COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Petroleum Search Subsidy Acts

PUBLICATION No. 61

SUMMARY OF DATA AND RESULTS

SURAT BASIN, QUEENSLAND

U-K-A. Flinton No. 1

U-K-A. Coomrith No. 1

U-K-A. Wunger No. 1

OF

UNION OIL DEVELOPMENT CORPORATION

KERN COUNTY LAND COMPANY

AND

AUSTRALIAN OIL AND GAS CORPORATION LIMITED

Issued under the Authority of the Hon. David Fairbairn
Minister for National Development
1965

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

MINISTER: THE HON. DAVID FAIRBAIRN, D.F.C., M.P.

SECRETARY: SIR HAROLD RAGGATT, C.B.E.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

DIRECTOR: J. M. RAYNER

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ASSISTANT DIRECTOR: M. A. CONDON

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FOREWORD

Under the Petroleum Search Subsidy Act 1959-1961, agreements relating to subsidized operations provide that the information obtained may be published by the Commonwealth Government six months after the completion of field work.

The growth of the exploration effort has greatly increased the number of subsidized projects and this increase has led to delays in publishing the results of operations.

The detailed results of subsidized operations may be examined at the offices of the Bureau of Mineral Resources in Canberra and Melbourne (after the agreed period) and copies of the reports may be purchased.

In order to make the main results of operations available early, short summaries are being prepared for publication. These will be grouped by area and date of completion as far as practicable. Drilling projects and geophysical projects will be grouped separately. In due course, full reports will be published concerning those operations which have produced the more important new data.

This Publication contains summaries of data and results of three drilling operations undertaken in the Surat Basin, Queensland: Union-Kern-A.O.G. Flinton No. 1, Union-Kern-A.O.G. Coomrith No. 1, and Union-Kern-A.O.G. Wunger No. 1. The information has been abstracted by the Petroleum Exploration Branch of the Bureau of Mineral Resources from well completion reports furnished by Union Oil Development Corporation.

J.M. RAYNER
DIRECTOR

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of

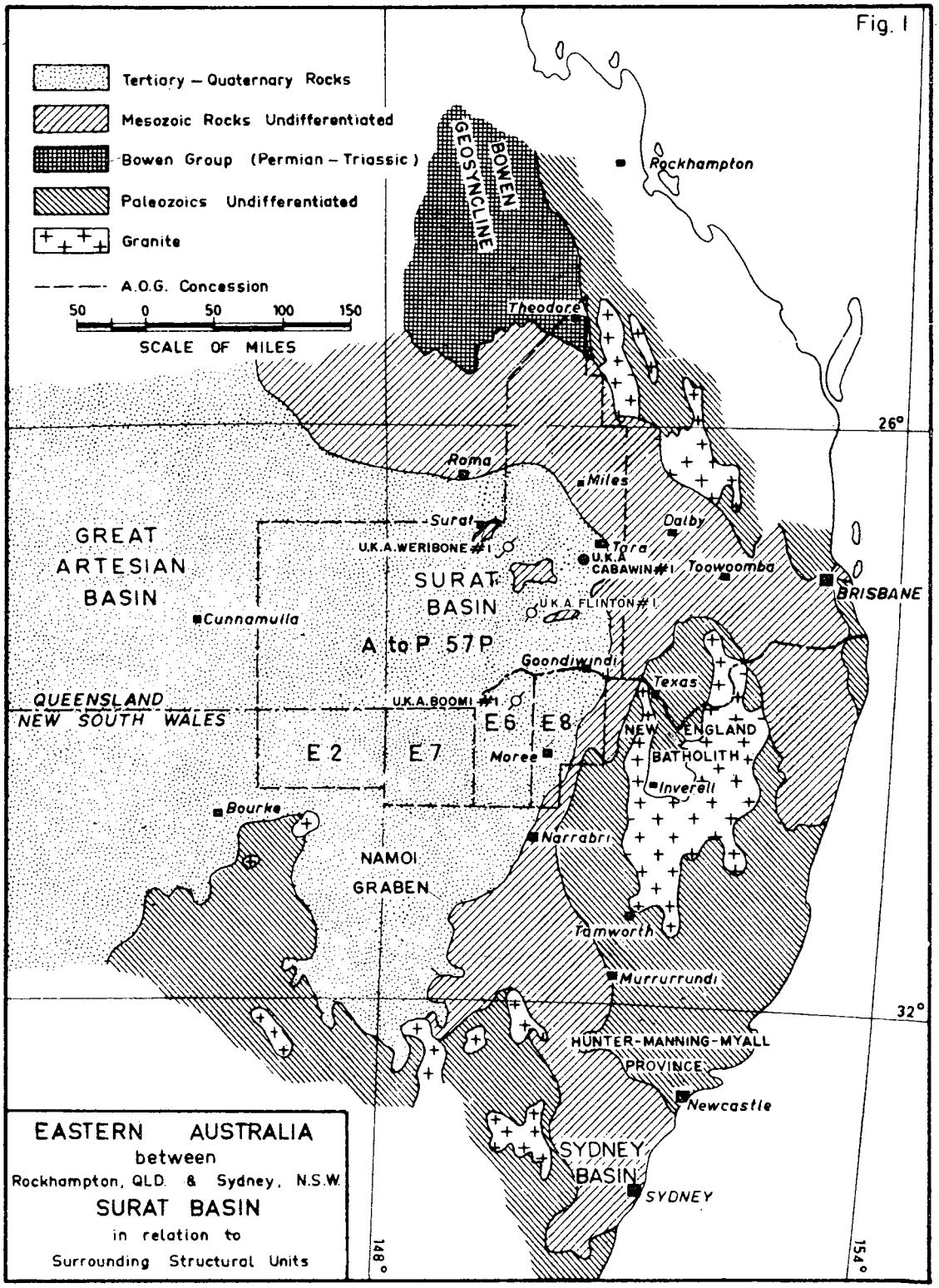
UNION OIL DEVELOPMENT CORPORATION

KERN COUNTY LAND COMPANY

and

AUSTRALIAN OIL AND GAS CORPORATION LIMITED

SUMMARY OF DATA AND RESULTS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Mesozoic Rocks Undifferentiated
Bowen Group (Permian – Triassic)
Paleozoics Undifferentiated
Granite
A.O.G. Concession
50 0 50 100 150
SCALE OF MILES
BOWEN GEOSYNCLINE
Rockhampton
Theodore
26°
Roma
Miles
Surat
Dalby
Tara
U.K.A. WERIBONE #1
U.K.A. CABAWIN #1
Toowoomba
BRISBANE
GREAT ARTESIAN BASIN
SURAT BASIN
U.K.A. FLINTON #1
Cunnamulla
A to P 57P
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Newcastle
SYDNEY BASIN
SYDNEY
148°
154°
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in relation to
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UNION-KERN-A.O.G. FLINTON NO. 1

SUMMARY OF DATA AND RESULTS *

SUMMARY

Union-Kern-A.O.G. Flinton No. 1 Well was drilled by Union Oil Development Corporation in the south-western part of the Surat Basin, Queensland. The well, located approximately eight miles east-south-east of Flinton and 44 miles south-west of U.K.A. Cabawin No. 1, was drilled by Oil Drilling and Exploration Limited for Union Oil Development Corporation to a total depth of 9123 feet. Drilling commenced on 10th August, 1963 and was completed on 11th September, 1963. A full programme of logging, testing, and coring was undertaken.

The well penetrated 2685 feet of shales with minor sands of the Lower Cretaceous Roma Formation; 2384 feet of sandstone with interbedded siltstone, claystone, and shale of the Jurassic Blythesdale Formation; 668 feet of the Walloon Formation; 565 feet of the Hutton Sandstone; 888 feet of Evergreen Shale and Precipice Sandstone equivalents; 718 feet of the Triassic Wandoan Formation equivalent; 392 feet of the Triassic Cabawin Formation; 563 feet of the Permian Kianga Formation; 167 feet of the Permian Back Creek Formation; and 93 feet of Permo-Carboniferous Kuttung Formation in which the well bottomed at 9123 feet.

Flinton No. 1 was drilled to test the hydrocarbon potential of a closed seismic structure. At the location of the well, the "G" Horizon structure map, which represents the structure on a stratigraphic level approximately at the top of the Precipice Sandstone, indicates a closure of about 100 feet over an area of about eleven square miles. No significant oil or gas shows were recorded. A drillstem test of the interval 7817 to 7845 feet was abortive because of packer failure. The well was then plugged below 4490 feet and leased for conversion to a water well.

The stratigraphic drilling operation at Union-Kern-A.O.G. Flinton No. 1 was subsidized under the Petroleum Search Subsidy Act 1959-1961, from surface to total depth.

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* Abstracted from: Well Completion Report No. 18, Union-Kern-A.O.G. Flinton No. 1, by Union Oil Development Corporation, October, 1963.

WELL HISTORY

General Data

Well name and number:	Union-Kern-A.O.G. Flinton No. 1
Location:	Latitude 27°54'52"S. Longitude 149°40'10"E.
Name and address of Tenement Holder:	Union Oil Development Corporation, and Kern County Land Company, 261 George Street, Sydney, New South Wales.
Details of Petroleum Tenement:	Authority to Prospect 57P, Queensland (approximately 47,000 square miles).
Total Depth:	9123 feet
Date drilling commenced:	10th August, 1963
Date drilling completed:	11th September, 1963
Date well abandoned:	16th September, 1963
Date rig released:	16th September, 1963
Elevation (ground):	819 feet
Elevation (top K.B.):	833 feet (datum for depths)
Status:	Well plugged and abandoned below 4490 feet and leased for conversion to a water well.
Cost:	£98,978 (estimated)

Drilling Data

Drilling Plant:		
Make:	Ideco Hydrair Junior Super	
Type:	7-11	
Hole sizes and depths:	30"	to 20 feet
	17 1/2"	to 1023 feet
	9 7/8"	to 1884 feet
	9"	to 9123 feet (T.D.)
Casing details:		
Size (in.):	20	13 3/8
Weight (lb./ft):	52	48
Grade:	10	H.40
Setting depth (ft):	20	966

Logging and Testing

Ditch Cuttings:	
Interval:	Ten feet from 1020 feet to total depth.
Coring:	Nine cores were cut using a Hughes "J" Type core barrel with both soft and hard formation cutter heads. A total of 61 feet was cored and 36.7 feet (60%) recovered.
Sidewall Cores:	Thirteen sidewall samples were taken between 7814 and 8068 feet, using a Schlumberger coring gun with medium-hard formation sample takers.
Electric and other logging (Schlumberger):	
Induction-Electrical Log:	966-9127 feet (2 runs)
Microlog:	6200-7942 feet (1 run)
Sonic Log:	966-9105 feet (1 run)
Continuous Dipmeter:	5700-9120 feet (1 run)
Velocity Survey:	Fourteen horizons were tested at depths ranging from 970 to 9120 feet.
Drilling Rate, Oil and Gas Log:	Continuous drilling rate and hydrocarbon plots were recorded during drilling.
Formation Testing:	One Halliburton formation test was carried out on a plug back.

GEOLOGY

Stratigraphy

Roma Formation (Lower Cretaceous): Surface to 2685 feet

Grey to brown, carbonaceous shale interbedded with grey to brown, carbonaceous siltstone and minor light to medium grey, fine-grained, quartzose, calcareous sandstone.

