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GEOLOGICAL SURVEY OF QUEENSLAND
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OCCURRENCE OF PETROLEUM AND
NATURAL GAS IN QUEENSLAND

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PREFACE



In the October 1952 number of the Queensland Government Mining Journal there appeared a paper by W. D. Mott, Senior Geologist, Geological Survey of Queensland, entitled "Oil in Queensland." This paper covered the stratigraphy and structure of the possibly oil-bearing sedimentary basins, gave an outline of the history of the petroleum search in this State, and presented a summary of the known occurrences of petroleum. The paper concluded with a discussion on the State's petroleum potentialities.

Mr. Mott's original paper included detailed accounts of all wells drilled primarily for oil or gas, as well as tabulated data on oil, gas and water analyses, which from various considerations were not published.

In the present report the original published material has been revised and brought up to date and the detail that was omitted from the earlier paper has been included. An exhaustive bibliography has been added.

The revision and additional material are the work of Messrs. J. H. Brooks, T. J. Madden and R. J. Allen.

The present paper brings the history of the oil search up to date as at the end of December, 1959.

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PART 1

INTRODUCTION

Numerous reports of traces of wax, oil and gas from bores are on record, many of which have been officially discounted, some confirmed by Government Chemical Laboratory analysis and others not investigated officially. Most of the occurrences are in insignificant quantity from a commercial point of view. Such occurrences are not claimed to be indications of near-by commercial accumulation, but it is suggested that they prove the wide-spread existence of sediments capable of generating petroleum.

A large area of Queensland is covered by Cretaceous and younger sediments; in this area correlation of buried rocks has to be based very largely on artesian bore records which usually take the form of drillers' logs. Scarcity of fossil evidence leaves only lithology and aquifers on which to base the correlations, and as most water bore logs are not detailed, the interpretation is of necessity somewhat conjectural.

Sedimentary rocks occupy an area in excess of 450,000 square miles in Queensland. Of over 12,000 water bores drilled in this area more than half are less than a thousand feet deep. The deep bores are usually many miles apart even in the more closely drilled areas, and, except in areas of shallow basement, very few have completely penetrated the sedimentary cover.

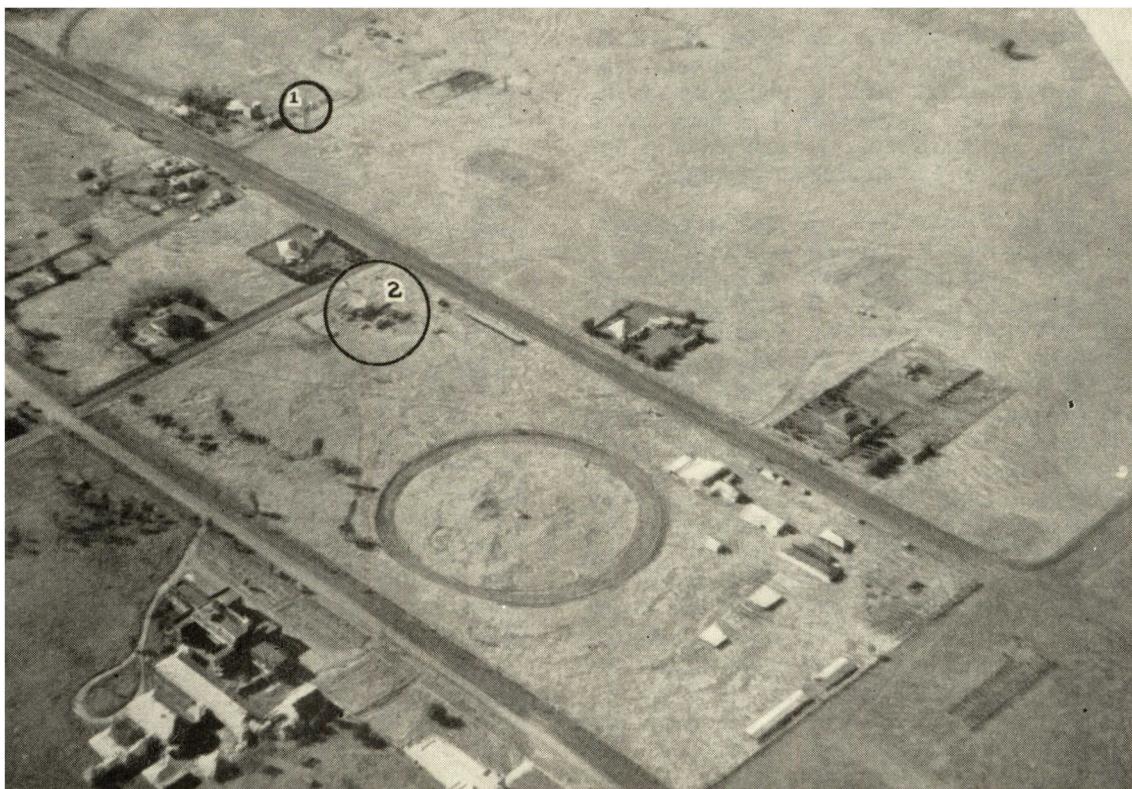
Sixteen figures accompany this paper. Figure 1 shows the distribution of all natural gas and petroleum occurrences verified by chemical analysis and the location of some reported occurrences which are considered important. The locations of all wells drilled specifically to search for oil and gas are shown. Figure 2 shows the geological elements of Queensland. Figure 3 shows a series of E-W sections through the Great Artesian Basin. The remaining figures are generalised stratigraphic logs of the more recent wells.

Lists of gas, oil and water analyses and a complete bibliography, are included.

HISTORY

During the early days of settlement in inland Queensland, bores drilled for water occasionally produced traces of oil and gas, but it was not until gas in quantity was found at Roma that the search for oil began.

In 1897 a town-water bore was drilled on Hospital Hill about a mile to the west of Roma. Later, in 1899, the water supply having proved inadequate, a further bore, Queensland Government No. 2, was drilled close by to determine the water-bearing potentialities of the sediments below the main aquifer. During the drilling operations a flow of gas was struck at 3,683 ft. which was measured at 44,600 cu. ft. per day. The



Aerial view of Hospital Hill, Roma, showing:—(1) Site of the old Government Bore, and (2) A.A.O. No. 4.

gas was not utilised and apparently ran to waste. Subsequently, in 1904, the flow was again measured, this time at 72,000 cu. ft. per day. In 1906 a gasometer was erected and it was planned to harness the gas flow to provide lighting for the town. However, after 10 days the flow of gas stopped suddenly and subsequent examination of the borehole with plummets indicated a blockage at 3,282 ft. After this the scheme for lighting the town was abandoned.

The Roma Mineral Oil Co. was formed in 1907 and with a State Government subsidy a well, Q.G. No. 3, was drilled for oil on Hospital Hill, 250 ft. from the water bore. Gas was struck at 3,702 ft., in a much greater volume than in Q.G. No. 2. Before the flow could be controlled, the gas was ignited by the fire from the steam plant and 6 weeks elapsed before the blaze was extinguished. Gas still continued to flow in undiminished volume after the fire, the pressure being such that it was impossible to get the tools into the hole to resume drilling. The hole was capped and left for three days; when the hole was opened there was no flow of gas. Drilling was continued for 10 ft., then the tools became stuck and were lost. In the subsequent fishing operations, two more sets of tools were lost in the hole and finally the well was abandoned.

At this stage the Queensland State Government consulted a number of petroleum technologists from Great Britain and the United States to determine the future programme in the Roma district. In the light of the knowledge at that time it was assumed that a very thick sedimentary section was present at Roma. Bores had penetrated marine Cretaceous and fresh-water Jurassic sediments to 3,700 ft. without any indication of basement, and there seemed every reason to suppose that a thick sequence of Triassic, and Permo-Carboniferous marine rocks, such as crop out to the north of Roma, existed under the area.

After careful consideration of the consultants' advice, the State Government decided to drill further deep bores. The area around Roma was proclaimed an oil reserve, and a site for No. 4 well was selected on Hospital Hill 400 ft. from No. 3 well. Drilling began in January 1916, and by the end of the year had reached 1,700 ft. At the end of 1917 the depth of the well was 2,875 ft. Drilling was suspended during 1918, and in 1919 the well was deepened to the gas horizon. There was a slight showing of gas between 3,610 ft. and 3,703 ft. but this was not fully tested for fear of collapse of the hole. At 3,702 ft. the drill stem broke and the tools were lost in the hole. In 1920 the casing was cut above the lost tools at 3,624 ft. and while the casing was being pulled, a large flow of gas broke into the well, seemingly from below. The extractable gasoline content of the gas was found to be 1.22 pints per 1,000 cu. ft. During 1921 an attempt was made to side-track the old hole and drill ahead, but during these operations the gas flow failed and attempts to revive it were unsuccessful. In 1922 work was continued and the

hole side-tracked, but difficulties in controlling the flow of water finally resulted in the abandonment of the well.

In 1920 a committee had been appointed to study the position at Roma. In the report of February 1921, two noteworthy points were brought out:

- (i.) "Apart from the petrol absorbed from the gas no liquid oil has yet been noticed in any material yielded from this (No. 4) bore."
- (ii.) While natural gas fields result from petroleum deposits some gas fields are known which do not yield any oil. Other natural gas fields yield oil only in small quantities and over small areas of the gas field. The finding of a natural gas containing petrol of the composition found at Roma is looked on as a very strong indication of the close proximity of oil. It is not, however, proof of such proximity and is certainly no proof of the presence of oil in commercially payable quantities. The most that can be said is that the fact that the gas contains petrol materially increases the prospects of success in boring for it."

The soundness of this latter statement has been fully justified by subsequent drilling and, even with the knowledge gained since that time, it could hardly be bettered today.

Despite the oil reserve placed around Roma, one company, Lander Oilfields (Australia) Ltd., was granted a permit to drill near Orallo, 25 miles northwest of Roma. During the period 1923 to 1926, this company drilled three holes, the deepest of which (No. 3) bottomed in granite at 2,660 ft. Later in 1926 the No. 1 well was deepened and also struck granite at 2,631 ft. Showings of oil and gas were logged in these wells and it was reported that an "oil sand" was penetrated, but nevertheless the wells were abandoned.

The presence of basement at so shallow a depth completely altered the concept of the geology of the district and necessitated a revision of the existing ideas on the potentialities of the region.

In 1924-25 Dr. A. Wade, adviser on petroleum to the Commonwealth, spent three months investigating the State's petroleum possibilities, visiting the Beaudesert-Boonah, Tewantin, Wolston, Longreach and Miles-Roma-Injune areas. Of these areas, Dr. Wade considered the Miles-Roma-Injune to be the only one worthy of further attention. On the evidence before him he estimated the chances of obtaining oil in this area at 30 per cent.

In 1926 the State Government withdrew the reservation placed on the Roma district. A new company, the Roma Oil Corporation, took over the plant and operations of Lander Oilfields (Australia) Ltd., and its first well, R.O.C. No. 1 (Hospital Hill), was spudded in close to the old Roma Mineral Oil

Company's No. 1 well on Hospital Hill. In selecting the location for this well, L. C. Ball of the Queensland Geological Survey obtained, from pits, dip evidence which he considered indicated that Hospital Hill coincided with a gentle structural dome. In 1927 a large flow of gas was struck at 3,703 ft., and flowed under control at 350 p.s.i. Light oil condensed at the mouth of the blow-off pipe and the petrol content of the gas was measured at 2·6 pints per 1,000 cu. ft. On deepening the well, production of gas was increased to 1,250,000 cu. ft. per day. At 3,869 ft. the drill passed out of the gas sand into metamorphosed rocks with quartz veins, which evidently represented basement. In 1928 an absorption plant was erected to recover the gasoline content of the gas and the liquid was sold directly as a motor spirit from a pump. Efforts to revive the gas flow after silting and to shut off water from the hole, were unsuccessful, and the well was abandoned in 1930.

The partial success of this well produced a minor oil boom and all the country around Roma was taken up in permits and leases. During 1928 seven deep tests were begun. Roma Oil Corporation began a second well (R.O.C. No. 2) on Hospital Hill; this encountered bedrock at 3,955 ft., apparently without striking any appreciable gas flow. The well was taken to 4,005 ft., the last core consisting of quartz-veined, crushed and foliated metamorphosed shale and grit. Another well, Lander Oilfields (Australia) Ltd. No. 4, drilled on the south flank of Hospital Hill, produced a small quantity of gas, which was reported to be more highly petroliferous than that in R.O.C. No. 1. This well bottomed at 4,109 ft. in metamorphosed shale and grit.

In 1929, 20 deep tests were drilling in the Roma district, but towards the end of the year activity declined as more and more dry holes were completed. Numerous shows of oil and gas were obtained from many of the wells, but in only one well, drilled by the Roma Blocks Oil Co. near Mt. Bassett, 7 miles northeast of Roma, was the showing appreciable. An "oil-sand" yielding 10 gallons of oil per day, but no gas, was reported at 3,445 ft. to 3,447 ft. (total depth).

Before the end of 1930, the centre of activity had moved to Blythdale, 10 miles east of Roma. Here five wells were drilled by different companies on what was believed to be a dome structure in Mesozoic rocks. The deepest well bottomed in granite at 4,130 ft. Good showings of oil were obtained in arkosic grits slightly above basement but in most cases the artesian water could not be shut off from the wells. Production was in too small a quantity to be payable and the area was abandoned.

Early in 1931 gas was again produced from R.O.C. No. 1, at the rate of 500,000 cu. ft. per day. The gas was run through the absorption plant for three months. Later R.O.C. No. 3 was brought in, and the combined production was put through the plant. The 27,000,000 cu. ft. of gas produced yielded 4,797 gallons of natural gasoline. These operations ceased

towards the end of the year when diminishing production made the project uneconomical. Up to this point in the search for oil the sum total of all production had been 30,000 gallons of natural gasoline from the wells on Hospital Hill and several hundred gallons of oil from the wells at Blythdale and near Mt. Bassett. A quantity of oily wax had been collected from the Town Water Bore at Longreach.

In 1930, Oil Search Ltd. began operations, with geological surveys in the Roma district and scout drilling near Warooby. Some 43 bores, drilled to an average depth of 160 ft., confirmed a structure indicated by earlier scout drilling by Builders Ltd.

In March, 1934, Drillers Ltd., an associate of Oil Search Ltd., began drilling O.S.L. No. 1 (Warooby), 6 miles east of Roma. The well bottomed in granite at 3,794 ft. Wet gas was produced at the rate of 500,000 cu. ft. per day but the well was closed down after testing in 1935. In March, 1952, the well blew out and was sealed in June, 1952.

In July, 1934, the Government again proclaimed an oil reserve in a rectangular area of 40,000 sq. miles around Roma; the legislation governing the search for oil in Queensland was amended and made more stringent, to prevent operations by speculative concerns with insufficient financial backing. In September, 1934, Oil Search Ltd. was granted an Authority to Prospect within the proclaimed area. Engaging the services of Dr. F. Reeves and D. Condit, it began regional geological surveys over an area extending from Roma to Springsure. Several good structures were found in the area and two sites were selected for testing. These were near Hutton Creek, approximately 60 miles north of Roma, and on Arcadia Station, 20 miles further to the north.

O.S.L. No. 2 (Hutton Creek) began drilling with cable tool plant in October, 1935, and by June, 1936, had reached 3,715 ft. At this depth, it was considered unsafe to continue drilling with this equipment and operations were temporarily suspended. Drilling of the Arcadia structure began in August 1936, and reached the limit of the plant at 4,110 ft. in December, 1937. By this time the Commonwealth Government was assisting the company financially to enable it to continue operations. At the beginning of 1938, drilling at O.S.L. No. 2 (Hutton Creek) was resumed, using rotary plant on loan to the company from the Government. The well was deepened to 4,688 ft. and at this depth was abandoned as a dry hole.

The rotary plant was transferred to O.S.L. No. 3 (Arcadia) and the well was deepened to 6,025 ft. Showings of oil and gas were obtained from several depths and very considerable flows of wet gas were recorded from three different sands between 2,500 ft. and 2,700 ft. These shows were very significant as this was the first time that oil indications had been found in rocks older than those present in the Roma district. Here the rocks were of Permian age, the gas being found some thousands of feet above basement, suggesting the possibility that the Roma shows might be due to the migration of the gas from Permian

deposits elsewhere, or, at the very least, that the gas deposits were not confined to the lower beds of the Mesozoic sequence as found at Roma.

The lowest of the gas sands encountered—between 2,671 ft. and 2,697 ft.—had the largest flow of gas, measured at between 3,000,000 and 4,000,000 cu. ft. per day at a pressure of nearly 500 p.s.i. Six months later when measured with new equipment, the gas flow was found to be 2,418,000 cu. ft. at 455 p.s.i. pressure. At the time, the utilisation of this gas was considered, but Oil Search Ltd. decided to concentrate the search for oil in Papua and New Guinea and surrendered its Queensland holdings.

During the preceding 35 years the search for oil had been centred mainly around Roma but some drilling had been done in the Beaudesert and Longreach areas. In 1922 oil indications were reported from a bore near Beaudesert and several years later Beaudesert Boring Co. No. 1 was put down and abandoned in coal measures at 1,437 ft. as a dry hole.

In the town of Longreach the water from the Town Water Bore No. 2 had been bringing up blobs of paraffin wax for many years. In 1928 Longreach Oil Wells Ltd. drilled a well close to the water bore. The well, which bottomed in granite at 3,298 ft., penetrated between 3,227-3,230 ft. an horizon which yielded wax at the rate of two gallons per day. Later in 1932, Oil Search Ltd. carried out scout drilling near Longreach, and large parts of the area were photographed from the air. By 1934 all activity in the area had ceased.

Between 1930 and 1934 a well was drilled at Wellington Point near Brisbane to test reported oil shows found in a water bore nearby. The well bottomed in metamorphic rocks at 3,950 ft. Gas and oil films were recorded from various horizons but in no significant quantities and the well was abandoned.

In October, 1935, Murilla Oil Co. began drilling with percussion tools, 4 miles west of Miles.

In November, 1939, the Queensland Government further amended that part of the Mining Act pertaining to the search for oil. The main feature of the amendments was a substantial increase in the size of the area granted for general investigation, and prospecting permits for areas of 200 square miles in which drilling could be done.

Encouraged by this new legislation the Shell Company applied for and was granted an Authority to Prospect covering 136,000 sq. miles. A subsidiary, Shell (Queensland) Development Pty. Ltd., was formed, and exploration work began in May, 1940. Reconnaissance surveys were made over the area covered by the Authority with investigations sometimes extending outside these limits; gravity surveys were also made and air photographs were taken of much of the area. By 1942 several structures had been located between Roma and Springsure and Petroleum Prospecting Permits were taken out to cover these areas. However, due to war conditions and the

unavailability of drilling equipment, operations were suspended in 1943. When work was resumed in 1947, structure core-drilling was carried out over these structures in an effort to locate a culmination suitable for drilling. Finally the Morella structure was selected, and drilling began in April, 1950. The well was abandoned as a dry hole at 4,634 ft. in February, 1951. Further drilling was contemplated on the Comet Anticline but the project was abandoned after a seismic traverse across the structure had indicated basement at a shallow depth. The company relinquished its permits and withdrew from the search in April, 1951.

In August, 1948, Condamine Oil Ltd. began drilling with percussion tools at Speculation, 24 miles north-east of Chinchilla.

In 1952 Associated Australian Oilfields N.L. entered the field and began drilling A.A.O. No. 1, between Roma and Warooby, to test a structure indicated as a gravity high by a Bureau of Mineral Resources gravity meter survey made during 1947-48, and supported by a seismic survey by the Bureau in 1950 on behalf of Roma Blocks Oil Co. N.L. and other associated companies. Basement was met at 3,879 ft. and small gas shows were recorded at 3,713 and 3,750 ft. The well was abandoned in August, 1952. Two further wells had been drilled by the end of 1953, both being abandoned as dry holes.

Early in 1953 an Authority to Prospect covering 5,700 square miles of the Maryborough Basin was taken out by the Lucky Strike Drilling Co., of Texas, U.S.A. This was the first time that attention had been directed to this part of Queensland, except for several very shallow bores which were drilled near Bundaberg in 1923.

The discovery of oil in commercial quantities at Rough Range in Western Australia in December, 1953 led to an intensification of the search for oil in Queensland. Many new companies were formed and large areas of the State were taken up under oil prospecting titles. By December, 1954, Authorities to Prospect covering 340,000 square miles, had been granted to fourteen different companies.

During 1954 and 1955 eighteen wells and twenty-four scout bores were drilled or drilling in Queensland. In the Longreach area four wells were drilled to basement to investigate the showings of wax which had been obtained in L.O.W. No. 1. One hundred and ten miles south-west of Longreach, the Westland Oil Co. drilled three wells, two of which penetrated to basement, to test the reported occurrence of wax in water bores in the district. The Lucky Strike Drilling Co. drilled two wells in the Maryborough Basin, on structures in Cretaceous sediments. In the Roma area, Associated Australian Oilfields N.L. drilled three more wells; only one, A.A.O. No. 4 (Hospital Hill) gave any significant showings of gas. Australasian Oil Exploration Ltd. drilled two wells on Reid's Dome and one on the Consuelo Anticline; these structures are located in Permian strata approximately 50 miles south-east of Springsure. Winneills

Pty. Ltd. drilled a well at Wellington Point near Brisbane, and several shallow scout bores for gas in the Mount Walker district, 20 miles south-west of Ipswich.

Numerous small showings of oil and gas were obtained from these wells, but only two were noteworthy. A.A.O. No. 4 (Hospital Hill) struck gas at 3,700-3,716 ft., which on testing recorded a maximum flow of 870,000 cu. ft. per day through a $\frac{3}{4}$ -in. bottom hole choke. However, in view of the number of wells that had produced gas from Hospital Hill previous to this, the occurrence did not add much to the existing knowledge. In the A.O.E. No. 1 well, on Reid's Dome, dry gas was struck at 466 ft., and flowed at the rate of 550,000 cu. ft. per day.

There was little drilling in 1956. Murilla Oil Ltd. No. 1 (Boyanda) which had been drilling since 1935, was abandoned as a dry hole at 4,782 ft. Mackay Oil Prospecting Syndicate began drilling a deep scout bore (No. 5) at Cape Hillsborough. Shallow scout bores were drilled near Mackay (Mackay Oil Prospecting Syndicate), Mt. Walker and Bald Hills (Winneills Pty. Ltd.) and Twin Hills (Providence Oil Pty. Ltd.)

In 1957, five wells and four scout bores were drilling or drilled. A.A.O. No. 7 well was drilled at Arcadia, via Injune, to 3,280 ft. South Pacific Ltd. drilled S.P.L. No. 1 at Birkhead, via Tambo, to 5,185 $\frac{1}{2}$ ft. Zinc Corporation Ltd. drilled Z.C.L. No. 1 at Weipa in western Cape York Peninsula, to 3,243 ft.



Geophysicist of Mines Administration Pty. Ltd.
operating Worden gravity meter.

Frome-Broken Hill Co. Pty. Ltd., Associated Australian Oilfields N.L. and Associated Freney Oil Fields N.L., in a joint venture, drilled F.B.H. No. 1 at Wyaaba, via Normanton, to 2,822 ft. All of these wells were abandoned as dry holes. M.O.P.S. Scout Bore No. 5 (Cape Hillsborough) was abandoned as a dry hole at 2,440 ft. Other scout bores were drilled at Talbalba, via Cunnamulla (Australian Oil and Gas Corporation Ltd.), Ray, via Quilpie (L. H. Smart Oil Exploration Pty. Ltd.) and Cribb Island, near Brisbane (Standard Gas Pty. Ltd.).

