COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Petroleum Search Subsidy Acts

PUBLICATION No. 79

SUMMARY OF DATA AND RESULTS

AMADEUS BASIN, NORTHERN TERRITORY

Alice No. 1 Well

Mt. Charlotte No. 1 Well

OF

EXOIL (N.T.) PTY LTD

AND

TRANSOIL (N.T.) PTY LTD

Issued under the Authority of the Hon. David Fairbairn
Minister for National Development
1966

11154/66.—L

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

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

SECRETARY: R. W. BOSWELL

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

DIRECTOR: J. M. RAYNER

THIS REPORT WAS PREPARED FOR PUBLICATION IN THE PETROLEUM EXPLORATION BRANCH

ASSISTANT DIRECTOR: M. A. CONDON

Published by the Bureau of Mineral Resources, Geology and Geophysics
Canberra A.C.T.

FOREWORD

Under the Petroleum Search Subsidy Act 1959-1964, 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 office of the Bureau of Mineral Resources in Canberra (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 two drilling operations undertaken in the Amadeus Basin, Northern Territory : Alice No. 1, and Mt Charlotte No. 1. The information has been abstracted by the Petroleum Exploration Branch of the Bureau of Mineral Resources from well completion reports furnished by Exoil (N.T.) Pty Ltd, and Transoil (N.T.) Pty Ltd.

J.M. RAYNER
Director

CONTENTS

ILLUSTRATIONS

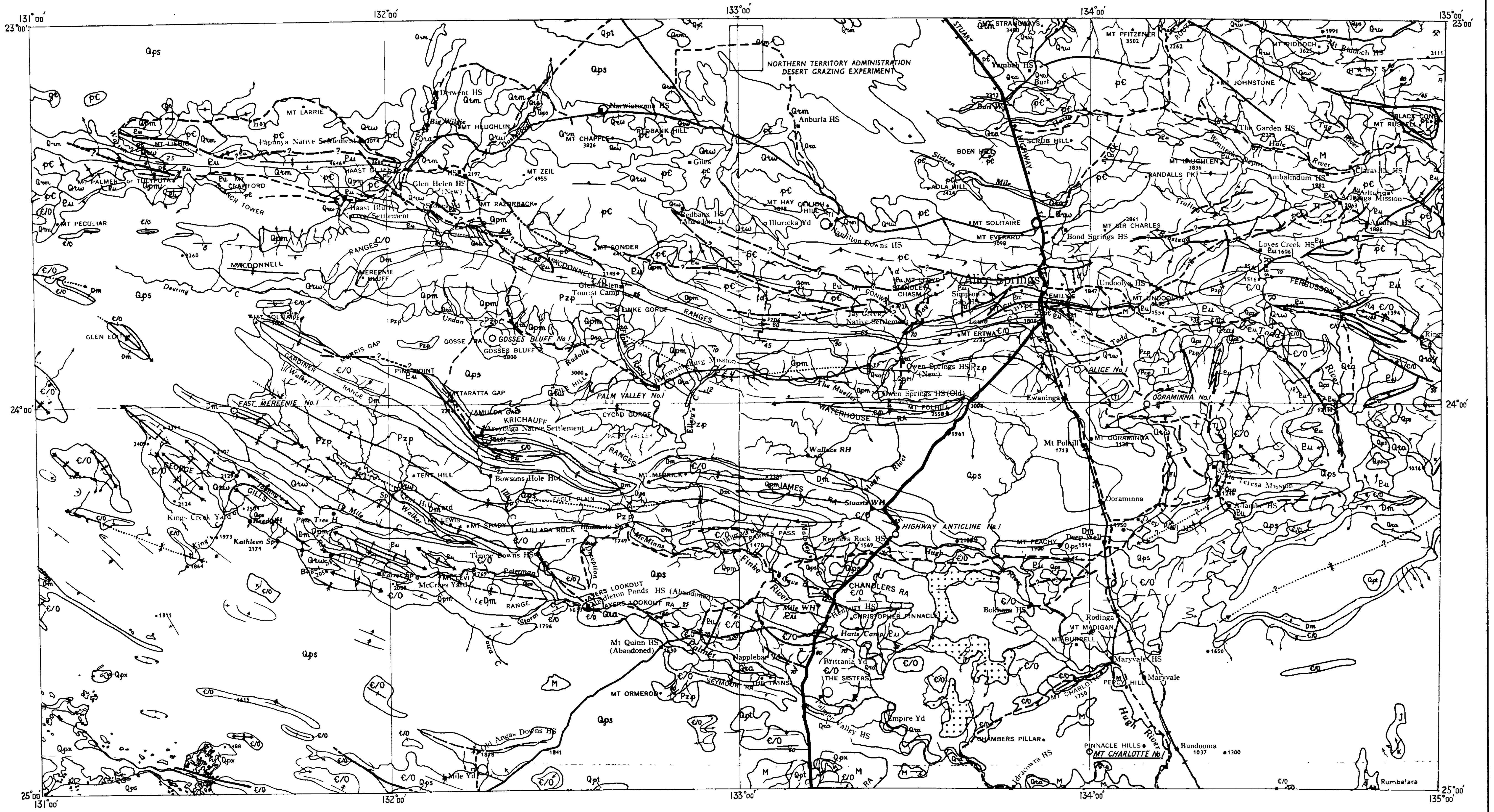
ALICE NO. 1

of

EXOIL (N.T.) PTY LTD

SUMMARY OF DATA AND RESULTS

Fig. I



LOCALITY AND GEOLOGICAL MAP
ALICE No.I AND MT CHARLOTTE No.I

SCALE 1:1,000,000

10 0 10 20 30 40
MILES

RECENT	Undifferentiated	Qra	*Alluvium*
		Qrw	*Wash*
		Qrm	*Soil*
RECENT TO PLEISTOCENE		Qps	*Aeolian sand*
		Qpt	*Kunkar, calcrete, alluvium*
		Qpx	*Evaporite and clay*
PLEISTOCENE		Qpm	*Terrace gravels*
TERTIARY		Tl	*Chalcedony, calcareous silt gypsiferous silt*
		▨	*Grey billy*
CRETACEOUS JURASSIC	Basin Sediments (in part)	M	*Sandstone, siltstone, claystone, arkose, gravel*
	Rumbalara Shale	K	*Shale, claystone fine-grained sandstone*
	De Souza Sandstone	J	*Sandstone*
(?) DEVONIAN	Pertnjara Fm	Pzp	*Sandstone, conglomerate siltstone*
(?)ORDOVICIAN	Mereenie Sandstone	Dm	*Sandstone*
ORDOVICIAN TO CAMBRIAN	Pertaoorrta, Larapinta Groups	€/O	*Sandstone, limestone, dolomite shale, quartz, greywacke*
UPPER PROTEROZOIC	Pertatataka Fm Bitter Springs Fm Heavitree Quartzite	Ꝑu	*Sandstone, quartzite, shale, dolomite limestone, siltstone, boulder beds arkose, quartz greywacke*
UNDIFFERENTIATED	Arunta Complex	p€	*Gneiss, schist, amphibolite, granite granodiorite, basic intrusives pegmatite, dolerite, gabbro, phyllite*

After
T. Quinlan, 1962

ALICE NO. 1

SUMMARY OF DATA AND RESULTS*

SUMMARY

Alice No. 1 Well, located about 17 miles south-south-east of Alice Springs, in the Amadeus Basin of the Northern Territory, was the second oil exploratory test drilled in the Basin. The well was drilled by Oil Drilling and Exploration Limited for Exoil (N.T.) Pty Ltd, to total depth of 7518 feet. Drilling commenced on 21st June, 1963 and was completed on 17th September, 1963. A full programme of logging, coring, and testing was undertaken.