Blythesdale Formation (Jurassic): 2685 to 5069 feet (2384 feet) ~727m

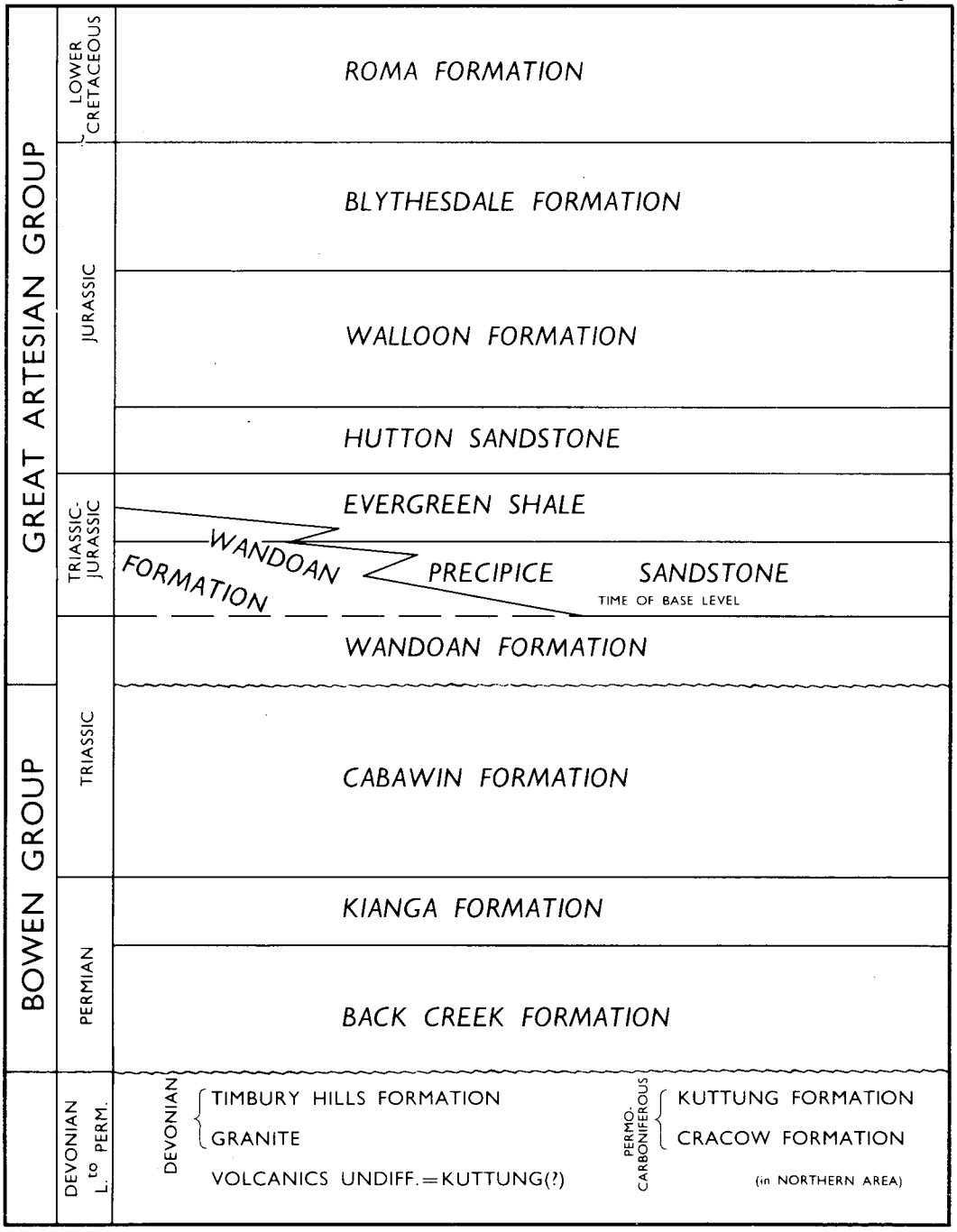
Fine to medium and coarse-grained, light grey sandstone interbedded with soft, grey, carbonaceous siltstone, claystone and shale.

Walloon Formation (Jurassic): 5069 to 5737 feet (668 feet)

Interbedded, fine-grained, grey sandstone, brown to grey siltstone, and brown to grey, carbonaceous shale with coal seams and stringers.

WEST ← BOWEN-SURAT BASIN → EAST

Fig. 2



COMPOSITE NOMENCLATURE CHART

Hutton Sandstone (Jurassic): 5737 to 6302 feet (565 feet)

Light grey, coarse-grained, quartzose, calcareous, porous sandstone with shale and siltstone interbeds.

Evergreen Shale, Precipice Sandstone, and Wandoan Formation Equivalents (Jurassic-Triassic): 6302 to 7908 feet (1606 feet)

Interdigitating quartz sandstone, quartz siltstone, and grey shale, regarded as the equivalents of the Evergreen Shale, Precipice Sandstone, and Wandoan Formation.

Cabawin Formation (Triassic): 7908 to 8300 feet (392 feet)

Tuffaceous, green sandstone, shale and conglomerate.

Kianga Formation (Permian): 8300 to 8863 feet (563 feet)

Interbedded coal, tuff and shale.

Back Creek Formation (Permian): 8863 to 9030 feet (167 feet)

Interbedded shale, siltstone, and tuff, with marine fossils below 8930 feet.

Kuttung Formation (Permo-Carboniferous): 9030 to 9123 feet (93 feet +)

Interbedded conglomerate, tuff, shale, chert, and andesite.

Structure

The Flinton prospect occurs in the south-western part of the Surat Basin. Structurally, the prospect lies on a terrace that borders the east dipping basinal monocline. Prior to drilling U.K.A. Coomrith No. 1 and Wunger No. 1, the closest wells to this prospect were U.K.A. Weribone No. 1 (about 40 miles to the north-west) and U.K.A. Boomi No. 1 (about 60 miles to the south).

The well was drilled on a seismic structure having a closure of 100 feet over an area of eleven square miles in the Precipice Sandstone. Underlying this formation is a sequence of Triassic and Permian rocks that were found to be petroliferous at U.K.A. Cabawin No. 1. These formations also are present on a closed structure at Flinton No. 1. The areal extent of the closure in the Permian is about six square miles; vertical closure is about 100 feet.

Oil and Gas Indications

No significant oil or gas shows were encountered in the drilling of Flinton No. 1 Well. After reaching total depth sidewall cores were taken over areas of apparent interest based on interpretation of the Induction-Electrical Log and the Sonic Log. Six of these samples over the interval 7830 to 7838 feet of the basal Wandoan sand recorded pale blue-white fluorescence with trace cuts. An open hole formation test of the interval 7817 to 7845 feet was attempted but the packer failed.

REFERENCES

MACK, J.E., Jr, 1963: Reconnaissance geology of the Surat Basin, Queensland and New South Wales. Bur. Min. Resour. Aust. Petrol. Search Subs. Acts Publ. 40.

UNION OIL DEVELOPMENT CORPORATION, 1963: Well Completion Report No. 18, Union-Kern-A.O.G. Flinton No. 1 (Unpubl.).

UNION OIL DEVELOPMENT CORPORATION, 1964: Union-Kern-A.O.G. Cabawin No. 1, Queensland. Bur. Min. Resour. Aust. Petrol. Search Subs. Acts Publ. 43.

UNION OIL DEVELOPMENT CORPORATION, 1964: Union-Kern-A.O.G. Moonie No. 1, Queensland. Bur. Min. Resour. Aust. Petrol. Search Subs. Acts Publ. 45.

ADDITIONAL DATA FILED IN THE BUREAU OF MINERAL RESOURCES

The following additional data relating to Union-Kern-A.O.G. Flinton No. 1, have been filed in the Bureau of Mineral Resources, Canberra, and are available for reference:

(i) Well Completion Report

Part A	: Geology, by A.S. Keller, F.A. Herrmann, and A.R. Carey	9 pp.
Appendix A	: Prognosis	1 p.
Appendix B	: Descriptions of cuttings	83 pp.
Appendix C	: Descriptions of cores	9 pp.
Appendix D	: Descriptions of sidewall cores	2 pp.
Appendix E	: Palynology, by N.J. de Jersey	2 pp.
Part B	: Engineering, by D.E. Pyle	6 pp.
Appendix F	: Mud Record	2 pp.
Appendix G	: Drilling Record	8 pp.
Appendix H	: Electrical Logging	7 pp.
Appendix I	: Velocity Survey	1 p.

(ii) Daily drilling reports for period 6th August, 1963 to 17th September, 1963.

(iii) Well logs including the following:

(a) Induction-Electrical Log
Run 1, 966-7942 feet (2", 5" = 100 ft)
Run 2, 7942-9127 feet (2" = 100 ft)

(b) Microlog
Run 1, 6200-7942 feet (2", 5" = 100 ft)

(c) Sonic Log
Run 1, 966-9105 feet (2", 5" = 100 ft)

(d) Continuous Dipmeter
Run 1, 5700-9120 feet (1.2" = 100 ft)

(e) Drilling rate, hydrocarbon analysis log (2" = 100 ft)

(iv) Seismic Structure Map, Flinton Prospect, "G" Horizon (Top Precipice)

(v) Composite Nomenclature Chart, Surat Basin

(vi) Velocity Survey determinations, U.K.A. Flinton No. 1.

UNION-KERN-A.O.G. COOMRITH NO. 1

of

UNION OIL DEVELOPMENT CORPORATION

KERN COUNTY LAND COMPANY

and

AUSTRALIAN OIL AND GAS CORPORATION LIMITED

SUMMARY OF DATA AND RESULTS

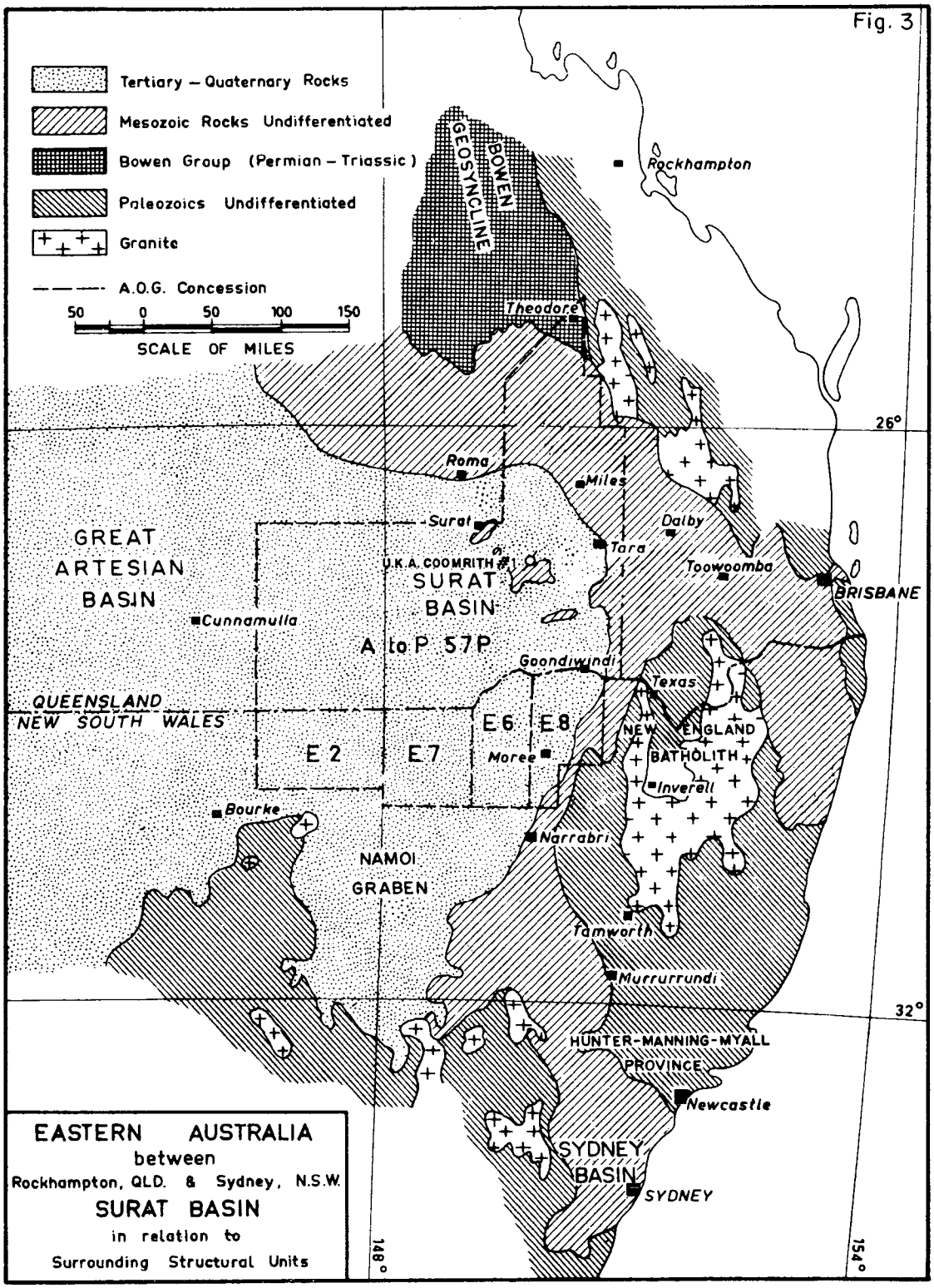


Fig. 3
Tertiary – Quaternary Rocks
Mesozoic Rocks Undifferentiated
Bowen Group (Permian – Triassic)
Paleozoics Undifferentiated
Granite
A.O.G. Concession
50 0 50 100 150
SCALE OF MILES
BOWEN GEOSYNCLINE
Rockhampton
Theodore
26°
Roma
Miles
Surat
Dalby
Tara
U.K.A. COOMRITH #1
SURAT BASIN
A to P 57P
Toowoomba
BRISBANE
GREAT ARTESIAN BASIN
Cunnamulla
Goondiwindi
Texas
QUEENSLAND
NEW SOUTH WALES
E 2
E 7
E 6
E 8
Moree
NEW ENGLAND BATHOLITH
Inverell
Bourke
Narrabri
NAMOI GRABEN
Tamworth
Murrurrundi
32°
HUNTER-MANNING-MYALL PROVINCE
Newcastle
SYDNEY BASIN
SYDNEY
148°
154°
EASTERN AUSTRALIA
between
Rockhampton, QLD. & Sydney, N.S.W.
SURAT BASIN
in relation to
Surrounding Structural Units

UNION-KERN-A.O.G. COOMRITH NO. 1

SUMMARY OF DATA AND RESULTS *

SUMMARY

Union-Kern-A.O.G. Coomrith No. 1 Well was drilled by Union Oil Development Corporation in the south-western part of the Surat Basin, Queensland. The well, located approximately 20 miles north-north-west of Flinton No. 1, was drilled by Oil Drilling and Exploration Limited for Union Oil Development Corporation to a total depth of 8426 feet. Drilling commenced on 20th September, 1963 and was completed on 9th October, 1963. A full programme of logging and coring was undertaken, but no formation tests were conducted.

