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RECORDS.

1962/79

EXPLANATORY NOTES, BRIGHTON DOWNS SHEET, QUEENSLAND.

by

W. Jauncey.

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SUMMARY

Cretaceous rocks crop out over nearly the whole of the Brighton Downs Sheet area. Lower Cretaceous marine sediments appear in the north-west and dip gently eastwards below freshwater deposits of Lower to Upper Cretaceous age. In two main areas of Tertiary sedimentation, one in the north and the other in the south-west, sandstone, clay and limestone have been deposited. Lateritisation is widespread over the area. Reliable subsurface information has been obtained from Ooroonoo No. 1 Well, drilled in 1960, and less reliable information from water bores.

Two samples of ironstone collected during this survey contain high percentages of iron oxide. Good supplies of underground water have been tapped by artesian bores. Little can be said about the hydrocarbon possibilities from the limited information available. The small-scale search for opal once carried on in the area has ceased completely.

INTRODUCTION

A reconnaissance survey of the Brighton Downs 4-mile Sheet area was conducted by geologists R. R. Vine and W. Jauncey of the Bureau of Mineral Resources between June and August, 1961; the survey was part of an overall programme to cover, in addition, three 1:250,000 sheet areas immediately to the north--Mackunda, McKinlay and Julia Creek.

Before field work commenced a photo-geological interpretation of the entire area was carried out by the Institut Francais du Petrole in Canberra; the air photos were taken by R.A.A.F. in 1951. As a result of observations made in the field, a complete re-interpretation was carried out by the writer. The geology of the area was then compiled on 1:46,500 base maps prepared by the Division of National Mapping, and reduced to quarter million scale photographically.

The Brighton Downs Sheet area covers nearly 7,000 square miles and is situated south-west of Winton in western Queensland. Grazing conditions range from poor in the hilly regions to good on the rolling downs. Six artesian

bores and several sub-artesian bores produce good water (artesian water is obtained mainly in the west of the area). Surface water is confined to waterholes in the channels of the Diamantina and its larger tributaries, for rainfall is very erratic and droughts are frequent. However, the head-waters of the Diamantina River are far to the north in the McKinlay area and consequently the river does not depend entirely on local rainfall.

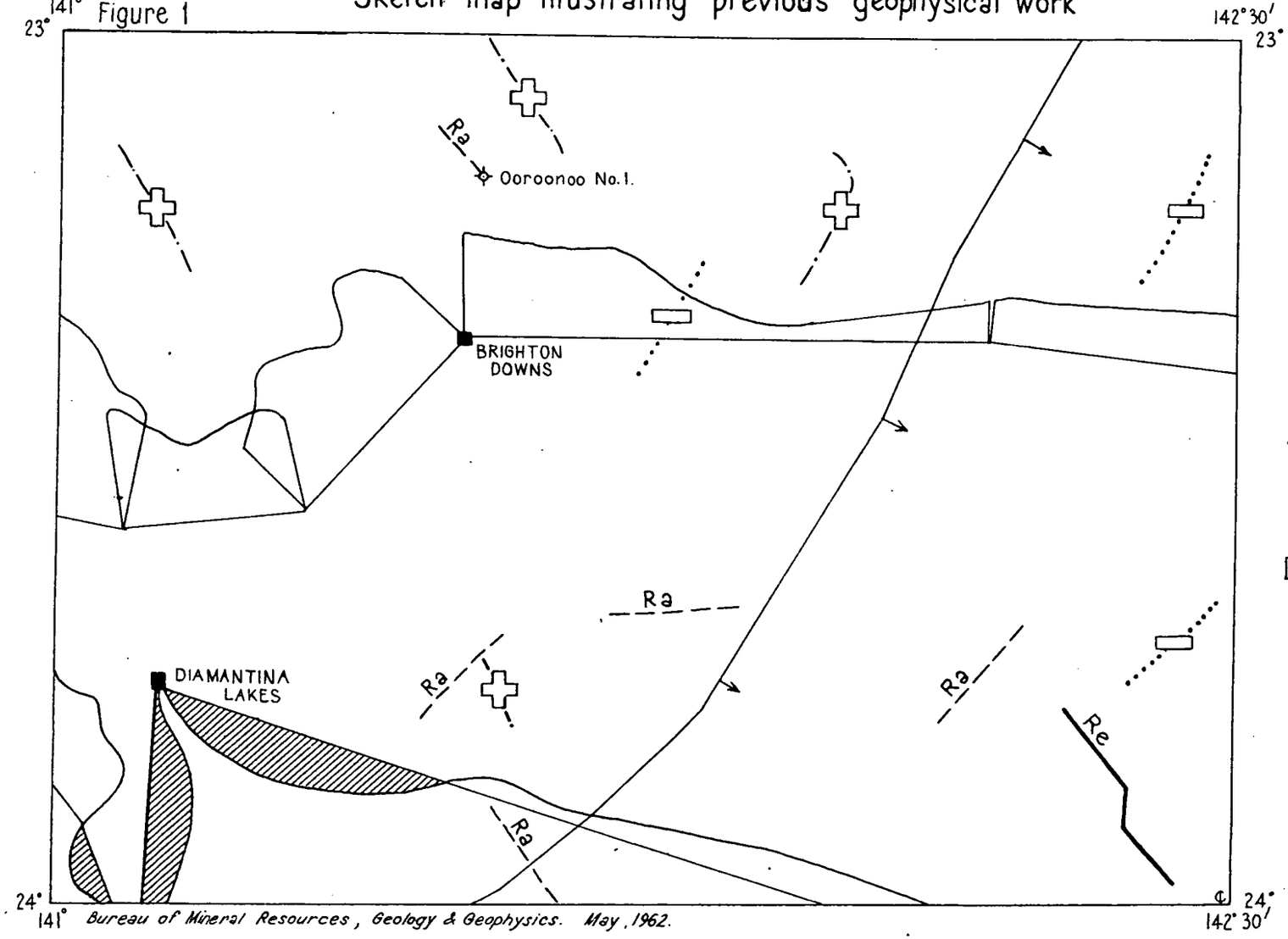
Access is much easier from north to south than from east to west. A graded and formed road from Winton to Brighton Downs and Diamantina Lakes follows the eastern margin of the Diamantina channels, and continues south to Davenport Downs. Another formed road in the east connects Winton with Mayneside Homestead (just to the east of the area). A new branch of this road leading to Elvo and the Mayne River (eventually to Jundah) was being constructed at the time of this survey. Station tracks are quite numerous and convenient, although in some places they are in poor repair, particularly in the hilly regions.

The only industry in the area is stock raising, mainly cattle. Some opal mining has been carried on in the past but is now at a complete standstill. The six homesteads shown on the map are the only centres of settlement, although there once was an hotel at the junction of the Mayne and Diamantina Rivers.

BRIGHTON DOWNS

Sketch map illustrating previous geophysical work

Figure 1



GRAVITY – Bureau of Mineral Resources, 1961.
(Carried out on grid with 7-mile spacing of stations)

Trend of positive anomalies

Trend of negative anomalies

Uniform Gravity gradient.

SEISMIC – Austral Geo Prospectors, 1961.

Ra — Refraction profile

Re — Reflection profile

AEROMAGNETIC – Bureau of Mineral Resources, 1958.

Aeromagnetic profile (shading indicates values below datum)

Dry stratigraphic test well

Homestead

5 0 5 10 15 Miles

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

PREVIOUS INVESTIGATIONS

Very little specific work had been done in the Brighton Downs area prior to this survey. However, many general accounts had been written about western Queensland and the Great Artesian Basin notably by Daintree (1872), Jack (1885, 1886, 1895(a), 1895(b)), Cameron (1901), Dunstan (1920), Jensen (1925) and Reid (1929).

