NELSON BORE (GLENELG-1).

WELL SUMMARY

GLENELG-1

(W432B)

WELL SUMMARY
GLENELG-1
(W432B)

CONTENTS...

DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT

Date: 22nd January 1997

Author: Tania M. Bennell

Just a note to inform of the whereabouts of additional information to do with this well.

See files in filing cabinet (Oil Wells) for "Nelson Bore" and "Glenelg-1". Each contains unique information including palynology, logs, drilling reports and general information to do with the drilling of the well.

There is also a Nelson Bore No. 1 which should not be confused with the Nelson Bore. They are situated 150 feet apart.

1.0 Well Summary

1.1 Well Card

PE905925

This is an enclosure indicator page.
The enclosure PE905925 is enclosed within the container PE904190 at this location in this document.

The enclosure PE905925 has the following characteristics:

ITEM_BARCODE	= PE905925
CONTAINER_BARCODE	= PE904190
NAME	= Well Card
BASIN	= OTWAY BASIN
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_CARD
DESCRIPTION	= Well Card (from WCR) for Glenelg-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W432B
WELL_NAME	= GLENELG-1
CONTRACTOR	= STATE AND GOVERNMENT
CLIENT_OP_CO	=

(Inserted by DNRE - Vic Govt Mines Dept)

1.2 Penetration Chart

PE905924

This is an enclosure indicator page.
The enclosure PE905924 is enclosed within the container PE904190 at this location in this document.

The enclosure PE905924 has the following characteristics:

ITEM_BARCODE	= PE905924
CONTAINER_BARCODE	= PE904190
NAME	= Well Penetration Chart
BASIN	= OTWAY BASIN
PERMIT	=
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Well Penetration Chart (from WCR) for Glenelg-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W432B
WELL_NAME	= GLENELG-1
CONTRACTOR	=
CLIENT_OP_CO	= SHELL DEVEOPMENT AUSTRALIA

(Inserted by DNRE - Vic Govt Mines Dept)

1.3 Well History

1950/7 REF ID: 14562

Summary

NELSON OIL BORE PROGRESS

Boring with the Commonwealth Government's deep-drilling plant at Nelson has reached a depth of 5,938 feet, striking micaceous sand containing grains of glauconite. This was stated yesterday by Mr G. Brown, Secretary for Mines.

Glauconite was found in bores at Lakes Entrance, but it is emphasised that oil is not always associated with glauconite deposits.

NB:ER

17th April, 1950.

Report on Geelong Oil Flow Company's Well No. 1 at Torquay

by N. Boutakoff, D.Sc.

---

1. Historical Review.

Geelong Oil Flow Company's well No. 1, located in Allotment 59, Parish of Puebla, near Torquay, was started early in 1948. The exact date of commencement of drilling cannot be ascertained from the records in this Department.

After drilling in clays and sands down to 70 feet, it penetrated marls and limestones with silty bands at the top, which are of Miocene age and which outcrop on the ocean cliffs nearby. The well remained in marl and limestone down to 867 feet, where ligneous sand of the lower Tertiary series was reported on the 7th May, 1949. Ligneous beds, mostly sand, were drilled through down to 1,100 feet, when the sandy beds were replaced by ligneous clay and the drill remained in this clay down to 1,200 feet.

At 1,200 feet a sharp change in lithology occurred and the sandstone and schistose rocks bored from 1,200-1,210 feet and 1,210-1,220 feet on 13th August, 1948, were declared to be "bedrock, probably Jurassic" by the Chief Government Geologist, Dr. D.E. Thomas.

As a result of this determination, the Geelong Oil Flow Company was informed by letter (S/MC of 11th August, 1948) that the bore "reached bedrock between 1,180 and 1,190 feet. In view of this no useful purpose will be served by carrying the bore down to a greater depth".

In spite of this advice, the Company informed the Secretary for Mines on the 6th September, 1948, that "it is intended to continue the search for oil indefinitely. The Directors will be guided entirely by the Company's Geologist, Dr. J.B. Pritchard". It further found it impossible to furnish this Department with its proposed scheme of operations.

By her Report No. 1948/65, Pal.Ser.No.27 of 14th October, 1948, Miss I. Crespin, Commonwealth Palaeontologist, entirely confirmed this Department's tentative diagnosis and stated that from 1,200 feet down "sandstone similar to the gray sandstone of the Jurassic rocks in the Geelong area, continued from this depth down to the last sample received at 1,260 feet".

Further support of this is contained in a report by Miss K.M. Pike of Melbourne University, on samples from No. 1 bore, Allotment 57, Parish of Puebla, where it is stated from palaeobotanical evidence that the material was definitely pre-Tertiary in age and the contained

micro-spores were very similar to those of Wonthaggi coal.

In spite of these reports, based on careful scientific work and the warnings issued by this Department, the well was continued, and on 16th November 1948, a deputation led by Mr. M.L.C. McDonald, interviewed the Minister. At this meeting the viewpoint of the Department was once more clearly expressed. Dr. D.E. Thomas stated: "We have this evidence of the Jurassic age of the rock; we merely wish to draw your attention to the fact that you have passed through the oil-bearing Tertiary rock .... We say definitely that you have passed through the Tertiary and are in the Jurassic Strata - which is underneath the oil-bearing Strata".

However, the well was continued and drilled in Jurassic rock for another year when, at a depth of 1,800 feet, high temperature water and inflammable gas caused some stir on the 2nd September, 1949. The writer visited the well on the 14th September, 1949, and took gas samples in company with Mr. F.F. Field, Chief Chemist. The gas was found to be hydrogen (68.1%) Methane (19.8%) and Nitrogen (13.5%) with traces of Co (1.4%) Co_2 (0.7%) O_2 (0.5%) and Ethane (0.7%) with unsaturated hydrocarbon (0.3%) making up the remaining fraction. A report was submitted on 20th September, 1949, which stated that the gas collected presented no relationship whatsoever to petroleum gas and, moreover, rock samples collected by the writer from the bailer at this depot, were Jurassic sandstone and shale, with small coal seamlets.

The collecting was carried out in the presence of the Oil Flow Company's Board of Directors. The diviner who had located the well-site was present and insisted on further drilling. Dr. Pritchard was not present. In spite of the writer's and Mr. F.F. Field's report, the drilling of the well in Jurassic was resumed.

Bituminous coal was again encountered in the 1,870-1,910 feet interval in blue mudstone, occasionally described as "clay". At 2,030 feet coal fragments were again noted by Dr. D.E. Thomas. The well reached the depth of 2,050 feet on 20th January 1950, still in fresh-water Jurassic rock.

2. Oil Possibilities.

Two formations are superimposed in the Torquay well; the Tertiary above and the Jurassic below. As shown above, the break between these two formations occurs around 1,200 feet. The Tertiaries are marine beds and consist of 70 feet of clay and sand, resting upon 797 feet of marl and limestone, which in turn rest upon 233 feet of ligneous sand and 100 feet of ligneous clay at the base of the formation.

The Jurassic formation is of fresh water (lake and swamp) depositional origin and consists of alternating sandstones and shales containing coal seamlets. Its thickness penetrated in the well is 850 feet, and its probable total thickness is considerably greater. Faulting accounts for the gas and hot water encountered in the 1,800-1,810 feet interval. The Tertiary beds are oil-bearing in the Lakes Entrance district. However, no trace of oil has been encountered in these beds in any of the many wells drilled in the Coolong area, and the Torquay well has failed to change this position.

The Jurassic rocks being of fresh-water origin can in no case be a source of oil. If brought in contact

with a source rock of marine origin, it is quite conceivable that Jurassic sandstone could possibly become a good secondary reservoir. However, no trace of oil has ever been detected in the superimposed Tertiaries of this area and, consequently, no oil has migrated into the Jurassic sandstone below. Furthermore, no trace of oil has ever been encountered in the Jurassic rocks of Victoria in the many bores and coal mining operations carried out in this formation. It is consequently considered as highly improbable that commercial oil will be found in Jurassic beds, vast outcrops of which do occur over this State. These are intensely fractured and present no trace of oil or gas seepages anywhere in Victoria.

The so-called traces of "oil", obtained from solution of black drilling scum, by Dr. Pritchard are bitumin extractions from coal, many seamlets of which have been traversed by the Torquay well. Their evidence is of no consequence and conclusions based on such evidence, in respect to commercial oil possibilities are rash.

Conclusions and Recommendations.

The writer's qualified opinion is as follows: The Geelong Oil Flow Company is wasting its time and the money of its shareholders in the drilling of this diviner-location well. The continuance of this drilling below the 1,200 feet level, when advice to stop the well, based on careful scientific examination of the cores, was duly given by this Department is especially to be regretted, because costs of drilling have become particularly heavy below that level, when hard rock was encountered, while prospects of obtaining commercial oil have, at the same time, become practically negligible.

It is hoped that future oil ventures in Victoria may be based on evidence more serious than "underground pools and oil rivers" located by diviners.

It is earnestly recommended that no public money be expended upon undertakings unsupported by proper scientific evidence and continued against geological advice.

1.4 Operations Summary

C O P Y

1st August, 1944.

NELSON BORE

MR. A. C. SMITH:

In accordance with the suggestions contained in the final paragraph of my minute dated 12/7/44, I visited the Nelson Bore. Owing to circumstances outside his control, Mr. Binney was unable to accompany me.

When I arrived at the bore, at 9.30 a.m. on Wednesday 19th instant, I found the crew inserting drill pipe. During the day I observed them finish running-in, drill six (6) feet of core between 6,101 and 6,107 feet, pull out 37 stands of drill pipe, and fill the bore with mud preparatory to shutting-down for the night. This gave me an excellent opportunity to study methods of working, and to discuss them with Mr. Best. A full report on my visit is attached hereto.

On the whole I was very favourably impressed with the present conduct of operations. Equipment is being maintained in good condition, the drilling crew works efficiently and with an excellent team spirit.

The main objectives of the bore are -

(a) To prove the nature and depth of sedimentaries overlying the basement;

(b) To determine the nature of the basement;

(c) To find indications of oil and/or gas.

Since it is impossible to forecast the depth to basement, the drilling programme must be planned to reach the maximum possible depth with the plant and equipment available.

In my earlier writing I stated that the $5\frac{5}{8}$-inch hole might be assumed to have been reduced in size to $4\frac{3}{4}$ inches, by the plastering action of the mud flush, and that in view of this fact, plus hole size and limited clearance around tool joints, the bore had already passed safe drilling depth. The case of running in and pulling out drill pipe indicates that the $5\frac{5}{8}$-inch hole between 4,227 and 5,708 feet has not been reduced in size, an important factor when estimating the depth to which the bore may now be taken.

The problems surrounding the Nelson bore are being examined on the basis of giving the bore a depth objective of 7,500 feet. With this in view I have the following recommendations to make, the page numbers refer to the attached report on my visit of 19/7/44 to Nelson.

/Emergency...

The following additional recommendations should receive consideration:-

The verticality of the hole should be tested as soon as possible by means of the Eastman regular type single shot clinograph now in Alexandria Store.

On the completion of drilling operations at Nelson, all drilling plant should be dismantled, thoroughly cleaned and inspected, preferably by Mr. Best. A detailed report should be submitted for each piece of machinery, and the report should specify replacement parts and repairs which will be required to put the unit in first class condition for further work.

I am at present engaged upon tests of the circulation mud; when these are completed recommendations will be submitted on mud control.

(Signed) H. TEMPLE WATTS,

Petroleum Engineer.

C O P Y

1st August, 1944.

REPORT ON VISIT TO NELSON BORE 19/7/44
(To accompany Minute dated 1/8/44.)

I N D E X

General Set-up -

Travelling Block: 8-line stringing, 1⅛" wire line.

Drill Pipe: 2⅞-inch A.P.I. with Regular tool joints.

At date, the following drill pipe is in reserve:-

On rack	7	lengths
On ground	8	"
To be straightened	3	"
	18	"

Pipe in use, plus this reserve, will carry the bore to 6,500 feet. Sixteen additional lengths on site are reported to be unsuitable for further use as drill pipe. In view of the possibility of some additional lengths being scrapped, immediate steps should be taken to locate other 2⅞-inch drill pipe, tool joints and collars. Dr. Raggatt, in a memo. to Secretary for Mines under date 23/5/44, states that only seven lengths (about 132 feet) are available at Alexandria.

Drill Pipe Protectors: One per length of drill @@ pipe, but used in cased section of hole only. In normal practice when drilling in abrasive formations the protectors would be used in the uncased section of hole also; in view of the small clearance Mr. Best has wisely decided not to use them outside the casing shoe.

/Drilling...

Drilling and Coring Bits: The following table shows the position with regard to bits:-

Type	Received from U.S.A.	Used in bore	Average footage per bit (Mr. Best).
Hughes Core	36	4	12
" Tri-cone	24	5	60
" Two-cone	24	-	-

Unless formations of a much harder or more abrasive nature are encountered, bit supplies will be adequate.

Slush Pumps - steam: 12" x 6¾" x 14" stroke, fitted with 4-inch liners. Piston rods are 2¼" in diameter. Maximum steaming pressure of boilers is 150 lb./sq. in.

Slush Pump - diesel: 5" x 10" stroke fitted with 3½-inch liners. Piston rods are 1¾" in diameter. Diesel engine is 72 B.H.P.

Vibrating Screen: Suitable screens have not been obtainable locally, and the vibrating screen is not in use.

Emergency Hoist: Calf-wheel brake has not been installed. As the calf-wheel has a steel rim the brake band should be drilled and fitted with ½" Ferrodo or similar brake segments 7" wide x 12" long, spaced ½-inch apart. About 18 segments will be required, each held by 8 x ¼" aluminium rivets, or C.S. brass bolts. The steel brake band should be marked by Mr. Best and sent to a properly equipped shop for drilling.

Chains and working parts of the hoist should be kept well greased, and the hoist operated once per week under load of, say. 2,500' of drill pipe.

Kelly and Drive: Kelly drive bushings are badly worn and are damaging the kelly. Even with packing pieces inserted between the drive and table bushings the 3-inch kelly is not held squarely in the opening. This results in serious jamming which supports part of the weight of drill pipe, making it impossible for the driller to maintain even weight on the bit while drilling.

A roller bearing drive bushing is at the rig and will be installed immediately. As the kelly is already badly worn, it may give trouble even with the new bushings.

In normal drilling practice kellies are annealed periodically; Mr. Best states that the Nelson kelly has been in use without annealing, and that it has already broken once. As facilities for annealing may not be available, steps should be taken to obtain a replacement kelly from one of the Oil Prospecting Companies. The kelly protector sub has not been reconditioned for a considerable time and the threads are in poor condition. The sub pin should be remachined.

/Swivel:...

Swivel: No spares are available at Nelson, and it is not known if they are held in stock at Alexandria. A replacement swivel could, however, be obtained from Roma Blocks Ltd. or some other Company, if required.

The existing swivel was inspected by Mr. Best and found to be in good working order when received at Nelson.

Elevator Links: Only one pair of 2" x 72" links are at Nelson for use with $2\frac{7}{8}$-inch Drill pipe elevators. A second set was taken from the bore during the shut-down period; these should be returned to Nelson immediately.

A pair of $2\frac{1}{2}$" x 72" links, too large for use with $2\frac{7}{8}$" drill pipe elevators, can be offered in substitution for the 2" x 72" links to be returned.