The well bottomed in the Triassic Cabawin Formation after drilling through the Lower Cretaceous Roma Formation to 2774 feet; the Jurassic Blythesdale Formation to 5237 feet; the Walloon Formation to 5998 feet; the Hutton Sandstone to 6633 feet; and Jurassic-Triassic equivalents of the Evergreen Shale, Precipice Sandstone, and Wandoan Formation to the unconformity at the base of the Great Artesian Group at 8412 feet. Below the unconformity, the well penetrated 14 feet of green, tuffaceous sandstone of the Cabawin Formation to total depth at 8426 feet. A normal sequence of Mesozoic rocks was found to the base of the Hutton Sandstone. The Evergreen, Precipice, Wandoan interval was found to be mostly occupied by tight Wandoan sandstone facies.

Coomrith No. 1 was drilled to test the petroleum potential of the Precipice Sandstone on a closed structure with a maximum vertical closure of 184 feet over an area of about nine square miles. No hydrocarbon shows were recorded, and the well was plugged and abandoned.

The test drilling operation at Union-Kern-A.O.G. Coomrith No. 1 was subsidized under the Petroleum Search Subsidy Act 1959-1961, from surface to total depth.

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* Abstracted from: Well Completion Report No. 19, Union-Kern-A.O.G. Coomrith No. 1, by Union Oil Development Corporation, November, 1963.

WELL HISTORY

General Data

Well name and number:	Union-Kern-A.O.G. Coomrith No. 1
Location:	Latitude 27°38'14"S. Longitude 149°34'08"E.
Name and address of Tenement Holder:	Union Oil Development Corporation, and Kern County Land Company, 261 George Street, Sydney, New South Wales.
Details of Petroleum Tenement:	Authority to Prospect 57P, Queensland.
Total Depth:	8426 feet
Date drilling commenced:	20th September, 1963
Date drilling completed:	9th October, 1963
Date well abandoned:	12th October, 1963
Date rig released:	12th October, 1963
Elevation (ground):	862 feet
Elevation (top K.B.):	876 feet (datum for depths)
Status:	Dry; plugged and abandoned
Cost:	£54,265 (estimated)

Drilling Data

Drilling Plant:			
Make:	Ideco Hydrair Junior Super		
Type:	7-11		
Hole sizes and depths:	30"	to	25 feet
	17 1/2"	to	820 feet
	12 1/4"	to	822 feet
	9 7/8"	to	1825 feet
	9"	to	8426 feet (T.D.)

Casing details:		
Size (in.):	20	13 3/8
Weight (lb./ft):	52	48
Grade:	10	H.40
Setting depth (ft):	20	811

Logging and Testing

Ditch Cuttings: Interval:	Ten feet from 822 feet to total depth.
Coring:	Five cores were cut using a Hughes "J" Type core barrel with hard formation core heads. A total of 45 feet was cored and 32.6 feet (72%) recovered.
Sidewall Cores:	Twenty-two sidewall samples were recovered between 6978 and 8410 feet using a Schlumberger coring gun with hard formation sample taker.
Electric and other logging (Schlumberger):	
Induction-Electrical Log:	811-8426 feet (1 run)
Sonic Log:	811-8412 feet (1 run)
Continuous Dipmeter:	5899-8420 feet (1 run)
Velocity Survey:	Twelve horizons were tested at depths ranging from 820 to 8410 feet.
Drilling Rate, Oil and Gas Log:	Continuous drilling rate and hydrocarbon plots were recorded during drilling.
Formation Testing:	No formation tests were conducted.

GEOLOGY

Stratigraphy

Roma Formation (Lower Cretaceous): Surface to 2774 feet

Interbedded, glauconitic siltstone, carbonaceous siltstone, carbonaceous shale, and minor beds of sandstone.

Blythesdale Formation (Jurassic): 2774 to 5237 feet (2463 feet)

Interbedded sandstone and shale to 3960 feet, followed by predominantly permeable sandstone.

Walloon Formation (Jurassic): 5237 to 5998 feet (761 feet)

Interbedded coal and shale grading down into the Hutton Sandstone.

Hutton Sandstone (Jurassic): 5998 to 6633 feet (635 feet)

Quartzose sandstone with subordinate interbeds of grey-brown siltstone and shale.

Evergreen Shale, Precipice Sandstone, and Wandoan Formation Equivalents (Jurassic-Triassic): 6633 to 8412 feet (1779 feet)

Interbedded, grey to brown shale, siltstone, and quartzose sandstone, with basal conglomerate containing tuffaceous granule-pebbles.

Detailed description, Evergreen Shale equivalent (6633 to 7187 feet)

6633-6900 feet (267 feet): SHALE and SILTSTONE, grey to brown, with finely disseminated carbonaceous matter. Thin, light grey, fine to coarse-grained, quartzose, porous SANDSTONE interbeds between 6775-6782 feet and 6810-6820 feet.

6900-7187 feet (287 feet): SANDSTONE, light grey, very fine to medium-grained, trace coarse-grained to pebble bands, streaky white clay matrix, tight, except for porous beds between 6917-6995 feet, 7043-7057 feet, and 7120-7133 feet. Interbeds of SILTSTONE and SHALE, grey to brown, carbonaceous, with trace pyrite.

Detailed description, Precipice Sandstone equivalent (7187 to 7413 feet)

7187-7292 feet (105 feet): SANDSTONE, light grey, very fine to medium-grained, quartzose, trace to abundant lithic grains, tight, with thin interbeds and streaks of grey to brown, carbonaceous SILTSTONE.

7292-7413 feet (121 feet): SANDSTONE, light grey, fine to medium-grained, trace coarse grains, quartzose, white clay matrix, tight, except for porous beds between 7300-7310 feet, 7340-7348 feet, and 7395-7408 feet. Thin interbeds of SILTSTONE and SHALE, grey to brown, carbonaceous.

Detailed description, Wandoan Formation equivalent (7413 to 8412 feet)

7413-7845 feet (432 feet): SHALE and SILTSTONE, grey to brown, carbonaceous, interbedded with SANDSTONE, light grey, fine to medium-grained, trace coarse grains, white clay matrix, tight.

7845-8090 feet (245 feet): SANDSTONE, light grey to green-grey, fine to medium-grained, quartzose, white clay matrix, tight, except for erratic porous streaks.

8090-8208 feet (118 feet): SHALE and SILTSTONE, grey to brown, carbonaceous, interbedded with SANDSTONE, light grey, fine-grained, silty, abundant clay matrix, tight.

8208-8308 feet (100 feet): SANDSTONE, white, light grey, fine to coarse-grained, streak sorted, quartzose, white calcareous clay matrix, tight, except for erratic porous streaks.

8308-8321 feet (13 feet): SHALE and SILTSTONE, grey to brown, carbonaceous.

8321-8412 feet (91 feet): CONGLOMERATE, pale green to orange-green, granules and pebbles of cream and pale green argillite, clear and orange quartz in white sandy tuffaceous clay matrix.

Cabawin Formation (Triassic): 8412 to 8426 feet (14 feet+)

Sandstone, apple-green, medium to coarse-grained, trace granules, sub-angular to subrounded grains of light green argillite, clear and orange quartz, trace mica, hard, tuffaceous.

Structure

The Coomrith prospect occurs in the south-western part of the Surat Basin. Structurally the prospect lies on a terrace that borders the east dipping basinal monocline. The closest wells to this prospect are U.K.A. Weribone No. 1, approximately 24 miles to the north-west and U.K.A. Flinton No. 1, 20 miles to the south-south-east. Weribone No. 1 and Flinton No. 1 were programmed to test the porous and permeable Precipice Sandstone. Elsewhere in the basin the Precipice Sandstone occupies a position either directly overlying an unconformity above the pre-Great Artesian Group section, or, in basinal position, directly overlying transitional quartzose clastics of the generally tight and impermeable Wandoan Formation, the basal formation of the Great Artesian Group. At Weribone No. 1, in a position updip from Coomrith towards the basinal margin, Wandoan sand facies "climbs" the unconformity and replaces the porous and permeable Precipice sand facies. At Flinton No. 1, the well penetrated a facies transitional between the Precipice and Wandoan formations. In Weribone No. 1, gas shows were encountered in tight Wandoan sandstone directly overlying the unconformity at the base of the Great Artesian Group; there were no shows in the Flinton well.

Coomrith No. 1 was drilled on a structural closure with a maximum of 184 feet of closure over nine square miles in the Precipice Sandstone. As in the Flinton well, Coomrith No. 1 intersected a transitional Precipice-Wandoan facies. However, at Coomrith No. 1, permeable Precipice facies was more restricted than at Flinton No. 1, and no shows of oil or gas were encountered in the sequence.

Oil and Gas Indications

No significant oil or gas shows were encountered in the drilling of U.K.A. Coomrith No. 1. Induction-Electric and Sonic Log interpretation did not indicate any zones of interest.

At Coomrith, as in other wells drilled to date by the company on the south-western flank of the basin, Wandoan sand facies is indicated to have "climbed" stratigraphically in the section, and replaced the porous and permeable Precipice sand facies and partially replaced the typical Evergreen shale facies.

REFERENCES

UNION OIL DEVELOPMENT CORPORATION, 1963: Well Completion Report No. 13, Union-Kern-A.O.G. Weribone No. 1 (Unpubl.).

UNION OIL DEVELOPMENT CORPORATION, 1963: Well Completion Report No. 19, Union-Kern-A.O.G. Coomrith No. 1 (Unpubl.).

UNION OIL DEVELOPMENT CORPORATION, 1964: Union-Kern-A.O.G. Wandoan No. 1, Queensland. Bur. Min. Resour. Aust. Petrol. Search Subs. Acts Publ. 59.

ADDITIONAL DATA FILED IN THE BUREAU OF MINERAL RESOURCES

The following additional data relating to Union-Kern-A.O.G. Coomrith No. 1, have been filed in the Bureau of Mineral Resources, Canberra, and are available for reference:

(i) Well Completion Report

Part A	: Geology, by J.E. Mack, Jr, F.A. Herrmann, and A.R. Carey	9 pp.
Appendix A	: Prognosis	1 p.
Appendix B	: Descriptions of cuttings	73 pp.
Appendix C	: Descriptions of cores	5 pp.
Appendix D	: Descriptions of sidewall cores	4 pp.
Part B	: Engineering, by D.E. Pyle	4 pp.
Appendix E	: Mud Record	2 pp.
Appendix F	: Drilling Record	6 pp.
Appendix G	: Electrical Logging	5 pp.
Appendix H	: Velocity Survey	1 p.

(ii) Daily drilling reports for period 18th September, 1963 to 14th October, 1963.

(iii) Well logs including the following:

(a) Induction-Electrical Log
Run 1, 811-8426 feet (2", 5" = 100 ft)

(b) Sonic Log
Run 1, 811-8412 feet (2", 5" = 100 ft)

(c) Continuous Dipmeter
Run 1, 5899-8420 feet (1.2" = 100 ft)

(d) Drilling rate, hydrocarbon analysis log (2" = 100 ft)

(iv) Seismic Structure Map, Coomrith Prospect, "G" Horizon (Top Precipice)

(v) Velocity Survey determinations, U.K.A. Coomrith No. 1.

