

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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1966/228



REPORT ON PHOTO-INTERPRETATION OF SURAT 1:250,000 SCALE SHEET,  
QUEENSLAND.

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by

J.C. Rivereau  
Institut Français du Pétrole

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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PHOTOGEOLOGICAL MAP	(in back pocket)

The opinions and views expressed in this Record are those of the author and are not necessarily those of the Bureau of Mineral Resources.

# REPORT ON PHOTO-INTERPRETATION OF SURAT 1:250,000

## SCALE SHEET, QUEENSLAND

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### SUMMARY

The "Amby Beds", mainly composed of siltstone overlying the Roma formation, crop out in the most part of the Sheet area in a large syncline outlined by some outcrops of the underlying Roma Formation. But the outcrops are largely duricrusted, and form prominent tablelands except around Surat and Southwood. The thickness of the "Amby Beds" increases south-eastward. Tertiary sand and gravel are spread throughout the Sheet area but are of little thickness and are associated with Quaternary sand which belongs to the present cycle of erosion.

### INTRODUCTION

Surat 1:250,000 scale Sheet is in the Surat Basin, between  $27^{\circ}$  and  $28^{\circ}$  south latitude and  $148^{\circ}30'$  and  $150^{\circ}$  east longitude. The photo-interpretation of this area has been carried out with the purpose of assisting in the planning and execution of the field work scheduled for the 1967 season. The air photographs used were flown in 1963 at a nominal scale of 1:85,000. Detail from the individual photo-scale overlays has been reported on overlays of the National Mapping photo-scale compilation sheets, and then reduced to a scale of 1:250,000.

Complementary notes, related to a field inspection of a week in this area, which was carried out after the photo-interpretation, have been included at the end of the report.

### PHYSIOGRAPHY

The Lower Cretaceous, which crops out mainly in the central and south-eastern part of the Sheet area, forms low cultivated lands (cereals).

The duricrusted areas, which principally occur in the southern part, form tablelands and are covered with bush and timber, as are also the Tertiary or sandy areas in the western part of the studied area.

The Condamine River, with a large, rich alluvial plain, crosses the Sheet area in the northern part, flowing west and then southward near Surat. West of Surat the name changes from Condamine to Balonne river.

### STRATIGRAPHY

In assigning possible geological equivalents to the photogeological units, reference has been made to the results of the field work and photo-interpretation previously completed (Exon, Casey and Galloway, 1966; Rivereau, 1966), and much information has been obtained in discussions in the field with N.F. Exon and E.N. Milligan.

### Lower Cretaceous

#### Klr, Roma Formation

It is a fairly soft formation which consists of mudstone. Within the studied area it occurs in the Balonne River valley, about midway between Surat and the southern boundary of the Sheet, and it is presumed to be at shallow depth everywhere along the Balonne river valley, hidden by Quaternary alluvium. The Roma Formation also crops out in the south-eastern corner but is mostly concealed by sand and thin Tertiary gravel cover.

#### Kla, "Amby Beds"

This name is provisional and has been given to a formation of siltstone overlying the Roma Formation. The name comes from the Amby Creek, near Mitchell, where this formation was first found during the 1966 field season.

It covers most of the studied area and is particularly well shown around Surat. Southward and south-eastward it is duricrusted and becomes thicker with a change in sedimentation and lithology (see complementary notes).

### Cainozoic

#### T, Tertiary sandstone, sand and gravel

The Tertiary sandstone is exposed in the eastern part of the Sheet area. Elsewhere the Tertiary is represented by gravel, usually of insignificant thickness, capping the Lower Cretaceous or the duricrust, or mixed with Quaternary sand.

Because of this, the gravel has not been separately mapped.

#### Czd, Duricrust

The duricrust forms flat or gently undulating scarp-forming tablelands covered with timber. Duricrust occurs at any level in the sequence, thus in the northern part, south and east of Surat, the top layers of the "Amby Beds" are duricrusted, but southeastward where the upper part of the "Amby Beds" has been eroded, the base of this formation and the Roma Formation are duricrusted.

#### Qs, Sand

Quaternary sand is exposed in large areas, filling the depressions of the duricrusted surface. It belongs to the present cycle of erosion.

