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BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

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PHOTO-INTERPRETATION OF THE EASTERN PART OF THE LUCHANAN 1:250,000 SCALE SHEET.

by

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PHOTO-INTERPRETATION OF THE EASTERN PART OF THE BUCHANAN 1:250,000 SCALE SHEET

SUMMARY

BUCHANAN is in the northern portion of the Drummond Basin, Queensland. Photo-interpretation of the eastern part of the Sheet, supplemented by field information from adjoining Sheets, indicates that folded Carboniferous rocks of the Drummond Group rest unconformably on the Anakie Metamorphics in the north-east of the area. Folding is tight in the east and more open on the west. Flat lying Tertiary rocks blanket the Carboniferous rocks in places and are being eroded by the present streams. The principal problems are the confirmation, or otherwise, of Devonian rocks underlying the Carboniferous east of the Anakie Metamorphics, and the establishment of formation boundaries throughout the Drummond Group.

INTRODUCTION

Photo-interpretation of BUCHANAN (F55/6) was carried out in 1963 with the purpose of assisting the planning and execution of the subsequent field work. Owing to a delay in the provision of a base map by the Royal Australian Army Survey Corps the photogeology was not compiled until December 1965.

In the meantime, during 1964, field mapping of the western part of the Sheet was completed, and prior to this the annotated overlays were made available to the field geologist. Field mapping of the eastern part is scheduled for 1966, and the map accompanying this report therefore shows photogeology on the eastern side and the results of field mapping on the west. This report deals with the photo-interpretation of only the area east of the line drawn on the map.

The air photographs used were taken by Adastra Airways Pty. Ltd. in 1962 for the National Mapping Division, Department of National Development. They have a nominal scale of 1:85,000 and a forward overlap of 80%, and are of good quality. Dyeline copies of the planimetric compilations at 1:85,000 scale were supplied by the R.A.S.C.; tracings of these were made on linen and copied on to polyester base diazo film. The photogeological detail was compiled on plastic overlays of the planimetric compilations by a graphical method from the annotated photograph overlays. The 1:85,000 scale photogeological compilations were combined with the planimetric compilations to give composite prints that were edited by pencil colouring. Letter symbols were then added to the photogeological compilations which were then reduced photographically to 1:250,000 scale, and the resultant positive printed together with the planimetric sheet to produce the final map.

Geological work prior to 1960 is summarized in Volume 7 (1960) of the Journal of the Geological Society of Australia, and since then reconnaisssance mapping of west BUCHANAN, and of the areas surrounding the Sheet has been completed (Malone, Corbett and Jensen, 1961, 1964), (Vine, Jauncey, Casey and Galloway, 1965), (Wyatt, Paine, Clarke, Gregory and Harding, 1966), (Malone, Jensen, Gregory and Forbes, 1962).

An unpublished map at a scale of 4 miles to an inch by Francarep Australia was consulted, but no report was available; however, the map shows the location of several stratigraphic sections measured by the Francarep geologists.

Good access is provided by the Gregory Developmental Road and a network of minor roads.

PHYSIOGRAPHY

The important streams are the Suttor and the Belyando, that drain the east part of the studied area, flowing generally towards the north, and the tributaries of the Belyando that flow east across the broad plain south of the Bulliwallah Range. In the north central part of the Sheet, Natal Creek and Blowhard Creek drain north to the Cape River.

The topographic forms bordering MT. COOLON are plains and lowlands; further west is rough hilly country forming uplands, particularly in the Llanarth Range and north of Bulliwallah Homestead where the terrain rises to over 1500 feet above sea level. In many places the Carboniferous rocks have the form of sharp ridges covered here and there by mesaform Tertiary deposits which are being eroded by the present streams. Plains are around 700 feet above sea level, and the lowlands are at an intermediate elevation between the plains and the uplands.

STRATIGRAPHY

The stratigraphy of the whole area of BUCHANAN is summarized in the attached Reference Sheet.

Palaeozoic

Anakie Metamorphics(Pzla) and Ukalunda Beds(Dk)

These sequences are known from MT. COOLON, BOWEN and CHARTERS TOWERS. The Ukalunda Beds cross on to BUCHANAN in the north-east of the Sheet. At the time of field mapping (Malone, Corbett and Jensen, 1961) these rocks were included in the Anakie Metamorphics, but the presence of Devonian fossils has led to their separation as the Ukalunda Beds (Malone, Jensen, Gregory and Forbes, 1962). The photo character of both units is similar - variable tone, closely spaced dendritic stream pattern and low relief, with higher rounded hills in places; the boundary between the Pzla and Dk on the photogeological map is therefore somewhat arbitrary. Several rock types have been reported from the Anakie Metamorphics, and in places on the map, boundaries have been drawn round areas of distinctive photo character within the unit.