UNION-KERN-A.O.G. WUNGER NO. 1

of

UNION OIL DEVELOPMENT CORPORATION

KERN COUNTY LAND COMPANY

and

AUSTRALIAN OIL AND GAS CORPORATION LIMITED

SUMMARY OF DATA AND RESULTS

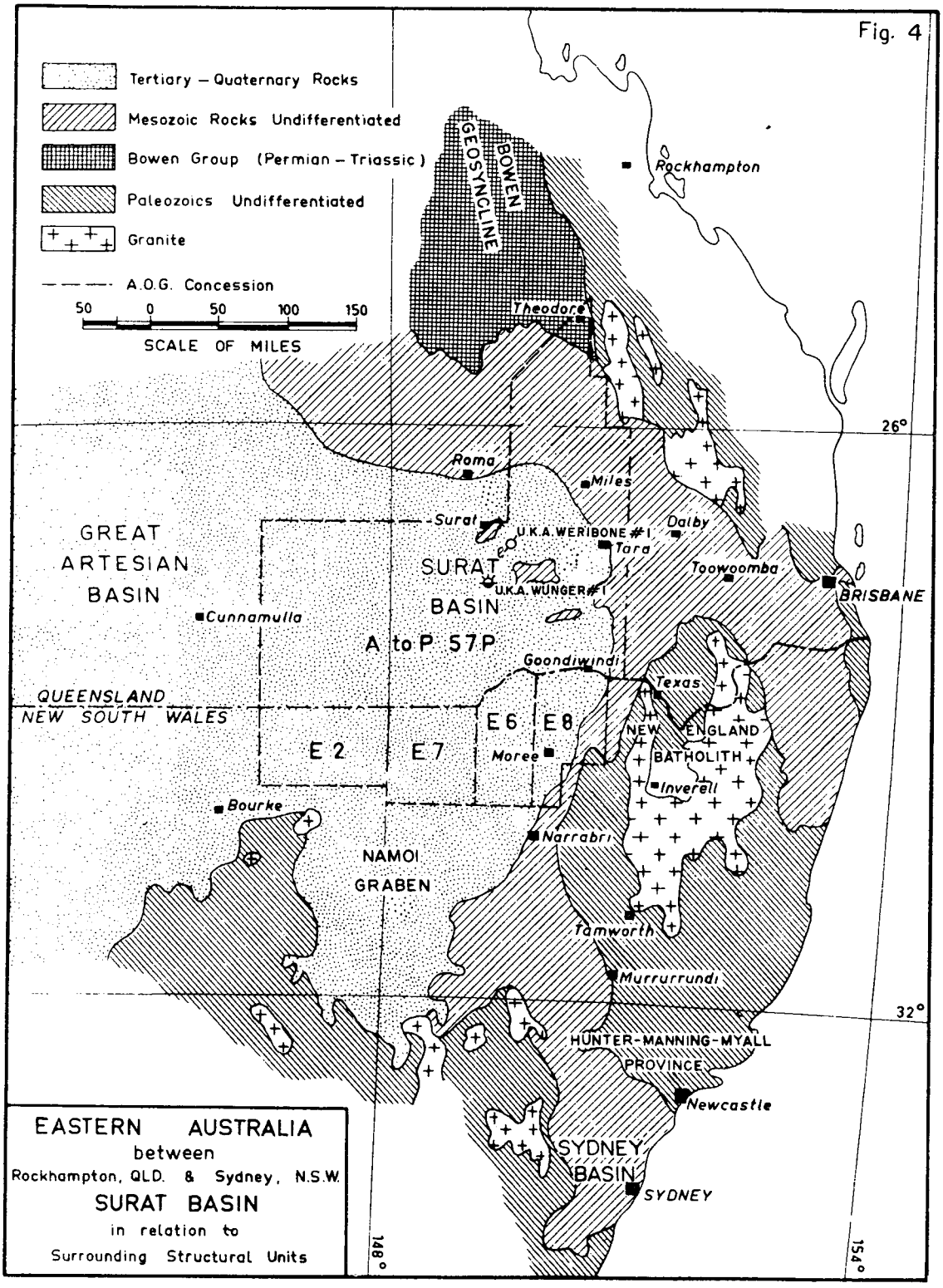
Fig. 4
Tertiary – Quaternary Rocks
Mesozoic Rocks Undifferentiated
Bowen Group (Permian – Triassic)
Paleozoics Undifferentiated
Granite
A.O.G. Concession
50 0 50 100 150
SCALE OF MILES
BOWEN GEOSYNCLINE
Rockhampton
Theodore
26°
Roma
Miles
Surat
U.K.A. WERIBONE #1
Tara
Dalby
Toowoomba
BRISBANE
GREAT ARTESIAN BASIN
SURAT BASIN
U.K.A. WUNGER #1
Cunnamulla
A to P 57P
Goondiwindi
Texas
QUEENSLAND
NEW SOUTH WALES
E 2
E 7
E 6
E 8
Moree
NEW ENGLAND BATHOLITH
Inverell
Bourke
Narrabri
NAMOI GRABEN
Tamworth
Murrurundi
32°
HUNTER-MANNING-MYALL PROVINCE
Newcastle
SYDNEY BASIN
SYDNEY
148°
154°
EASTERN AUSTRALIA
between
Rockhampton, QLD. & Sydney, N.S.W.
SURAT BASIN
in relation to
Surrounding Structural Units

UNION-KERN-A.O.G. WUNGER NO. 1

SUMMARY OF DATA AND RESULTS *

SUMMARY

Union-Kern-A.O.G. Wunger No. 1 Well was drilled by Union Oil Development Corporation in the south-western part of the Surat Basin, Queensland. The well, located approximately 37 miles west-north-west of Flinton No. 1 and 27 miles west-south-west of Coomrith No. 1, was drilled by Oil Drilling and Exploration Limited for Union Oil Development Corporation to a total depth of 6339 feet. Drilling commenced on 15th October, 1963 and was completed on 28th October, 1963. A full programme of logging, testing, and coring was undertaken.

Wunger No. 1 bottomed in metamorphics of (?) Devonian Timbury Hills Formation after penetrating 6292 feet of Mesozoic sediments. The well was drilled through the Lower Cretaceous Roma Formation to 2547 feet; the Jurassic Blythesdale Formation to 4740 feet; the Walloon Formation to 5228 feet; the Hutton Sandstone to 5647 feet; the Jurassic-Triassic Evergreen Shale to 5842 feet; and the Wandoan Formation to 6306 feet. Unconformably below the Wandoan Formation, the well penetrated 33 feet of slate of the Timbury Hills Formation. The Evergreen Shale at Wunger No. 1 is largely replaced by impermeable Wandoan sandstone facies. The basal Wandoan sandstone section, between 6279 and 6306 feet, is the probable time equivalent of the upper part of the Precipice Sandstone.

The well was drilled to test a structure on which it was hoped that the basal sandstone of the Jurassic-Triassic sediments would have adequate porosity and permeability. The Wunger structure covers more than 75 square miles and there is at least 250 feet of vertical closure within this area. A strong oil and gas show was recorded in the basal Wandoan sandstone. An open hole formation test over the interval 6283 to 6301 feet produced 10 B/D of 60° A.P.I. gravity oil, and 180 Mcf/D of gas. A later test over the interval 6281 to 6290 feet produced only gassy water and mud. Upon completion of this test the well was plugged and abandoned.

The stratigraphic drilling operation at Union-Kern-A.O.G. Wunger No. 1 was subsidized under the Petroleum Search Subsidy Act 1959-1961, from surface to total depth.

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* Abstracted from: Well Completion Report No. 20, Union-Kern-A.O.G. Wunger No. 1, by Union Oil Development Corporation, November, 1963.

WELL HISTORY

General Data

Well name and number:	Union-Kern-A.O.G. Wunger No. 1
Location:	Latitude 27°40'45"S. Longitude 149°07'34"E.
Name and address of Tenement Holder:	Union Oil Development Corporation, and Kern County Land Company, 261 George Street, Sydney, New South Wales.
Details of Petroleum Tenement:	Authority to Prospect 57P, Queensland.
Total Depth:	6339 feet
Date drilling commenced:	15th October, 1963
Date drilling completed:	28th October, 1963
Date well abandoned:	3rd November, 1963
Date rig released:	3rd November, 1963
Elevation (ground):	991 feet
Elevation (top K.B.):	1005 feet (datum for depths)
Status:	Plugged and abandoned
Cost:	£69,600 (estimated)

Drilling Data

Drilling Plant:

Make:	Ideco Hydrair Junior Super
Type:	7-11

Hole sizes and depths:

30"	to	15 feet
17 1/2"	to	592 feet
12 1/4"	to	660 feet
9"	to	6337 feet
7 7/8"	to	6339 feet (T.D.)

Casing details:

Size (in.):	20	13 3/8
Weight (lb./ft):	52	48
Grade:	10	H.40
Setting depth (ft):	15	587

Logging and Testing

Ditch Cuttings:

Interval:	Ten feet from 660 feet to total depth.
Coring:	Five cores were cut using a Hughes "J" Type core barrel with hard formation cutter heads. A total of 36 feet was cored and 27 feet (75%) recovered.

Sidewall Cores: None

Electric and other logging (Schlumberger):

Induction-Electrical Log:	587-6336 feet (1 run)
Sonic Log:	587-6330 feet (1 run)
Microlog:	5200-6336 feet (1 run)
Microlaterolog:	5200-6336 feet (1 run)
Continuous Dipmeter:	5000-6332 feet (1 run)

Velocity Survey: Ten horizons were tested at depths ranging from 600 to 6330 feet.

Drilling Rate, Oil and Gas Log: Continuous drilling rate and hydrocarbon plots were recorded during drilling.

Formation Testing: Two Halliburton formation tests were carried out during and on completion of the drilling of the well. Details are tabulated below:

Date	Tester	Interval (feet)	Packer (feet)	Cushion	Open	Results
27.10.63	Howco Hydro-spring 8" expand-ing shoe packer	6283-6301	6281-6283	500' mud	90 mins	Flowed 740 B/D gross, 10 B/D net, 98% cut, 60° API, 75-100 psi. on d.p., 180 Mcf/D, 5/8" surface choke PRD (Outside) Chart: Init. Hydrostatic 3600 psi. Init. Shut-in 2800 Init. Flow 1900 Final Flow) Clock Final Shut-in) stopped Final Hydrostatic 3500
2.11.63	Howco Hydro-spring 8" expand-ing shoe packer	6281-6290	6279-6281	540' mud	105 mins	Opened tool with moderate blow increasing to strong blow after 2 mins, continuing for duration of test. Recovered gross rise 5830 feet, net rise 5290 feet; consisting of 180 feet slightly gassy mud, 540 feet slightly gassy watery mud, 5110 feet slightly gassy water BT (Inside) Chart: Init. Hydrostatic 3600 psi. Init. Shut-in Tool plugged Init. Flow 820 Final Flow 2540 Final Shut-in 2780 Final Hydrostatic 3550

GEOLOGY

Stratigraphy

The stratigraphic sequence encountered in Union-Kern-A.O.G. Wunger No. 1 is shown in the Table below:

Age	Formation	Depth Intervals (feet)	Thickness (feet)
Lower Cretaceous	Roma Formation	14-2547	2533+
Jurassic	Blythesdale Formation	2547-4740	2193
Jurassic	Walloon Formation	4740-5228	488
Jurassic	Hutton Sandstone	5228-5647	419
Jurassic-Triassic	Evergreen Shale	5647-5842	195
Jurassic-Triassic	Wandoan Formation	5842-6306	464
Devonian (?)	Timbury Hills Formation	6306-6339	33+

Roma Formation (Lower Cretaceous): 14 to 2547 feet (2533 feet+)

Shale with minor sandstone.

Blythesdale Formation (Jurassic): 2547 to 4740 feet (2193 feet)

Predominantly light grey, quartzose sandstone with interbeds of carbonaceous shale and siltstone.

Walloon Formation (Jurassic): 4740 to 5228 feet (488 feet)

Interbedded shale, siltstone, tight sandstone, and minor coal seams.

Hutton Sandstone (Jurassic): 5228 to 5647 feet (419 feet)

Quartzose sandstone (light grey, granular to fine pebbly, porous, and loosely cemented) with siltstone interbeds and traces of coal.

Evergreen Shale (Jurassic-Triassic): 5647 to 5842 feet (195 feet)

Shale and siltstone, grey to brown, tan, with interbeds of sandstone, light grey to grey-green, very fine to medium-grained, silty, calcareous, between 5716-5726 feet and 5760-5783 feet, and thin coal seams between 5818-5842 feet.

Wandoan Formation (Jurassic-Triassic): 5842 to 6306 feet (464 feet)

Tight, light grey to grey-green, fine to medium-grained, quartzose, calcareous sandstone with a clay matrix, and interbeds of siltstone and shale, grading downwards into quartz pebble conglomerate.

Detailed description, Wandoan Formation

5842-5986 feet (144 feet): SANDSTONE, light grey to grey-green, very fine-grained to granules, streak sorted, quartzose, calcareous, white clay matrix, tight, except for porous streaks between 5886-5920 feet, and 5967-5973 feet. Interbeds of SILTSTONE and SHALE, grey to brown, soft, carbonaceous, between 5920-5946 feet.