### STRUCTURE

The presence of the "Amby Beds" suggests that the main feature of the Sheet area is a gentle syncline with a possible north-west trending axis passing near Surat. On its borders the Roma Formation crops out and in the south-eastern corner probably also the Minmi Member of the Blythesdale Formation.

### COMPLEMENTARY NOTES

These notes concern the field traverses carried out during a week spent in the Surat area in September 1966.

Sampling points are numbered and the corresponding numbers have been reported on the map and on the air photographs. Numbers between brackets refer to Run and photo numbers.

SURAT  
REFERENCE

TABLE 1

Photogeological character	Possible geological equivalent		
	Qa - Alluvium	QUATERNARY	CAINOZOIC
	Qs - Sand		
Dark tone, flat, scarp-forming	Czd - Duricrust		
Medium grey tone, soft appearance timber cover, gently undulating surface	T - Sandstone, sand, gravel	UNDIFFERENTIATED	
		TERTIARY	
Light grey tone with white spots, mainly cultivated	Kla - Siltstone	"AMBY BEDS" *	MESOZOIC
Light grey tone, very soft appearance, cultivated.	Klr - Mudstone	ROMA FORMATION	

\* Provisional name

-261 (R1-88)

In the river bed. Black, very duricrusted conglomerate including Tertiary cobbles and boulders of a fine sandstone.

This conglomerate would be younger than the Tertiary formation.

-262 (R1-92)

White siltstone and fine sandstone. No duricrust. Top of the "Amby Beds?"

Few feet of Tertiary at the top.

-263 (R1-88)

In the river bed - dark grey duricrusted siltstone - very much like 261.

-264 (R1-88)

Duricrusted mudstones.

-265 (R1-88)

Silicified duricrust. Fine sandstones.

-266 (R1-88)

Two well defined benches.

- bottom one : siltstone and fine sandstone
- top one : mudstone and duricrusted mudstone. No Tertiary.

-267 (R1-88)

White siltstone

-271 (R1-76)

In the Balonne river, under the bridge at the entrance of Surat.

About 30 feet of typical, fossiliferous, "Amby Beds". Lithology is soft siltstone and some inter-bedded harder siltstone and sandstone forming beds up to a foot thick, yellow brownish in colour.

-272 (R1-76)

- Base : "Amby Beds" similar to R71;
- Middle : 50 feet of mudstone;
- Top : 80 feet of duricrusted mudstone and siltstone.

-273 (R1-76)

Mudstone. Duricrusted conglomerate in the river bed similar ? to 261. About two feet of Tertiary gravel cap the surface.

-274 (R1-80)

Tertiary sand.

-275 (R3-80)

Typical "Amby Beds".

-276 (R5-96)

60 to 80 feet of mudstone regarded as the Roma Formation.

Tertiary gravel at the top.

-281 (R7-32)

From bottom to top,

-15 feet of mudstone.

-10 feet of interbedded siltstone and mudstone.

Each layer is about  $1/3$ rd of an inch thick.

Towards the top in places the mudstone layers are reduced to mud pellets.

This formation, which has been found in many places on the Surat Sheet area has been labelled A2 and is presumably underlying the typical "Amby Beds" found around Surat. Its thickness seems to increase southward and south-eastwards. The Roma Formation is underneath.

- 15 feet of mudstone.

- 15 feet of duricrusted fine sandstone.

-282 (R7-12)

Sand over duricrusted "Amby Beds".

-283 (R6-32)

Duricrusted siltstone and mudstone "Amby Beds"?

-291 (R6-40)

Duricrust

-292 (R5-68)

Beds of hard, thinly bedded, cross-bedded sandstone.

-293 (R5-64)

Similar to 292. These beds could be the Minmi Member of the Blythesdale Formation; the "Amby Beds" are found at 294, and though the Roma Formation is not clearly shown in this area it may be present in the cultivated area between the top of the small hills formed by the "Amby Beds" and the bottom of the creeks where these presumed Minmi sandstones are found.

-294 (R5-72)

Typical A2 "Amby Beds" - The boundary between the "Amby Beds" and the Roma Formation cannot be traced from air photographs.

