6844

COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS.

1962/70

EXPLANATORY NOTES, MACKUNDA SHEET, QUEENSLAND

by

R.R. Vine.

PART 1 of 2

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EXPLANATORY NOTES, MACKUNDA SHEET, QUEENSLAND.

SUMMARY

Mapping of the Mackunda Sheet area was carried out during 1961 by the Great Artesian Basin field party of the Bureau of Mineral Resources. A conformable sequence from the basal Cretaceous Longsight Sandstone to the ?Upper Cretaceous Winton Formation is present. The Mackunda Beds are named as a transitional unit between the marine, Lower Cretaceous Wilgunya Formation and the non-marine Winton Formation.

At the junction of the Diamantina River with its main tributaries, the freshwater Old Cork Basin was formed by warping during the Tertiary. The warping was probably associated with movement on the Cork Fault.

Plentiful supplies of underground water are available in the Longsight Sandstone aquifer, but it is mainly too deep to be economically tapped for pastoral use. Smaller and less certain supplies are available in the Mackunda Beds and the lower part of the Winton Formation. Precious opal is widespread in the Winton Formation, where it is associated with the pallid zone of the laterite profile. Possible source beds for petroleum are present in the marine Wilgunya Formation; poor reservoir rocks exist in the Winton Formation, but the Longsight Sandstone would provide an excellant reservoir. Only in the western edge of the Sheet are the rocks below the Longsight Sandstone known; the petroleum prospects may be enhanced if a marine section of Mesozoic or Palaeozoic age is preserved below the Longsight in the rest of the Sheet.

Recommendations are made for further regional gravity work, for aeromagnetic and seismic work in the south-east, and for stratigraphic bores to test the possible extension of the Georgina Basin in the south-west and the pre-Cretaceous sequence in the south-east.

INTRODUCTION

In 1961 the Mackunda 1:250,000 Sheet was mapped as part of a long term project to map the margins of the Great Artesian Basin. The Queensland part of the western margin had been mapped in the period 1957 to 1960 by field parties led by J.N. Casey and M.A. Reynolds. In 1961, the four Sheets on the north-western margin of the Euromanga Sub-basin - Brighton Downs, Mackunda, McKinlay and Julia Creek - were mapped; Explanatory Notes to accompany each Sheet have been prepared (Jauncey, 1962; Vine & Jauncey, 1962a, 1962b). The party consisted of R.R. Vine and W. Jauncey with I. Chertok as draftsman.

Access to the area is good; a main highway from Winton to Boulia runs roughly east-west across the area, a second highway from Winton to Diamantina Lakes and Davenport Downs passes through the east and south-east of the area. In the lowlands, access within the area is excellent, with many station tracks. In hill country, tracks are few because the country is rough and has little pastoral value. Dirt roads are most numerous in the area, and become impassable after small amounts of rain. The main roads have been constructed with very high crowns to facilitate drainage and even after heavy rain they are usually trafficable within three days.

Water supplies, though widely scattered, are generally good. In the western half of the Sheet many bores have reached the basal Cretaceous aquifer, which yields abundant supplies of potable water. Along the Diamantina River there are several permanent, or near-permanent, waterholes. Elsewhere, except in the hill country, there is a scattering of shallow, sub-artesian bores (many brackish), and large earth tanks.

The whole of the Mackunda area is held under petroleum "Authority to Prospect" - 54P by The Papuan Apinaipi Petroleum Co.Ltd and 80P by Magellan Petroleum Corporation and Central Queensland Petroleum Co. Pty Ltd.

PREVIOUS INVESTIGATIONS

Before this survey no systematic work was done on the area of the Mackunda Sheet; however, regional reconnaissance work had been done in western Queensland. From 1872 to 1930 many papers and maps were published, containing plentiful speculation, but from which emerged the broad picture of the Mesozoic Great Artesian Basin with a western margin of mineralised Precambrian rocks (Daintree, 1872; Jack, 1885, 1886, 1895a, 1895b; Cameron, 1901; Dunstan, 1920; Jensen, 1925, Woolnough & David, 1926; Reid, 1929). In this period it was recognised that in western Queensland the Mesozoic sequence consists of a basal sandstone aquifer, succeeded by Cretaceous marine shales and non-marine sandstones and shales, and by Tertiary freshwater deposits.

From 1930 to 1954 Whitehouse carried out more systematic work on the Great Artesian Basin as a whole. His work was on two distinct subjects: Mesozoic stratigraphy (Whitehouse, 1930, 1945, 1953, 1954) and late geological history (Whitehouse, 1940, 1941, 1948). He suggested that a faunal and time break occurred within the marine lutites, and postulated two periods of lateritisation, which were the results of fluctuating climatic conditions. The last report (Whitehouse, 1954) gives a complete, comprehensive and valuable account of all that was known of the Great Artesian Basin stratigraphy, structure and water supply.

More recently the Bureau of Mineral Resources has started systematic regional mapping of the margins of the basin. Reports so far available cover the nearby Sheets of Boulia (Casey et al., 1960) and Springvale (Reynolds, 1960), and of south-western Queensland (Reynolds, Olgers & Jauncey, 1961). The nomenclature used for western Queensland (Casey, 1959) together with a possible correlation with Whitehouse's terms is :

B.M.R. Western Queensland.	Whitehouse, Great Artesian Basin.
Winton Formation	Winton Formation
Wilgunya Formation -	
Upper)	
Toolebuc Member)	Tambo Formation
Lower	Roma Formation
Longsight Sandstone	Blythesdale Group (upper part only)

Several geophysical surveys have been made :

Seismic - Austral Geo Prospectors Pty Ltd (for The Papuan Apinaipi Petroleum Co. Ltd) (A.G.P., 1961).

Gravity - Bureau of Mineral Resources (map only - Plate IV).
Mines Administration Pty Ltd, (for The Papuan Apinaipi Petroleum Co. Ltd) (Starkey, 1960).

Central Geophysical Corporation (for Magellan Petroleum Corporation) (Harris, 1960).

Aeromagnetic - Bureau of Mineral Resources (Jewell, 1960).
Catawba Corporation (unpublished).
Central Queensland Petroleum Co. Pty Ltd.(unpublished).

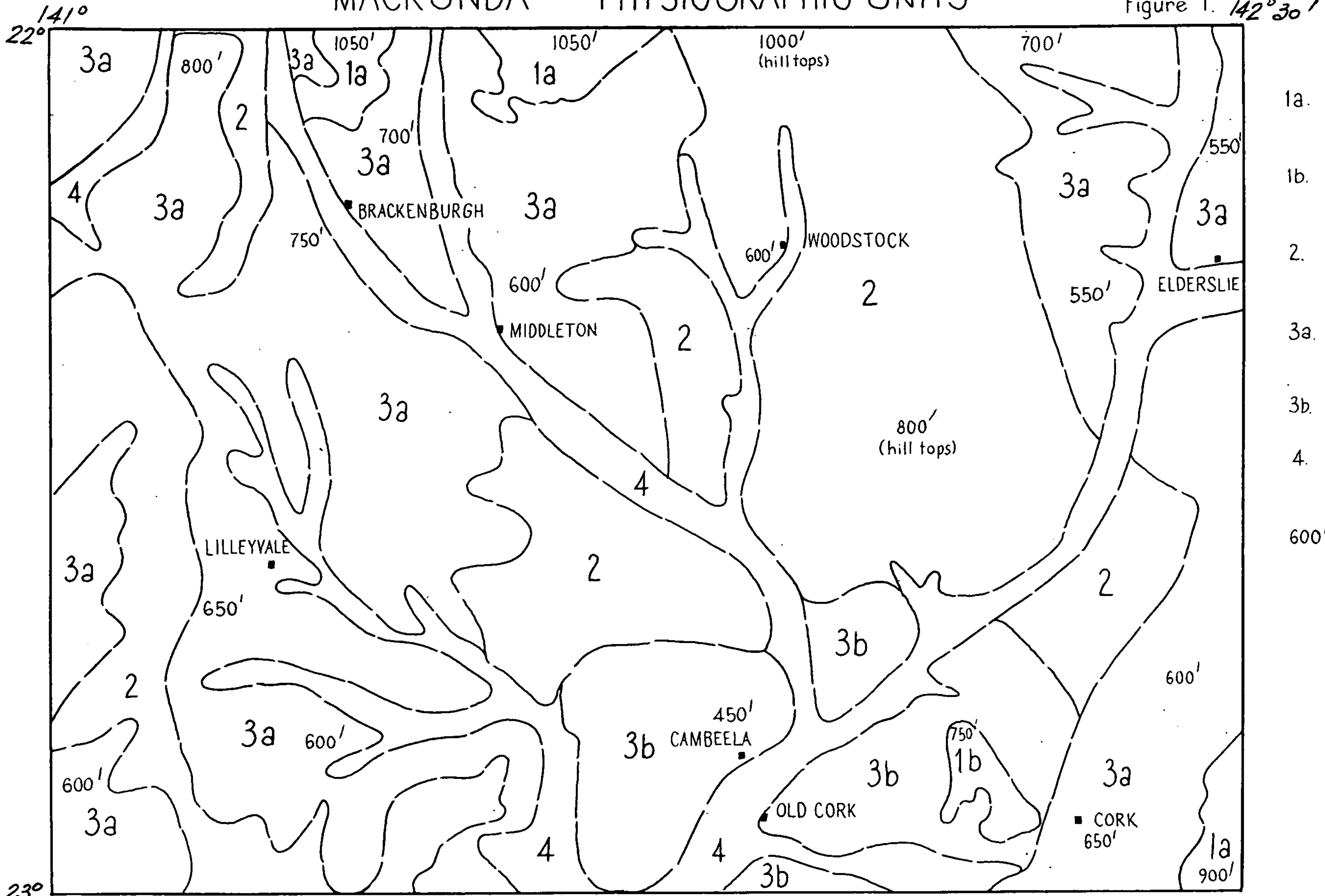
PHYSIOGRAPHY

The physiographic units are related to the degree to which an old duricrust surface has been stripped from the area. The largest remnants of the duricrust surface form plateaus and a laterite profile up to and including the ferruginous zone is commonly preserved on them.

Plateau areas grade into the areas of strong dissection, where the topography is made up of large to small mesas and buttes, and lower scree-covered hills and slopes. The cappings of the mesas and buttes are normally silcrete, formed by the silicification of various parts of the laterite profile.

MACKUNDA PHYSIOGRAPHIC UNITS

Figure 1.



1a. *Plateaus* – *duricrust cap on Cretaceous sediments.*

1b. *Plateau* – *duricrust cap on Tertiary sediments*

2. *Duricrust residual areas – mesas, buttes scree covered hills.*

3a. *Downs country – thin soil cover on Cretaceous rocks*

3b. *Plains* – *level flats with scarp edges*

4. *Alluvial belts, containing water courses with braided channels.*

600' *Average height of area.*

5 0 5 10 15 Miles

Bureau of Mineral Resources Geology & Geophysics. April 1962.

A further gradation takes place into lowlands, the areas from which the deeply weathered rocks have been entirely stripped. Where the underlying rocks are Cretaceous, the lowlands form rolling downs, which are referred to as black soil plains, but in this area the soil cover is generally thin, and outcrops can be found in the banks of many creeks. Tertiary lake deposits in the Old Cork Basin produce extremely flat plains which end in sharp, low scarps along the Diamantina River. The main watercourses have strongly braided channels within broad, flat belts of alluvium.

The locations of the physiographic units are shown in Figure 1.

STRATIGRAPHY

The stratigraphy of the Mackunda Sheet area is summarised in Table 1. Units below the upper member of the Wilgunya Formation are not known in outcrop in the area, but they have been projected into the area as a result of mapping further west and south (Casey et al., 1960; Reynolds, 1960; Reynolds, Olgers and Jauncey, 1961). Continuation of these units sub-surface in the Mackunda area is based on the interpretation of drillers' logs. No new information on the upper member of the Wilgunya Formation was obtained from the rather limited outcrops in the west and north-west of the Sheet.

Results of the mapping showed (a) that transition beds are developed between the marine Wilgunya Formation and the non-marine Winton Formation, and (b) that a Tertiary freshwater basin was formed in the Old Cork area. The new units are referred to in Table 1, and are defined and described in detail below.

Thin sections of arenitic rocks of the Winton Formation and Mackunda Beds show that most are arkosic. Friable arenites are mainly arkose with average compositions: feldspar (dominantly plagioclase) 60%, quartz 30% and chlorite 10%. Tough beds have similar proportions of the clastic fraction, but with a calcareous cement varying between 40% and 60% of the whole rock.

Note that "duricrust" is used in the sense originally given by Woolnough (1928, pp.892-3): "a hard crust or 'armor-plate' of chemically formed material. This crust may be aluminous, ferruginous, siliceous or calcareous; but always reflects in its composition the nature of the underlying bed rocks."

TABLE 1 - STRATIGRAPHY OF THE MACKUNDA SHEET.

ROCK UNIT	THICKNESS (feet)	LITHOLOGY	DISTRIBUTION	STRUCTURE	TOPOGRAPHY	STRATIGRAPHIC RELATIONSHIPS	PRINCIPAL REFERENCES
ALLUVIUM (Qa)	0-100	Clay, silt, gravel near hills.	Along all major watercourses.		Flood plains	Quaternary	
SOIL (Qb)	0-?30	Grey & black soil.	Approximately 35 sq.miles around Lucknow No.1 bore.		Very flat plain	Thick soil sheet overlying Wilgunya Formation, possibly flood plain deposit.	
SAND (Qs)	0-50	Loose sand	Small areas east of Old Cork Homestead.		Plain, with partly eroded dunes; crests active after dry spells.	Overlies Old Cork Beds, and apparently related to outcrop of sandy beds. Quaternary.	
GRAVEL (Czg)	0-40	Gravel, some breccia of silicified siltstone.	Small areas west and south of Cork Homestead.	Possible fans from fault line scarp.	Low flat-topped rounded hills.	Overlies Winton Formation; probably derived from faulted Winton rocks, Old Cork Beds and Mueller Sandstone. Cainozoic, undifferentiated.	
DURICRUST (Czd)	Cappings	Laterite, silcrete.	Hill and plateau cappings throughout large part of area. See Physiography, this report.	Flat-lying except where the laterite profile has been affected by the Cork Fault.	Cappings of plateaus, mesas and buttes.	Deposited as chemical alteration product of Mesozoic and Tertiary rocks. Cainozoic, undifferentiated.	Woolnough, 192[illegible].
MUELLER SANDSTONE (Tu)	5-30	Brown, white and red, fine-grained ferruginous sandstone; silty sandstone, pebble conglomerate, fine breccia.	Mueller Range and very small outcrop adjacent to the Cork Fault on southern margin of Sheet.	Thin flat cover over most of Mueller Range, but thickening and dipping gently east near Cork Fault.	Plateau of Mueller Range.	Overlies Old Cork Beds disconformably in west, unconformably in east. Tertiary.	New Formation; defined in this report.
OLD CORK BEDS (To)	0-300+	White, grey and green claystone, sandy siltstone, limestone, sandstone, conglomeratic sandstone, ?algal beds.	About 800 sq.miles around the junction of Middleton Creek with the Diamantina River.	Flat-lying	Plains, ending in low scarps against present valleys; flat hill cappings in northern outcrops.	Overlies Winton Formation unconformably. Lithologically and faunally similar to rocks of Springvale Basin. Tertiary.	New unit, defined in this report.
WINTON FORMATION (Kuw)	1500+	Thickly to massively interbedded arkose, siltstone, calcareous arkose, arkosic limestone, coal.	Eastern 2/3rd of Sheet area.	very gentle east dip displaced by Cork Fault.	Steep-sided hills and rolling downs.	Conformably overlies Mackunda Beds, and unconformably overlain by Old Cork Beds. Lower-Upper Cretaceous.	Whitehouse, 1930, 1954. Reynolds et al., 1961.

TABLE 1 - page 2.

ROCK UNIT	THICKNESS (feet)	LITHOLOGY	DISTRIBUTION	STRUCTURE	TOPOGRAPHY	STRATIGRAPHIC RELATIONSHIPS	PRINCIPAL REFERENCES
MACKUNDA BEDS (Klm)	300-500 (estimated)	Thinly interbedded arkose and siltstone, with medium-bedded arkose, calcareous arkose and arkosic limestone.	Western 1/3rd of Sheet area. Sub-surface eastern part of Sheet.	Very gentle east dip.	Rolling downs, steep-sided hills.	Conformably overlies Wilgunya Formation; overlain conformably by Winton Formation. Lower Cretaceous.	New unit, this report.
WILGUNYA FORMATION							
upper member (Klw_2)	700-1400 thickening eastwards	Blue and grey claystone, siltstone, and silty limestone.	Valley of Warburton Creek and Lucknow No.1 bore area; sub-surface rest of Sheet.	Very gentle east dip.	Rolling downs, soil-covered plain, steep-sided **hills.**		
Toolabuc member (Klw(t))	30	White, grey and pink limestone, calcareous shale, coquinite.	Sub-surface only.	Very gentle east dip		Conformably overlies Longsight Sandstone, overlain conformably by Mackunda Beds. Probably equivalent to Roma and Tambo Formations. Lower Cretaceous.	Casey, 1959. Casey et al., 1960. Reynolds, 1960. Reynolds et al., 1961.
lower member (Klw_1)	400-500 ?thickening eastwards	Blue and grey claystone, siltstone, sandy beds.	Sub-surface only.	Very gentle east dip.			
LONGSIGHT SANDSTONE (Kll)	50-1300 thickening eastwards	Sandstone, conglomerate "pipe-clay" and "shale" (drillers' terms)	Sub-surface only.	Filling basement relief; top dips very gently eastwards.		Overlies Precambrian and Lower Palaeozoic rocks unconformably, overlain conformably by Wilgunya Formation. Probably equivalent to upper part of Blythesdale Group. ?Jurassic-Lower Cretaceous.	Casey, 1959 Casey et al., 1960 Reynolds, 1960 Reynolds et al., 1961
PRE-MESOZOIC		Basement recorded by drillers as "granite", "limestone", "bedrock", "hard flinty rock" and "red marl".	Sub-surface only.	Probably folded and faulted.		Probably a continuation of the Precambrian rocks of north-west Queensland and the Lower Palaeozoic sediments of the Georgina Basin.	