Block Line: No spare line is available at Nelson. The existing line, $1\frac{1}{8}$" x 2,250' is generally in good condition, but Mr. Best states it is showing signs of wear in the central portion. He intends to reverse the line when the wear is more pronounced, thereby putting into use the new portion now spooled on the calf-wheel.

The position of the worn section, about the middle of the line, indicates that the wear may be occurring at the dead-line sheave on the crown block. This sheave, which carries the dead-line from the calf-wheel, does not rotate during drilling operations, and is subject only to part rotation when the block line is alternately stressed and relieved during hoisting operations. If there is a flaw in the lubricating system or in the bearings of this sheave, excessive friction will be set up which will result in abnormal wear on the line.

The behaviour of the weight indicator, which is noticeably sluggish during drilling operations, also points to possible trouble at the dead-line sheave.

Mr. Best informs me that the line is shortened periodically. This shortening consists of cutting off about 6 feet of line at the rotary drum and results in new sections of line coming into contact at the places where most wear occurs. These places are -

(1) at the end and beginning of each lap of wire on the rotary drum.

(2) at the dead-line sheave.

(3) at the calf-wheel.

The line should be shortened once per week, or more often if noticeable wear is seen on the abovementioned sections.

To minimise wear at the calf-wheel drum, the last 6 to 12 turns of line should be spooled over a layer of Balata belting.

Wire line Spooler: This was designed for use with a 120-ft. derrick. The Nelson derrick is only 94 feet high and the

/block...

block line accordingly lies at a different angle; thus it happens that the sheaves of the Emsco wire spooler are not running true on the line, and are probably causing some wear. An improvement could be effected by affixing a bracket to the head-board, and mounting the wire spooler on this bracket in a correct position in relation to the block line.

Boilers: Considerable trouble is being experienced with the tubes in No. 1 boiler; Mr. Binney has had difficulty in obtaining suitable tubes for replacement purposes and the matter is still receiving his attention.

The supply of firewood is adequate and although much of the wood is green there has been no difficulty in keeping a head of steam for normal drilling. Valves are set to blow off at 150 lb./square inch.

When pulling out of the hole both boilers are taxed to the limit and the head of steam is rapidly pulled down. It is probable that the overload when pulling out, and the nightly shut down, are primarily the causes of tube trouble. Some improvement in boiler operation would result if the feed water were pre-heated by means of the exhaust steam from the engine.

It will probably be necessary to instal a third boiler if the bore-hole is to be carried below 6,500 feet. A boiler is available in Alexandria store, which could be put in working order at a cost of around £50. (Mr. Dee 17/3/43). No pipework or external fittings are available at Alexandria, and it is not known if the figure quoted by Mr. Dee covers these items.

OPERATING TECHNIQUE

Working Conditions: Working hours are 8.15 a.m. to 5 p.m. Monday to Friday inclusive. The bore is shut down on Saturday and Sunday and, owing to lack of skilled labour, it has not been possible to run a second shift.

Mr. Best goes to the rig early each morning to raise steam and grease up the machinery so that the driller can start running-in as soon as he comes on shift.

Since it is necessary to pull the tools back inside the casing (Shoe is at 4,227 feet) at the end of each shift, and run to bottom at the beginning of the next shift, it follows that as the hole becomes progressively deeper less and less time will be spent drilling or coring on bottom.

Thus far the bore has stood up very well, Mr. Best reporting that having left bottom at 3.30 p.m. on Friday last, to pull back to the shoe, the tools were run down and drilling resumed by 11.30 a.m. on Monday.

The average progress since the resumption of drilling at 5,708 feet has been 39.3 feet per week. Assuming that good drilling conditions persist, boring may continue for some weeks under the present system of operation. If difficult formations are encountered it will be

/necessary...

necessary to arrange immediately for continuous operation, 24 hours daily and 7 days weekly.

In view of the small clearance around the tool joints, and of the depth of uncased hole, every attempt must be made to secure proper working conditions. If progress is held up under one-shift operation boring should be suspended undil a second shift is available. The safety of the bore hole must not be jeopardised.

Running-in Drill Pipe: On the day of my visit Driller Hughes started into the hole with the core barrel, at 8.30 a.m. Circulation was established 3 stands (198 feet) off bottom, the pump pressure at start being 1,200 lbs./sq. inch, dropping back gradually to 600 lbs./sq. inch. Circulation was again established 1 stand off bottom with 1,000 lbs./sq. inch pressure, and at bottom with 900 lbs./sq. inch. The Diesel-driven pump was in use.

While lowering the last stand the weight indicator showed 24 points; the normal hanging weight was later found to be 32 points - the difference of 6 points indicating the plastic nature of the mud in the lower part of the bore. Owing to the sluggish operation of the weight indicator, the difference between lowering and hanging weights may have been greater than that recorded.

When lifting drill pipe from the slips with last stand in hole the reading was 37 points; when pulling out later in the day, after drilling and circulating for some hours, the reading was 34 points. The reading for blocks and hook was 12 points.

Under existing conditions in the bore running in speeds are not excessive; they should not be increased however, and if the bore shows signs of mud ringing they will, no doubt, be reduced at the instruction of Foreman Best.

Pulling-out Drill Pipe:

Driller Hughes reports that there is no drag when pulling out. The following table shows the weight indicator readings recorded by me, while the core barrel was being hoisted, on 19/7/44, the depth then being 6.107 feet:-

Time started to hoist	Stand No.	Reading at start	Maximum reading while pulling	Mininum reading while pulling
3.42 p.m.	1	33	34	33
3.45 p.m.	2	33	35	31½
3.46½ "	3	32½	34	32
3.48½ "	4	32½	33	32
3.49½ "	5	32½	33	31
3.51	6	31½	32½	31
4.07 "	14	30	30	30
4.20½ "	22	28	28	28
4.34 "	30	26	26	26
4.37 "	32	25½	26	25
4.46 "	37	stands pulled; filled bore with mud and shut down for the night at 5.p.m. Core barrel entered casing shoe at about 29th stand.		

/The weight

The weight indicator needle oscillated appreciably while pulling the first three stands, but was fairly steady while pulling the remainder. This indicates that the hole between 4,227 and 5,800 feet is in very good condition, but may possibly be mud-ringing slightly between 5,900 feet and bottom. Attention is again drawn to the sluggishness of the weight indicator and the present impossibility of obtaining accurate readings.

Driller Hughes reports that the normal pull out is made with 2 stands on low gear, about 60 stands on second, and the remainder (30 stands) on high gear.

Inview of the possibility of mud-ringing or other deformation of the bore walls, it will be advisable to pull the first 3 stands on low gear, and to pull them slowly. This will minimise the swabbing effect of the tools thereby leaving the hole in better condition for the next run-in. Also, it will enable the driller to observe any drag on the bit, and to cease hoisting if the weight indicator shows a continuously increasing pull.

In addition, it will be advisable to start each stand slowly away from the slips and subsequently to accelerate to the desired hoisting speed, until the bit has entered the casing shoe.

When pulling-out, the level of the mud fluid in the bore is progressively lowered as the drill pipe is withdrawn. Mud is pumped into the bore to restore the fluid level, once when the drill pipe is half out, again when all pipe is out. With half the drill pipe out the fluid level will have dropped to 450 feet, with a resultant reduction of 235 lbs. per square inch in the pressure exerted at the bottom of the bore by the mud column. This reduction in pressure coupled with the swabbing action of the tools will tend to break down the bore walls, and may seriously retard drilling if caving or other troublesome formations are encountered.

It will be advisable to keep the bore full of mud while pulling out; this may be done without loss of time by fitting a small hose to the pump blow-down, the other end of the hose to be inserted in the conductor box, and by having the pump engine running slowly.. The excess mud pumped, if any, will return to the flume.

The drill pipe is broken-out by rotary.

Two safety measures are toreceive the attention of Mr. Best. Derrickman's safety belt is to be inspected and the safety rope renewed periodically; an adjustable sun screen is to be mounted at side of derrick if the driller finds the sun's glare troublesome on long trips.

Drilling and Coring: During my visit new hole was cored from 6,101 to 6,107 feet, in 3 hours 5 minutes. Table speed was maintained at about 50 R.P.M., with about 3 vernier points on the weight indicator. Owing to the kelly jamming in the drive bushings and to the sluggishness of the weight indicator it was difficult for the driller to maintain constant weight on the bit.

/While

While drilling with a rock bit a check on weight may readily be made by picking-up the tools off bottom; this is not good practice when coring, for it results in breakage of the core. With the deep hole and the small bit diameter it is essential that all working parts should be in first class condition if the driller is to control the bit weight accurately. Everything possible should be done to keep the weight indicator functioning properly.

Another method for checking possibly excessive weight on the bit is to throw out the rotary clutch and observe the amount of torque in the drill pipe. This method is followed at Nelson, but while better than nothing it is a poor substitute for a good weight indicator. The torque amounted to less than half-a-turn when washing down through heavy mud near bottom, and a bare half-turn when coring.

The makers recommend not more than 1,000 lbs. per inch of bit diameter, which would give a maximum permissible loading of 4,750 lbs. on the rock bits now in use. With 8 lines strung on the blocks this loading would be represented by 1½ points on the weight indicator. The maximum permissible loading for core bits is roughly 2/3 of that for rock bits.

The amount of weight carried on the bit has a direct influence on the size of cuttings obtained if the stratum is not extremely friable. The absence of cuttings of a size large enough to be collected as samples on a screen may be due to insufficient weight on the bit. When the indicator is in good working order tests should be made carrying progressively heavier weights, keeping within the maximum recommended by the maker. The use of light drilling weight is, in general, advocated to ensure straight hole but there is no possibility of drilling "crooked hole" with the existing small clearance around tool joints.

The pump pressure was 750 to 850 lbs./sq. inch at the commencement of coring, but had dropped to 550 - 600 lbs./sq. inch after 2½ hours steady coring and circulation. The diesel-driven pump was running at 45 R.P.M. (crank shaft speed) throughout.

The pump pressure when breaking circulation after running-in, was 1,200 lbs./sq. inch When working at this pressure an overall mechanical efficiency of 55% was developed by the pumping unit; since the mechanical efficiency for this class of pump is usually rated at 60%, it is apparent that the unit has very nearly reached the limit of loading.

To break circulation at higher pressures Mr. Best proposes to remove two suction valvesfrom the pump, thereby decreasing the volumetric output and enabling a proportionately higher pressure to be built up. This results, however, in a severe pulsating movement which will, in time, cause damage to the mud lines and pump. Also, the diesel-driven pump is only rated for working pressure of 1,000 lbs./sq.inch and will be seriously overloaded.

If consistently high pressures are required it will be advisable to compound the two pumps, leading the discharge of the diesel-driven pump into the suction of the steampump; the latter, rated for 2,000 lbs./sq. in. working pressure, will be suitable for operation at that pressure.

/If the

If the pumps are compounded in this manner it will be necessary to instal a variable flow mud bean in the blow-down of the diesel-driven pump, to control the pressure passing to the second pump while starting up.

Under present conditions in the bore, the walls appear to be standing up very well during drilling periods. As the depth increases, or if appreciable mud-ringing develops, it will be necessary to pull up off bottom and "pass collars" periodically to keep the hole clear. No definite period can be given for passing collars, the operation being carried out as often as is necessary.

Mud Control: When operations were resumed on 22nd April, after a shut-down of 3½ months' duration, the bore was found to be in good condition, and no difficulty was experienced in washing down to bottom, 5,708 feet, which was reached by 4th May. Mr. Best reports that chunks of plastic mud were obtained in the returns.

Mention has been made earlier in this report on the behaviour of the bore when shut down over the week-end, (see page 4). There is apparently no tendency for the mud to settle out completely, thereby forming a solid cake; the action appeared to be limited to the loss of some water and the formation of a semi-plastic mud which is readily broken down by circulation.

The rotary mud is prepared from Glenelg River silt which is delivered to the bore site by a 2 horse dray at a charge of £2/10/- per day. Since 6 to 8 loads, each of about 2 cubic yards, are brought in daily the rotary mud is obtainable at a very low cost. With 1.2 specific gravity mud in use, a complete change of mud can be obtained for the present depth of the bore at a cost of about £1 for silt, plus mixing costs. Mr. Best reports that the supply of silt near the bore is running low and that new sites may have to be found. The band from which rig supplies are at present drawn is 4 inches in thickness, with a thin capping of detritus and underlain by sand. The band originally drawn from has cut out.

Mr. Best reports that there have been no losses of mud to the formation. There is a constant loss of water to the formation while drilling, which is replaced by adding water to the returns at surface. With 45 R.P.M. on the Diesel-driven pump the circulation rate at the mud pipe was 48 gallons per minute, and water was being added in the flume at the rate of 3 to 4 gallons per minute.

No formations have been drilled between 5,708 and 6,100 feet which would make mud while drilling. The constant addition of water to the flush to maintain a given specific gravity, plus the addition of sandy formations being drilled, results in an overall increase in the volume of circulation mud, the excess being pumped to waste.

Mr. Best reports also that no water or oil shows have been observed since the resumption of drilling and that the only gas show active is a small one at about 4,600 feet (depth subject to confirmation).

The drilling mud is being maintained at about 1.2 specific gravity, and was 1.187 sp. gr. on the day of my visit.

/Temperature

Temperature of the mud at the return pipe was 78° F, and of the mud in the suction pit was 75½° F; atmospheric shade temperature was 62° F. The low temperature of the returns points to a low thermal gradient for this area. An attempt is to be made to obtain the bottom hole temperature by means of a maximum recording thermometer run in the core barrel. As the type of thermometer to be used was not designed for this class of work, hoisting and breaking of tool joints will have to be done gently when pulling out.

Owing to the lack of a stop watch, or dher means of measuring time, viscosity readings have not been taken. These readings are of paramount importance for the control of mud fluid, and a stop watch should be provided immediately.

Four drums of circulation mud were obtained on 19/7/44 as follows -

Time	Drum No.	Depth of hole	Operation in hand	Source of mud
12.20 p.m.	1	6,101'	Washing down, 2 feet off bottom.	Returns
2.20 "	2	6,104'	Coring	"
3.00 "	3	6,105'4"	"	"
3.30 "	4	6,107'	"	"

These, together with a quantity of Glenelg River silt, have been brought to Melbourne for testing with a view to finding the best method of reducing viscosity while maintaining good wall-building properties.

Mr. Best reports that no bentonite has been added to the mud since drilling was suspended at 5,708 feet.

(Signed) H. Temple Watts

Petroleum Engineer.

1st August, 1944.

2.0 Lithology

2.1 Weekly Drilling Record

NELSON BORE (GLENELG-1) ?

DEPARTMENT OF MINES.

Week Ending 4/9/1942
Consecutive Report No. of this Bore 39
Postal Address Nelson

Bore No. Parish Glenelg Position—From [illegible] corner of [illegible] to 10 ch. 85 then [illegible] 290
Allotment Section 6-SEP-1942
Boring Operations with [illegible] Drill No. for—~~Coal~~, Oil, Water, ~~Gold~~*
Diameter of Bore Hole 7 1/2 inches Reduced to 5 7/8 inches diameter at 3963 feet

FEET BORED.