In 1958, three wells and nine scout bores were drilled or drilling. Associated Australian Oilfields N.L. drilled A.A.O. No. 8 at Karumba, via Normanton, to a final depth of 2,364 ft. Drilling of C.O.L. No. 1 (Speculation) was suspended to allow change over from percussion to rotary equipment. Longreach Oil Ltd. drilled L.O.L. No. 5 at Balmoral, near Longreach, to a final depth of 1,367 ft. Scout bores were drilled at Canaway Downs, via Quilpie (L. H. Smart Oil Exploration Co. Ltd.), Cribb Island, Pinkenba and Gumdale (Standard Gas Pty. Ltd.) and Plevna, via Mackay (W. C. and H J. Walz). Publication of the discovery, in the middle of Great Artesian Basin, of large domal structures, awoke much interest in the oil possibilities of Queensland. By the end of 1958, nearly the whole of the State had been taken up under oil prospecting titles.

In 1959, five wells and twenty-eight scout bores were drilled or drilling in Queensland, and one deep



Reflection seismic shooting by Geosurveys of Australia
Ltd. near Beaudesert, S.E. Queensland.

well (D.F.S. Innamincka No. 1) was drilled in South Australia, adjacent to the Queensland border. Australian Oil and Gas Corp. Ltd. deepened an artesian water bore at Mirri Mirri, via Meandarra, for stratigraphic information. Humber Barrier Reef Oils Pty. Ltd. drilled a stratigraphic well (H.B.R. No. 1) to final depth of 1,898 ft. on Wreck Island, off Gladstone. Longreach Oil Ltd. drilled L.O.L. No. 6 to final depth of 1,268 ft. at Balmoral. Associated Freney Oil Fields N.L. began drilling near Cooroora in October; progress depth on 31st December, 1959, was 2,822 ft. Delhi Australian Petroleum Ltd., Frome-Broken Hill Pty. Ltd. and Santos Ltd. began drilling a well near Betoota; progress depth on 31st December, 1959, was 1,701 ft. Condamine Oil Ltd. continued washover and milling operations in C.O.L. No. 1 (Speculation). Scout bores were drilled at Canaway Downs and Gumba (L. H. Smart Oil Exploration Co. Ltd.), Gumdale and Cribb Island (Standard Gas Pty. Ltd.), Burketown and Mornington Island (Santos Ltd. and Delhi Australian Petroleum Ltd.).

SEDIMENTARY BASINS

Sedimentary basins occupy most of the area of the State. They include the Georgina, Hodgkinson, Star, Drummond, Yarrol, Bowen, Great Artesian, Esk, Maryborough, Moreton and Laura Basins.

Georgina Basin

The name Georgina Basin is used in a loose sense, to indicate the area south and west of the Cloncurry Massif, in which Lower Cambrian to Lower Ordovician marine sediments crop out.

Hodgkinson, Star and Drummond Basins

These are three Middle Palaeozoic basins in north-eastern and central Queensland. Sedimentation began in upper Middle Devonian times and continued into the Lower Carboniferous (except possibly in the Hodgkinson Basin, where proof is lacking). The Hodgkinson Basin contains marine and continental sediments, including conglomerate, greywacke, sandstone and shale, with some limestone. These sediments have been strongly folded, intruded by granite, and mineralised. In the Star Basin, the succession is probably paralic. It generally begins with a thick coralline limestone of upper Middle Devonian age; this is followed by conglomerate, sandstone and shale, with plant beds. In the Drummond Basin, the succession consists of mainly continental conglomerate, sandstone, shale and possibly volcanics; marine beds crop out in the north-east.

Yarrol Basin

The Yarrol Basin extends from Broad Sound through Rockhampton and Yarrol to south of Mundubbera, where it disappears under the Great Artesian Basin, to reappear near Texas on the New South Wales border. It originated as an intra-montane marine basin, at the same time as the Drummond Basin, i.e. at the beginning of the upper Middle

Devonian. Sedimentation continued into the Permian. The strata include andesite, andesitic tuff, shale, grit, sandstone and limestone.

Bowen Basin

The Bowen Basin began as a great miogeocline in the early Permo-Carboniferous. In the north, the sequence consists of thick continental volcanics, followed by marine beds with intercalated coal measures, followed by thick Permian coal measures. The Bowen Basin plunges southward under the Great Artesian Basin. The Springsure Shelf extends westward from the Bowen Basin into the eastern part of the old Drummond Basin. The Triassic sediments of the Bowen Basin are continental shale and sandstone, continuous to the south with the Triassic sediments of the Great Artesian Basin. Downwarping of the Bowen Basin had ceased by the Jurassic.

Great Artesian Basin

The Great Artesian Basin is the largest artesian basin in the world, covering a known land area of 670,000 sq. miles, of which an area of some 430,000 sq. miles lies in Queensland. Subsidence began in the Permian, and may still be in progress. The Great Artesian Basin is divided into three lesser basins: the Carpentaria, Eromanga and Surat Sub-Basins, by two main ridges of bedrock: the Euroka and Nebine Ridges.

Sedimentation began in late Permian times in the area south-west of the Bowen Basin, and continued into the Triassic. In the Upper Triassic, a freshwater transgression greatly extended the limits of the basin. In the Lower Cretaceous, a marine transgression extended the limits of the basin to their maximum. In the Upper Cretaceous, there was a return to continental sedimentation.

Large folds exist in the deeper part of the basin, in the south-western part of the State. The fold axes generally trend north-east; the larger structures are up to 50 miles in length; closure at surface is up to 1,000 ft.

Esk Basin

The Esk Basin may have formed as a rift at the beginning of Permo-Carboniferous times. The succession includes Permo-Carboniferous marine sediments, and Triassic continental andesitic conglomerate and tuff, conglomerate, sandstone, shale and acid volcanics. Sedimentation ceased in the Upper Triassic.

Maryborough Basin

The Maryborough Basin began to subside in the late Palaeozoic. Sedimentation was marine in the Permo-Carboniferous, continental from Triassic to early Cretaceous, marine in the Aptian, and continental again in the Upper Cretaceous.

Moreton Basin

The Moreton Basin probably began to downwarp in early Triassic times. Basic volcanic flows and tuff

are overlain by Middle Triassic breccia, shale, conglomerate, tuff, sandstone and coal measures, Upper Triassic sandstone, and Jurassic sandstone and coal measures. Sedimentation ceased in the Jurassic.

Laura Basin

Subsidence of the Laura Basin possibly began early in the Jurassic. Sedimentation appears to have been continental until the Aptian, when there was a marine incursion.

Tasman Geosyncline

The Tasman Geosyncline was a great mobile belt, which throughout the Palaeozoic, occupied what is now the eastern coastal portion of Australia. The Queensland portion included the Hodgkinson, Star, Drummond, Yarrol, Bowen, Esk and Maryborough Basins.

STRATIGRAPHY

Precambrian

Precambrian rocks crop out mainly in the Cloncurry, Georgetown and Cape York Peninsula areas. They range from high-grade metamorphics (Archaeozoic?) to unaltered sediments (Upper Proterozoic?).

Certain unfossiliferous low-grade metamorphics in the structural highs of the Tasman Geosyncline may also be of Precambrian age.

Cambrian-Ordovician

Fossiliferous Cambrian and Ordovician strata crop out only in the Georgina Basin. They consist mainly of marine limestone, dolomite, sandstone and siltstone, and range from Lower Cambrian to Middle Ordovician in age. In part, they are richly fossiliferous. These Cambrian-Ordovician beds generally lie sub-horizontally and are unmetamorphosed. They are potential source beds for petroleum.

Some of the apparently unfossiliferous low-grade metamorphics cropping out in the structural highs of the Tasman Geosyncline may belong to the Cambrian and Ordovician.

Silurian

Silurian rocks crop out only in the eastern part of the State, within the area of the Tasman Geosyncline. In the Upper Silurian-Lower Devonian, 20,000 ft. of limestone, shale, sandstone and conglomerate were laid down on the Chillagoe Shelf. In part, the limestone is abundantly fossiliferous, and appears originally to have been biohermal. The strata are strongly folded and slightly metamorphosed.

Some of the apparently unfossiliferous low-grade metamorphics of the structural highs of the Tasman Geosyncline may belong to the Silurian.

Devonian

Devonian strata, like the Silurian, crop out only in the eastern part of the State. The thick limestone, shale, sandstone and conglomerate strata of the

Chillagoe Shelf extend up into the Devonian. In the coastal highs, Lower or lower Middle Devonian andesitic tuff and limestone appear to lie conformably on Silurian(?) quartzite. Upper Middle Devonian and Upper Devonian limestone, tuff, sandstone, conglomerate and shale are found only in the Drummond, Star, Hodgkinson and Yarrol Basins; only in the Yarrol Basin are these sediments entirely marine.

Probable mid-Devonian serpentines are associated with epi-lower Middle Devonian earth movements.

Lower Carboniferous

Lower Carboniferous strata lie conformably on the Upper Devonian in the Drummond, Star, Hodgkinson and Yarrol Basins; they are mainly continental in the Drummond, Star and Hodgkinson Basins, and marine in the Yarrol Basin.

Middle Carboniferous (Moscovian) marine beds crop out in the Yarrol Basin and near Mt. Barney in the far south-east of the State.

Permo-Carboniferous

This term is used because of doubt about how much of the strata are Upper Carboniferous and how much Permian in age.

In the Bowen Basin, the Bowen System consists of volcanic rocks, and marine and continental sediments. The distribution of the various lithofacies is fairly well-marked, with continental sediments to the north and west, marine sediments to the south and east, and both marine and continental sediments between these areas. The marine sediments are essentially miogeosynclinal.

The Lower Bowen consists mainly of volcanics, which range from basalt through andesite to rhyolite, but also contains continental and marine sediments; the thickness is about 5,000 ft. The Middle Bowen consists of about 3,500 ft. of continental and marine sediments; at the base are the Collinsville Coal Measures, overlain by predominantly marine sediments. The Upper Bowen consists essentially of continental beds with coal seams, and is about 10,000 ft. thick.

In the Styx River area, the Bowen sequence is considerably thicker than in the Bowen Basin proper.

On the Springsure Shelf, the Bowen sequence consists of continental glacials, overlain by sandstone and shale, with a single, short, narrow marine incursion from the Bowen Basin.

In the Great Artesian Basin, Permo-Carboniferous sediments have been met in bores at Wallumbilla and Innamincka (in north-eastern South Australia), and possibly at Springleigh, Hughenden and Burketown.

In the Yarrol Basin, sandstone and limestone are followed by volcanics. In the Esk Basin, thick volcanics and some thin marine strata occur. In the Gympie area the strata consist of greenstone, shale, greywacke, conglomerate and limestone.

Epi-Permian granites intrude the coastal ranges.

Triassic

The Triassic strata crop out only in the south-eastern part of the State, but have been met in bores over much of the Great Artesian Basin. They are entirely continental, and include shale, sandstone, conglomerate and volcanics.

In the southern part of the Bowen Basin, and in that part of the Great Artesian Basin south of the Springsure Shelf, the older Triassic sequence rests with slight unconformity on the Permo-Carboniferous, and consists of quartz sandstone (Clematis Sandstone), 400 ft. thick, followed conformably by shale and sandy shale (Moolayember Shale) over 1,000 ft. thick. These older Triassic beds are overlain unconformably by Upper Triassic quartz sandstone and shale (equated with the Bundamba Group of the Moreton Basin), about 800 ft. thick. These beds are widespread in the Eromanga and Surat Sub-Basins, and contain the principal aquifer.

In the Moreton Basin, Middle Triassic coal measures (Ipswich Coal Measures), 4,000 ft. thick, are overlain unconformably by Upper Triassic continental sandstone and conglomerate (Bundamba Group), 750 ft. thick. In the Esk Basin, Lower and Middle Triassic volcanics, shale, sandstone and conglomerate are overlain unconformably by sandstone equated with the Bundamba Group. In the Maryborough Basin, Middle Triassic shale, sandstone and conglomerate are overlain by sandstone equated with the Bundamba Group.

Jurassic

Jurassic sediments crop out only in the eastern part of the State, but like those of the Upper Triassic, have been met in bores over much of the Great Artesian Basin. They are entirely continental.

In the Great Artesian Basin, the Upper Triassic beds are overlain conformably by up to 1,000 ft. of continental sandstone, silt and shale (equated with the Marburg Sandstone of the Moreton Basin). These beds are followed conformably by up to 1,350 ft. of continental calcareous shale, sandy limestone and coal measures (equated with the Walloon Coal Measures of the Moreton Basin). In the Carpentaria Sub-Basin possible Jurassic sandstone crops out near Croydon, and was met in Zinc Corporation Ltd. No. 1 (Weipa) well.

In the Moreton Basin, continental feldspathic quartz sandstone, silt and shale (Marburg Formation) overlie the Bundamba Group conformably, and are overlain conformably by continental shale, sandstone and coal measures (Walloon Coal Measures).

In the Maryborough Basin, coal measures equated with the Walloon are intruded by porphyrite and andesite.

In the Laura Basin, sandstone, conglomerate and shale with thin coal bands, are referred to the Jurassic.

Cretaceous

Cretaceous strata, both continental and marine, are very widespread in Queensland.

In the Great Artesian Basin, Upper Jurassic-Lower Cretaceous sandstone, shale and conglomerate (Blythesdale Group), up to 1,200 ft. thick, lie conformably on Jurassic or unconformably on older strata. They are continental in the lower half, and transitional to marine in the upper half. They are followed conformably by about 1,200 ft. of marine Lower Cretaceous blue shale with intercalated calcareous siltstone and limestone (Roma Formation, Lower Aptian; Tambo Formation, Middle-Upper Albian). In the Eromanga and Surat Basins, these beds in turn are followed conformably by Upper Cretaceous lacustrine shale, sandstone, limestone and coal seams (Winton Formation) up to 2,200 ft. thick. In the Carpentaria Sub-Basin, only Blythesdale, Roma and Tambo equivalents are known.

In the Maryborough Basin, thick trachytic and andesitic tuffs (Grahams Creek Volcanics) are overlain conformably by 6,000 ft. of marine shale, siltstone, sandstone and limestone (Maryborough Formation) of Lower Aptian age. These beds are followed conformably by Upper Cretaceous lacustrine sandstone and shale with coal (Burram Coal Measures).

Near Stanwell, west of Rockhampton, the Lower Cretaceous coal measures contain a very thin marine band of Valanginian age.

In the Laura Basin, probable Blythesdale and Roma equivalents are developed.

Cainozoic

Cainozoic continental sediments are widespread in Queensland. They consist mainly of thin Tertiary conglomerate, sandstone, mudstone and limestone, and Quaternary alluvium. The Tertiary succession in eastern Queensland also contains beds of oil shale of limited extent.

Tertiary marine sediments are known only from a bore (H.B.R. No. 1) on Wreck Island off Gladstone.

Volcanics, mainly plateau basalts and rhyolitic and trachytic masses, are widely distributed in northern and eastern Queensland. Some are interbedded with continental sediments.

STRATIGRAPHIC TABLE—BOWEN BASIN

Age	Collinsville Area (after Reid, 1929)	Comet Area (after Derrington and Morgan, 1959)	Springsure Area (after Springsure 4 mile geol. map—Hill, 1957)	Craew—Theodore Area (after Derrington and Morgan, 1959)
Triassic	Redcliffe Fmn ≡ Carborough Fmn		Bundamba Group —unconformity— Moolayember Shale Clematis Sandstone —unconformity— Rewan Fmn —unconformity—	≡ Bundamba Group —unconformity— ≡ Moolayember Shale ≡ Clematis Sandstone
Permo-Carboniferous	Bowen System Upper Bowen Coal Measures Middle Bowen Group Middle Bowen Marine "Series" Collinsville Coal Measures —unconformity— Lower Bowen Volcanics Mount Devlin Volcanics Mount Devlin Coal Measures Mount Tous-saint Volcanics	Taurus Fmn Crocker Fmn Maria Fmn	Bandanna Fmn Mantuan Downs Fmn Catherine Sandstone Ingelara Beds Serocold (≡ Aldebaran) Sandstone Cattle Creek Fmn ≡ Sirius Shale —unconformity? Staircase Sandstone Stanleigh Shale —unconformity— Orion Shale	Theodore Group Isla Fmn Kia-Ora Fmn Gyranada Fmn Back Creek Group Mount Steel Fmn Passion Hill Fmn Acacia Fmn Orange Creek Fmn Oxtrack Fmn —unconformity— Camboon Volcanics

STRATIGRAPHIC TABLE—GREAT ARTESIAN BASIN

Age	Carpentaria Sub-Basin (after Laing and Power, 1959)	Eromanga Sub-Basin (after Whitehouse, 1955)	Surat Sub-Basin (after Whitehouse, 1955 and Jenkins, 1959)
Tertiary	Lynd Fmn —unconformity—	Glendower Fmn —unconformity? Eyrian Fmn —unconformity?	Eyrian Fmn ≡ Telgazli Fmn —unconformity—
Cretaceous	Normanton Fmn Kamleroi Limestone Blackdown Fmn Gilbert River Fmn ≡ Wrotham Park Sandstone —unconformity—	Winton Fmn Tambo Fmn Roma Fmn Blythesdale Group —unconformity— Walloon Coal Measures Marburg Sandstone Bundamba Group —unconformity— Moolayember Shale Clematis Sandstone —unconformity?	Tambo Fmn Roma Fmn Blythesdale Group ≡ Griman Creek Fmn —unconformity— Walloon Coal Measures Marburg Sandstone Bundamba Group —unconformity— Moolayember Shale Clematis Sandstone
Jurassic	Inoruni Sandstone —unconformity—		
Triassic			
Permian	Croydon Granite and Croydon Felsite (Permian?) (basement)	Mantuan Downs Fmn Colinlea Fmn	

STRATIGRAPHIC TABLE—MARYBOROUGH BASIN

(After unpublished reports by W. F. Ridley and
W. L. Hawthorne)

Age	Formations
Tertiary	volcanics
	Elliott Fmn volcanics
Cretaceous	unconformity ?
	Burrum Coal Measures Maryborough Fmn unconformity ?
Jurassic	Grahams Creek Volcanics
	unconformity
Triassic	Watalgan Granite (intrudes Tiaro C.M.) Tiaro Coal Measures
	Myrtle Creek Sandstone Brooweena Fmn Stony Range Volcanics
Permian	unconformity
	Gympie Group

STRATIGRAPHIC TABLE—MORETON BASIN

Age	Formations
Tertiary	Silkstone Fmn Redbank Plains Fmn
	unconformity
Cretaceous	
Jurassic	Walloon Coal Measures Marburg Sandstone Bundamba Group
	unconformity
Triassic	Ipswich Coal Measures Andesitic volcanoes ?
	{ Blackstone Fmn Cooneana Fmn Tivoli Fmn Khlo Sub-Group, Brisbane Tuff ?
Palaeozoic ?	unconformity
	Metamorphics, intruded by granite

CONCLUSION

Many indications of oil and gas have been found in Queensland, but as yet no commercial accumulations are known. The most significant indications were found in the Roma district. The wet gas there may be of commercial importance, if sufficient reserves can be proved. This gas is believed to have been derived from Palaeozoic marine sediments elsewhere in the Great Artesian Basin and to have migrated to its present position. Most of the shows of dry gas in Queensland were probably derived from coal. The occurrences of wax are of little value in indicating the proximity of oil.

Over 200 wells and scout bores have been drilled for oil in Queensland, but few have been located on known structures. There have been unfortunate tendencies:

- (a) To drill close to water bores in which oil or gas shows were met,
- (b) To drill structures poorly defined from inadequate surface mapping or gravimetric survey only.

The 12,000 or more artesian and sub-artesian bores drilled in the Great Artesian Basin have not effectively tested it for oil and gas. The average depth of artesian bores only is about 1,400 ft. The sub-artesian bores generally are shallower. Many water bores penetrated the marine Cretaceous, but of these, few were drilled on the anticlinal structures now known to exist in the Basin. Most of the bores bottomed in aquifers well above the horizon of the known oil reservoir beds (Triassic) of the Roma area, or the potential reservoir beds in the Palaeozoic sediments believed to underlie the Mesozoic beds of the Eromanga and Surat Sub-Basins. Of the first 4,500 water bores put down in the Great Artesian Basin between 1887 and 1928, only 233 penetrated below 3,000 ft. The deepest was Springleigh No. 3, which reached final depth of 7,009 ft. in 1921; the second deepest, Bulgroo, bottomed at 5,517 ft.; only two other bores penetrated below 5,000 ft.

At the time of writing, December 1959, interest is centred on the deeper middle portions of the Great Artesian Basin, where 5,000 + ft. of Mesozoic sediments are believed to overlie an even greater thickness of Palaeozoic sediments, and many large domes have been discovered.

PART 2

WELLS DRILLED FOR OIL OR GAS

The following pages contain a review of all the wells drilled specifically for oil or gas in Queensland. It includes the location of the wells, depths, rig type, casing details, stratigraphy and showings, if any, which were found. The review is set out in alphabetical order with respect to the company or syndicate for whom the drilling was carried out, and conforms to the standard nomenclature adopted by the Queensland Department of Mines for reference to oil wells (i.e. name of operator—number of well—locality).

Tabulated at the end of this review, is a list of bores drilled for water or other purposes from which indications of oil or gas were verified by analysis, and a list of bores in which oil or gas has been reported and which are considered significant. Appended to the text are gas, oil and water analyses.

Alton Downs

See Melrose Petroleum Prospecting Co. Ltd.

Arcadia

See O.S.L. No. 3 (Arcadia)

Associated Australian Oilfields N.L. No. 1 (Roma) (Fig. 4)

This well is located on the eastern slope of Timbury Ridge, 34 chains north-west from the south-eastern corner of portion 143, parish of Roma, 4 miles east of the township. Rotary table elevation was 1,128 ft. above sea level, 5 ft. above ground surface.

The site was selected on a geophysical "high" defined by Bureau of Mineral Resources gravity and reflection surveys.

Drilling with rotary plant (Sullivan 300A) began on 20th March, 1952, and total depth of 3,897 ft. was reached on 10th August.

Post-Cretaceous clay and gravel were penetrated from surface to 45 ft. Roma Formation to 200 ft., Blythesdale Group to 770 ft., Walloon Coal Measures to 2,772 ft., Bundamba Group to 3,259 ft. and Moolayember Shale and possibly older sediments to 3,897 ft.

In the Waloons porous water sands occur from 1,230–1,390 ft., resting on greenish sandstone containing oolites of siderite or chamosite to 1,435 ft. Good coal seams occur between 1,933 ft. and 2,332 ft.

The base of the Bundamba Group is marked by a shale pebble conglomerate. Similar rock was met at 3,015–3,027 ft. in R.B.O. No. 3.

At 3,567 ft., 2½ ft. of dark-brown argillaceous sandstone was cored. On examination this proved to consist of rounded quartz grains in a brown- to honey-coloured clay matrix, part of which is bentonitic. A similar rock was found in cores from R.B.O. No. 3 at 3,311–3,314 ft. This may prove a good marker

bed because the clay matrix and rounded quartz suggest stable conditions.

At 3,878 ft. a hard, pale greenish-white, compact silt with siderite nodules and pellets was entered, which persisted to total depth, 3,897 ft. A thin section of this rock shows clay and siderite cement between quartz grains without sign of metamorphism. The rock appears to have suffered fracturing, subsequently filled with siderite. This rock may correlate with "oolitic carb. rock" noted at 3,721–3,729 ft. in O.S.L. No. 1 (Warooby), 34 ft. above granite basement, and is very similar to rocks penetrated in C.O.L. No. 1 well, north of Chinchilla, just above the base of the Mesozoic sequence.

Several packer tests were made without production. With packer seat at 3,733 ft. and bottom at 3,897 ft. a ten minute test gave gas at the rate of 6,500 cu. ft. per day at 90 p.s.i. flow pressure, but this was not in economic quantity. The only report of oil was at 3,785 ft. when a thin streak of fine sandstone showed a positive chloroform cut and fluorescence.

Water was not recorded, though normally it would be expected in sandstones of the Blythesdale Group, Walloon Coal Measures and Bundamba Group. No water was recorded during tests.