Alice No. 1 was spudded in the (?)Devonian Pertnjara Formation, and entered (?)Ordovician Mereenie Sandstone at 1165 feet. The well then penetrated the Ordovician Pacoota Sandstone at 2115 feet, the Cambrian Goyder Formation at 3004 feet, the Jay Creek Limestone at 3850 feet, and the Arumbera Sandstone at 7240 feet, in which the well bottomed at 7518 feet.

Nine drillstem tests were run over intervals between 3481 feet and total depth, but no hydrocarbons were produced. Oil bleeding was recorded from a core over the interval 6122' 2" to 6128' 5" in the Jay Creek Limestone.

Salt was encountered in the bottom 500 feet of the Jay Creek Limestone.

The stratigraphic drilling operation at Alice No. 1 was subsidized under the Petroleum Search Subsidy Act 1959-1961, from surface to total depth.

---

* Abstracted from : Well Completion Report, Alice No. 1, by R.L. Pemberton, S.S. Chambers, R.N. Planalp, and E.A. Webb, for Exoil (N.T.) Pty Ltd, March, 1964.

WELL HISTORY

General Data

Well name and number:	Alice No. 1
Location:	Latitude: 23°54' 47"S. Longitude: 133°58' 00"E.
Name and address of Tenement Holder:	Magellan Petroleum (N.T.) Pty Ltd, 276 Edward Street, Brisbane, Queensland
Details of Petroleum Tenement:	Oil Permit No. 43, Northern Territory (6950 square miles)
Total Depth:	7518 feet (driller) 7503 feet (Schlumberger)
Date drilling commenced:	21st June, 1963
Date drilling completed:	17th September, 1963
Date well abandoned:	23rd September, 1963
Date rig released:	23rd September, 1963
Elevation (ground):	1742 feet
Elevation (K.B.):	1753 feet (datum for depths)
Status:	Capped water well
Cost:	£156,439

Drilling Data

Drilling Plant:

Make:	National-Ideal
Type:	T.32

Hole sizes and depths:

17 1/2"	to	837 feet
12 1/4"	to	2357 feet
8 3/4"	to	7513 feet
7 7/8"	to	7518 feet (T.D.)

Casing details:

Size (in.):	13 3/8	9 5/8
Weight (lb./ft):	48	36
Grade:	H.40	H.40
Setting depth (ft):	829	2323

Logging and Testing

Ditch Cuttings:

Interval: Ten feet from surface to 3520 feet and five feet from 3520 feet to total depth.

Coring: Twenty-eight cores were cut using a Hughes "J" Type core barrel with both hard formation and soft formation cutter heads. A total of 215 feet was cored and 170 feet 10 inches (83%) recovered.

Sidewall Cores: No sidewall samples were taken.

Electric and other logging (Schlumberger):

Electrical Log:	827-4118 feet	(1 run)
Microcaliper Log:	827-4116 feet	(1 run)
Laterolog:	3400-7498 feet	(1 run)
Microlaterolog:	3400-7490 feet	(1 run)
Gamma Ray Log:	10-7490 feet	(2 runs)
Sonic Log:	828-6812 feet	(2 runs)

Drilling Time and Gas Log: Continuous drilling rate and gas plots were recorded during drilling.

Formation Testing: The following nine drillstem tests were undertaken during drilling operations:

Test Number	Test Interval (feet)	Remarks
1	3481-3530	Rec. 570 feet muddy fresh water.
2	6068-6119	Rec. 100 feet drilling mud.
3	6090-6137	Rec. 60 feet dead mud.
4	6371-6392	Rec. 5897 feet watery mud and salt water.
5	7205-7518	Rec. 5000 feet drilling mud and salt water. Misrun.
6	7285-7518	Rec. 3760 feet salt water drilling mud, and salt water.
7	6549-7205	Rec. 4990 feet salt water drilling mud, and salt water. Misrun.
8	6533-7205	Rec. 100 feet salt water drilling mud. Misrun.
9	6455-7141	Rec. 3000 feet salt water drilling mud, and salt water.

Deviation Survey: Forty-six readings (one misrun) were taken with a Lane-Wells instrument during drilling. The maximum hole deviation of 6 3/4° was recorded at 6644 feet and 6870 feet. The final reading at 7300 feet was 6½°.

GEOLOGY

Stratigraphy

General:

Alice No. 1 Well spudded in the (?)Devonian Pertnjara Formation and drilled through the (?)Ordovician Mereenie Sandstone, the Ordovician Pacoota Sandstone, the Cambrian Goyder Formation, and Jay Creek Limestone, before reaching total depth at 7518 feet in the Cambrian Arumbera Sandstone. The stratigraphic sequence encountered in the well is shown in the Table below:

Age	Formation	Depth Intervals (feet)	Thickness (feet)
(?)Devonian	Pertnjara Formation	11-1165	1154 +
(?)Ordovician	Mereenie Sandstone	1165-2115	950
Ordovician	Pacoota Sandstone	2115-3004	889
Cambrian	Goyder Formation	3004-3850	846
Cambrian	Jay Creek Limestone	3850-7240	3390
Cambrian	Arumbera Sandstone	7240-7518	278 +

Detailed:

Pertnjara Formation (?Devonian)[1]: Surface to 1165 feet (1154 feet+)

Dominantly red, poorly consolidated, poorly sorted, partly arkosic sandstone, ranging from silty to conglomeratic. The cement may be ferruginous, argillaceous, calcareous or kaolinitic. Muscovite, biotite, chert, and various dark mineral grains are present. No clearly defined lithological break was recognized between the Pertnjara Formation and the Mereenie Sandstone in Alice No. 1.

---

(1) Footnote by Bureau of Mineral Resources:

The age of the base of the Pertnjara Formation, as indicated by fossil evidence, is Upper Devonian and it is considered by the Bureau that the formation may extend up into the Carboniferous.

Mereenie Sandstone (?Ordovician) [2]: 1165 to 2115 feet (950 feet)

Sandstone, generally clean, white to brown, current bedded, poorly to fairly consolidated, well sorted, fine to medium-grained, with pebbly zones, arkosic in places. Porosity is poor to fair, intergranular. The cement is siliceous to calcareous. Red shale and siltstone partings are present throughout.

Pacoota Sandstone (Ordovician): 2115 to 3004 feet (889 feet)

Dominantly sandstone with about 30 percent of interbedded shale, claystone, and siltstone. The sandstone is current bedded and ranges from red to white, from poorly to well sorted, and from very fine to very coarse-grained. The cement may be siliceous, argillaceous, calcareous, or kaolinitic. Some zones are brecciated. Scolithus worm tubes occur. The claystone, most abundant in the upper part, is white, calcareous, and soft to siliceous and abrasive. The shale and siltstone are red to yellow, calcareous, micaceous, and sandy.

Goyder Formation (Cambrian): 3004 to 3850 feet (846 feet)

Interbedded dolomite, sandstone, and shale. The dolomite is white to brown, fine to coarsely crystalline, oolitic in places, sandy; shell fragments are present. The sandstone is dolomitic, contains up to 35 percent of glauconite, and has mica and pyrite as minor accessories. The shale is red, brown, black, and green and is stylolitic, micaceous, and contains worm trails.

Heavy black asphaltic oil was present in sandstones and dolomites between 3450 and 3640 feet.

Jay Creek Limestone (Cambrian): 3850 to 7240 feet (3390 feet)

Dominantly limestone, divided into five units based on the quantity of associated dolomite, sandstone, shale, and salt.

The limestone is grey to brown, cryptocrystalline to finely crystalline, oolitic in parts, and sandy. Coarse bioclastic zones appear to be formed of recrystallized fossil debris. The dolomite is white, brown, and green, sandy, silty, micaceous, fine and dense. The sandstone is grey to brown, fine to medium-grained, subangular, and calcareous, grading into limestone. The shale is red, brown, green, grey, calcareous, silty, sandy, and micaceous; it is stylolitic in part. The salt, restricted to the bottom 500 feet, is coarsely crystalline and associated with red shale, gypsiferous mudstone, and siltstone.