5986-6086 feet (100 feet): SANDSTONE, light grey to grey-green, very fine to medium-grained, trace coarse streaks, tight, with thin interbeds of SILTSTONE and SHALE, sandy, grey to brown, carbonaceous.

6086-6238 feet (152 feet): SANDSTONE, light grey to grey-green, brown, fine to medium-grained, trace coarse grains, quartzose, streaks of red, black, and orange mineral grains, calcareous clay matrix, tight, except for porous streaks between 6129-6134 feet and 6155-6163 feet.

6238-6279 feet (41 feet): SHALE and SILTSTONE, grey to brown, soft, carbonaceous.

6279-6306 feet (27 feet): SANDSTONE, light grey, medium to very coarse-grained, quartzose, streaky clay matrix, thin dark grey, carbonaceous shale bands; grades downwards into CONGLOMERATE at 6293 feet, light grey, rounded pebbles to cobbles up to 2 1/2" in diameter of milky to light grey quartz in a medium to coarse-grained, quartzose sandstone matrix. Porosity and permeability developed between 6280-6284 feet and 6290-6301 feet.

Timbury Hills Formation (Devonian ?): 6306 to 6339 feet (33 feet +)

Dark grey, hard, graphitic slate, veined with calcite; trace mica along cleavage planes; fractured.

Structure

The Wunger prospect occurs in the south-western part of the Surat Basin on the western shelf. At U.K.A. Weribone No. 1, approximately 28 miles to the north-north-east, the Wandoan Formation, the basal unit of the Great Artesian Group, unconformably overlies the Cabawin Formation. Here, Wandoan facies has "climbed" the unconformity and replaced permeable Precipice sand facies. Below the Cabawin Formation, Weribone No. 1 penetrated a thin Permian Kianga sequence below which the well bottomed in metamorphics. At Wunger, it was anticipated that the Wandoan Formation would directly overlie basement rocks. Weribone No. 1 had strong gas shows in the basal part of the Wandoan Formation directly above the unconformity. At Wunger, it was hoped that porous and permeable sand might be better developed than at Weribone on the unconformity and afford a suitable reservoir.

The Wunger prospect is the largest structure defined to date in the Great Artesian section of the Surat Basin. The Wunger structure covers more than 75 square miles, and within these limits, there is a minimum of 250 feet of vertical closure. The Mesozoic closure is thought to be the result of drape over a faulted basement "high" of similar proportions.

The Evergreen Shale at Wunger is largely replaced by impermeable Wandoan sandstone facies. The basal Wandoan sandstone section, between 6279 and 6306 feet, is the probable time equivalent of the upper part of the Precipice Sandstone. A strong oil and gas show was recorded in this basal sandstone which unconformably overlies metamorphics of the Timbury Hills Formation.

Oil and Gas Indications

Strong oil and gas shows were recorded in the basal part of the Wandoan Formation between 6279 and 6306 feet. Cores from the interval 6284-6306 feet had a good petroleum odour, light blue fluorescence and trace cuts in carbon tetrachloride. Core analyses of this sandstone showed porosities ranging from 4.8 to 18.5%, permeabilities from 0 to 372 md, and oil/water ratios of 0-0.18. The results of two formation tests carried out in U.K.A. Wunger No. 1 Well are tabulated on page 21.

REFERENCES

UNION OIL DEVELOPMENT CORPORATION, 1963: Well Completion Report No. 20, Union-Kern-A.O.G. Wunger No. 1 (Unpubl.).

UNION OIL DEVELOPMENT CORPORATION, 1964: Union-Kern-A.O.G. Cabawin East No. 1, Queensland. Bur. Min. Resour. Aust. Petrol. Search Subs. Acts Publ. 44.

ADDITIONAL DATA FILED IN THE BUREAU OF MINERAL RESOURCES

The following additional data relating to Union-Kern-A.O.G. Wunger No. 1, have been filed in the Bureau of Mineral Resources, Canberra, and are available for reference:

(i) Well Completion Report

Part A	: Geology, by J.E. Mack, Jr, F.A. Herrmann, and A.R. Carey	5 pp.
Appendix A	: Prognosis	1 p.
Appendix B	: Descriptions of cuttings	38 pp.
Appendix C	: Descriptions of cores	5 pp.
Part B	: Engineering, by W.J. Stewart and D.E. Pyle	4 pp.
Appendix D	: Mud Record	2 pp.
Appendix E	: Drilling Record	6 pp.
Appendix F	: Electrical Logging	7 pp.
Appendix G	: Core Analysis	1 p.
Appendix H	: Water Analysis	2 pp.
Appendix I	: Gas Analysis	1 p.
Appendix J	: Crude Oil Analysis	1 p.
Appendix K	: Velocity Survey	1 p.
Appendix L	: Formation Test Data and Charts	1 p.

(ii) Daily drilling reports for period 15th October, 1963 to 2nd November, 1963.

(iii) Well logs including the following:

(a) Induction-Electrical Log
Run 1, 587-6336 feet (2", 5" = 100 ft)

(b) Sonic Log
Run 1, 587-6330 feet (2", 5" = 100 ft)

(c) Microlog
Run 1, 5200-6336 feet (2", 5" = 100 ft)

(d) Microlaterolog
Run 1, 5200-6336 feet (2", 5" = 100 ft)

(e) Continuous Dipmeter
Run 1, 5000-6332 feet (1.2" = 100 ft)

(f) Drilling rate, hydrocarbon analysis log (2" = 100 ft)

(iv) Seismic Structure Map, Wunger Prospect, (Top Evergreen Shale)

(v) Velocity Survey determinations, U.K.A. Wunger No. 1.

U.O.D.C. WELL COMPLETION REPORT No 18

COMPANY: UNION OIL DEVELOPMENT CORPORATION

PETROLEUM TENEMENT: A to P 57P
MILITARY 4-MILE SHEET: SURAT

WELL No. UNION-KERN-A.O.G FLINTON No.1
BASIN: BOWEN-SURAT

STATE: QUEENSLAND
WELL STATUS: PLUGGED & ABANDONED BELOW 4490', LEASED TO PROPERTY OWNER FOR CONVERSION TO WATER WELL

INDUCTION ELECTRIC LOG DATA

DATUM: K.B.

RUN No.	1	2		
DATE	Aug. 28, 1963	Sept. 11, 1963		
FIRST READING	7942'	9127'		
LAST READING	966'	7942'		
INTERVAL MEASURED	6976'	1185'		
Csg. SCHLUMBERGER	966'	966'		
Csg. DRILLER	965'	966'		
DEPTH REACHED	7943'	9128'		
BOTTOM DRILLER	7939'	9123'		
MUD NATURE	Spersene	Spersene		
DENSITY-VISCOSITY	80 - 49	82 - 45		
MUD RESISTIVITY	2·66 @ 80°F	2·21 @ 70°F		
MUD RESIST. B.H.T.	1·32 @ 161°F	0·9 @ 170°F		
pH FLUID LOSS	9/8·2cc/30min	9/7·2cc/30min.		
ORIGIN OF SAMPLE	Flowline	Tanks		
R.M.F.	2·46 @ 70°F	Press 2·02 @ 60°F		
R.M.C.	2·35 @ 80°F	A4 0·35 @ 170°F		
BIT SIZE.....1	9⅞" to 1884'	9⅞" to 1884'		
2	9" to T.D.	9" to T.D.		
Csg. SIZE	13⅜"	13⅜"		
OPR. RIG TIME	3½ hrs.	3½ hrs.		
TRUCK No.	4503	4501		
RECORDED BY	J. Buckley	Neville-Buckley		
WITNESSED BY	E. McLeod	J. Turk		

NAME OF WELL: Union-Kern-A.O.G. Flinton No.1
STATE: Queensland
COUNTRY: Australia
COUNTY: Pring
PARISH: Kinkora
PORTION: 29
LATITUDE: 27°54'52"S
LONGITUDE: 149°40'10"E
ELEVATION: K.B. 833'
G.L. 819'
T.D. .....: 9123'
DATE SPUDDED: August 10, 1963
DATE T.D.: September 11, 1963
DATE RIG RELEASED: September 16, 1963
STATUS OF WELL: Plugged & abandoned below 4490'. Leased to property owner for conversion to water well
DRILLED BY: Oil Drilling & Exploration Ltd.
DRILLING METHOD: Rotary Ideco Super Junior T-11
LOGGING: Schlumberger
CEMENTING: Halliburton
MUD LOGGING: Union Oil Development Corporation

OTHER ELECTRICAL LOGS
SONIC LOG: 9105'-966'
VELOCITY SURVEY: 9120'-970'
MICROLOG: 7942'-6200'
CONT. DIPMETER: 9120'-5700'

LITHOLOGIC REFERENCE

- Conglomerate
- Sandstone
- Limy sandstone
- Tuffaceous sandstone
- Tuff
- Shale or mudstone
- Limy shale
- Siltstone
- Coal and carbonaceous matter
- Volcanic flows

WELL SYMBOLS

- Gas show slight
- Gas show strong
- Oil show slight
- Oil show strong
- Oil and gas show
- Fluorescence
- Blowout
- Macrofossil
- Spore, pollen
- No.1 Core interval, No and recovery
- Sidewall core
- Perforated interval
- Formation test or production test
- O.H. and in csg.
- Plugged interval