Shift.		From. feet.	To. feet.	For Shift. feet.
Monday 31/8/42	a.m.	[illegible]		
	p.m.	4025	4033	8
Tuesday 1/9/42	a.m.	4033	4041	8
	p.m.	4041	4061	20
Wednesday 2/9/42	a.m.	4061	4079	18
	p.m.	4079	4085	6
Thursday 3/9/42	a.m.	4085	4085	— 6
	p.m.	[illegible]		
Friday 4/9/42	a.m.	[illegible]		
	p.m.	[illegible]		
Saturday 29/8/42	a.m.	[illegible]		
	p.m.	[illegible]		
			TOTAL FOR WEEK ...	[illegible]

CASING.

Size. Inch	In Hole. feet.	Not in Use. feet.	Total. feet.
11¾			
8			
7			
6			
5			
4			

TOOLS USED.

	From. feet.	To. feet.
Auger ...		
Drive pump		
Star bit ...		
Calyx ...		
Shot ...		
Diamonds...		

FUEL.

Brought forward	240
Received during Week	880
Total ...	1120
On Hand ...	890
Used.. ...	230

WATER.

Struck at .... feet.
Artesian .... gallons per hour.
Baling .... " " "
Quality—Fresh, Brackish, Salt* ....
Standing at .... feet when bore completed.

STAFF.

Position.	Name.	Shift Hours.	Days worked.
Foreman	[illegible]	8 till 5	6
Sub foreman ...	[illegible]	8 till [illegible]	"
Sub foreman ...		" till "	"
Assistant ...	[illegible]	" till "	"
Assistant ...	[illegible]	" till "	"
Assistant ...	[illegible]	" till "	"
Assistant ...	[illegible]	12.30 till 8	"
Assistant ...	[illegible]	" till "	"
Assistant ...	[illegible]	" till "	"
Assistant ...	[illegible]	" till "	"

STRATA PASSED THROUGH.

Material.	From. ft. in.	To. ft. in.	Thickness. ft. in.	Core Obtained. ft. in.
[illegible] clay (mis)	4023	4041	18	
[illegible]	4041	4052	11	
[illegible]	4052	[illegible]	[illegible]	
[illegible]	40[illegible]	40[illegible]	[illegible]	
[illegible]	40[illegible]	40[illegible]	1	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	18	
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	28	
[illegible]	[illegible]	[illegible]	6	

[illegible] 10/9/42

Remarks on strata that are worth recording, also explanations of any delays, repairs, loss of material, &c. :—

Slight showing of gas carrying a few globules of oil at approximately 4045.

[illegible]

Signature of Foreman [illegible]

Checked by Director of Geological Survey [illegible] 14/9/1942
Checked by Engineer for Boring [illegible]
Date received at Head Office ....

When indicating strata passed through, drillers should record the description first and then the material, as for instance :—
"Decomposed basalt" (not basalt, decomposed).
"Yellow clay" (not clay, yellow).
"Hard fossiliferous limestone" (not limestone, hard, fossiliferous).
This, however, does not affect the description of combined materials; in such cases the usual practice will continue of showing "sandy clay" for a mixture in which sand predominates, and "clayey sand" for a mixture in which clay predominates. In other words for combined materials show first the name of the material which is the smallest part of the bulk.

2761. * Strike out words not applicable.

(5)

PRODUCING OILFIELD LIMITED

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers Oilwell Supplier L'd.

DRILLING REPORT

MT. GAMBIER NO. 1 BORE: 1st. Bore to 640 feet in fine sand.

NELSON NO. 1 BORE: 1st. Bore to 1520 feet. Running 5" casing and clearing out hole. Sand and clay formation.

PORTLAND NO. 1 BORE: 1st. Bore to 1630 feet in sticky grey marl.

LAKE BOGA NO. 1 BORE: 1st. Bore to 767 feet.

PRODUCING OILFIELDS LIMITED

B Ryan

Secretary.

Secretary

1. Mr Wraith

3. Mr Knoll.

PRODUCING OILFIELDS LIMITED

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers Oilwell Supplies Ltd.)

DRILLING REPORTS

LAKE BOCA NO. 1 BORE: Bore to 774 feet.

MT. GAMBIER NO. 1 BORE: 660 feet in drift sand. Freeing up 10" casing.

WILSON NO. 1 BORE: 1535 feet in alternate layers of sand and clay.

PORTLAND NO. 1 BORE: 1666 feet in marl.

PRODUCING OILFIELDS LIMITED

Secretary.

.PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

MT. GAMBIER NO. 1 BORE:	25th.	Bore to 634 feet in fine sand and clay
PORTLAND NO. 1 BORE:	25th.	Bore to 1618 feet in hard limestone.
NELSON NO. 1 BORE:	25th.	Bore to 1520 feet. Still running 5 inch casing.
LAKE BOGA NO. 1 BORE:	25th.	Bore to 758 feet.

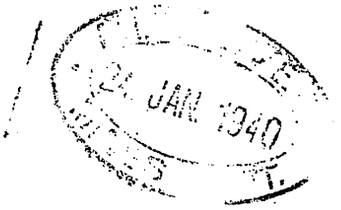
PRODUCING OILFIELDS LIMITED

D Ryan

Secretary.

Secretary

J. M. Cook.



PRODUCING OILFIELDS LIMITED.

(In conjuction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

WEEKLY DRILLING REPORTS.

PORTLAND No. 1 BORE: 18th Bore to 1487 feet in grey sticky marl.

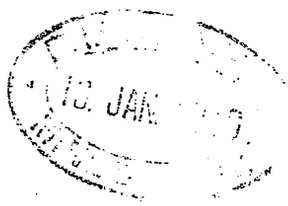
MT. GAMBIER No.1 BORE: 18th Bore to 610 feet in fine sand and clay.

LAKE BOGA. No.1 BORE: 18th Bore to 761 feet in hard sandstone.

NELSON No. 1. BORE: 18th Week spent in running 5" casing.

PRODUCING OILFIELDS LIMITED.

Secretary.



PRODUCING OILFIELDS LIMITED

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

WEEKLY DRILLING REPORTS

LAKE BOGA NO. 1 BORE: 11th. 743 feet in hard sandstone

MT. GAMBIER NO. 1 BORE: 11th. 564 feet in coarse sand.

NELSON NO. 1 BORE: 11th. 1520 feet layers of sand and clay

PORTLAND NO. 1 BORE: 11th. 1545 feet in grey sticky marl.

PRODUCING OILFIELDS LIMITED

Secretary.

2. Mr Croll

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

MELROSE NO. 1 BORE: 14th. Bore to 1480 feet, formation layers of sand and clay.

MT. CAMBRIAN NO. 1 BORE: 14th. Bore to 515 feet in sandy clay formation.

PORTLAND NO. 1 BORE: 14th. Bore to 1741 feet in sticky grey marl.

PRODUCING OILFIELDS LIMITED

B. Ryan

Secretary.

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

LAKE BOGA NO. 1 BORE: 30th. Bore to 700 in hard sandstone

MT. GAMBIER NO. 1 BORE: 30th. Bore to 460 feet in drift sand

WILSON NO. 1 BORE: 30th. Bore to 1377 feet in fine layers sand and clay.

PORTLAND NO. 1 BORE: 30th. Bore to 1035 feet in sticky grey marl.

PRODUCING OILFIELDS LIMITED

B Ryan

Secretary.

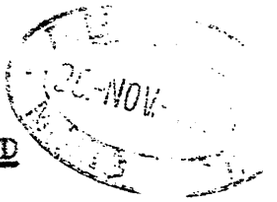
Secretary ✓

2.

3

4

Mo 278



PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

MT. GAMBIER NO. 1 BORE: 23rd. Bore to 450 feet in fine sand. Most of week spent in running casing.

NELSON NO. 1 BORE: 23rd. Bore to 1360 feet in fine sand and clay formation.

PORTLAND NO. 1 BORE: 23rd. Bore to 943 feet in marl formation

LAKE BOGA NO. 1 BORE: 23rd. Bore to 692 feet.

PRODUCING OILFIELDS LIMITED

Secretary.

1. Secretary ✓

2. Mr Wraith W

3. Mr Cook.

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

MT. GAMBIER NO. 1 BORE: 17th. 440 feet in fine sand.

NELSON NO. 1 BORE: 17th. Bore to 1360 feet in fine sand and layers of clay.

PORTLAND NO. 1 BORE: 17th. Bore to 940 feet in marl.

LAKE BOGA NO. 4 BORE: 17th. Recommenced drilling on Monday 13th.

PRODUCING OILFIELDS LIMITED

Secretary.

1. Secretary

2. Mr Kraeuth

3. Mr Caroll

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

MT. GAMBIER NO. 1 BORE: 10th. 395 feet in fine sand.

WILSON NO. 1 BORE: 10th. Bore to 1340 feet in fine sand.

PORTLAND NO. 1 BORE: 10th. Bore to 700 feet in limestone.

PRODUCING OILFIELDS LIMITED

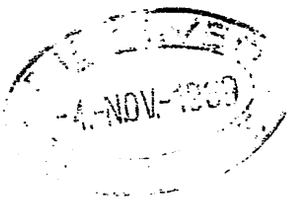
BASIL J. JACKSON

Secretary.

(1) The Secretary
(2) Mr Wraith
(3) Mr Croll.

PROUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORTS



(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

MT. GAMBIER NO. 1 BORE: 3rd. Bore to 375 feet in sandy cley.

NELSON NO. 1 BORE: 3rd. Bore to 1320 feet. Replacing faulty engine this week.

PORTLAND NO. 1 BORE: 3rd. Bore to 665 feet in limestone.

LAKE BOGA NO. 1 BORE: Work suspended pending arrival of new driller.

Yours faithfully,
PROUCING OILFIELDS LIMITED

Secretary.

(1) Secretary ✓ RB

(2) Mr Hartley 25

(3) Mr Crall. R.

PRODUCING OILFIELDS LIMITED.

WEEKLY DRILLING REPORT.

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

NELSON No. 1 BORE: 26th Bore to 1320 feet in sandy clay.

[illegible] No. 1 Bore. 26th Week spent running 8 inch. casing.

MT. GAMBIER No. 1 BORE: 26th Bore to 330 feet in brown sandy clay.

LAKE EDGA No. 1. BORE: 26th Work delayed pending arrival of new driller.

Yours faithfully,
PRODUCING OILFIELDS LIMITED.

Secretary.

Mr Farr

PRODUCING OILFIELDS LTD.

WEEKLY DRILLING REPORT

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

MT. GAMBIER NO. 1 BORE: 12th. To 265 feet in hard quartzite boulders

NELSON NO. 1 BORE: 12th. Bore to 1208 feet in fine sand

PORTLAND NO. 1 BORE: 12th. Week spent recovering lost tools. Tools now recovered and drilling recommenced.

LAKE BOGA NO. 1 BORE: 12th Work temporarily suspended owing illness drill foreman.

PRODUCING OILFIELDS LIMITED

Basil Stradbroke

Secretary.

Mr Carell

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORT.

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oil-well Supplies Ltd.)

[illegible] Well No. 1 North: 8th. Down to 264 ft in intrusive boulders and sand.

[illegible] Well No. 2 South: 7th. No work this week owing to ill health of drilling staff. Hope to start in few days.

[illegible] Well No. 3 North: 7th. Down to 1167 ft in sand. Awaiting arrival of drill collars.

[illegible] Well No. 4 North: 7th. Down to 502 ft in limestone. Now running 20 inch casing.

PRODUCING OILFIELDS LTD.

[signature]

Secretary.

To Mr Ball

Ans 10/10/39

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORT

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

NELSON NO. 1 BORE: 28th. Bore to 1187 feet in gravel and sand.

LAKE BOGA NO. 1 BORE: 28th. Bore to 687 feet in hard sandstone material.

MT. GAMBIER NO. 1 BORE: 28th. Bore to 264 feet in black sand and gravel.

PORTLAND NO. 1 BORE: 28th. Bore to 592 feet in limestone and grey marl.

Ans 3/10/39

PRODUCING OILFIELDS LIMITED

Secretary.

13

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORT

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

NELSON NO. 1 BORE: 22nd. Bore to 1164 feet in sandy clay

MT. GAMBIER NO. 1 BORE: 22nd. Bore to 262 feet in black sand.

PORTLAND NO. 1 BORE: 22nd. drill now in limestone at 463 feet

LAKE BOGA NO. 1 BORE: 22nd. Bore to 682 feet in hard sandstone.

PRODUCING OILFIELDS LIMITED

Basil Jackson

Secretary.

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORT

(In conjunction with Western Petroleum N.L.)
(In conjunction with Producers' Oilwell Supplies Ltd.)

NELSON NO. 1 BORE: 14th. Bore ~~to 3000~~ feet in fine sand.
Running 6" casing.

PORTLAND NO. 1 BORE: 14th. Bore to 242 feet in limestone and marl formation.

MT. GAMBIER NO. 1 BORE: 14th. To 260 feet in brown clay.

LAKE BOGA NO. 1 BORE: 14th. Bore to 675 feet in hard sandstone.

PRODUCING OILFIELDS LIMITED
Brazil Hadlow
Secretary.

(1) Lecky
(2) Coll.
(3) Moore
19/9/39

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORT

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

NELSON NO. 1 BORE: 7th. From 1072 to 1078 fine sand and gravel. Now running casing.

PORTLAND NO. 1 BORE: 7th. Drilling recommenced today. 270 to 285 feet in limestone. Now in marl.

MT. GAMBIER No. 1 BORE: 7th. 120 to 210 feet Limestone. Now in marl.

LAKE BOCA NO. 1 BORE: 7th. To 662 feet in hard sandstone.

PRODUCING OILFIELDS LIMITED

Secretary.

To Mr Ercoll

Ans 11.9.39

PRODUCING OILFIELDS LIMITED

(In conjunction with Western Petroleum N.L.)
(In conjunction with Producers' Oilwell Supplies Ltd.)

NELSON NO. 1 BORE: 31st. From 1004 to 1072 feet in sand clay. Struck sand at 1072 feet.

PORTLAND NO. 1 BORE: 31st. Plant still under water, contractors hope recommence drilling on Monday.

LAKE BOGA No. 1 BORE: 31st. to 658 feet in hard sandstone

MT. GAMBIER NO. 1 BORE: 31st. Boring started. Bore to 120 feet in limestone.

PRODUCING OILFIELDS LIMITED

Secretary.

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORT

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

LAKE BOGA NO. 1 BORE: to 648 ft. in hard sandstone.

PORTLAND NO. 1 BORE: Work suspended owing to machinery under water caused by heavy rains.

HELSON NO. 1 BORE: Delayed owing bad weather, heavy rains, Bore to 1004 ft. in sandy clay.

MT. GAMBIER NO. 1 BORE: Drilling commenced this week.

PRODUCING OILFIELDS LIMITED

Basil Jackson

Secretary.

PRODUCING OILFIELDS LIMITED

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd)

PORTLAND NO. 1 BORE: to 770 feet. Work delayed owing difficulties tools. Hope adjust by week end.

NELSON NO. 1 BORE: 975 feet to 986 feet in puggy clay. Sinking shaft to accommodate casing.

LAKE BOGA NO. 1 BORE: 631 to 635 feet in sandstone.

MT. GAMBIER NO. 1 BORE: Plant on site and now being erected

HOWLONG NO. 1 BORE: Expect delivery plant on site next week.

PRODUCING OILFIELDS LIMITED

Secretary.

PRODUCING OILFIELDS LIMITED

WEEKLY BORING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

PORTLAND NO. 1 BORE: 10th. 275 feet in Limestone.