Dolomite cores from the interval 6116 to 6130 feet bled high gravity (43° A.P.I.) dark brown oil.

---

(2) Footnote by Bureau of Mineral Resources:

The Mereenie Sandstone in Alice No. 1 is considered by the Bureau to be Silurian to Devonian in age: no Ordovician sediments younger than the Pacoota Sandstone are present in the well.

Arumbera Sandstone (Cambrian): 7240 to 7518 feet (278 feet +)

The top of this formation is gradational into the basal unit of the Jay Creek Limestone, and is taken at the first appearance of sand in the red beds beneath the salt. It consists of interbedded, red sandstone, siltstone, and shale, and is siliceous and calcareous. Three thin dolomite beds occur in the upper part.

Structure

Alice No. 1 was located on the crest of a small seismic structure with 130 feet of closure on Cambrian and Ordovician horizons. In addition, the well was located in such a position as to test two seismically anomalous zones occurring within the lower Jay Creek Limestone. Both zones were interpreted to represent biohermal developments. The lower zone was found from drilling and subsequent analysis of the continuous velocity log to be caused by salt. The upper zone yielded six feet of oil-bleeding core, but no reef facies was recognized.

Dips measured on cores from the well were reported as flat throughout the section penetrated.

Oil and Gas Indications and Potential

Asphaltic oil in the Goyder Formation, and bleeding oil cores and minor gas shows in the Jay Creek Limestone, in Alice No. 1, established that the Lower Palaeozoic sediments of the Amadeus Basin have hydrocarbon potential. Nine drillstem tests were attempted at the various shows recorded, but no hydrocarbons were produced. Good reservoir beds were also present in the Arumbera, Pacoota, Mereenie, and Pertnjara formations.

Porosity and Permeability of Sediments Penetrated

Measured porosities and permeabilities are shown in Appendix A (ii) to the well completion report. The Pertnjara, Mereenie, and Pacoota formations exhibit good porosities and permeabilities.

Cores Nos 22 and 23 from the Jay Creek Limestone, were found to have high oil saturations but porosities and permeabilities were very low.

The Arumbera Sandstone, found to be porous near the surface at Ooraminna No. 1, was porous at depth in Alice No. 1.

In the lower parts of the section the permeability was seriously reduced by the presence of secondary anhydrite. This mineral commonly fills fractures and joints in the Jay Creek Limestone which is oil-bearing in parts, but exhibits low permeability.

Contribution to Geological Concepts resulting from Drilling

Alice No. 1 Well proved the presence of hydrocarbons in the Cambrian sediments of the Amadeus Basin. However, the well did not determine whether reefing was present in the Jay Creek Limestone. It confirmed that the gravity minimum over the structure is due to intrusion of salt, a common feature of this Basin.

Potential reservoir beds were found in the Arumbera, Pacoota, Mereenie, and Pertnjara formations.

The well established that the Horn Valley Siltstone and the Stairway Sandstone are missing from the section in this locality. The Jay Creek Limestone has thickened eastward from the type section at Ellery Creek and is 3390 feet thick at Alice No. 1. The Pacoota Sandstone has thinned to 889 feet from its Ellery Creek thickness of 2500 feet, and the Mereenie Sandstone has thinned from 1200 feet at Ellery Creek to 950 feet in the well.

ADDITIONAL DATA FILED IN THE BUREAU OF MINERAL RESOURCES

The following additional data relating to Alice No. 1 Well, have been filed in the Bureau of Mineral Resources, Canberra, and are available for reference:

(i) Well Completion Report, by R.L. Pemberton, S.S. Chambers, R.N. Planalp, and E.A. Webb — 28 pp.

Appendix A(i)	:	Core descriptions, by R.L. Pemberton	10 pp.
Appendix A(ii)	:	Core analyses, by Core Laboratories Inc.	12 pp.
		Core analyses, by BMR.	10 pp.
Appendix B	:	Petrographic descriptions of cores, by W.B. Bryan	14 pp.
Appendix C	:	Drillstem test reports and pressure charts, by R.L. Pemberton	9 pp.

(ii) Daily drilling reports for period 21st June, 1963, to 23rd September, 1963.

(iii) Schlumberger well logs including the following:

(a) Electrical

Run 1,	827-4118 feet	(scale 2", 5" : 100 ft)

(b) Microcaliper Log

Run 1,	827-4116 feet	(scale 2", 5" : 100 ft)

(c) Laterolog

Run 1,	3400-7498 feet	(scale 2", 5" : 100 ft)

(d) Microlaterolog

Run 1,	3400-7490 feet	(scale 2", 5" : 100 ft)

(e) Gamma Ray Log

Run 1,	10-6832 feet	(scale 2", 5" ; 100 ft)
Run 2,	7328-7490 feet	(scale 2", 5" : 100 ft)

(f) Sonic Log

Run 1,	828-4109 feet	(scale 2", 5" : 100 ft)
Run 2,	4009-6812 feet	(scale 2", 5" : 100 ft)

(iv) Drilling rate and hydrocarbon analysis log.

MT CHARLOTTE NO. 1

of

TRANSOIL (N.T.) PTY LTD

SUMMARY OF DATA AND RESULTS

11154/66.—2

MT CHARLOTTE NO. 1

SUMMARY OF DATA AND RESULTS *

SUMMARY

Mt Charlotte No. 1 Well, located about 84 miles south of Alice Springs, in the Amadeus Basin of the Northern Territory, was drilled by Oil Drilling and Exploration Limited for Transoil (N.T.) Pty Ltd to total depth of 6943 feet. Drilling commenced on 12th December, 1964 and was completed on 6th February, 1965. A full programme of logging, coring, and testing was undertaken.

Mt Charlotte No. 1 spudded in the Pertnjara Formation and entered the Ordovician Stairway Sandstone at 1200 feet. The well then penetrated the Cambrian Jay Creek Limestone at 1545 feet, and the Chandler Limestone at 2330 feet. The Proterozoic Pertatataka Formation was encountered at 3072 feet, and the well bottomed in the Bitter Springs Formation at 6943 feet.

Air and mist drilling between 345 and 4858 feet provided continuous open-hole evaluation over this interval. No hydrocarbon shows were encountered before conversion to mud drilling at 4858 feet. While drilling below this depth, four open-hole formation tests were attempted to evaluate small gas shows recorded on the gas detector, but no hydrocarbons were produced. The gas shows were found to be associated with black shales within the Proterozoic dolomite section below 5230 feet.

The well was completed as a water well in the Ordovician Stairway Sandstone.

The stratigraphic drilling operation at Mt Charlotte No. 1 was subsidized under the Petroleum Search Subsidy Act 1959-1964, from surface to total depth.

---

* Abstracted from : Well Completion Report, Mt Charlotte No. 1, by N.R. McTaggart, R.L. Pemberton, and R.N. Planalp, Transoil (N.T.) Pty Ltd, June, 1965.