No samples of gas, oil or water were collected. The only casing used was 186 ft. of 9½ in. casing cemented to surface. The hole was kept in good condition by controlling the drilling mud; cores were taken at 50 ft. intervals to 2,991 ft. and continuously from 3,037 ft. Cores were cut with 5¾ in. bits and the hole reamed to 7½ in.

Before abandoning the well, cement plugs were set at 3,655–3,705 ft., 180–200 ft. and surface to 35 ft.

A.A.O. No. 2 (Roma) (Fig. 4)

This well is located on portion 473, parish of Euthulla, approximately ¼ mile east of R.B.O. No. 4, ½ mile south of R.B.O. No. 1, and 6·7 miles north-north-east of Roma. Ground level at the site is 1,092·5 ft. above sea level and rotary table elevation, from which all depths were measured, was 1,097 ft.

The well was spudded on the 6th October, 1952, using a Sullivan 300A rotary plant, and reached total depth of 3,616 ft. on the 3rd February, 1953. The objective of the well was to check and test oil sands logged in R.B.O. No. 4 at 3,497–3,508 ft., 3,566 ft. and 3,572 ft.

Drilling commenced with an 11 in. hole to 160 ft. and 9½ in. casing was run to 154 ft. and cemented to surface. From 160 ft. to 2,985 ft., 7½ in. hole was drilled and below this depth the hole was cored at intervals with a 5¾ in. bit, and then reamed to 7½ in. On reaching basement 6½ in. casing was run to 3,593 ft. and cemented over the bottom 440 ft., the casing being seated approximately 20 ft. below the lower oil sand.

The penetrated section consisted of Roma Formation to 261 ft., Blythesdale Group to 1,101 ft., Walloon Coal Measures to 2,261 ft., Bundamba Group to 3,101 ft., Moolayember Shale to 3,598 ft. and granite wash and decomposed granite basement to 3,616 ft. The section from 3,477 ft. to 3,599 ft. of the Moolayember Shale, has been correlated with the Hospital Hill Sandstone, from which gas and condensate were obtained at Hospital Hill, Roma.

As in A.A.O. No. 1 and R.B.O. No. 3, the base of the Bundamba Group is marked by a shale pebble conglomerate; correlation with A.A.O. No. 1 shows the Bundamba-Moolayember contact to be 121 ft. higher stratigraphically.

Examination of the cores indicated three horizons to be tested within the Hospital Hill Sandstone. These were "oil sands" at 3,549 ft. 4 in.-3,553 ft. 10 in. and 3,517 ft.-3,521 ft. and a "gas sand" at 3,477 ft.-3,489 ft. The lithological character of the formation 3,477 ft.-3,489 ft. suggests it is equivalent to the upper oil sand in the R.B.O. No. 4 bore. A core of the section 3,477 ft.-3,495 ft. consisted of sandstone in the top 12 ft., with shale and carbonaceous laminations in the upper 9 ft. but porous and clean in the lower 3 ft. One foot of black shale separated this bed from a 3 in. band of sandstone giving an ether cut and fluorescence under ultra-violet light. Beneath this zone was 4 ft. 6 in. of sandstone, compact and laminated at the top, but more porous towards the bottom of the core. A formation test using a rat hole packer was made over the section 3,452 ft.-3,510 ft., but no production was obtained.

After the well had been cased, production tests were carried out over the intervals mentioned previously. The first test was on the section 3,549 ft. 4 in.-3,553 ft. 10 in. Casing was perforated between 3,550 ft. 10 in.-3,552 ft. 4 in. and the hole swabbed, but only saline water with slight oil films and some gas was produced. Subsequent examination of the cores by the Bureau of Mineral Resources indicated that the upper part of this sand had a much higher porosity and the oil/water ratio was also higher. The perforations from the previous test were cement-sealed and the interval 3,522 ft. 3 in.-3,553 ft. 3 in. was then shot-perforated but with little success, the quantity of oil in the oil/water mixture remaining at about 1½ per cent. This horizon was plugged and the casing between 3,518 ft. 6 in. and 3,519 ft. 6 in. was perforated, producing small quantities of gas and saline water. Without sealing the perforations, further tests were made on the upper gas sands; the casing between 3,480 ft. and 3,485 ft. was shot resulting in a flow of salt water (70 gallons per hour) with a scum of oil and a little gas. However, it was uncertain whether the flow was coming in from the upper "gas sand" or the lower "oil sand" but in either case there was no production and it was decided to abandon the well.

Cement plugs were set opposite all perforations, the casing cut at 3,114 ft. and pulled. Cement plugs were also set from 3,114 ft. to 3,144 ft., 2,950 ft. to

3,000 ft., 2,200 ft. to 2,250 ft. and 9½ in casing was plugged top and bottom. The hole was finally abandoned on the 27th April, 1953.

A.A.O. No. 3 (Roma) (Fig. 4)

This well is located 40 chains bearing 103° (magnetic) from the north-west corner of portion 473, parish of Euthulla. It is 6·3 miles bearing 16½° east from Roma railway station. Ground level at the site is 1,085 ft. above sea level and rotary table elevation, from which all depths were measured, was 1,090 ft.

Drilling commenced on the 4th August, 1953, using a Sullivan 300A rotary plant, and was abandoned as a dry hole at 3,644 ft. on the 26th November, 1953. This well was located so that it would penetrate the Hospital Hill Sandstone down-dip from the R.B.O. No. 4 bore, a westerly dip being computed from the available information. However, on the completion of drilling it was clear that the structure below the Bundamba Group has a south-westerly dip in the Block 16 area, so that this well was located up-dip from R.B.O. No. 4.

The section penetrated consists of Roma Formation from surface to 245 ft., Blythesdale Group to 1,105 ft., Walloon Coal Measures to 2,290 ft., Bundamba Group to 3,056 ft. and Moolayember Shale to 3,597 ft.

The Blythesdale Group is composed of three distinct units; mainly water-bearing sandstone from 245 ft. to 385 ft., shale and coaly shale with thin coal bands and beds from 385 ft. to 535 ft., and sandstone containing many red garnets from 535 ft. to 1,105 ft.

The Moolayember Shale can be divided into two formations on lithological and electrical characteristics. From 3,056 ft. to 3,473 ft. the lithology is shale and argillaceous sandstone, generally calcareous, with low self-potentials. The interval 3,473 ft.-3,597 ft. consists of sandstone and shale with sandy partings. The sandstone is commonly porous and contains oil, water and some gas. The interval shows high self-potential and resistivity properties distinct from the overlying sediments, and therefore constitutes a lithological unit. It is correlated with the beds (Hospital Hill Sandstone) from which gas and condensate were obtained at Hospital Hill, Roma.

At 3,597 ft. the well penetrated granitic material which shows definite evidence of a clastic origin to a depth of 3,600 ft. Below this depth, to bottom at 3,644 ft., the material is weathered, but no information was obtained to identify it as true basement or granite wash.

The change of electrical properties at each stratigraphic boundary, except the top of the Hospital Hill Sandstone, is quite sharp and definite, suggesting that the contacts are disconformable. This is supported by the presence of oxidised shales at 1,105 ft.

Altogether nineteen cores were cut. Cores were taken at 3,134 ft. and 3,156 ft. to locate the shale

pebble conglomerate at the base of the Bundamba Sandstone and coring was continuous from 3,332 ft. to 3,604 ft. Positive showings of oil were obtained from nine separate intervals of core from the section 3,486 ft.-3,584 ft., and oil was visible in the pore space in five of these intervals.

Porosity determinations made on eight different sands between 3,488 ft. and 3,555 ft. gave an average porosity of 20 per cent. with the range from 13 per cent. to 24 per cent.

Formation tests using a Halliburton Tester and Wall Packer, were carried out on the section 3,469 ft.-3,567 ft., with the packer set immediately above the most promising sands. Only one test gave a positive result, that being over the interval 3,469 ft.-3,501 ft. During a 30-minute test, 6.4 cu. ft. of saline water, some gas and a trace of oil were produced from the sandy beds between 3,486 ft. and 3,492 ft.

The evidence obtained from this well indicates that porosity and permeability are not constant, and vary both laterally and vertically within each sandstone bed. This has resulted in the formation of porous sandstone lenses enveloped by sandstones of low permeability. Gas and/or oil is confined to the porous portions of the formation at a pressure somewhat below hydrostatic pressure; this porous lens when punctured by a well may lose some pressure to the hole and under test will produce a quantity of fluid proportional to the pressure and volume of the lens. When this volume has been removed, there is no means of recharge of the pore space because of the surrounding relatively impermeable formation. This was borne out by the behaviour of the sand between 3,486 ft. and 3,491 ft. During the first test this sand produced gas and saline water but when tested again, only drilling mud filtrate was produced, showing that no replenishment of the formation fluids had taken place after the first test.

These conditions explain why wells such as R.B.O. No. 1 and No. 4 produced oil when first tested but did not react to production tests, and why production tests on A.A.O. No. 2 well were unsuccessful. Other wells in the area have punctured small lenses of porous formation and so gave insignificant production or failed to react at all.

The individual oil sands occupy different positions within the sequence so that correlation of the oil-bearing beds from well to well is not possible. It has been shown that the discontinuity of permeability is regional and therefore caused by depositional irregularities. A poorly sorted sand from 3,542 ft. to 3,556 ft., which showed gas in the core but gave no production on test, illustrates the lack of permeability of individual strata.

The only casing used in the well was 104 ft. of 8½ in casing cemented to surface. On completion of testing, cement plugs were set at 3,450 ft.-3,600 ft., 3,050 ft.-3,070 ft., and 2,250 ft.-2,300 ft. The well was left uncapped and was later converted for use as a water well.

A.A.O. No. 4 (Hospital Hill) (Fig. 5)

This well is located 120 ft. north-west from the corner of Bower and Cottell Streets, Hospital Hill, Town of Roma. Ground level at the site is 1,035 ft. above sea level and rotary table elevation was 1,040 ft.

The hole was drilled with a Sullivan 300A rotary plant; drilling commenced on the 14th January, 1954, and reached a total depth of 3,891 ft. The well was closed down after testing on the 22nd July, 1954.

An 11 in. hole was drilled to 310 ft. and 7½ in. hole was carried to total depth. Coring was continuous from 3,645 ft. to 3,891 ft., cores being cut with a 5½ in. core bit, and the hole reamed to 7½ in. A surface string of 8½ in. casing was set at 300 ft. and cemented to surface; 6½ in. casing was run to 3,775 ft. and cemented to 3,240 ft.

The succession penetrated consisted of Roma Formation, from surface to 290 ft. followed by the Blythesdale Group to 1,360 ft. This group is made up of four distinct units:—from 290 ft. to 535 ft., the "Transition Stage" mainly of grey and dark-grey mudstone, fine argillaceous and calcareous sandstone and some beds of thin impure limestone; from 535 ft. to 720 ft., the Mooga Sandstone consisting of fine to medium grained argillaceous sandstone with some minor dark- and light-grey shale; the "Fossil Wood Stage" from 720 ft. to 890 ft. consisting of dark-grey shale with many carbonaceous bands and thin coal seams; and from 890 ft. to 1,360 ft. the Gubberamunda Sandstone of white uncemented quartzose sandstone with very minor shaly bands (Reeves, 1947).

From 1,360 ft. to 2,675 ft. the Walloon Coal Measures consist of grey carbonaceous shale with some thin coaly bands and minor sandstone; and from 2,675 ft. to 3,295 ft. the Bundamba Group consists mainly of medium to coarse partially cemented sandstone with minor bands of light- to dark-grey shale. The base is marked by an intraformational conglomerate. The Moolayember Shale, occurring from 3,295 ft. to 3,882 ft., is separated from the Bundamba Group by what appears to be a major unconformity. To 3,683 ft. the formation consists of grey shale with some minor well cemented sandstone. At 3,683 ft. a minor unconformity (?) occurs; from that point to 3,882 ft. the sequence is one of medium to coarse porous sandstone containing water and gas, and grey carbonaceous shale. This member has been named the Hospital Hill Sandstone; the upper member is as yet unnamed.

Basement was met at 3,882 ft. and penetrated to 3,891 ft., this interval being thought to represent the old soil formed on the basal complex of metamorphosed pelitic rocks.

Several features were noted in this well which may have value for correlation purposes in future wells in this area:

- (1) A noticeable concentration of red garnet in the basal 100 ft. of the Gubberamunda Sandstone.

- (2) The quartz grains of the thin interbedded sandstones of the Walloon Coal Measures are subrounded and frosted.
- (3) The quartz grains of the sandstone of the Bundamba Group are subangular and clear.
- (4) A bed of grey mudstone with numerous pisoliths and nodules of siderite occurs from 3,735 ft. to 3,741 ft. This zone probably coincides with the "buff shales" noted in previous wells on Hospital Hill.
- (5) A zone of black shale with calcite pisoliths occurs from 3,826 ft. to 3,829 ft.

No evidence of petroleum was found in any of the cores, but gas was noted in cores at four different depths between 3,683 ft. and 3,880 ft. In the interval 3,685 ft.-3,699 ft., gas bubbling was noted in the core when pulled, and in the core between 3,699 ft. and 3,714 ft. strong gas bubbling was seen. Also, when drilling this section, the drilling mud was strongly gas cut. Some gas activity was noted in the core between 3,818 ft. and 3,826 ft. and a small amount of gas with much saline water was recorded between 3,869 ft. and 3,880 ft.

Formation tests were carried out over the section 3,676 ft.-3,891 ft. The intervals were 3,676 ft.-3,699 ft., 3,693 ft.-3,714 ft., 3,797 ft.-3,831 ft. and 3,844 ft.-3,891 ft. Two of these intervals gave production under test; the interval 3,693 ft.-3,714 ft. yielded gas and the section 3,834 ft.-3,891 ft. produced saline water with a small proportion of dissolved gas.

A production test was made on the gas sand; the casing between 3,700 ft. and 3,716 ft. was perforated and the gas sand put on test for 28 hours. The sand produced gas at the rate of 870,000 cu. ft. per day through a $\frac{3}{8}$ in. bottom hole choke and the maximum closed in pressure was 500 p.s.i. At the beginning of the test a small amount of water was blown free with the gas but the quantity decreased to insignificant amounts towards the end.

The well was muddled off with viscous 1.9 sp. gr. mud and the master gate closed pending future testing. The salinity of water from 3,869 ft. to 3,879 ft. was 2,600 p.p.m. chloride. The analysis of gas from the test was: Oxygen 0.2 per cent.; carbon dioxide 0.5 per cent.; nitrogen 0.8 per cent.; methane 83.1 per cent.; ethane and higher homologues 15.4 per cent.

A.A.O. No. 5 (Hospital Hill) (Fig. 5)

This well is located on Hospital Hill, Roma, in Town Lot 79F and 2,442 ft. on a bearing of 328° from A.A.O. No. 4. Ground level at the site is 1,019 ft. above sea level and rotary table elevation was 1,024 ft.

Drilling commenced on the 9th August, 1954, with a Sullivan 300A rotary plant, and the well was abandoned after testing on the 15th March, 1955, at a total depth of 4,079 ft. An 11 in. hole was drilled to 155 ft., a 7 $\frac{3}{8}$ in. hole to 4,020 ft. and a 5 $\frac{3}{8}$ in. hole

to 4,079 ft. The only casing used was a surface string of 8 $\frac{1}{2}$ in. casing seated at 153 ft. and cemented to the surface.

The lithology in this well correlates closely with the lithology in A.A.O. No. 4, though some differences in formation thickness are evident. The well penetrated:

Roma Formation from surface to 290 ft.

Blythesdale Group—290 ft. to 1,327 ft., with four distinct units, viz.: "Transition Stage"—290 ft. to 505 ft., mainly light-grey mudstone and sandy mudstone, shale and fine-grained sandstone with some interbedded impure limestone; Mooga Sandstone—505 ft. to 730 ft., essentially sandstone, very fine-grained, argillaceous, micaceous at the top to coarse sandstone at the base; "Fossil Wood Stage"—730 ft. to 825 ft., mainly light- to dark-grey shale, slightly carbonaceous in part; Gubberamunda Sandstone—825 ft. to 1,327 ft., fine- to coarse-grained friable argillaceous sandstone, with some shaly bands.

Walloon Coal Measures—1,327 ft. to 2,700 ft. Essentially shale interbedded with sandy shale and sandstone. The shale is light- to dark-grey, slightly carbonaceous in part, with some thin coaly bands. The sandy shale and sandstone are fine-grained, carbonaceous, light-grey and friable in part.

Bundamba Group—2,700 ft. to 3,328 ft. Porous sandstone, medium grained quartzose, poorly cemented, with some dark carbonaceous to light-grey shale and sandy shale.

Moolayember Shale—3,328 ft. to 4,070 ft. Interbedded fine-grained argillaceous sandstone and light- to dark-grey shale mark the top. These are underlain by alternating beds of dark-grey carbonaceous shale, sandy shale and moderately fine- to medium-grained sandstone (the Hospital Hill Sandstone). In the lower section, moderately to highly carbonaceous and bituminous shale predominates. An increasing frequency of narrow beds of pebble conglomerate is evident towards the base. Dips are generally flat to 5°, somewhat uneven.

Basement—4,070 ft. to total depth. This section is marked by a conspicuous major unconformity with the overlying beds. It comprises light-greenish and greyish-green, indurated, interbedded mudstone, siltstone and shale having a dip of 40°. The age of these beds is unknown.

Thirty-two cores were cut; the first was taken from 3,539 ft. to 3,554 ft. and the remainder were taken from 3,616 ft. to total depth. Showings of gas were logged in eight separate sections of core between 3,539 ft. and 4,018 ft. and some iridescent oily patches were seen in the mud from 3,539 ft.

Thirteen formation tests were made, in only one of which was gas produced in measurable quantities. No oil was produced. The Hospital Hill gas sand, which was initially the principal objective, was tested twice while coring. After coring to total depth the hole was plugged back to 4,012 ft. to test a possible oil sand at 4,002 ft., but this zone proved barren. The hole was then plugged back to the base of the Hospital Hill gas sand at 3,739 ft. Three attempts were made to induce production of gas by injecting dieseline, followed by swabbing, but without success. The first attempt was unsuccessful due to packer seat failure. The second attempt, which was mechanically successful, covered the whole section of the gas sand from

3,700 ft. to 3,739 ft. Formation water and a little gas were produced. When measured this was at the rate of 1,040 cu. ft. of gas and 119 barrels of water per day. An estimated 97 barrels of mud filtrate and 409 barrels of formation water were produced.

The hole was then plugged back to 3,710 ft. for re-test of the upper section of the sand. Persistent efforts to induce a flow of either gas or water were, however, unsuccessful, though 310 barrels of formation water were swabbed out. It was concluded that the well was situated below the edge water limit at this part of the structure.

Cement plugs were set between 4,079 ft. and 3,600 ft., 2,700 ft. and 2,650 ft., 750 ft. and 698 ft. and the well abandoned for conversion to a water well to 698 ft.

A.A.O. No. 6 (Hospital Hill) (Fig. 5)

This well is located 181 ft. bearing 325° from the point of the acute angle formed by Miscamble Street and Queen Street, Hospital Hill, Roma. Ground level at the site is 995 ft. and the rotary table elevation was 1,005 ft.

The well was drilled with a National T32 rotary plant; drilling commenced on the 7th June, 1955, and reached a total depth of 4,285 ft. The well was abandoned as a dry hole on the 3rd August, 1955. Drilling commenced with an 11½ in. hole to 175 ft., then 7½ in. hole to 4,272 ft. and 5¾ in. rat-hole to total depth. The only casing used was a 172 ft. string of 8½ in. casing, which was cemented to surface.

The section penetrated consists of Roma Formation from surface to 310 ft., Blythesdale Group to 1,385 ft., Walloon Coal Measures to 2,710 ft., Bundamba Group to 3,350 ft., and Moolayember Shale to 4,209 ft. From 4,209 ft. to 4,285 ft., basement consists of hard, indurated, black and green shale, and white, well-cemented quartzose sandstone dipping at 50–60°. The age of these beds is unknown.

In general the lithology of the rocks encountered in this well is similar to the lithologies met in A.A.O. No. 4 and A.A.O. No. 5, with the exception that in A.A.O. No. 6 the Moolayember Shale appears to contain many more thin beds of coal than in A.A.O. No. 4.

A.A.O. No. 6 was sited to be on or near the axis of the inferred continuation of the Hospital Hill Anticline. However, the axis does not appear to be continuous, and in this well the top of the Hospital Hill Sandstone is some 60 ft. lower than in A.A.O. No. 4.

Two intervals of the well were cored. Firstly from 3,600 ft. to 3,746 ft. coring was continuous and was designed to core through the expected gas sand, and secondly between 4,213 ft. and 4,285 ft. two further cores were taken to obtain a sample of basement.

No indications of oil or gas were seen either in the cores or in the drilling mud. Formation tests were carried out over the intervals 3,605 ft.–3,636 ft., 3,696 ft.–3,726 ft. and 3,920 ft.–3,955 ft., the only production being small quantities of very saline water from the latter two sections.

Cement plugs were set from 4,285 ft. to 3,600 ft., 2,700 ft. to 2,650 ft., 750 ft. to 700 ft., and 50 ft. to surface and the well abandoned.

A.A.O. No. 7 (Arcadia) (Fig. 6)

The well is located at lat. 25° 17' 54" S., long. 148° 47' 43" E., approximately 40 miles north-north-east of Injune. It was spudded-in on 8th April, 1957, and abandoned as a dry hole at a total depth of 3,280 ft. on 14th July, 1957. A Sullivan 300A rotary plant was used. The rotary table elevation was 1,227 ft., 5 ft. above the ground surface.

The site is one mile east of the crest of the Arcadia Anticline and the well was designed to test the gas prospects of the Permian sedimentary formations. A tentative stratigraphic correlation by the Company is as follows:—

Surface–845 ft. . .	Upper Bandanna Formation
845–1,160 ft. . .	Lower Bandanna Formation
1,160–1,480 ft. . .	Catherine Sandstone
1,480–2,200 ft. . .	Ingelara Beds
2,200–2,290 ft. . .	"Transition Beds"
2,290–2,760 ft. . .	Cattle Creek Formation
2,760 ft.–bottom	Staircase Sandstone

Twelve core samples were taken at intervals between 170 ft. and 2,951 ft. Fresh-water and marine fossils obtained from these cores assisted in correlation.

Packer tests were carried out at 2,795½ ft., 2,818½ ft. and 2,919½ ft. A small quantity of gas was obtained in the third test at 2,919½ ft. but this was of no commercial importance. Electric logs were taken and these indicated that no potentially productive horizons had been penetrated.

Eight and five-eighths inch casing was cemented in from the surface to 420 ft. The diameter of the hole below 420 ft. ranged from 7½ in. to 5¾ in. On abandonment the well was plugged from 400 ft. to 430 ft. and from the surface to 20 ft.

A.A.O. No. 8 (Karumba) (Fig. 7)

This well is located 4½ miles north of the Karumba Pilot Station, Gulf of Carpentaria, at lat. 17° 24' 36.6", long. 140° 52' 21.9" E. Rotary table elevation was 20 ft. above mean sea level, and 5 ft. above surface. The well was drilled 5,000 ft. to the west of the crest of the Karumba gravity high. The contractor was Mines Administration Pty. Ltd., and the rig a Sullivan 300A. The drilling was subsidised by the Commonwealth Government under the *Petroleum Search Subsidy Act*, 1957–58. The well was spudded in on 6th February, 1958. Eleven inch hole was drilled to 205 ft. and 8½ in. 36 lb. casing was run to 198 ft. and cemented to surface. Drilling of 5¾ in. hole was continued to total depth of 2,364 ft. Three cores were cut, at 1,303–1,323 ft., 2,191–2,195 ft. and 2,363–2,364 ft. The hole was logged electrically to total depth by the Bureau of Mineral Resources, with a Widco single-electrode unit. Resistivity and natural potential curves were recorded.