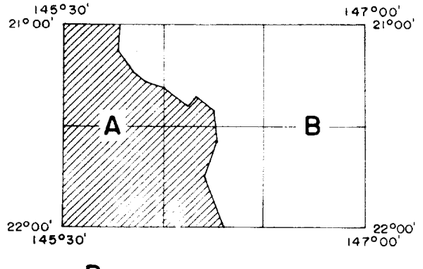
Granodiorite D/Ci

Granodiorite has been mapped on MT. COOLON, and is extended by its photo appearance of mottled texture and low relief on to north-east BUCHANAN. An isolated outcrop is interpreted on Run 4, photo 5008.

BUCHANAN REFERENCE SHEET
S.F. 55—6

Photogeological Character — Possible Geological Interpretation

Photogeological Character					
	Qa	Alluvium		QUATERNARY	CAINOZOIC
Grey toned, stippled texture	Cz	Soil, sand		UNDIFFERENTIATED	CAINOZOIC
Light toned, forms low mesas, unbedded	T			TERTIARY	CAINOZOIC
Grey toned, rounded form, low relief	Ci	Diorite		CARBONIFEROUS	PALAEOZOIC
Light toned, striated pattern, well bedded	C_3		Drummond Group	CARBONIFEROUS	PALAEOZOIC
Character similar to C_3, but unit recessive with respect to C_1 and C_3	C_2		Drummond Group	CARBONIFEROUS	PALAEOZOIC
Medium to dark toned, bedded	C_1		Drummond Group	CARBONIFEROUS	PALAEOZOIC
Dark toned, well bedded, forms sharp ridges	Cd	Undifferentiated	Drummond Group	CARBONIFEROUS	PALAEOZOIC
Light toned, relatively high relief	V	Volcanic rocks		DEVONIAN — CARBONIFEROUS	PALAEOZOIC
Mottled texture, low relief	D/Ci	Granodiorite		DEVONIAN — CARBONIFEROUS	PALAEOZOIC
Variable tone, fine dendritic stream pattern, low relief	Dk	Ukalunda Beds		DEVONIAN	PALAEOZOIC
Variable tone, fine dendritic stream pattern, low relief generally, with some higher rounded hills	Pzla	Anakie Metamorphics		UNDIFFERENTIATED	PALAEOZOIC
	U	Undetermined			



B Photogeological Interpretation.

A Geological Mapping

Photogeological Symbols

- Lithological boundary
- Probable lithological boundary
- Anticlinal axis
- Synclinal axis
- Fault
- Probable fault
- Edge of bed
- Probable edge of bed
- Edge of bed expressed as scarp

Estimated dips

- Horizontal
- Very low
- Low
- Medium
- Steep
- Vertical

- Trend line
- Joint pattern

Geological Reference

(Geology and compilation 1964 by R.R.Vine (B.M.R.) and D.J.Casey (G.S.Q.).)

CAINOZOIC	QUATERNARY		Qa	*Alluvium*
CAINOZOIC	QUATERNARY		Qs	*Sand, gravel, soil, rubble*
CAINOZOIC	UNDIFFERENTIATED		Czd	*Duricrust (silcrete, ferricrete)*
CAINOZOIC	TERTIARY (?)		T	*Argillaceous sandstone*
MESOZOIC	JURASSIC — LOWER CRETACEOUS	Ronlo Beds	J—Kr	*Quartz sandstone, siltstone, mudstone*
MESOZOIC	MIDDLE—UPPER TRIASSIC	Moolayember Formation	Rm	*Mudstone, lithic sandstone, quartz sandstone*
MESOZOIC	LOWER TRIASSIC	Dunda Beds	Rld	*Lithic sandstone, quartz sandstone, siltstone, mudstone*
MESOZOIC	LOWER TRIASSIC	Warang Sandstone	Rlw	*Kaolinitic quartz sandstone, siltstone, mudstone*
PALAEOZOIC	UPPER PERMIAN	Betts Creek Beds	Pub	*Siltstone, lithic sandstone, mudstone, carbonaceous shale*
PALAEOZOIC	UNDIFFERENTIATED		Pz	*Lithic sandstone*