11154/66.—3

WELL HISTORY

General Data

Well name and number:	Mt Charlotte No. 1
Location:	Latitude: 24°53'41"S. Longitude: 133°59'11"E.
Name and address of Tenement Holder:	Finke Oil Company Pty Ltd, 137 Queen Street, Brisbane, Queensland
Details of Petroleum Tenement :	Farmout Area MC (220 square miles) of Oil Permit No. 72, (9693 square miles) Northern Territory
Total Depth:	6943 feet (driller) 6939 feet (Welex)
Date drilling commenced:	12th December, 1964
Date drilling completed:	6th February, 1965
Date well abandoned:	7th February, 1965
Date rig released:	7th February, 1965
Elevation (ground):	1246 feet
Elevation (K.B.):	1260 feet (datum for depths)
Status:	Completed as a water well
Cost:	£118,015

Drilling Data

Drilling Plant:

Make:	National-Ideal			
Type:	T.32			
Hole sizes and depths:	17 1/2"	to	308	feet
	12 1/4"	to	1849	feet
	8 3/4"	to	6937	feet
	7 13/16"	to	6943	feet

Casing details:

Size (in.):	13 3/8	9 5/8
Weight (lb./ft):	48	36
Grade:	H.40	J.55
Setting depth (ft):	303	1831

Logging and Testing

Ditch Cuttings:

Interval: Ten feet from surface to total depth; five feet when coring.

Coring: Twenty-six cores were cut, using a Hughes "J" Type core barrel with hard formation cutter heads, and a Christensen diamond core barrel with 7 13/16" diamond core heads.

A total of 315.5 feet was cored and 226.5 feet (72%) recovered.

Sidewall Cores: No sidewall samples were taken.

Electric and other logging (Welex):

Induction-Electric Log:	304-1828 feet	(1 run)
Guard Log:	1830-6934 feet	(2 runs)
FoRxo-Caliper Log:	1830-6936 feet	(2 runs)
Acoustic-Caliper Log:	304-6931 feet	(3 runs)
Gamma Ray Log:	280-1818 feet	(1 run)

Drilling Time and Gas Log: Continuous drilling rate and gas plots were recorded during mud drilling.

Formation Testing: While drilling with mud, the following four open-hole drillstem tests were run:

Test Number	Test Interval (feet)	Remarks
1	5400-5429	Recovery nil; no flow.
2	5435-5594	Rec. 40 feet drilling fluid.
3	5847-5976	Rec. 10 feet drilling fluid.
4	6709-6761	Rec. 300 feet drilling fluid.

Deviation Survey: Twenty-seven readings (two misruns) were taken during drilling. The maximum hole deviation of 5 1/4° was recorded at 5918 feet. The final reading at 6890 feet was 1 1/2°

GEOLOGY

Stratigraphy

General:

Mt Charlotte No. 1 was spudded in the (?)Devonian Pertnjara Formation. The well subsequently penetrated the Ordovician Stairway Sandstone, Cambrian Jay Creek Limestone and Chandler Limestone, and Proterozoic Pertatataka Formation, an unnamed formation, and finally the Bitter Springs Formation, before reaching total depth at 6943 feet. The stratigraphic sequence encountered in the well is shown in the Table below:

Age	Formation	Depth Intervals (feet)	Thickness (feet)
(?)Devonian	Pertnjara Formation	14-1200	1186 +
Ordovician	Stairway Sandstone	1200-1545	345
Cambrian	Jay Creek Limestone	1545-2330	785
Cambrian	Chandler Limestone	2330-3072	742
Upper Proterozoic	Pertatataka Formation	3072-4673	1601
Upper Proterozoic	Unnamed	4673-5266	593
Upper Proterozoic	Bitter Springs Formation	5266-6943	1677 +

Detailed:

Pertnjara Formation (?Devonian) (*): Surface to 1200 feet (1186 feet +)

Red-brown to purple, silty, slightly micaceous shale, and brown, grey or tan, fine to medium-grained, poorly sorted, porous sandstone.

(*) See footnote by Bureau of Mineral Resources on page 4.

Stairway Sandstone (Ordovician): 1200 to 1545 feet (345 feet)

Thinly interbedded, tan, slightly calcareous sandstone, and grey to purple, silty, micaceous shale. The sandstone ranges from very fine at the top to conglomeratic at the base of the sequence. The unit is phosphatic and shows worm-like impressions.

Jay Creek Limestone (Cambrian): 1545 to 2330 feet (785 feet)

Mainly red-brown, silty to gritty, micaceous shale, with interbeds of calcareous siltstone (in the upper portion), and cryptocrystalline, hard, silicified dolomite. Anhydrite and phosphate are associated with the dolomite.

Chandler Limestone (Cambrian): 2330 to 3072 feet (742 feet)

Mostly white to tan, coarsely crystalline halite, with some interstitial grey-brown clay, and interbeds of grey to brown, calcareous siltstone between 2800 and 2895 feet.

Pertatataka Formation (Upper Proterozoic): 3072 to 4673 feet (1601 feet)

Grey, brown, and green, micaceous, silty shale with minor interbeds of grey-brown, sandy siltstone associated with green glauconite pellets, and becoming dolomitic towards the base.

Unnamed formation (Upper Proterozoic) (**): 4673 to 5266 feet (593 feet)

Predominantly white to grey, fine, siliceous dolomite with a little anhydrite and scattered beds and partings of light to dark grey, argillaceous sandstone and grey, black to brown, silty, micaceous shale.

Bitter Springs Formation (Upper Proterozoic): 5266 to 6943 feet (1677 feet +)

Predominantly white to grey, silicified, gypsiferous dolomite with traces of anhydrite to 5860 feet, and chert from 6805 to 6910 feet, and with interbeds of grey, green, and purple, silty, micaceous shale, and buff to colourless glauconitic siltstone. The latter grades downward into sandstone. Coarsely crystalline salt, associated with contorted sediments, occurs from 6106 to 6240 feet, 6316 to 6324 feet, and 6710 to 6805 feet.

Structure

The well site was selected between two anticlinal axes indicated from data from seismic and gravity surveys carried out over the area. A seismic structure map contoured on a reflector within the Bitter Springs Formation delineated the Mt Charlotte structure, with the anticlinal axis approximately 1.5 miles south of the well location. A shallow seismic horizon within the Jay Creek Limestone was also mapped. This horizon showed a structure with slightly more than 100 feet of closure centred about half a mile north of the wellsite.

(**) This unit is now considered by the Company and the Bureau to be part of the Bitter Springs Formation.

A marked structural change at 5266 feet is evident on Sonic and Guard log curves. Observed dips above this depth are 2° to 3°, while dips below range from 20° to 40°. This structural change may indicate either a low angle thrust carrying flat lying beds across steeply dipping dolomite, or an unconformity. Seismic evidence indicates that the total thickness of the Bitter Springs Formation at the well location should be about 3500 feet.

Oil and Gas Indications and Potential

The most significant indications of hydrocarbons found in Mt Charlotte No. 1 came from black shales within the Proterozoic dolomite section. Small gas kicks on the gas detector and faint traces of fluorescence recorded between 5230 and 5660 feet, and gas kicks from 6720 to 6760 feet, appear to have been associated with a dark grey shale. Traces of wet gas extracted from cores indicate that the Bitter Springs Formation has some source rock potential.

The shallow Pertnjara Formation and Stairway Sandstone were the only formations encountered in the well with any signs of adequate reservoir characteristics.

Porosity and Permeability of Sediments Penetrated

The sandstones in the upper 1500 feet of Mt Charlotte No. 1 Well were clean and moderately silicified, but poor sorting, especially in the sandstones of the Stairway Sandstone, has slightly reduced porosity. Visual estimates of porosities average 15 percent, or higher in the rarely preserved grain clusters, and would be considerably higher where better sorting and reduced cementation occur. The logs indicate average porosities of 20 percent for sandstone beds within the Pertnjara Formation and the Stairway Sandstone.

No permeability was found over the well section from 1545 to 4810 feet. The inflow of fluid from the interval 4810 to 4820 feet prevented further air drilling in this well. The fluid level rose some 4300 feet above the aquifer, indicating the presence of significant permeability as well as reservoir pressure.

Fractured and recemented dark grey shales were recovered in a core at 5424 feet but Drillstem Test No. 1 covered the zone and the interval was found to be tight.