The strata penetrated were as follows:—

Surface—70 ft.	Beach deposits, etc.	Quaternary
70–129 ft.	Lynd Formation	Tertiary
129–1,610 ft.	Normanton Formation	
1,610–2,277 ft.	Blackdown Formation	
2,277–2,360 ft.	Wrotham Park Sandstone	Cretaceous
2,360–2,364 ft.	Basement	

The Quaternary section from surface to 70 ft. consisted mainly of shell fragments with minor sand.

The Lynd Formation was mainly a quartz sand with minor amounts of shell fragments and laterite pebbles.

The section from 129 to 260 ft. consists of red and white sandy laterite, similar to the laterite developed at Normanton. This is underlain by weathered Normanton Formation from 260 to 304 ft. and unweathered Normanton Formation from 304 to 1,610 ft. The formation consists mainly of shale, with minor amounts of sandstone. Sandstone is dominant at the top of the section, whereas it is almost absent towards the base of the formation.

From 1,610 to 2,277 ft. shale with minor amounts of sandstone, are assumed to be equivalent to the Blackdown Formation.

The placing of the base of the Normanton Formation is founded on the same evidence as for F.B.H. No. 1 (Wyaaba), and the same conclusion regarding its accuracy holds.

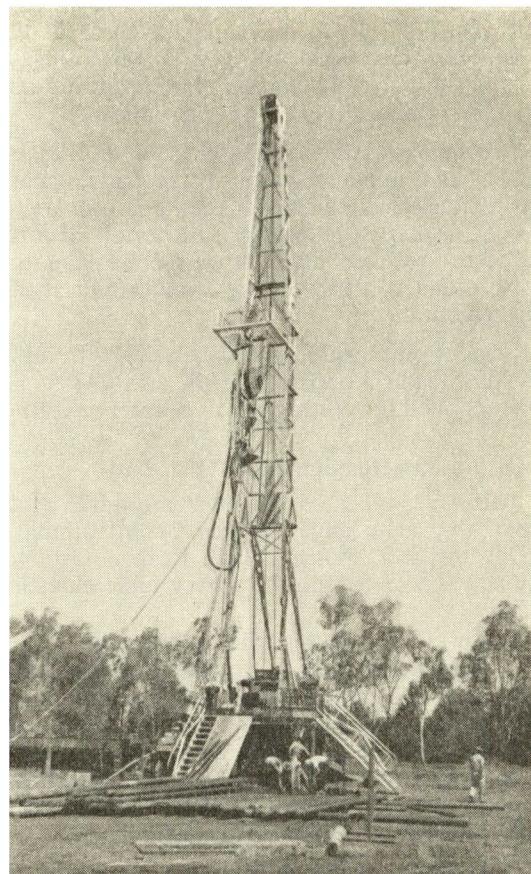
The section from 2,277 to 2,360 ft. consists of interbedded shale and medium-grained quartz sandstone, and is correlated with the Wrotham Park Sandstone.

Basement of granitised quartzite was met at 2,360 ft.

A gas smell was noticed in the mud return pipe and in the cuttings at 1,599 ft.; the cuttings gave a positive acetone test. Another positive acetone test was obtained in cuttings from shales at 1,828–1,838 ft. Cuttings from sandstone at 2,279–2,281 ft. showed slight yellow fluorescence, brown staining and a positive acetone test. Cuttings from sandstone at 2,301–2,303 ft. showed strong yellow fluorescence, brown staining and a positive acetone test. A formation test was carried out on the Wrotham Park Sandstone with the hole at total depth, and with the packer set at 2,279 ft. After 28 minutes, artesian water flowed from the top of the drill pipe 8 ft. above the rotary table. The well was plugged and abandoned on 3rd March, 1958.

Associated Freney Oil Fields N.L. Coorooraah No. 1

This well was located at lat. 23° 07' 30" S., long. 148° 42' 40" E., on an anticline defined by surface geological mapping, gravimetric and seismic methods. The drilling was subsidised by the Commonwealth Government under the *Petroleum Search Subsidy Act*, 1957–58. The rig was a National T32, and the drilling contractor was Mines Administration Pty Ltd. Rotary table elevation was approximately 605 ft. Drilling began on 25th October, 1959, and progress depth on 31st December, 1959, was 2,822 ft.



Rigging up to test the Coorooraah structure.
National T32 rig at site of A.F.O. Coorooraah
No. 1 well.

Australian Oil Corporation No. 1 (Beaudesert)

The well is situated on the southern boundary of portion 23, parish of Beaudesert, 5 chains west from the Brisbane-Mt. Lindesay road.

The well was drilled in 1924, one chain west from Dunn's Bore, sunk in 1922, which reportedly showed a seepage of 5 gallons of oil at 77 ft.

Formations penetrated were Recent alluvium to 116 ft., clay and sand of Tertiary age to 353 ft. and Mesozoic (?) trachy-dolerite to 385 ft., the final depth.

Gas was reported at 224 ft. and definite traces of oil at 77 ft., 84 ft., 93 ft. and 228 ft. Water was shut off by casing to 216 ft. The well was abandoned.

A.O.C. No. 2 (Beaudesert)

This shallow well was sunk late in 1924, 170 ft. east from A.O.C. No. 1, to prove the validity of the original seepage in Dunn's Bore. It was abandoned at 112 ft., having penetrated clay, sand, pebble beds and impure limestone. No trace of oil was recorded.

L. C. Ball considered the oil showings to be of vegetable origin. The original seepage oil is recorded as consisting of 95 per cent. kerosene and 5 per cent. lubricating oil.

Australasian Oil Exploration Ltd. No. 1 (Reid's Dome)
(Fig. 8)

This well is located 29 miles south-west from Rolleston at lat. $24^{\circ} 47' 25''$ S., long. $148^{\circ} 19' 18''$ E. Rotary table elevation, from which all depths were measured, was 979·7 ft., the ground elevation being 969·7 ft.

The well was spudded-in on the 30th August, 1954, and completed at a total depth of 9,060 ft. on the 20th April, 1955. The drilling was done on contract by Petroleum Drilling Corporation Ltd., using a National 50 rotary plant.

The well was sited on Reid's Dome, which is a culmination within the Serocold Anticline. Drilling commenced almost at the base of the Aldebaran Sandstone, of Permian age. At a depth of 70 ft. there is a marked lithological change from arenaceous to argillaceous estuarine type of sediments, and this depth probably marks the base of the Aldebaran Sandstone. This Permian estuarine sequence extends down to 1,695 ft. and consists predominantly of shaly beds with intercalated thin silts and limestones. Marine fossils were found in the interval 190 ft.-200 ft. From 1,695 ft. to approximately 2,000 ft., there is a conformable transition to freshwater conditions—lacustrine beds characterised by the presence of coaly beds and a Permian *Glossopteris* flora. Drilling was continued into this sequence for over 7,000 ft. and was finally abandoned, still in the same formation,

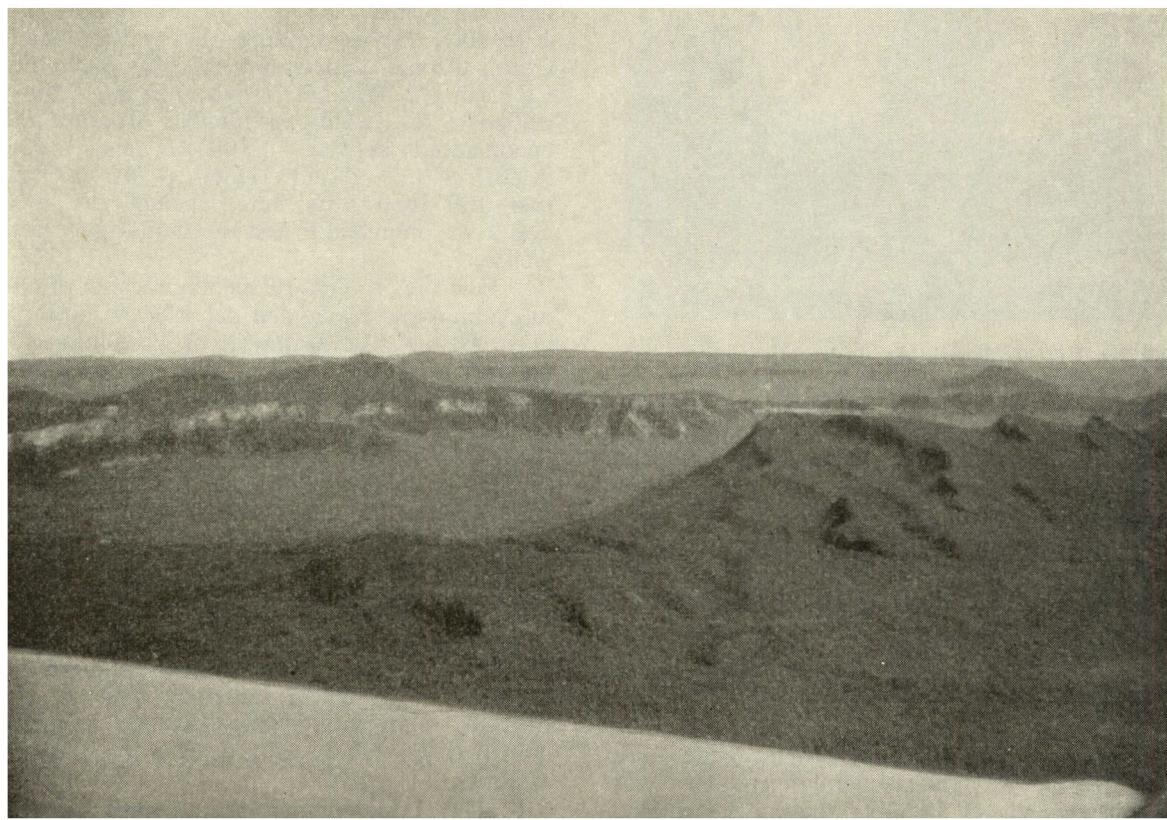
after traces of igneous activity and localised zones of metamorphism had been encountered.* This section from 70 to 9,060 ft. is correlated with the Cattle Creek Formation. The marine or estuarine beds consist mainly of dark carbonaceous shale with minor thin beds of limestone. The shale may be sandy, silty, or calcareous. Carbonaceous matter is finely divided and uniformly distributed. Parts of the shale contain coarse rounded grains of sand with a few small erratic pebbles and joints infilled with calcite.

The strata beneath the marine beds consist of a very thick monotonously uniform sequence of tight carbonaceous sand and coaly anhydritic shale. The coaly layers are generally only a few feet thick, and are commonly split by shaly laminations.

Crystalline graphite encountered in the cuttings from a depth of 8,025 ft. was found to be associated with a 2 ft. thick band of a dark-green igneous rock—probably a micro-diorite—at 8,022 ft. Below this the formation reverted to carbonaceous shale with coaly sections. In a core taken at 8,818-8,835 ft., a quartz veinlet was seen; a core at 8,937 ft. contained graphitic shale which showed evidence of induration throughout.

In all, 37 cores were taken at various intervals, in most cases 20 ft. cores being cut, with the core recovery ranging from 1 ft. to 20 ft.

Numerous showings of oil and gas were obtained mainly in the section above 3,500 ft.



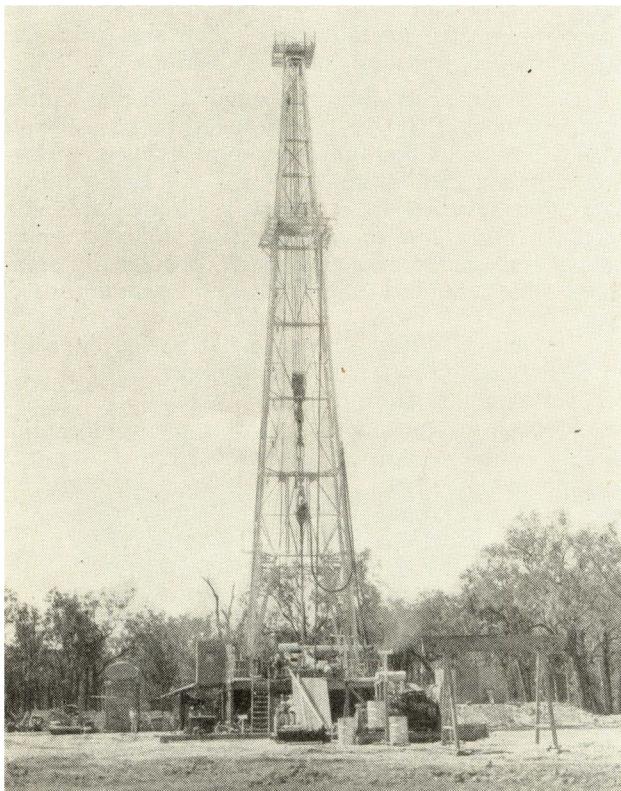
Aerial view of the Reid's Dome structure, showing the truncated axis.

*Final report on A.O.E. No. 1 (Reid's Dome). Webb (1956) later divided the succession thus: 0-70 ft. Aldebaran Sandstone; 70-1,695 ft. Cattle Creek Shale; 1,695-6,300 (?) ft. "undivided freshwater sediments"; 6,300 (?) ft. unconformity; 6,300-9,060 ft. "lower shales and mudstones".

Oil showings were recorded from—

- Core 5 1,745–1,764 ft.—Faint bleeding of green oil giving patchy but strong fluorescence
- Core 8 2,309–2,326 ft.—Slight oil bleeding in fine-grained sandstones with thin coaly shale partings.
- Core 15 3,454–3,474 ft.—Slight oil bleeding and oily smell from 4 feet of fine-grained silty sandstone

In addition, 21 sidewall cores taken between 483 ft. and 3,367 ft. showed fluorescence.



A.O.E. No. 1 (Reid's Dome). The rig is a National 50.

During the drilling operations, gas broke through the drilling mud at a depth of 466 ft. Subsequently a drill stem test over the interval 448 ft.–467 ft. yielded a gas flow of 550,000 cu. ft. per day. Analysis of the gas showed the methane content to be 97·4 per cent. with carbon dioxide 1·2 per cent.; oxygen 0·5 per cent.; nitrogen 0·9 per cent. Further small gas shows were recorded from 2,699 ft.–2,716 ft. and 4,460 ft.–4,477 ft. (Table III).

Due to the great distance of the well from a potential market, no action was taken to utilise this gas.

In all, twelve drill stem tests were made to a depth of 6,545 ft. Subsequently another was attempted at a depth of 7,853 ft., where the electric log and sidewall core showed a fracture zone which was possibly gas-bearing. However, in spite of reaming operations, the packer failed to pass the interval

4,400–4,500 ft. and in view of the condition of the hole, further testing was considered to be impossible.

Porosity and permeability determinations were made on cores from 464 ft., 2,711 ft. and 4,132 ft. Porosities ranged from 12 to 18 per cent. and permeabilities from 0 to 19 millidarcies.

The conclusions reached from the drilling of this well were ". . . that these oil shows represent residual traces. Apart from the three cores showing slight oil bleeding no really definite staining was observed throughout the entire section. It is highly probable that the drill stem tests, the rare slight oil bleeding and the more sensitive fluorescence tests, indicate pre-existing reservoirs which are now largely depleted." (Completion report on well A.O.E. No. 1 by K. R. Miles.)

Cement plugs were set from 2,190 to 2,230 ft., 295 to 445 ft. and 10 ft. to surface, and the hole abandoned.

A.O.E. No. 2 (Reid's Dome) (Fig 8)

This well is located on the southern culmination of Reid's Dome at lat. 24° 51' S., long. 148° 19' E., approximately 33 miles south-west of Rolleston. Rotary table elevation from which all depths were measured, was 1,219·3 ft.; the ground elevation is 1,208·3 ft.

The well was spudded-in on the 2nd June, 1955, and completed at a depth of 4,060 ft. on the 13th July, 1955. Drilling was by Petroleum Drilling Corp., through their sub-contractors Santa Fe Drilling Co., using a National 50 rotary plant. The well was drilled to test, up-dip, a number of water-filled sands encountered between 1,700 ft. and 4,220 ft. in A.O.E. No. 1 (Reid's Dome). In A.O.E. No. 1, two drill stem tests were mechanically unsuccessful and it was intended to test the sands again in the No. 2 well.

The upper 70 ft. of section consists of Quaternary alluvium—unconsolidated deposits of sand, gravel and clay. Below is the Cattle Creek Formation of Permian age which is divided into an upper transitional sequence and a lower continental sequence. From 70 ft. to 1,310 ft. are the transitional beds with depositional environment varying from continental to marine. They consist of quartz sandstone, mostly with a clay matrix, grey and brown shale carrying marine fossils and some erratic pebbles, carbonaceous and micaceous shale and siltstone with plant remains, often pyritic, thin limestone beds and subordinate amounts of gypsum and some coal. It is difficult to distinguish lithologically between these deposits and the underlying continental deposits. However, the former are characterised on the electric log by a lower mean resistivity than the continental deposits, and an obvious increase in resistivity at 1,310 ft. is taken as the base of the transitional deposits.

The Permian continental deposits occupy the section from 1,310 ft. to 4,060 ft., total depth. The lithology is not greatly different from the transitional beds, the main point of difference being the absence

of marine fossils. This section is more arenaceous than the overlying beds and consists of quartz sandstone, commonly calcareous, carbonaceous and micaeuous shales and siltstones, a few thin fresh-water limestones and some coal.

Micro-diorite was met from 2,757–2,798 ft. and from 3,306–3,312 ft. These are probably sills. The micro-diorite may be genetically related to the igneous rock in A.O.E. No. 1, which occurs at a depth of 8,022 ft. Stratigraphical correlations of the two wells indicate that A.O.E. No. 2 well is 600 ft. higher structurally than A.O.E. No. 1.

Ten formation tests were made between 716 ft. and 4,060 ft., but no oil or gas was produced. A sand tested between 716 ft. and 736 ft. was found to be water-filled but all other sands were dry.

Sixteen cores were taken between 81 ft. and total depth, as well as nine sidewall cores from the interval 2,744 ft.–3,417 ft. Only one core, from 724 ft. to 734 ft., showed fluorescence and no evidence of oil or gas was seen in the other cores.

The only casing used in the well was a surface string of 13 $\frac{1}{2}$ in. casing seated at 210 ft. and cemented to surface.

Cement plugs were set at 1,620 ft. to 1,600 ft., 210 ft. to 190 ft., 10 ft. to surface, and the well abandoned.

A.O.E. No. 3 (Consuelo) (Fig. 8)

This well is located on the Consuelo Anticline, approximately 15 $\frac{1}{2}$ miles west-south-west from Rolleston. Coordinates of the position are lat. 24° 33' 40" S., long. 148° 23' 20" E. Ground level at the site is 988 ft. above sea level and rotary table elevation, from which all depths were measured, was 1,000 ft.

The well was drilled by the Santa Fe Drilling Company using a National 50 rotary plant. Drilling began on the 1st September, 1955 and was completed at a total depth of 4,437 ft. on the 1st November, 1955.

The Consuelo Anticline is a closed anticline approximately 12 miles long and between 2 and 3 miles wide; it lies to the east of and parallel to, the Serocold Anticline. The structure closes in the Aldebaran Sandstone, and the well was drilled primarily to test this formation.

The sequence consists of Aldebaran Sandstone from surface to 2,130 ft., Cattle Creek Formation to 3,200 ft. and undifferentiated beds to total depth.

The Aldebaran Sandstone consists mainly of quartz sandstone, quartz conglomerate and some carbonaceous shale, with numerous thin coal seams. The deposits are of fresh water origin and electric logging indicates that porosity is up to 25%.

The Cattle Creek Formation consists predominantly of shale, silty shale and siltstone. The shale is usually dark grey-brown and includes both carbonaceous and marine types. Some thin limestone beds are interbedded with the shale, and sandstone, when it occurs is usually fine-grained and tight. The top of the formation is fairly well defined at 2,130 ft. but

the base is indefinite, as there is a gradation from freshwater to marine conditions. However, by electric log correlation with A.O.E. No. 2 well, the base of the formation has been placed tentatively at 3,200 ft.

Below the Cattle Creek Formation the beds are undifferentiated and cannot be correlated with the beds occupying the same stratigraphic position in the wells on Reid's Dome, either in lithology or by electric logging. These beds consist mainly of dark shale, carbonaceous between 3,200 ft. and 4,140 ft. and pyritic below this depth.

Three formation tests were made on the Aldebaran Sandstone, but in none of these was any indication of oil or gas found. In the first test over the interval 355 ft. to 428 ft., the formation was water-filled; in the second test on the interval 1,400 ft. to 1,477 ft. the packer failed to hold both in the test and on the re-run. The third test, made with the hole at 1,610 ft. and packer set at 1,493 ft., recovered 190 ft. of watery drilling fluid. No formation tests were made in the Cattle Creek Formation.

At the conclusion of drilling, cement plugs were set at 2,180 ft. to 2,102 ft., 206 ft. to 195 ft. and 10 ft. to surface, and the well abandoned.

Australian Oil and Gas Corporation Ltd. Scout Bores

Nos. 1 and 2 (Talbalba)

These bores are located 80 miles south-east of Cunnamulla, at lat. 28° 58' 8" S., long. 146° 33' 58" E. Bore No. 1 is 117 ft. south of water bore Reg. No. 4654 ("Talbalba No. 6"), and bore No. 2 is 500 ft. north-east of the water bore. Surface elevation of both bores is approximately 460 ft.

The object of drilling was to test the reported occurrence of oil at 723 ft. 6 in. in the water bore. The holes were drilled between July and December 1957, with an Hydromaster 1500 percussion plant. Both were begun at 6 in. diameter. No. 1 was abandoned at 774 ft. without reducing hole-size. In No. 2, water was encountered at shallow depths, and a 494 ft. string of 6 in. pipe was cemented in. Below this depth, a 5 in. hole was drilled to 1,000 ft. On completion of drilling, aquifers were sealed off with cement plugs.

Sludge samples were taken at frequent intervals during the drilling, but no coring was done. There was no electric logging.

The first 130 ft. of strata in the bores consist of siliceous gibber and sandy clay, which were believed to be of Tertiary age. The underlying beds are shale, silty shale, siltstone and sandy shale. These strata yielded Lower Cretaceous foraminifera between 365 and 768 ft. in No. 1, and between 336 and 995 ft. in No. 2.

No oil or gas shows were reported.

Salt water was struck in No. 1 bore at 62 ft. In No. 2 bore, salt water was struck at 22–30 ft. and 152 ft.; brackish water, flowing at the rate of 1,000 gallons per day, was struck at 560–600 ft.

A.O.G. No. 1 (Noondoo)

In 1958, Australian Oil and Gas Corp. Ltd. had intended to subsidise deepening of Noondoo Trust Bore, then drilling, for stratigraphic information. The name A.O.G. No. 1 (Noondoo) was used for this bore in correspondence. Subsequently, after further consideration of the geological data available, the corporation decided not to proceed with its plan.

A.O.G. No. 2 (Mirri Mirri) (Fig. 9)

This well was begun as a water bore, I.W.S.C. Reg. No. 13683. Drilling from 3,000 ft. to total depth, 4,645 ft., was paid for by Australian Oil and Gas Corp. Ltd., for the purpose of obtaining stratigraphic information. The well is located at lat. $27^{\circ} 31' S.$, long. $149^{\circ} 55' E.$, 13 miles bearing 173° from Meandarra. Elevation of the site is 998 ft. The drill was an Hydromaster 1500, owned by Mr. A. Moy, of Miles. The bore reached 3,000 ft. on 20th November, 1958, and was completed as a non-flowing water bore on 25th May, 1959.

Six inch casing was run to 196 ft., and pressure cemented in February 1958. Five inch casing was run to 4,603 ft. To complete the bore as a water producer, the 5 in. casing was cut at 190 ft. and the surface lengths removed to allow the insertion of a pump within the 6 in. casing. The 5 in. casing was slotted at 2,340 ft., 2,370 ft., 3,205 ft., 3,615 ft., 4,125 ft., 4,345 ft., 4,400 ft. and 4,500 ft.