NELSON NO. 1 BORE: 10th. 975 feet, sandy clay. Waiting arrival of 6" casing.

LAKE BOGA NO. 1 BORE: 10th. 631 feet in white clays.

MT. GAMBIER NO. 1 BORE: 10th. Machinery taken to site, expect start drilling within week.

PRODUCING OILFIELDS LIMITED

Basil J Jackson

Secretary.

Mr Croll

PRODUCING OILFIELDS LIMITED

WEEKLY BORING REPORTS

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.

NELSON NO. 1 BORE: 921 to 970 feet in coarse sand with bands of cemented sand.

LAKE BODA NO. 1 BORE: 3rd. 596 feet. Difficulty experienced during week with swelling clay in the bore, formation now under control.

PORTLAND NO. 1 BORE: 3rd. 165 feet. Basalt boulders and clay.

PRODUCING OILFIELDS LIMITED

Basil Jackson

Secretary.

Mr Croll

MV 1655
OR 1887

M 5981

PRODUCING OILFIELDS LIMITED

WEEKLY BORING REPORT

(In conjunction with Western Petroleum N. L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

LAKE BOGA NO. 1 BORE: 27th. 500 to 512 feet black marl, 513 to 517 feet fine sand drift, 518 to 549 dark brown marl, 550 to 560 coarse drift, 561 to 600 feet, white clay.

NELSON NO. 1 BORE: 27th. 903 to 921 feet coarse sand, 922 to 925 feet cemented sand, 925 to 928 feet coarse sand.

PORTLAND NO. 1 BORE: to 2 feet, surface soil, 2 to 10 feet yellow clay, 13 to 45 feet basalt, 46 to 90 feet hard basalt

MT. GAMBIER NO. 1 BORE: Contract signed for drilling well machinery moving in a few days.

PRODUCING OILFIELDS LIMITED

Basil Jackson

Secretary.

(1) Mr Moore

(2) Mr Crabb

Entered ans 31.7.29

PRODUCING OILFIELDS LIMITED

WEEKLY BORING REPORT

(In conjunction with Western Petroleum N.L.)

(In conjunction with Producers' Oilwell Supplies Ltd.)

PRESS REPORT 31/2/59

NELSON NO. 1 BORE: 20th. Bore to 903 feet in coarse sand, cased to same depth.

LAKE BOGA NO. 1 BORE: 20th. No progress owing non-arrival casing. Delivered at site yesterday. Drilling recommenced.

PORTLAND NO. 1 BORE: 20th. Drilling commenced. Bore to 45 feet in basalt. Casing being run.

PRODUCING OILFIELDS LIMITED

Basil Jackson

Secretary.

(returns on proper form required for Lake Boga others on prior bond))

PRODUCING OILFIELDS LIMITED

DRILLING REPORTS

(In conjunction with Western Petroleum N.L. In conjunction with Producers' Oilwell Supplies Limited)

NELSON NO. 1 BORE: 14th. Running 8" casing to shut off water.

LAKE BOGA NO. 1 BORE: 14th. Boring 446 to 462 feet in black and brown marl, 462 to 503 feet in soft sandstone.

PORTLAND NO. 1 BORE: Slight delay commencing, now expect start drilling Monday morning.

MT. GAMBIER NO. 1 BORE: Finalising drilling contract. Hope have same completed next week.

PRODUCING OILFIELDS LIMITED

Secretary.

PRODUCING OILFIELDS LIMITED

WEEKLY DRILLING REPORT

(In conjunction with Western Petroleum N.L.)

PPL. 102 NELSON NO. 1 BORE: Nelson, 6th. Bore to 662 feet in fine and coarse sand. Well now being cased.

PORTLAND NO. 1BORE: Portland, 6th. All plant and machinery erected. Slight delay in commencing. Drilling should start next week.

(In conjunction with Producers' Oilwell Supplies Ltd.)

PPL 107 LAKE BOGA NO. 1 BORE: Lake Boga, 6th. Bore to 402 feet formation black pug and sandstone bars.

PRODUCING OILFIELDS LIMITED

David Thomson

Secretary.

Mr Croll

PPL 102

Enclosed Ans 11.7.99

Mr Croll. Have telephoned & written to Company re correct reports Ans 11.7.99

90 PET. PROS LICENCE

MINING REPORTS

P R O D U C I N G O I L F I E L D S L I M I T E D

DRILLING REPORT

(In conjunction with Western Petroleum N.L.) EYLTON NO. 1 BORE:
To 108 feet limestone. To 270 feet limestone with bands of flint.

(In conjunction with Producers' Oilwell Supplies Limited)
LAKE BOGA NO. 1 BORE: To 150 feet brown and yellow sandstone
" 177 feet sandstone.
" 195 feet black shale
" 200 feet yellow sandstone
" 204 feet black shale and sandstone pebbles - black froth showing gas bubbles.

PRODUCERS OILFIELDS LIMITED

Secretary.

2.2 Core Descriptions

Lithology.

FORAMS

Glenelg 1.

108 (F) White vfpx bryoz lst

112 Gr sli ff chert

132 Gr bryozoal marly lst quite hard

152 Mod porous gr ff bryoz sli glauc marly lst

172 fx grained sli calcitic bryoz lst + gr ff cherty lst.

192 gr mod porous bryozoal fx lst, sli calcitic

198 ff cherty lst.

220 fx grained sli porous lst sli bryoz

230 chert

253 cherty lst + fx sli bryoz lst. (C/F 220)

293 (F) Cream fx sli bryoz lst.

310 Cream porous bryoz lst trace 'siderite' + glauc Pf Campbell =

32● KIA less porous with tiny calcite rhombs.

348 sli ff cream-grey chert – cherty lst

388 White 'rough' mod dense bryoz lst

390 KIA with yellow patches cherty lst, occ yellow fossil mat sli calcitic ? Vague diffuse variant

410 (F) lt gr sli calcitic mod porous bryoz lst/marly lst (poor core)

432 mod porous yellowish bryoz lst, occ yellow bryozoa c/f 390 ? Vague diffuse variant

453 (F) fx occ white porous bryoz lst.

474 part Xtal (calcite) lst with bryoz mod porous

494 (F) occ white vbryoz ff lst

517 vpx white mod dense lst traces orange pink 'dots' chiefly vporous bryoz lst

534● Cream v porous bryoz lst chips, chiefly dirty marbly bryoz lst.

536 Porous pink calcite xtals sli oolic

557 lt pink calcite KIA

578 V porous occ white bryozoa lst part quite calcitic occ gast + yellow bryozoa

V. well cemented.

582 Porous pink calcite (c/f 557)

587 buff bryozoal calcite with a lot cement

597 (F) Calcitic mod porous bryozoal lst

607 Bryoz lst occasionally with pinkish infilling; Calcitic

625 c/f 587 lower sli lst content

635 KIA

646 hard dense bryoz lst change in bryozoa type wide irregular flat surface ?

666 KIA with calcite & V porous bryo patches, cream colours ?? Nararaterish

686 Dense occ white bryo lst – long branching bryozoa

700 (F) C/F 666 + 646.

Check Glenelg 1. Cores

Glenelg 1.

816 Semi cale med-gram sst. Otz is col, rnd, - S rnd, stained
Sample is orange pink — No fossils seen.

Post Mep Var
?? Upton Var

902 Cale verse-granular sst — Otz rd 40-60% col, (pale) cel stained, cement Mep Var
is lime & calcite, occ calcite rhombs, glauc, semi recd
to 0.5mm
Much lighter colour than 816, lower ex transl white Otz

923 NTA some finer grained Otz Mep Var.

917 finer grained sylt/vfs 'clayey' foss semi calcarenite with the grains being
dolo/calcite 15%. cse-verse Otz — bry with semi stones Nana Mep Var.

Comparison with Cor 180m Waiarei 21-75-3.

736 wh/gr Pebbly bryozoal, sli foraminifl dense clad lst marly lst.
746 wh/gr Mod bryozoal clad lst
756 gr bryoz + foram marl bryoz similar to Waiarei 21-75-3 Cor 180 m. * Wash for forams
770 buff wh/gr ff lst. prob with sponge spics Messin bryoz & forams
779 wh/gr mod bd bryozoal lst. Some similarity to Waiarei 21-75-3 Cor 180m. * ? Pel
807 sli ff chalky lst.

666 White (ground, pipe like) bryozoal lst v porous ext parts.
689 sli clayey wh/gr bryoz lst NTA. occ forams
700 gr wh lst — pipe like & flat marly bryozoa.
730 Sandy & pipe like - mostly bryozoa gr-wh bryoz lst, occ forams

635 bryozoal dolomite - bryozoa - thin branching Some resemblance to Waiarei at 180m *
635 NTA *

607 White pink bryoz dolo lst. occ forams, v ff, Pink-calcite ? ?
597 Dolo wh-gr bryoz lst.
587 v/f 635
582 Pink dolomite, replaced bryozoa ?
587 Ind, v porous calcite bryozoal lst. (crleans)
557 Pink dolo lst
537 Porous pink dolomite v/f 582

Bleasby 1 Oct 20. 75

534 Amended bryozoa - lst. ol-gr + white cream
bryozoa pisolithic + flat-porous, large porosity

517 reminder - ATA white lst with ool echi. spicul

494 Cream col. bryozoa + foraminifera, ool echinoid spicul,

474 Cream bryo slightly lst, traces of orange yellow limonite.

465 Gr bryozoal mud, some recall like bryozoa, ool foram - bryozoa bear some resemblance to Warrani at 180 m

432 Cream yellow lst, bryozoal + foram lst.

410 Gr sli bryozoal dolomitic calcarenite

390 as F 432

368 gy-white ff - bryo, foram lst.

349 Chert ff. (as Warrani 21m, 48m 177m 189m 198m)

328 sli dolo sli bryo lst., white or cream

310 ATA

293 Clasts ATA

253 Softish sli bryozoal lst. gy-white, + gr grnd ff chert (see note at 348).

230 Mod ff gr chert ATA. (see note at 348)

220 sl. sli ff white-gy lst.

198 ff gr chert. (see not at 348)

192 sli bryozoal, sl. gr mud lst.

172 ATA with gr chert

152 Clean bryo fine lst. as Warrani Col 96 m

132 Gr bryozoal lst

112 Gr ff chert. (see note 348)

108 sl. white sli bryo lst.

6 Clearly / Cont

720 Mod hard white bryozoal lst plast + branching bryozoa A/A

730 gr sli speckled ⫽ lst. bryozoa A/A

731 Vhard lt gr dense, bryozoal ⫽ lst.

746 A/A less dense, minor dendritic pyrite, occ calcite xtals

758 gr foraminiferal marl with silicified bryozoa casts.

770 Mod hard V lt gr ⫽ bryo lst with echinoid spines - casts.

779(F) Dense fn bryo lst, dendritic pyrite patches occ fossils ? Pkl or Nanawaituk

790 Grades A/A. no pyrite

807(F) fn bryo lst with calcite xtals

811 bryo ⫽ lst with trace glauconite

872 Calcite xtals with dolomite matrix

817-837 Qtz - med to v coarse grain, lt (pale) occ stained brown, rd low spher

Vcse sli dolo cemented sst. Pos Clifton Var / Mepunga Var

837-857 A/A. 10% frosted, occ Qtz freq stained, nods of limonite ? Mep Var.

857-874 A/A med - grain,

877 Core A/A calcite cemented

874-885 darker sample A/A

885-902 A/A

902 as for 877

903-922 A/A

923(F) Cemented frosted Qtz with 15% (~5%) lt Qtz med-vcse. frags 60%. lt + stained Qtz Mep Variant or Delaroyn Variant

939(F) fn - vcse Qtz marbly lt. Mep. Variant

947 Cemented xtal dolomite with biot glauc nods + occ Mepunga Qtz grains Nanawaitukk or Mep. Variant

953 green brown chamosite sdst or frsd sand, Up to 30% chamosite or glauc Mep or Delaroyn Variant

963(F) dst or fn sst with occ mepunga Qtz + sept wisps glauc/chamosite/limonite nods trace of muscovite

976 Sandy limonitic chloritic marl, Mepunga Qtz grains vcse to Portland 3 Mep Variant

Var clear Qtz

989 Qtzose v limonitic brown hard marl Delaroyn or Mepunga Variant

992 Core Delaroyn frsd/sdst sli micac + marly.

Clifton NO lithol evidence for or the cemented pyrite calcite at 536' is most unusual. but doubt if this is a Clifton Variant

Top Nanna may be at 685' or possibly 796' Check Rx's

Over →

May 18 77

Oberlady 1 Dil Top check re Tyrendarra Embay boreholes

1079 fn micac lt brn/gy or wh slst, laminated or carb part
Normally regard as Dil

1089 gy wh micac carb slst or v/fn sst. thn bedded ow carb lams A/A

1099 lt brn A/A. with med dk brn mst lenses, blebs (calc micac)
ow carb lams, sands (v/fn) are ow clean. gen as A/A

1109 bioturbated muddy brn slst to v/fn micac sst. - freq cleaner fn sst
'Tubes' to 0.7mm. v/fn sands are mod clean Regard as Dil.

1119 muddy v/fn sst/slst. less bioturbated than above. [Pen 70% slt/sand] A/A

1129 muddy slst + v/fn sst. pply bioturbated A/A.

1139 gen as A/A but mudstones A/A

1145 bioturbated micac muddy v/fn sst/slst. Dil type A/A

1153 thn dk brn ogy wh slst/v/fn sst, abn carb, no material
wh
qtz (frosted) pebbles to 7-10 mm ppn thn bedded Dil type
dissd.

1179 fn sst disturbed by drilling, gen as slst/v/fn ogy wh sst. A/A. no pebs A/A.
Dil disturbed dk brn mst bands to 2 mm

1199 A/A. Thn micac ogy wh slst v/fn sst w mst rnts. Dil type

More mica

More sand/vfn sst

The bioturbated micac muddy slst/v/fn sst sequence furnishes at 1145 + is underlain by a predominantly ogy white micac slst/v/fn sst, thn bedded with 2 mm thick mst interbeds. Occasional frosted white qtz pebs still recorded.

I regard both as belonging to the Oberon

PPF prob 3660 – 3690 ??

