section)
- H.W.M. High water mark
- Sand with high heavy mineral content
- PC12 Sample number
- Water table
- Heavy mineral bearing sand

N.J.M., Dec '55