Marine and freshwater Cretaceous and freshwater Tertiary sediments have long been recognised in western Queensland. Whitehouse has written prolifically on the subject (1930, 1940, 1941, 1945, 1948, 1953, 1954), and in his account of the Queensland portion of the Great Artesian Basin (1954) he described the following succession:

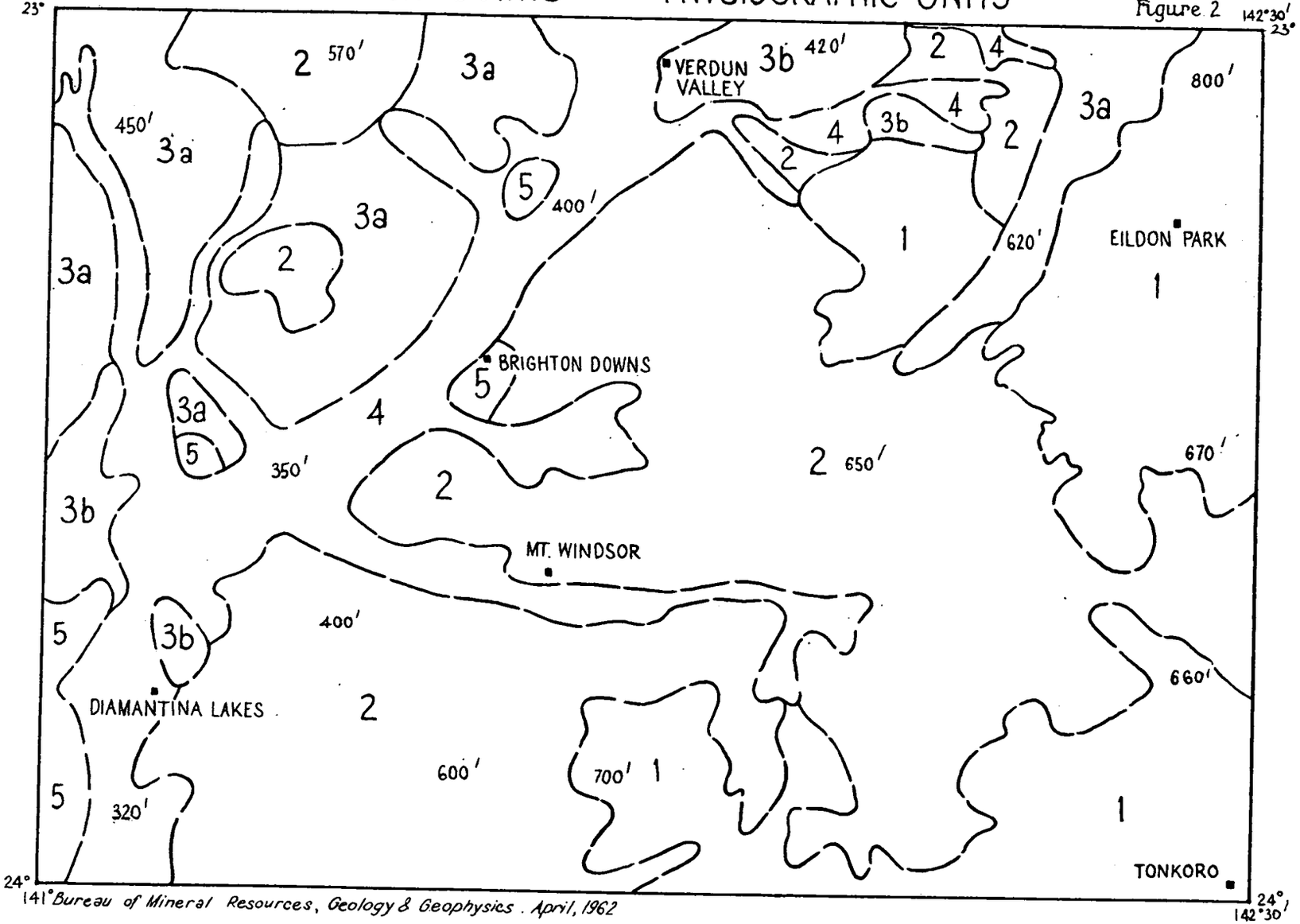
Freshwater	Eyrian Series	Tertiary
Freshwater	Winton Formation)	
Marine	Tambo Formation)	Cretaceous
Marine	Roma Formation)	

Casey (1959) named Lower Cretaceous sediments in western Queensland, the Longsight Sandstone, the Wilgunya Formation and its Toolebuc Member. Some areas adjacent to the Brighton Downs Sheet have been described by Casey, Reynolds, Dow, Pritchard, Vine and Paten (1960), Reynolds (1960), Paten (1960), and Reynolds, Olgers and Jauncey (1961). Paten (1961) has given a full account of the Tertiary sediments in the Springvale Basin, including some observations made in the western part of the Brighton Downs area. He introduced the names Springvale Formation and Horse Creek Formation (Paten, 1960). Contemporaneously with the 1961 survey, Vine (1962) recognised a new Cretaceous unit transitional between the Wilgunya Formation and the Winton Formation, which he has called the Mackunda Beds. In addition, Tertiary sediments exposed on the boundary between the Brighton Downs and Mackunda areas have been grouped together under the name Old Cork Beds, (Vine, 1962).

Part of the area forms a section of Authority to Prospect 75P, leased by Conorada Petroleum Corporation. After preliminary photogeological interpretation by the company an off-structure well was drilled in 1960 at the confluence of Ooroonoo Creek with the Diamantina River. The well, Ooroonoo No. 1, reached a total depth of 3,852 feet and was completed in granite of Precambrian age (859 million years on K/A determination) after passing through 3,840 feet of Cretaceous and Upper Jurassic sediments (McPhee, 1962). A subsidised seismic survey was carried out in 1961 in the south-east of the Brighton Downs area by Austral Geo Prospectors pty. Ltd., on behalf of Conorada Petroleum Corporation. The results

BRIGHTON DOWNS — PHYSIOGRAPHIC UNITS

Figure 2



1. *Plateaus* - Duricrust cap on Cretaceous sediments

2 *Duricrust residual areas* - mesas, buttes scree covered hills, residual ironstone and gravel

3a. *Downs* - Soil cover on rolling topography overlying Cretaceous rocks.

3b *Plains* - Flats with scarp edges.

4 *Alluvial belts* - water courses with braided channels.

5 *Dune areas* — aeolian sand accumulation

620' *Average height of area*

5 0 5 10 15 Miles

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

of this survey will be available for publication in November, 1962.

An airborne gravity survey was conducted in the Brighton Downs area in 1961 by the Geophysical Branch of the Bureau of Mineral Resources (Lonsdale, 1962).

Figure 1 illustrates geophysical work done in the area.

PHYSIOGRAPHY

In this area there are a number of distinct physiographic units. The following description is illustrated in Figure 2.

1. Duricrust plateaus. These are confined to the south-east and east of the region. Extensive areas of duricrust covered with a thin layer of red soil support a thick growth of gidyea scrub and spinifex. In the north, on each side of the Holberton Structure the plateaus have steep scarp edges, up to 200 feet high, whereas in the southern areas a much more indistinct boundary exists between this unit and the dissected duricrust. The duricrust is not confined to one stratigraphic level, and consequently extends over a variety of altitudes, decreasing towards the south and west.
2. Duricrust residual areas. This is the dominant unit of the area. Intense mechanical erosion has sculptured a badlands topography of mesas and buttes with residual duricrust caps, and smaller, scree-covered hills. Gravel and fragmentary ironstone litter the surface at the feet of these hills. Topography of this type is found in the centre and north-west of the area. A more intermediate stage of dissection has been reached in the south and south-east, where streams have not cut down so far beneath the duricrust. The surface is rough and broken and there are many small creeks.

The whole of the residual duricrust area has very little permanent water, and supports scrub cover of varying density.