PLATE I

Figure 1 - Typical lithologies of the Mackunda Beds, thinly interbedded arkose and siltstone, with a thicker bed of poorly cross-bedded arkose and development of concretions of calcareous arkose or arkosic limestone, ½ mile west of Elanna Tank, Gnalta Station. (B.M.R. negative M/138)

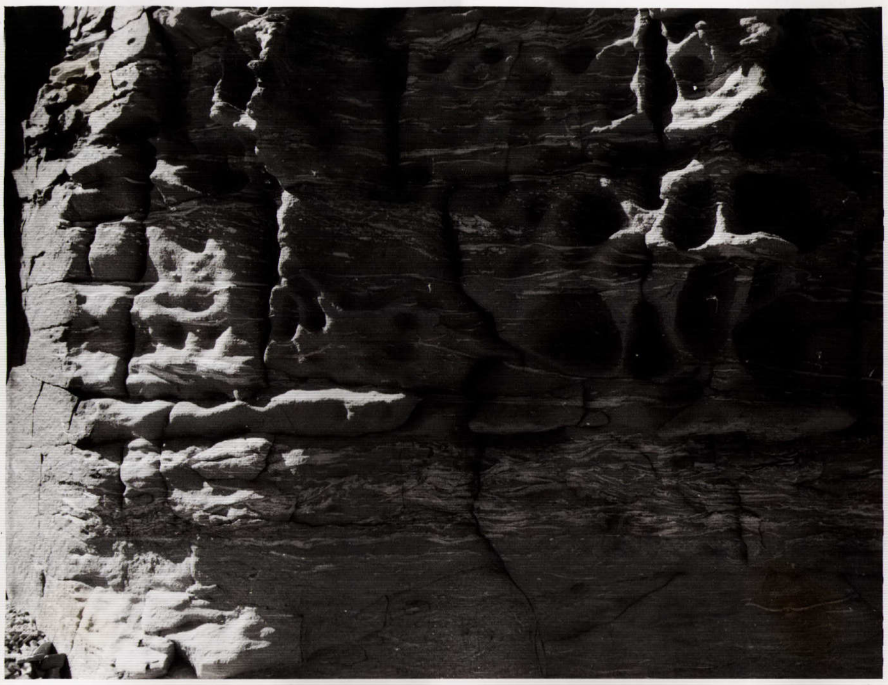


Figure 2 - Massive arkose of the Winton Formation, with stringers and pellets of siltstone, 2 miles east of 10-mile Tank, Chiltern Hills Station (thickness of section about 4 feet). (B.M.R. negative M/138)

Mackunda Beds

The Mackunda Beds are defined as a sequence of thinly and very thinly interbedded arkose and siltstone, with medium-bedded arkose, calcareous arkose, and arkosic limestone. They conformably overlie the Wilgunya Formation and are overlain conformably by the Winton Formation. The reference area is in the headwaters of Mackunda West Creek (from which the name is taken) on Gnalta Station. The unit is regarded as transitional between the marine Wilgunya Formation and the non-marine Winton Formation, and although it contains a marine fauna it is lithologically similar to the Winton Formation.

The Mackunda Beds can be separated from the Wilgunya Formation by the change from poorly-bedded claystone and siltstone, to well-bedded, thinly interbedded arkose and siltstone, commonly containing plant fragments. The Mackunda Beds are very similar to the Winton Formation; both have the same lithologies, but thin interbedding is rare in the Winton Formation, which is characterised by massive to thick interbedding of arkose and siltstone.

Plate I, Figure 1 is a typical outcrop of the Mackunda Beds. It shows clearly the characteristic lithologies of the unit; thinly interbedded arkose and siltstone, a thicker bed of arkose with some cross bedding and scouring of the lower beds, and the development of concretions of calcareous arkose or arkosic limestone. Reynolds, Olgers and Jauncey (1961, Plate VI, Figure 2) illustrate another good, though weathered, exposure in a road cutting 5 miles south-west of Lilleyvale Homestead. At this stage the lithologies were regarded as typical of the Winton Formation; the transitional nature of these beds was revealed by later mapping.

For comparison, Winton Formation lithologies are shown in Plate I, Figure 2, and Plate II, Figure 1; these are both of a weathered outcrop. The first shows a massive bed of arkose which contains stringers and pellets of siltstone in cross beds. The second shows a slump roll of interlaminated arkose and siltstone, somewhat similar to the thin interbedding of the Mackunda Beds, but here only a small part of a large exposure of massive arkose and siltstone beds.

Calcareous concretions are also developed from the thick-bedded and cross-bedded arkose of the Winton Formation. This is illustrated in Plate II, Figure 2, which is a photograph of some of the concretions removed from Devil's Elbow Tank on Woodstock Station. Here the distinguishing features are the thick bedding and the very strong cross bedding, which is seldom found so well developed in the Mackunda Beds.

PLATE II

Figure 1 - Slump roll of interlaminated arkose and siltstone of the Winton Formation, 2 miles east of 10-mile Tank, Chiltern Hills Station. Somewhat similar to lithology of Mackunda Beds, but interbedded with massive arkose. (B.M.R. negative M/138)

Figure 2 - Strongly cross-bedded Winton Formation concretions excavated from Devil's Elbow Tank, Woodstock Station. (B.M.R. negative M/138).

It was not possible to measure a complete section through the Mackunda Beds; the thickness is estimated from regional mapping at between 300 and 500 feet.

Distribution of the Mackunda Beds is in a broad belt extending from the south-west of the sheet to the northern margin between Middleton and Saville Creeks. It has been mapped extending north-eastwards in the McKinlay Sheet area (Vine and Jauncey, 1962a) and southwards in the Brighton Downs Sheet area (Jauncey, 1962). Similar rocks were seen in the Boulia area, and have been recorded in the Springvale area (Reynolds, 1960). The beds give rise to both rolling downs and, where protected by a duricrust cap, steep-sided hills.

Field examination of shelly fossils from the unit suggested a similarity with Upper Wilgunya (Tambo) forms. Marine microfossils, with some forms found elsewhere in Lower Cretaceous rocks, were found in samples collected from the bottom of new tanks on Gnalta Station and from Towers Creek Tank on Cawnpore Station (Appendix A). Plant fragments are common in the Mackunda Beds, but most of those collected were indeterminate (Mary White, 1962). Gregy Tank, on Gnalta Station, (GAB 622) contained both marine microfossils and plant fragments in the interbedded siltstone and friable arkose.

Shelly fossils collected from the Mackunda Beds have not yet been closely examined. No definite age was possible from plant fossils, but plants from the overlying Winton Formation were dated as Lower Cretaceous (Mary White, 1962). Examination of the microfossils (Appendix A) suggests a Lower Cretaceous age for the unit, but the determination is not exclusive. The underlying Wilgunya Formation is also Lower Cretaceous, so the Mackunda Beds are regarded as Lower Cretaceous.

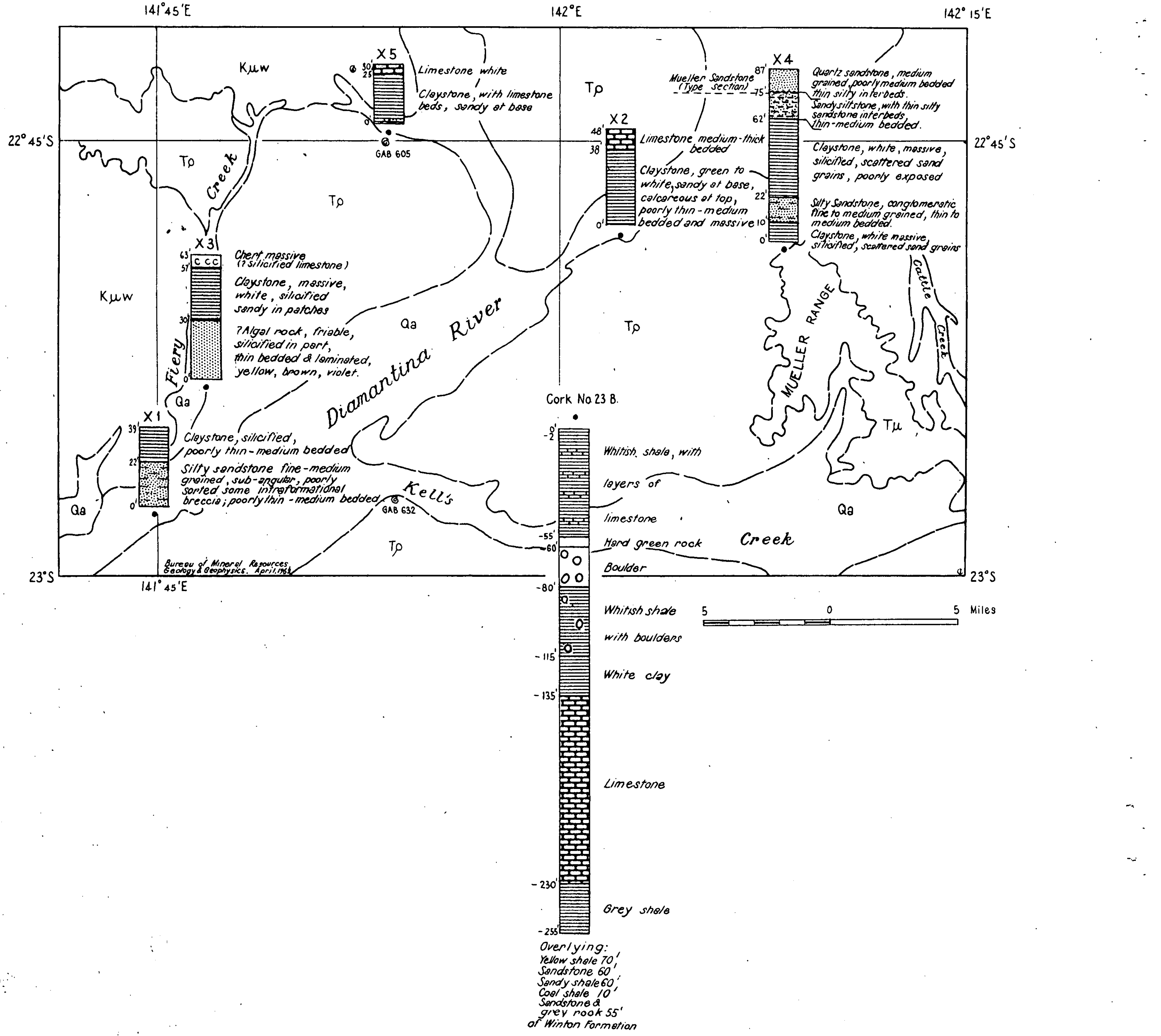
The lithologies in the Mackunda Beds and the presence of both marine and terrestial fossils suggest that the Mackunda Beds were laid down in a restricted, shallow, muddy sea, or in lagoons. These were subject both to inundation from the open sea and to periodic floods bearing arenitic sediments and much plant debris. Terpstra (Appendix A) notes that the microfossil fauna is poor and attributes this to recent weathering; it may, however, be a reflection of lack of access to the open sea.

Age of Mesozoic Units

The age of the Longsight Sandstone and the Wilgunya Formation was determined from areas west of the Mackunda Sheet. From the outcrops in the Mackunda area only one collection of fossils was made, this from the upper member of the Wilgunya Formation.

STRATIGRAPHIC SECTIONS
OLD CORK BASIN

Plate III



Casey et al (1960) stated that both formations were Lower Cretaceous, but that deposition of the Longsight Sandstone might have started late in the Jurassic. The Longsight Sandstone east of the Cork Fault, although still shown as such in the cross-section (Plate IX) is probably equivalent to several of the units within the Blythesdale Group (Whitehouse, 1954), and therefore would be partly Jurassic in age.

The age of the Mackunda Beds is discussed above (p. 6); they are regarded as Lower Cretaceous.

Two useful collections of plant fossils were made from the Winton Formation. GAB 613, from near Cork Homestead, was dated as Lower Cretaceous, and GAB 637, from east of Boolbie Bore, as Cretaceous or younger (Mary White, 1962). GAB 613 is on the upthrown side of the Cork Fault and comes from low in the Winton Formation; GAB 637 is probably from a much higher level. The Winton Formation, therefore, started in the Lower Cretaceous, but in view of the great thickness of the formation above the level of the determinable fossils it must still be regarded as likely to extend into the Upper Cretaceous. For this reason it is still shown on the geological map (Plate IX) as ?Upper Cretaceous, and must remain so until more evidence of the age of all parts of the formation is available. A large collection of non-marine pelecypods was made west of Franklin Homestead (GAB 622); these have not yet been determined. Three forms are present, one at least is similar to Unio.

Old Cork Beds

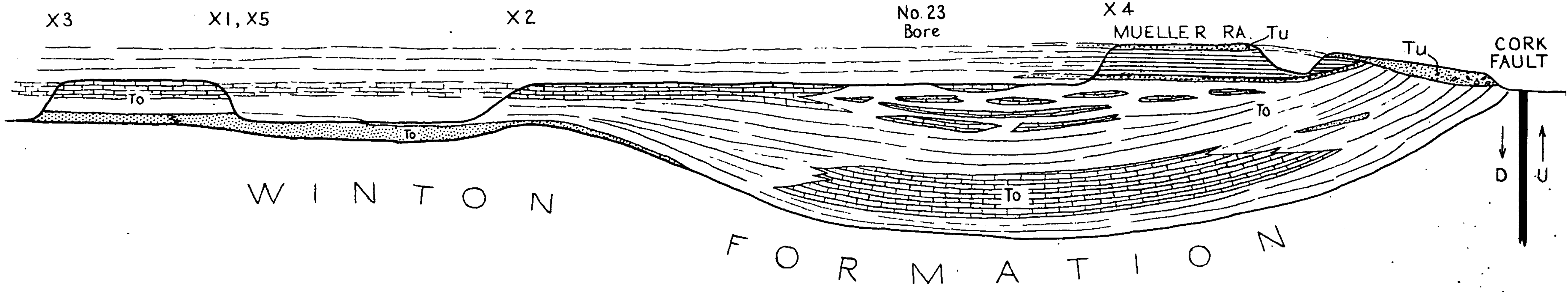
The Old Cork Beds are defined as a sequence of claystone, siltstone, sandy siltstone, limestone, sandstone, conglomeratic sandstone, and ?algal beds exposed in the Old Cork Basin. They overlie the Winton Formation unconformably, and are overlain disconformably and unconformably by the Mueller Sandstone. The reference locality is at Old Cork Homestead (from which the name is taken) which is built on a bench of limestone and silicified limestone of the unit.

The Old Cork Basin was formed as a downwarp in sediments of the Winton Formation. It was formed by ponding of the ancestral Diamantina River, and bounded on the east by the Cork Fault.

Similar lithologies are present in the sequence in the Springvale Basin (Paten, 1961; Jauncey, 1962), but no direct correlation can be made. The Old Cork Basin and the Springvale Basin were probably never connected, the two basins owing their origins to activity on separate faults which had the effect of damming or ponding parts of rivers.

STRUCTURAL INTERPRETATION OF OLD CORK BASIN (Diagrammatic only)

Figure 2



Bureau of Mineral Resources,
Geology & Geophysics. April 1962.

No complete sequence is exposed in any one place in the Old Cork Basin and the relationships between the various lithologies are largely a matter of interpretation. Sections were measured in different parts of the basin and different parts of the sequence; these are shown in Plate III. In addition, Cork No.23 Bore penetrated 255 feet of rocks interpreted as part of the Old Cork Beds. Figure 2 gives a possible interpretation of the sequence within the basin; this is not a cross-section, but purely a diagrammatic representation of the relationship between the known sequences.

In the northern part of the basin sandy siltstone of the upper part of the Old Cork Beds has been strongly leached and developed silicified caps of silcrete. Recent erosion has exposed the rocks in steep-sided hills of startling whiteness. Some of the silcrete has the appearance of conglomerate on a horizontal surface, but in vertical section is tubular (Plate IV, Figure 1). Further north, hills of the Winton Formation have a capping of a similar "conglomeratic" silcrete which is tentatively assigned to the Old Cork Beds.