Contribution to Geological Concepts Resulting from Drilling

Mt Charlotte No. 1 proved that most of the sequence mapped in the Amadeus Basin to the north, persists to the south-eastern margin of the Basin. The Areyonga Formation appears to be absent only 50 miles south-west from where almost 5000 feet of the formation have been reported. Along the southern margin of the Basin, the unit lies disconformably or unconformably on older formations.

The Arumbera Sandstone is absent in the well; this is in accord with mapping to the west where the formation is thin over the southern disturbed block and is absent altogether over some Proterozoic "highs".

The absence of the lower Larapinta Group and all of the Mereenie Sandstone from the Mt Charlotte No. 1 section was expected from mapping.

A normal Pertaoorrta section was penetrated; the Jay Creek Limestone was somewhat thinner than expected, and the Goyder Formation was absent. A Hugh River Shale facies dominates the Jay Creek Limestone section. The thick salt member of the Chandler Limestone was not expected in this well.

Both the Bitter Springs and Jay Creek formations can now be mapped reliably by seismic methods.

REFERENCES

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS, (Ed.), 1966: Ooraminna No. 1 Well and Palm Valley No. 1 Well, of Exoil (N.T.) Pty Ltd, and Magellan Petroleum (N.T.) Pty Ltd, in Summary of data and results, Amadeus Basin, Northern Territory. Bur. Min. Resour. Aust. Petrol. Search Subs. Acts Publ. 78.

RANFORD, L.C., COOK, P.J., and WELLS, A.T., 1966: The geology of the central part of the Amadeus Basin, Northern Territory. Bur. Min. Resour. Aust. Rep. 86.

WELLS, A.T., RANFORD, L.C., STEWART, A.J., COOK, P.J., and SHAW, R.D., 1965: The geology of the north-eastern part of the Amadeus Basin, Northern Territory. Bur. Min. Resour. Aust. Rep. 113 (In press).

ADDITIONAL DATA FILED IN THE BUREAU OF MINERAL RESOURCES

The following additional data relating to Mt Charlotte No. 1 Well, have been filed in the Bureau of Mineral Resources, Canberra, and are available for reference:

(i) Well Completion Report, by N.R. McTaggart, R.L. Pemberton, and R. N. Planalp — 29 pp.

Appendix 1:	Core descriptions	8 pp.
Appendix 2:	Age determination	4 pp.
Appendix 3:	Palaeontological report, by B. Daily	6 pp.
Appendix 4:	Hydrocarbon analysis, by H.W. Sears	1 p.
Appendix 5:	Source rock analysis, by Olexcon International	2 pp.
Appendix 6:	Petrological report, by R. Townend	5 pp.
Appendix 7:	Drillstem test reports and pressure charts	8 pp.
Appendix 8:	Velocity survey report, by Geophysical Associates Pty Ltd	5 pp.
Appendix 9:	Water analyses, by Animal Industry Branch, N.T. Administration	2 pp.

(ii) Daily drilling reports for period 12th December, 1964 to 6th February, 1965.

(iii) Welex well logs including the following:

(a) Induction-Electric Log

Run 1, 304-1828 feet (scale 2", 5" : 100 ft)

(b) Guard Log

Run 1, 1830-4998 feet (scale 2", 5" : 100 ft)
Run 2, 4900-6934 feet (scale 2", 5" : 100 ft)

(c) FoRxo-Caliper Log

Run 1, 1830-4999 feet (scale 2", 5" : 100 ft)
Run 2, 4900-6936 feet (scale 2", 5" : 100 ft)

(d) Acoustic-Caliper Log

Run 1, 304-1818 feet (scale 2", 5" : 100 ft)
Run 2, 1830-4995 feet (scale 2", 5" : 100 ft)
Run 3, 4900-6931 feet (scale 2", 5" : 100 ft)

(e) Gamma Ray Log

Run 1, 280-1818 feet (scale 2", 5" : 100 ft)

PLATE 1
SHEET 1

COMPOSITE WELL LOG

COMPANY : EXOIL (N.T.) PTY. LTD. , MAGELLAN PETROLEUM CORP , AUSTRAM OIL PTY. LTD., FARMOUT DRILLERS N.L.

WELL NUMBER : ALICE NO. 1

PETROLEUM TENEMENT: O.P. 43 STATE : N.T. 4 - MILE SHEET: ALICE SPRINGS BASIN: AMADEUS WELL STATUS : CAPPED WATER WELL

LOCATION : Lat. 23° 54′ 47″ S. Long. 133° 58′ 00″ E.
ELEVATION: Reference. Pt. K.B. 1753′ ASL.
Ground 1742′ ASL.

Date Spudded : 21 June, 1963.
Date Drilling Stopped: 17 Sept., 1963.
Date Rig Off : 23 Sept., 1963.
Total Depth : Driller 7518′
Schlum. 7503′

Hole Size	In	From	To
	17½	Surface	837′
	12¼	837′	2357′
	8¾	2357′	7513′
	7⅞	7513′	7518′

Casing	In.	Wt.	Gr.	Depth	Cmt.	Cmt'd. To
	13⅜	48lb.	H-40	829′	710 sx.	Surface
	9⅝	36lb.	H-40	2323′	300 sx.	

Cement Plugs	From	To	Sacks
1	7205′	7300′	50
1A	7141′	7205′	50
2	6500′	6600′	35
3	6200′	6300′	35
4	5900′	6000′	35
5	2280′	2380′	50
5A	2150′	2280′	40

Well Head Fittings : Welded steel plate
Drilled By: O.D. & E.
Logged By: Schlumberger
Mud Logging By: Corelab
Cemented By: O.D. & E.
Drilling Method: Rotary - Mud
Lithology By: R.L. Pemberton
Drafting by GEODRAFTING SERVICES

ELECTRIC LOG DATA

RUN No.	1
Date	25 · 7 · 63
Footage Logged	3291′
Logged From	4118′
Logged To	827′
Total Depth Electric Log	4119′
Total Depth Driller	4127′
Casing Shoe Electric Log	827′
Casing Shoe Driller	829′
Bit Size	8¾″
Mud Kind	GEL
Treatment	
Water Loss cc's/30min.	9·2
Weight lbs/cu.ft.	69·56
Viscosity (Marsh) Sec.	37
pH	11
Resistivity ~ m²/m & Temp.	2·7 @ 60° F / 1·6 @ 104° F
Max. Recorded Temp.	104° F
Electrode Spacing	16″
Symmetrical	64″
	18′ 8″
Non-Symmetrical	
Recorded By	J.A.W. White

LATEROLOG DATA

RUN No	1
Date	16 · 9 · 63
First Reading	7498′
Last Reading	3400′
Feet Measured	4098′
Csg. Schlum.	
Csg. Driller	2323′
Depth Reached	7503′
Bottom Driller	7518′
Mud Nat.	Brine
Dens. / Visc.	9·8 /
Mud Resist.	06 @ 78° F
Resist. B.H.T.	@ 150° F
pH ( )	
Wtr. Loss	cc/30min
Rmf:	
Rmc:	
Bit Size	8¾″
Laterolog 3	
Laterolog 7	
Opr. Rig Time	7 hrs.
Truck No.	SKW
Recorded By	J.A.W. White
Witness	R. Planaip

GAMMA RAY DATA

RUN No	1
Date	17 · 9 · 63
Total Depth - Driller	7518′
Top of Logged Interval	10′ 7328′
Bottom of Logged Interval	6832′ 7490′
Type of Fluid in Hole	Brine
Fluid Level	
Max. Recorded Temp.	150° F
Neutron Source Strength & Type	
Source Spacing - In.	
Length of Measuring Device	4′
O.D. of Instrument - In.	3⅜
Time Constant - Secs.	2
Logging Speed Ft./Min.	30
Statistical Variation - In.	
Sensitivity Reference	400
Recorded By	J.A.W. White

WELL SYMBOLS

- Core, interval, number and recovery.
- Plugged interval.
- Casing shoe.
- Formation test, interval and number.
- x 107 Circulation loss, partial, and s.g. mud.
- x.x. 106 Circulation loss, complete, and s.g. mud.
- Oil show, strong.
- Fluorescence.