3. Downs and plains. This unit has been divided into two types.

a). Downs. Prevailing mainly in the west of the area, the downs are gently undulating, thinly covered with black soil on which grow Mitchell grass and, near creeks, wattle trees. The downs in the east lie aligned with the Holberton Structure, and are thus tectonically separated from their counterpart in the west.

b). Plains. Confined entirely to areas of Tertiary sediments, the plains are very flat and monotonous. Flats of clay, usually soft and unconsolidated, and black soil merge gradually with adjacent physiographic units in the north, while in the south they are mainly bounded by scarp edges. Vegetation is mainly Mitchell grass and small bushes.

4. Alluvial belts. The Diamantina River and its tributaries have deposited alluvial silts and gravels in wide courses. Water flows (usually only in the summer) along braided channels which are the dominant feature of the main rivers and streams. The Mayne River and the tributaries of the Diamantina are more clearly defined and less braided towards their head-waters. Coolabah, gum and gidyea trees grow along the alluvial belts, and, except where roads have been formed, access is very poor.

5. Dune areas. Linear sand-ridges cover quite large areas, mainly along the course of the Diamantina River and adjacent to Tertiary outcrops. Yellow in the south and red near Brighton Downs Homestead, the dunes are low and are aligned north-north-west, the prevailing direction of the dunes on the eastern margin of the Simpson Desert. A few small bushes and some spinifex grow in these areas.

STRATIGRAPHY

The stratigraphy of the Brighton Downs area is summarised in Table 1. A new unit, the Moses Sandstone, is described here for the first time.

Moses Sandstone

The Moses Sandstone is a sequence of fine-grained, angular quartz sandstone, partly, slightly calcareous, and dense, brown, sandy, limonitic ironstone. It unconformably overlies deeply weathered sediments of the Winton Formation or where that Formation is absent, the Mackunda

TABLE 1

STRATIGRAPHY OF THE BRIGHTON DOWNS SHEET AREA

ROCK UNIT	THICKNESS (FEET)	LITHOLOGIES	DISTRIBUTION	STRUCTURE	TOPOGRAPHY	STRATIGRAPHICAL RELATIONSHIPS AND AGE	PRINCIPAL REFERENCES
Alluvium (Qa)		Silt, gravel near hills	All rivers and creeks			Deposited on all formations. Quaternary	
Sand (Qs)		Wind-blown red and yellow quartz sand	Isolated patches, mainly along course of Diamantina River		Sand-dunes and sandy flats	Overlying Cretaceous and Tertiary sediments. Quaternary.	
Gibber Gravel (Czg)	Thin cover	Rounded pebbles of silicified sandstone	North-east, north and west of Mount Holberton		Rolling gibber plain.		
Duricrust (Czd)	Approx. 20 (top eroded)	Silicified siltstone and sandstone; indurated cap of laterite profile	East of Diamantina River, Macartney Range, west of Brighton Downs No. 5 bore.	Affected by Holberton Structure.	Flat-topped hills and mesas, dissected and undissected plateaus; gently undulating duricrust.	Chemical alteration of Winton Formation and Mackunda Beds. Cainozoic.	Woolnough 1928
Undifferentiated ?Tertiary (?T)	Thin cover	Unconsolidated, light grey clay.	Adjacent to Tertiary deposits in the extreme west of the Sheet area.	Flat-lying	Flat plains	Unknown. ?Tertiary	
Undifferentiated Tertiary (T)	Approx. 35	Green and white bedded chert, red and purple sandy clay.	Small, isolated structure 8 miles north-west of Mount Windsor Homestead.	Top-horizontal sandy clay, Unconformity, Syncline formed in chert.	Small rounded hills, low cliffs	Unconformable on Winton Formation. Tertiary.	This report (see Structure)
Old Cork Beds (To)	0-65	Leached and partly silicified cross-bedded silty sandstone; unconsolidated clay; silicified ?algal rock.	Northern edge of Sheet area.	Small sedimentary basin.	Flat-topped hills and flat plains.	Unconformable on Winton Formation. Tertiary.	Vine, 1962
Horse Creek Formation (Th)	0-40	Brown and grey, fine-grained limestone. Ostracods, charophytes, faecal pellets.	Goyder and Hamilton Ranges, north-west and south-east of Hunter's Gorge.	Flat-lying; unconformably filling depressions in Springvale Formation and against the Moses Sandstone.	Flat plains with scarp edges.	Unconformably on Springvale Formation and Moses Sandstone.	Pater, 1960, 1961.
Springvale Formation (Tv)	0-70	Iron-stained, chemically altered siliceous dense rocks, limestone, swelling clay and rare sandstone.	Goyder and Hamilton Ranges, north-west and south-east of Hunter's Gorge.	Gently folded, chemically altered.	Flat plains with scarp edges.	Unconformable on Moses Sandstone; folded before deposition of Horse Creek Formation. Tertiary.	Pater 1960, 1961
Moses Sandstone (Ts)	0-60	Fine-grained silicified sandstone, in part calcareous; limonitic ironstone.	Goyder and Hamilton Ranges near Hunter's Gorge, and isolated outcrops 20 miles north and south of Hunter's Gorge.	Slightly warped (dips up to 8°).	Flat-topped hills.	Unconformable on Winton Formation and Mackunda Beds.	New unit. This report.

ROCK UNIT	THICKNESS (FEET)	LITHOLOGIES	DISTRIBUTION	STRUCTURE	TOPOGRAPHY	STRATIGRAPHICAL RELATIONSHIPS AND AGE	BIBLIOGRAPHICAL REFERENCES
Winton Formation (Kuw)	1000+ (Estimated)	Massive-bedded lensing arkose, siltstone, calcareous arkose, arkosic limestone. In part lateritised and silicified. Limonitic ironstone nodules and concretions. Plant remains, silicified wood.	Most of the Sheet area except the northern and western margins.	Flat lying, gently folded, thickening generally eastwards and southwards. Probably faulted at Kolberton Structure.	Plateaus, dissected plateaus and mesas; rolling downs.	Conformable on the Mackunda Beds. Lower - Upper Cretaceous	Whitehouse, 1954
Mackunda Beds (Klm)	350 (Estimated)	Arkose and siltstone, thinly interbedded. Calcareous arkose, arkosic limestone. Partly lateritised and silicified. Plant remains.	North-west part of Sheet area, west of Diamantina River; Sub-surface.	Flat-lying, dipping gently eastwards. Probably faulted in north-east.	Dissected plateaus and mesas, rolling downs.	Conformable on Wilgunya Formation. Lower Cretaceous	Vine, 1962
Wilgunya Formation							
upper member Klw_2	700-1500 (Estimated)	Blue-grey claystone and siltstone. Silty limestone. Pelecypods, fish scales, Inoceramus.	Restricted outcrop in north-west of Sheet area. Sub-surface.	Flat-lying, probably faulted in the east.	Rolling downs.	Conformable on Toolebuc Member. Lower Cretaceous.	Casey, 1959, Casey et. al., 1960, Reynolds, 1960, McPhee, 1962.
Toolebuc Member Klw(t)	30-40	Limestone, limestone coquina, (Inoceramus fragments and fish scales), calcareous shale.	Subsurface (only direct evidence in Ooroonoo No. 1 Well, and Diamantina Plains Bore).	Flat-lying, probably faulted in the east.		Conformable on lower member, Wilgunya Formation. Lower Cretaceous	Casey, 1959, Casey et. al. 1960, Reynolds, 1960, McPhee, 1962.
lower member Klw_1	500-600	Blue, grey claystone and siltstone, silty limestone.	Sub-surface.	Flat-lying, probably faulted in the east.		Conformable on Longsight Sandstone. Lower Cretaceous	Casey, 1959, Casey et. al. 1960, Reynolds 1960.
Longsight Sandstone Kl1	200-1500	Sandstone, "pipe-clay" (driller's term)	Sub-surface.	Blanket sand on basement, faulted in the east.		Unconformable on Precambrian. Upper Jurassic-Lower Cretaceous.	Casey, 1959, Casey et. al. 1960.
Precambrian		Granite	Bottom of Ooroonoo No. 1 Well.			Precambrian	McPhee, 1962

Beds, and is silicified and partly leached. The upper surface is erosional, and the unit seems to have been slightly warped, with dips usually 1^{o} or 2^{o}, but increasing to 8^{o} in the south.