The bore was logged by the driller from surface to total depth and lithologically from 2,960 ft. to total depth. A gamma ray log was run by Mines Administration Pty. Ltd. from surface to 3,725 ft.; unfortunately the sonde could not be run below this depth as it was limited by its construction to operation at temperatures below $140^{\circ}F$.

The company's geologist, Dr. T. B. H. Jenkins, divided the section stratigraphically thus:

0- 70 ft.	Telgazi Formation
70-2 340 ft.	Rolling Downs Group (with marine beds probably between 700 and 1,200 feet)
2,340-4,625 ft.	Blythesdale Group
4,625-4,645 ft.	Walloon Coal Measures

with the possible alternative correlation:

2,340- ?	Blythesdale Group
? -3,960 ft.	Walloon Coal Measures
3,960-4,645 ft.	Marburg Sandstone and/or Bundamba Group

No shows of oil were met. A slight show of gas was met at 4,570 ft.

Australian Roma Oil Ltd. No. 1 (Hunterton)

The well was drilled between October 1928, and September 1929. It is situated 4 miles north-west from Hunterton, which is on the Roma-Injune railway line. Surface elevation is 1,235 ft.

Walloon Coal Measures were penetrated to 1,114 ft., Bundamba Group to 1,895 ft. and brown shale and sandstone of Moolayember Shale to 2,402 ft. Eight feet of metamorphic rock were drilled before reaching granite. Total depth after re-measurement was 2,424 ft.

Gas in bailings was recorded from 450 ft. and between 2,020 ft. and 2,310 ft. Only traces of oil were reported. Water is present in the Bundamba Group and at 2,295 ft.

All casing was removed and the well abandoned.

A.R.O. No. 2 (Gubberamunda)

The well is located on portion 37, parish of Gubberamunda, county of Waldegrave, 20 miles north from Roma. It was drilled in 1929. Surface elevation is 1,258 ft.

The Bundamba Group was reached at 1,620 ft. and persisted to 2,170 ft. Metamorphic bedrock was reached at 2,773 ft., and drilling ceased at 2,831 ft. in November 1929.

Gas is recorded at 2,080 ft. with water, and 2,734 ft. Oil shows were reported from 2,255 ft. to 2,325 ft. and somewhat above 2,694 ft.

Water was recorded at 155 ft., 170 ft., 735 ft., 1,526 ft. and 2,080 ft. Upper waters were shut off by seating 10 in. casing at 519 ft. Eight inch casing was cemented at 1,911 ft., and 6 in. casing was clay-sealed by spudding it into 80 ft. of clay when hole bottom was at 2,765 ft. Records show 2,774 ft. 6 in. of this casing in the hole. Tests proved a successful water shut-off by this method, after which the hole was deepened to 2,832 ft.

Re-measurement of total depth gave 2,853 ft., and this figure appears to have been adopted during the testing attempts.

Between November 1929, and April 1931, several attempts were made to test the lower part of the hole by setting the 6 in. casing at different depths and with plugs and packers, but all were failures due to water invasion.

If 2,853 ft. is the true depth of the hole, then the 6 in. casing was clay-sealed at 2,774 ft. when the bottom of the hole was 2,794 ft. Drilling reports show that 8 ft. of sandstone was drilled below the shoe of the casing before bedrock was reached, and that the hole to bottom was dry. This would constitute an effective test of the lower 8 ft. of sandstone. The reports do not mention drilling out 20 ft. of clay below the casing shoe so it cannot be assumed that this section was effectively tested. It is very probable that the method of sealing the casing also sealed at least 80 ft. of formation against relatively low pressure formation fluids.

Testing operations consisted of pulling the 6 in. casing to about 1,750 ft., re-running and unsuccessfully cementing at 2,625 ft., cutting at the fourth length and cementing again at about 2,545 ft. Water came in after drilling through the cement. Attempts to plug the hole back to 2,700 ft. (old measurement) and test brown shales, obtained showings of gas and oil before water flooded again.

The well was abandoned in April 1931, without effectively testing the oil indications at 2,255 ft. or 2,694 ft.

A.R.O. No. 3 (Mooga)

This well is situated 12 miles north from Roma near the north-east corner of portion 83, parish of Mooga. Surface elevation is 1,141 ft. The well was drilled with rotary plant between February and October 1929.

Formations penetrated were: Blythesdale Group from surface to 450 ft., Walloon Coal Measures to 1,922 ft., Bundamba Group to 2,450 ft. and Moolayember Shale to 3,132 ft. The Company representatives placed basement at 3,209 ft., but L. C. Ball's decision of 3,132 ft. is accepted.

Gas shows are recorded with coal, in the Walloon Coal Measures, at 2,080 ft. and from 2,815 ft. to basement. Oil is recorded from brown oil shale at 1,720 ft. and between 2,800 ft. and basement. This latter section was tested and gave a seepage only. Water occurs at 1,284 ft. A sample from 2,817 ft. was analysed as oil shale. No free oil was found in the sample.

The only casing recorded is 11½ in. casing cemented at 2,814 ft. and plugged at the surface with cement. Cores were taken at intervals from 1,976 ft. The hole was tested by bailing but only seeps of oil and little gas were obtained.

The well was abandoned by filling with mud, placing a cement plug from 2,825 ft. to 2,800 ft., cutting and pulling the 11½ in. casing from 1,140 ft. and placing a 7 ft. plug of concrete and wire line 5 ft. below the surface.

A.R.O. No. 4 (Blythdale)

The well is situated 20 chains north-east from Blythdale Railway Station, which is 11 miles east of Roma. Surface elevation is 1,019 ft.

Drilling commenced on 18th April, 1929, and ceased on 29th November, 1929. Attempts were made to produce oil until November 1930, when the Company suspended the effort. A final attempt was made in April, 1932, to pump out the flooded sands and induce a flow of oil, but the well was then abandoned.

Stratigraphic intervals penetrated are:—Roma Formation from surface to 295 ft. Blythesdale Group to 870 ft., Walloon Coal Measures to 2,670 ft., Bundamba Group to 3,280 ft., Moolayember Shale to 3,866 ft. Granite was drilled for 38 ft. to total depth of 3,904 ft.

Gas was recorded from 1,730 ft., 1,830 ft., 2,520 ft., 3,656 ft. and 3,844 ft. (Table III.)

Oil indications are recorded at 1,844 ft. and 3,814 ft. and an oil sand from 3,844 ft. to 3,850 ft. (Table IV.).

Water occurred at 368 ft. (saline), 373 ft., 464 ft., 644 ft., 3,284 ft. and 3,850 ft.—3,860 ft. The bore flows from 3,850 ft. or from a higher aquifer leaking behind the casing. (Table V). A temperature of 140° F. is recorded of bailings, presumably from near bottom.

Cores were taken from 1,490 ft. at irregular intervals to bottom.

Fifteen-and-a-half-inch casing was cemented at 115 ft.; 11½ in. casing was cemented at 3,333 ft. With bottom at 3,850 ft., the hole was bridged to 3,843 ft. with a 7 ft. wooden plug, and 8½ in. casing run and cemented at 3,843 ft.

Testing began by bailing to 1,035 ft. (cement inside the casing was at 3,336 ft.) to check the casing. As no leak was apparent the core barrel was run to drill out the cement to 18 in. below the shoe and test the cement seal. Reports claim no core was recovered and the drill had penetrated the cement, but no qualifying explanation is recorded. Bailing began and with the level reduced to 1,200 ft. the hole was making water "which may be from behind the casing or water forced into the oil sand in trying to get circulation." Bailing continued and gas began to blow with the water at 750 ft. (this is either a mistake or refers to depth of water in the hole, i.e. water level at 3,100 ft. approximately). The gas had a petroliferous smell and burnt with a yellow flame. Bailings from bottom showed oily streaks and rock fragments considered to come from behind the casing.

When bailing ceased the water flowed over the casing at 80 gallons per hour, thus proving to the operators that it was coming from an aquifer and not from the oil sand.

The hole was deepened 10 ft. by coring, during which the rate of flow increased to 1,000 gallons per hour. White coarse grit recovered in the core barrel gave coloration to chloroform test. Coring continued to granite at 3,865 ft. and on to 3,904 ft.

Tubing was run, and it is recorded that the formation took water at 150 p.s.i. pressure and the flow pressure was 35 p.s.i.

Cement (24 sacks) was pumped with tubing at 2,899 ft., followed by pulling back 160 ft., circulating with clean water to remove cement from the tubing and a further half-hour circulation under pressure. A pressure of 250 p.s.i. was left in the well for 7 days, and when released the well was quiet. The cementing was tested and proved a water seal.

Coring from the shoe gave the following results:—After 15 in., water flowed at 60 gallons per hour, a further 6 in. core caused the flow to increase to 120 gallons per hour; another 6 in. core induced further increase without gas or oil; 18 in. was then cored and gas became active (at 3,847 ft. approximately). Underreaming was done for 3 ft. to clean the walls of the hole but only colours resulted. There is no record of water flow rates after reaming.

Continuous bailing resulted in reduction of water flow and gas activity, and black wax was collected from the bailings. The water level was about 500 ft. at this time. Subsequently it was reduced to 2,200 ft., when both water and gas became more active and several pints of crude oil were collected. The operators concluded that the reduction of hydrostatic pressure caused the cement plug in the bottom of the hole to move and release water and oil from below 3,847 ft.

The well was filled with water and left to stand for 5 days. The overflow was only $1\frac{1}{2}$ gallons, showing that artesian water was sealed off. Bailings from bottom brought up wax and lighter oil.

Check measurements with sand line and drill pipe made the top of the cement plug 3,843 ft. 5 in. and 3,843 ft. 8 in. below the table. Another drill pipe measurement made the plug 3,845 ft. and the casing shoe 3,841 ft. 5 in. below the rotary table. (Presumably depths of formation changes were recorded from the rotary table, in which case the casing shoe is 2 ft. 6 in. above the top of oil sand at 3,844 ft. and at best, only 1 ft. of this sand was open to the hole at this stage.).

The hole was cleaned out and reamed to $10\frac{1}{2}$ in. diameter for 6 ft. 9 in. below the casing shoe with increase in water flow.

A lead plug was placed in the hole so as to leave 3 ft. 9 in. of open hole below the casing, and bailing lowered the fluid level to 2,450 ft. Water and oil activity was greater than before reaming and plugging. The lead plug lifted 3 in. during tests.

The operators concluded that an oil sand exists in the 3 ft. 9 in. section below the casing, and that this had been cemented off in the original cementing operation.

An expanding rubber packer was designed and set above the lead plug. Bailing showed effective water shut-off but oil and gas were also restricted. Acid treatment was not effective.

Records of subsequent testing are wanting, but it is recorded that in May 1930, water with gas and oil films flowed at the rate of 1,800 gallons per hour. A pilot absorption test on the gas gave $7\frac{1}{2}$ pints of gasoline per 1,000 cu. ft. of gas.

It is assumed from notes that the $8\frac{1}{2}$ in. casing seal failed and had to be recemented, and a $6\frac{1}{2}$ in. liner run to 3,868 ft., cemented and perforated at about 3,859 ft. Bailing showed water flow of 327 gallons per hour and gas activity. This perforation was cemented up and another perforation made at 3,848 ft. which produced water.

It was decided to abandon the well and the bottom of the hole was plugged with cement. The top of the cut $8\frac{1}{2}$ in. casing was capped with cement (no record of when or where cut), the $11\frac{1}{2}$ in. casing pulled and the hole filled with heavy mud. A plate was welded over the 15 in. surface casing.

A.R.O. No. 5 (Blythdale)

The well is situated on reserve 61, parish of Blythdale. Surface elevation is 1,014 ft.

Drilling commenced on 30th December, 1929, and ceased at 3,848 ft. 6 in. on 24th October, 1930, without reaching bedrock.

Blythdale Group was penetrated from surface to 707 ft. The base of the Walloon Coal Measures cannot be determined accurately from the graphic log as no thick sands were recorded, and coal occurs within the interval expected to represent the Bundamba

Group. In thickness considerations, the top of the Bundamba Group is placed at 2,500 ft. and the top of the Moolayember Shale at 3,200 ft.

Gas was recorded at 1,230 ft., with coal, 1,876 ft., 2,950 ft. to 3,122 ft., 3,216 ft., 3,730 ft., 3,770 ft. and 3,830 ft. No wet gas was analysed from this well. (Table III).

Oil was recorded between 3,769 ft. and bottom, the strongest occurrences being at 3,830 ft. and 3,847 ft. (Table IV).

Water was reported at 186 ft. and flows from 3,102 ft. and 3,830 ft. (17,000 gallons per day; temp. 170° F.).

Selective coring commenced at 1,500 ft. and was almost continuous from 3,635 ft. Surface casing, 15 in. diameter, was cemented at 110 ft., $8\frac{1}{2}$ in. casing was cemented at 3,760 ft.

The section 3,760 ft. to 3,780 ft. was tested by bailing but failed to produce fluid. Artesian flow from 3,830 ft. was accompanied by gas and oil. Efforts to shut off water and produce from the upper part of the sand, 3,830 ft.–3,834 ft., which showed oil in cores, failed. A liner was set at 3,834 ft. and further coring showed water and oil sands to 3,848 ft.

The operators decided that the oil and water were located in the same sand and endeavoured to obtain oil production by pumping water at the rate of 50,000 gallons per day and allowing the oil to separate out.

No details of results are available, but it is recorded that in 1932, pumping caused A.R.O. No. 4 to cease flowing.

A.R.O. No. 6 (Cornwall)

The well is situated 37 miles north-west from Roma on Flagstone Creek, parish of Cornwall. Surface elevation is 1,334 ft.

The well was drilled with rotary tools to 300 ft. by Roma Cornwall Dome N.L. between 12th August, 1927, and 10th September, 1929. It was taken over by Australian Roma Oil and deepened to 2,306 ft. by 7th April, 1930.

Blythdale Group was penetrated from surface to 523 ft., Walloon Coal Measures to 1,228 ft., Bundamba Group to 1,756 ft., Moolayember Shale to 2,234 ft. and pre-Mesozoic slates to 2,306 ft.

No gas or oil is recorded from the well. Water is recorded at 1,230 ft. and 1,440 ft.

Cores were taken at intervals from 633 ft. A dip of 10° is recorded at 2,068 ft., 45° at 2,241 ft. and 56° at 2,255 ft.

No casing was used in the well. Testing consisted of bailing but the water level could not be reduced below 340 ft. The well was abandoned.

A.R.O. No. 7 (Solitary Creek)

This well is situated at the head of Solitary Creek, on portion 11, parish of Whithu, 20 miles north-east from Roma. Surface elevation is 1,361 ft.

Roma Mooga Oilfields N.L. drilled this well to 1,702 ft. with percussion plant between 27th March, 1929, and 2nd August, 1929. Australian Roma Oil Ltd. deepened the well to 3,609 ft. between 23rd April, 1930, and 31st May, 1932, using cable tools to 2,600 ft. and rotary to bottom.

Drilling logs show that the well penetrated Blythdale Group from surface to 472 ft., Walloon Coal Measures to 1,897 ft., Bundamba Group to 2,545 ft. and Moolayember Shale of shale with sandstone and probably older sediments to 3,586 ft. Metamorphosed sediments, consisting of chert, indurated shaly sandstone and crystalline siliceous limestone, are recorded to total depth 3,609 ft.

Variegated green and red shales from 3,125 ft. suggest Rewan Formation; the sediments described as "soapstone" with coal from about 3,335 ft., are suggestive of the Bandanna Formation. The descriptions of soapstone suggest bentonitic clay, but drilling mud reactions suggest that gypsum or anhydrite is also present in the formation. Dr. H. I. Jensen correlates strata at 3,360 ft. in this well with those at 3,200 ft. in Stewart's Mooga N.L. No. 1. Dolomitic limestone was reported at 3,522 ft.

Gas is recorded from 1,400 ft., 1,458 ft., 1,702 ft., 1,800 ft. to 1,920 ft., 2,710 ft., 3,418 ft. to 3,450 ft.

Oil signs are recorded at 1,432 ft., 1,610 ft., 2,980 ft.-3,087 ft., 3,325 ft.-3,328 ft. and 3,354 ft.-3,357 ft. in cored sandstone, 3,386 ft.-3,427 ft. and 3,576 ft.-3,581 ft.

Water shows occurred at 170 ft. (200 gallons per day), 420 ft., 3,113 ft. to 3,150 ft. (oily) and 3,452 ft.

Cores were taken from 2,060 ft. to bottom. Dips recorded are 10° at 3,250 ft., 5° at 3,352 ft. and 15° in the metamorphics at 3,586 ft.

Ten inch casing was seated at 114 ft.; 8 in. casing was cemented at 2,555 ft.; 6 in. casing was cemented at 2,966 ft.; 4 in. casing was cemented at 3,318 ft.

Reports on testing this well are few and difficult to piece together. The bailing tests after the 6 in. casing was seated at about 2,900 ft. showed oil and gas entering the hole to 3,110 ft. but no clear water was bailed. Fluid level was not lowered beyond 640 ft. The casing was cemented at 2,966 ft. with bottom of hole at 3,150 ft., and tested successfully. When cleaning out, cement was met 23 ft. above the shoe, indicating that the casing was cemented for 180 ft. up the annular space between casing and walls of the hole. The cement was drilled to 4 ft. below the shoe and bailing commenced.

When all mud and cement-contaminated water had been bailed out, the level of gas- and oil-contaminated water in the hole was 463 ft. as against 600 ft. when bailing commenced. Thief bailing to bottom did not show any section of clear water or oil concentration, but gas was stronger towards bottom.

To ensure that the cement seal was not leaking, a pressure test was applied, but no change was noticed in the annular space, proving that there was no leak through the cement.

It was decided that the section under test, 2,966 ft. to 3,105 ft. (3,095 ft. to 3,140 ft. was filled with cavings) was too low in porosity to produce, and also that sub-artesian water beds existed with the oil and gas sands. (Before this test it was considered that this section was dry). In view of this, the decision was made to drill on, and re-test later if considered necessary.

The hole was deepened to 3,385 ft. where another bailing test took place. Thief bailing showed water entering the hole to about 3,180 ft. (with gas?) and gas and oil without water, from 3,246 ft. to bottom. Intensive bailing from this lower section gave gas, yellow oil and black crude oil. During this test the water level stood at 400 ft. and bailing at the rate of 400 gallons per hour maintained the level at 733 ft.

Operations were suspended in November 1931, with bottom at 3,536 ft. Re-measurement of the hole when reopened on 7th May, 1932, gave 3,543 ft. as bottom.

With depth at 3,610 ft. the bit stuck and drill-pipe parted at 2,046 ft. Reports covering fishing operations over three months are missing, but apparently the drill pipe was backed off, or shot off at 3,585 ft.; 4 in. casing was run and cemented at 3,318 ft., the hole cleaned out to the top of the fish and bailing commenced.

Water entered the hole at 3,452 ft. The hole was plugged from bottom to 3,460 ft. with sand and stones, and to 3,422 ft. with cement. Bailing over eleven days showed a reduction in static water level from 444 ft. to 710 ft. but subsequent bailing did not improve the position.

Records cease on 7th December, 1932. Apparently attempts to isolate and test the oil sections were abandoned.

A.R.O. No. 8 (Blythdale)

The well is located on reserve 61, parish of Blythdale, 1,000 ft. north-west from A.R.O. No. 5. Surface elevation is 1,037 ft.

Drilling with rotary tools commenced on 7th June, 1930 and total depth of 3,988 ft. was reached on 24th October, 1930.

The well penetrated Roma Formation from surface to 217 ft., Blythdale Group to 756 ft., Walloon Coal Measures to 2,668 ft., Bundamba Group to 3,300 ft. and Moolayember Shale to granite basement at 3,872 ft.

The only gas recorded was from the lowest 6 ft. of sediments. Oil was recorded at 3,650 ft. and an oil sand with water from 3,856 ft. to 3,872 ft.

Cores were taken between 2,347 ft. and 2,531 ft., 3,300 ft. and 3,380 ft. and 3,540 ft. and bottom. Surface casing was cemented at 244 ft. and 8½ in. casing at 3,605 ft. This has since been removed.

The formations were tested by setting a packer at different depths and bailing the hole. Very little gas was evident but artesian water was obtained. The hole was filled and cemented back with the intention of sealing the lower part of the oil sand, but the cement was placed too high. There is no record of a thorough test being made.

A.R.O. No. 9 (Gunnewin)

Five shallow scout holes had been drilled before this well was begun by Kayenta Oil Prospecting Co. in October 1928. The well reached total depth of 2,104 ft. in September 1930. Australian Roma Oil supervised the later drilling and testing of the formation. Percussion tools were used.

The well was situated 7½ miles west of Gunnewin, which is on the Roma-Injune railway. Surface elevation is 1,547 ft.

Walloon Coal Measures were penetrated from surface to 748 ft., Bundamba Group to 1,361 ft. and Moolayember Shale and older sediments to metamorphic bedrock at 2,060 ft. Dark and talcose slates were drilled for 44 ft. to total depth, 2,204 ft.

Gas was reported from 1,140 ft., 1,485 ft., in black sand at 1,590 ft. and at 1,682 ft., and 1,772 ft. In surrounding water and scout bores, gas was struck on several occasions in the Walloon Coal Measures. Analyses proved absence of petrolierous constituents.

Oil was recorded at 950 ft. and thence frequently to basement. In no case was there sufficient to collect, and many of the shows may have been caused by grease on the tools. Water was struck at 1,485 ft. and 1,705 ft.

Ten inch casing was seated at 844 ft., and 8 in. casing was cemented at 1,352 ft. An attempt was made to test the sands at 1,595 ft.–1,625 ft. by cementing 6 in. casing at 1,593 ft. after plugging the hole to 1,628 ft. with stones, sand and three bags of cement. The test proved non-productive, but mistakes in casing and cement measurements probably affected the results. All casing was removed and the hole abandoned.

A.R.O. No. 10 (Orallo)

This well is situated on portion 63v, parish of Bengalla, 21 miles north-west from Roma. It is also known as Roma Orallo Ltd. No. 1. Surface elevation is 1,162 ft.

It was drilled with percussion tools between 2nd September, 1929, and 20th September, 1930.

Formations penetrated were Blythesdale Group from surface to 462 ft., Walloon Coal Measures to 1,825 ft., Bundamba Group to 2,396 ft. and Moolayember Shale to 2,835 ft.; quartzite, schist and metamorphosed tuff were drilled to 2,863 ft.

Gas was reported from about 2,800 ft., and oil and gas showings from 2,833 ft. to 2,835 ft. Water occurred at 350 ft., 440 ft., 1,030 ft., 1,755 ft., 1,825 ft., 1,900 ft. and 2,285 ft.

Ten inch casing was set at 152 ft., and 8 in. casing followed the bit. With bottom at 2,822 ft. the hole was bailed. Slight showings of gas and oil were noted but were of no consequence. No water came into the hole. When drilling 2,833 ft. to 2,835 ft., gas and oil showings were recorded, but bailing to 2,000 ft. with bottom at 2,863 ft. gave less and less gas production, proving no accumulation. The well was abandoned.

A.R.O. No. 11 (Blythdale)

This well is situated on portion 109, parish of Tingun, 400 yards south-east from Blythdale railway station. It is also referred to as East Roma Oilfield No. 1.

Drilling commenced on 24th June, 1929, with percussion tools, and total depth of 4,162 ft. was reached on 8th April, 1931.

The base of the Roma Formation was reached at 268 ft. No record of strata is available between 450 ft. and 783 ft., and hence the base of the Blythdale Group cannot be located. Shales and sandstones with coal and brown shale were penetrated to 2,969 ft. This is greater than the normal thickness of Walloon Coal Measures, which may, perhaps, fill an erosion channel in the Bundamba Group. The base of the Bundamba Group was reached at 3,301 ft., Moolayember Shale and probably older sediments rest on granite basement at 4,135 ft.

Gas was recorded at 385 ft., 1,860 ft., 1,907 ft., 2,282 ft., 2,566 ft., 3,909 ft. and while bailing the lower part of the hole. Oil occurred at 4,123 ft.–4,129 ft. in arkose, and several pints were bailed from the top of the water column after the well was left to stand for several months.

