Northern Territory Government

InfoCentre

NT Minerals and Energy

Petroleum Exploration Reports

This file contains scanned images of hardcopy reports/data submitted to the Northern Territory Government under Petroleum Legislation.

Bringing Forward Discovery

This information is made available to assist future petroleum explorers and may be distributed freely.

Scanning information

The quality of the scan reflects the condition of the original hardcopy report/data.

InfoCentre

Call:	+61 8 8999 6443
Click:	geoscience.info@nt.gov.au www.minerals.nt.gov.au
Visit:	3rd floor Centrepoint Building Smith Street Mall Darwin Northern Territory 0800

A09-093.indd

Report No. NT/2/72.

GRAVITY AND GEOLOGICAL INVESTIGATIONS

NORTH OF THE MOYLE RIVER - PORT KEATS AREA,

NORTHERN TERRITORY.

By :

J.E. BURBURY.

Mines Administration Pty.Limited,
31 Charlotte Street,
BRISBANE.
September, 1959.

SUMMARY :

A detailed gravity survey, some regional gravity and a geological reconnaissance, were carried out over an area of approximately 30 square miles north of the Moyle River in the Port Keats Aboriginal Reserve. The work was carried out during April and May, 1959. One geologist/geophysicist, one surveyor & two field assistants were employed on the survey. A helicopter was used for two days to establish regional gravity stations along the Moyle River.

INTRODUCTION :

Trend lines observed on airphotographs of the area just north of the Moyle River indicated the possibility of a geological structure in that area. The airphotos also indicated that rock outcrops were present in the area. It was decided that a combined geological and gravity survey should be carried out in order to determine the presence of a geological structure.

GEOGRAPHY :

The area surveyed is approximately 130 miles south of Darwin and approximately 8 miles north-east of the mouth of the Moyle River. It is surrounded by swamp on three sides and the coastline north of the Moyle River mouth on the fourth. The country is sandy and gently undulating with some flat-topped mesas up to 200 feet high. Tall spear grass and low scrub cover most of the area, all tall timber having been killed or flattened by a cyclone some years previously. Potable water was found in one locality only, in a small creek approximately 7 miles from the coast.

GRAVITY SURVEY :

A Worden Gravity Meter No.216 was used for the gravity surveys.

Surveying was commenced from the camp set up on the creek 7 miles in from the coast. A station at the camp was connected to gravity station S.27 on the coast and ten regional stations were established up the Moyle River. A helicopter was used for this work and elevations were determined by altimeter and position obtained from airphotos.

The results of this work have been plotted onto the regional gravity map of the Bonaparte Gulf Basin and indicate a gravity ridge over the Moyle River swamp.

The detailed gravity was commenced from Station 1 at the base camp. Positions and elevations were determined by the stadia method of surveying. Seventy stations were established at approximately 1000 foot intervals. Sheet 1 shows the corrected gravity values (relative Bouguer Gravity) plotted onto the survey plan at a scale of 1000 feet per inch and contoured at an interval of 0.1 milligal. The gravity values rise gradually from Station 70 south-east to Station 65 with an average gradient of 1 milligal per mile; no major irregularity occurs in the gradient that could indicate a geological structure at depth. The general south-west trend of the contour confirms the possibility of a gravity ridge over the Moyle River - as indicated by the regional traverse.

GEOLOGY :

Scattered rock outcrops occur over the area in the form of low ridges and flat-topped mesas up to 200 feet high. As many of these outcrops as possible were examined during the survey. The dominant lithology was medium grained felspathic quartz sandstone, commonly containing numerous small mud pellets. All outcrops were found to be flat lying and apparently unfossiliferous. A section measured in the hills near the base camp is as follows :-

Base of hill to 28 feet.	Medium grained, cream to white, felspathic quartz sandstone with minor amounts of white mica. Weathers fawn to brown - cross bedded. Some small mud pellets.
28 - 42 feet.	Obscured by rubble.
42 - 75 feet.	Medium grained, ferruginous, quartz sandstone with minor amounts of feldspar and white mica. Cross bedded.
75 - 110 feet.	Fawn to white, medium to fine grained, kaolinic quartz sandstone - moderate amount of white mica and numerous white mud pellets up to 3/4 inch. Very friable.
110 - 150 feet.	Cream to white, medium to fine, kaolinic quartz sandstone weathering brown to red and forming cap rock on mesa. Small caves have been eroded around base of this section. Sandstone is case hardened irregularly.

The lithological sequence in other parts of the area showed a marked similarity to the section above. Lithologies are similar to those observed in the flat-topped hills in the Port Keats area, measured during 1956 survey. Although no fossils were found, it appears likely that the flat-topped hills mapped north of the Moyle would be contiguous with those mapped in Port Keats area to the south.

The airphoto trend lines were not clearly apparent on the ground. They appeared to be vegetation features, but no outcrops were observed along the trends. Attempts were made to follow the trends on the ground, but this was found impossible over distances greater than a few hundred yards. It is suggested that the trends could represent old swamp lines and not be related to any geological feature.

At the conclusion of the survey, visits were made to Cape Dombey and Cape Hay and outcrops observed in those localities. It has been suggested that these outcrops are Triassic.

At Cape Dombey low cliffs extend for approximately 8 miles - ranging from 20 to 50 feet high. Cliffs are red to dark red-brown and are strongly weathered. Resistant beds of ferruginous quartz sandstone with abundant mica stand out in the cliffs. Rocks are flat-lying and apparently unfossiliferous.

At Cape Hay, low cliffs extend for 2 - 3 miles with a maximum height of 50 feet. Outcrop is yellow and brown flat-lying mudstones and shales with interbedded more resistant siltstones.

Large samples were collected from these localities and have been forwarded to the Bureau of Mineral Resources for palaeontological study.

CONCLUSION :

The detailed geological and gravity survey north of the Moyle River failed to confirm the presence of a geological structure in that area.