This sandstone is named from Moses Cone, a small conical hill composed of the unit and situated 1 mile south of Hunter's Gorge. The type section (fig. 3) was measured in the western scarp of the Goyder Range at a point 3 miles north-north-west of Hunter's Gorge, at Lat.$23^{o}40'$S., Long.$141^{o}06'$E.

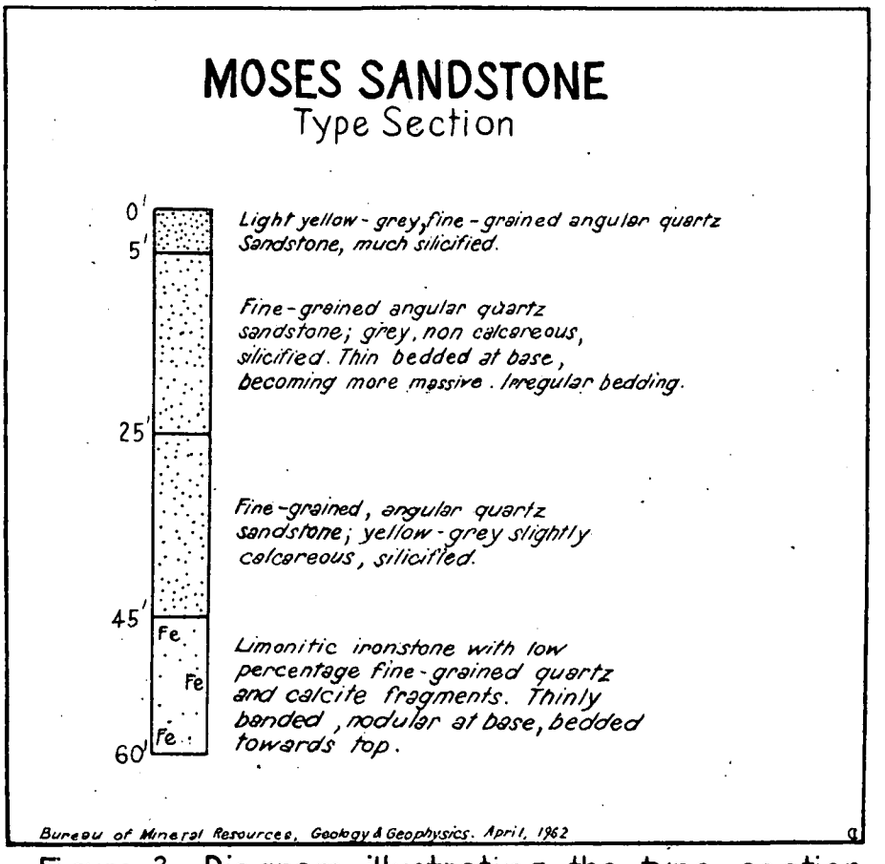


Figure 3- Diagram illustrating the type section of the Moses Sandstone.

The Moses Sandstone crops out in flat-topped, scarp-sided hills in three places; on either side of Hunter's Gorge, an outlier 20 miles to the north on the banks of Pot Jostler Creek, and the third 5 miles south-east of Diamantina Plains bore. The three localities are aligned in a roughly north-north-west direction over a total distance of 40 miles.

Examination of thin sections cut from samples collected from the type section shows that 40% of the rock is composed of angular, fine-grained quartz, set in a matrix of opal, chalcedony and calcite. The unit is easily recognisable in the hand specimen as a silicified fine-grained sandstone. In thin section the ironstone proved to contain a small percentage of fine-grained quartz in a matrix of

thinly banded limonite. Small fragments of similar ironstone are contained in the overlying sandstone.

Bedding varies from thin to massive, and irregular to lensing. The Springvale Basin (Paten, 1961) is regarded, on the basis of palaeontological evidence (P. Jones, pers. comm.) as having been deposited in a fresh or brackish water environment. While no fossils have been found in the Moses Sandstone, it is probable that this unit was also laid down by irregular currents in a fresh or brackish water basin which was, judging from the area covered by the Moses Sandstone, small in size.

The age of the Moses Sandstone is not certain. It is younger than the Winton Formation, which it overlies unconformably, and is itself overlain unconformably by the Springvale Formation. The Moses Sandstone is tentatively assigned to the Tertiary.

STRUCTURE

The most prominent physiographic feature of the area is a discontinuous scarp extending from Mount Holberton southwards and south-westwards.

Associated with some gentle westerly dips, this scarp is the surface expression of a structure affecting Cretaceous and older rocks. This feature, here named the Holberton Structure, is probably a fault. It cannot be traced further south than about 23°20'S, nor much further north than 23°S, where it is en echelon with the Cork Fault (Vine, 1962). A comparison of the drillers' logs for Gidyea and Cork Homestead (Mackunda Sheet) bores indicates a total displacement of the Longsight Sandstone, by the combined structures, of 1,000 feet, with displacement down to the west.

A change in gravity contour pattern is associated with the Holberton Structure (Lonsdale, 1962). West of the line irregular contours indicate a shallow basement, while east of it a gentle gradient indicates an eastward deepening basin. Thus there is an anomaly which is part of a large-scale regional problem. This has been discussed by Vine (1962).

Other tectonic features in the Brighton Downs area

involve Tertiary sediments. In a small syncline 8 miles northwest of Mount Windsor Homestead, sediments of the Winton Formation and younger green and white cherts have been folded, with dips of up to 26°. Subsequently, 10 feet of sandy clay were deposited in the hollow of the syncline. This structure is isolated and has no lateral continuation.

Periods of gentle folding separated the deposition of the three formations in the Springvale Basin. The Moses Sandstone, south-east of Diamantina Plains Bore, dips at 8° to the south-west. The Springvale Formation dips off the flank of the Moses Sandstone in the Goyder Range, and was itself warped and gently folded before the deposition of the Horse Creek Formation.

GEOLOGICAL HISTORY

The log of Ooroonoo No. 1 Well shows that at least 3,800 feet of sediment have been deposited in the Brighton Downs area since late Jurassic times. Gravity contours (Lonsdale, 1962) indicate that the edge of the Boulia Shelf (Whitehouse, 1954) is coincident with the line of the Holberton Structure, and that to the east of this line the basin deepens.

On this shelf a blanket of arenaceous material (the Longsight Sandstone) was laid down, filling depressions and spreading over the edge of the Boulia Shelf, freshwater conditions prevailed at first, changing later to brackish and marine. A long period of deposition of silt and clay followed, represented by the Wilgunya Formation, with some intervals of silty limestone deposition. A major break in this type of sedimentation occurred with the deposition of the Toolebuc Member, which is predominantly a limestone unit.

A gradual reversion to freshwater conditions began with the deposition of the Mackunda Beds (Vine, 1962). In the lacustrine conditions of a rapidly filling basin, the freshwater Winton arkose, siltstone and arkosic limestone were laid down. Subsequently erosion took place and deep weathering resulted in the laterisation of surface sediments. Further erosion removed parts of the laterite profile, and on this new surface a silcrete cap formed.

Not enough evidence is available to date the beginning of the Holberton Structure. However, movement occurred along this line at some time after the duricrust formed, causing a down-warp to the west in which the Old Cork Beds were deposited (Vine, 1962) in a restricted basin. Other Tertiary sediments were deposited at about the same time in the southern half of the area (i.e. in the Springvale Basin, and near Mount Windsor Homestead); these were also affected by slight tectonic movement.

Strong chemical weathering occurred both during and after the deposition of the Tertiary sequences, as evidenced by the formation of cherts in the Springvale Formation and north-west of Mount Windsor, the silification of the Moses Sandstone, and the leaching of the Old Cork Beds. Bore records indicate that chemical weathering has continued into Recent times.