LITHOLOGIC REFERENCE

- Sandstone
- Conglomerate
- Siltstone
- Shale
- Limestone
- Dolomite
- Evaporite - salt
- ch Cherty

CASING RECORD

Run No.	Size In.	Wt. Lbs.	Interval - Ft.	
			To	
1	13⅜	48	Surface	829
2	9⅝	36	Surface	2323

OPEN HOLE RECORD

Bit Size In.	Interval - Ft. To	
17½	Surface	837
12¼	837	2357
8¾	2357	7518

OTHER BORE - HOLE LOGS

Micro - Caliper 827′ - 4116′
Sonic 828′ - 6812′
Microlaterolog 3400′ - 7490′

SHEET 1 of 3

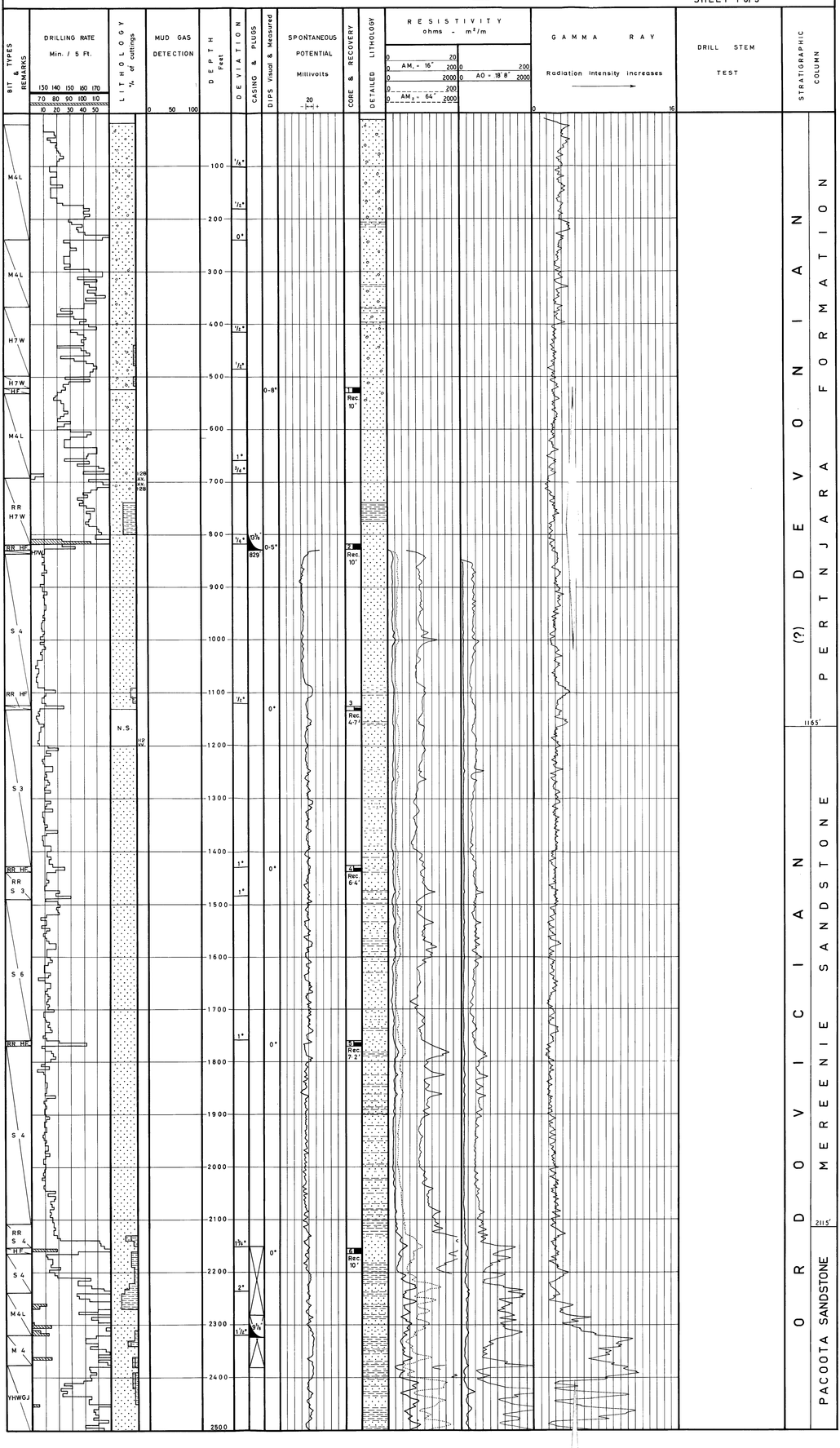


PLATE 1
SHEET 2

COMPOSITE WELL LOG

ALICE NO. 1

2500' - 5000'
SHEET 2 of 3

BIT TYPES & REMARKS | DRILLING RATE Min. / 5 Ft. | LITHOLOGY % of cuttings | MUD GAS DETECTION | DEPTH Feet | DEVIATION | CASING & PLUGS | DIPS Visual & Measured | SPONTANEOUS POTENTIAL Millivolts | CORE & RECOVERY | DETAILED LITHOLOGY | RESISTIVITY ohms - m²/m | GAMMA RAY Radiation intensity increases | DRILL STEM TEST | STRATIGRAPHIC COLUMN

YHWGJ
RR HF
M 5
M4L
M5W
M4N
Truco
S 6
M 4

2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000

3° 3¼° 4¼° 4⅞° 5¼° 5½° 5° 5¼° 5¼° 6° 6°

0° 0° 0-5° 0-10° 0-5° 0-5° 0-5° ?

7 Rec. 3.3'
8 Rec. 1.5'
9 Rec. 4.5'
10 Rec. 4'
11 Rec. 22.4'
12 Rec. 5.5'
13 Rec. D
14 Rec. 2.7'
15 Rec. 4'
16 Rec. 5'

LATEROLOG 10 LATEROLOG

RESISTIVITY ohms - m²/m
0 20
0 AM, = 16" 200 0 200
0 2000 0 AO = 18'8" 2000
0 200
0 AM, = 64" 2000

GAMMA RAY Radiation intensity increases
0 16

D.S.T. No. 1
Rec. 570' muddy fresh water.

STRATIGRAPHIC COLUMN

ORDOVICIAN
PACOOTA SANDSTONE
3004'
GOYDER FORMATION
3850'
CAMBRIAN
MIDDLE
JAY CREEK LIMESTONE

PLATE 1
SHEET 3

COMPOSITE WELL LOG

ALICE NO. 1

5000′ - 7518′

SHEET 3 of 3

COMPOSITE WELL LOG
TRANSOIL (N.T.) PTY. LTD.
MOUNT CHARLOTTE No.1 WELL

PETROLEUM TENEMENT: O.P. 72

STATE: NORTHERN TERRITORY | 4-MILE SHEET: RODINGA | BASIN: AMADEUS | WELL STATUS: WATER WELL

LOCATION	Lat. 24° 53' 41" S.
	Long. 133° 59' 11" E.
	Ground Level 1246' A.S.L.
ELEVATION	Kelly Bushing 1260' A.S.L.
Date Spudded	Dec. 12, 1964
Date Drilling Stopped	Feb. 6, 1965
Date Rig Off	Feb. 6, 1965
Total Depth Driller	6943'
E-Log	6939'

Hole Size	Inches	From	To
	17½	Surface	308'
	12¼	308'	1849'
	8¾	1849'	6937'
	7⅞	6937'	6943'