Distribution of the Old Cork Beds is restricted to a roughly circular area, centred approximately at Old Cork and extending into the Brighton Downs Sheet area; it extends northwards and northwestwards as thin cappings on hills. Most of the area is open, grassy plain which ends in low scarps against the Diamantina River and its tributaries. West of the Diamantina River, in the southern part of the basin, the lowest beds of the sequence form small plateaus and mesas.

Fossils were found at two localities, GAB 605 and GAB 632; both are in limestone. GAB 605 is from an extensive limestone plain which includes most of Cambeela and Munduran Stations, whereas GAB 632 is in a thin bed of limestone in a clay sequence stratigraphically slightly lower. The stratigraphical positions are shown diagrammatically in Figure 2. The fossils were determined by P. Jones as cyprid ostracods and Planorbis sp. (Appendix B).

The Old Cork Beds are regarded as of Tertiary age, but without any definite dating. They are older than the Mueller Sandstone, which is lateritised, and have suffered considerable erosion since the main lateritisation; they are younger than the Winton Formation. The cyprid species at GAB 632 has previously been found in the Horse Creek Formation of the Springvale Basin, which is regarded as Tertiary, on similar evidence.

PLATE IV

Figure 1 - Silcrete formed from sandy siltstone of the Old Cork Beds, 1 mile east of Mogila Tank, Munduran Station. (B.M.R. negative M/138)

Figure 2 - Conglomerate facies of the Mueller Sandstone overlying siltstone of the Old Cork Beds, 4 miles west of Cork Homestead. The contact is at the hammer head. (B.M.R. negative M/138)

Deposition of the Old Cork Beds was in a local freshwater or brackish basin, the Old Cork Basin, formed at the junction of the Diamantina with two of its main tributaries, Middleton and Mackunda Creeks, when tectonic activity caused temporary damming of the river. The tectonic activity was probably movement on the Cork Fault which caused some downwarping immediately west of the fault.

Mueller Sandstone

The Mueller Sandstone is defined as the sequence of sandstone and silty sandstone capping the Mueller Range (from which the name is taken) and thickening and becoming conglomeratic eastwards near the Cork Fault. It overlies the Old Cork Beds disconformably over most of the Mueller Range and rests unconformably on an eroded surface of the Old Cork Beds near the Cork Fault. The type section was measured in the western scarp face of the Mueller Range, $\frac{1}{4}$ mile south-east of Top Knot Tank of Red Hill, near the northern end of the range; longitude 142° 10' E., latitude 22° 50' S. Figure 2 shows the type section of the formation (in the interval from 75 to 87 feet of section X4) in relation to the Old Cork Beds.

Over most of the Mueller Range the formation is a thin sheet (5 to 12 feet thick) of quartz sandstone and silty sandstone. In the south-east it thickens to an estimated 30 feet, and near the Cork Fault it contains conglomerate beds, including a basal conglomerate. Some breccia crops out at the northern end of the Cork airstrip. Near the Cork Fault the thin basal conglomerate rests on an irregular surface of siltstone of the Old Cork Beds (Plate IV, Figure 2). On the Mueller Range the Mueller Sandstone is within the mottled and ferruginous zones of a laterite profile. It is fresher in the south-east, but the underlying Old Cork Beds are strongly leached. Probably in this area the sequence was thicker but has been partly eroded.

Outcrops of the Mueller Sandstone are confined to the Mueller Range and a small area adjacent to the Cork Fault on the southern margin of the Sheet. The unit forms the protective capping of the plateau of the Mueller Range, but has had no significant topographic effect in the southern outcrop.

No fossils were found in the formation. The lower limit of age is given by its unconformable relationship over the Old Cork Beds, which are themselves unconformable on the Winton Formation; the upper age limit is given by the lateritisation and subsequent strong erosion. It is probably of Tertiary age, but nothing comparable has been seen in any of the Tertiary basins of western Queensland.

The Mueller Sandstone was deposited in the freshwater or brackish water Old Cork Basin, following tectonic activity, probably on the Cork Fault. This exposed some of the Old Cork Beds to erosion and their debris was incorporated in conglomerate bands in the Mueller Sandstone. Arcuate trends show on the airphotos of the Cork airstrip area. These coincide with the thickest part of the formation, and represent the surface traces of gently easterly dips of large foresets developed into a local downwarp west of the Cork Fault. Broad current ripples, scours and slump structures are present in the thicker sequence of laminated and thin-bedded sandstone in this area.

STRUCTURE

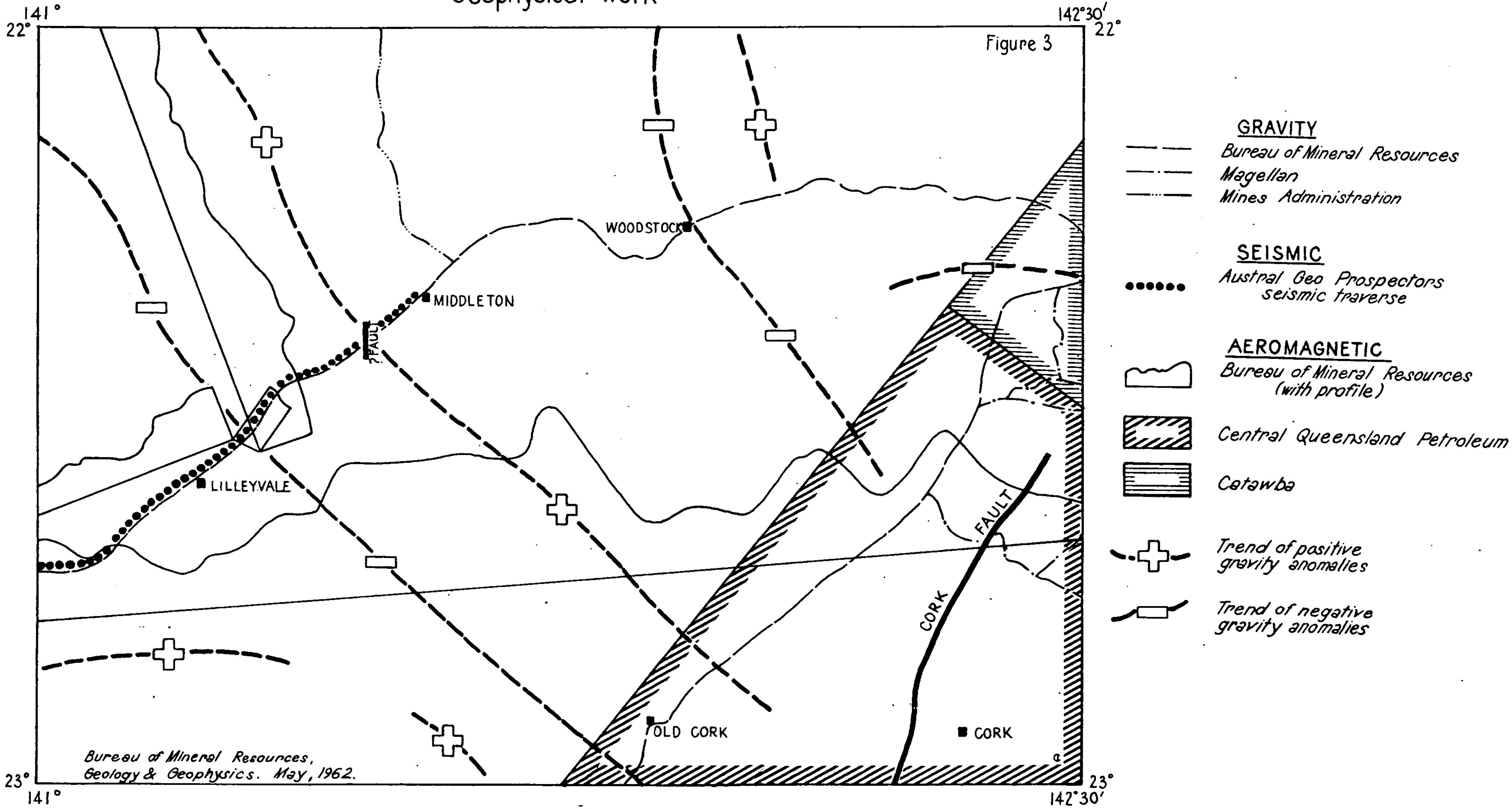
Structural information for the Mackunda area was obtained from four sources, each of which is to a certain extent interpretative.

(a) Surface Mapping : this indicated a regional, very gentle, east dip of the Mesozoic rocks, shown by the distribution of the formations, and a major north and north-north-east trending fault, 4 miles west of Cork Homestead. The fault, here named the Cork Fault, shows on the ground as a line of westward dips of 30° to 35°. West of Whyralah Homestead the dips are not so steep but are possibly modified by cross-faulting. The continuation beyond Tranby Homestead is inferred from a few gentle dips and geophysical evidence. Just north of Kell's Creek the laterite profile in the Winton Formation is affected by the fault, the upper part being folded and some of the pallid zone faulted out, with fresh siltstone and arkose exposed to the east of the fault. This establishes the minimum surface displacement of the fault at 200 feet, as that is the average thickness of the laterite profile in the area.

The Cork Fault cannot be traced much farther south than 23° South, but it gives place to a second structure approximately 2 miles to the east, and en echelon with it. This is the Holberton Structure (Jauncey, 1962).

(b) Airphoto Interpretation : the results of this are reported separately (de Lassus St Genies, Perry and Scanvic, 1962). The main feature is a complicated fault system including part of the Cork Fault in the south-east of the Sheet. Examination of the localities of many of these interpreted faults failed to find traces of them on the ground. It is possible that many of them represent joint traces or ghosts of deeper fractures.

MACKUNDA
Geophysical work



(c) Drillers' Logs : In the western half of the area many water bores reach the basal Cretaceous aquifer but few penetrate it. The logs of these bores have been used to plot contours on the top and bottom of the Longsight Sandstone, to make an isopach map of the unit, and to show the lithologies of the pre-Cretaceous rocks. The bores are widely spaced so all the contours must be regarded as tentative, but the following conclusions can be drawn :

(i) There was considerable relief before the deposition of the Longsight Sandstone, in the form of large valleys radiating from north-west of the Mackunda area (from Plate V).

(ii) Most of the pre-Longsight relief was obliterated by the deposition of the Longsight Sandstone (Plate VI).

(iii) There has been little post-Longsight movement in the western half of the Mackunda area (Plate VII).

In the eastern half of the Mackunda area most of the bores are shallow, drilled only into the Winton Formation and the Mackunda Beds, and they have little value for structural interpretation. Only two bores, both over 4000 feet deep, have reached the Longsight Sandstone. One, at Castle Hill Homestead, has no record of the strata penetrated. The other is at Cork Homestead, and together with Gidyea Bore in the north of the Brighton Downs area (Jauncey, 1962), shows that both the Wilgunya Formation and the Longsight Sandstone thicken eastwards.

The en echelon structures, the Cork Fault and the Holberton Structure, are between Cork Homestead and Gidyea Bores. A comparison of the logs of the two bores shows that the combined structures have caused a regional displacement of approximately 1000 feet, with the downthrow to the west.

(d) Geophysical Surveys : geophysical surveys of the Mackunda area are listed on page 3, their locations are shown on Figure 3.

The single seismic traverse indicated a fault near Middleton with the western side downthrown by about 250 feet; a local steepening of the dip was associated with the fault. No trace of the fault was found by the surface mapping.

The gravity and magnetic gradients in the south-east clearly reflect the Cork Fault but interpretation of the results is much more difficult. Both the surface mapping and the Magellan gravity results (Harris, 1960) indicate downthrow to the west, but the aeromagnetic results suggest deepening of the basin east of the fault. Jewell (1960) postulates the edge of the Boulia Shelf at the sharp change in character of the magnetic profile at the Cork Fault. It is of interest that a Bureau of Mineral Resources seismic traverse west of Winton indicated a fault with a downthrow of approximately 1000 feet to the west. This fault may be the extension of the Cork Fault to the north-east.

Two interpretations of the conflicting results are possible :

(i) The Cork Fault is the expression of an old hingeline, with thicker sedimentation to the east, and later faulting causing uplift of the deeper (east) portion.

(ii) The Cork Fault occurs along a line separating basement rocks of markedly different magnetic or lithological characteristics.

These cannot be resolved without further sub-surface information.

Geophysical work over the rest of the area is limited to three gravity and two aeromagnetic traverses. Inevitably the gravity contouring is tentative on such widely spaced traverses, but the trends indicated (Figure 3) bear no relation to the Mesozoic geology of the Mackunda area. It must be inferred, therefore, that west of the Cork Fault basement characteristics are paramount in influencing the gravity and magnetic results.

GEOLOGICAL HISTORY

The geological history of the area began with the formation of the Precambrian mineral belt of north-west Queensland, and the subsequent Lower Palaeozoic sedimentation in the Georgina Basin. The only record of this in the Mackunda area is in the drillers' descriptions of basement rocks in the south-west and north-west.

In western Queensland, Mesozoic sedimentation started with the deposition, on an old surface of considerable relief, of the Longsight Sandstone. At first, in the late Jurassic, it was non-marine, but later, in the Cretaceous, became marine.

Practically all the pre-Mesozoic relief was obliterated beneath a blanket of Longsight Sandstone of variable thickness (Plate VI), so that the succeeding Wilgunya Formation was deposited on a smooth surface (Plate VII). Albian and Aptian times were marked by slow, quiet, muddy sedimentation, broken only by the change to the clear water deposition of the Toolebuc limestone Member.

The gradational change to the Mackunda Beds indicated the gradual cutting off of marine conditions, first as an alteration with floods of brackish or freshwater deposits, and later, with the start of the Winton Formation, with the change to a large lake or enclosed sea. Cretaceous sedimentation was probably brought to a close with the filling of the basin.

Late in the Cretaceous, or early in the Tertiary, the present drainage was initiated, but flowed only sluggishly across the exposed level lake bed. Chemical weathering started at this stage.

Gentle folding, probably associated with movement on the Cork Fault, formed the Old Cork Basin in a downwarp on the downthrow side of the fault. The folding also partly dammed the ancestral Diamantina River and its main tributaries, to give a landlocked lake of about 1000 square miles. The sediments brought into this lake were the clay-silt residues of the chemical weathering which was the main erosive agent at that time. Limestone was deposited during minimum sediment supply, and probably owes its origin to the leaching of lime from calcareous beds in the Winton Formation.

Faulting, and associated folding, increased late in the period of deposition of the Old Cork Beds, causing the formation of some sandy and conglomeratic rocks near the eastern margin of the basin at the Cork Fault. More marked movement, resulting in an erosional break, most obvious near the fault, followed by an arenitic phase with the deposition of the Mueller Sandstone.

Over most of the area chemical weathering had been proceeding during this time. In a period of quiescence subsequent to the deposition of the Mueller Sandstone, the Tertiary sediments were also affected, and a lateritic profile, thinner than elsewhere, was imposed upon them. Renewed activity on the Cork Fault folded the lateritic profile and exposed it to erosion on the east of the fault.

Rejuvenation of the whole river system led to the erosion of many parts of the old laterite surface, but in areas of local stability strong silicification was able to continue. Considerable Quaternary erosion has developed the topography of duricrust residuals and the more advanced rolling downs, stripped most of the Tertiary sequence down to a resistant limestone horizon, and caused the Cork Fault scarp to retreat to its present position forming the irregular western margin of the Tully Range.

ECONOMIC GEOLOGY

Underground Water

The most dependable supplies of underground water come from the Longsight Sandstone, and in low-lying areas the head is sufficient to produce flowing bores, (Chiltern Hills No.2, Mackunda, Cawnpore No.7, Franklin Homestead). Other bores obtaining water from this formation are pumping from shallow depths. The Longsight Sandstone yields abundant supplies of potable water (analyses available from Irrigation and Water Supply Commission, Brisbane); it is warm to hot in the west (100° - 150°) and nearly boiling in the east. Only in the extreme west is it still economic to drill to the fairly shallow depths of the Longsight Sandstone (1000 to 1500 feet), and most property owners now prefer to sink large earth tanks.

In the eastern two thirds of the Sheet area, many bores have been drilled in an attempt to get stock water from shallow depths (mainly less than 600 feet). The most successful ones are those which reach the Mackunda Beds or the base of the Winton Formation. Supplies are considerably less than from the Longsight Sandstone, and quality varies from potable to saline. Several equipped bores have had to be abandoned because the water has increased in salinity since they were equipped.

The Cork Fault has had a major effect on the locating of shallow sub-artesian bores. Of the 8 bores drilled west of the fault, only two give usable stock water, most of the others are too saline. East of the fault, where approximately 20 bores have been drilled (excluding replacement bores) only three dud bores are recorded. The bores east of the fault reach the base of the Winton Formation or the Mackunda Beds; on the west, or downthrow side, of the fault the bores penetrate higher stratigraphic levels.