The most recent deposits in the area are the alluvia and the sand-dunes.

ECONOMIC GEOLOGY

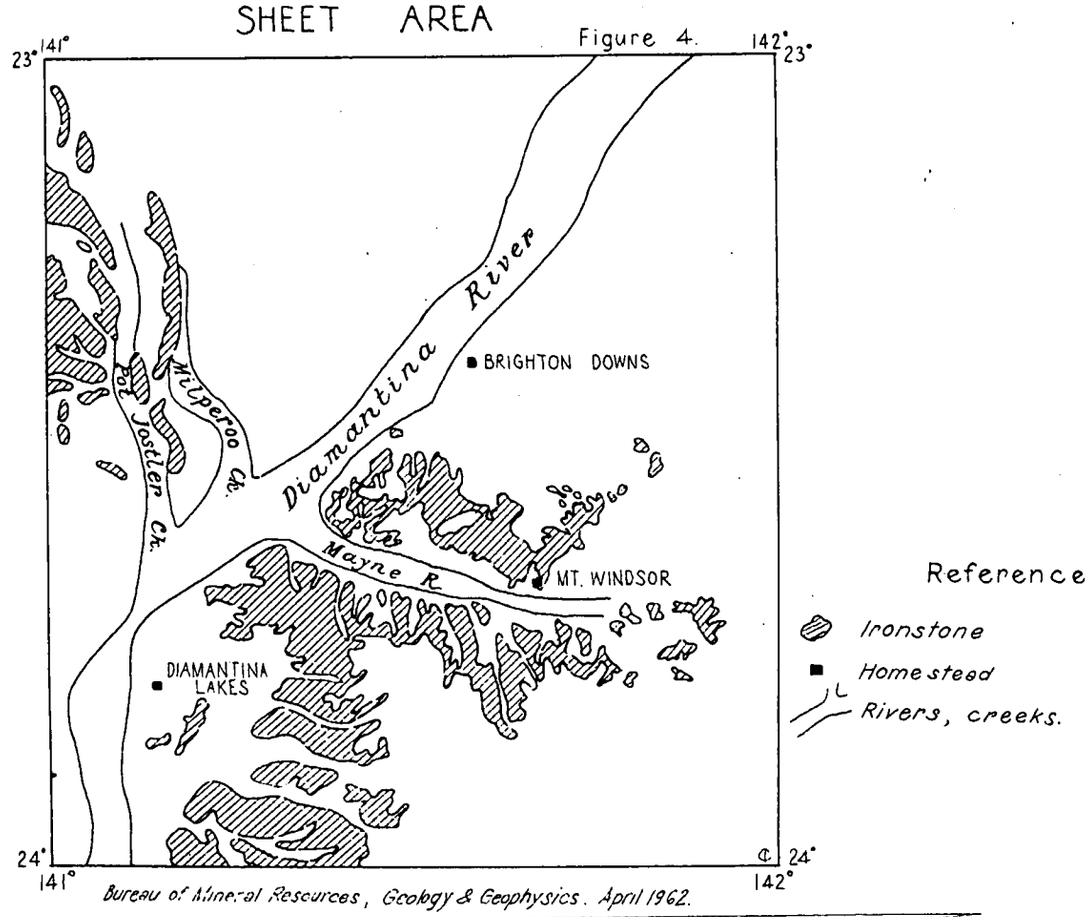
Iron - Analyses of two samples of ironstone are in Appendix II of this report. G.A.B. 707 was collected from a band of ironstone exposed in a creek bed, 12 miles south-west of Mount Holberton (plate II). The ironstone, six inches to one foot thick, weathered and exposed, lies on top of mottled purple, white and yellow fine-grained sandstone, in the mottled zone of lateritisation. The exposure is limited to the banks of a very small waterhole.

G.A.B. 747, with a very high iron oxide content, was collected from 22 miles north of Hunter's Gorge (plate II). The ironstone is black and very heavy, with polished surfaces, and is exposed as angular cobble fragments littering the surface. The thickness of the ironstone cover has not been determined but is unlikely to be more than one foot thick. The type of ironstone represented by sample G.A.B.747 is remarkable for its dark colour and considerable weight. Ironstone exposed at the base of the Moses Sandstone ($\frac{3}{4}$ mile south-west) does not compare in weight. It is possible that the very high percentage of iron oxide in sample G.A.B. 747 is due to secondary enrichment by surface ferrous solutions.

Figure 4 illustrates the distribution of fragmentary ironstone in the Brighton Downs area. Although ironstone is quite widespread the areas shown in figure 4 are the most notable.

SKETCH MAP SHOWING DISTRIBUTION OF IRONSTONE IN BRIGHTON DOWNS SHEET AREA

Figure 4.



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

Light to dark brown, limonitic ironstone has formed at many, irregular levels in the laterite profile in the Brighton Downs area. It is suggested that a systematic sampling programme through both the laterite profile and in the area of ironstone cover would yield results of economic interest.

Underground Water

Good supplies of potable water have been obtained from six flowing bores in the area. They are Brighton Downs Nos. 1, 3, and 5 Bores, Gidyea Bore, Mayne Pub Bore and Diamantina Plains Bore. Most of the water is about 150° Fahrenheit, but the water from Gidyea Bore is nearly boiling; a taste of soda was noted in the water from Gidyea and Mayne Pub Bores.

Attempts to obtain shallow sub-artesian water have met with more varied success, but moderate supplies are

produced on Cork Station from the Mackunda Beds and Winton Formation. A graphic representation of drillers' records is given in Plate I.

Opal. The Brighton Downs area lies on the western edge of the Opalton opal field, but no known search for this mineral is now being carried on. Diggings were found at two localities (Plate II) and fragments of precious opal were culled from the spoil heaps. There has been a high degree of silification over the area in general, and common opal was noted at several places in Winton Formation sediments. The mineral forms in either leached and kaolinised arkoses or in limonitic ironstone. No correlation was possible for the known occurrences of opal, nor were there any surface indications for its presence. Conditions for working are very poor owing to the lack of water. It is not expected that the opal search will recommence in the area in the foreseeable future.

Hydrocarbons. The area forms part of Authority to Prospect 75P, leased by Conorada Petroleum Corporation. In 1960 they drilled an off-structure well, Ooroonoo No. 1, to a total depth of 3,852 feet. The well was completed in Precambrian granite (McPhee, 1962). This was overlain by Jurassic to Cretaceous sandstones and shales, with no trace of hydrocarbons. There is no mention of oil or gas in the drillers' logs for the Brighton Downs area. A seismic survey was done in 1961 by Austral Geo Prospectors Pty. Ltd. on behalf of Conorada Petroleum Corporation, but the results of this survey are not yet available for publication.

Vine (1962) suggests a stratigraphic well east of the Cork Fault - Holberton Structure line, the exact location to be chosen after more detailed geophysical work. The site for such a well may be in the Brighton Downs area.

Sand and gravel. Sand in considerable quantities has been deposited in sand-ridges (see Plate II). It is ferruginous, and probably quite unsuitable for concrete. The walls of the Mayne Hotel ruins are of adobe, small gravel fragments in a mud matrix. All other buildings in the area are of wood.

The duricrust, after it is broken and crushed, is suitable for use in road making. Gibber gravel to the north of Mount Holberton can be used for the same purpose.

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APPENDIX I

The tables in this appendix contain all the available information about water bores in the Brighton Downs Sheet area. The abbreviations used are as follows :-

B.	Brackish
Bd.	Band
Bk.	Black
Bl.	Blue
Bld.	Boulders
Br.	Brown
Cl.	Clay
Dk.	Dark
F.	Fresh
Gn.	Green
Gvl.	Gravel
Gy.	Grey
Hd.	Hard
I.B.C.	International Boring Company
L.	Instrument-levelled
Lst.	Limestone
Lt.	Light
N.O.I.	No other information
P.	Potable
P.cl.	Pipe clay
P.D.	Position doubtful
Qtz.	Quartz
R.	Red
Rk.	Rock
S.	Sand.
S.A.	Sub-artesian
Sa.	Saline
Sh.	Shale
Sst.	Sandstone
St.	Stone
Sy.	Sandy
T.D.	Total depth
V.	Very
W.	With
Wh.	White

Data contained in these tables were obtained from drillers' logs supplied by the Irrigation and Water Supply Commission, Brisbane and from field observations. The bores are listed numerically by registered numbers.