Clearly 1. Oct 1 '75

2732	Approx Top PMM & Variants	PMMVar
3080	Poss base of ?1st PMM unit	PMMVar
Core 3236	sli marn pale orange sst – Qtz fn-verse, mainly sub-rd. trans/orange, with mainly even surfs. (No glaze).	Del Var ???
3366	Core brn sli marn sli ff (explosion) mst with carb frags	PMM
3655	Core Marn – lams brn dargey sli carb mst	PMM
3690	gr mod hd pyritic/ Poss sedentary also mainly mst with occ calcite intergrowth (via drusy cavities) Qtz smooth sli smoky clear – opaque crse-verse.	?? Paarattic or ? Del Var.
3712	gr hd dolo sli sandy shrt. Poss basal PPF? Qtz not PPF like most unusual.	Paarattic or ? Del Var
3718	Disturbated hd sandy mrst SHO wh+gr-blk	
3723	lam lenticular gr/white fn sltly sst	?? Paarattic like
3740	Mbdl/mst black sli carb w white lams frost	" "
3791	Cemented brn sst – Qtz med sang – sub	Cardies type
3805	ATA as shst.	" "
3850	Ember like brn sli marn carb mst.	
3875	Marn med-verse sst w mst lams (brn)	Cardies type
3885	lam brn sli carb mst fn sst (white) lenses c/c 3850	
3955	Med-crse opaque Qtz, ang – rd	Paarattic.
4075	brn sli carb mst, minor fn sst patches c/c 3850 3885	
4085	fn-med Qtz sub ang – transl/opaque prob lam w mst	Paarattic/Var Cardies
4180-4202	Dilute – Qtz, Contam, med-gran, some stain 20% Col, sang – rd, Rare gr chert. Rare gr hd brn mst Mbdl, Rare glaze, [Some PPF like Qtz]	
4220	med-pebble opaque/Qtz transl. ang-rd occ coal frag sli calc	Cardies
4260	med-pebble Qtz – 20% Col + stained Rare · PPF/Type Marn glaze.	
	briefly contam	
4291	ATA Trace blk vermicular (prob bio mods) hd ppf mud	
4302	lam brn sltly mard + fn white sst.	Paarattic Var
4368	gr-brn sli carb + marn mst on sst.	
4506	White opaque/transl Qtz-fn, marn, sli carb	Paarattic Var
4681	fn-med Qtz- Col pale orange, coal frags, Pyrite cemented sli marnly chips, comp fining marn/marnly sand/silt blds.	? Nullamare
4743	fn sst wh, with wispy fining fn sst/mst lenses (irregular)	Paarattic Var
4746	ATA. gr brn shst lenses. ; carb	"
4792	lam white + gr blk shst + fn sst, carb w occ crse-verse Qtz grains	Paarattic
4808	Qtz – fn – gran V pyritic – clasts, 80% Col pale orange – ylh. marnly S rst	
4809	fn crse opaque – transl white Qtz. minor pyrite + carb frags	Prob Nullar Var Paarattic.

to 1015 basically basaltic or [illegible] at Salt Lake type

6935 [illegible] muddy [illegible] basaltic type [illegible] ~ unsure ?

Nelson Bore Microplankton.

Deflandre & Cookson 1955 Aust J Mar Freshw Res. Vol 6 242-313

Stover - Spec Pub Geol Soc Aust. 4. 1973 Page 167-188

T-Lillei Zone
Maast. - Cenomanian
See Douglas 1980.

Deflandrea pellucida — Nelson Bore · 1181.5 m (3874')

Apteodinium tetradecanthum — Mast Paleocene - lower L Balmei Zone. 3874'

Hystrichosphaeras cingulatas — Nelson Bore 992'

Hystrichosphaeridium complex (White) — Nelson Bore 5782' 6192'
Hystrichosphaeridium heteracanthum — 5782'
Ondontochitina cribropoda — Nelson Bore 5782' U Cretac. Paleg Eocenus Zone

Epicephalopyxis indentata — Nelson Bore 3874', 992'
Hystrichosphaera ramosa — 992'

Tricolpites Edwardsii — 3723' 3874', 4025', Part L Balmei Zone. to U Creta

M. Phyllopsorites australiensis Cookson 5782, 6085' Part U Creta.
CICATRICOSISPORITES

See also Cookson & Pike '54 Aust. J. Botany 2 197-219.

Nelson Bore 992' Myrteaceidites parvus forma anemus
992 Proteacidites pachypolus
992 Santalumidites cainozoicus (Eocene)
992 Cupaneidites orthoteichus
992 Tricolpites harrisii

3723, 3874, 4025. Tricolpites Edwardsii Upper Creta - Paleocene.

Bundy 1. Nilpa Core Bay 24.

108 bst. cont to 534.

536 - 582 Pinkish bst.

587 marly bst

646 bst

736 - 812 Marly bst / lst.

816 - 923 Clifton / Mepunga verse ferruginous calc sand - grit

939 ? Dilwyn lumpy coarse sst. occ ferruginised grains.

947 Dolomite, limonitic nodular. ferruginous occ Qtz grains

953 ? Volcs { Weath gneiss? ppy with soft greenish nodules, occ qtz grains
976 ?Tuff limonitic nods, ferruginous occ Qtz grains
989 { hard laminated mudstone with ferruginised & foliated fn - grit sized qtz grains

992 Dilwyn " Dilwyn Non calc.

Brown silty sst.

- 3154 Dilwyn marly Pmn - lam shale / sst.

3206 some qtz grit - pebbles

3236 fine - occ well cemented ferruginous sandstone

32[redacted] laminated bedded. v hst / mst.

3274 v fine white sst (Parmelle like)

3566 - 3647 Pember like mst / shale. 3650 rare calc fossils - Dilwyn

3647 - 3655 Mst Pember. Shale

3690 - 3718. PPF Vhard - ms, pyritic mst w occ - verse smoky Qtz grains to mdy sst.
Sli laminated shst / mdy sst.

3723 Lam mst / sst black & white

3850 Ferruginous shale with v minor fine white sst lams. ? Parmelle like
Sli ferruginous mst. — Pember like

3795 pebbly sst. & lam brown shale / white fn sst. (Andrew like)

3874 Sli pebbly occ fn - crse sst. unconsol.

3887 mst like 3850.

39[redacted] Pebbly fn - crse sst

4015 mst like 3850, 3887

4085 fine sandy shale.

4220 crse sst. like 3874, 3920 also some brown shaly mst w fine sand lams

4259 crse sst w smoky Qtz pebbles

4280 - 4302 Otibei Sands crse unconsol sst. w ferruginised grains } pebble Mt like

4260 - 4277 MTA Sli pebbly.

4291 - 4300 MTA

4302 Thin brown mst w v fine white sst lams

4366 brown mst

4506 fine white sst. Resinite Parmelle.

4607

4681 yellowish well cemented fn - med sst. Sli ? bioturbation ?? Nullawarre sonset.

4743 hard fine white sst w brown muddy clast wisps, lams.

4808 crse pebbly, pyritic, sst. rare glauc (not unusual glauc) ?? Nulla.

4911 clean crse Qtz sst

4968 mdy sst

4970 fine white sst w lam black shale / shst

5010 Otibei Sands sst -

5112 fm white slt w/ sandy slt [illegible] & brown silty clst
5191 N/R. Typical shaly Rannoch.
5202 white/gy fm-med slt. occ strong mic cmt, silty sandy
dom - thin fm slt & brown clst

5391 - 5427 Seller Formn v close spc grain mbrs fining sequs

5458 fine, thin slt. slt muddy
5536 Thin, rhythmic, fine siltstone slt. & brown ?calc sandy laminae
5597 fine white slt. some calc lams
5782 Lightly [illegible] Channel, clst - v fm slt. black & gely mottling. typical
Channel Rannoch. Siltstone fine silty slt. v hd. w worn soft green nodes.

5835 hd siltstone / fining fm slt
8861 N/A as Channel Rannoch.
5915 fm slt. fining or siltstone or pale dk gy soft nodes

6085 ?Channel Rannoch, mbrs, muddy Rannoch slt. brg. fining & v hd, siltstone brownish/fm slt. with soft pale grn nodes. see 5782 5915.

6192 mbr slt & v hd fining clst

6233 Channel Rannoch typical fm sandy slt. some clean fm sst slt & mst dk gy sandy slt.
sands may be quite ?glauc. type Nulla.

6298 Unspec Rannoch slt. slt chloritic & slt glauc med slt. w occ [illegible] grain slt may even be silic ? altered type Nulla
6337 Cemented clst fm slt w occ glauc pellet

6408 hd gy/gr mst w black flecks; slt wavy mst typical Kildonan type

6418 hd glauc med sandy slt, silty mst. - ?thin mud matrix

6489 Typical dark Rannoch type v fm slt. laminae, mbrs, thinning

6520 variecoloured fm-v fine micaceous sand. w gr shale chips

6570 Shale chips w sand

6577 mdly dkgy fine sand occ calc frag Rannoch calc pors
thinning

6615 Seller - core - v fine sand (finely lam) w micaceous shale (v muddy slt)
6650 " (Caution) - Similar, mbrs of shale (v muddy slt) Shale & sand
6670 " - sand (v fine) w shale
6680 core - fine white slt w black mbrs, lams & nods. (Kinlochan?)
Rannoch.

6754 core - fine gy/gr glauc slt & black silt some thinning
6894 core - hd, fm-med, white sandst w w flecks mudclasts still present
mbrs/lams/laminae

7062 Seller - med-v fine sand w micaceous slt mbrs gr shale (v muddy slt)
clst grains glauc. finely but can be strained
7175 - Seller - med-v fine clst. (Sandy/fissile) gy mbrs & lags shale (muddy slt)
7250 - Seller - fine, fm-v fine micaceous muddy slt, w glauc sandst.

TD 7305

Nelson Bore.

At 4045' drilling foreman reported a "slight showing of gas carrying a few globules of oil.

Log Value Oil Wells Pelican Point 2000 - 2311'

on Boatakoff N.1963 Mesozoic 11522 Geol Surv Vic

T.D. 7305 ft. Completed 1965

0 - 812 feet Limestone, dolomite + marl

812 - 992 feet Glauconitic + ferruginous sandstone + grit

992' - 7305 feet Lignitic sandstones, grits + siltstones.

Original Drillers Log for Week Ended 4/9/42

Consequent Report No 39.

" Slight showing of gas carrying a few globules of oil at approximately 4045 feet."

2.3 Lithological Logs

PUEBLA 62
8014
LITH

GEELONG FLOW. 1

Surface level ca 100'

Rock units	Samples	Depth struck	Driller's log	Depth struck	Thickness	Lithologic log
		0	soil	0	33'	pale reddish brown, mottled light
Q1	S	1'	red clays		10.06	grey clayey coarse sand and
	S	15'	red sandy clay			sandy clay
Formation	S	33'	white sandy clay	33'	37'	dark yellowish orange and greyish
	S	43'	yellow clay (sandy)		11.27	orange, mottled very light grey
	S	47'	yellow clay			and yellowish grey, sandy silty
						clay, less commonly sandy clayey
						silt; sparsely fossiliferous (rare
						foraminifera)
	S	70'	grey silty clay	70'	20'	yellowish grey calcareous silty
			with bands of	21.33	6.09	clay and silty marl with inter-
			limestone			beds of fine-grained limestone,
						fossiliferous (pelecypods, bryozoa,
						foraminifera)
	S	90'	dark silty clay	90'	150'	pale yellowish brown silty marl
	S	120'	marl	27.43	45.72	with interbeds of fine-grained
	S	150'	marl with bands			limestone; richly fossiliferous
			of limestone			(bryozoans, pelecypods, gastro-
						pods, echinoids, foraminifera)
				240'	160'	pale yellowish brown silty marl
	S	306'	marl	73.14	48.77	and calcareous silty clay, with
	S	325'	layers of stone			limestone interbeds; pyrite
			and marl			common, glauconite rare; richly
Puebla	S	385	sticky marl			fossiliferous (bryozoans, pelecypods,
						gastropods, echinoids, foraminifera)
				400'	200'	as above, but without limestone
	S	405'	marl	121.91	60.95	interbeds
	S	525'	very sticky marl			
	S	535'	marl			
				600'	10'	brownish grey calcareous silty
				182.87	3.05	clay; pyrite abundant; fossi-
						liferous (gastropods, foraminifera
				610'	160'	yellowish brown and brownish
				185.92	48.77	grey calcareous silty clay and

Tertiary	Eocene	Nanaimo Group	Extrusive Igneous Rocks				light olive grey silty marl; glauconite, pyrite and limonite present; richly fossiliferous (pelecypods, gastropods, bryozoans, echinoids, foraminifera)
					770' 234.68	90' 27.43	brownish grey silt and silty clay, fine to coarse sand and granule gravel; less commonly light olive grey silty sandy marl; glauconite, pyrite and limonite present; marl richly fossiliferous, silt and sand less so (gastropods most common)
					262.77	2.733	
				860' igneous rock	860'	7'	basalt (?)
		Nanaimo Group	Demon's Bluff Formation	S 867' igneous sand	867' 264.25	293' 89.30	brownish grey to brownish black (generally becoming darker downwards) carbonaceous clayey silt and very fine sand, less commonly carbonaceous silty clay; pyrite abundant; locally with burrows and sparsely fossiliferous (gastropods most common)
				S 1130' igneous clay			
			Extrusive Igneous Rocks		1160' 353.55	60' 18.28	light grey, locally light brownish grey and brownish grey silty somewhat sandy clay, kaolinitic and somewhat pyritic
			Otway Formation	S 1220' blue clay	1220' 577.84	830' 252.97	light grey, less commonly medium grey to medium dark grey mudstone, siltstone and fine sandstone; locally coal laminae, plant remains and pyrite
				S 1260' igneous clay			
				S 1290' hard mudstone			
				S 1535' blue slate			
				S 1800' grey sandstone			
				S 1810' iron pyrites			
				S 1830' blue clay			
				S 1910' blue slab			
				S 1940' blue clay			
				2050' (Total depth)	2050'		

624.81

PUBLA 8014
LITH 2

GEELONG FLOW OIL CO. LTD.

NO. I. BORE.

Lithological Log.

(Copied from Original Driller Log by G.J. Coulson.)

0'	-	1'	Soil
1'	-	15'	Red Clays
15'	-	33'	Red Sandy Clay
33'	-	43'	White Sandy Clay (Water)
43'	-	47'	Yellow Clay (Sandy)
47'	-	70'	Yellow Clay
70'	-	90'	Grey silty Clay with Bands of limestone
90'	-	120'	Dark silty clay
120'	-	150'	Marl.
150'	-	306'	Marl with bands of limestone (Water)
306'	-	325'	Marl
325'	-	385'	Layers of Stone and Marl
385'	-	405'	Sticky marl.
405'	-	525'	Marl
525'	-	535'	Very sticky marl
535'	-	860'	Marl
860'	-	867'	Igneous rock
867'	-	1130'	Ligneous sand
1130'	-	1220'	Ligneous clay *
1220'	-	1260'	Blue clay
1260'	-	1290'	Ligneous clay *
1290'	-	1535'	Hard Mudstone
1535'	-	1800'	Blue slate *
(1800'	-	1810')	No sample, sludge with gas and grey earth*
1800'	-	1810'	Grey Sandstone
1810'	-	1830'	Iron Pyrites *
1830'	-	1910'	Blue clay
1910'	-	1940'	Blue slab
1940'	-	2050'	Blue clay *

* The following notes were made by Dr. D.E. Thomas.

On 16:8:1948	1200' - 1210' - 1220'	Bedrock, probably Jurassic.
On 20:9:1948	1260' - 1290'	The samples are mudstone and Sandstones belong to the Jurassic
1:6:1949	1590' - 1600'	Black Carbonaceous mudstone containing fossil plants of Jurassic age.
29:9:1949	1810' - 1830'	Jurassic sandstone and mudstone
22:11:1949	1900' - 1910'	Contains some bituminous coals. Thickness cannot be determined for Samples by percussion drilling.
23:1:1950		At. 2030' some fragments of coal.

Original Driller log has recorded for the interval 1800' - 1810'. No Sample - The Sludge now being brought up by the "bailer" from the bottom of the bore, is of high temperature and contains gas which ignites when a lighted match is applied to the top of the "bailer".

Earth washes off drill when being drawn to the surface of the bore. The samples last obtained have been a grey earth. At 1800' the strata has hardened considerably and is a hard sandstone.