Opal

Small amounts of precious opal are reported by the local inhabitants from many parts of the Mackunda area. The most quoted areas are in the face of the Tully Range, in the vicinity of Chiltern Hills No.2 bore and in the hills west of Franklin Homestead. A few localities were examined, and some conclusions were drawn on the conditions necessary for the occurrence of precious opal :

(a) Host rocks appear to be confined to the Winton Formation.

(b) Host lithologies are both weathered arkose and limonite bands. Opal was found replacing some siltstone pellets in massive arkose beds. "Bluebottle" or blue potch is more common in the limonite preservation.

(c) The rocks are not sufficiently silicified to form a silcrete, but commonly occur in the sides of hills which have a silcrete cap.

(d) Precious opal occurs low in the laterite profile, in the pallid zone where original textures are still visible.

(e) The pallid zone is usually pink, possibly deriving its colour from staining by a partly destroyed laterite cap.

These conditions can be satisfied in a large, though inaccessible part of the Sheet (Physiographic unit 2, and the margins of unit 1a, Figure 1). Together with the many reports of opal occurrences it is likely that much more opal remains to be won.

Road Metal

Material suitable for surfacing gravel roads is plentiful in the areas of residual duricrust caps, but is non-existant on the downs. The material is mainly leached and silicified siltstone and arkose, but ironstone gravel cloaking some of the lower hills is also usable.

Building Materials

Limestone in the area is invariably too silty or arkosic to be suitable for lime making.

Gravel for aggregate in the form of billy can be found at the foot of many duricrust hills. Sand is very rare; this is a reflection of the general small proportion of quartz in the Mesozoic sequence. Some sand is available in the dunes near Old Cork Homestead, and some could be obtained from the sandstone at the base of the Old Cork Beds, but both are rather dirty for concrete making. Sand from the Mueller Sandstone is mainly very strongly ironstained.

Petroleum

With the very strong flushing of the most obvious reservoir - the Longsight Sandstone - the marine Cretaceous sequence tends to be ignored with regard to oil search. Drillers have sometimes recorded "kerosene shale" or "oily shale" in bores in the Wilgunya Formation in western Queensland. Some drillers will report this in conversation, but not include it in the log of the bore submitted to Irrigation and Water Supply Commission. Lucknow No.23 bore is an example of this, and a sample from 1020 feet depth given to the writer had a prominent oil slick. The driller stated that this was common in the area, but no record of it appears in the logs of any of the recent bores he had drilled on Lucknow Station. The sample was analysed in the Petroleum Technology Laboratory of the Bureau of Mineral Resources, the result is : "An extraction by the Dean and Stark vapour method, using toluene as solvent was carried out. The following percentages by weight of residual fluids were obtained: Water 25.6%, Oil 0.56% - ?asphaltic content". Assuming no contamination, the proportion of residual oil present in dark lutites means that that part of the sequence must be regarded as a possible source rock. The sample came from 480 feet above the top of the Longsight Sandstone, and is probably from the base of the Upper Wilgunya Formation.

Aquifers are present in the Mackunda Beds and low in the Winton Formation. The increase in salinity with use of some of these suggests that they are not of great areal extent, and the higher salinity of the aquifers from higher in the sequence suggests a minimum of meteoric flushing. The Winton Formation could therefore contain suitable reservoirs with the possibility of both structural and stratigraphic traps, and it is above possible source rocks. The area cannot therefore be altogether excluded from consideration in petroleum search.

RECOMMENDATIONS

Further work is required to resolve three main problems:

(a) The age of the limestone recorded below the Longsight Sandstone in the south-west of the Sheet area. This is of importance to establish if Lower Palaeozoic carbonate rocks of the Georgina Basin are preserved east of the Lucknow Granite (Casey et al., 1960), and to determine how much of the sequence is preserved. This can be achieved by a stratigraphic bore near Lucknow No.9 bore (Reg.No.3463). The bore will penetrate approximately 1550 feet of Mesozoic rocks and an unknown thickness of probable Cambrian and Ordovician rocks before reaching igneous or metamorphic basement.

(b) The stratigraphy and oil prospects east of the Cork Fault. East of the Cork Fault the pre-Cretaceous geological sequence is only inferred; a three-stage programme of work is required to obtain further information:

1. Complete the aeromagnetic cover of the area eastwards from a line parallel to and four miles west of the Cork Fault;

2. Make at least one seismic traverse across the Cork Fault on lines to be selected when all the aeromagnetic results are available;

3. Drill a deep stratigraphic hole east of the Cork Fault at a structural culmination where the Cretaceous sequence is thinnest. It is possible that this may be in the Winton Sheet area, but the most likely site from present mapping is near Cork No.11 tank.

The stratigraphic hole will also be of value to test for petroleum indications near a possible fault trap and up-dip from the inferred deepest part of the Euromanga Basin west of the Longreach Ridge.

(c) The relationship between stratigraphy and gravity results west of the Cork Fault. No definite conclusions can be drawn from the existing widely spaced gravity traverses; it is essential that the Mackunda area be surveyed systematically. A reconnaissance helicopter gravity survey on a 7-mile grid is tentatively programmed for the Bureau of Mineral Resources for the winter of 1963. It is recommended that this survey be carried out with a modification of more detailed work along the lines of the Cork Fault and the Holberton Structure.

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APPENDIX A.

Examination of samples submitted by R.R. Vine and W. Jauncey

by

G.R.J. Terpstra.

Ten samples from the Mackunda area have been examined for microfossils. The results are as follows:

GAB	606	Haplophragmoides spp.
"	607	No foraminifera
"	609	?Haplophragmoides sp.
"	618	No foraminifera
"	619	Trochammina cf. raggatti Crespin Trochammina cf. depressa Lozo Verneuilinoides sp.
"	620	Haplophragmoides spp.
"	621	?Trochammina sp.
"	622	Few broken specimens of arenaceous species.
"	623	Haplophragmoides sp.
"	629A	No foraminifera.

The fauna observed in some of the samples as shown above is very poor. This is most likely due to the weathered nature of the rock material examined.

GAB 619 contains a few species which so far in Australia are known to occur in Lower Cretaceous sediments.

From this evidence it is believed that other samples such as GAB 606, 609, 620, 621, 623 and possibly 622 also represent deposits of a Lower Cretaceous age.

The deposition of the beds concerned is regarded to have taken place under marine or shallow marine environmental conditions.

23rd March 1962.

APPENDIX B.

Micropalaeontological examination of post-Cretaceous limestones from the north-western margin of the Great Artesian Basin, Queensland

by

P.J. Jones.

Two surface samples of post-Cretaceous limestones (Old Cork Beds), collected by R.R. Vine from the area represented by the Mackunda 1:250,000 Sheet, were submitted for examination.

A freshwater assemblage of ostracods (cyprids), and gastropods is noted, and a post-Cretaceous age is suggested.

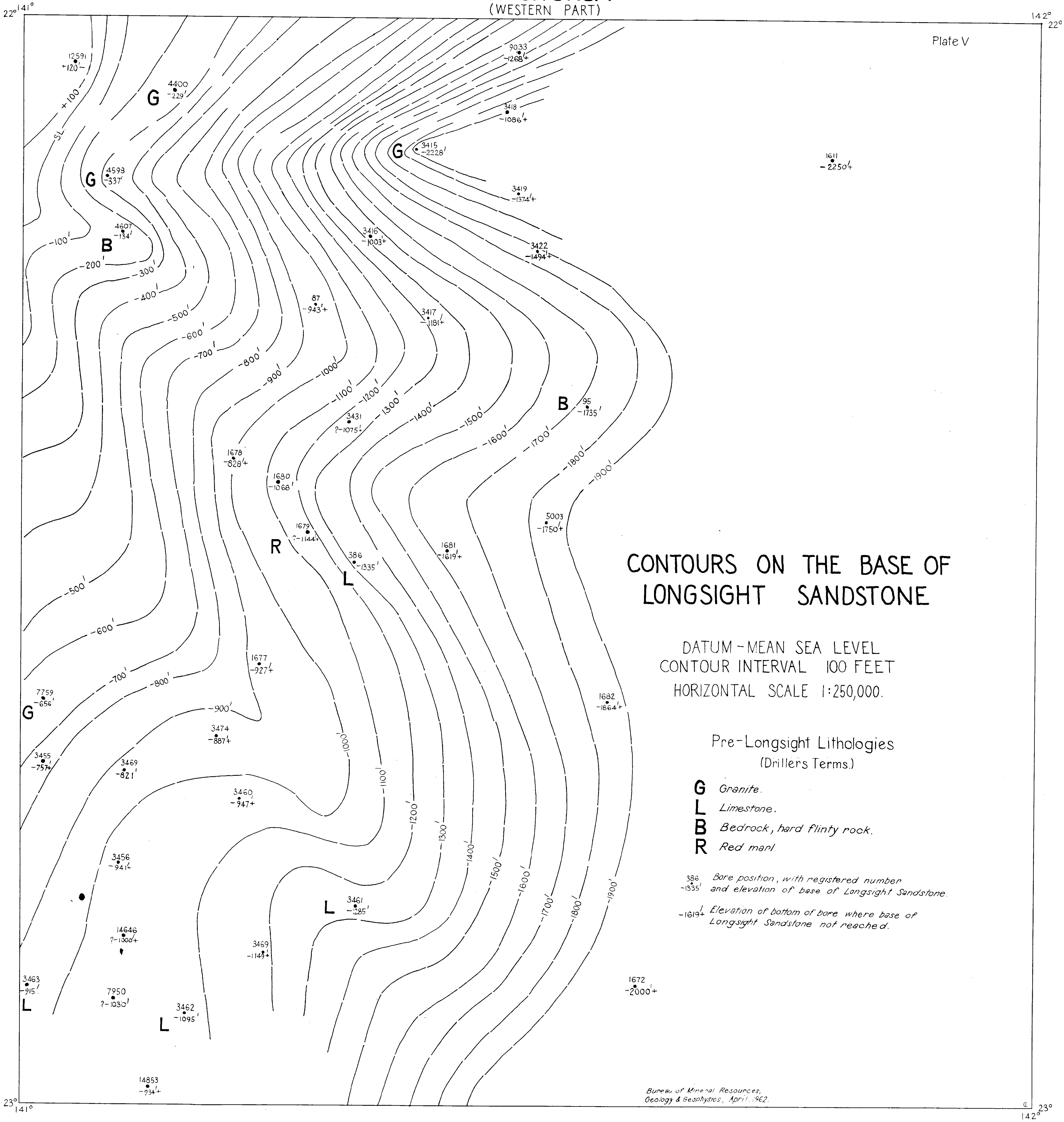
GAB 605 : Shelly limestone from Old Cork Beds 7 miles north of Cambeela Homestead, Mackunda 1:250,000 Sheet, Run 12, photo 5157, field point 29.

Ostracods (Cyprididae) abundant, forming a high percentage of the rock, which is described here as a freshwater ostracod limestone.

GAB 632 : Green-grey porous limestone from Old Cork Beds 1 mile south-east of Old Cork homestead, Mackunda 1:250,000 Sheet, Run 15, photo 5019, field point 176.

Gastropods (*Planorbis* sp.) and ostracods (Cyprididae), both indicating a freshwater environment. The cyprids are represented by one species, previously found in the Horse Creek Formation at locality S25a (scarp near track south side of Ida Creek, ½ mile south of Junction Yard, Springvale Station, Springvale 1:250,000 Sheet). A post-Cretaceous age is suggested.

MACKUNDA
(WESTERN PART)



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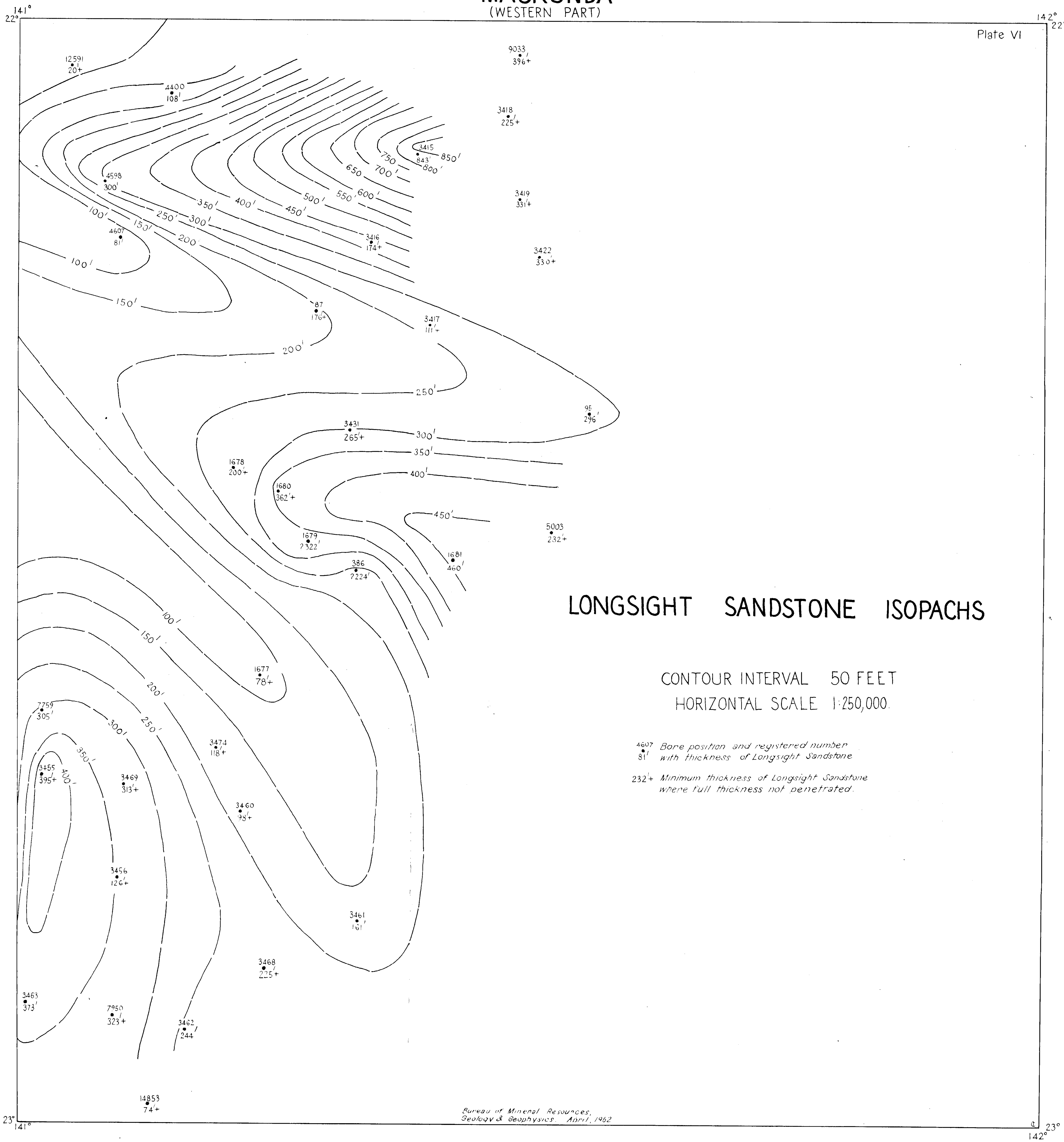

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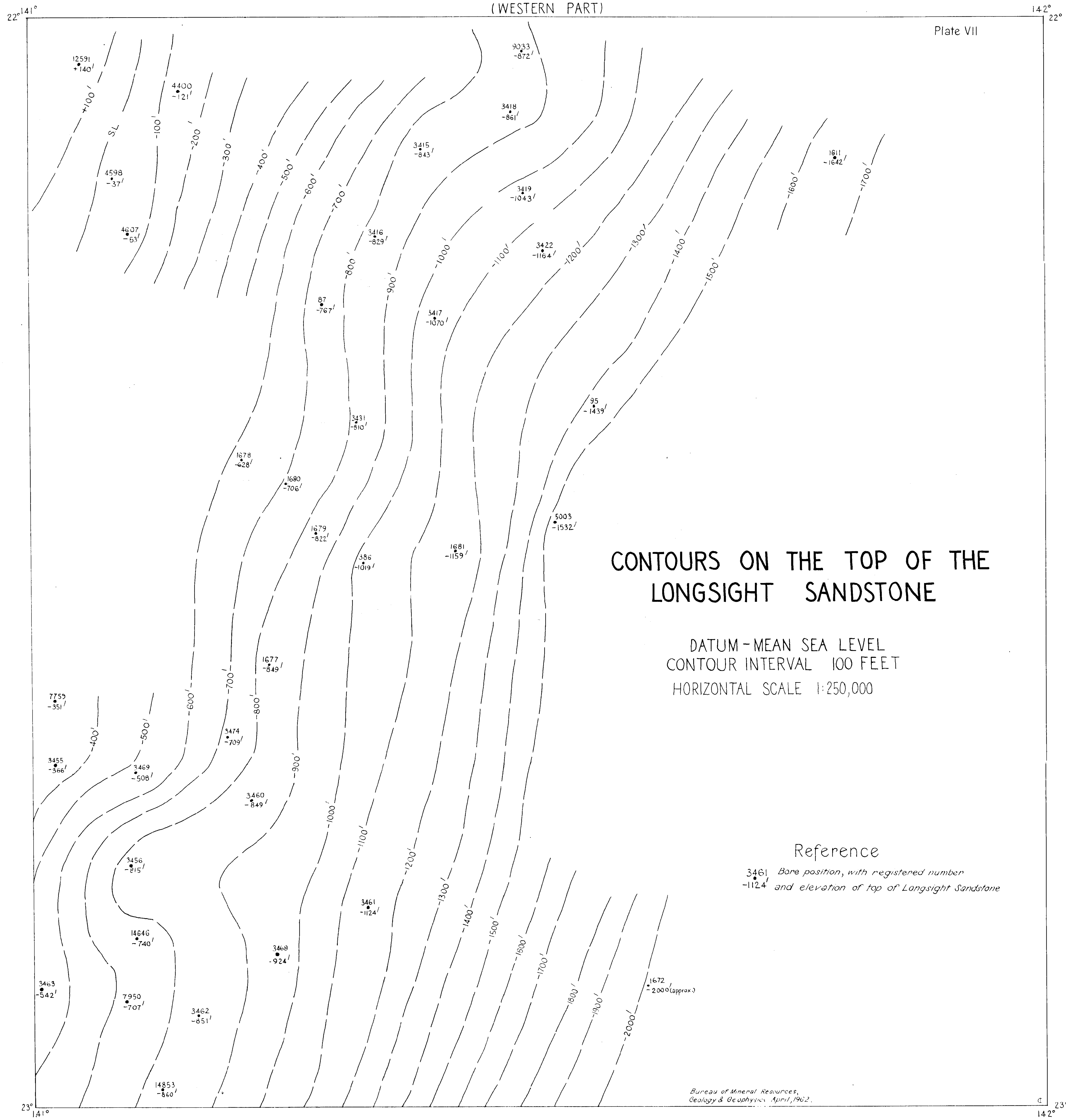