-295 (R4-30)

Duricrusted A2 "Amby Beds".



-296 (R3-60)

Duricrusted "Amby Beds".

-297 (R3-64)

Duricrusted "Amby Beds".

-298 (R3-64)

Beds of massive sandstone similar to locality.

293 Minmi Member?

-299-2910 (R4-22)

Base : Mudstone

Middle : 100 feet of A2 "Amby Beds"

Top : Duricrusted A2 "Amby Beds"

In this area, as in 293-294 area, it seems that there is the sequence: "Amby Beds" then Roma Formation then Minmi Member from point 299 to 298 but, here also, the boundaries cannot be traced from air photographs.

-2911 (R1-60)

Duricrusted A2 "Amby Beds"

-2912-2913 (R2-60)

Duricrusted siltstone and fine sandstone.

May be similar to the top of 272;

Mudstone underneath.

-2914 (R2-68)

A2 "Amby Beds"

-2915 (R2-68)

"Amby Beds"

-2917 (R1-68)

In the Balonne River Bed

Base : A2 "Amby Beds";

Middle : 10 feet of mudstones;

Top : Typical "Amby Beds" similar to 271.

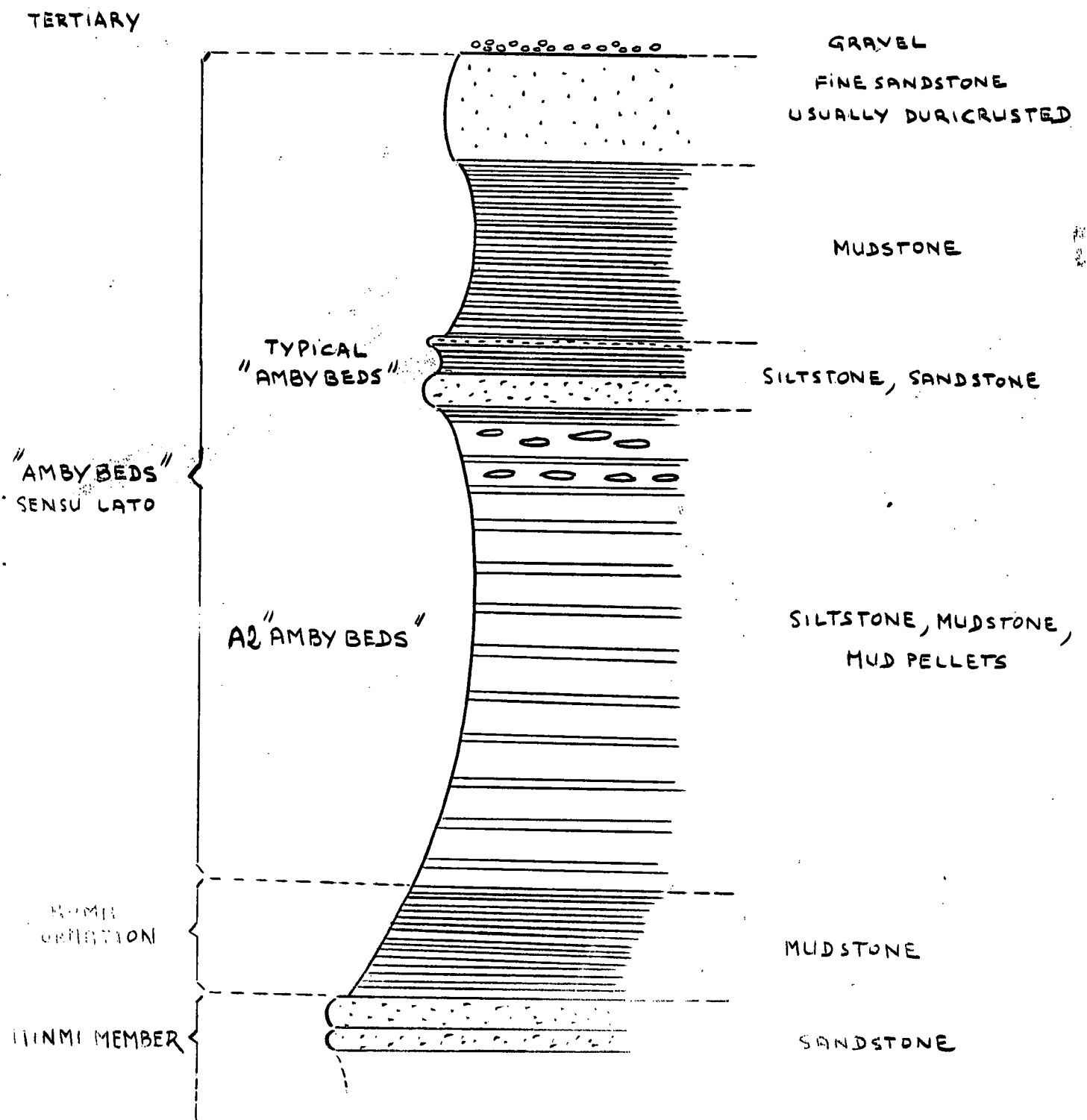
Figure 1 gives an idea of the possible sequence on the Surat Sheet area. The thickness of formation A2 increases southward from 10 to 20 feet near Surat to more than a hundred feet in the middle eastern part of the Sheet area.