Reg. No. / Name / Property	Position (from Brighton Downs Homestead)	Elevation (feet)	Driller / Year completed	Standing water level / Pump depth (feet)	WATER: Struck (feet)	WATER: Rose to (feet)	WATER: Supply (g.p.d.)	WATER: Quality	WATER: Temp. oF	DRILLERS LOG
1671 No.1 Brighton Downs	9 mi. . . . W.N.W.	377	1894	Flow	2396	Flow	773,000	F.	155°	T.D. 2396 N.O.I.
1673 No.3 Brighton Downs	21 mi. N.W.	556	I.B.C. 1910	Flow	400 2106 2147 2188 2236	? Surface Surface Surface Surface	? 3,000	B. P.	Hot	0-146' y & br. Sh. -258 br. sh. -680 gy. sh. -687 gy & br. sh. -2000 gy. sh. -2106 p. cl. -2250 Sst.
1675 No.5. Brighton Downs	25 mi N.N.W.	531	I.B.C. 1913	Flow	2238 2274 2331 2420	Surface) " " "	1,700,000		Hot	0- 154 y. cl. - 293 Gy. sy. sh. - 594 Gy. sh. - 625 Br. sh. - 657 Br. sy. sh. -1798 Gy. sh. -2000 Gy. sh., patches gn. sy. sh. -2166 Gy. sh. -2243 Gy. sh.w. p.cl. -2420 S. rk.

Reg. No. / Name / Property	Position (from Brighton Downs Homestead)	Elevation (feet)	Driller / Year Completed	Standing water level: Pump depth (feet)	WATER: Struck (feet)	Rose to (feet)	Supply (g.p.d.)	Quality	Temp. oF	DRILLER'S LOG	
2237 Gidyea Cork	43 mi. N.E.	556	I.B.C. 1916	Flow	406		soak	Sa		0-31-Y.cl. -70 R.rotten St. 83-Wh.cl. 93-Gy.rotten St. 103-Gy.drift mud 122-r.rotten st. 216-y.sh. 304-Lt.gy.sh. 315-Dk.gy.sh. 348-Lt.gy.sh. 360-Gy.rk.with sy.sh. 377-Br.sh. 405-Gy.sy.sh. 427-Gy.sh. 446-Gn.sy.sh. 475-Gy.sy.sh. 516-Gy.sh. 533-Gy.sh. 610-Bl.sh. 631-Bl.gn.sh. 649-Bl.sh. 685-Bl.gn.sh. 708-Bl.sh. 759-Gn.sh. 762-Lst.rk. 811-Bk.sh. 813-Hd.rk. 831-Gn.bl.sh. 841-Wh.rk. 849-Gn.bl.sh. 892-Bl.sh. 1100-Bl.sh. 1108-Lst.rk.	1128-P.cl.s. 1165-Bl.sh. 1168-Bl.sh. 1179-Bk.sh. 1233-Br.sh. 1313-Bl.sh. 1450-Gy.sy.sh. 1480-Br.sh. 1892-Bl.sh. 1920-Dk.sticky sh. 3034-Bl.sh. 3090-s.sh. 3264-Bl.sh. 3265-Hd.Stk. 3720-Bl.sh. 3842-Hd.sst.gy. sy.sh. 3891-Fine sst. 3930-Sst. 4122-Wh.sst. 4145-Chocolate sst. 4153-Rk. 4188-Sst. 4261-Wh.sst. 4317-Sst. 4563-Hd.sst.
					438						
					3842	20					
					3853	S'face	475		Very		
					3857	"	5000		Hot		
					3860	"	20,000				
					3892	"	80,000				
					3902	"	100,000				
					3922	"	110,000				
					3946	"	120,000				
					3953	"	130,000	F			
					4000	"	170,000				
					4024	"	180,000				
					4032	"	260,000				
					4043	"	340,000				
					4287	"	400,000				
					4316	"	440,000				
					4340	"	520,000				

Reg. No. Name Property	Position (from Brighton Downs Homestead)	Elevation (feet)	Driller Year Completed	Standing water level Pump depth (feet)	WATER Struck (feet)	Rose to (feet)	Supply (g.p.d.)	Quality.	Temp. oF	DRILLERS LOG
2240 No. 3 (Dud) Cork	32 mi. E.N.E.	612	1912					Sa		T.D. 612 N.O.I.
2249 No. 12 Cork	39 mi. N.E. (P.D.)									T.D. 948 N.O.I.
5100 Diamantina Plains. Diamantina Lakes	47 mi. S.S.W.	L318	1937	Flow	80 222 342 2067) 2356)	60 ? ? S'face	? ? ? 1,459,560	Sa Sa ? F	150°	0-3-Surface soil 6-Br.cl. 40-y.sy.cl. 41-Sy.rk. 55-Sy.y.cl. 61-Bl.sh. 64-Wh.rk. 217-Bl.sh. 233-Bl.sy.sh. 303-Gy.sh. 342-Bl.sh. 370-Gy.sh. 384-Bl.sh. 446-Sy.sh. 468-Sy.rk. 490-Sy.sh. 510-Gy.sh. 515-Sy.sh. 517-Rk. 527-Fine sy.sh. 551-Gy.sh. 553-Rk. 551-Hd.gy.sh. 584-Rk. 722-Hd.gy.sh. 745-V.hd.Sh.rk. 829-Bl.sh. 831-Sh.rk. 876-Bl.sh. 1231-Gy.sh. 1282-Hd.bd. 1288-Gy.sh. 1290-Hd.bd. 1429-Gy.sh. 1464-Rk. mixed in sh. 1593-Bl.sh. 1722-Gy.sh. 1723-Rk. 1914-Sh. 1966-Sticky sh. 2006-Hd.gy.sh. 2010-Br.sh. 2067-Gy.sh. 2313-Sst. 2332-Hd.bd. 2347-Sst. 2350-Coal 2353-Qtz.seam. 2354-Hd.sst. 2358-sh.

Reg. No. Name Property.	Position (from Brighton Downs Homestead)	Elevation (feet)	Driller — Year completed.	Standing water level — Pump depth (feet)	WATER — Struck (feet)	Rose to	Supply (g.p.d.)	Quality.	Temp. oF.	DRILLERS LOG
7251 No.16 Cork.	49 mi. E.N.E.		1931	S.A.						T.D.520.N.O.I.
7252 No.13 Cork.	27 mi. N.N.E.		1926							T.D.955.N.O.I.
10572 Homestead - Elvo.	44 mi. E.		1945	S.A.	49	30				0-49-Wh.rk. 60-Softer rk & Gvl.
10644 Mayne Pub. Stock Route	18 mi. S.S.W.		1946	Flowing	100 370 613 2434) to) 2459)	 150 80 Surface	Sa Sa Sa F		Hot	100-Br.& y.cl. w. ironstone at 18' -134 Gy. Sh. -164 Sh. & rk. -208 Br. & bl. sh. -304 Gy.sh. -613 Gy.sh.w. hd. bds. gy.rk. -625 Lst. -1811 Gy.sh. -1842 Dk.gy.sh. -1877 Bk.sh. -1905 Dk.gy.sh. -2109 Sticky gy.sh. -2112 Sy.sh. -2343 Gy.sh. -2397 ?Rk. -2434 ?Sh. -2459 Sst.