MACKUNDA
QUEENSLAND

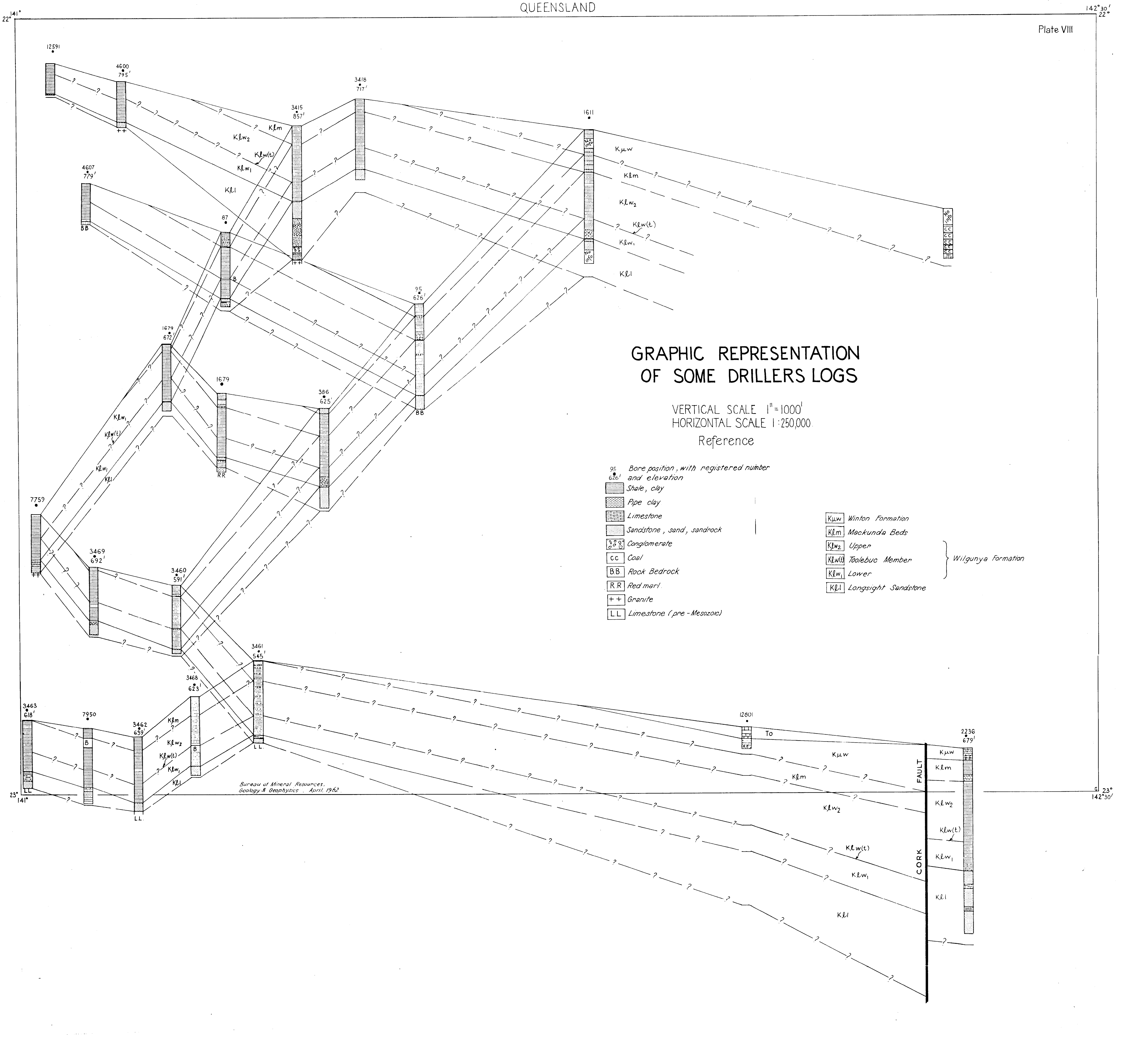


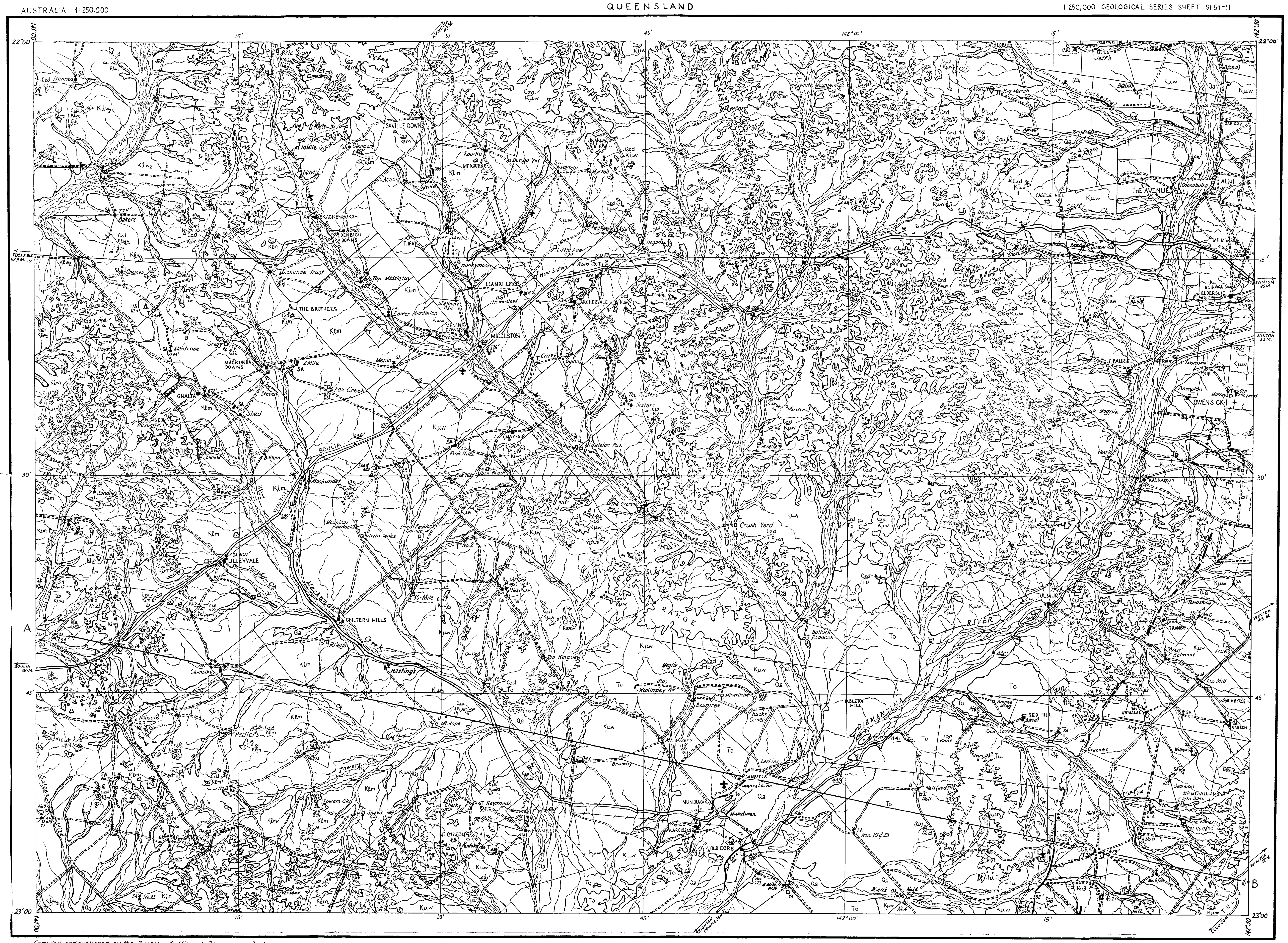
Plate IX

MACKUNDA

QUEENSLAND

AUSTRALIA 1:250,000

1:250,000 GEOLOGICAL SERIES SHEET SF54-11



PRELIMINARY EDITION, 1962

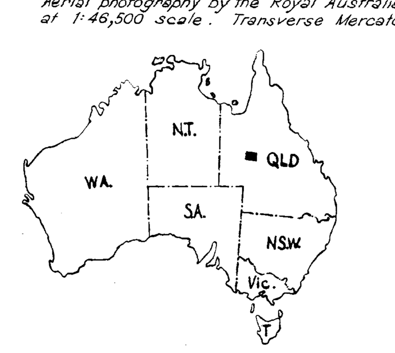
SUBJECT TO AMENDMENT

Reference

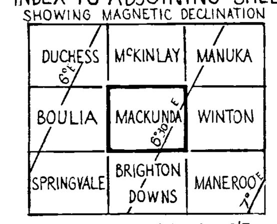
CAINOZOIC	QUATERNARY		Qa	Alluvium
			Qb	Soil
			Qs	Blown Sand
	UNDIFFERENTIATED		Czg	Gravel
			Czd	Duricrust - silcrete and laterite.
	TERTIARY	Mueller Sandstone	Tu	Sandstone, conglomerate.
		Old Cork Beds	To	Sandstone, clay, limestone
MESOZOIC	? UPPER CRETACEOUS	Winton Formation	Kμw	Arkose, siltstone, arkosic limestone.
	LOWER CRETACEOUS	Mackunda Beds	Klm	Arkose, siltstone, arkosic limestone
		Wilgunya Formation: Upper	Klw₂	Mudstone, limestone, sandy limestone
		Wilgunya Formation: Toolebuc Member	Klw(t)	Limestone, calcareous shale. (in section only)
		Wilgunya Formation: Lower	Klw₁	Mudstone, limestone, sandy limestone (in section only)
		Longsight Sandstone	Kll	Sandstone, conglomerate. (in section only)

Geological boundary, position approximate.
Strike and dip of beds
Fault, position accurate
Fault, position approximate
Fault, inferred
Monoclinal flexure, position approximate.
GAB 623 Macrofossil locality
GAB 637 Plant fossil locality
GAB 628 Fossil wood locality
GAB 616 Microfossil locality
Opal mine
Road
Vehicle track
●A Artesian bore
●SA Sub-artesian bore
●B(abd) Abandoned bore
Dud bore
T Earth tank
Dam
Building
Yd. Yard
Windmill
Fence
Dog netting fence
Landing ground
· 479' Instrument levelled height } feet above mean sea level
· 683' Barometric spot height } feet above mean sea level
(P.D.) Position doubtful

Compiled and published by the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Topographic base compiled by the Division of National Mapping and the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Aerial photography by the Royal Australian Air Force; complete vertical coverage at 1:46,500 scale. Transverse Mercator Projection.



INDEX TO ADJOINING SHEETS
SHOWING MAGNETIC DECLINATION



ANNUAL CHANGE 2'E

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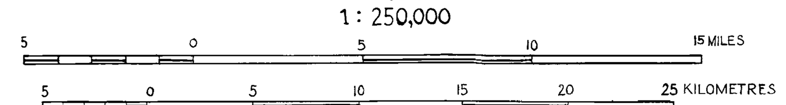
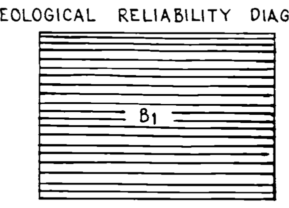
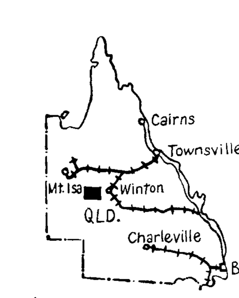


GEOLOGICAL RELIABILITY DIAGRAM



B1 Detailed reconnaissance - numerous traverses and air-photo interpretation

Geology by R.R. Vine, W. Jauncey.
Compiled Jan. 1962, by R.R. Vine
Drawn by I. Chertok.



Section
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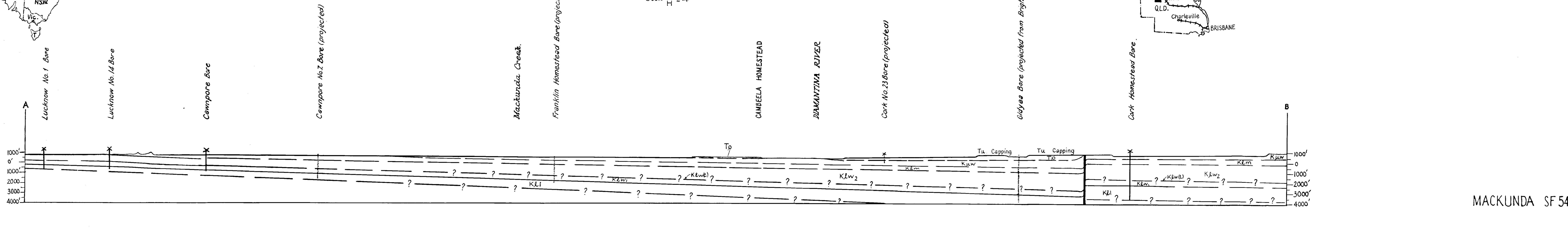

MACKUNDA SF54-11

10814

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

RECORDS

APPENDIX C to RECORDS 1962/70

BORE DATA - MACKUNDA

PART 2 of 2

APPENDIX C to RECORDS 1962/70

BORE DATA - MACKUNDA

Information on all bores in the Mackunda Sheet area, collected from the Irrigation and Water Supply Commission, Brisbane, and from property owners and managers, is listed in this Appendix.

The order of listing is numerical by the registered numbers allocated to water bores by the Irrigation and Water Supply Commission.

Abbreviations used in this Appendix are as follows :

Position

Mi	Miles		
N	North		from Middleton township.
S	South		
E	East		
W	West		

Elevation

868'	Elevation of ground surface at bore. Barometric measurement or method of survey not known.
L868	Elevation of ground surface at bore, instrument levelled height.

Standing water level

S.A.	Present water level unknown, pumping from below surface.

Water Quality

P	Potable
F	Fresh
B	Brackish
S	Salty or saline

Drillers Log

Bd	band	P.cl.	pipe clay
Bk	black	Pk	pink
Bl.	blue	Qtz	quartz
Bld.	boulder	Qtzite	quartzite
Br.	brown	Rd	red
Cl.	clay	Rk	rock
Cong.	conglomerate	S.	sand
Cs.	coarse	Sh.	shale
Dk	dark	Shy	shaley
F.	fine	Sst.	sandstone
Fm.	formation	St.	stone
Gn	green	Stk	streak
Gvl	gravel	Stky	sticky
Gy	grey	Sy	sandy
Hd	hard	T.D.	total depth
Lst.	limestone	v.	very
Lt	light	w.	with
N.O.I.	no other information	wh.	white

BORE DATA - MACKUNDA

Reg. No. Name Property	Position	Elevation (feet)	Driller Year completed	Standing water level / Pump depth (feet)	WATER. Struck (feet)	Rose to (feet)	Supply (g.p.d.)	Quality	Temp. °F	DRILLERS LOG
Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column. J	Column K

Throughout this Appendix the Columns are indicated by the letters A to K. The full headings are given above.