3.0 Palynology/Paleontology

3.1 Mesozoic Stratigraphic Palynology

P.R. Evans

Alan Partridge

Palynology

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS

RECORDS:

1966/69

MESOZOIC STRATIGRAPHIC PALYNOLOGY OF THE OTWAY BASIN

by

P. R. Evans

15928/65

MESOZOIC STRATIGRAPHIC PALYNOLOGY OF THE OTWAY BASIN

by

P.R. Evans

Records 1966/69

CONTENTS

ODNL Mount Salt No. 1

The distribution of selected species and form genera in Mount Salt No. 1 were listed by Evans (in Oil Development N.L., 1963), who attempted to indicate on the basis of these fossils the probable correlates of the well section to be found in the eastern portion of the Otway Basin. Bureau of Mineral Resources, Geology & Geophysics (1965b) used these correlations to interpret the well in terms of formations occurring in the eastern Otway Basin.

BMR NO. (MFP)	CORE/CUTTINGS	DEPTH (Feet)	PALYN. UNIT
2191	Core 8	2913	T
2193	" 11	3682	
2914	" 13	4219	X.a = Xenikoon aust
2119	" 14	4538	
2120	" 18	5039	
2114	" 19	5194	N.a
2112	" 20	5490	
2113	" 21	5790	
2106	" 23	6404	D.a
2107	" 24	6672	
2103	" 25	6985	
2104	" 26	7473	
2115	" 28	7940	?
2116	" 29	8429	
2117	" 30	8919	
2195	" 31	9424	?
2196	" 33	9849	
2197	" 34	10037	K2

The Nelson Bore (= Glenelg No. 1)

Drilled by the Commonwealth and Victorian Governments long before subsidized operations commenced in the Otway Basin (Department of Mines, Victoria, 1941-46), the Nelson Bore was studied by Baker (1961), Baker & Cookson (1955), Cookson (1956), Crespin (1954), and Douglas (1962). The writer has also examined selected samples, and uses the results in the present report.

BMR SAMPLE NO. (MFP)		CORE/CUTTINGS	DEPTH (Feet)	PALYN. UNIT
	I.C.	Core	3874	D. pellucida
1831		"	4205	
1832		"	4300	
1833		"	4500	?
1834		"	4867	
1835		"	4920 1477m	X.a
498		"	5112	= Xenikoon australis
	I.C., J.D.	"	5304	
500		"	5708	
	J.D.	"	5782 1736	
501		"	6000 1801	N.a
502		"	6129	= Nelsonella aceras
503	I.C.	"	6233-6236	
504		"	6418	
505		"	6575 1974	D.c
	J.D.	"	6672-6681 2083	= Isabelidinium cretaceum
506		"	6751-6754	
507		"	6843-6844	
508		Cuttings	7062-7071 2123	?
509		"	7296	

I.C. = examined by Dr. Isabel Cookson.
J.D. = examined by Mr. J.G. Douglas.

ODNL Penola No. 1

Penola No. 1 was initially examined by Evans (1961b), whose results were later published in Hare & Associates (1963). The well formed in part the basis of Dettmann's study (1963) of Cretaceous microfloras in the south-eastern Australian region.

BMR SAMPLE NO. (MFP)	CORE/CUTTINGS	DEPTH (Feet)	PALYN. UNIT
	ODNL Penola No. 1		
1253	Core 1	1200-1210	
1254	" 2	1410-1418	
1255	" 3	1610-1620	
1256	" 4	1805-1815	
1257	" 5	2010-2020	K2b
1258)	" 6	2200-2210	
1316)			
1259	" 7	2380-2390	
1260	" 8	2586-2596	
1261	" 9	2790-2798	K2a

REFERENCES

ALLIANCE OIL DEVELOPMENT AUSTRALIA N.L., 1966 - Completion report Kalangadoo No. 1 O.E.L. 22, South Australia (unpubl.).

BAIN, J.S., 1962 - Well completion report, Pretty Hill No. 1, southwest Victoria. Frome-Broken Hill Co. Pty Ltd Rep., 7200-G-94 (unpubl.).

BAIN, J.S., 1964a - Well completion report - Sherbrook No. 1, southwest Victoria. Ibid., (unpubl.).

BAIN, J.S., 1964b - Well completion report - Ferguson's Hill No. 1, southwest Victoria. Ibid., (unpubl.).

BAKER, G., 1953 - The relation of the Cyclammina-bearing sediments to the older Tertiary deposits southeast of Princetown, Victoria. Nat.Mus.Melb.Mem., 18, 125-134.

BAKER, G., 1961 - Studies of the Nelson Bore sediments, western Victoria. Geol.Surv.Vic.Bull., 58.

BAKER, G. & COOKSON, I.C., 1955 - Age of the Nelson Bore sediments. Aust. J.Sci., 17, 133-134.

BALME, B.E., 1963 - Plant microfossils from the Lower Triassic of Western Australia. Palaeontology, 6(1), 12-40.

BELFORD, D.J., 1958 - Stratigraphy and micropalaeontology of the Upper Cretaceous of Western Australia. Geol.Rund., 47(2), 629-947.

BENEDECK, S., 1964 - Well completion report - Port Campbell No. 4, southwest Victoria. Frome-Broken Hill Co. Pty Ltd., (unpubl.).

BERGGREN, W.A., 1965 - Paleocene, a micropaleontologist's point of view. Bull.Amer.Ass.Petr.Geol., 49(9), 1473-1484.

BOCK, P.E. & GLENIE, R.C., 1965 - Late Cretaceous and Tertiary depositional cycles in south-western Victoria. Proc. Roy.Soc.Vic., 79(1), 153-163.

BOUTAKOFF, N. & SPRIGG, R.C., 1953 - Summary report on the petroleum possibilities of the Mount Gambier Sunklands. Min.Geol.J., 5(2), 28-42.

BROWN, G.A., 1965 - New geological concepts Casterton area Otway Basin - Victoria. Aust.Petr.Expl. Ass.Journ. (for 1965) (in press).

COOKSON, Isabel C., & DETTMANN, Mary E., 1958 - Some trilete spores from Upper Mesozoic deposits in the eastern Australian region. Proc.Roy.Soc.Vic., 70(2), 95-128.

COOKSON, Isabel C. & DETTMANN, Mary E., 1959a - Corrigenda for 'Some trilete spores from Upper Mesozoic deposits in the eastern Australian region'. Ibid., 71(1), 138.

COOKSON, Isabel C. & DETTMANN, Mary E., 1959b - Cyclosporites, Cretaceous microspore : corrected name. Aust.J.Sci., 21(8), 260.

COOKSON, Isabel C. & DETTMANN, Mary E., 1959c - On Schizosporis, a new form genus from Australian Cretaceous deposits. Micropaleontology, 5(2), 213-216.

COOKSON, Isabel C. & DETTMANN, Mary E., 1961 - Reappraisal of the Mesozoic microspore genus Aequitriradites. Palaeontology, 4(3), 425-427.

COOKSON, Isabel C. & EISENACK, A., 1958 - Microplankton from Australian and New Guinea Upper Mesozoic sediments. Proc. Roy.Soc.Vic., 70(1), 19-80.

COOKSON, Isabel C. & EISENACK, A., 1960 - Microplankton from Australian Cretaceous sediments. Micropaleontology, 6(1), 1-18.

COOKSON, Isabel C. & EISENACK, A., 1961a - Upper Cretaceous microplankton from the Belfast No. 4 Bore, south-western Victoria. Proc.Roy.Soc.Vic., 74(1), 69-76.

COOKSON, Isabel C. & EISENACK, A., 1961b - Tertiary microplankton from the Rottnest Island Bore, Western Australia. J.Roy. Soc.W.A., 44, 39-47.

COOKSON, Isabel C. & EISENACK, A., 1962 - Additional microplankton from Australian Cretaceous sediments. Micropaleontology, 8(4), 485-507.

COOKSON, Isabel C. & MANUM, S., 1964 - On Defl. victoriensis n.sp., D. tripartita C. & E. and related species. Proc. Roy. Soc.Vic., 77(2), 521-524.

CRESPIN, Irene, 1954 - The Nelson Bore, south-western Victoria, micropalaeontology and stratigraphical succession. Bur.Min.Resour.Aust.Rep., 11.

CUNDILL, J.R., 1965 - Planet Casterton No. 1. Completion Report for Planet Exploration Company. Cundill, Myers & Assoc. (unpubl.).

3.2 Paleontological Core Data Sheets

SAMPLE NO.

GLENELG 1

Depth: 220'
Material: CORE
Locality:
Formation:

Rock Type:
Geological Information:
Collected by:

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed		JUNE '78
Polished		
Sectioned		
Slides		

General Description of Fauna: 1 spec G. dehiscens (broken all ch)
G. woodi

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation:
Lithology:
Age: 6
Determined by: Date:

8469/54

SAMPLE NO.

GLENELG 1?

Depth: 108'
Material: CORE
Locality:
Formation:

Rock Type:
Geological Information:
Collected by:

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed	JUNE '78	
Polished		
Sectioned		
Slides		

General Description of Fauna: rather sparse fauna
G. woodi common
G. stavensis (reworked? contn?)

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation:
Lithology:
Age: 6
Determined by: Date:

8469/54

AMPLE NO.

GLENELG 1

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

Depth	293'
Material	CORE
Locality	
Formation	

Rock Type	
Geological Information	
Collected by	

——	Signature	Date
Inspected		
Washed		JUNE '78
Polished		
Sectioned		
Slides		

General Description of Fauna: rather sparse fauna mostly small planktonics

G. Ruggeri

A. scitula (cont'd)

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation

Lithology

Age 5 (-6)

Determined by: | Date

8469/54

SAMPLE NO.

GLENELG 1

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

Depth	410'
Material	CORE
Locality	
Formation	

Rock Type	
Geological Information	higher V. conoidea (=plecta) acc Crespin (1954) in 368-390' spl
Collected by	

——	Signature	Date
Inspected		
Washed		JUNE '78
Polished		
Sectioned		
Slides		

General Description of Fauna: rather sparse fauna mostly small planktonics

G. crassaformis

G. scitula

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation

Lithology

Age 5

Determined by: | Date

8469/54

	807'
terial	
ocality	
ormation	

Rock Type	
Geological Information	
Collected by	

	Signature	Date
Inspected		
Washed W		May '75
Polished		
Sectioned	IK; CA/[illegible]	
Slides	G C	

eneral Description of Fauna

Chiliguembelina cubensis
Iov 2 poorly developed S. angiporoides

B. cubensis

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Othe
Abundant						
Common						
Rare						

Preservation

Lithology

✓ ac 779'

Age (3-)4

Determined by: | Date

8469/54

LE NO.

GLENELG 1

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

Depth	779'
Material	CORE
Locality	
Formation	

Rock Type	
Geological Information	
Collected by	

	Signature	Date
Inspected		
Washed		JUNE '7
Polished		
Sectioned		
Slides		

General Description of Fauna sparse fauna

S. angiporoides

C. cubensis (abdt)

G. stavensis "

B. cubensis

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	C
Abundant						
Common						
Rare						

Preservation

Lithology

Age 3

Determined by: | Date

8469/54

SAMPLE NO.

GLENELG 1

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

Depth	700'
Material	CORE
Locality	
Formation	

Rock Type	
Geological Information	
Collected by	

	Signature	Date
Inspected		
Washed		JUNE '
Polished		
Sectioned		
Slides		

General Description of Fauna sparse fauna

C. cubensis (abdt)

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.
Abundant					
Common					
Rare					

Preservation

SAMPLE NO.

GLENELG 1

Depth	597'
Material	CORE
Locality	
Formation	

Rock Type	
Geological Information	
Collected by	

MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed		JUNE '-
Polished		
Sectioned		
Slides		

General Description of Fauna sparse fauna, small planktonics

G. stavensis (common)

[illegible] (rare)

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	C
Abundant						
Common						
Rare						

Preservation

Lithology

Age 4

Determined by: | Date

8469/54

SAMPLE NO.

GLENELG 1

Depth	494'
Material	CORE
Locality	
Formation	

Rock Type	
Geological Information	
Collected by	

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed	JUNE '78	
Polished		
Sectioned		
Slides		

General Description of Fauna G. eugubina

G. stavensis

[illegible]

[illegible] (cont'd)

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.
Abundant					
Common					
Rare					

Preservation

Lithology

Age 5

Determined by: | Date

8469/54

SAMPLE NO.

GLENELG 1

Depth	453'
Material	CORE
Locality	
Formation	

Rock Type	
Geological Information	
Collected by	

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed	JUNE '78	
Polished		
Sectioned		
Slides		

General Description of Fauna G. eugubina

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.
Abundant					
Common					
Rare					

Preservation

SAMPLE NO. | GLENELG 1

Depth: 923'
Material:
Locality:
Formation:

Rock Type:
Geological Information:
Collected by:

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed W		May '75
Polished		
Sectioned	CA (plank)	
Slides W	C	

General Description of Fauna: rich planktonics; somewhat "limestony" preservation

S. angiporoides
C. cubensis

A. aotearoa – contamination

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation:

Lithology:

Age: 3

Determined by: | Date:

8400/54

SAMPLE NO. | GLENELG 1

Depth: 807'
Material:
Locality:
Formation:

Rock Type:
Geological Information:
Collected by:

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed W		May '75
Polished		
Sectioned	IK; CA (plank)	
Slides G	C	

General Description of Fauna:

Chiloguembelina cubensis
1 or 2 poorly developed S. angiporoides

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation:

Lithology:

Age: (3-)4

Determined by: | Date:

8400/54

SAMPLE NO.

GLENELG 1

Depth 1221'

Material

Locality

Formation

Rock Type

Geological Information

Collected by

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed W		May '75
Polished		
Sectioned		
Slides		

General Description of Fauna

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other
Abundant						
Common						
Rare						

Preservation

Lithology

Age

Determined by: Date

8469/54

SAMPLE NO.

GLENELG 1

Depth 939'

Material

Locality

Formation

Rock Type

Geological Information

Collected by

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed W		May '75
Polished		
Sectioned	1K; CA(plank)	
Slides	G C	

General Description of Fauna a few S. angiporoides

Ammonia aoteana (& other spp) - contaminant

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other
Abundant						
Common						
Rare						

Preservation

Lithology

Age 3

Determined by: Date

8469/54

SAMPLE NO.

GLENELG 1

Depth: 2748'

Material:

Locality:

Formation:

Rock Type:

Geological Information:

Collected by:

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed W		May '75
Polished		
Sectioned		
Slides W		

General Description of Fauna: planktonic, mostly small; incl. S. angiporoides;

Ammonia aoteana — contaminatn

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation:

Lithology:

Age:

Determined by: | Date:

8469/54

SAMPLE NO.