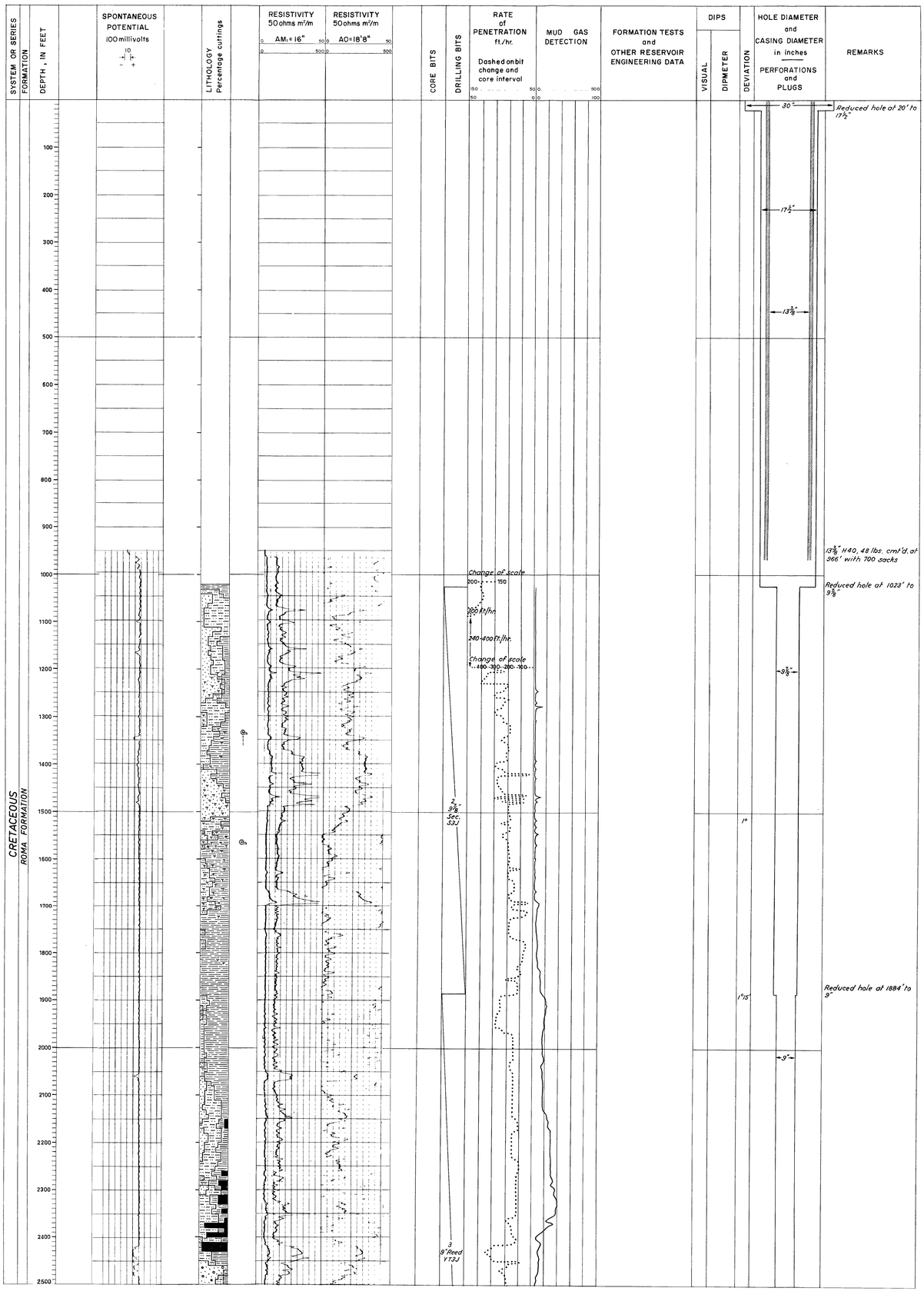
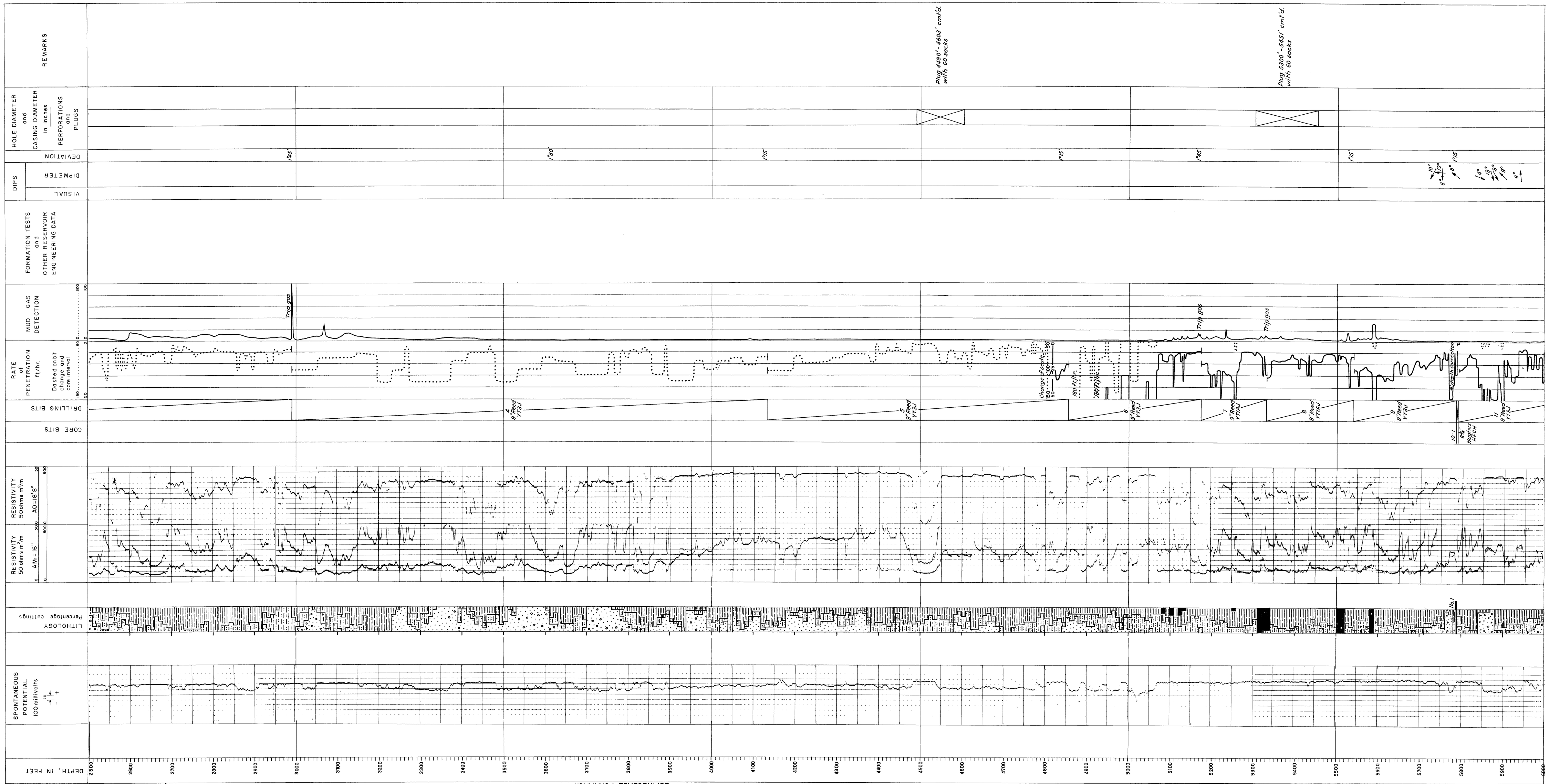
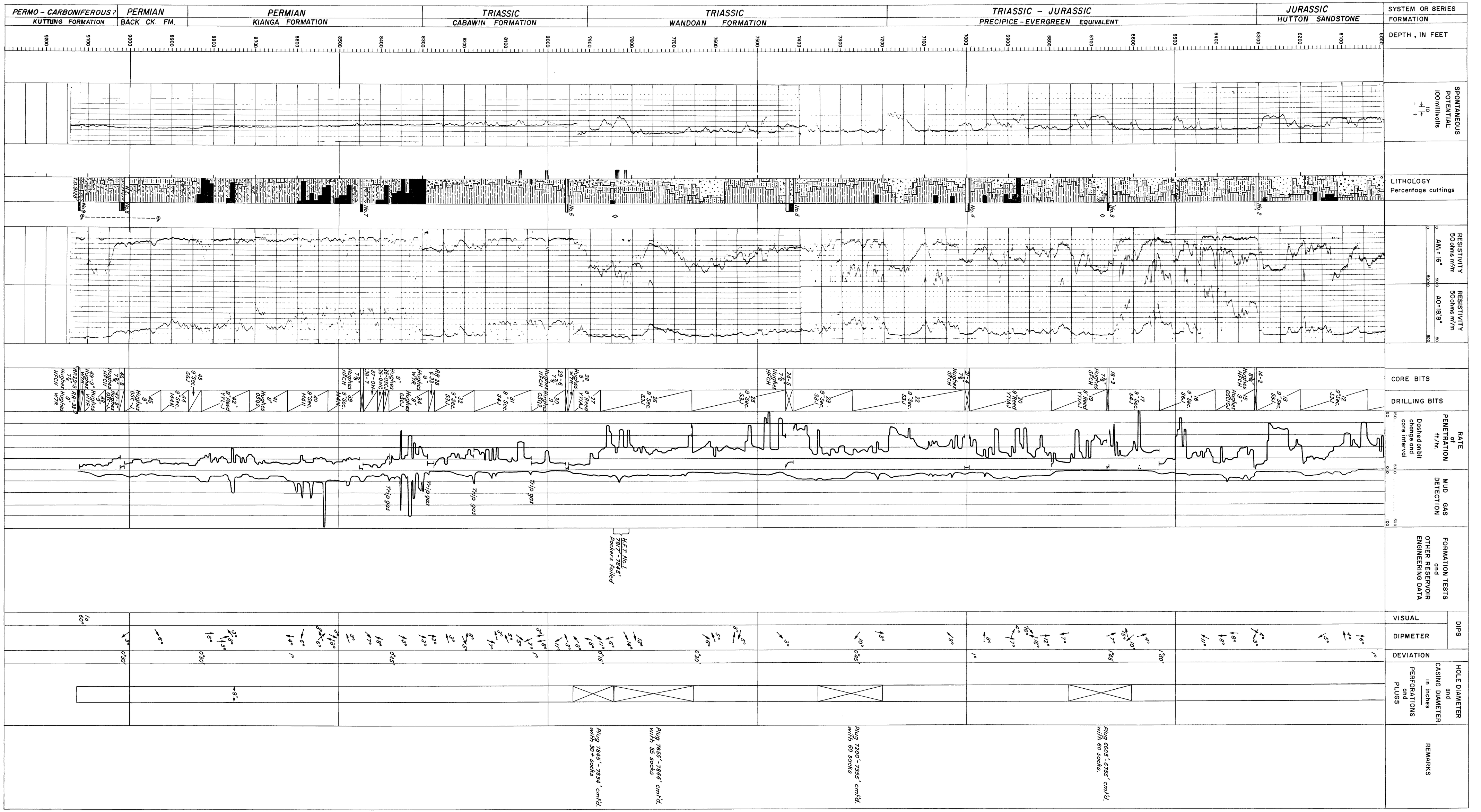


PLATE 1
SHEET 2

UNION-KERN-A.O.G. FLINTON No.1





UNION - KERN - A.O.G. FLINTON No.1

PLATE I
SHEET 3

U.O.D.C. WELL COMPLETION REPORT No. 19

COMPANY: UNION OIL DEVELOPMENT CORPORATION

PETROLEUM TENEMENT: A to P 57 P
MILITARY 4-MILE SHEET: SURAT

WELL No: UNION-KERN-A.O.G COOMRITH No.1
BASIN: BOWEN-SURAT

STATE: QUEENSLAND
WELL STATUS: PLUGGED & ABANDONED

DATUM. K.B.

INDUCTION ELECTRIC LOG DATA

RUN No.	1			
DATE	October 9, 1963			
FIRST READING	8426'			
LAST READING	811'			
INTERVAL MEASURED	7615'			
Csg. SCHLUMBERGER	811'			
Csg. DRILLER	811'			
DEPTH REACHED	8427'			
BOTTOM DRILLER	8426'			
MUD NATURE	Caustic			
DENSITY - VISCOSITY	83.5 - 76			
MUD RESISTIVITY	4.0 @ 80°F			
MUD RESIST. B.H.T.	1.9 @ 164°F			
pH FLUID LOSS	9-7.4 CC 30 min.			
ORIGIN OF SAMPLE	Flow line			
R.M.F.	3.8 @ 72°F			
R.M.C.	3.3 @ 80°F			
BIT SIZE.....1	9" to T.D.			
2				
Csg. SIZE	13⅜"			
OPR. RIG TIME	5 hrs.			
TRUCK No.	4501			
RECORDED BY	J. Buckley			
WITNESSED BY	J. Turk			

OTHER LOGS

MICROLOG: —
SONIC LOG: 811'-8412'
CONTINUOUS DIPMETER: 5899'-8420'
VELOCITY SURVEY: 820'-8410'

NAME OF WELL: Union-Kern-A.O.G. Coomrith No.1
STATE: Queensland
COUNTRY: Australia
COUNTY: Pring
PARISH: Coomrith
PORTION: 22
LATITUDE: 27° 38' 14"·5
LONGITUDE: 149° 34' 08" E
ELEVATION: K.B. 876'

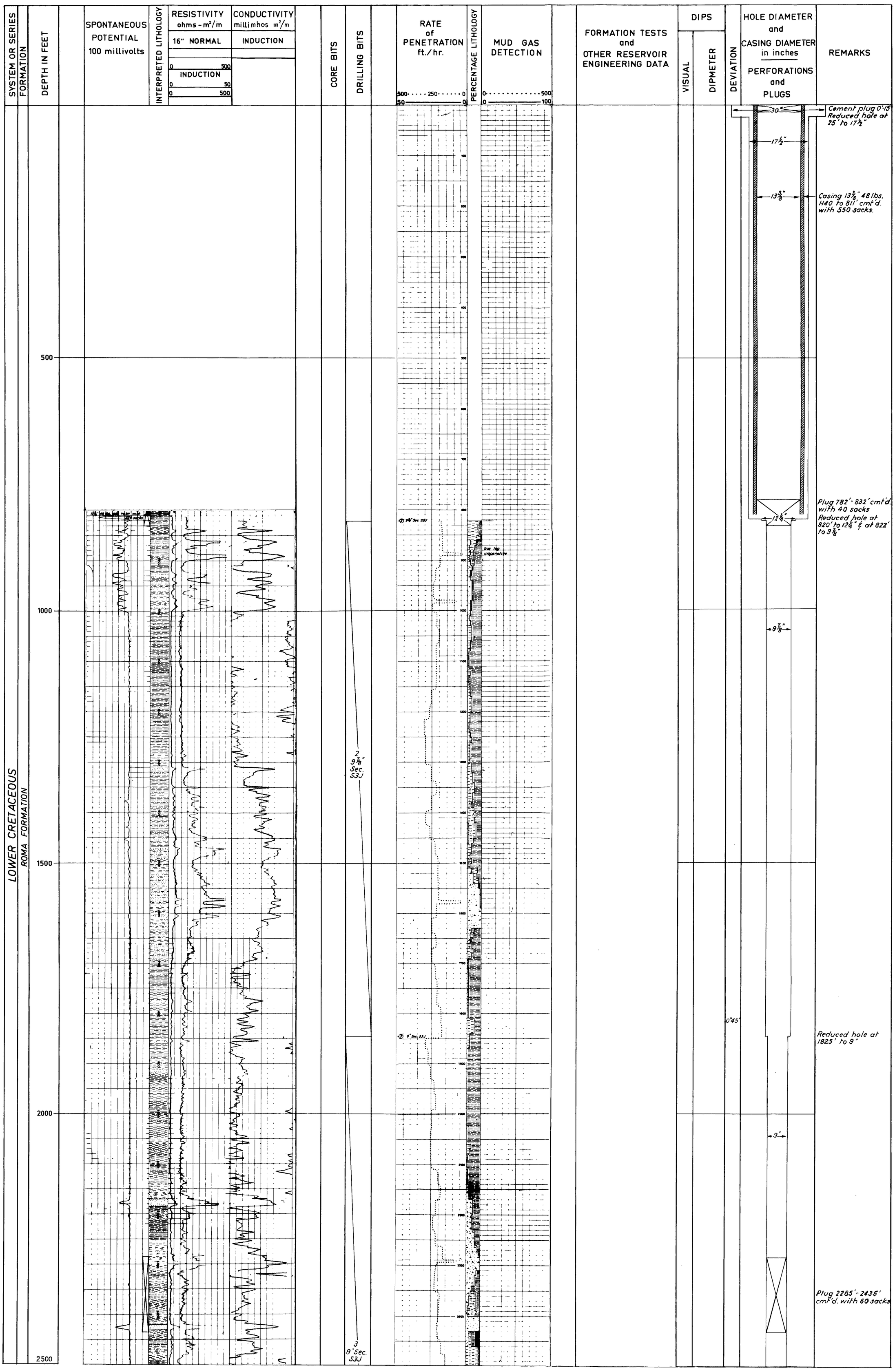
T.D. 8426'
DATE SPUDDED: September 20, 1963
DATE T.D.: October 9, 1963
DATE RIG RELEASED: October 12, 1963
DRILLED BY: Oil Drilling & Exploration Ltd.
DRILLING METHOD: Ideco T-11 Super Junior
LOGGING: Schlumberger
CEMENTING: Halliburton
MUD LOGGING: Union Oil Development Corporation