A	B	C	D	E	F	G	H	I	J	K	
87 Mackunda Trust TRUST	18Mi WNW		1919	S.A.	230 1487 1535 1616) 1659)	?150 200 124 121		P.		2'Bk soil 21'soft sst. 120'y.sy.cl. 142'Bk.sh. 144'Hd.bd. 230'Bl.sh. 240'Sh&sst. 260'Sy.sh. 261'Hd.bd. 276'Rotten sst 283'Hd.bd. 320'Sy.sh. 900'Bl.sh.	1035Gy.sh. 1040Hd.rk. 1070Hd.sh. 1267Bl.sh. 1421Gy.sh. 1487Br.sh. 1502 s. 1510Sy.cl. 1545 sst. 1606Sy.sh. 1616 s. 1660Sy.sh. 1663Dk.sh.

A	B	C	D	E	F	G	H	I	J	K
95	½ Mi SE	626		S.A.	210	?	Soak	s		0-33 y.cl &s.rk
Middleton					260	150	"Supply"	s		-96 y.cl.
TOWN					1167	?50	"	B	90	-100 lt.bl.sst.
					1314	60	"	F		-210 Bk.sh. * 260 Bk.sh.w.
					1374	43	"	F		-306 Bk.sh. bds.bl.sh.
					1422	30	"	F		-580 Lt.gy.sh.Emundic
					1490	15	"	F		-669 Slate-col.sh.&sst.
					1564	3	"	F		-751 Gy.sh.
					2065	Surface	16,292		140	-825 Lt.bl.cl.& s.
					2110	"	57,783		145	-955 Gy.sh. *
					2250	"	562,135		150at	-992 Bd of gn.s.
					2315	"	171,578		152	-1031 Gy & br.rotten sh.
							Total	———		-1127 Rotten gy.sh.
							954,462	* - 992 Lt.bl.		-1130 Hd.br.sh.
							(1903)	slatey sh.		-1167 Lt.gy.sh.
								at 992 Bd.of		-1190 Gy.s.rk.& plastic cl.
								gn.s.		-1191 Lst.
										-1288 Lt.gy.sh.c hd.bds.
										-1314 Lt.gy.sh.
										-1329 Ct.s & pebbles
										-1362 GY.shy.mud
										-1363 Lst.
										-1388 Cl.sh.& Pebbles
										-1399 Shy.mud
										-1418 Sticky cl.
										-1422 Hd.s.rk.
										-1438 Sy.sh.
										at 1438 Gvl &qtz.
										-1444 Sy.sh.
										-1490 Gy.shy.cl.
										-1496 Gy.sst.
										-1507 Sticky cl.s.& gvl.
										-1544 Gy.sh.& cl.
								-1564 Gy.sst.		at 1544 Lst.
								-1586 Gy.sy.cl.		-1561 Gy.cl.
								-1610 Gy.shy.cl.		-1586 Gy.sy.cl.

A	B	C	D	E	F	G	H	I	J	K
95 Middleton TOWN (cont.)										-1625 Lt.bl.soapstone at 1625 Lst. -1657 Gy sy cl -1667 Cl.pebbles & iron pyrites -1710 Lt.bl.plastic cl. -1711 Bd.hd.bl & wh.rk. -1750 Lt.bl.plastic cl. at 1750 Lt. s. -1776 Sy.sh. -1796 Plastic cl. & pebbles -1810 Mud & pebbles -1871 Lt.bl.plastic cl & pebbles -1873 Bd.rk. like qtz. -1894 Sy.sh. at 1894 s. -1910 Mud -2004 Plastic cl.& pebbles -2006 Bd.hd.rk. -2020 Sy.cl.& pebbles -2028 Mud -2064 Lt.gy.sh.cl. -2065 Hd.bd.rk. -2110 soft wh.sst. -?2125 Cs.gvl. -2250 Soft wh.sst. thin bds.pcl. & carb.timber. -2252 Flinty gvl. -2315 Soft wh.sst. -2361 Cs.wh.sst.& large flint gvl. Bottom in hd flinty rock.

A	B	C	D	E	F	G	H	I	J	K	
152 WOODSTOCK (AVENUE)	43½ Mi ENE		1886							T.D. 334 N.O.I.	
153 ?Dud WOODSTOCK (AVENUE)	43½Mi ENE		1887							T.D. 434 N.O.I.	
386	18 Mi	580	1911	Flow-	120	170	"Supply"	E		- 4 Subsoil	- 1613 wh.cl.& s.
Mackurda	SW			ing	208	110	"	B		- 49 y.cl.	- 1616 sst.
					1595)		10,000	P		- 52 Bl.cl.	- 1670 Alternate layers of
(SHIRE)					1614)		"Slight			- 65 y.cl.	sst.,p.cl.& s.
					)		increase"			- 197 Bl.sh.	- 1770 sst.
					1652)		12,400			- 220 Bl.s.rk.	- 1781 Dry sst.
					1677)		24,000		115	- 268 Gy.sh.w bds.bl.s.rk.	- 1800 sst.
					1690)		)		126	- 368 By.sh.	-1815 Gvl.qtz.lst.
					1705)		) increasing		137	- 457 Gy.sy.sh.	Pyrites at 178
					1725)	Sur-	)		140	- 482 Gy.sy.sh.w bds chca.sh.	260
					)	face	)			- 542 Br.sh.	Lst.345-7
					1750		)		141	- 638 Gy.sh.	402-5
					1770)		)			- 650 Bl.sh.	413-7
					1790)		555,950			- 681 Gy.sh.	426-9
					1800)				142	- 1127 Bl.sh.w.copie	Pyrites at 560
					1810)		782,500		142	- 1156 Gy.sh.	Lst. at 614
					1815)		837,000		142	- 1165 Br.sh.	681
							(1911)			- 1181 Br.sh. & copie	744
							709,000			- 1198 Br.sh.	822
							(1914)			- 1334 Gy.sh.occ.stks.sy.sh.	853
										- 1460 Hd.bl.sh.	858
										- 1542 Br.sh.	965
										- 1547 Gy.sy.sh.	Shell at
										- 1591 Gy.sh.w bds.sy.sh.	970
											Lst.994 - 5

A	B	C	D	E	F	G	H	I	J	K
										1046-51 at 1127 1156 1198-9 1430 Qtzite at 1460 Lignite 1705 Qtzite 1712
1502 Top Mill TRANBY	63Mi; ESE		1910							T.D. 331 N.O.I.
1503 Belmont TRANBY.	60Mi; ESE		1915							T.D. 620 N.O.I.
1504 House NAREEN	67Mi; ESE		1915							T.D. 636 N.O.I.
1505 No.6	61Mi; ESE		Weston W.J. 1938		430		12,000			0-411 No info -426 Sh. -447 sy.cl. -500 Gy.cl. -516 Br.sh. -546 P.cl. -547 Gy.sh.
1515 ? CARISBROOKE			1912							T.D. 424 N.O.I.

A	B	C	D	E	F	G	H	I	J	K
1518 ? NAREEN			1914							T.D. 502 N.O.I.
1611 Boolbie WOODSTOCK	22Mi; NE		1915	SA	336 780 2600 2700	250 ? 20 Sur- face	 167,690 (1925)	S B F		0-20'cl - 720 Hd.bl.sh.- 1580 Gy.sh. - 2610 p.cl. - 104 sh. - 770 sst. - 1759 Bk.sh. - 2668 sst. - 193 Bl.sh.- 840 sy.sh. - 1800 Gy.sh. - 2700 Sy.p.cl& sst - 196 rk. - 847 Bl.rk. - 1852 Bk.sh. - 3150 No info. - 420 No info-900 Bl.sh. - 1930 streaky bk. sh. - 456 Bl.sl.- 910 Sd.rk. - 2000 choc.sh. - 516 Sy.sh.- 950 Sy.sh. - 2249 Bad caving dk.bl.strata. - 542 Bl.sh.- 980 Gy.sh. - 2260 Gy.sh. & gn.sst. - 580 sst. -1000 Bl.sh. - 2390 Gy.sh. w hd.stks. - 710 sy.sh.-1140 Bk.sh. * - 2442 Gy.sh.gn.sst. * 2515 Stky sy. - 2555 Gy.gn.sst. * 251[illegible] gy.sh. - 2580 Hd.bl.flint qz.
1672 House FRANKLIN	38Mi; S	L431	1895	Flow- ing	2426	Sur- face	665,000	F	153	0- 2405+ Sh N.O.I. T.D. 2426
1677 House LILLEYVALE	26Mi; SW	601	1912	S.A.	500 1380 1460 to bottom	))Sur-)face	Soak	 F		0- ?1450 sh. - 1478 Hd.rk.s. & p.cl. - 1528 wh. rk.
1678 House GNALTA	22Mi WSW	L672	1911	S.A.	1300) 1500)	Sur- face	Abt. 340,000 (1911) 161,400 (1913)	F	132	0- 70 y.sh.& rk. -1300 Bl.sh. -1500 sst.

A	B	C	D	E	F	G	H	I	J	K
1679 Bottom GNALTA	19Mi; SW		1927	S.A.	1443 1515) 1540) 1575) 1600) 1650) 1770)	12 Sur-) face	 40,000) 150,000)))			0 - 3' Soil - 13 y.cl. - 29 Gy.rk. - 139 y.cl. - 189 Gy.cong.&s. - 192 V.hd.rk. - 242 V.hd.sst. - 272 Sy.sh. - 274 V.hd.rk. - 314 Gy.s[illegible].&sh. - 510 V.hd.gy.sh. -1014 Gy.sh. -1060 Bk.sh. -1452 Gy.sh. - 1460 Water s. - 1480 s[illegible]. & cl. - 1510 Water s[illegible]. - 1577 sd. & cl. - 1692 stky.cl. - 1767 water s[illegible]. - 1774 s&.[illegible]clrd.marl.
1680 Shed GNALTA	20Mi; WSW		1918	S.A.	1356 1470 1580 1595) 1650) 1664) 1681) 1700)	30 20 10 Sur- face	 140,000 Total 155,000 F			- 55' Sh - 70 Hd.rk. - 177 st.& sh - 200 Bl.sh.&s. - 299 Sst.& bk.sh - 303 Hd.rk. -1158' Bk.sh. -1180 sty.sh. -1340 Bk.sh. -1356 sy.sh. -1360 S[illegible]. -1395 P.cl. - 1400 S[illegible].rk. - 1450 s[illegible] rk & gvl. - 1490 sy.sh.p.cl. - 1515 p.cl.s.rk. - 1671 s.rk. - 1679 Gvl. w qtz. - 1718 sd.rk.
1681 Shed	13Mi; SW	625	1919	S.A.	207 2000	169 Sur- face	410,850		139	0- 3' Bk soil - 59 y.sst. - 87 Bk.sst. - 104 Gy.sst. - 125 Wh.lst. - 1178 Gy.sh. - 1532 Bk.sh. - 1533 Hd.rk. -1544 SSt. -1545 Bk.&gy.rk. -1567 Gy.sh.&cl. -1594 Bl.sst.&cl. -1638 S[illegible].&cl. -1663 Choc.sh. -1609 Gy.sst. -1752 Gy.sh. - 1784 flaggy sh. - 1832 p.cl.&sst. - 1919 sst. - 1981 Drift s[illegible]. - 2026 V.hd.sh. - 2049 Drift s[illegible]. - 2075 p.cl.& sst. - 2244 sst.

A	B	C	D	E	F	G	H	I	J	K	
1682	19 Mi;	L590	1924	Flow-			665,000		153	0 = 2 Soil	- 708 Gy.sh.
No.2	S			ing						- 14 Y.chalky sh.	- 710 Gy.rk.
CHILTERN					290	246		S		- 24 Gy.chalkysh.	- 770 Gy.sy.sh.
HILLS					701	200		B		- 94 Gy.&Rd.hd.sst.	- 773 Gy.rk.
					2290)		)20,000)			- 108 Y.cl.	-1160 Gy.puggy sh.
					2310)		90,000)			- 123 Bl.sh.	-1167 Gy.rk.
					2415)	Sur-	110,000)	F		- 143 Hd.gy.sst.	-1283 Hd.gy.sh.
					2442)	face	175,000)			- 147 Bl.sh.	-1726 Puggy hd.gy.sh.w bds.
					2484)		195,000)			- 175 Gy.sst.	ashy substance
					2529)		360,000)			- 270 Sy.bl.sh.	-2099 Hd.br woody strata
										- 242 Bk.sh.	-2107 V.Hd.gritty rk.
										- 246 Bl.sh.	-2137 Mineralised congl.w.lava
										- 254 Sy.bl.sh.	-2289 Highly mineralised
										- 256 Bl.rk.	choc.sh.
										- 282 Gy.sh.	-2320 Hd.sst.
										- 288 Bl.rk.	-2356 Hd.p.cl.
										- 291 Gn.sst.	-2364 Hd.s.rk.
										- 366 Sy.bl.sh.	-2377 Hd.p.cl.
										- 368 Bl.rk.	-2554 Free drilling & hd
										- 424 Sy.bl.sh.	close sst.alternating.
										- 571 Gy.sh.	
										- 574 Gy.rk.	
										- 641 Gy.sh.	
										- 642 Gn.sst.	

A	B	C	D	E	F	G	H	I	J	K.
2236 Homestead CORK	64Mi; SE	L679	1.B.C. 1909	S.A.	2900 3344) 3542)	28 Sur- face		P	0	- 40 sy.p.cl - 70 sy.sh. - 140 gy.sh.&s. - 285 gy.sh,coal, & s.rk. - 605 bk.sh. - 740 sy.sh. - 875 bk.sh. - 1445 Bl.sh. - 1943 gy.sh. - 2318 bk.sh. - 2672 sh. - 2849 p.cl.& hd. streaks - 3042 s.rk. - 3133 s.rk.p.cl. - 3187 SSt.&bds.br.rk. - 3312 hd.sst. - 3372 v.hd.rk. - 3542 v.hd.sst. - 3582 ? - 3621 bk.sh.hd.s.rk. - 3647 crumbly sh. - 3823 hd.s.rk.qtz. - 3970 sst. - 4079 hd.br.s.rk. - 4142 hd.s.rk.
2239 Old [illegible] Williams WHYRALAH	65Mi; SE		1915	Bore Collapsed (Abd.)	585	131				T.D.585 Bottom in sst. N.O.I.
2244 ? WHYRALAH			1917	Abd.	250 610	160		B F		T.D.700 N.O.I.
2245 No.8 [illegible] CORK	69Mi; SE		1917	Abd.			5000 5,000			T.D. 750 Bottom in s.rk. (Replaced by [illegible] 11989) N.O.I.
* 2246 No.9(Dud) CORK	55Mi; SE		?1917					S		T.D. 584 N.O.I.
2248 No.11 CORK	49Mi; SE			Abd.				S		T.D. 495 N.O.I.

A	B	C	D	E	F	G	H	I	J	K
2247 No.10 CORK	49 Mi SE		1917					B		T.D. 500 N.O.I.

A	B.	C	D	E	F	G	H	I	J		K
2485 House No.2 CASTLE HILL	50Mi; ENE	620	1902	Flowing		Surface	1,415000 (1902) 471,300 (1935)		Very Hot	T.D. 4523	N.O.I.
2488 Alni ALNI	50Mi; ENE		1913	S.A.						T.D. 340	N.O.I.
2489 ? CATHEDRAL	48Mi; ENE		1926	248 (Abd)	352 509 828 930					T.D. 1102	N.O.I.
2490 ? CATHEDRAL	52Mi; ENE		1914	Abd.	290) 348) 509) 520) 967)	184				T.D. 996	N.O.I.
2492 ? Yaurla ALBRIGHTON	56Mi; ENE		1913	S.A.						T.D. 476	N.O.I.
2493 ?(Dud) CATHEDRAL	53Mi; ENE		1913							T.D. 573	N.O.I.
2497 ? WOODSTOCK (AVENUE)	57Mi; ENE		1914	Abd.						T.D. 1166	N.O.I.

A	B	C	D	E	F	G	H	I	J	K
2498 Dunbar CASTLE HILL	49Mi; ENE		1914	Abd	?370 ?1108			Fair Stock Water		0- 317 No info. - 323 y. inflammable wax - 370 No.info. -1005 Sh & coal - 1109 No info.
2499 ? PIBAURIE	48Mi; E		1914	Abd	421 750 1096					T.D. 1096 N.O.I.
2500 ? TRANBY (OWEN'S CREEK)	58Mi; E		1914	Abd	640 925 1017					T.D. 1017 N.O.I.
3414 Scour LLANRHIDOL	9 Mi; N	654	1892	S.A.	2140	Sur- face	614928		155	T.D. 2241 N.O.I.
3415 Glenmore Brackenburg	19Mi; NW	L 857	IBC 1897	S.A.	1700	106				0- 75' Mud -1700 Bl.&bk.sh. -2042 Water s. -2090 Water s, stks qtz. -2190 Bk.sy.sh. -2450 p.cl.& s. -2720 Sh., sst. -2849 Congl. -2900 Gn.sh. -2922 S.rk. -2993 Wh.gn.rd.sst.gnsh. -3008 Quicksand on top hd.rk. -3067 Rd.granity drifts. -3070 Mica -3085 Granite
3416 House BRACKINBURGH	17Mi; NW	706	IBC 1907	S.A.	280) 315) 1709	Below Sur- face				0- 26 y.cl&drift s. - 50 y.cl & gravel - 235 Bl.sh - 350 Sst & bl sh - 525 Gy sh. - 900 bk.sh. -1190 Gy.sh. -1215 Sh & s. -1275 Dk.sh. -1445 Sy sh. -1535 Gy.sh. -1709 S. rk.