Casing	Inches	Wt.	Gr.	Depth	Cement	Cmt'd to
Surface	13⅜	48 lb	H – 40	303'	220 sacks	Surface
Intermediate	9⅝	36 lb	J – 55	1831'	465 sacks	Surface

Cement PLugs	From	To	Sacks
1	5450'	5339'	60
2	4750'	4558'	80
3	2000'	1685'	75

Well Head Fittings	Open – for water well completion
Drilled by	Oil Drilling and Exploration Ltd., National T-32
Logged by	Welex
Drilling Method	Rotary
Mud Logging by	Exoil
Lithology by	Perryman and MacTaggart

ELECTRIC LOG DATA — ACOUSTIC LOG DATA — FORXO CALIPER LOG DATA

	INDUCTION	GUARD		ACOUSTIC		FORXO CALIPER	
Date	23 Dec.,1964	6 Jan., 1965	6 Feb., 1965	23 Dec.,1964	6 Jan.,1965	6 Feb., 1965	6 Jan., 1965	6 Feb., 1965
Run No.	One	One	Two	One	Two	Three	One	Two
Depth – Driller	1831'	5005'	6943'	1828'	5005'	6943'	5005'	6943'
Depth – Welex	1834'	5003'	6939'	1825'	5003'	6939'	5002'	6939'
Bottom Log Interval	1828'	4998'	6934'	1818'	4995'	6937'	4999'	6936'
Top Log Interval	304'	1830'	4900'	304'	1830'	4900'	1830'	4900'
Casing – Driller	13⅜ – 303'	9⅝ – 1831'	9⅝ – 1831'	13⅜ – 303'	9⅝ – 1831'	9⅝ – 1831'	9⅝ – 1831'	9⅝ – 1831'
Casing–Welex	304'	1830'	——	304'	1830'	——	1830'	1830'
Bit Size	12¼"	8¾"	8¾"	12¼"	8¾"	8¾"	8¾"	8¾"
Type Fluid in Hole	Salt Water	Salt Water	Mud	Water base mud	Salt Water	Mud	Salt Water	Mud
Density / Viscosity	——	10-4 / 32	10-8 / 42	——	10-4 / 32	10-8 / 42	10-4 / 32	10-8 / 42
pH / Fluid Loss	——	6-5 / —	5-0 90ml.	——	6-5 / —	5-0 / 90ml.	6-5 / —	5-0 / 90ml.
Source of Sample	——	Flow Line	Flow Line		Flow Line	Flow Line	Flow Line	Flow Line
Rm at Meas. Temp.	——	.076 @ 96°F	.084 @ 90°F	——	76 @ 96°F	.084 @ 90°F	.076 @ 96°F	.084 @ 90°F
Rmf at Measured Temp.	——	.068 @ 96°F	.048 @ 90°F	——	.168 @ 96°F	.048 @ 90°F	.068 @ 96°F	.048 @ 90°F
Rmc at Meas. Temp.	——	.081 @ 96°	.110 @ 90°F	——	.181 @ 96°F	.110 @ 90°F	.081 @ 96°F	.110 @ 90°F
Source Rmf Rmc	——	M. / M.	M. / M.	——	M. / M.	M. / M.	M. / M.	M. / M.
Rm at BHT	——	.052 @ 136°F	.031 @ 158°F	——	.052 @ 136°F	.031 @ 158°F	.052 a 136°F	.031 a 158°F
Time Since Circ.								
Max. Rec. Temp.		136°F	158°F	94°F	136°F	158°F	136°F	158°F
Equip. / Location	3222 / Aust.	3222 / Aust.	3222 / Aust.	3222 / Aust.	3222 / Aust.	3222 / Aust	3222 / Aust.	3222 / Aust
Recorded by	T.J. Wall	Wall – Myers	Myers	T.J. Wall	Myers	Myers	Myers	Myers
Witnessed by	Perryman	Perryman	MacTaggart	Perryman	Perryman	MacTaggart	Perryman	MacTaggart

RADIOACTIVITY LOG DATA

Date	6 Jan., 1965	6 Jan., 1965	6 Feb., 1965
Run No.	One	Two	Three
Type Log	Gamma Ray	Gamma Ray	Gamma Ray
Depth – Driller	——	5005'	6948'
Depth – Welex		5003'	6939'
Bottom Logged Interval	1818'	4995'	6937'
Top Logged Interval	280'	1830'	4900'
Type Fluid in Hole	Salt water mud	Salt water	Mud
Salinity, PPM Cl	——		
Density	10-2	10-4	10-8
Level	Surface		
Max. rec. temp., deg. F		136	158
Operating Rig Time			
Recorded by	Myers	Myers	Myers
Witnessed by	Perryman	Perryman	MacTaggart

RUN	BORE – HOLE RECORD			CASING RECORD			
No.	Bit	From	To	Size	Wt.	From	To
1	17½	Surface	308'	13⅜		0'	303'
	12¼	308 '	1849 '	9⅝		0'	1831'
2	8¾	1849'	6937'				
3	7⅞	6937'	6943'				

WELL SYMBOLS

- Gas show, slight
- Fluorescence
- Core, interval, recovery and number
- Cement Plugs
- Casing shoe
- Formation test, interval and number
- Perforated interval

LITHOLOGIC REFERENCE

- Sand and/or sandstone
- Siltstone
- Gravel and coarse sand
- Conglomerate
- Clay
- Silty mudstone
- Shale
- Dolomite
- Salt
- Cherty
- cal Calcareous
- c Carbonaceous
- a Argillaceous
- si Siliceous
- ph Phosphatic
- py Pyritic
- gl Glauconitic
- mi Micaceous
- g Gypsum
- A Anhydrite