GLENELG 1

Depth: 1690'

Material:

Locality:

Formation:

Rock Type:

Geological Information:

Collected by:

Geological Survey of Victoria
MICROPALAEONTOLOGICAL LABORATORY

—	Signature	Date
Inspected		
Washed W		May '75
Polished		
Sectioned	CA (plank)	
Slides W	C	

General Description of Fauna: planktonics include S. angiporoides

Ammonia aoteana — contamnatn

Occurrence	For.	Ostr.	Bryoz.	Echin.	Moll.	Other.
Abundant						
Common						
Rare						

Preservation:

Lithology:

Age:

Determined by: | Date:

8469/54

3.3. Report on the Age of Nelson Bore Sediments

ARSONS, D. S., and HOLMES, R.
6, 164, 183.
SONS, D. S., and MORRISON, S. A.
161, 764.
TISELIUS, ARNE (1951): J. gen.
89.
BRAND, K., and RUTKOWSKI, H.
ol. Chem., 23, 1146.
(1949): Ann. Rep. on Progress
Soc., London), 45, 267.
and DUNN, M. S. (1949): J.
oc., 71, 4121.

ans and Coastal Sandrock in
ern Queensland

), Ball (1924), Bryan and
id David (1950) have all
nation on the beaches of
and for which the name
is now generally accepted.
describe[illegible]s

not very strongly cemented
ed aggregation of colourless
ins with a variable content
rganic matter. This latter
plies the binding material
colour of the rock, which
rongly coherent black sand-
ible pale aggregate. Most
ock is brown in colour, and
it.

rmation has been variously
uthors above as from Ter-
ryan and Jones, and David,
resents a cemented floor of
mps; Ball ascribes its for-
ation of beach sands by
s from overflowing swamp

ther investigations, evidence
which indicates that these
of two main types, with a

despread is a 'fossil' B
er humus podzols developed
landsc[illegible] and of varying
y Pleis[illegible]e. During the
ations of sea-level in the
d early Recent there has
en truncation of the A
possibly, portion of the B)
ng with siliceous material.
xposed again by erosion of
redunes.

ty sands which have been
mpressed, and which are
exposed. Sometimes these
erlie a fossil B horizon of

s are, possibly, former
which have been buried
—e.g., mangrove swamps.
he most common and are
from each other by tex-
by the presence in Type 2
bodies of various genera,
ype 1 may include banded

deposits of heavy minerals of the rutile-zircon group.

These fossil humic pans and buried peats extend seaward below low water mark, and also occur at levels of up to approximately 250 feet above present sea-level at various places on the southern coast of Queensland and the northern coast of New South Wales. In the latter area they are, mostly, only a few feet above sea-level. Many of the exposures do not conform to the present landscape. It seems possible that these formations may yield information concerning eustatic fluctuations in the Pleistocene; this hypothesis is now being tested. Detailed evidence in support of these statements will be presented elsewhere in due course.

Acknowledgements

The author is deeply grateful to Professor James Thorp, Earlham College, Indiana, U.S.A., and to Professor W. H. Bryan, Geology Department, University of Queensland, for helpful criticism and discussion.

J. E. COALDRAKE.
C.S.I.R.O. Division of Plant Industry,
Plant and Soils Laboratory,
Brisbane.
28 October 1954.

References

DUNSTAN, B. (1916): Harrap's Geography of Queensland, 164.
BALL, L. C. (1924): *Qld. Govt. Mining J.*, *25*, 354.
BRYAN, W. H., and JONES, O. A. (1945): *Univ. Qld. Papers, Dept. Geol.*, *2* (*N.S.*) (*12*), 79-80.
DAVID, T. W. E. (1950): The Geology of the Commonwealth of Australia, *1*, 602.

Age of Nelson Bore Sediments

When boring operations ceased in 1945, the Nelson Bore (*see* Dept. of Mines, Victoria, 1946), located near the mouth of the Glenelg River, south-western Victoria, had penetrated 7,305 feet of sediments without reaching lacustrine Jurassic strata. The bore was commenced 10 feet above sea level, the first 816 feet being composed of Janjukian limestones and marls.

At 816 feet there occurs a marked lithological break, thought to be indicative of a time break on the basis of correlation across to the Older Tertiary succession in the Princetown district of western Victoria. Immediately below this the bore penetrated 174 feet of coarse sandstone underlain by a glauconitic oolitic rock with occasional specimens of *Cyclammina*, and hence marine. At 990 feet below the surface another marked lithological break is observed, and from then on for approximately 1,650 feet there occurs a marine series of similar alternating carbonaceous and non-carbonaceous fine sandstones and siltstones with *Cyclammina* and so-called 'algal-markings'.

This series grades downwards into a group of sediments some 1,050 feet thick, composed of marine fine sandstones and siltstones with much less included carbonaceous material than the preceding 1,650 feet, and without the 'algal-markings' of those sediments. They include types in which mica flakes have increased in amount, and in places contain occasional glauconite and marine fossils. Interbedded light and dark grey to brown shales and mudstones are a feature of these parts of the Nelson Bore sediments, and occasional bands of coarse sandstones have been observed between 3,500 and 4,500 feet. Below these strata the bottom 2,800 feet or so of sediments are dominantly sandy (arenites), with occasional interbedded argillaceous layers in places containing carbonaceous laminae. The arenites contain authigenic minerals of marine origin, such as glauconite, collophane, dolomite, etc. Thus beneath the topmost lithological break (at 816 feet) there are 6,489 feet of pre-Janjukian, post-Jurassic, marine sediments. Little can be said at present of the 174 feet of sediments that lie immediately below this lithological break, except that they are not all 'glauconitic sandstones' as reported; they have been placed in the Nelson Formation (Oligocene) by Boutakoff and Sprigg (1953, p. 41). Certain of the lowermost 6,315 feet, however, have recently yielded some interesting and important geological information.

No outcrops of sediments like those intersected below 816 feet in the Nelson Bore have yet been recorded in the vicinity of Nelson, parish of Glenelg, counties Follett and Normanby. Hence studies of these sediments are confined to limited amounts of material provided by bore core samples, which range in diameter from 2½ inches near the top to approximately 1½ inches near the bottom of the bore, and so do not reveal much in the way of macrofossils. Up to the present time, the few macrofossils noted in the bore core samples have provided no specific indications of the age of the sediments, so that reliance has to be placed on the micro-organisms that can be isolated from them.

Examination of the foraminiferal content by Crespin (1947) led to the conclusion that 'the entire series of carbonaceous sandstones and shales from the depth of 7,299 feet up to 989 feet' is probably referable to the Anglesean Stage of Middle Miocene age. Boutakoff and Sprigg (1953, p. 30) concluded that the lowest sediments penetrated by the Nelson Bore 'presumably still represent the Dartmoor Formation' (at the top of the Knight Group), to which an Eocene to Palaeocene age was assigned.

The results of recent studies of the microfloral contents (Cookson, 1954; Cookson and Pike, 1954), and of the planktonic micro-organisms (Cookson, 1953; Deflandre and Cookson, 1954, 1955) of selected sediments from the Nelson Bore confirm the results obtained from lithological and stratigraphical studies in progress over the past decade in connexion with the nature and disposition of the Nelson Bore sediments, and the comparison of these with the sediments constituting the Older Tertiary succession in the Moonlight Head - Princetown district of south-western Victoria. Moreover the

discovery of dinoflagellates and hystrichosphaerids among the planktonic micro-organisms provides further proof of the marine environment of this theatre of sedimentation.

The following conclusions arise from the studies referred to above:

(a) The sediments examined for pollen grains, microspores, and planktonic micro-organisms from 992 feet in the Nelson Bore are lithologically identical with those in the upper portion of the Wangerrip Group in the Moonlight Head - Princetown district. The sediments are also *Cyclammina*-bearing at each locality, and those from each locality contain similar microfloral assemblages. A Lower Eocene age has been assigned to these sediments in the Princetown district (Baker, 1950, 1953).

(b) The sediments examined for micro-organisms between 3,650 feet and 4,025 feet in the Nelson Bore can be matched reasonably well with those of the Pebble Point Formation at the base of the Wangerrip Group in the Moonlight Head - Princetown district, and have been found to contain a somewhat older microfloral and planktonic micro-organism assemblage than those obtained at 992 feet. At each locality the sediments contain similar pollen types, characterized by *Triorites edwardsii* (Cookson, 1954; Cookson and Pike, 1954) and the dinoflagellate *Deflandrea bakeri* (Deflandre and Cookson, 1954, 1955). The age of the Pebble Point Formation is regarded as being Lower Eocene with Palaeocene affinities (Baker, 1950, 1953).

(c) The sediments intersected below approximately 4,250 feet in the Nelson Bore are not represented in the Moonlight Head - Princetown district, but those between 4,250 feet and approximately 4,500 feet evidently still belong to the Lower Eocene to Palaeocene.

From some of the occasionally carbonaceous silty shales and mudstones occurring interbedded with the lowermost 2,800 feet of marine arenites, the sporomorph *Mohriosporites australiensis* and the planktonic micro-organisms *Hystrichosphæridium complex* and *Odontochitina cribropoda* (Deflandre and Cookson, 1954, 1955) have been isolated from between 5,782 feet and 6,192 feet. These microfossils occur in Australian Upper Cretaceous sediments, but have not so far been found in Australian Tertiary deposits.

It now becomes evident that the earlier placing of the entire thickness of the lowermost 6,300 feet or so of the Nelson Bore sediments into the Dartmoor Formation (Boutakoff and Sprigg, 1953, p. 41) needs revision on the basis of the new information recently obtained from these parts of the bore, for the Dartmoor Formation has been placed above the Bahgallah Formation; and the Bahgallah Formation has been correlated by Kenley (1951) with the Pebble Point Formation of the Moonlight Head-Princetown district (Baker, 1943, 1950, 1953), equivalents of which are represented in the middle portions (approximately 3,600 feet to about 4,025 feet) of the Nelson Bore. The lowermost 6,315 feet of sediments intersected in the Nelson Bore are now shown to be partly Upper Cretaceous and partly Lower Eocene to Palaeocene, according to conclusions (a) to (c) listed above, but the boundaries between the eras have not yet been accurately determined.

G. Baker,
Isabel C. Cookson.
c.o. University of Melbourne.
17 January 1955.

References

Baker, G. (1943): *Proc. Roy. Soc. Vict., 55,* 237.
——— (1950): *Proc. Roy. Soc. Vict., 60,* 17.
——— (1953): *Mem. Nat. Mus., Melb., 18,* 125.
Boutakoff, N., and Sprigg, R. C. (1953): *Min. Geol. J., 5,* 28.
Cookson, I. C. (1953): *Mem. Nat. Mus., Melb., 18,* 107.
——— (1954): *Proc. Roy. Soc. Vict., 66,* 119.
Cookson, I. C., and Pike, K. M. (1954): *Aust. J. Bot., 2,* 197.
Crespin, I. (1947): *Rep. Bur. Miner. Resour. Aust., Comm. Palaeont. Rep., 1947,* 62.
Deflandre, G., and Cookson, I. C. (1954): *C. R. Acad. Sci., Paris, 239,* 1235.
——— (1955): *Aust. J. Marine and Fresh Water Res., 6.*
Department of Mines, Victoria (1946): *Rep. Dep. Min. Vict., 1946,* 26.
Kenley, P. R. (1951): *Aust. J. Sci., 14,* 91.

Concretions and Associated Minerals in Triassic Beds near Gosford

Abstract

Triassic sandy shales near Gosford contain zoned concretions. Tabular barytes, a kaolinitic mineral, and millerite are associated. Crystalline discoidal aggregates of barytes occur in adjacent beds.

Introduction

This note reports observations made at the Gosford Brick, Tile, and Pipe Company's quarry, on Pacific Highway, about 1½ miles west of Gosford. Specimens are described tentatively, pending further field and laboratory study.

Mineralized, zoned, concretions were collected at the quarry initially (11 August 1954) by H. G. Golding and R. Burdon, and later (22 October 1954) by H. G. Golding, F. N. Hanlon, and L. Koch. Barite discs were collected there by Golding on 30 November 1954.

The quarry exposes a capping of graphitic sandstone underlain by some 50 feet of sandy shales. Millimetre-laminites, with alternate shaley and sandy laminae, often plant-bearing and micaceous, are frequent, and constitute the matrix of the concretions. The sequence is placed by Hanlon (personal communication) as very close to the top of the Gosford Formation.

Concretions

Raggatt (1929) described calcareous concretions, and (1937, 345) noted zoned concretions, from Permian strata. Lovering (1954) noted iron oxide concretions and sideritic nodules, and (1953, 164, 166) hollow mineralized

concretionary structures, from beds. Hanlon, Osborne and I 112, 117) listed Narrabeen horiz ironstone nodules and concretion (1948, 6) referred to 'pecu nodules' at a higher level in Group. Apart from iron stai the concretions described in th lack notable iron. They also tinctive zonal structure.

The concretions reported he mostly on two levels, about 8 in the quarry floor. They are indur bodies, the longest diameter inches, lying parallel to the host to frequent dissection by wea planes, truncated 'slices' rathe concretions were collected. A without parting planes showed exterior, and, when sawn, sho like mineralized cracks intern

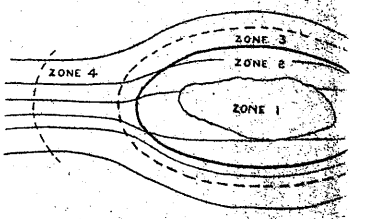


Figure 1.
Diagrammatic vertical section cretion and matrix, showing th stratification planes to

Parting planes and sawn sect characteristic lithologic zones Figure 1) of apparently ma millimetre-grained material h ellipsoidal shape, not always disposed in relation to the exte form of the concretion. It effe with acid in fresh specimens, weathered specimens. A thin abundant radial aggregates (replaced by a kaolinitic m weathered specimen). Subor minerals (magnetite?) in the f and idioblastic carbonate rh weathered specimens, are notew has, in weathered specimens, a mottled appearance.

Zone 1 is somewhat crenulat peripherally. It is surrounde grey shale-silt grade 'shell' with horizontal laminae (zone 2, Fi zone also effervesces with acid. approximates to the surface of the concretion. A third narro concentric zone (zone 3, Figur the matrix immediately outside and a fourth 'shell' of discolo (zone 4, Figure 1), which effer sometimes occurs.

Wanwin-1
: CORE 4 (168.9-174.3m) : *asperopolus* Zone : late Early to early Middle Eocene : marginally marine.

Glenelg-1
: CORE (302m) : *asperopolus* Zone : late Early to early Middle Eocene : marginally marine.

: CORE (390m) : upper *diversus* Zone : Early Eocene : marginally marine.

Narrawaturk-6
: CORE 10 (630-639.7m) : lower *asperus* Zone (*heterophlycta* dinocyst Zone) : Middle Eocene : very nearshore marine.

: CORE (633.2-639.7m) : lower *asperus* Zone (*heterophlycta* dinocyst Zone) : Middle Eocene : marginally marine.

Dartmoor-25
: CORE (57-61.4m) : middle *diversus* Zone : Early Eocene : non-marine.

Devondale Road Quarry : 5719600E : indeterminate : only trace inertinite seen.

Lavers Hill (south of Sandpit Road) : indeterminate : only trace inertinite seen.

Wye River : Beach : indeterminate : abundant fungal debris seen.

The lower *asperus* Zone samples are consistent with the lower Nirranda Sub Group. The *asperopolus* and upper *diversus* Zone samples are consistent with the Burrungule Member and the immediately underlying Dilwyn Formation. The middle *diversus* Zone sample is consistent with the Dilwyn Formation underlying the Burrungule Member.

Roger Morgan
18.6.93

W.FAX.GREGPRK2

4.0 Geochemical Reports

4.1 Preliminary Report on Samples from no. 1 Bore

PRELIMINARY REPORT ON SAMPLES FROM No. 1 BORE, ALLOTMENT 57, PARISH OF PUEBLA, VICTORIA, (GEELONG FLOW OIL CO).