A	B	C	D	E	F	G	H	I	J	K
3417 Top Middleton MENIN DOWNS	11Mi; WNW	660	IBC 1910	S.A.	177 1750) 1738) 1841	Below surface Surface	Soak 477,231	 F		0 - 7' Soil - 20 y.sh. - 26 Rd.sh. - 40 Drift - 1730 Bl.sh. - 1841 Hd.sst.
3418 Saville Downs LLANRHEIDOL	19Mi; NNW	717	IBC 1911	S.A.	1619 1803	28 Surface	 50,000	 F		0 - 150 Surface cl. bl.sh. - 1578 Bl.sh. - 1803 S. rk.
3419 Top Saville LLANRHEIDOL	23Mi; NNW	680	IBC 1912	S.A.	128 417 1726) 1775-) 1873) 1924-) 2011)	 100 Sur- face	440,077	S F F		0 - ? Br soil, gvl & s. - 1150 Bl.sh - 1155 Lst - 1250 Bl.sh - 1290 Br sh - 1548 Bl sh - 1554 Lst. - 1723 Bl sh. - 1730 S.& sh. - 1734 Sst. - 1780 Hd.sst. - 1878 Rotten sst. - 1929 Hd.sst. - 2000 Rotten sst. - 2054 Hd.sst.
3420 Lud LLANRHEIDOL	5Mi; NE		1913		310	270		B		Bl.Sst. at water level N.O.I. T.D. 379
3421 Ada LLANRHEIDOL	13Mi; NE		1914	S.A.	222					0 - 222 No info. - 463 Bl.sst.
3422 Lower Saville LLANRHEIDOL	10Mi; NNW		W.Krantz 1921	S.A.	120 1850 1886	Below Surface 100 Sur- face	 334,000			0 - 76' Pk rk & y.cl - 101 y.cl.&bl.sh - 1844 Bl.sh. - 1851 Bl.sh.ws.rk. - 1865 Hd.rk, sandy cl. - 1918 sycl. - 1923 sy.gy.cl. - 1953 sy.cl. - 1968 Hds. &fine s. - 1982 Sy.cl. - 1996 P.cl.

Cont...

A	B	C	D	E	F	G	H	I	J	K
3422 Lower Saville LLANRHEIDOL										- 2010' P.cl & sst. - 2040 Sy.cl. - 2054 Hd.Rd.rk & sst. - 2167 Sst. - 2174 Hd.gy.sh.
3423 House ARCHERVALE	8Mi; ENE	724	1913	S.A.				B		T.D. 1400 N.O.I.
3424 Dud ARCHERVALE	11Mi; NE	684	1913							T.D. 337 N.O.I.
3425 Connor ARCHERVALE	10Mi; E	632	1914	S.A.						T.D. 550 N.O.I.
3426 Dud MAYFAIR	Not located Approx- imately 8Mi; SSW		1914							T.D. 480 N.O.I.
3427 Dud MAYFAIR	11Mi; SSW									T.D. 450 N.O.I.
3428 Dud MAYFAIR	Not located Approx- imately 10Mi;S.									N.O.I.
3429 ?Dud MACKUNDA DOWNS	19Mi; W		1914							T.D. 200 N.O.I.

A	B	C	D	E	F	G	H	I	J	K
3430 Dud MACKUNDA DOWNS	Not located									T.D. 200 N.O.I.
3431 2-Mile MACKUNDA DOWNS	15Mi; W		1919	S.A.	163 305-11 Near Bottom	200 Sur- face	163,305	S		0- 61 Surface cl. - 162 Gy.cl. - 163 Hd.gr.rk. - 168 Sst. - 305 Dk.gy.sh. - 311 Sst. - 1211 Gr.sh. - 1445 Dk.gr.sh. - 1710 No info.
3455 No.1 LUCKNOW	41Mi; SW	L654	1895	S.A.	1020) 1100) 1128)	Sur- face	525,110	F	121	0- 500 Bk.sh. - 1020 Bl.sh. - 1030 Sst. - 1188 Drift s. - 1411 No info.
3456 No.2 Woolshed LUCKNOW	42Mi; SW	L630	1900	S.A. (ceased flow- ing 1910)	1445) 1480)	Surface	250,000	G	1480	0- 220 y.sh. - 1445 Bl.sh. - 1480 Sst.,s.drift - 1571 No info.
3460 Cawnpore CAWNPORE	33Mi; SW	L591	1909	S.A.	200 1450) 1452) 1485) 1490) 1500) 1505) 1510) 1513)	Sur- face	Soak 630,000 (1909) 450,000 (1913)	P	131	0- 5 Rd.cl. - 105 y.sh. - 200 Bl.sh. - 250 Sy.sh - 450 Gy.sh. - 500 Bk.sh. - 505 Lst. - 600 Bk.sh. - 631 Bl.sh. - 670 Bk.sh. - 750 Gy.sh. - 990 Bk.sh.drift. - 1000 Lst. - 1008 Bk.sh. - 1013 Lst. - 1090 Bk.sh. - 1093 Lst. - 1280 Bk.sh. - 1285 Gy.sst. - 1380 Bk.sh. - 1382 Pyrites - 1440 P.cl. - 1450 Sst. - 1485 P.cl. - 1538 Alternate layers of sst. & cl.

A	B	C	D	E	F	G	H	I	J	K
3461 No.7 CAWNPORE	35Mi; SSW	L545	1910	Flow- ing	1660) 1750) (plus many more flows)	Surface	750,000	P	146	0- 5 Rd.cl. - 95 y.sh. - 202 y.sh w bds of lst&qtzite - 302 Bl sh. - 304 Qtzite - 434 Bl sh - 438 Qtzite - 623 Bk.sh. - 626 Qtzite - 786 Bk sh - 787 Qtzite - 987 Bk.sh drift - 990 Qtzite - 1104 Bk.sh - 1106 Qtzite - 1221 Bk sh - 1226 Qtzite - 1286 Bk.sh - 1289 Qtzite - 1480 Bk.sh. - 1499 Qtzite & p.cl. - 1669 Bk.sh - 1700 Layers of sh & qtz - 1730 P.cl. - 1759 Sst.& qtz. - 1830 Sst.with pyriteband - 1837 Lst.
3462 No.8 LUCKNOW	47Mi; SW	639	1911	S.A. (ceased flow- ing 1921)	263 1496 1564- 1620	20 Sur- face	Soak 370,000	G	140	0 - 8 Rd.cl. - 90 y.sh. - 91 surface lst. - 140 y.sh. - 183 Gy.sh.w bds qtzite - 260 Gy.sh. - 263 Gn.s. - 285 Gy.sh. - 287 Qtzite - 320 Gy.sh. - 323 Qtzite - 390 Gy.sh. - 393 Qtzite - 590 Gy.sh. - 686 Bl.sh. - 688 Qtzite - 1480 Bk.sh w bds of qtz . - 1496 Qtzite,cl & s. - 1545 Hd.sst. - 1590 P.cl.& bands sst, - 1661 Alternate layers sst. qtz.& s. - 1734 Lst.
3463 No.9 LUCKNOW	51Mi; SW	618	1913	S.A. (ceased flowing 1926)	1167 1195) 1265) 1280) 1305) 1360)	? Sur- face	166,480	F G		0 - 78 y.sh. - 650 Gy.sh. - 652 Qtzite - 870 Bk.sh - 872 Qtzite - 1131 Bk.sh - 1134 Congl. - 1160 P.cl. - 1178 s. - 1200 P.cl - 1210 soft sst. - 1346 P.cl.w inch seams s. - 1351 Hd.sst. - 1380 P.cl. - 1411 Soft wh.sst. - 1413 P.cl. - 1515 Soft wh.sst. - 1530 P.cl. - 1533 Coarse dry gvlbed - Lst.bottom.

A	B	C	D	E	F	G	H	I	J	K.
3468 No.13 CAWNPORE	40Mi; SW	623	1916	S.A. (ceased flow- ing 1928)	333 1548) 1636) 1653) 1695) 1706) 1715)	320 Surface 303,000 G				0– 15 wh.sst. – 90 y.sh. – 104 gy.sh. – 110 sst. – 130 Gy.sh. – 135 Hd.sst. – 230 Gy.sh – 233 qtzite – 260 Gy.sh. – 322 Bk.sh. – 324 Qtzite – 364 gy.sh. – 366 qtzite – 455 Gy.sh. – 457 qtzite – 550 Gy.sh. – 555 Gn.sst. – 575 Gy.sh. – 600 Sy.sh. – 602 qtzite. – 660 Gy.sh. – 746 Bk.sh. – 770 Gy.sh. – 832 Bk.sh. – 834 Qtzite – 860 Bk.sh. – 867 qtzite – 902 Gy.sh. – 904 qtzite –1012 Gy.sh. –1014 Qtzite –1039 Gy.sh. –1040 Qtzite. –1093 Bk.sh. –1100 Sediment-ary rk. –1253 Bk.rk. –1254 Qtzite –1284 Bk.sh. –1288 Qtzite. –1340 Bk.sh. –1344 Qtzite –1376 Bk.sh. –1380 Qtzite –1485 Bk.sh. –1488 Qtzite –1519 Bk.sh. –1521 Qtzite. –1547 Bk.sh. –1550 s. –1570 P.cl. –1590 Sst. –1597 Congl. –1704 S.&soft s. –1706 Congl. –1726 Hd.sst. –1770 soft sst. –1772 congl.
3469 No.14 LUCKNOW	37Mi; SW	1692	J. Hannay 1918	50 (1924) –	1202 1322 1339- 74	75) 60) 50)	Unlimited G			0 – 20 Ironstone & s. – 119 y.sh. – 199 Gy.sh. – 200 Sedimentary rk. – 307 Gy.sh. – 563 Gy.sh w bds.qtzite – 565 Sst. – 1089 Gy.sh wbds qtzite – 1103 Bk.sh. – 1116 Sedimentary rk. – 1128 Bk.sh. – 1131 Sst. – 1137 Gy.sh. – 1140 Sst. –1200 Bk.sh. –1201 Drift –1224 P.cl. –1226 s. –1295 P.cl. –1319 s. –1323 Hd.sst. –1336 P.cl. –1340 s. –1360 P.cl. –1364 s. –1404 sst. –1417 P.cl. –1513 Fine sst.

A	B	C	D	E	F	G	H	I	J	K
3471 No.16 LUCKNOW	36Mi; SW		1912	57 (1924)			Unlimited G		T.D. 1352	N.O.I.
3472 Montrose(1) GNALTA	25Mi; W	741	1915	? ?. Dud					T.D. 60	N.O.I.
3473 Montrose(2) GNALTA	25Mi; W	741	1915	S.A.					T.D. 165	N.O.I.
3474 Skipper LILLEYVALE	32Mi; SW	641	1917	S.A.	1342) 1388) 1442) 1452) 1478)	Surface 196,000				0 – 13'Gvl. – 25 y.sh – 30 Sst. – 65 y.sh – 70 Sst. – 100 y.sh. – 104 Sst. – 357 Gy.sh. – 360 Qtzite. – 371 Gy.sh. – 376 Qtzite – 420 Gy.sh. – 423 Qtzite – 440 Gy.sh. – 445 Qtzite – 534 Gy.sh. – 537 Qtzite. – 653 Gy.sh. – 654 Qtzite – 700 Bk.sh. – 701 Qtzite – 711 Bk.sh. – 714 Sedimentary rk. – 750 Gy.sh. – 790 Bk.cl. – 800 Qtzite – 930 Gy.sh. – 934 Qtzite – 970 Gy.sh. – 974 Qtzite –1000 Bk.cl. –1003 Qtzite –1020 Bk.sh. –1023 Qtzite –1055 Bk.sh. –1057 Qtzite. –1115 Bk.sh. –1116 Qtzite –1163 Bk.sh. –1165 Qtzite –1350 Bk.sh. –1351 Congl. –1366 P.cl. –1370 S. –1414 P.cl. –1420 S. –1430 P.cl. –1440 S. –1450 P.cl. –1470 Sst. –1474 P.cl. –1500 S. –1528 Hd.sst.
4598 ?17-Mile TOOLEBUC	33Mi: NW	L763	1895	S.A.	838	?60		F		0– 85 y.cl. – 475 Bl.sh. – 800 Bk.sh. –1100 sst. –1196 Granite

A	B	C	D	E	F	G	H	I	J	K
4600 Jubilee TOOLIBUC	33Mi; NW	L795	1898	S.A.	970			F		0- 35 Rd.cl.& gvl. - 124 y.cl. - 216 Bl.cl. - 218 Lst. - 523 Bl.sh. - 581 Bk.sh. - 916 Bl.sh. - 957 Bl.sh.& rotten s. - 961 Bl.sh.& s. - 1000 Sst. - 1024 Drift s. Bottom in granite.
4607 Baker's TOOLEBUC	31Mi; WNW	L779	1899	S.A.	913			F		0- 280 Rd.cl.bl&y.sh - 574 Bl.sh. - 729 Bl.sh.w.hd.stks. - 832 Bl.sh. -835 Hd.rk. -913 sst. at -913 Bedrock.
5003 Pink Hills MAYFAIR	8Mi; SSW		1935	S.A.	180 300 2200	 35	) small) Main supply	B F		0- 3 Soil - 12 y.cl. - 13 Hd.bl.rk. - 45 y.cl. - 70 Gy.cl. - 72 Hd.bl.rk. - 78 y.sy.cl. - 80 Hd.bl.rk. - 93 y.sh. - 110 y.sy.sh. - 180 soft bl.rk. - 220 Bl.rk. - 360 Bl.sh. - 660 Gy.sh. - 1800 Gy.caving sh. - 1960 Hd.sh. - 2160 Hd.stky sh. - 2165 sh. - 2172 s & sh. - 2180 water s. - 2280 Hd.gy.shly mixture - 2350 Cementy fine s. - 2400 Hd.cs. s.
5751 Shed ARCHERVALE	10Mi; E		1923							T.D. 607 N.O.I.
5752 Sisters ARCHERVALE	13Mi; SE		1922							T.D. 427 N.O.I.
5754 House ALNI	63Mi; ENE		1926	S.A. (Not used)				B		T.D. 776 N.O.I.

A	B	C	D	E	F	G	H	I	J	K
6021 ?Old Salt CASTLE HILL	48Mi; ENE		1913	Abd.	230 352 509					T.D. 1070 N.O.I.
6022 Top Horse ELDERSLIE	62Mi; ENE		1914	S.A.				F		T.D. 1040 N.O.I.
6023 ?Castle ?(Dud) CASTLE HILL	44Mi; ENE		1914							T.D. 1017 N.O.I.
6368 ? VERDON VALLEY (RED HILL)	49Mi; SE		1935	?Abd						T.D. 400 N.O.I.
6387 Menin MENIN DOWNS	7Mi; W		1921							T.D. 500 N.O.I.
6738 ? NAREEN	63Mi; ESE				175 370 485 561 587					0- 93 Rk. -305 sh. - 500 sst.sh. - 96 sh.sst. -370 sst - 515 sst. -103 Bk.sh. -397 sh - 525 sst.,sh. -125 sh. -425 Rk. - 541 Rk. -175 sst. -430 sst. - 545 sst. -200 sh -445 Rk. - 559 Rk. -298 Rk. -485 sst. - 587 sst.

A	B	C	D	E	F	G	H	I	J	K
6951 ? DENBIGH DOWNS	41Mi; NW		1923	Abd.						T.D. 400 N.O.I.
7092 Acacia MACKUNDA DOWNS	25Mi; NW		1920	S.A.						T.D. 1600 N.O.I.
7093 Sardila GNALTA	33Mi; WSW		1921	S.A.						T.D. 1200 N.O.I.
7253 No.14 Dud CCRK	55Mi; SE		1926							T.D. 602 N.O.I.
7254 No.15 Dud CCRK	52Mi; SE		1926							T.D. 808 N.O.I.
7309 Patricia MENIN DOWNS	5Mi; WNW			S.A.						N.O.I.
7622 Chelsea GNALTA	30Mi; WNW			S.A.						T.D. 1817 N.O.I.
7623 Dud GNALTA	not located									T.D. 982 N.O.I.