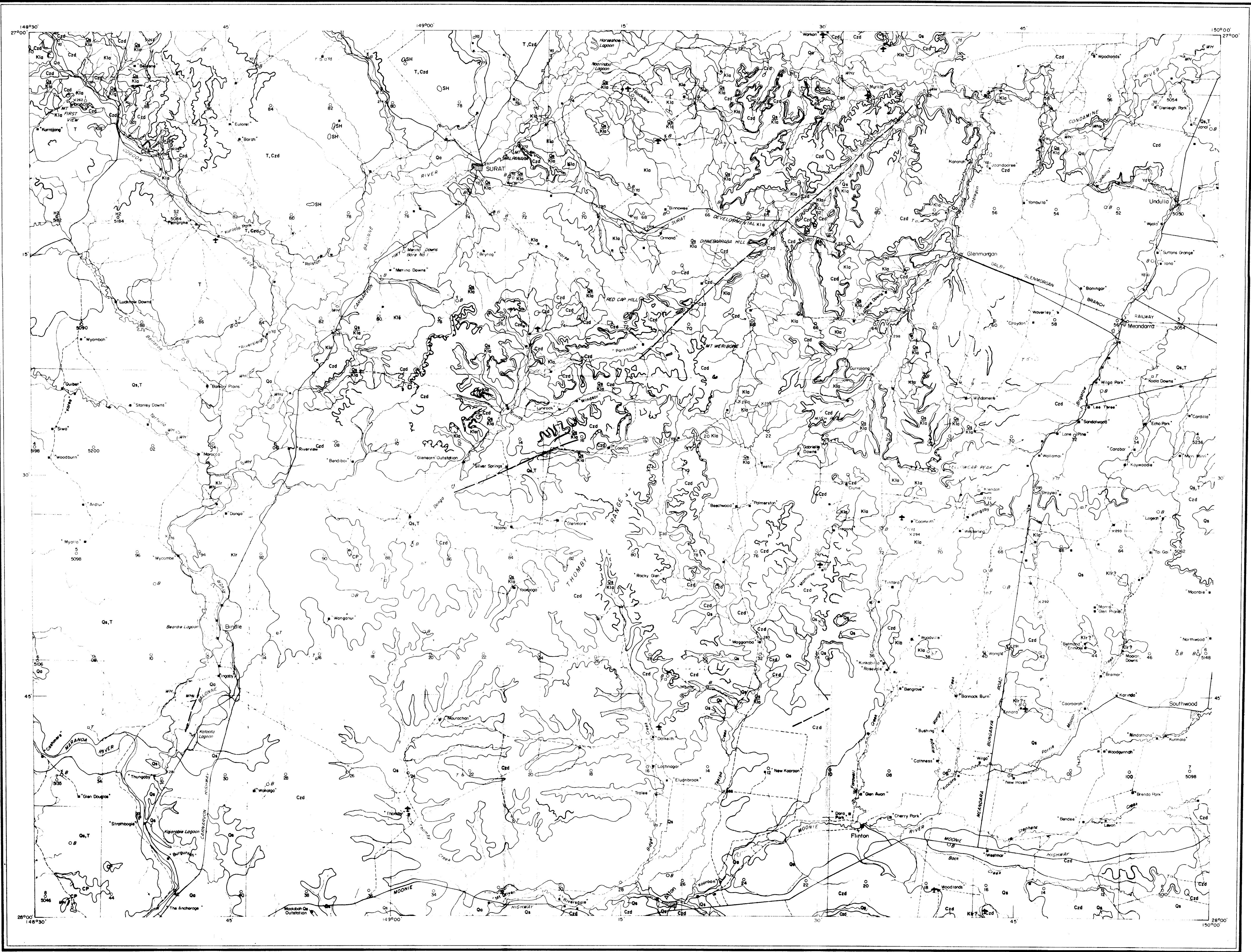
REFERENCES

EXON, N.F., CASEY, D.J., & GALLOWAY, M.C., 1966 - The Geology of the northern half of the Mitchell 1:250,000 Sheet area, Qld., Bur. Min. Resour. Aust. Rec. 1966/90.

RIVEREAU, J.C., 1966 - Report on photo-interpretation of Mitchell (Southern half), Roma and Chinchilla 1:250,000 scale Sheets, Qld., Bur. Min. Resour. Aust. Rec. 1966/100.

FIGURE 1





REFERENCE

Photogeological Character Possible Geological Equivalent

<div>Qa</div>	Alluvium	QUATERNARY	CAINOZOIC
<div>Qs</div>	Sand		
<div>Czd</div>	Duricrust	UNDIFFERENTIATED	
<div>T</div>	Sandstone, sand, gravel	TERTIARY	
<div>Kla</div>	Siltstone	"Amby Beds"*	LOWER CRETACEOUS
<div>Klr</div>	Mudstone	Roma Formation	

\* Provisional name

<div></div>	Lithological boundary	<div></div>	Principal road
<div></div>	Probable lithological boundary	<div></div>	Minor roads and tracks
<div></div>	Anticlinal axis	<div></div>	Railway line
<div></div>	Synclinal axis	<div></div>	Telephone line
<div></div>	Fault	<div></div>	Fence
<div></div>	Probable fault	<div></div>	State boundary
<div></div>	Edge of bed	<div></div>	Mine
<div></div>	Probable edge of bed	<div></div>	Homestead
<div></div>	Edge of bed expressed as scarp	<div></div>	Yard
<div></div>	Estimated dips	<div></div>	Windpump