Geochem

Report No. 1948/50.

(Pal. Series No. 19).

This account of the micropalaeontological examination of samples received from this bore to date is presented as a preliminary report. The samples examined were taken from the surface down to the depth of 1,130 feet. The bore is being drilled by percussion methods and consequently there is some admixture of fossil species. However, towards the lower part of the bore, these adventitious species disappear and the species recorded are characteristic of the beds in which they are found.

The approximate limits of the various stratigraphic horizons recognised in the samples are as follows:-

Pleistocene to Recent	-	Surface down to 70 feet.
Middle Miocene	-	70 feet down to 1,130 feet.
Balcombian stage	-	70 feet down to 230 feet.
Janjukian stage	-	230 feet down to 770 feet.
Anglesean stage	-	770 feet down to 1,130 feet.

Pleistocene to Recent.

Seventy feet of reddish to ochreous, unfossiliferous sandstones of Pleistocene to Recent age overlie the marine Tertiaries.

Middle Miocene.

1. Balcombian stage.

The yellowish limestone at 70-80 feet most probably represents the top of the Balcombian stage. From 80 feet down to 230 feet the rocks range from cream coloured limestones to grey marls containing numerous foraminifera. These beds apparently represent the lower portion of the Balcombian stage, typical zonal species being present. Operculina victoriensis is common at 210-220 feet and is present in most of the samples down to 230 feet in association with Cibicides victoriensis and Crospinella umbonifera.

2. Janjukian Stage.

The bore passes into Janjukian stage at approximately 230-240 feet when zonal foraminifera such as Massilina torquayensis are met with in grey marls. These grey marls persist down to 460 feet where the lithology changes to sandy marls containing Turritella aldingae. Typical foraminifera of the upper part of the Janjukian, Clavulinoides szaboi var. victoriensis, Liebusella antipodum, Sigmoilina victoriensis are fairly common.

At 600 feet pyrites is prevalent in the samples and the marls change from grey to greenish-grey in colour. Fragments of small mollusca such as Turritella aldingae, and Murex polyphyllus occur occasionally. Glauconite grains are common at 640-670 feet.

The foraminiferal assemblage of the lower Bird Rock horizon occurs from 700 feet down to 770 feet, zonal species such as Massilina torquayensis, Victoriella plecte, Cyclammina incisa, and Sherbornina atkinsoni being recorded.

3. Anglesean Stage.

At approximately 770 feet the bore passes into the

Anglesean stage where it is represented by a coarse sandstone consisting of rounded to angular quartz grains. At 780 feet it passes into dark grey carbonaceous sandstone composed of fine angular quartz grains, and containing Ammodiscus sp. At 890 feet the lithology is a dark grey to brown, fine grained ligneous sandstone which is typical of the type Anglesean material, and which persists down to the last sample at 1,130 feet. Small foraminifera are present, their test being replaced with pyrites. Large tests of Cyclammina occur from 1,000 feet down to 1,050 feet and the genus is present down to 1,120-1,130 feet, where it is common. A small fish tooth was found at 1,110-1,120 feet.

I. Crespin

Canberra, A.C.T.
13/8/48.

I. Crespin.
Commonwealth Palaeontologist.

PRELIMINARY REPORT ON FURTHER SAMPLES FROM NO. 1 BORE ALLOTMENT 57, PARISH OF PUEBLA, VICTORIA.

(Geelong Flow Oil Co.)

Report No. 1948/65
(Pal. Ser. No. 27)

The samples recently received for examination came from the depth of 1130 feet down to 1260 feet and were in continuation of the series reported upon on 13/8/48.

Based on lithological evidence, the present series of samples from the Geelong Flow Oil Bore apparently passed out of the Tertiary into the Jurassic at 1,200 feet, when the lithology changed from grey shales into a grey sandstone containing large quartz pebbles and fine angular grains of clear and milky quartz.

The samples from 1,130 feet down to 1,160 feet consisted of brown, lignitiferous sandstone typical of the Anglesean stage of the Tertiary and containing the characteristic Anglesean foraminifera Cyclammina. From 1,160 feet down to 1,200 feet pale grey sandstones and shales containing abundant pyrite were encountered and a specimen of Cyclammina, partially replaced with pyrite was present at 1,180-1,190 feet.

At 1,200 feet there was a sharp change in lithology, and sandstone similar to the grey sandstone of the Jurassic rocks in the Geelong area continued from this depth down to the last sample received at 1,260 feet.

I. Crespin

14th October, 1948.
CANBERRA, A.C.T.

(I. Crespin)
Commonwealth Palaeontologist.

4.2 Report on Rocks & Inflammable Gas

1949/25

REPORT ON THE ROCKS AND THE INFLAMMABLE GAS COLLECTED FROM THE GEELONG FLOW OIL COMPANY'S WELL NEAR TORQUAY.

By N. Boutakoff, B.Sc.

The Geelong Flow Oil Company's Torquay cable-tool well passed out of ligneous basal Tertiary clay and entered bluish-grey shale at 1200-1210 feet, which Dr. D. E. Thomas considered at the time as being probably of Jurassic age. It continued in rocks of the same type and occasional hard sandstone, down to a depth of 1800 feet, reached on 2nd September, 1949, when high temperature and inflammable gas were reported to this Department. Both were mentioned again at 1810 feet, on the 10th September, 1949.

On the 14th September 1949, the writer paid a visit to the well, with the object of investigating the inflammable gas and of ascertaining, if possible, the age of the rocks being drilled through.

Inflammable gas was twice brought up with the mud by dart valve bailer and the mud was found to drop approximately 18 inches in the 20-ft. bailer, after the gas had tumultuously escaped from it. On this first visit, equipment for collecting gas from the bailer, was found to be inadequate under existing conditions.

The mud in the bailer was found to be hot and slightly steaming. A maxima thermometer was let down the well twice and recorded a temperature of 120 deg. F. at well bottom. A black coal scum was at that time floating over the mud released from the bailer.

Collecting at the bottom of the mud trough, brought to light several fragments of splintered grey shale, some containing plant remains and one also being traversed by a thin streak of black coal. The contents of the bailer were then thoroughly examined and from the second load of mud hoisted to the surface, six chips of fossiliferous Jurassic rock were secured, two being blue-grey sandstone and four blue-grey to black shale, all fragments containing numerous plant remains. The depth of the well at the time of collecting must have been around 1815 feet although the driller mentioned a depth of 1810 feet, which, according to drilling reports submitted to this Department, was reached on 10th September.

On the 19th September 1949, a second trip was made to the

well in company of Mr. F. F. Field, Senior Chemist, Government Laboratories, with the object of securing a sizable sample of the inflammable gas. The well was then reported to have reached the depth of 1825 feet. A gas trap, designed by the writer, was used, consisting of an 8-ft. dart valve bailer, closed at the top with a welded-on steel lid, carrying a ¾-inch cock.

The bailer was let down the well with the cock open and spudded. As soon as it was hoisted to the surface, the gas at the cock head was bled until it ignited, thus removing traces of air. The cock was then locked, connected with a gallon water-filled bottle and gradually opened. Two bailings were found necessary to fill the bottle with gas.

Analyses of the gas are as follows:-

Hydrogen	63.1%	63.1%
Methane.....	19.8%	19.8%
Nitrogen.....	13.5%	14.2%
CO	1.4%	1.4%
CO_2.....	0.7%	0.7%
O_2	0.5%	0.5%
Ethane.....	0.7%	nil.
Unsaturated Hydrocarbon..	0.3%	0.3%
Total.....100%		100%

Mr. Field's report is attached. This gas contains only traces of ethane and can in no way be taken as a favourable indication for oil or petroleum gas.

The large percentage of methane may be attributable to the presence of coal and carbonized plant remains in the rocks being drilled through.

The remarkably high percentage of hydrogen recalls to memory the hydrogen wells drilled in South Australia and thoroughly investigated by L. Keith Ward in 1933[1]. From this author we learn that two wells drilled for oil in South Australia, the first late in 1921 on Kangaroo Island and the second in 1931, east of Minlaton on Yorke

(1) L. Keith Ward - "Inflammable Gases occluded in the pre-Palaeozoic

Peninsula, encountered inflammable gas, mostly composed of hydrogen, in pre-Palaeozoic rocks, consisting in mica-schist, phyllite and quartz-mica-schist in the first case and Upper Pre-Cambrian limestone in the second. The depth interval was 615-950 feet, on Kangaroo Island, and 370-1,666 feet on Yorke Peninsula. The analyses given by Ward are as follows:-

Kangaroo Island

	(1) At 615 feet		(2) At 950 feet.
CO_2	5.3%	.....	0.52%
O_2	4.3%	.....	3.55%
Ethylene etc.....	0.5%	.....	nil.
CO	nil	.....	nil.
Hydrogen	53.3%	.....	68.64%
Methane	2.6%	.....	4.68%
Nitrogen ..... (by difference)	36.0%	.....	22.61%
Total.....	100 %	.....	100 %

Yorke Peninsula (Miniaton) -

	I 790'	II 790'	III 860'	IV 860'	V 860'	VI 1,666'
CO_2	0.8%	0.2%	0.8%	0.8%	0.6%	nil
O_2	nil	nil	3.2%	2.4%	3.0%	1.2%
Ethylene etc...	nil	nil	nil	nil	nil	nil
CO	nil	nil	nil	nil	nil	nil
Hydrogen.....	74.0%	76.0%	60.0%	64.4%	60.0%	84.0%
Methane	7.5%	7.5%	5.4%	7.0%	5.6%	nil
Nitrogen ..... (by difference)	17.7%	16.3%	30.6%	25.4%	30.8%	14.8%
Total	100%	100%	100%	100%	100%	100%

From correspondence between Ward and Chamberlin (Chicago University) quoted by Ward, (loc. cit. pp.46-47) it appears that the presence of methane and ethylene seems to suggest organic origin whereas the high proportion of hydrogen "rather suggests that it has come from inorganic sources". According to Chamberlin reactions between water and ferrous compounds at 100 deg. or 200 deg. temper-

ature would possibly account for the high proportion of hydrogen; at the same time "a slight rise in temperature would break up organic matter, giving rise to methane".

It may be recalled that a relatively high temperature has been recorded in the present bore, suggestive of hot water circulation along faults. It should further be mentioned that pyrites has been recorded in the well after the writer's visit, in the 1825'-1830' interval, together with warm water and inflammable gas. Chamberlin also mentioned (Ward loc. cit. p. 47) blowers of gas in some potash mines near Strassfurt, in which hydrogen is present in the proportion of 93 per cent.

The occurrence of hydrogen gas in a well near Torquay, Victoria, is of considerable scientific interest and again shows that this gas is widely distributed through a variety of rocks of vastly different ages.

The occurrence of oil in the fresh-water Jurassic of Torquay is considered as highly improbable, on account of the non-petroliferous nature of the overlying Tertiary beds and of the underlying Ordovician slates. The deepening of the well near Torquay is extremely unlikely to yield profitable results and therefore cannot be recommended.

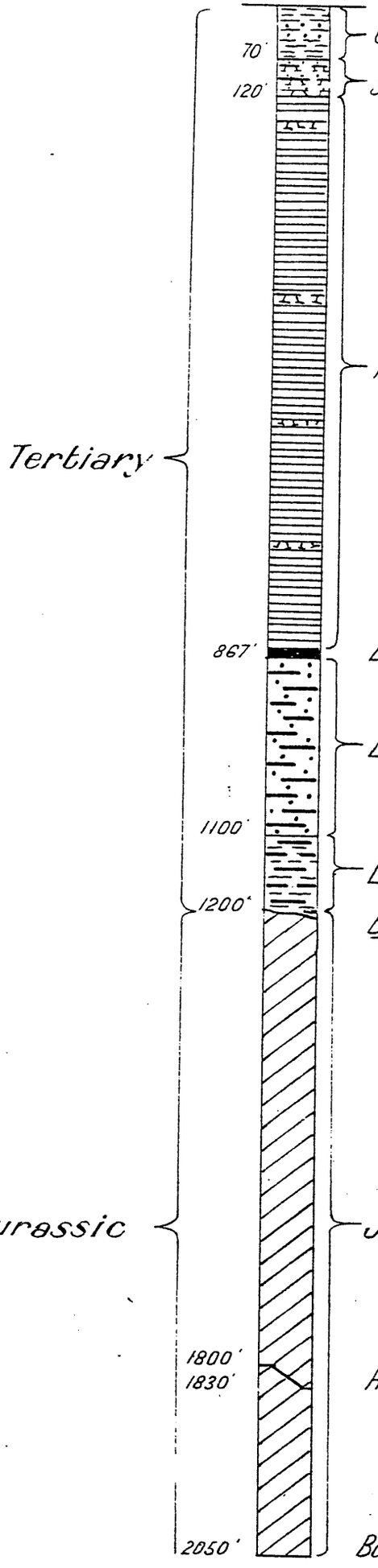
D. Thomson

Senior Geologist.

26th September, 1949.

GEELONG FLOW OIL CO. LTD
Bore No 1 Parish of Puebla

SCALE : 200 FEET TO 1 INCH



Clay, sandy clay.

Silt with limestone bands.

Marl with limestone bands

Tertiary

Basalt ?

Ligneous sand

Ligneous clay

Base of Tertiary beds and oil possibilities.

Jurassic

Jurassic

Hot water & Hydrogen gas.

Bottom of Bore (January 1950)

5.0 Enclosures

5.1 Gamma Ray Log

5.2 Density Log

PE604488

This is an enclosure indicator page.
The enclosure PE604488 is enclosed within the container PE904190 at this location in this document.

The enclosure PE604488 has the following characteristics:

ITEM_BARCODE	= PE604488
CONTAINER_BARCODE	= PE904190
NAME	= Gammma Ray Well Log
BASIN	= OTWAY BASIN
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Gamma Ray Well Log (from WCR) for Glenelg-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W432B
WELL_NAME	= GLENELG-1
CONTRACTOR	= WIDCO
CLIENT_OP_CO	= SHELL DEVEOPMENT AUSTRALIA

(Inserted by DNRE - Vic Govt Mines Dept)

PE604691

This is an enclosure indicator page.
The enclosure PE604691 is enclosed within the container PE904190 at this location in this document.

The enclosure PE604691 has the following characteristics:

ITEM_BARCODE	= PE604691
CONTAINER_BARCODE	= PE904190
NAME	= Density Well Log
BASIN	= OTWAY BASIN
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Density Well Log (from WCR) for Glenelg-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W432B
WELL_NAME	= GLENELG-1
CONTRACTOR	= WIDCO
CLIENT_OP_CO	= SHELL DEVEOPMENT AUSTRALIA

(Inserted by DNRE - Vic Govt Mines Dept)

5.3. Gamma Ray & Density Log

PE604690

This is an enclosure indicator page.
The enclosure PE604690 is enclosed within the container PE904190 at this location in this document.

The enclosure PE604690 has the following characteristics:

ITEM_BARCODE	= PE604690
CONTAINER_BARCODE	= PE904190
NAME	= Gamma Ray and Density log
BASIN	= OTWAY BASIN
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Gamma Ray and Density Log (from WCR) for Glenelg-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W432B
WELL_NAME	= GLENELG-1
CONTRACTOR	=
CLIENT_OP_CO	= SHELL DEVEOPMENT AUSTRALIA

(Inserted by DNRE - Vic Govt Mines Dept)