Reg. No. / Name / Property	Position (from Brighton Downs Homestead)	Elevation (feet)	Driller / Year completed	Standing water level: Pump depth (feet)	WATER: Struck (feet)	WATER: Rose to (feet)	WATER: Supply (g.p.d.)	WATER: Quality	WATER: Temp. oF	DRILLERS LOG
10711 - Elvo	48 mi. E.		1946	S.A. 210	361-373	140	13,000	Sa	Cool	0-3 Pure soil -40 Porous br.rk. -43 Dk.slip-back -60 Y.sst. -103 Lt.y.sst. -170 Various colours of cl. -200 Gy.cl. -322 Dk. slatey cl. -361 V.hd.dk.cl. -373 Bl.sst. -374 Gy.hd.rk.
11676 Green's Elvo	34 mi. E.N.E.		1950	S.A.	34	27				0-5 Drifts -11 S. & gvl. -33 Rk. -60 Rk. & cl.
11997 Homestead Eildon Park	56 mi. E.N.E.		Blackwell 1952	169 254	230 365 430	210 210 164	2,800 3,621 13,000	Good " "		0-1 Surface Soil -10 R.Rk. -12 Lime rk. -45 Lst. -130 Y.sh. -225 Gy.sh. -230 Coal sh. -235 Water-bearing sst. -240 Coal sh. -255 Gy.sh. -259 Gy.rk. -280 Sy.sh. -285 Gy.rk. -289 Sy.sh. -295 Loose sy.sh. -299 Gy.rk. -312 Gy.sh. -315 Gy.rk. -325 Gy.sh. -330 Gy.rk. -365 Gy.sh. -370 Water-bearing sst. -390 Gy.sh. -395 Water-bearing sst. -410 Gy.sh. -430 Gy.sh. -440 Water-bearing sst. -445 Br.coal sh. -470 Gn.sh. -478 Sy.sh. -480 Gy.rk. -494 Gy.sh.

Reg. No. / Name / Property	Position (from Brighton Downs Homestead)	Elevation (feet)	Driller / Year completed	Standing water level (Pump depth feet)	WATER: Struck (feet)	WATER: Rose to (feet)	WATER: Supply (g.p.d.)	WATER: Quality	WATER: Temp. oF	DRILLERS LOG
12613 No. 22. Cork	52 mi. N.E.		A.Stower 1954	145 250	185 430 497	 145 145	Soak 12,000	B Sa		0-3 Surface soil -15 Bld. -65 Y.sh. -75 Coal sh. -76 Gy.sh. -107 Gy.sh. -110 Gy.rk. -185 Gy.sh. -195 Coal sh. -220 Gy.sh. -225 Coal sh. -245 Gn.sst. -250 Rk. -285 Sy.sh. -365 Gy.sh. -370 Coal sh. -415 Gy.sh. -420 Sy.p.cl. -425 Gy.rk. -430 Sst. -450 Sy.sh. -455 Sy.p.cl. -458 Gy.rk. -495 Sy.p.cl. -515 Gy.sst. -535 Sy.sh.
13553 Rosebrook Eildon Park	58 mi. E.S.E. (P.D.)		1956	85 315	184 388	105 85	1,200 8,400	P P		0-8 Surface soil -20 Y.sst. -46 R.sst. -65 Cl. -100 Y.cl. -184 Gy.sh. -210 Gy.sy.sh. -235 Gy.sh. -248 Gy.sy.sh. -251 Gy.sst. -265 Gy.sh.w. rk.seams. -300 Gy.sy.sh. w.rk.seams. -315 Gy.sh. -320 Gy.sy.sh. -375 Gy.sh. -378 Gy. sst. -406 Gy.sy.sh. -425 Gy.sh.

Reg. No. / Name / Property	Position (from Brighton Downs Homestead)	Elevation (feet)	Driller / Year completed	Standing water level / Pump depth (feet)	Struck (feet)	Rose to (feet)	Supply (g.p.d.)	Quality	Temp. oF	DRILLERS LOG
13858 – Elvo	33 mi. E.		1914							T.D. 160. N.O.L.
13859 – Elvo	52 mi. E.N.E. (P.D.)		Brown 1959	188 188	323	188	2880	Good		0-296 No record -310 Gy.sh. -346 Gy.sh.w. patches of s. -354 Lt.gy.sh. & s. -372 Br.sh. -410 Gy.sh. -446 Br.sh. -590 Gy.sh.
13982 – Elvo	43 mi. E.S.E. (P.D.)		Brown 1959	85 -	125 246	85 85	360) Pumped out 1920) 1959	P		0-6 Gvl.soil -43 Coloured sst. -80 Y.sst. -108 Y.sy.cl. -124 Y.cl.w.rk. bars -136 Y.cl.& gvl., rk.bars. -192 Y.cl., rk.bars -244 Y.cl. patches rk. -249 Y.cl.s.gvl. -268 Gy.sh.
13983 – Elvo	46 mi. E. (P.D.)		1959		67 99	48) 48)	2160			0-9 R.soil -44 Sst. -99 Sy.cl. -120 Sst.
13984 Elvo Elvo	33 mi. E.N.E.		1959		52 77	46 46	14,400			0-6 Top soil -52 Sst. -96 Wh.rk.
14475 – Cork	39 mi. N.E.							P.		N.O.L.

APPENDIX II

ANALYSIS OF IRONSTONE

by

S. Baker

Following are results for the partial analysis of two samples of ironstone submitted by W. Jauncey.

Field No.	Locality	SiO_2	Fe_2O_3	Al_2O_3	TiO_2
GAB 707	Brighton Downs SF 54-15, Q'ld. Holberton	31.96%	44.22%	14.0%	1.1%
GAB 747	Brighton Downs SF 54-15, McKartney	11.22%	84.6%	n.d.	n.d.

n.d. = not determined.