Geological Symbols

- Geological boundary
- Fault (Where location of boundaries and faults is approximate, line is broken; where inferred, queried; where concealed, boundaries are dotted, faults are shown by short dashes.)
- 16 — Strike and dip of strata
- Dip 15° } Air-photo interpretation
- Trend lines } Air-photo interpretation
- G1447 — Plant fossil locality with reference number
- Type section
- Measured section
- x32 — Locality reference number
- Artesian bore flowing
- Sub-artesian bore or well
- Abandoned bore or well

R8520 Refers to bore registered number of Queensland Irrigation and Water Supply Commission records

Topographic

- Road, track
- Fence
- Homestead
- Yard
- Windpump
- Landing ground
- Tank
- Bore
- WH — Waterhole
- Dam
- PD — Position doubtful

?Volcanic rocks V

Two outcrops south of Mt. Hope Homestead (Run 4, 5010) with relatively high relief are shown as probable volcanic rocks, following the Francarep map. Two other outcrops, on Run 5/5190 and on Run 8/5044 are also included in this category.

Carboniferous

Drummond Group Cd - C_1 - C_2 - C_3

Dark toned well bedded rocks that form sharp ridges are widely distributed in the north-east of the area. These are referred to undifferentiated Drummond Group of Carboniferous age (Cd). South of St. Ann's Homestead and forming part of the Llanarth Range is a light grey toned well bedded jointed unit; stratigraphically above and below are dull grey toned sequences with lighter toned patches. On the map these units have been separated by boundaries, but are included with the Cd. On the Francarep map they are shown as Devonian.

Mt. Bingeringo is formed of medium to dark toned bedded rocks (C_1) that are overlain by a well bedded less resistant sequence (C_2); this in turn is succeeded by a light toned very well bedded unit with a rather distinctive striated pattern (C_3). The latter unit occupies a large syncline north of Bulliwallah Homestead and is found again in a syncline in the vicinity of Watts No.1 Mill west of Mt. Bingeringo. C_1 is shown only at Mt. Bingeringo and in a small anticline to the south (Run 5/5180), and though it will doubtless be found elsewhere by field work, its appearance is not sufficiently different from that of Cd to make its identification certain on the photographs, particularly in areas of tight folding.

C_2 can be distinguished only in the vicinity of C_1 and C_3; elsewhere its pattern is too like that of Cd to be differentiated.

Diorite Ci

A small outcrop of diorite intrusive into the Drummond Group rocks has been mapped on the south-west border of MT. COOLON. This comes across on to BUCHANAN just south of the road to Twin Hills Homestead.

Cainozoic

Tertiary T

The Carboniferous rocks are covered in many places by mesaform deposits with a light tone and medium dense tree cover; no bedding can be seen in the air photos. These deposits are correlated with Tertiary sandstone, conglomerate, siltstone and claystone on

CHARTERS TOWERS, MT. COOLON and BOWEN.

Undifferentiated Cz

Flat-lying cover including soil and sand is placed in this category; it is grey-toned with a stippled texture, and is distinguished from river alluvium (Qa).

Particular Problems

The main problem to be solved is the location of formation boundaries within the Drummond Group. Another is the checking of an outcrop about three miles south-east of No. 6 Bore (south of Mirtna Homestead) which is tentatively shown as Warang Sandstone, but may belong to the Drummond Group. A third important problem is the confirmation or otherwise of Devonian rocks west of the Anakie Metamorphics.

STRUCTURE

The structure of the Anakie Metamorphics and Ukalunda Beds is not evident from the photos, but field investigations of adjacent areas indicate that they are basement with respect to the Drummond Group, which in the north-east of BUCHANAN dips off them to the west; for example near Scartwater Homestead (Run 1/5106).

Folding in the Drummond Group is strongly developed in the north-east, with steep limbs and steep plunges; commonly beds dip so steeply as to appear vertical, but their direction in places can be decided by following them along strike to the nose of a fold.

In the Bulliwallah Range and westward, folding is relatively open; west of Schaeffers Hut, dips in unit C_3 range from fairly steep at the edge of a broad syncline to almost flat-lying in the axial region.

Mt. Bingeringo is an anticlinal mountain (unit C_1) and to the west is another open syncline in C_3.

East of Natal Downs is a narrow anticline with the axis trending north-west, and the south limb cut by a fault also trending north-west. In general the trend of fold axes in the Carboniferous rocks ranges from north-west to north-north-east.

Structurally the Tertiary rocks have the form of a flat sheet that partly blankets the uneven Carboniferous surface, but that is being stripped off by the present cycle of erosion.