WELL SYMBOLS

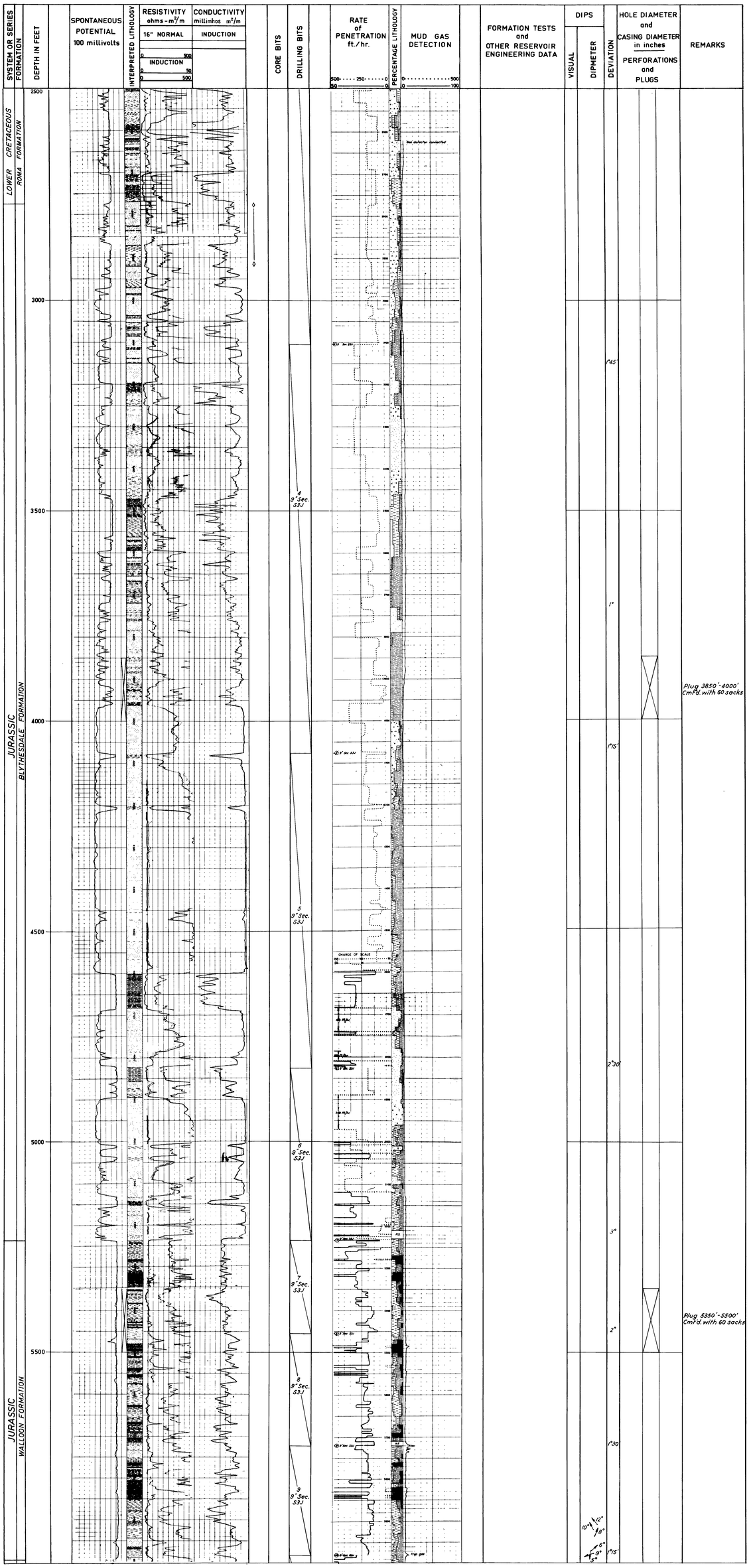
- GAS SHOW SLIGHT
- GAS SHOW STRONG
- OIL SHOW SLIGHT
- OIL SHOW STRONG
- OIL AND GAS SHOW
- FLUORESCENCE
- BLOWOUT
- MACROFOSSIL
- SPORE, POLLEN
- CORE INTERVAL, No. & RECOVERY
- PERFORATED INTERVAL
- FORMATION TEST OR PRODUCTION TEST
- O.H. & IN CASING
- PLUGGED INTERVAL

LITHOLOGIC REFERENCE

- CONGLOMERATE
- SANDSTONE
- LIMY SANDSTONE
- TUFFACEOUS S'STONE
- TUFF
- SHALE OR MUDSTONE
- LIMY SHALE
- SILTSTONE
- COAL & CARBONACEOUS MATTER
- VOLCANIC FLOWS
- METAMORPHICS



UNION - KERN - A.O.G. COOMRITH No.1



UNION - KERN - A.O.G COOMRITH No.1

SYSTEM OR SERIES: JURASSIC / TRIASSIC-JURASSIC / TRIASSIC
FORMATION: HUTTON SANDSTONE / EVERGREEN SHALE EQUIVALENT / PRECIPICE S/S EQUIV.? / WANDOAN FORMATION / CABAWIN FM.

DEPTH IN FEET: 6000, 6500, 7000, 7500, 8000, 8500

SPONTANEOUS POTENTIAL 100 millivolts

INTERPRETED LITHOLOGY

RESISTIVITY ohms - m^2/m — 16" NORMAL

INDUCTION 0 500 | 0 50 | 0 500

CONDUCTIVITY millimhos m^2/m — INDUCTION

CORE BITS

DRILLING BITS

RATE of PENETRATION ft./hr. 150 50 | 50 0

PERCENTAGE LITHOLOGY

MUD GAS DETECTION 0 500 | 0 100

FORMATION TESTS and OTHER RESERVOIR ENGINEERING DATA

DIPS — VISUAL / DIPMETER

DEVIATION

HOLE DIAMETER and CASING DIAMETER in inches — PERFORATIONS and PLUGS

REMARKS

10 9"Sec. S3J
11 9"Sec. S3J
12 9"Sec. S3J
13 9"Sec. S3J
14 9"Sec. S4J
15 9"Sec. S4J
16 9"Sec. S4J
17-1 8¾" Hughes HFCH
18 9"Sec. S3J
19 9"Sec. S3J
20-2 7⅞" Hughes HFCH
21 9"Sec. S3J
22 9"Sec. S3J
23-3 7⅞" Hughes HFCH
24 9"Sec. S3J
25-4 7⅞" Hughes HFCH
26 9"Sec. S4J
27 9" Hughes OSC3J
28 9"Sec. M4L
29 9"Sec. H7W
30-5 7⅞" Hughes HFCH

Core No. 1 7023' - 7036' Rec. 12'
Core No. 2 7432' - 7457' Rec. 5'
Core No. 3 7808' - 7820' Rec. 12'
Core No. 4 8075' - 8088' Rec. 10'1"
Core No. 5 8421' - 8426' Rec. 3' 10"
T.D. 8426'
2 S.W.C. 6978', 6880', 6942', 6861', 6824', 6885', 6988'
1 S.W.C. 7851'
5 S.W.C.'s
5 S.W.C.'s
5 S.W.C.'s
2° depth correction
Trip gas
Circulated sample - no show
N.S.

DEVIATION: 2° | 2° | 2°15' | 2°30' | 1° | 1°30' | 1°15' | 0°45'

Plug 6950' - 7100' Cmt'd. with 60 sacks

U.O.D.C. WELL COMPLETION REPORT No. 20

COMPANY: UNION OIL DEVELOPMENT CORPORATION

PETROLEUM TENEMENT: A to P 57 P
MILITARY 4-MILE SHEET: SURAT

WELL No: UNION-KERN-A.O.G WUNGER No.1
BASIN: BOWEN-SURAT

STATE: QUEENSLAND
WELL STATUS: PLUGGED & ABANDONED

INDUCTION ELECTRIC LOG DATA

DATUM: K.B.

RUN No	1			
DATE	October 28, 1963			
FIRST READING	6336'			
LAST READING	587'			
INTERVAL MEASURED	5749'			
Csg. SCHLUMBERGER	587'			
Csg. DRILLER	587'			
DEPTH REACHED	6337'			
BOTTOM DRILLER	6339'			
MUD NATURE	Spersene			
DENSITY-VISCOSITY	79-49			
MUD RESISTIVITY	3·48 @ 77°F			
MUD RESIST. B.H.T.	1·75 @ 152°F			
pH FLUID LOSS	9/8·8 CC 30 mins.			
ORIGIN OF SAMPLE	Flow line			
R.M.F	3·5 @ 77°F			
R.M.C.	3·1 @ 77°F			
BIT SIZE 1	9" to 6337'			
2	7⅞" to 6339'			
Csg. SIZE	13⅜"			
OPR. RIG TIME	3 hrs.			
TRUCK No	4501			
RECORDED BY	J. Buckley			
WITNESSED BY	B. Stewart			

NAME OF WELL: Union-Kern-A.O.G. Wunger No.1
STATE: Queensland
COUNTRY: Australia
COUNTY: Belmore
PARISH: Wunger
PORTION: 1
LATITUDE: 27° 40' 45" S
LONGITUDE: 149° 07' 34" E
ELEVATION: K.B. 1005'
G.L. 991'
T.D. 6339'
DATE SPUDDED: October 15, 1963
DATE T.D.: October 28, 1963
DATE RIG RELEASED: November 3, 1963
DRILLED BY: Oil Drilling & Exploration Ltd.
DRILLING METHOD: Ideco 7-11 Super Junior
LOGGING: Schlumberger
CEMENTING: Halliburton
MUD LOGGING: Union Oil Development Corporation

OTHER LOGS

MICROLOG: 5200' - 6336
SONIC LOG: 587' - 6330'
MICROLATEROLOG: 5200' - 6336'
CONTINUOUS DIPMETER: 5000' - 6332'
VELOCITY SURVEY: 600' - 6330'

WELL SYMBOLS

- GAS SHOW SLIGHT
- GAS SHOW STRONG
- OIL SHOW SLIGHT
- OIL SHOW STRONG
- OIL AND GAS SHOW
- FLUORESCENCE
- BLOWOUT
- MACROFOSSIL
- SPORE, POLLEN
- CORE INTERVAL, No. & RECOVERY
- PERFORATED INTERVAL
- FORMATION TEST OR PRODUCTION TEST
- O.H & IN CASING
- PLUGGED INTERVAL

LITHOLOGIC REFERENCE

- CONGLOMERATE
- SANDSTONE
- LIMY SANDSTONE
- TUFFACEOUS S'STONE
- TUFF
- SHALE OR MUDSTONE
- LIMY SHALE
- SILTSTONE
- COAL & CARBONACEOUS MATTER
- VOLCANIC FLOWS
- METAMORPHICS