Water was logged at 385 ft., 904 ft., 1,137 ft. and 3,971 ft. Temperature at 2,258 ft. was 131 F.

Coring commenced at 3,862 ft., with a Baker percussion barrel; cores from 3,876 ft. to 4,122 ft. showed dips of 5°–10°.

Casing used in the hole consisted of 20 ft. of 12 in. surface string, 960 ft. of 10 in. diam., 1,935 ft. of 8 in. cemented, 6 in. diam. cemented at 3,862 ft., a cemented liner from 4,110 ft. to 3,810 ft. All casing is reported to have been removed.

Interesting features of this well are the water recorded at 900 ft. to 1,000 ft. and 1,140 ft. to 1,210 ft. These aquifers flowed more than 100,000 gallons per day and appear from lithology to be in the Walloon Coal Measures. A richly garnetiferous sandstone recorded at 1,137 ft. may be useful for correlation purposes.

The well was bailed dry in March 1931, and only films of black oil and traces of gas were obtained. No water entered the hole. The hole was deepened to ensure bedrock had been reached, and was bailed dry, sealed and left to stand for 6 months. On re-opening, fluid level was at 500 ft., with about 5 quarts of light oil on top. A charge was exploded

in the hole to shatter the oil sand but subsequently the bailer was lost and it was five months before the hole was bailed to 3,650 ft.

No further records are available. Presumably the tests were non-productive.

A.R.O. No. 12 (Euthulla)

This well was drilled to 2,005 ft. by Mid-continent Mines Co., and deepened by Australian Roma Oil Ltd. to 3,020 ft.

It is situated on reserve 143, parish of Euthulla, 8 miles north-north-west from Roma. Surface elevation is 1,165 ft.

Drilling commenced on 1st November, 1928, and 2,005 ft. depth was reached on 21st September, 1929. Operations were resumed in November 1930, and ceased in April 1931.

The well commenced in sandy beds of the Roma Formation. Blytheshdale Group was penetrated from 370 ft. to 1,000 ft.; Walloon Coal Measures to 2,310 ft.; Bundamba Group to 2,485 ft. and Moolayember Shale to total depth.

Gas was recorded at 1,988 ft. and analysed as carbon dioxide 1·4 per cent., methane 64 per cent., inert 30·6 per cent., air 4 per cent. Showings are recorded at 2,330 ft. with water, 2,440 ft., 2,856 ft. A sludge sample from 1,270 ft. gave 3·8 per cent. oil, but no major showings are recorded. Water was found at 373 ft., 510 ft., 760 ft., 1,165 ft. (rose to 100 ft.), 1,900 ft., 2,310 ft. and 2,815 ft.

At least the last 45 ft. of the hole was cored, but depths are doubtful owing to a re-measurement, which was not clearly recorded.

The hole was bailed when depth was 2,005 ft., but water flooded the hole and drowned out the small gas show. There is no record of further testing. All casing was removed from the hole.

A.R.O. No. 13 (Euthulla)

The well is situated on portion 411, parish of Euthulla, 6 miles north-west from Roma, at lat. 26° 30' S., 148° 43' 20" E. Surface elevation is 985 ft. (approx.).

Drilling by Interstate Mines and Petroleum Ltd. commenced on 8th December, 1928, and was suspended in November 1929, at 1,480 ft. Australian Roma Oil Ltd. resumed drilling in November 1930, and reached total depth, 2,705 ft., on 31st March, 1931.

The section penetrated was Roma Formation to 628 ft., Blytheshdale Group to 1,110 ft., Walloon Coal Measures to 2,460 ft. and Bundamba Group to 2,705 ft.

Gas was recorded from 330 ft., 1,360 ft., 1,437 ft., 1,620 ft., 1,758 ft., 1,888 ft. and 2,170 ft. to bottom. No analysis was made so shows are assumed to have been slight. Oil colours were seen at 910 ft. (sludge samples contained 1·4 per cent. free oil), 980 ft. (0·04 per cent. free oil), 1,060 ft. (15·7 per cent. free oil), 1,365 ft. and 2,000 ft.

Water was found at 330 ft., 355 ft., 618 ft., 730 ft. (flowed?), 1,000 ft. and 2,460 ft. (rose to 300 ft.).

Ten inch casing was seated at 1,112 ft., 8 in. casing was seated at 1,898 ft., and 6 in. casing was run to near bottom. On completion of drilling all casing was removed.

With casing seated at 1,355 ft. and the hole dry, oil and gas showed from 1,360 ft. to 1,366 ft. while drilling was in progress. No samples were collected and conditions prove no quantity present. The section 1,480 ft.-1,493 ft. gave traces of oil and some gas when the fluid level was reduced to 300 ft., but no further record is available.

The hole appears to have been abandoned when tools were lost at 2,705 ft.

A.R.O. No. 14 (Blythdale)

This well is located 6 miles north from Blythdale, near the southern boundary of portion 105, parish of Blythdale. Surface elevation is 1,151 ft.

Drilling commenced on 17th January, 1931, and ceased on 30th April, 1931, at 3,544 ft.

The well penetrated Blytheshdale Group from surface to 415 ft., Walloon Coal Measures to 2,429 ft., Bundamba Group to 3,060 ft. and Moolayember Shale to granite basement at 3,533 ft.

Gas was recorded at 3,400 ft. and from 3,480 ft. to 3,530 ft. Gas from the lower zone proved to be petroliferous and was estimated to flow at the rate of 5,000 cu. ft. per day (Table III).

Oil was reported from 283 ft. in the water bore put down near A.R.O. No. 14. The reservoir rock was carbonaceous sandstone. At 280 ft. in A.R.O. No. 14, brown shale was recorded. No other show was logged but numerous positive solvent tests were recorded. Water was recorded at 120 ft.

Eleven inch diameter casing was cemented at 415 ft. and 5½ in. casing was cemented at 3,268 ft. Cores were taken from 40 ft. to 63 ft., 1,730 ft. to 1,905 ft., 2,105 ft. to 2,120 ft., 3,100 ft. to bottom.

The well was tested by bailing in September 1931, and petroliferous gas was obtained, but efforts to improve production above 4,000 cu. ft. per day were not successful. Absorption tests of the gas showed it to be three times more productive than the Roma gas.

Further bailing tests were made in May 1932. Some light oil was recorded but records cease before completion of the tests.

It is presumed the casing was withdrawn and the well abandoned.

A.R.O. No. 15 (Bungil)

This well is situated on portion 156F, parish of Bungil, 4 miles south-west from Roma. Surface elevation is 993 ft.

Drilling by Roma Oil South Blocks commenced on 3rd January, 1929. Percussion tools were used to a depth of 3,735 ft. Australian Roma Oil Ltd. took

over at 3,735 ft. in March 1931, and drilled with rotary tools. Drilling ceased on 21st May, 1931, at 4,110 ft.

Formation boundaries were located at the following depths: Base of the Roma Formation 650 ft.; base of Blythesdale Group 1,555 ft.; base of Walloon Coal Measures 2,712 ft.; base of Bundamba Group 3,500 ft.; the Moolayember Shale rests on metamorphic basement at 4,090 ft.

Some gas was noted at 2,430 ft. and traces of oil and gas were logged at 3,600 ft. to 3,732 ft.

Water was reported at 650 ft. to 830 ft., 1,039 ft. to 1,139 ft., 1,475 ft., 1,965 ft., 2,795 ft. and from between 3,965 ft. and 4,000 ft.

Circulation was lost at 4,022 ft., but there is no record of how much was pumped to formation or of its subsequently being tested.

Cores taken in the lower section of the hole showed gentle dips. Ten inch casing was seated at 495 ft.; 8 in. at 2,002 ft. and 6 in. was cemented at 3,702 ft.

The well was tested by bailing at 3,742 ft., with bottom at 3,907 ft., without production. The section 3,965 ft.-4,000 ft. was tested with a packer and bailing tests, with negative results, though water entering would not allow reduction of fluid level below 1,050 ft. No test below 4,000 ft. is recorded.

A.R.O. No. 16

See R.O.C. No. 1 (Hospital Hill).

A.R.O. No. 17

See R.O.C. No. 3 (Roma).

A.R.O. No. 18

No record of the nature or location of this well is available.

A.R.O. No. 19 (Wallumbilla)

The well is situated on the north-western outskirts of Wallumbilla township, 24 miles east from Roma. Surface elevation is 1,042 ft.

Drilling commenced on 25th October, 1932, and reached a depth of 4,968 ft. in December 1933. Rotary equipment was used.

The log suggests Roma Formation extends to 508 ft., Blythesdale Group to 1,373 ft., Walloon Coal Measures to 3,380 ft., Bundamba Group to 3,480 ft., and Moolayember Shale to at least 4,200 ft. Brown and carbonaceous shale occurs to 4,219 ft. This is followed by sandstone and shale with greenish coloration and siderite nodules to 4,488 ft. and multi-coloured shale, including brown, red and grey, with sandy beds to 4,842 ft. The sediments from 4,842 ft. to bottom are mainly sandstone.

It is probable that the sediments below 4,488 ft., from which *Calamites* and (?) *Vertebraria* are recorded, are of Permian age. If this is so the greenish sideritic sediments may be equivalent to the lower

Mesozoic sediments found in wells further east—C.O.L. No. 1 (Speculation), M.O.C. No. 1 (Boyanda) and A.R.O. No. 20 (Dalby)—and the overlying brown shales comparable with the Ipswich Coal Measures.

L. C. Ball considered 4,310 ft. as the base of the Mesozoic sediments with a slight angular unconformity, but this amounted, on average dips, to only one degree.

Comparison with A.R.O. No. 7, where coals from 3,471 ft. are considered to be of Permian age, suggests a general thickening towards the east of the pre-Bundamba section, particularly the Moolayember Shale and carbonaceous sediments immediately below. Sediments at 2,905 ft. in A.R.O. No. 7 may be correlated with those at 4,219 ft. in A.R.O. No. 19.

Gas was reported at 4,585 ft. and in the sandstone from 4,842 ft. to 4,958 ft. This latter proved to be petrolierous, but no volume was produced. (Table III.)

Odours of oil were noted in cores from 4,479 ft., 4,576 ft., 4,847 ft., and 4,911 ft. No sample was collected.

Water was logged at 511 ft., 680 ft., 1,880 ft., 1,944 ft.-2,000 ft., 2,299 ft., 3,596 ft., 3,800 ft. and 4,256 ft. No water was noted below 4,300 ft.

Water collected during swabbing tests, and considered to be leaking from above the casing shoe at 4,467 ft., contained 125 grains per gallon sodium chloride and 39 grains sodium carbonate, which is high for artesian waters.

Coring commenced at 3,600 ft., and was carried out almost continuously to bottom. Dips recorded average 10° to 4,600 ft. and 4° at 4,800 ft., the deepest recorded.

Eleven and three-quarter inch casing was cemented at 542 ft., 8½ in. seated at 1,813 ft., and 5¾ in. cemented (not effectively) at 4,467 ft. A 4 in. liner was cemented between 4,015 ft. and 4,768 ft.

In February 1934, the hole was tested from 4,467 ft. to bottom, 4,968 ft., by running tubing to 4,300 ft., displacing the drilling mud with water and swabbing the hole. After reducing the fluid level to 220 ft., the well flowed water, presumably from above the casing shoe. Petrolierous gas was noticed after swabbing for two days, and a sample was collected. This test, though a failure, proved presence of gas with some water in the lower part of the hole. (Water analysis above).

The 4 in. liner was cemented to 4,768 ft. and the hole again swabbed. With fluid level at 4,025 ft. water with very little gas entered the hole at 52 gallons per hour.

Gas was evident when pulling the tubing, and pressure built up when the well was closed in, but it was not proved that the gas and water occupied separate sands. The well was taken over as a town water well.

A.R.O. No. 20 (Dalby)

This well was drilled in 1934-35 by a subsidiary company, Australian Roma Oil (Dalby) Ltd., on behalf of the Dalby Council, for water to 3,500 ft., and on behalf of Australian Roma Oil Co. to any greater depth.

It is situated to the north-west of town reserve 167. Surface elevation is 1,125 ft.

The well was drilled with rotary tools to total depth, which is unknown, the last record being from 3,543 ft.

Tertiary clay, sand and gravel were penetrated from surface to 422 ft., Walloon Coal Measures to 1,114 ft. (with 8 ft. of coal at 764 ft.), Bundamba Group to 2,100 ft., Moolayember Shale to 2,784 ft., Clematis Sandstone to 3,220 ft. then indurated carbonaceous shale and sandstone to 3,543 ft. with conglomerate at 3,441 ft. It is not certain whether the base of the Mesozoics should be placed at 3,220 ft. or at the conglomerate at 3,441 ft. Comparison with cores from C.O.L. No. 1 (Speculation) to the west, suggest that the conglomerate may be pre-Mesozoic.

No gas or oil shows were logged. A little water was found in the Tertiary sediments at 100 ft. and 409 ft., and in the Walloons at 764 ft. Water between 1,976 ft. and 2,800 ft. rose to 18 ft. from surface when tested. Another show was logged at 2,065 ft.

Casing history is not recorded. Cores were taken at selected depths and showed dips of 5° or less to bottom. The only test recorded was the water test at 2,800 ft. The well is used for town supply.

A.R.O. No. 21 (Brigalow)

This well is located on D. Gruhle's property, portion 44, parish of Ewer, approximately 6 miles south-south-west from Brigalow. Surface elevation is 1,040 ft. It was sunk 100 ft. south-west from a water bore which had oil showings at 408 ft.

Drilling commenced on 21st June, 1936, and ceased at 611 ft. on 23rd January, 1937. Percussion tools were used.

Formations penetrated consisted of 178 ft. of clay and sandstone showing oxidation colours, pebbles near the base and also carbonaceous material; followed by grey and carbonaceous shales and coal seams to 611 ft. with sandstone bands and beds between 445 and 468 ft. and calcareous sandstone 522 ft. to 530 ft. The upper 178 ft. is probably Tertiary sediments, the remainder Walloon Coal Measures. Coal seams are recorded at 351 ft. (3 ft.); 423 ft. (3 ft.); 468 ft. (2 ft.); and 485 ft. (1 ft.).

Gas showings are recorded from 348 ft., 421 ft. to 432 ft. and occasionally to 554 ft. No sample was collected. Oil colours occurred from 430 ft. to 563 ft. Water is recorded as salty to 426 ft. and fresh at 452 ft.

A bailing test at 432 ft. with casing seated at 421 ft. gave light oil showings and gas which burnt with a 4 in. flame. No volume was measured. It was intended to shoot the well but on lifting the casing water flooded the hole and the project was abandoned.

C

Beaudesert Boring Company No. 1 (Beaudesert)

This bore is situated on portion 13, parish of Beaudesert, one mile south-west of Beaudesert township. Surface elevation is approximately 80 ft.

Drilling with percussion tools commenced on 11th April, 1929, and was abandoned at 1,600 ft. in April 1932.

Formations penetrated consist of alluvium to 92 ft. and Walloon Coal Measures to bottom, with a dolerite sill from 300 ft. to 330 ft.

Gas and oil were recorded at frequent intervals, particularly below 1,200 ft., but as small showings only. Gas from 1,420 ft. was analysed as 0·8 per cent. carbon dioxide, 64·5 per cent. methane, 34·7 per cent. inert gas.

Water was found in the alluvium and at 350 ft., 728 ft. and 812 ft. in the Walloon Coal Measures.

Eight inch casing was seated at 348 ft. and 6 in. casing followed the bit. No cementing is recorded. No attempt to test the well is recorded, but as there is no information concerning the last 200 ft. of drilling, a test may have been made.

Bell's Topel Bore No. 1 (Boonah)

This shallow bore was sunk during 1929 on portion 216A, parish of Coochin, one mile west of Dugandan railway station, which is the terminus of the Fassifern branch railway. The bore was drilled to check reports of oily material found in shallow water wells and bores in the immediate vicinity. It penetrated 112 ft. of clay and black and grey shale with some coal, belonging to the Walloon Coal Measures.

Bell's Bore, Boonah

See Boonah Oil Prospecting Co. Ltd. No. 1 (Dugandan).

Bishop's Scout Bores Nos. 1 and 2 (Toorbul)

Two percussion bore holes were sunk in the vicinity of Toorbul Point between 1937 and 1940. The sites were selected by divination. The surface elevation of the sites is not known but would be less than 25 ft. The first was located in portion 6, parish of Toorbul, county of Canning, 8 miles by road from Caboolture. It reached a depth of 188 ft. in sandstone with some shale.

The second borehole was located in portion 26v, parish of Toorbul. The total depth was reported to be 807 ft. After penetrating 55 ft. of clay and gravel of probable post-Tertiary age, the strata consisted of fine to medium grained, slightly calcareous sandstone with some shale, of Mesozoic age. Water was reported at 175 ft. (salt), 300 ft., 465 ft., 484 ft. and 676 ft. Inflammable gas shows were reported at 350 ft. and 484 ft., but these were not confirmed.

Boonah Oil Prospecting Co. Ltd. No. 1 (Dugandan)

This well is situated 2 miles eastwards from Dugandan railway station on subdivision 2, portion 8, parish of Dugandan.

The site was chosen by divination, and oil was predicted at 380 ft. to 390 ft. Records show a depth of 352 ft. at the end of 1929 but no further information is available.

The log shows soil and "billy" to 20 ft., basalt to 152 ft. with 20 ft. of black shale from 111 ft. "Bundamba type" sandstone is logged from 170 ft. to 250 ft. followed by shales with coal from 280 ft. to 292 ft. and from 340 ft. to 350 ft. This latter coal analysed 1·8 per cent. moisture, 28 per cent. volatile matter, 32·3 per cent. fixed carbon and 37·9 per cent. ash which is comparable with Ipswich coal analyses. However, the regional geology suggests that this formation is Walloon, and there is no evidence available to support the suggestion that it may be Ipswich Coal Measures.

There is no record of gas or oil, but spa water is recorded at 111 ft. and brackish water at 345 ft. No other details are on record.

Blume's Bore

See Malta Oil Company No. 1 (Nive River).

Brigalow

See A.R.O. No. 21 (Brigalow).

British Australasian Oil Syndicate No. 1 (Gatton)

This well is situated 4 chains from the south-west corner of subdivision 8, portion 35, parish of Tenthill, 6 miles south-west from Gatton; surface elevation is approximately 400 ft. The well is also referred to as Robinson's Bore. The site was selected by divination.

Drilling commenced on 6th May, 1931, and reached a depth of 1,082 ft. on 16th January, 1933.

Formations penetrated consisted of Tertiary clay and hard brown sandstone to 40 ft., Walloon Coal Measures (calcareous sandy mudstone and sandstone) to 671 ft., Bundamba Group (conglomeratic at the base) to 996 ft., and Ipswich Coal Measures (shale, grit and carbonaceous shale), to bottom at 1,082 ft.

Gas was recorded at intervals between 519 ft. and 1,080 ft. but no sample was collected. Analyses showed the presence of thick black oil in sludge samples from 930 ft. and 945 ft., but the quantity of oil was very small.

Water was recorded at 40 ft., 944 ft., 979 ft. with gas and oil specks and at 1,008 ft.

Several bailing tests were made by seating the casing as the drilling progressed but no production was obtained.

A surface string of 8 in. casing was cemented at 60 ft. All other casing was removed before abandonment.

Brown's Scout Bores Nos. 1 and 2 (Chinchilla)

Two shallow holes were sunk by E. T. Brown in 1929 on portion 22, parish of Ewer, 10 miles south from Chinchilla, to investigate the possibility of petroleum in the area. Gas under pressure had been reported from a water bore on the same portion in 1916.

The first well struck gas in small quantity at 172 ft. and the second, 30 ft. away, proved a better gas show. (Analyses Table III).

Tertiary sediments rest on Walloon Coal Measures at approximately 160 ft.

Further operations were suspended because the quantity of gas was not up to expectations. Analysis showed no ethane content.

Builder's Ltd. Scout Bores (Roma)

Builders Ltd. drilled 158 shallow structural and stratigraphic bores in the Roma area in 1928. The maximum depth was less than 500 ft., and aggregate footage was 35,000 ft.

Although several anticlinal structures were found, no deep test was made. Groups of closely spaced bore holes revealed the lenticularity of the Cretaceous sediments.

Cockatoo No. 2 Bore

See Providence Oil Pty. Ltd. No. 1 (Twin Hills).

Condamine Oil Limited No. 1 (Speculation)

This well is located 24 miles north-east of Chinchilla, at lat. 26° 28' S., long. 150° 44' E. Drilling began with a percussion plant on 5th August, 1948. A string of tools was lost in the hole, at 2,202 ft. on 6th April, 1953. After by-passing this, the well was deepened to 2,332 ft. in the period up to 28th August, 1957. The rig was subsequently converted to rotary operation, and reaming was carried out until October 1959, when operations were temporarily suspended; total depth remained 2,332 ft.

The strata penetrated were:

0-	250 ft.	Walloon Coal Measures
250-1,041 ft.		Bundamba Group
1,041-1,555 ft.		Moolayember Shale
1,555-1,765 ft.		Clematis Sandstone
1,765-2,332 ft.		indurated conglomerate

The indurated conglomerate met from 1,765 ft. to total depth, consists largely of fragments of volcanic rocks.

The driller reported a gas showing at a depth of 2,200 ft.; this has not been confirmed.

Consolidated Roma Oil Ltd. Scout Bores Nos. 1-4 (Brigalow)

Four shallow scout holes were drilled in 1928 on the north-western outskirts of Brigalow township, to determine the structure of the area about Beutel's water bore, in portion 48, parish of Earle, in which gas was found.

The bores showed a north-south fold, and a deep test site was selected but not drilled. Formations penetrated were 60 ft.-70 ft. of Tertiary sand and grit followed by Walloon Coal Measures. Coal seams up to 6 ft. thick are recorded at 172 ft. maximum depth.

Cooper's No. 1 Well (Lowood)

This well is located on portion 376, parish of Walloon, $4\frac{1}{2}$ miles bearing 165° from Lowood. The site was selected by divination. Surface elevation is approximately 600 ft.

Drilling commenced in July 1920, and reached 1,265 ft. on 9th July, 1923. A percussion plant was used.

Basalt was penetrated to 31 ft., Bundamba Group to 365 ft. and Ipswich Coal Measures to total depth 1,265 ft. Black shale and oil shale were logged frequently but the only coal reported was at 886 ft.

Gas and oil showings were logged at numerous depths in the Ipswich Coal Measures. Gases from 800 ft. and 950 ft. were non-petroliferous. A trace of oil was found in sludge from 900 ft. (Table IV).

Water was logged at 305 ft. and 536 ft. A water analysis was made on water collected in 1935 with casing at 900 ft. but the depth of the aquifer cannot be determined (Table V).

Records do not show any formation test results but it is assumed that the showings were too small to warrant testing.

Currier's Bore

See Salt Domes Oil Syndicate No. 2 (Boonah).