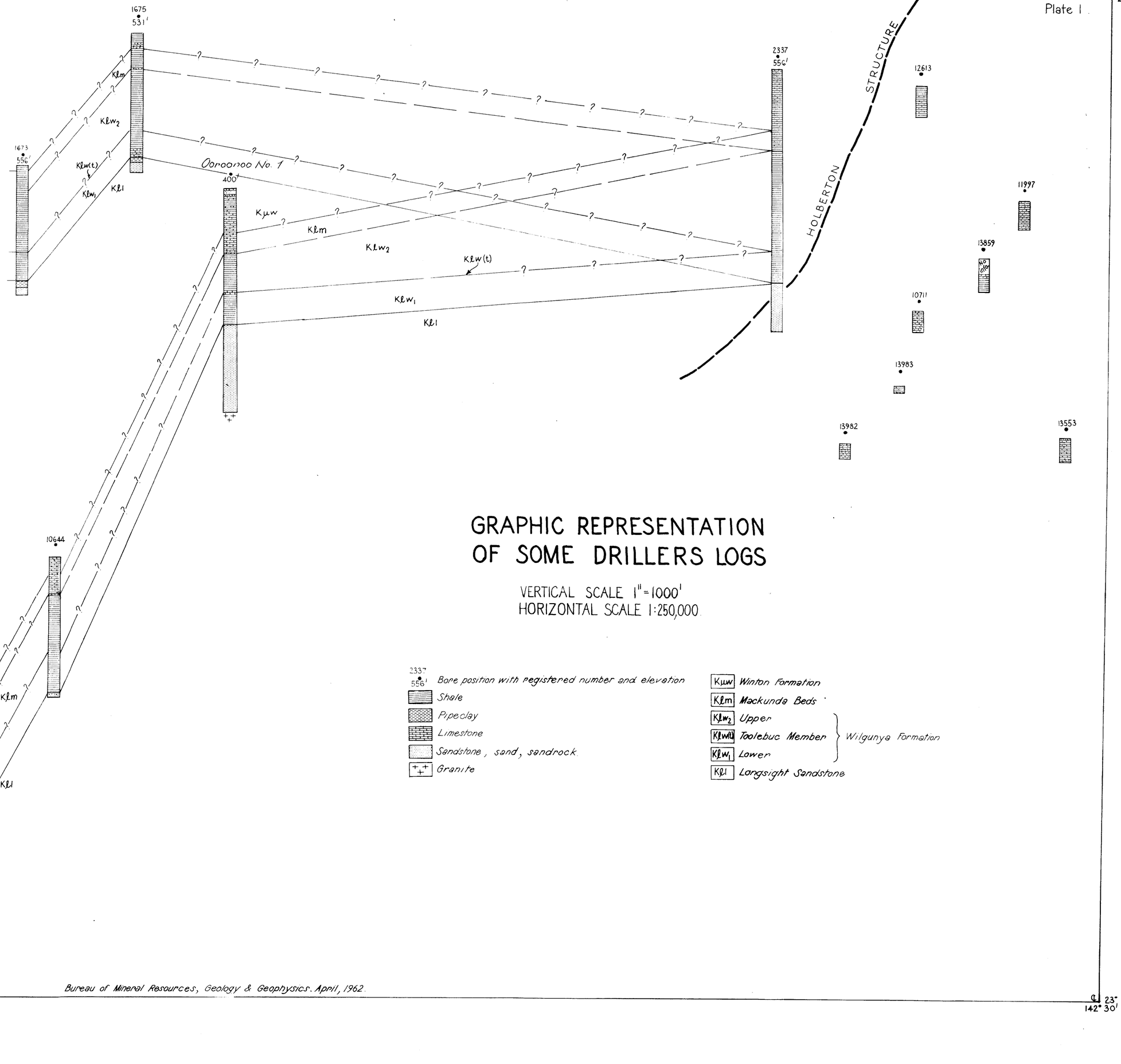
LAB. NO. 62/1081

BRIGHTON DOWNS
QUEENSLAND

Plate 1

23° 14·1°

142° 30′ 23°



GRAPHIC REPRESENTATION OF SOME DRILLERS LOGS

VERTICAL SCALE 1" = 1000′
HORIZONTAL SCALE 1:250,000

2337 / 556′ — Bore position with registered number and elevation
Shale
Pipeclay
Limestone
Sandstone, sand, sandrock
Granite

Kμw — Winton Formation
Klm — Mackunda Beds
Klw2 — Upper
Klw(t) — Toolebuc Member
Klw1 — Lower
} Wilgunya Formation
Kl1 — Longsight Sandstone

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

24° 14·1°

23° 142° 30′

BRIGHTON DOWNS
QUEENSLAND

AUSTRALIA 1:250,000

1:250,000 GEOLOGICAL SERIES SHEET SF 54-15

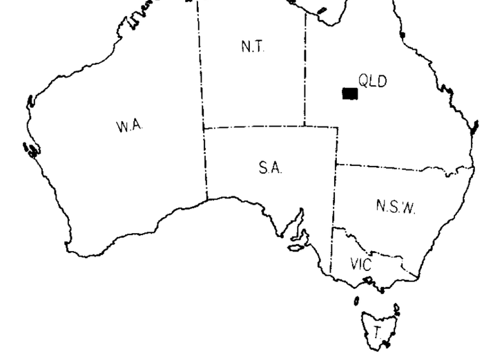
PRELIMINARY EDITION, 1962
SUBJECT TO AMENDMENT

Reference

Era	Period	Unit	Symbol	Lithology
CAINOZOIC	QUATERNARY		Qa	Alluvium (silt, sand, gravel)
			Qs	Aeolian sand
	UNDIFFERENTIATED		Czg	Gravel
			Czd	Duricrust (silcrete, laterite)
	TERTIARY	Undifferentiated	?T	Clay
		Undifferentiated	T	Sandstone, chert
		Old Cork Beds	To	Sandstone, clay, limestone.
		Horse Creek Formation	Th	Limestone
		Springvale Formation	Tv	Silicified clay, chert, limestone.
		Moses Sandstone	Ts	Sandstone, opal, chalcedony
MESOZOIC	? UPPER CRETACEOUS	Winton Formation	Kμw	Arkose, siltstone, arkosic limestone
	LOWER CRETACEOUS	Mackunda Beds	Klm	Arkose, siltstone, arkosic limestone
		Wilgunya Formation: Upper	Klw_2	Siltstone, claystone, silty limestone
		Wilgunya Formation: Toolebuc Member	Klw(t)	Limestone, calcareous shale (Cross section only)
		Wilgunya Formation: Lower	Klw_1	Siltstone, claystone, silty limestone. (Cross section only)
		Longsight Sandstone	Kll	Sandstone, pipeclay (Cross section only)

- Synclinal axis, position approximate
- Geological boundary, position approximate.
- 8 Strike and dip of strata
- Fault, position approximate
- ? Fault, inferred.
- GAB 786 Macrofossil locality and reference number
- GAB 705 Plant fossil locality and reference number
- GAB 787 Fossil wood locality and reference number
- O Opal mine, glory hole.
- Road
- Vehicle track.
- • A Artesian bore
- • S.A. Sub-artesian bore
- B •(P.D.) Bore, position doubtful
- Dud bore
- T Earth tank
- Dam
- Building
- Yd. Yard
- Windmill
- Fence
- Dog netting fence
- Landing ground
- • 318' Instrument levelled height } feet above mean sea level
- • 556' Barometric spot height } feet above mean sea level
- Sand dunes
- Dry stratigraphic test well
- × GAB 707 Sample locality and reference number

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 & Geophysics, Department of National Development. Aerial photography by the Royal Australian Air Force; complete vertical coverage at 1:46,500 scale. Transverse Mercator Projection.



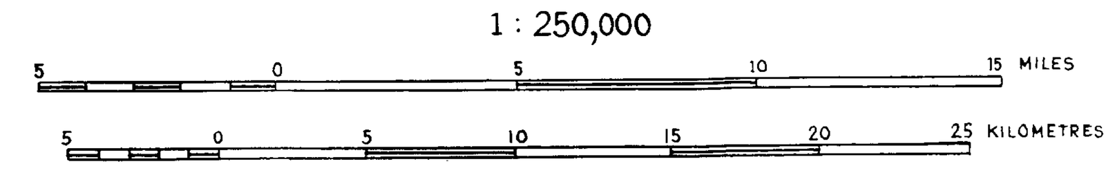
INDEX TO ADJOINING SHEETS
SHOWING MAGNETIC DECLINATION

BOULIA	MACKUNDA	WINTON
SPRINGVALE	BRIGHTON DOWNS	MANEROO
MACHATTIE	CONNEMARA	JUNDAH

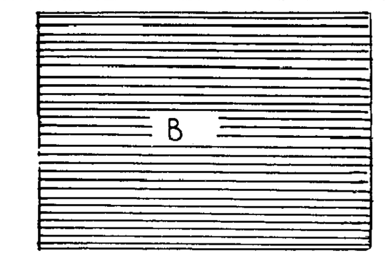
6°E 6°30' 7°E

ANNUAL CHANGE 2'E

Scale
1:250,000



GEOLOGICAL RELIABILITY DIAGRAM

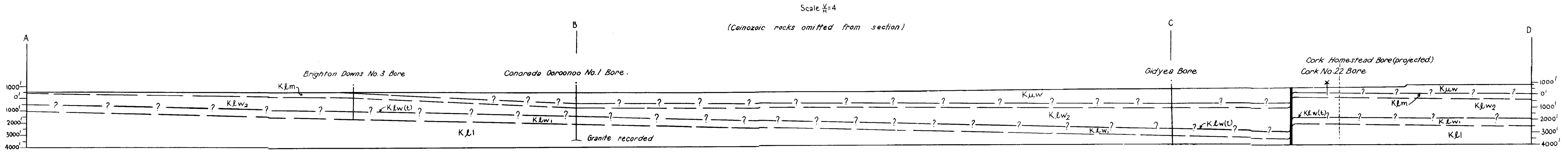


B *Detailed reconnaissance - numerous traverses and air-photo interpretation.*

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

Section ABCD
Scale V/H = 4

(Cainozoic rocks omitted from section)



BRIGHTON DOWNS SF 54-15