SYSTEM OR SERIES: LOWER CRETACEOUS
FORMATION: ROMA FORMATION
DEPTH IN FEET
SPONTANEOUS POTENTIAL 100 millivolts
INTERPRETED LITHOLOGY
RESISTIVITY ohms - m²/m: 16" NORMAL 0–10; 0–50; 0–500; INDUCTION 0–50; 0–500
CONDUCTIVITY millimhos m²/m: INDUCTION 500–0
CORE BITS
DRILLING BITS
RATE of PENETRATION ft./hr.: 500–0; 50–0
PERCENTAGE LITHOLOGY
MUD GAS DETECTION: 0–500; 0–100
FORMATION TESTS and OTHER RESERVOIR ENGINEERING DATA
DIPS: VISUAL; DIPMETER
DEVIATION
HOLE DIAMETER and CASING DIAMETER in inches — PERFORATIONS and PLUGS
REMARKS

500
1000
1500

30"
Surface plug 0'-15' cmt'd. with 15 sks. Hole reduced at 15' to 17½"
17½"
13⅜"
13⅜" casing H40, 48 lbs. cmt'd. to 587' with 500 sacks
Plug - 560' - 600' cmt'd. with 50 sacks
Hole reduced at 592' to 12¼"
12¼"
1°15'
Hole reduced at 660' to 9"
9"
0°45'
2
9"
Hughes
OSC3J

UNION - KERN - A.O.G. WUNGER No.1

SYSTEM OR SERIES / FORMATION	DEPTH IN FEET	SPONTANEOUS POTENTIAL 100 millivolts	INTERPRETED LITHOLOGY	RESISTIVITY ohms - m^2/m / CONDUCTIVITY millimhos m^2/m	CORE BITS	DRILLING BITS	RATE of PENETRATION ft./hr.	PERCENTAGE LITHOLOGY	MUD GAS DETECTION	FORMATION TESTS and OTHER RESERVOIR ENGINEERING DATA	DIPS: VISUAL	DIPS: DIPMETER	DEVIATION	HOLE DIAMETER and CASING DIAMETER in inches / PERFORATIONS and PLUGS	REMARKS
LOWER CRETACEOUS ROMA FORMATION	1500			16" NORMAL 0–10; INDUCTION 0–50; INDUCTION 0–500; CONDUCTIVITY INDUCTION 500–0			500–0; 50–0		0–500; 0–100						
	2000														
	2500														
JURASSIC BLYTHESDALE FORMATION	3000				3 9" Hughes 05C3J								0°45'		Plug - 2100'-2250' cmt'd. with 60 sacks
	3500														

PLATE 3
SHEET 3

UNION - KERN - A.O.G WUNGER No.1

SYSTEM OR SERIES: JURASSIC
FORMATION: BLYTHESDALE FORMATION / WALLOON FORMATION / HUTTON SANDSTONE / EVERGREEN SHALE / TRIASSIC - JURASSIC: WANDOAN FORMATION / TIMBURY HILLS FORMATION

DEPTH IN FEET: 4000, 4500, 5000, 5500, 6000, 6500

SPONTANEOUS POTENTIAL 100 millivolts

INTERPRETED LITHOLOGY

RESISTIVITY ohms - m^2/m
16" NORMAL 0 — 10 — 500 — 0
INDUCTION 0 — 50 — 500

CONDUCTIVITY millimhos m^2/m
INDUCTION 500 — 0

CORE BITS

DRILLING BITS

4 9" Hughes 05C3J
5 9" Hughes 05C3J
6 9" Hughes 05C3J
7 9" Hughes 05C3J
8 9" Hughes 05C3J
9 9" Hughes 05C3J
10 9" Hughes 05C3J
11 9" Hughes 05C3J
12 9" Hughes 05C3J
13 - 1 7⅞" Hughes HFCH
14 9" Sec. S4J
15 - 2, 16 - 3, 18 - 4 All 8¾" Hughes HFCH
19 9" Sec. S4J
20 - 5 7⅞" Hughes HFCH

RATE of PENETRATION ft./hr. 500 — 0 / 50 — 0

PERCENTAGE LITHOLOGY

MUD GAS DETECTION 0 — 500 / 0 — 100

Change of scale

Core No 1 6081' - 6094' Rec 12'7"
Core No 2 6284' - 6296' Rec 10
Core No 3 6296' - 6301' Rec 1
Core No 4 6301' - 6305' Rec 1'6"
Core No 5 6337' - 6339' Rec 2
T.D. 6339'
Trip gas
Circulated, sample very small gas kick, but no hydrocarbons
Circulated drilling break no show

H.F.T. No.1 6283' - 6301'
Good blow. Mud to surface 35 mins. Gas to surface 42 mins. 740 b/d. gross, 10 b/d. net 60° API crude, 98% cut, 180 Mcf/d. gas
IHP - 3600 FHP - 3500
ISIP - 2800 FSIP -
IFP - 1900 FFP -

H.F.T. No. 2 6281' - 6290'
Medium to strong blow in 2 mins. Recovered 5830' H_2O
IHP - 3600 FHP - 3550
ISIP - FSIP - 2780
IFP 820 FFP - 2540

FORMATION TESTS and OTHER RESERVOIR ENGINEERING DATA

Depth Feet	Por. %	Perm. md.	O.W. Ratio
6284	4·8	0·12	0
6287	9·4	0·35	0
6288	18·5	322	0·13
6289	17·4	372	0·18
6290	17·8	190	0·05
6291	15·1	182	0·12
6292	17·9	272	0·14
6294	11·9	118	0

DIPS
VISUAL
DIPMETER

0° 0° 0° 60°

3° 5° 3° 4° 10° 10° 4° 3° 9° 10° 4° 0°45' 4° 4° 3° 5° 13° 12° 36° 9° 8° 6° 3° 7° 13° 6° 5° 4° 2° 10° 3° 6° 9°

DEVIATION
1°
1°30'
1°45'
0°45'
2°

HOLE DIAMETER and CASING DIAMETER in inches
PERFORATIONS and PLUGS

9" 9" 7⅞"

REMARKS

Note change of scale in rate of penetration at 4100'

Plug: 4625' - 4775' cmt'd. with 60 sacks

Plug: 6190' - 6290' cmt'd. with 40 sacks

PLATE 4

N.W. ← 46 Miles ± → S.E. S.W. ← 44 Miles ± → N.E.

U.K.A. WERIBONE #1. U.K.A. FLINTON #1. U.K.A. CABAWIN #1.

DATUM BASE HUTTON SANDSTONE

DATUM BASE HUTTON SANDSTONE

EVERGREEN SHALE

EVERGREEN SHALE

TRIASSIC

TRIASSIC

PRECIPICE SANDSTONE

JURASSIC

JURASSIC

TRANSITION ZONE

TRIASSIC

TRIASSIC

WANDOAN FORMATION

WANDOAN FORMATION

TRIASSIC

TRIASSIC

BASE GREAT ARTESIAN GROUP

BASE GREAT ARTESIAN GROUP

CABAWIN FORMATION

CABAWIN FORMATION

UNION OIL DEVELOPMENT CORPORATION

CORRELATION SECTION

SHOWING

RELATIONSHIPS WANDOAN FM. — PRECIPICE S.S.

WERIBONE #1. — FLINTON #1 — CABAWIN #1.

A.B. KELLER AUGUST 1963.

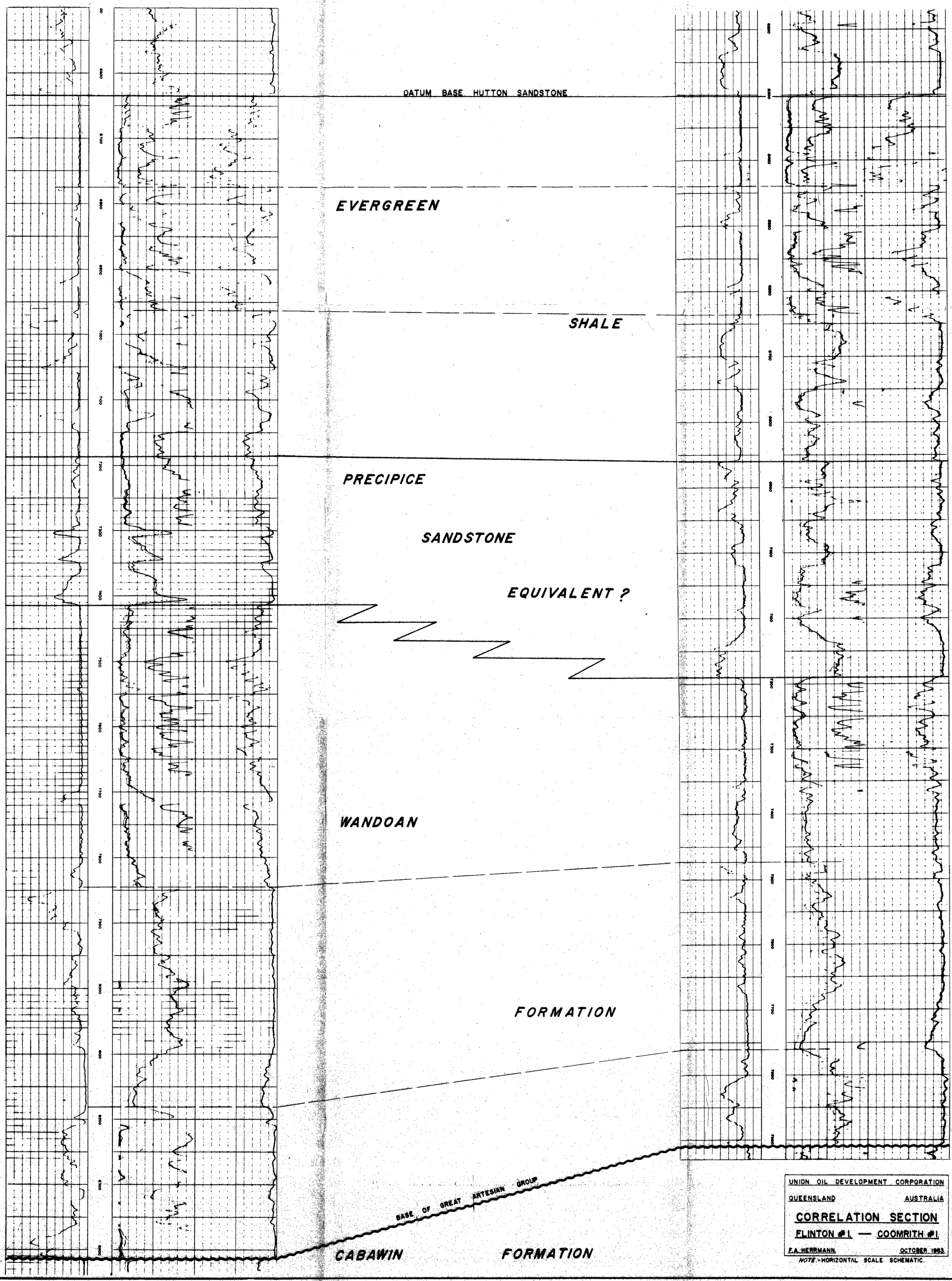
NOTE - HORIZONTAL SCALE SCHEMATIC.

PLATE 5

N.W. ← 19·2 MILES. → S.E.

U.K.A. COOMRITH #1.

U.K.A. FLINTON #1.



UNION OIL DEVELOPMENT CORPORATION

QUEENSLAND AUSTRALIA

CORRELATION SECTION

FLINTON #1. — COOMRITH #1.

F.A. HERRMANN. OCTOBER 1963.

NOTE.-HORIZONTAL SCALE SCHEMATIC.

PLATE 6

28.7 Miles

S.W.

U.K.A. WUNGER #1
Elev. 1005' K.B.

N.E.

U.K.A. WERIBONE #1
Elev. 1115' K.B.

DATUM SEA LEVEL

ROMA FORMATION

CRETACEOUS

BLYTHESDALE FORMATION

JURASSIC

WALLOON FORMATION

JURASSIC

HUTTON SANDSTONE

JURASSIC

EVERGREEN SHALE

JURASSIC

WANDOAN FORMATION

TRIASSIC — JURASSIC

BASE OF THE GREAT ARTESIAN GROUP

TIMBURY HILLS FORMATION

CABAWIN FORMATION

TRIASSIC

DEVONIAN ?

KIANGA FORMATION

PERMIAN

UNION OIL DEVELOPMENT CORPORATION
QUEENSLAND AUSTRALIA

CORRELATION SECTION

U.K.A. WUNGER #1. — U.K.A. WERIBONE #1.

F.A. HERRMANN. NOVEMBER 1963.

VERTICAL SCALE :- 1" = 200'.
HORIZONTAL SCALE :- SCHEMATIC.