Delhi-Frome-Santos Innamincka No. 1

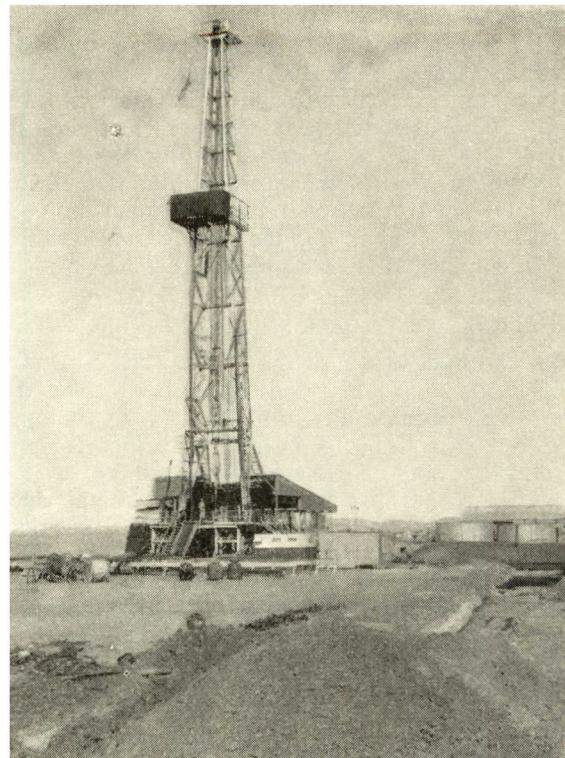
This well was drilled at lat. $27^\circ 29' 21.3''$ S., long. $140^\circ 55' 7.7''$ E., in South Australia, adjacent to the Queensland border, to test a large anticlinal structure (Innamincka Dome) defined by surface geological mapping and seismic methods. The three partners in the venture were Delhi Australian Petroleum Ltd., Frome-Broken Hill Co. Pty. Ltd and Santos Ltd. The drilling was subsidised by the Commonwealth Government under the *Petroleum Search Subsidy Act*, 1957-58. The drilling contractor was Delta Drilling Co., and the rig a National Ideal 130. Rotary table elevation was 412.7 ft., and surface elevation 401.7 ft. Drilling commenced on 28th March, 1959, and was completed at a total depth of 12,637 ft. on 16th November, 1959. The well was completed as an artesian water well on 27th November, 1959.

Delhi-Frome-Santos Betoota No. 1

This well was drilled at lat. $25^\circ 42' 30''$ S., long. $140^\circ 49' 51''$ E., to test a large anticlinal structure (Betoota structure), defined by surface geological mapping and seismic methods. The drilling was subsidised by the Commonwealth Government under the *Petroleum Search Subsidy Act*, 1957-58. Surface elevation was approximately 345 ft. The drilling contractor was Delta Drilling Co., and the rig a National "Ideal" 130. Drilling commenced on 22nd December, 1959, and progress depth at midnight on 31st December, 1959, was 1,201 ft.

Delta Oil N.L. Nos. 1 and 2 (Barcaldine) (P.P.P. 148)

Two wells were sunk by Delta Oil N.L., some 14 miles bearing 105° from Barcaldine, to check the



Delta Drilling Co.'s National 130 rig drilling D.F.S.
Betoota No. 1, S. W. Queensland.

report of oil showings in an old water bore. The approximate location of the bores is lat. $23^\circ 37'$ S., long. $145^\circ 30'$ E., but their relative position is not recorded. Surface elevation is approximately 950 ft.

Well No. 1 was commenced on 7th January, 1929, and reached 675 ft.; well No. 2 was commenced on 10th March, 1930, and operations ceased on 30th May, 1930, at 420 ft., with the exhaustion of the Company's finances

Formations penetrated were Tertiary clay and gravel to 46 ft., marine Cretaceous to 432 ft., Blythdale Group to 528 ft., and brown and blue shale with coal and some sandstone (probably Walloon Coal Measures) to 675 ft. No. 2 well reached the marine Cretaceous at 70 ft., but did not reach the top of the Blythdale Group.

No gas was logged. Wax was reported at 435 ft. and drillings and cores from 634 ft. to 675 ft. gave traces of free oil on analysis.

Water was logged as —good supply at 46 ft.; 432 ft. and 485 ft., large artesian supplies; and 615 ft. to bottom, salty water.

Drillers Ltd.

See O.S.L. Nos. 1-3.

East Roma Oilfield No. 1

See A.R.O. No. 11 (Blythdale).

Fagen's Bore

See Salt Domes Oil Syndicate No. 1 (Boonah).

Frome-Broken Hill Co. Pty. Ltd. No. 1 (Wyaaba)

This well is located 90 miles north-north-east of Normanton at lat. $16^{\circ} 29' 30''$ S., long. $141^{\circ} 37' 22''$ E. The rotary table elevation was 40·5 ft. above mean sea level, 5 ft. above ground level. The well was sited in a gravity trough with the object of finding the thickness and nature of the sedimentary section. The drilling was a joint venture between Frome-Broken Hill, and Associated Australian Oilfields N.L.—Associated Freney Oil Fields N.L., who held adjacent Authorities to Prospect.

The well was spudded in on 19th October, 1957, and reached final depth, 2,822 ft., on 15th November, 1957. The rig used was a Sullivan 300A, operated by Mines Administration Pty. Ltd. An 11 in. hole was drilled to 175 ft., then 8½ in. J55 x 36 lb. casing was run to 169 ft., and cemented to the surface. A 5½ in. open hole was drilled from 175 ft. to total depth, 2,822 ft. The well was abandoned as a dry hole by placing cement plugs from 2,640 to 2,610 ft., 180 to 160 ft., and from 20 ft. to the surface. Five cores were cut during the drilling. The hole was logged electrically to total depth, by the Bureau of Mineral Resources with a Widco single electrode unit. Self potential and point resistivity curves were recorded.

The strata penetrated in the well may be divided into the following units:—

Surface—120 ft.	Alluvium, etc.	Quaternary ?
120—335 ft.	Lynd Formation equivalent	Tertiary
335—1,820 ft.	Normanton Formation equivalent	
1,820—2,623 ft.	Blackdown Formation equivalent	Cretaceous
2,623—2,763 ft.	Wrotham Park Sandstone equivalent	
2,763—2,822 ft.	Basement	Pre-Cretaceous

The section above 105 ft. consists of fine to coarse very friable quartz sandstone, and is tentatively correlated as Quaternary alluvium.

The Lynd Formation equivalents consist of fine to coarse grained quartz sandstone, with interbedded gravel and conglomerate. The upper 30 ft. consist entirely of gravel and conglomerate. No fossils were present in this formation and the beds are of freshwater origin.

The Normanton Formation equivalent is dominantly argillaceous. The top of the unit is characterised by a 10 ft. bed of red-brown sandstone, underlain by kaolinite. This is thought to represent a residual lateritic profile developed before deposition of the overlying Lynd Formation. Throughout the section interbeds of sandstone and siltstone are common, and are up to 40 ft. in thickness. Generally, the formation is composed of silty shale, with minor amounts of calcareous siltstone, calcareous sandstone, and cone-in-cone limestone. Glauconitic sandstone and siltstone are common below 1,165 ft.

Microfossils were first recorded from 900 ft. On this basis the section 335 to 805 ft. has been correlated with the fresh-water Winton Formation, but as there is no record of Upper Cretaceous fresh-water sediments in

the Carpentaria Sub-Basin, it seems better to include this interval 335 ft.—805 ft. in the Normanton Formation equivalent.

From 1,820 ft. to 2,627 ft. the section consists largely of shale, with interbeds of glauconitic siltstone and sandstone. This unit has been correlated with the Blackdown Formation, the upper limit in this well being based on breaks in the self-potential and resistivity curves. This can be correlated with a similar horizon in A.A.O. No. 8 (Karumba) well, but it is not certain that this corresponds to the junction of the Normanton and Blackdown Formations at their type localities. Micropalaeontological studies by the Bureau of Mineral Resources have indicated a lower Cretaceous age for the interval 900 ft.—2,700 ft., with an age of "probably Albian" (i.e. Tambo or Normanton equivalent) from 1,157 to 2,200 ft.

The Wrotham Park Sandstone equivalent from 2,627 ft. to 2,763 ft., consists largely of glauconitic sandstone, with a few interbeds of shale. A few carbonised plant remains were found in Core No. 4, 2,627—2,637 ft.

The basement rock consists of sheared andesine-chlorite-quartz greenstone, derived from gabbro.

There were no shows of oil or gas in the well. No formation tests were made.

Glenalvon Mineral Oil Co. Scout Bores (Rosewood)

A number of shallow boreholes were drilled in this area but records of Nos. 1, 2 and 7 only are available. Nos. 1 and 2 are situated in portion 10, parish of Forbes, county of Churchill (lat. $27^{\circ} 45'$ S., long. $150^{\circ} 34'$ E.) and were drilled in 1907. No 7 is in subdivision 32 N7, parish of Forbes, 10 chains south-east of No. 1, and was drilled in 1927.

No. 1 bore (elevation 350 ft.) was drilled to 120 ft. in light coloured shale. Gas was encountered at 105 ft. No. 2 bore (elevation 300 ft.) was drilled through shale, sandstone and some coal (Walloon Coal Measures) to a probable depth of 660 ft. No. 7 bore (elevation 300 ft.) was drilled to a depth of 170 ft. in sandstone and yellow shale. Gas was encountered from 117 ft. to 170 ft. and consisted of 57 per cent. methane, 40 per cent. inert gas and 0·5 per cent. carbon dioxide. (Table III.) Several other bores in the vicinity are known to have encountered gas.

Golden Chance Syndicate No. 1 (Helidon)

The site of this well was selected by divination on the boundary between portions 9V and 10V, parish of Taylor, county of Churchill, 5 miles east from Toowoomba. Surface elevation is approximately 900 ft.

Drilling commenced on 7th August, 1937, and ceased on 31st August, 1938, at 858 ft., the limit of the light percussion plant used.

The well penetrated only Walloon Coal Measures, consisting of sandstone, shale and calcareous shale, without coal seams.

Gas was recorded at 782 ft. in black shale, but no sample was collected. Water is recorded as being difficult to shut off but no depth is recorded. No tests were made.

Henzell's Scout Bores (Stradbroke Island)

In 1930, R. Henzell drilled two shallow scout bores near the pumping station dam, $1\frac{1}{2}$ miles north of Dunwich on Stradbroke Island, to try to locate the source of oil films seen on the waters of the dam. No. 1 bore was sunk $\frac{1}{2}$ chain east of the dam, to a depth of 56 ft. No. 2 was sunk 9 chains south-east of the dam, and at an elevation of 30 ft. above it, to an unknown depth, in excess of 63 ft. The bores penetrated only dune sand and swamp deposits. No show of oil was met. L. C. Ball concluded that the oil showing in the dam was due to contamination from power plant dumps.

Hodinotte's Oil Bores (Tambo)

These bores were drilled in 1922 on Macfarlane Downs at the head of Cone Creek, 20 miles west of Tambo, lat. $24^{\circ} 52' S.$; long. $145^{\circ} 54' E.$ The surface elevation is about 1,300 ft.

There was one bore 1,200 ft. deep, and three very shallow holes nearby.

The bores penetrated marine Cretaceous rocks. Signs and odours of oil were found, possibly caused by the pulverising of oil shale. Saline water only was encountered.

Humber Barrier Reef Oils Pty. Ltd. No. 1 (Wreck Island) (Fig. 10)

This stratigraphic well was drilled at lat. $23^{\circ} 20' S.$, long. $151^{\circ} 57' 30'' E.$, on Wreck Island, about 65 miles north-east of Gladstone. The drilling was subsidised by the Commonwealth Government, under the *Petroleum Search Subsidy Act*, 1957-1958. The drillers were Mines Administration Pty. Ltd., and the rig was a National T32. Rotary table elevation was 22 ft. above mean low tide and 9 ft. above surface. The well was spudded-in on 7th May, 1959, reached final depth of 1,898 ft. on 12th June, 1959, and was plugged and abandoned as a dry hole on 14th June, 1959.

A $12\frac{1}{4}$ in. hole was drilled to 493 ft. Due to lost circulation, cuttings had to be bailed from the hole. The $12\frac{1}{4}$ in. pilot hole was opened to $17\frac{1}{2}$ in. and $13\frac{1}{2}$ in. J55 x 54.5 lb. STC casing was run to 480 ft. A $12\frac{1}{4}$ in. hole was drilled to 1,170 ft., and $9\frac{1}{2}$ in. J55 x 40 lb. STC casing was run and cemented to 1,110 ft. An $8\frac{1}{2}$ in. hole was then drilled to total depth, 1,898 ft. Fourteen cores were cut. The hole was logged to total depth with a Failing Logmaster, giving S.P., point, 16 in. and 63 in. resistivity, and gamma ray curves. The section penetrated was divided thus:

0-	310 ft.	Recent R1	calcarenite
310-	398 ft.	Recent R2	limestone
398-	530 ft.	Pleistocene P1	quartz sandstone
530-	735 ft.	U. Pliocene P1	limestone
735-	945 ft.	L. Pliocene P2	calcarenite
945-1,025 ft.		U.M. Miocene M1	calcarenite
1,025-1,110 ft.		U.M. Miocene M2	sandstone
1,110-1,385 ft.		L. Miocene M3	calcarenite
1,385-1,540 ft.		L. Miocene M4	siltstone
1,540-1,780 ft.		L. Miocene M5	sandstone
1,780-1,795 ft.		L. Miocene M6	coarse sandstone
1,795-1,898 ft.		Basement	dacitic lapilli tuff

The age determinations are tentative only. The entire sedimentary section is marine and dominantly calcareous. The units R1 and R2 are composed of reef detritus. P1 is composed mainly of terrigenous material. P1, P2, M1, M2 and M3 are composed essentially of reef detritus, although minor amounts of terrigenous material are present. M4, M5 and M6 are composed dominantly of terrigenous material. The basement rock was named dacitic intrusion breccia by the Bureau of Mineral Resources, and dacitic lapilli tuff by the Geological Survey of Queensland.

No shows of oil or gas were noted, and no drill stem tests were made. Three deviation surveys were made; maximum deviation was $\frac{1}{2}^{\circ}$ at 1,580 ft. The well was abandoned by placing cement plugs from 1,160 ft. to 1,060 ft., and from 50 ft. to surface.

Hutton Creek

See Oil Search Ltd. No. 2 (Hutton Creek).

Interstate Mines and Petroleum No. 1

See A.R.O. No. 13 (Euthulla).

Isis Petroleum Prospecting Syndicate Bores (Elliott River)

This syndicate sank one well to 600 ft. and two very shallow wells. Drilling was done with percussion tools, during 1923.

The 600 ft. well is situated on the southern boundary of portion 1,131 near the division between 21v and 19v, parish of Bundaberg, 10 miles south from Bundaberg township. Surface elevation is approximately 55 ft.

Tertiary clay and soft water-bearing sandstone, with 10 ft. of lignite at 60 ft., were penetrated to 170 ft., and Burrum Coal Measures (Cretaceous) to 600 ft. No coal was reported.

Gas was recorded at 325 ft., 395 ft.-405 ft. and 590 ft.-600 ft. For analyses see Appendix I.

Kayenta Oil and Coal Syndicate

See A.R.O. No. 9 (Gunnewin).

Landar Oilfields (Aust.) Ltd. No. 1 (Orallo)

This well is situated near the south-west corner of portion 26, parish of Orallo, 28 miles north-west from Roma. Surface elevation is 1,360 ft.

Drilling with rotary tools commenced on 15th November, 1923, and reached a depth of 2,644 ft. on 21st June, 1924. The well was temporarily abandoned on 31st July, 1924, when 2,515 ft. 6 in. of drill pipe became stuck in the hole.

The graphic log is difficult to interpret but the formation boundaries are at approximately the following depths: Blythesdale Group from surface to 320 ft., Walloon Coal Measures to 1,290 ft., Bundamba Group to 1,960 ft. and Moolayember Shale to total depth 2,644 ft. On the evidence of L.O.A.L. No. 3 well drilled nearby, granite basement is at or near this depth.

Gas and oil shows were logged at frequent intervals in the Walloon Coal Measures and from 1,800 ft. to bottom. Samples of sludge and scum collected by bailing at 2,640 ft. gave some natural oil (Table IV), and gas analysed as: air 20 per cent., inert gas 80 per cent. Later samples from near bottom gave 65·6–80 per cent. hydrogen, 2·3–3·7 per cent. methane and the remainder inert gases. Hydrogen is not normally a constituent of natural gas and the Government Chemical Laboratory supported the suggestion that it was formed by the action of the cement-contaminated water on the aluminium bailer.

The casing state of the well is very doubtful, because of cutting and parting strings and cementing liners in attempts to test the well. Fifteen and a half inch casing was cemented at 220 ft., and 10 in. casing was cemented at 1,238 ft., without effecting a seal.

In 1925, after the drilling of L.O.A.L. No. 2 (Orallo), L.O.A.L. No. 1 was reopened and the drill pipe recovered. A reamer then became stuck and was shot off at about 2,100 ft.; when the 10 in. casing was pulled to clear the hole, it parted at 1,355 ft. Eight inch casing was then run through the 10 in. sleeve to 2,160 ft. and cemented. The plug was drilled out and the hole cleaned to bottom with a 7½ in. (?) bit, the hole diameter being about 9 in. Bailing reduced the fluid level to about 750 ft. but inflow prevented further lowering. Some gas was obtained by thief bailing at 1,200 ft.

As the objective was to test shows between 2,160 ft. and 2,260 ft., a plug was set at 2,260 ft. Bailing to 887 ft. revealed some gas and inflow of saline water contaminated with cement.

The hole was plugged again at 2,260 ft. and was bailed to 1,100 ft., when influx prevented further lowering of the fluid level.

The operators were satisfied that the cement round the casing and at the plug was water-tight and decided to place another plug at 2,180 ft.

Apparently this plug was incorrectly measured and filled the hole to 2,121 ft., that is, above the 8 in. casing.

No further records are available, and presumably the hole was abandoned in this condition.

L.O.A.L. No. 2 (Orallo)

This well is situated 112 chains north-east of L.O.A.L. No. 1 (Orallo), near the middle of the northern boundary of portion 26, parish of Orallo. Surface elevation is 1,440 ft.

Drilling commenced on 23rd October, 1924, with rotary tools; final depth of 2,839 ft. was reached on 9th April, 1925.

Blythesdale Group was penetrated to 280 ft., Walloon Coal Measures to 1,220 ft., Bundamba Group to 1,805 ft. and Moolayember Shale to bottom (2,839 ft.).

Gas was logged at 760 ft., 2,180 ft.–2,208 ft., and an oil showing was logged at 760 ft.

Water was met at 230 ft., 460 ft., 1,250 ft. and 1,460 ft. After total depth was reached, the drilling mud was displaced by water and the well tested to 200 gallons per day. Water level was 400 ft. It was stated that with air lift at 1,250 ft., the well would produce one million gallons per day.

No coring or testing appears on record. The management abandoned the hole because it considered that the lithology was unsuitable for oil accumulation.

The only casing used was 174 ft. of 18 in. diam. surface string. The well was covered on abandonment.

L.O.A.L. No. 3 (Orallo)

This well is situated 236 ft. east and 27 ft. south from L.O.A.L. No. 1 (Orallo). Surface elevation is 1,363 ft.

The expenses were subsidised by the Commonwealth Government to check showings reported in the original well, which were not thoroughly tested because of various mishaps to equipment and materials.

Drilling commenced on 13th May, 1926, and ceased at 2,672 ft. in October 1926.

Tertiary clay and gravel were penetrated to 160 ft. To 375 ft., the drill met shale with some sandstone, which are correlated with Blythesdale Group, though the lithology logged is not normal for this Group and it is possible that most of the Group was eroded before deposition of the Tertiary sediments. Walloon Coal Measures were met to 1,280 ft. and Bundamba Group to 1,960 ft. Sandstones and brown shales correlated with the Moolayember Shale rest on granite at 2,659 ft.

Gas and oil were logged frequently from 1,900 ft. down. Gas collected from the mud stream and considered to originate at 2,241 ft., was analysed as 91 per cent. inert gas. Water was recorded at 210 ft. and doubtfully at 1,890 ft.

Cores were taken at intervals from 1,908 ft. to bottom. Dips of 20° were recorded at 1,931 ft., 2,350 ft. and 2,573 ft.

Eighty-three feet of 18 in. surface casing only, was used in the well. No testing was recorded before the well was sealed and abandoned.

When drilling at 2,262 ft. the drilling mud had a specific gravity of 1·24 and driller's reports show "balling" of the bit in the lower part of the hole. Mud of this density would be more than sufficient to hold back gas at pressures comparable with those in the Roma area.

L.O.A.L. No. 4 (Hospital Hill)

This well is situated near the north-east corner of portion 178, parish of Roma, between the Hospital Hill bores and the railway line. Surface elevation is 1,018 ft.

Drilling, with rotary tools, commenced on 12th April, 1929, and reached 4,158 ft. on 24th September, 1929.

Roma Formation was penetrated from surface to 760 ft.; Blythesdale Group to 1,390 ft.; Walloon Coal Measures to 2,680 ft.; Bundamba Group to 3,265 ft. and Moolayember Shale to 3,838 ft., where metamorphic bedrock was entered.

Gas was reported at 760 ft., 1,000 ft. (small), 1,725 ft., 1,938 ft., 3,548 ft., 3,691 ft. (strong) and 3,895 ft. (Table III). Oil signs were recorded at 2,800 ft. and wax at 2,890 ft. Positive chloroform tests were reported at 3,500 ft. (Table IV).

A gas sample collected two months after testing the well contained 29·2 per cent. ethane and higher hydrocarbons. A sludge collected at 758 ft. gave 0·4 per cent. thick mineral oil.

Water was logged at 410 ft., 790 ft., 992 ft., 1,335 ft., 1,580 ft., 3,215 ft.–3,250 ft. and 3,410 ft. Water flowed between the 12½ in. casing set at 1,302 ft. and the 8½ in. casing set at 3,654 ft.

Cores were taken from 3,420 ft. to bottom. The Mesozoic sediments showed dips of 10° and the metamorphics 60° to 70°.

The hole below the 8½ in. casing was bailed almost dry, but only showings of gas and oil were obtained, with slight water influx. The well was shut down for two months during which period some gas entered the hole, but in no quantity.

Longreach Oil Ltd.

During 1954–55 eight scout bores were drilled for Longreach Oil Ltd. by J. and MacD. Royle Pty. Ltd., in the Balmoral, Lochinvar and Delta North areas, east of Longreach. The object was to obtain stratigraphic and structural information. Depth ranged from 25 to 602 ft. No shows of oil or gas were recorded.

From 1954 to 1959, six test wells were drilled for Longreach Oil Ltd.: one at Cleeve, three at Longreach, and two at Balmoral.

L.O.L. No. 1 (Cleeve) (Fig. 11)

This well is located at lat. 23° 25' 40" S., long. 144° 23' 30" E., 8½ miles east of Longreach. Surface elevation is 700 ft., and rotary table elevation was 712 ft. The well was drilled by Oil Drilling and Exploration Ltd., with a National T32 rig, and was designed to test the Cretaceous rocks in the area. Drilling began on 17th December, 1954, and was completed on 13th January, 1955, at a depth of 3,068 ft.

The following formations were penetrated:

0–1,550 ft.	Tambo Formation
1,550–2,097 ft.	Roma Formation
2,097–2,284 ft.	Upper Blythesdale Group
2,284–2,412 ft.	Lower Blythesdale Group
2,412–3,056 ft.	Walloon Coal Measures
3,056–3,068 ft.	Basement—weathered granite

The Tambo and Roma Formations consist mainly of dark shale and sandy shale with some siltstone, sandstone and limestone. The division between the two formations is placed at 1,550 ft. The Blythesdale Group, from 2,097 ft. to 2,412 ft. consists of fine to

coarse sandstone, with some dark shale. The Walloon Coal Measures extend from 2,412 ft. to 3,056 ft. and consist of hard black shale and fine to coarse grained sandstone, with some coal and limestone. Weathered granite basement was penetrated from 3,056 ft. to total depth 3,068 ft.

Artesian aquifers were met between 2,097 ft. and 2,145 ft., 2,222 ft. and 2,388 ft. and 2,798 ft. and 2,821 ft.

The only petroleum manifestation in this well was a faint oil staining of grains in sandstone at 2,946 ft. to 2,956 ft. The oil-bearing rocks met in the lower part of the L.O.W. No. 1 bore, were not found in this well, and apparently had wedged out against a basement rise. In L.O.L. No. 1, the basement is 289 ft. higher structurally than in L.O.W. No. 1 bore.

L.O.L. No. 2 (Longreach) (Fig. 11)

This well is located on R. 47, Town of Longreach. Surface elevation is 628 ft. and rotary table elevation, from which all depth measurements were made, was 639 ft.