A	B	C	D	E	F	G	H	I	J	K
7624 Iud GNALTA	NOT LOCATED									T.D. 542 N.O.I.
7625 Dud GNALTA	NOT LOCATED									T.D. 612 N.O.I.
7669 Rourke LLANRHEIDOL	16Mi; N		1925	S.A.						T.D. 2400 N.O.I.
7759 No.17 LUCKNOW	39Mi; SW		I.B.C. 1940	S.A.	1031 1044-9	250) 85)	57,600			0- 9'Hd.ironstone - 18 Rd.cl. - 37 y.cl. - 43 Gy.slip rk. - 73 y.cl. - 396 Gy.sh. - 538 Dk.gy.sh. - 598 Gy.sh. - 647 Br.sh - 757 Gy.sh. - 758 Hd seam -1031 Gy.sh. -1036 Drift s. -1038 Gy.sh. -1042 Sticky sh. -1044 Hd.gy.sh. -1049 Drift s. -1078 Sticky sh. -1120 Sy.sh. -1181 Hd.gy.sh. -1192 wh.sy.cl. -1225 Fine srk -1235 Lt.br.sh. -1261 Fine s.rk. -1262 Gravel -1294 Sy.p.cl. -1328 v.hd.gy. s.rk& mica -1336 Hd.qtz & mica -1388 Granite Fm.
7760 No.18 LUCKNOW	48Mi; SW		I.B.C. 1940	S.A.	220 1337 1373 1428- 1510	 130 73 60	Soak			0- 12'Soil&rd.cl. - 90 y.cl - 220 Gy.sh. - 223 Hd.rk. - 438 Gy.rk. - 865 Gy.sh. - 910 Dk.gy.sh. -1015 Rotten bk. sh.caves badly -1337 Dk.gy.sh. -1339 Rotten s.rk. -1350 Stxy,Lt.gy.sh. -1373 STxy,gy.sh. -1375 Coarse s. -1402 St xy.sh. -1424 Wh.sh.cl. -1428 Tough gy.sh. -1463 Coarse drifts -1506 S.rk. -1510 Gravel -1529 S.rk w seams wh.p.cl. -1537 S.rk. w carbon seams -1550 yls.rk. -1565 S.rk.w coal seams -1582 s.rk. -1660 Lt.br.sh.

A	B	C	D	E	F	G	H	I	J	K
9033 Saville No.2 LLANRHEIDOL	23Mi; NNW		Godfrey Bros. 1942	S.A.	1891	170	24,000			0- 10' Soil - 37 y.sh. - 57 y.sh. boulders - 82 Gy.rk.y. sst. - 95 sh & sst - 240 Gy.sh. - 252 S.rk. - 270 Gy.sst. - 349 Gy.slippery black cl. - 374 Bk.sh.&gy.rk. - 412 Sy.sh. -420 Gy.rk,& sst. - 474 Sy &gy. sh.rk. - 534 Bl.sh & sy.sh. - 544 Sh & rk. - 597 Gy.sh. - 947 Bk.sh. -1150 Br.sh. -1200 Bk.sh. -1350 Br.sh. -1585 Dk.sh. -1595 Br.sh. -1622 Dk.sh. -1648 sst.& layers rk. -1656 sst. -1810 Lt.sy.sh. -1845 wh.rk. & artesian s. -1870 Sy.sh. -1874 Granite rk. -1883 sst. -1889 rk. -1898 Gravel &rk. -2015 sst.
9034 Martel LLANRHEIDOL	15Mi; NNE		1941	S.A.						T.D. 408 N.O.I.
9461 No.2 VERDON VALLEY (RED HILL)	55Mi; SE		1943	S.A.	530-60	150	10,000	B		0- 7 Br.soil - 14 S - 22 Rk. - 37 Gy.slip. back - 42 Gy.soil & stone - 62 Slip gy. cl. - 88 Gy.cl. - 120 Gy.sst. - 138 sst. -155 Bk.sst & gvl. -189 Bk.cl. -206 Bk.sst. -268 Bk.slip cl. -286 Bk.sst. -308 Bk.cl. -324 Rk. -412 Gy.cl. -422 Rk. -458 Bk.cl. -504 Gy.cl. -530 Bk.cl. -560 sst.& gvl. -578 Hd.bk.cl. -600 Extremely hd.rk.

A	B	C	D	E	F	G	H	I	J	K
10279 Red Hill Homestead VERLON VALLEY (RED HILL)	52Mi; SE		1944	Abd (silted up)	160-90) 312-32) 390-410)	160				0- 2 No info. - 40 Rk. -220 Cl. -230 Rk. -250 Cl. -270 Rk. -285 cl. -312 sst. -332 sst.& gvl. -350 Cl. -390 Rk & sst. -410 S & gvl. -450 Cl.
10948 Stallion Paddock MENIN DOWNS	4Mi; NNW			S.A.						T.D. 228 N.O.I.
10949 Lower Middleton MENIN DOWNS	8Mi; WNW			S.A.						T.D. 400 N.O.I.
11115 Williams WHYRALAH.	65Mi; SE	A.Blackwell	1948	196 244	468-72 541-53	212) 196)	9,800			0- 3 Surface soil - 83 y.cl. -100 sst. -125 sh. -140 Gy.sst. -195 Sh. -196 Rk. -216 sh. -217 Rk. -220 Sh. -222 Rk. -288 sh. -290 rk. -318 Sy.sh. -327 Sh. -328 rk. -333 sh. -350 p.cl. -356 Sy.sh. -380 Br.sh. -410 Sy.p.cl. -445 Sh. -460 Sy.p.cl. -461 Rk. -468 Sy.sh. -480 Br.sh. -502 Sy.p.cl. -563 Rk. -505 Sy.P.cl. -540 Sh. -541 Rk. -553 Sy.p.cl. -563 Sh. -564 Rk. -600 Sh.

A	B	C	D	E	F	G	H	I	J	K
11168 No.17 CORK	69Mi; SE		A.Blackwell 1948	166 300 (Abd.)	360 599- 607	180)) 166)	15,000			0- 2 Soil -115 y.cl. -117 Rk. -120 y.cl. -130 sh. -140 Sst. -150 Sh. -160 Sy.sh. -210 Sh. -222 Br.sh. -233 Sh. -240 Sy.sh. -256 Sh. -257 Rk. -285 Sh. -296 Sst. -297 Sy.p.cl. -298 Rk. -300 Sh -325 Sy.p.cl. -360 Sh. -365 Sst. -370 Sh. -375 Sst. -390 Sh. -391 Rk. -385 Sh. -400 Sy.p.cl. -450 Sh. -455 Sy.sh. -456 Sh. -458 Rk. -460 Sh. -473 Sy.sh. -490 sh. -499 Sy.sh. -500 Rk. -529 Sh. -530 Rk. -540 Sh. -553 Sy.p.cl. -554 Rk. -590 Sh. -599 Br.sh. -607 sst. -609 Rk. -615 Sy.p.cl. -617 Sh.
11844 No.18 Dud CORK	62Mi; SE		Blackwell 1951	115 300	119 524-33 534-40	115) 115)	Soak 17,000	B		0- 2 Soil - 25 y.cl. - 45 y &br.cl. - 82 y.cl. -105 y.sst. -117 Gy.sst. -119 Rk. -142 Gy.sst. -145 Br.sh. -175 Gy.sh. -205 Sy.sh. -213 Gy.sh. -215 Br.sh. -290 Gy.sh. -295 Sy.p.cl. -299 Gy.sh. -300 Rk. -308 Sy.sh. -345 Gy.sh. -350 Sy.p.cl. -360 Sy.sh. -368 Gy.sh. -375 Br.coal & sh. -380 Gy.sh. -381 Rk. -385 Sy.br.sh. -395 Gy.sh. -396 Rk. -403 Gy.sh. -415 Sy.sh. -433 Gy.sh. -434 Rk. -523 Gy.sh. -524 Rk. -533 Sst. -534 Rk. -540 Gy.sst. -560 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K		
11363	59Mi.		A Stower		195	159)				Surface	– 302 Gy.rk.	– 470 Gy.sh.
No.19	SE		1951	134	405	159)	17,000			0– 3 Soil	– 317 Gy.sh.	– 475 wh.p. cl.
CORK				230	540	134)				– 16 Y.sh.	– 323 Gy.rk.	– 480 Br.sh.
										– 40 Wh.p.cl.	– 340 Br.sh.	– 495 Gy.sh.
										– 55 Gy.sh.	– & coal	– 500 Sst.
										– 65 Y.sh.	– 355 Sy.sh.	– 515 Gy.sh.
										– 70 Br.sh.	– 360 Br.sh.	– 520 Br.sh.
										– 105 Gy.sh.	– 375 Gy.sh.	– 530 Sy.sh.
										– 108 Gy.rk.	– 385 Sy.sh.	– 540 Br.sh.& Coal
										– 138 Sy.sh.	– 395 Gy.sh.	– 555 Sst.
										– 195 Gy.sh.	– 400 Gy.rk.	– 558 Gy.rk.
										– 205 Sst.	– 405 Sy.sh.	– 584 Sy.sh.
										– 225 Sy.sh.	– 425 Sst.	
										– 300 Gy.sh.		

A	B	C	D	E	F	G	H	I	J	K
11989 No.20 CORK	69Mi; SE		1951	201 334	295 701 797	210) 210) 201)	13,000	S FAIR FAIR		0- 3 Surface Soil - 40 y.sh. - 50 Bd.ofblds. -110 y.sh. -120 Bd.blds. -130 y.sh. -135 Gy.rk. -140 y.sh. -165 Gy.sh. -170 Gy.rk. -210 Sy.sh. -240 Gy.sh. -270 Sy.sh. -275 Gy.rk. -295 Sy.sh. -315 Sst. -320 Gy.sh. -325 Gy.rk. -375 Gy.sh. -381 Gy.rk. -401 Gy.sh. -404 Gy.rk. -455 Sy.sh. -460 wh.sst. -463 Gy.rk. -468 wh.sst. -490 Sy.sh. -575 Gy.sh. -577 Gy.rk. -584 Gy.sh. -587 Gy.rk. -615 Br.sh.w. coal seams -648 Gy.sh. -672 Bk.rk. -680 Gy.sh. -695 Sy.sh. -700 Gy.sh. -705 Sy.sh. -730 wh.sst. -732 Br.sh. -733 Gy.sh. -760 Gy.sst. -797 Gy.sh. -802 Gy.sst. -805 Gy.rk. -813 Gy.sst. -825 Gy.sh.
11990 Lud WHYRALAH	58Mi; ESE				230	210	4,000			0- 3 Soil - 27 y.sh. - 36 Gy.rk. -105 y.sh. -230 Gy.sh. -240 Sst. -250 Sy.sh. -255 Gy.sh. -257 Gy.rk. -270 Sy.sh. -300 Gy.sh. -310 Sy.sh. -315 Gy.rk. --420 Gy.sh. -425 Sy.p.cl. -440 Sy.sh. -700 Gy.sh.
12049 No.21 CORK	66Mi; SE		Blackwell 1952	170 300	213 645 720	170) 170) 170)	15,000	G		0- 3 Surface soil - 9 y.sst. - 55 y.cl. - 63 Lst. - 80 Sst. - 81 Blds. -105 Sst. -110 Br.sh. -130 Blds. -137 Sy.sh. -140 Rk. -155 Gy.sh. -180 Br.sh. -200 Sy.sh. -204 Blds. -213 Sy.sh. -245 Gn.sst. -280 Gy.sh. -285 Rk. -325 Gy.sh. -330 Br.sh. -380 Gy.sh. -382 Rk. -447 Gy.sh. -500 Sy.p.cl. -530 Gy.sh. -550 Sy.p.cl. -553 Rk. -575 Sy.plcl. -645 Gy.sh. -655 Sy.p.cl. -720 Gy.sh. -743 Gn.sy.sh. -750 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K
12556 Mt.William House WHYRALAH	65Mi; SE		Blackwell 1951	156 275	195 460	175 156	4,000 9,600 (Total)	S Excellent		0– 3' Surface Soil – 100 y.sh. – 115 Sy.p.cl. – 120 Br.rk. – 140 Sy.sh. – 165 Gy.sh. – 185 Sy.sh. – 190 Hd.sst. -193 Sst. -205 Sy.sh. -375 Gy.sh. -400 Sy.sh. -405 Sy.p.cl. -410 Gy.rk. -415 Sy.p.cl. -420 Gy.rk. -4[illegible]5 Br.coal sh. -460 Thin beds coal gy sh.& sy.p.cl. -470 Open sst. -485 Gy.sh.
12557 Dud WHYRALAH	67Mi; SE		1953	S.A.	406-58	200	1920			0– 3 Soil – 65 y.cl. – 67 Rk. – 85 y.cl. – 100 Gy.sh. – 111 Sy.sh. – 118 Gy.sh. – 120 Rk. -140 Gy.sh. -212 Sy.sh. -230 Gy.sh. -270 Sy.sh. -309 Gy.sh. -310 Rk. -323 Br.sh. -345 Sy.sh. -390 Gy.sh. -400 Sy.sh. -406 Rk. -425 Sy.sh. -545 Gy.sh. -555 Br.sh. -620 Gy.sh. -640 Sy.p.cl. -700 Gy.sh.
12558 Cameron WHYRALAH	65Mi; SE	* See page 27a								
12574 ? NAREEN	67Mi; ESE		A.&M. Stower 1954	93 186	175 545	130 93	4000 11520 (Total)	S G		0– 2' Surface Soil – 85 y.sh. – 125 Gy.sh. – 145 Sy.sh. – 155 Gy.sst. – 295 Gy.sh. – 335 Coal sh. & coal. -455 Gy.sh. -460 Coal sh. & coal. -466 Gy.rk. -470 Gy.sst. -480 Coal sh. & coal -517 Sy.sh. -527 Gy.sst. -535 Gy.rk. -545 Sy.sh. -570 Gy.sst. -585 Gy.sh. -588 Br.sh.

A	B	C	D	E	F	G	H	I	J	K
12558 Cameron WHYRALAE	65Mi. SE		Blackwell 1954	137 250	480- 490 615- 625	145 137	6,700) 11,500) (Total)	P		0 - 3 Surface soil - 87 y.cl. - 95 Gy.sh. - 97 Rk. - 110 Gy.sh. - 120 Gy.sst. - 146 Gy.sy.sh. - 149 Rk. - 160 Gy.sy.sh. - 161.Bk.coal sh. - 182 Gy.sy.sh. - 185 Rk. - 200 Gy.sh. - 220 Gy.sy.sh. - 240 Gy.sh. - 255 Gy.sst. - 290 Gy.sh. - 295 Gy.sy.sh. - 297 Rk. - 307 Gy.sh. - 312 Gy.sy.sh. - 315 Br.sh. - 335 Gy.sh. - 350 Gy.sst. - 357 Rk. - 375 Br.sh. - 385 Gy.sh. - 400 Gy.sh. - 401 Rk. - 425 Gy.sh. - 428 Choc.sh. - 430 Gy.sy.sh. - 438 Sy.p.cl. - 445 Bk.coal sh. - 480 Gy.sh. - 490 Gn.sst. - 496 Br.sh. - 510 Gy.sh. - 527 Br.sh. - 530 Rk. - 572 Gy.sh. - 574 Rk. - 604 Gy.sh. - 608 Rk. - 615 Gy.sh. - 625 Gy.sy.sh. - 633 Br.sh. - 638 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K
12591 HENNES TOOLEBUC	39Mi; NW		1954	320 350	680) 700)	250	36,000			0- 12 wh.chalk - 95 y.cl. - 104 y.cl.& ironstone - 254 Bl.sh. - 263 Sst. - 273 ironstone - 680 Bl.sh. - 688 Sst. - 700 S.
128C1 No.23 CORK	49Mi; SE		1954	70 ?	75 460	70 70	4,000 23,000	S Fair		0 - 2 Soil - 55 wh.sh.w layers lst. - 60 Hd.gn.rk. - 80 Boulder - 115 wh.sh.w. boulders. - 135 wh.cl. - 230 lst. - 255 Gy.sh. - 325 y.sh. - 365 sst. - 385 Hd.sst. - 425 Sy.sh. - 435 Coal sh. - 478 Sst. - 482 Gy.rk. - 490 Sst.
14132 No.24 CORK	69 Mi; SE		1960	S.A.						T.D. 895 N.O.I.
14622 ? Albrighton	64 Mi;			S.A.						T.D. 400 N.O.I.
14646 No.22 LUCKNOW	45 Mi; SW		W.G. Law 1961	S.A.	1390) 1460)	136		F		0- 5 Soil - 15 Cl. - 30 y.cl. - 70 Dk.cl. - 185 Dk.Mudst. - 490 Mudst. - 512 Dk.Mudst. - 625 Mudst. - 1390 Dk.mudst. - 1392 Sst. - 1400 Bk.sst.-soak - 1440 P.cl. - 1640 Sst. - 1650 Cl.
14853 No.23 LUCKNOW	52 Mi; SSW		W.G. Law 1961	S.A.				F		0- 12 Sy.cl. - 65 cl. - 82 Dk.sh. - 186 Dk.mudst. - 290 Gy.sy.sh. - 350 Gy.sh.hd.bds - 460 Bk.mudstone - 580 Mudstone -710 Dk.Mudstone -1500 Bk.mudstone -1574 Sst. SAMPLES 80 Thinly interbedded siltstone & arkose. 980 bl-gy claystone. 1020 bl-gy claystone with oil slick -1074 Calcite veined blue lst.-*

* 1574 Conglomer.

A	B	C	D	E	F	G	H	I	J	K
Unregistered ? ALBRIGHTON	66Mi; NE			Abd.						Originally a well to 200' deepened as a bore to approximately 500'. N.O.I.
Unregistered ? BRACKENBURGH	20Mi; NW			Abd.						N.O.I.
Unregistered ? House(Dud) CHILTERN HILLS	24Mi; SSW						Nil			T.D. 400. Stopped at that depth as "that was limit of license."