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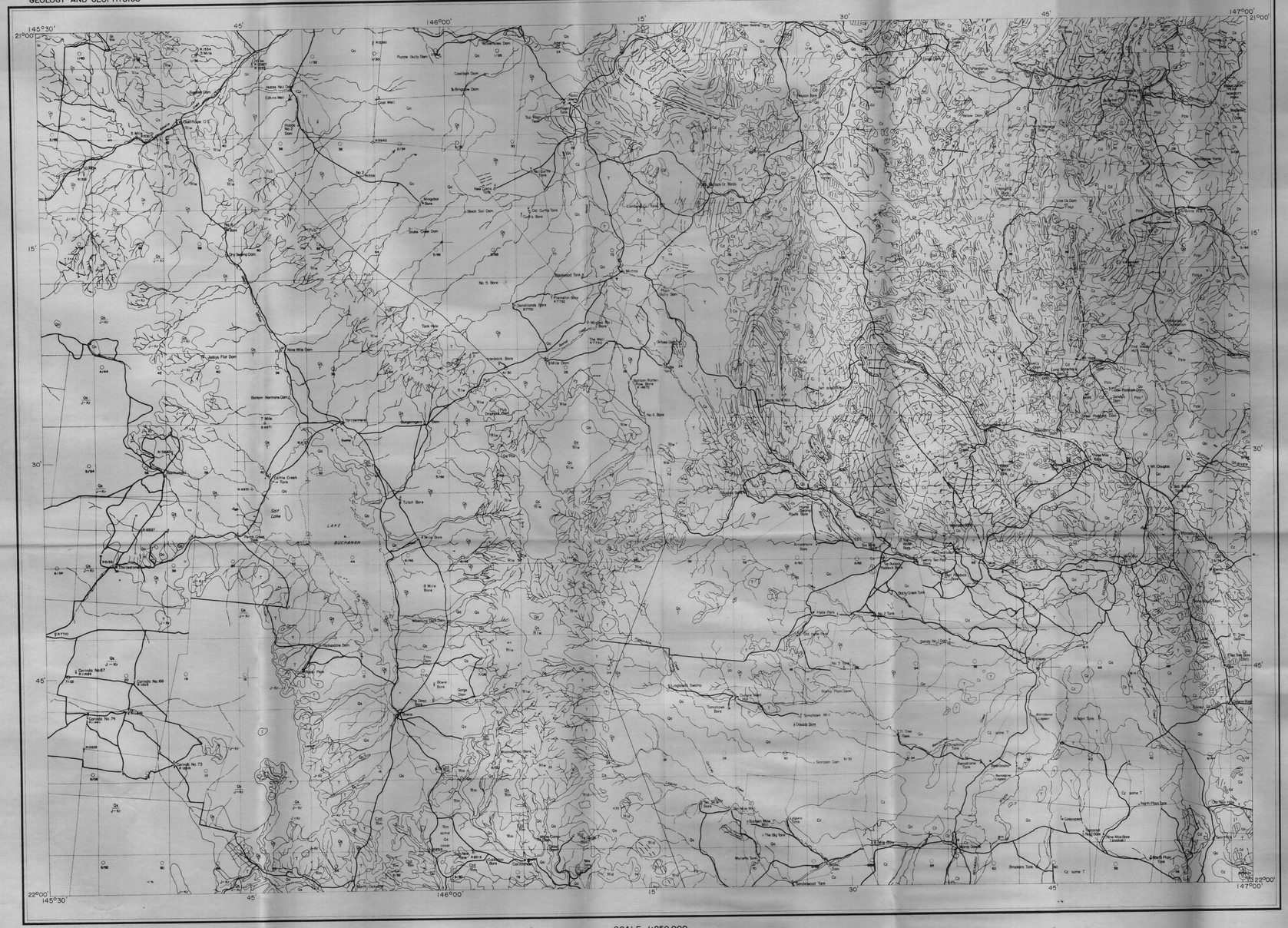
GEOLOGY AND GEOPHYSICS

BUCHANAN

QUEENSLAND

AUSTRALIA 1:250,000
PHOTOGEOLOGICAL SHEET SF55-6


145°30'
146°00'
147°00'
21°00'
22°00'
15'
30'
45'
LAKE BUCHANAN
Buchanan
Torrowanna
Burgengreen Dam
Dry Swamp Dam
Jodys Flat Dam
Nine Mile Dam
Bottom Normans Dam
Cattle Creek Tank
Tylch Bore
Corridor No.67
Corridor No.68
Corridor No.74
Corridor No.73
Mt Douglas
Mt Dougal
Mt Mackay
Mt Mackay Tank
Mt Mackay Bore
Mt Mackay Dam
Mt Mackay Yards