FOSSILS

- Macro
- Plant

Drafting by GEODRAFTING SERVICES
April, 1965

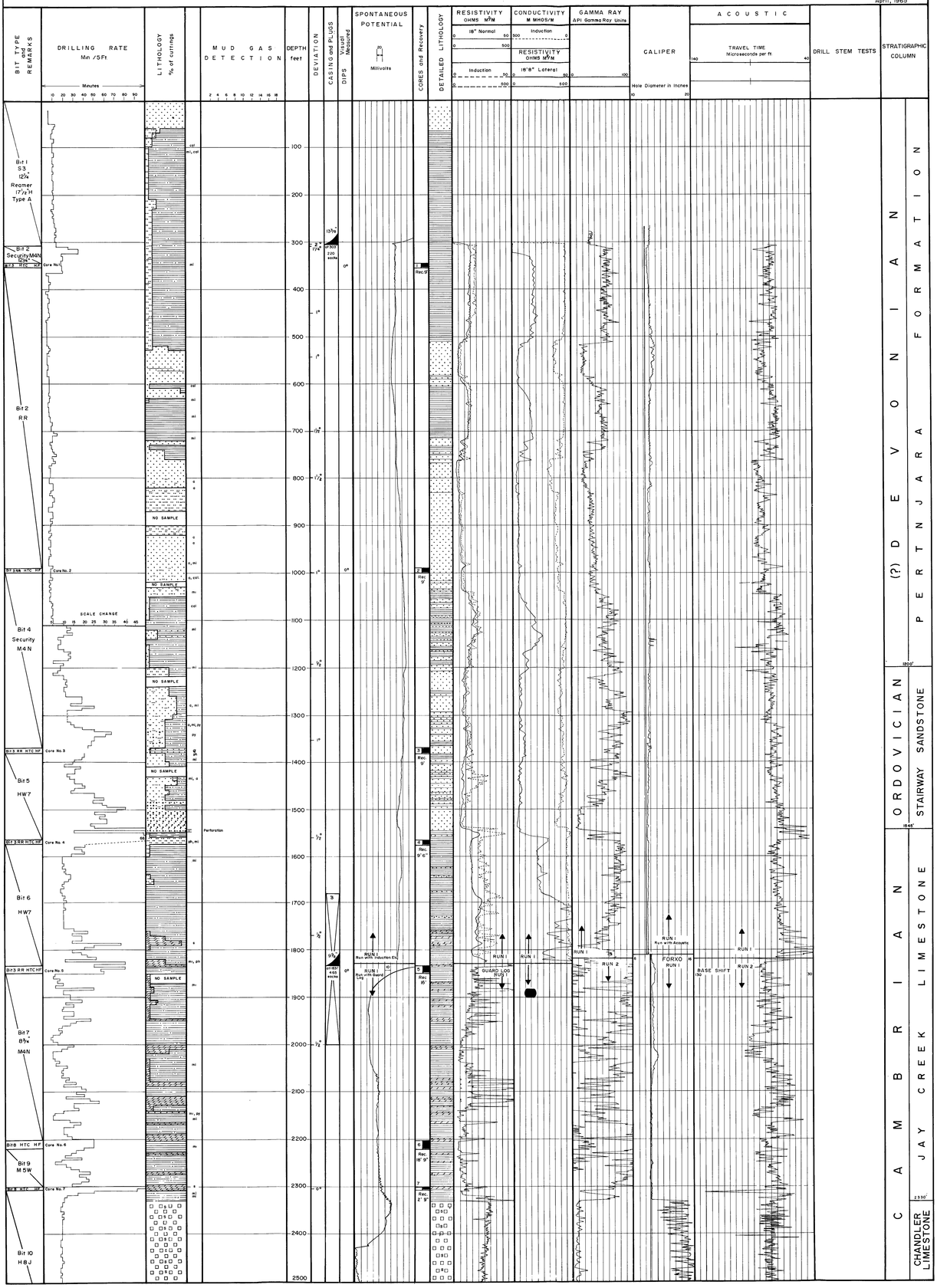


PLATE 2
SHEET 2

COMPOSITE WELL LOG

MOUNT CHARLOTTE No. 1 WELL

2500 — 5000'

Sheet 2 of 3

BIT TYPE and REMARKS

DRILLING RATE
Min. / 5 Ft.
Minutes
5 10 15 20 25 30 35 40 45

LITHOLOGY
% of cuttings

WELL SYMBOLS

MUD GAS DETECTION
2 4 6 8 10 12 14 16 18

DEPTH
feet

DEVIATION

CASING and PLUGS

DIPS
Visual
Measured

SPONTANEOUS POTENTIAL
10
Millivolts

CORES and Recovery

DETAILED LITHOLOGY

RESISTIVITY
OHMS M²/M
GUARD LOG
0 50
0 500
0 5000

GAMMA RAY
API Gamma Ray Units
0 100
100 200

CALIPER
Hole Diameter in Inches
6 16

ACOUSTIC
TRAVEL TIME
Microseconds per ft.
130 30
230 130

DRILL STEM TESTS

STRATIGRAPHIC COLUMN

Depth	Bit / Remarks	Core	Deviation	Dips	Cores & Recovery	Lithology	Stratigraphic Column
2600	Bit 11 HTC HF 7⅞	Core No 8	¾°		8 Rec. 4'		
2700	Bit 12 H7WG						
2800							
2900	Bit 11RR HTC HF 7⅞	Core No. 9	¼°		9 Rec. 6'		
3000	Bit 12 RR						
3100			1°	10°			
3200	Bit 11 RR HTC HF 7⅞	Core No. 10			10 Rec. 3'		
3300	Bit 12 RR						
3400							
3500	Bit 11 RR HTC HF 7⅞	Core No. 11	1¼°	0°	11 Rec. 6'		
3600							
3700	Bit 13 M4LG		2½°				
3800							
3900							
4000	Bit 11 RR HTC HF	Core No. 12			12 Rec. 5'		
4100							
4200	Bit 13 RR M4LG						
4300							
4400							
4500	Bit 11 RR HTC HF 7⅞	Core No. 13		2	13 Rec 5'		
4600	Bit 14 H7WG						
4700	Bit 15 HTC HF 7⅞ Core No. 14	SCALE CHANGE 10 20 30 40 50 60 70 80 90 100			14 Rec. Nil		
4800	Bit 10 RR with Hammerdrill				15 Rec. 2'		
4900	Bit 11 Rerun HTC HF 7⅞ Core No. 15	NO SAMPLE					
5000	Bit 10 RR with Hammerdrill		2¼°				
	Bit 16 H7WG						

RUN 1 RUN 2 RUN 1 RUN 2 RUN 3 RUN 1 RUN 2 RUN 3

STRATIGRAPHIC COLUMN

CAMBRIAN
LIMESTONE
CHANDLER
3072'

PROTEROZOIC
FORMATION
UN-NAMED
4673'

PLATE 2
SHEET 3

COMPOSITE WELL LOG

MOUNT CHARLOTTE No. 1 WELL

5000 – 6943'
Sheet 3 of 3

BIT TYPE and REMARKS

DRILLING RATE
Min. /5 Ft.
Minutes
10 20 30 40 50 60 70 80 90

LITHOLOGY % of cuttings

WELL SYMBOLS

MUD GAS DETECTION
2 4 6 8 10 12 14 16 18

DEPTH feet

DEVIATION

CASING and PLUGS

DIPS Visual Measured

SPONTANEOUS POTENTIAL
10
Millivolts

CORES and RECOVERY

DETAILED LITHOLOGY

RESISTIVITY
OHMS M^2/M
GUARD LOG
0 50
0 500
0 5000

GAMMA RAY
API Gamma Ray Units
0 100
100 200

CALIPER
Hole Diameter in Inches
6 16

ACOUSTIC
TRAVEL TIME
Microseconds per ft.
130 30
230 130

DRILL STEM TESTS

STRATIGRAPHIC COLUMN

Bit 17 H7UG
Bit 18 CD64 — $7^{13}/_{16}$" Core No. 16
Bit 19 C2GJA
Bit 18 $7^{13}/_{16}$" — Core No 17
Bit 17 RR H7UG
Bit 20 M4LG
Bit 18 RR $7^{13}/_{16}$" — Core No. 18
Bit 21 H7UG
Bit 22 M5W
Bit 18 RR $7^{13}/_{16}$" — Core No. 19
Bit 22 RR M5W
Bit 23 H7WG
Bit 24 M4N — Bit 18 RR Core No. 20
Bit 25 H7W
Bit 18 RR — Core No. 21
Bit 26 M5W
Bit 27 HJUG
Bit 28 H7UG
Bit 29 YCGJ
Bit 30 H7WG
Bit 19 RR — Core No 22
Bit 31 M7L
Bit 3 RR — Core No 23
Bit 32 M4L
Bit 33 M4L
Bit 34 HFCH — Core No.24
Bit 35 M4LG
Bit 36 HFCH — Core No. 25
Bit 35 RR
Bit 37 H7WG
Bit 38 H7WG
RR 18

5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000

Deviation: 2° 3° 4½° 5¼° 4¼° 1½°

Dips: 3°–4° 3°–5° ? 35° 20° 20° 25° 40°

Cores and Recovery:
16 Rec 25'
17 Rec. 10' 9"
18 Rec. 12'
19 Rec. 13'
20 Rec. Nil
21 Rec. 12'
22 Rec. 13'
23 Rec 6' 7"
24 Rec 11' 6"
25 Rec 14' 6"
26 Rec 5'
T.D. 6943'

D.S.T. No. 1
Rec. nil.

D.S.T. No. 2
Rec. 40' drilling fluid.

D.S.T. No. 3
Rec. 10' drilling fluid

D.S.T. No. 4
Rec. 300' drilling fluid

UNCONFORMITY 5266'

PROTEROZOIC

SPRINGS FORMATION

BITTER