The well was drilled by Oil Drilling and Exploration Ltd. using a National T32 rotary plant. Drilling commenced on the 25th January, 1955, and total depth of 3,224 ft. was reached on the 28th February, 1955.

The following strata were penetrated:

Surface–1,590 ft.	Tambo Formation
1,590–2,300 ft.	Roma Formation
2,300–2,445 ft.	Upper Blythesdale Group
2,445–2,615 ft.	Lower Blythesdale Group
2,615–3,191 ft.	Walloon Coal Measures
3,191–3,219 ft.	? Permian or Triassic
3,219–3,224 ft.	Basement—weathered granite

Marine Cretaceous beds of the Tambo and Roma Formations from surface to 2,300 ft. consist of black shale, with minor sandstone, siltstone and limestone. Blythesdale Group sediments consist of grey sandstone and grey- to dark-grey shale. This group is separated into upper and lower divisions, partly on electric log data. Walloon Coal Measures from 2,615 ft. to 3,191 ft. consist of compact sandstone, argillaceous sandstone and black shale. A coal sample from 3,185 ft. was examined at the Geological Survey of Queensland, and found to contain a Jurassic spore assemblage. The sequence contains porous sandstone with dark shale bands from 2,445 ft. to 2,615 ft. and porous sandstone from 2,869 ft. to 2,910 ft. Brittle dark shale and argillaceous sandstone with little porosity occur from 2,615 ft. to 2,869 ft. and from 2,910 ft. to 3,191 ft. A zone of calcite veins occurs at 3,178 ft. The basal members, 3,184 ft. to 3,191 ft. consist of sandy shale and coarse pebbly sandstone with a four inch coaly band at 3,185 ft.

Sandy chert from 3,191 ft. to 3,198 ft. rests on coarse to conglomeratic quartz sandstone with kaolin matrix; this passes into decomposed granite at 3,219 ft. The age of this basal sequence is indefinite but is possibly Lower Triassic or Upper Permian. The

absence of the sandy chert in two wells subsequently drilled close to this hole, indicates that the chert is of local occurrence.

Water bearing beds, as shown by the electric log, occur in the upper section of the Blythesdale Group at 2,300 ft.-2,310 ft. and 2,395 ft.-2,410 ft., but the main aquifer beds are in the Jurassic between 2,445 ft. and 2,615 ft., and 2,860 ft., and 2,900 ft.

On completion of the hole the interval 2,860 ft.-2,900 ft. was tested for two hours, during which time 1,440 ft. of mud and 1,455 ft. of water without any indications of oil or gas were recovered. In the chert at 3,191 ft., fracture planes had a waxy lustre and gave a faint fluorescence, possibly due to mineral wax; no other oil indications were noted. The 50 ft. of petroliferous rocks encountered in L.O.W. No. 1 and Longreach No. 2 water bore between the chert horizon and basement were, in this well, only 21 ft. thick, indicating a wedge-out against a rising basement.

Cement plugs were set at 2,900 ft. to 2,975 ft., 2,170 ft.-2,200 ft. and from 20 ft. to surface and the hole abandoned.

L.O.L. No. 3 (Longreach) (Fig. 11)

This well is located 225 ft. west and 40 ft. south from the north-east corner of R. 49, Town of Longreach. Surface elevation is 618 ft. and rotary table elevation was 629 ft.

The well was drilled by Oil Drilling and Exploration Ltd. using a National T20 rotary plant. Drilling commenced on the 15th March, 1955, and was completed on the 13th April, 1955, at a depth of 3,490 ft.

Cretaceous beds were penetrated from surface to 2,545 ft. These consist of marine shale from surface to 2,400 ft. followed by black shale with sandy bands and streaks to 2,545 ft. A 5 ft. water bed occurs at 2,400 ft. On the basis of electric logging, the base of the Tambo Formation is placed at 1,690 ft., the base of the Roma Formation at 2,400 ft. and the upper section of the Blythesdale Group at 2,545 ft. Between this depth and the decomposed granite basement at 3,404 ft., the rocks are of Jurassic age. Sandstone occurring between 2,545 ft. and 2,700 ft. is indicated by the electric log to be water-bearing and is considered to be equivalent to the lower section of the Blythesdale Group. Below this is a sequence of shale and sandstone, with a porous sandstone horizon between 2,964 ft. and 3,009 ft. This sandstone aquifer is equivalent to the sandstone between 2,860 ft. and 2,900 ft. in L.O.L. No. 2. Below this sand, the sequence is thicker than in L.O.L. No. 2 and the basal members are coarser; is it possible that these rocks may be lateral equivalents of the Bundamba Group.

The conclusions reached were that the sedimentary sequence thickens to the west, and is of Jurassic age, and that there was no evidence to suggest the presence of older sediments.

No oil or gas indications were noted.

L.O.L. No. 4 (Longreach) (Fig. 11)

This well is located near the north-west corner of sub-division 1, allotment 2, section 1, Town of Longreach, 1,200 ft. bearing 233° true from L.O.L. No. 2 well. Surface elevation is 619 ft. and rotary table elevation, from which all depths were measured, was 630 ft.

Drilling was commenced on the 22nd April, 1955, by Oil Drilling and Exploration Ltd. with a National T20 rotary plant, and completed on the 19th May, 1955, at a depth of 3,277 ft.

No rock samples were described from the top 2,000 ft. because of the proximity to earlier wells. Below this depth marine Cretaceous shale was penetrated to 2,332 ft. Probable marine sandstone, buff granular limestone and black shale with sandy streaks were penetrated to 2,474 ft. Water-bearing sands occur in this interval, but the main aquifers were met below 2,474 ft. On the basis of electric logging, the base of the Tambo Formation is placed at 1,650 ft., the base of the Roma Formation at 2,332 ft., and the base of the upper part of the Blythesdale Group at 2,474 ft. Coarse sandstone, with black to coaly shale and some limestone, between 2,474 ft. and 2,638 ft. are considered to be of Jurassic age and are placed in the lower part of the Blythesdale Group.

The sequence to granite at 3,275 ft. is of Jurassic age. Spore examination of coal samples from 3,237 ft. shows it to be comparable to the Walloon Coal Measures at Rosewood. The sequence consists of fine micaceous sandstone and dark shale becoming coaly towards the base.

Water beds are indicated at 2,332 ft., between 2,450 ft. and 2,560 ft. and between 2,895 ft. and 2,945 ft. A drill stem test over the interval 3,204 ft. to bottom recovered water, which rose 2,150 ft. in the drill pipe in 12 hours. No sample was taken, but the electric log suggests that the water is slightly saline.

Petroliferous indications were obtained over several sections. Thin argillaceous sandstone bands at 3,170 ft. and 3,174 ft. gave petroliferous odours when freshly broken. Seven feet of core recovered from the interval 3,215 ft. to 3,225 ft., gave fluorescence in several places. The core consisted of coarse to pebbly sandstone with clay cement, some of which was stained brown and gave the fluorescence. Core recovered from 3,245 ft. to 3,249 ft. consisted of medium grained, porous to argillaceous sandstone, showing dark brown oil staining and having faint odours and fluorescence.

A five hour test of the interval 3,204 ft.-3,237 ft., yielded 155 linear feet of water without sign of oil or gas. A twelve hour test of the interval 3,204 ft.-3,237 ft. yielded 2,150 linear feet of water, very slightly oil cut. These tests show that the sand at 3,245 ft. contains water, with some oil and no gas. Swabbing would probably have induced

inflow of more oil, but the small thickness and poor porosity of the reservoir rock preclude the possibility of significant accumulations.

L.O.L. No. 4 was located 600 ft. away from Longreach water bore and L.O.W. No. 1 well both of which showed promising manifestations of oil and gas. Although favourably located structurally in relation to these wells, it failed to give equivalent manifestations. The conclusion was reached that the Longreach area, in the immediate vicinity of the wells, is unfavourable for commercial accumulation of oil.

Cement plugs were set at 3,277 ft. to 3,257 ft., 2,320 ft. to 2,300 ft. and 20 ft. to surface, and the hole abandoned.

L.O.L. No. 5 (Balmoral)

This well is situated 16 miles bearing 34° from Ilfracombe, at lat. 23° 18' S., long 144° 39' E. Surface elevation is 714 ft., and height of casing head was 1 ft. The well was drilled to test the Lower Cretaceous beds on a gentle anticlinal structure, the presence of which was deduced from water-bore data. The drillers were Godfrey Bros., and the rig an Hydromaster 1500 percussion unit. Drilling began on 1st March, 1958, total depth of 1,367 ft. was reached on 31st May, 1958, and the well was plugged and abandoned on 5th June, 1958. Eight inch casing was cemented to surface at 203 ft.; 6 in. casing was used as a following string, and withdrawn after total depth was reached. The well penetrated calcareous mudstone, calcareous shale, limestone and sandstone (equivalent Tambo and Roma Formations?) to 1,308 ft., and sandstone, mudstone and shale (equivalent Blythesdale Group?) from 1,308 ft. to total depth, 1,367 ft. No trace of oil or gas was found. No water was met to 1,308 ft. A flow estimated at 7,000 gallons per day was met in the sandstone from 1,308 ft. to 1,335 ft., taken as the top of the Blythesdale Group. The well was concluded to be off structure, on the north-eastern limb.

L.O.L. No. 6 (Balmoral)

This well is situated at lat. 23° 18' S., long. 144° 38' E., 3,000 ft. bearing 235° magnetic from L.O.L. No. 5 well. It was drilled with the same aim as L.O.L. No. 5, that is, to test a gentle anticlinal structure deduced from logs of surrounding water bores. The drillers were Godfrey Bros. and the rig an Hydromaster 1500 percussion unit. Elevation of casing collar was 748 ft. above sea level, 1 ft. above ground level. Drilling began on 6th March, 1959, and total depth of 1,268 ft. was reached on 25th May, 1959. The well was plugged at the surface, and from 1,160 to 1,190 ft., and was abandoned on 30th May, 1959. Six inch casing was cemented to surface at 200 ft. Five inch casing was used as following string and withdrawn after reaching total depth. The sediments penetrated from surface to 1,168 ft. consisted mainly of mudstone with marine fossils in some bands; these beds have been correlated with the Tambo and Roma Formations. The base of the Tambo Formation is

possibly at 465 ft. where there is a slight change in lithology. The uppermost aquifer of the Blythesdale Group was met at 1,168 ft., and 100 ft. of sandstone and sandy mudstone of this formation were penetrated to the total depth of 1,268 ft.

The driller reported an oil scum while drilling very fossiliferous beds at 722 ft. to 748 ft. Samples from this zone proved to be impermeable.

No gas was met.

The top of the Blythesdale Group was 174 ft. higher in this well than in L.O.L. No. 5. Comparison of the log of L.O.L. No. 6 with the logs of surrounding water bores, indicates that this well is situated on the north-east flank of the structure.

Longreach Oil Wells Ltd. No. 1 (Longreach)

This well was drilled partly by Oriomo Oil Ltd. and partly by Oil Search Ltd., to produce heavy oil and wax found when sinking the two Longreach water bores, No. 1 and No. 2. The deep test was preceded by scout drilling.

The well is located 7 chains north-east of Longreach water bore No. 1. Surface elevation is 620 ft.

Drilling began late in 1928 and ceased at 3,351 ft. on 14th February, 1931.

The base of the Cretaceous marine sediments was reached at 2,323 ft. and the base of the Blythesdale Group at 2,603 ft. The sequence from 2,603 ft. to granite basement at 3,268 ft. consists of grey shale, brown shale and sandstone, the lowest 50 ft. being coaly and sandy.

Gas sampled at 2,336 ft. consisted of 66.2 per cent. methane and 33.8 per cent. inert gas. Shows were recorded at 2,486 ft., 2,630 ft., 2,923 ft. and 3,229 ft. The latter show gave 9.1 per cent. carbon dioxide, 72 per cent. methane, 18.9 per cent. inert gas on analysis.

Samples examined in 1952 gave positive acetone tests at 640 ft. and 3,235 ft. Oil was reported at 2,486 ft., with wax giving 98.5 per cent. petrolene and 1.5 per cent. asphaltine on analysis; at 2,910 ft., and at 3,227 ft., where 1 gallon of oil and 3 gallons of water entered the bailed hole per day.

Artesian water was struck at 2,323 ft., 2,900 ft. and 3,146 ft. Some water entered the lower part of the hole during testing. A temperature of 180° F. was recorded at 3,164 ft.

Thirty feet of 11½ in. surface casing was cemented; 8 in. casing was cemented at 1,287 ft. Six and three-eighths inch casing was seated at 3,164 ft. effecting water shut off.

With bottom of the hole at 3,243 ft., bailing to 1,600 ft. produced 5 gallons of oil. The casing was lowered to 3,204 ft. and cemented. Bailing tests produced small quantities of oil, wax and water.

A fatal accident occurred when preparing to shoot the well; after several months delay, Oil Search Ltd. deepened the hole to basement at 3,253 ft. and drilled decomposed granite and pegmatite to 3,351 ft.

The well was closed down on 14th February, 1931, by filling with heavy mud to the casing shoe, then 50 ft of cement, then mud to surface.

Lucky Strike Drilling Co. No. 1 (Cherwell) (Fig. 12)

This well is located in the parish of Cherwell, county of Cook, 25 miles north-west of Maryborough. Coordinates of the position are lat. $25^{\circ} 14' 43''$ S., long. $152^{\circ} 28' 36''$ E. Elevation of the site is 56 ft. above sea level, and rotary table elevation, from which all depth measurements were made, was 73 ft.

The well was drilled on the crest of the Cherwell Creek Anticline by Oil Drilling and Exploration Ltd., using a National 80B rotary plant. Drilling commenced on the 8th November, 1954, and total depth of 9,773 ft. was reached on the 6th March, 1955. To date, this is the deepest well drilled for oil in Queensland.

Initially a 12½ in. hole was drilled to 800 ft., then reamed to 17½ in. From this point to total depth,

8½ in. hole was drilled. One string of 13½-in. O.D. casing was seated at 764 ft. and cemented to surface.

The formations penetrated consist of Elliott Formation from surface to 55 ft., Burrum Coal Measures to 1,490 ft., Maryborough Formation to 7,570 ft. and Grahams Creek Volcanics to 9,773 ft.

The Burrum Coal Measures consist of grey, white and green coloured, fine-grained sandstone, and grey to black sandy and carbonaceous shale, with a few thin bands of sandy limestone. Black bituminous coal was recorded in the interval 395 ft. to 1,020 ft.

The Maryborough Formation consists for the most part of marine, grey to dark grey shale and sandy shale with some fine-grained sandstone and dense limestone. The sandstone, which is better developed in the upper part of the formation, is uniformly tight and virtually devoid of porosity.

The Grahams Creek Volcanics consist of sandy shale and siltstone between 7,570 ft. and 8,345 ft., and mainly volcanics (tuffaceous sandstone and conglomerate, tuff and ash beds with a few thin beds of coal) below 8,345 ft. Seventeen cores were taken between 2,740 ft. and 9,773 ft., and in none of these cores were indications of oil or gas apparent. An electric log of the well run by Oil Drilling and Exploration Ltd. also failed to indicate the presence of any accumulation of hydrocarbon. The logs indicated a thick column of fairly homogeneous material, with little variation in either lithology or porosity.

The well was abandoned after being filled with heavy mud, and plugged with cement from 20 ft. to surface.

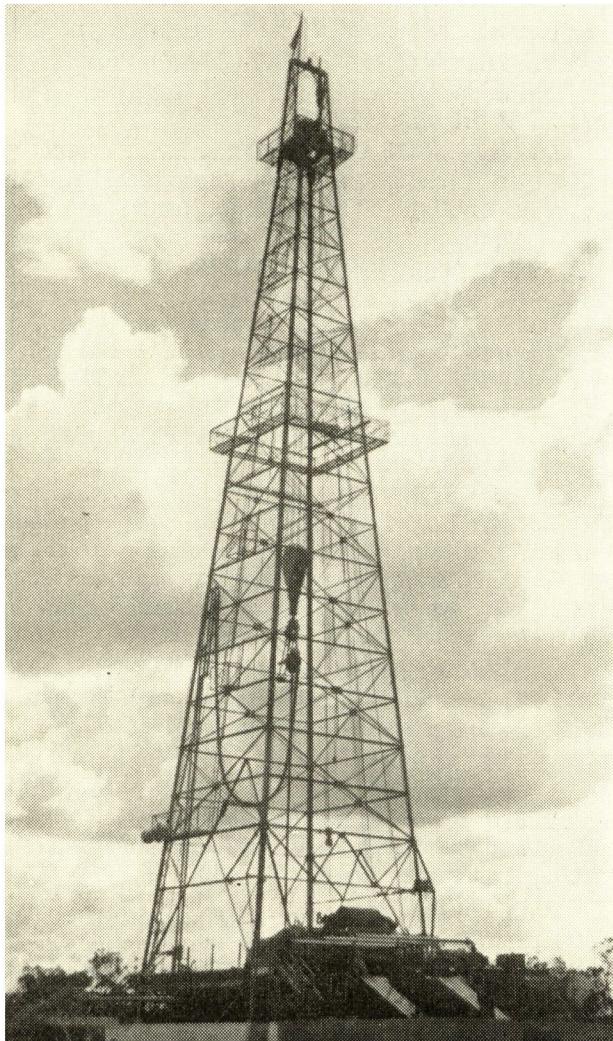
L.S.D. No. 2 (Susan River) (Fig. 12)

This well is situated in the south-east section of portion 2v, parish of Urangan, approximately 15 miles north-north-east of Maryborough. Ground level at the site is 49 ft. above sea level, and rotary table elevation was 66 ft.

The well was drilled to test the Susan River Anticline. Drilling by Oil Drilling and Exploration Ltd commenced on the 9th April, 1955, and was completed on the 9th August, 1955, at a depth of 8,069 ft. A National 80B rotary plant was used.

A 12½ in. hole was drilled from surface to 291 ft., then reamed to 17½ in. to a depth of 274 ft. From this point to total depth an 8½ in. hole was drilled. The only casing used in the well was a surface string of 13½ in. casing seated at 265 ft. and cemented to surface.

The penetrated section consists of Maryborough Formation from surface to 4,160 ft. and Graham's Creek Volcanics from 4,160 ft. to 8,069 ft. Lithologically, the Maryborough Formation consists of hard, silty shale, shale and siltstone with thin beds of brownish limestone and very minor developments of sandstone. The Grahams Creek Volcanics contains in the upper



Oil Drilling and Exploration Ltd.'s National 80B rig drilling a deep test (9,773 ft.) for Lucky Strike Drilling Co. at Cherwell Creek, near Maryborough.

part 750 ft. of black carbonaceous shale of fresh-water origin and below this rocks of volcanic origin—tuffaceous sandstone, tuff, volcanic conglomerate and ash beds.

In all, fourteen cores were taken with a wireline core barrel; in none of these was any indication of oil or gas seen. The well was logged electrically by Oil Drilling and Exploration Ltd., the log indicating very little variation in porosity and with no suggestion of any concentration of hydrocarbons.

On abandonment, the hole was filled with heavy mud and the top 20 ft. of the well plugged with cement.

Mackay Oil Prospecting Syndicate Scout Bores

These scout bores were drilled for the purpose of testing the significance of reported oil seepages at several points along the coastline in the Mackay area. Nos. 1-4 bores were drilled with a Failing 750 rotary rig by Oil Drilling and Exploration Ltd., and No. 5 with an Hydromaster 1500 percussion rig.

M.O.P.S. Scout Bores No. 1 and No. 2 (Half Tide)

These are situated on the coastline 10 miles north-north-east of Sarina in portion 1,296, parish of Hector, county of Carlisle. They were drilled in December 1955. Six and half inch diameter boreholes were sunk to a depth of 55 ft. in No. 1 and to 130 ft. in No. 2. The elevation above sea level of the sites was 10 ft. and 15 ft. respectively. The country rocks are silicified sandstone and pyroclastics, heavily intruded with intermediate and basic dykes. The holes were abandoned.

M.O.P.S. Scout Bore No. 3 (Hay Point)

The site is 12 miles north-north-east of Sarina, in portion 742, parish of Hector. It was drilled in December 1955, to a depth of 150 ft. The elevation above sea level of the site is 80 ft. The rock succession penetrated was similar to that in Scouts Nos. 1 and 2 (Half Tide).

M.O.P.S. Scout Bore No. 4 (Cape Hillsborough)

The site is on the coastline, 19 miles north-north-west of Mackay, in the parish of Ossa, county of Carlisle. The elevation above sea level of the site is 10 ft. It was drilled in January 1956, to a depth of 303 ft., and penetrated fresh-water shales with some sandstone and grit of Tertiary age. Electric logs were taken. The hole was abandoned.

M.O.P.S. Scout Bore No. 5 (Cape Hillsborough)

This bore is located near Cape Hillsborough, 2 chains from the high-water mark forming the southern boundary of R. 60, Parish of Ossa. Surface elevation is 30 ft. above sea-level. The bore was drilled with an Hydromaster 1500 percussion rig, from December 1956 to October 1957. Final depth was 2,405 ft. The bore was cased to 2,330 ft., using 8 in. casing to 290 ft., 6 in. casing from 290 ft. to 1,905 ft., and 4 in. casing from 1,905 ft. to 2,330 ft.

To 725 ft. the bore penetrated Tertiary (?) sediments, consisting of shale with minor sandstone to 225 ft. and sandstone from 225 ft. to 725 ft. From 725 ft. to total depth 2,405 ft., the bore penetrated Lower Carboniferous (?) green and purple andesitic tuff, some andesite and some tuffaceous sandstone; veins of quartz and calcite, and disseminated pyrite, occur below 905 ft. No shows of oil or gas were recorded.

Mackay Petroleum Prospecting Syndicate Scout No. 1 (Port Clinton)

This well was located by divination near the southern shore of Port Clinton, lat. $22^{\circ} 39' S.$, long. $150^{\circ} 45' E.$ Surface elevation is approximately 10 ft. The well was drilled between 1938 and 1941. It penetrated 135 ft. of clay, sand and gravel above metamorphic rock. Total depth was 363 ft.

Malta Oil Company No. 1 (Nive River)

This well is located 35 miles east from Tambo, at lat. $24^{\circ} 55' S.$, long. $146^{\circ} 50' E.$, near the head of Nive River, in the centre of portion 3, parish of Malta, county of Nive.

It was commenced in 1924 on a site selected by Dr. H. I. Jensen, and was at this time known as "Hodinotte's Bore." The Malta Oil Company took over the bore in 1925 at progress depth of about 600 ft. and deepened it to 1,160 ft. calling it "Blume's Bore." In 1926 the well was sold to Tambo Oil Syndicate, the stated depth being 1,385 ft. There is a doubt on the authenticity of this figure; in 1929 a log was submitted by Tambo Oil Syndicate of a well on their permit No. 104, which reached 1,160 ft. and compares with both Hodinotte's and Blume's information, so that they are assumed to be the same well.

The log shows sandstone to 22 ft., grey and brown shale with coal to 485 ft., grey sandy shale to 810 ft. and sandstone to 1,065 ft. with micaceous black and dark shale at 900-943 ft. Dr. F. W. Whitehouse's mapping shows the surface rock to belong to the Blytheshdale Group, and it is concluded that the well penetrated 788 ft. of Walloon Coal Measures and 255 ft. of Bundamba Group. However, there is a possibility that the sediments below 900 ft. are of Permian age.

Oil scum was reported from several places in the carbonaceous shale sections, and from below the black shale at 900 ft., where it seemed to be associated with water in the sandstones.

Saline water is recorded at 92 ft. and 130 ft., and in the sandstone from 810 ft. to 900 ft. Fresh water is recorded from 943 ft. to bottom.

Melrose Petroleum Prospecting Co. Ltd. No. 1 (Alton Downs)

The well is situated in the south-east corner of portion 49, parish of Nicholson, county Livingstone, about 7 miles north-west of Rockhampton. It was sunk in 1921 with percussion tools by Melrose Petroleum Prospecting Co. Ltd.; the site was selected by divination.