<div></div>	Horizontal	<div></div>	Airport or Airfield, Landing ground
<div></div>	Very low	<div></div>	Bore
<div></div>	Low	<div></div>	Tank
<div></div>	Medium	<div></div>	Well
<div></div>	Sleep	<div></div>	Spring
<div></div>	Vertical	<div></div>	Waterhole
<div></div>	Trend line	<div></div>	Dam
<div></div>	Joint pattern	<div></div>	Clay pan
<div></div>	Specimen locality and reference number	<div></div>	Sink hole
<div></div>		<div></div>	Photo-centre points
<div></div>		<div></div>	Photo-centre points-adjointing sheet

Compiled by the Bureau of Mineral Resources, Geology and Geophysics  
Base map compiled from Queensland Two Mile Series cadastral maps.  
Aerial photography by Ad Astra Airways Pty. Ltd. 1963; complete vertical  
coverage at 1:85,000 scale. Detail from photographs and location of  
centre points adjusted to base map by reference to planimetry.  
Transverse Mercator Projection.

SCALE 1 : 250,000



INDEX TO ADJOINING SHEETS

MITCHELL	ROMA	CHINCHILLA
HOMEBOIN	SURAT	DALBY
DIRRANBANDI	ST. GEORGE	GOONDIWINDI

Photo-interpretation by the Photogeological Group,  
Bureau of Mineral Resources, Geology and Geophysics 1966.  
Interpreted by J.C. Riverero, Institut Français du Pétrole  
Compiled by D.E. Brentnall, B.M.R.