

**Midwest-2
(W416)**

Well Summary Report

Table of Contents

Well Summary Card

Report on the Midwest-2 Bore

Sample Descriptions and Palaeontology

Lithology and Petrography

Production Records

PE904155

This is an enclosure indicator page.
The enclosure PE904155 is enclosed within the
container PE906522 at this location in this
document.

The enclosure PE904155 has the following characteristics:

- ITEM_BARCODE = PE904155
- CONTAINER_BARCODE = PE906522
- NAME = well card
- BASIN = GIPPSLAND
- PERMIT =
- TYPE = WELL
- SUBTYPE = WELL_CARD
- DESCRIPTION = well card Midwest 2
- REMARKS = abandoned 1932
- DATE_CREATED =
- DATE_RECEIVED =
- W_NO = W416
- WELL_NAME = Midwest-2
- CONTRACTOR = Midwest Oil Co
- CLIENT_OP_CO = Midwest Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

W 416

REPORT ON THE MIDWEST NO. 2 BORE,

LAKES ENTRANCE,

EAST GIPPSLAND.

14/11/37
E. Chapman

Report on Samples of Cuttings
from Midwest No. 2 Bore

REPORT ON THE MID WEST NO.2 BORE, LAKES ENTRANCE,
EAST GIPPSLAND.

LOCATION.-

This bore is situated 144 chains to the N.E. of the Government Bore No.1 (3) the Bridge, Lakes Entrance.

DATE OF DRILLING.-

The original log prepared by Mr. Lightner states that it was spudded on 18/6/31.

DRILLING METHODS.-

The percussion or Churn Drilling equipment was used in this bore. Bore material so obtained is not entirely satisfactory from the point of view of making a thoroughly detailed scientific examination.

The following results must therefore be taken with a certain amount of caution. However, from the fact that casing was used to line the bore-hole down to 2656 feet, leaving only 744 feet uncased down to 3400 feet, has reduced the chances of the samples being greatly mixed. Indeed, from this examination data have been checked up which go to prove that they are perhaps more reliable than could have been expected by such methods.

It is a matter of regret that during boring operations a stricter method of ~~procuring samples~~ was not carried out and a more complete sequence preserved. The material available, however, has supplied some very interesting, not to say unexpected palaeo^{geo}graphic data, which throws much light on the early topography of the district.

Although there was no marked carelessness in collecting the samples, as seen in the remarkable consistence of the occurrence of the little organisms in the Lower Oligocene sands, there was one example of wrong allocation, where, at a reputed depth of 1250' a reddish granitic sand with quartz and chlorite is intercalated in the Glauconite series. This seems to have come from about 200 feet lower in the series.

The percussion method of drilling accounts for the comminuted character of the samples throughout. By the percussion drill it would have been impossible to bore through a solid mass of granite, ^{in the time} hence it is logical to regard the granitic sands as such, and, supported by the occurrence of minute fossil organisms, ^{which occur in the great majority of the samples (74)} to refer them to the Lower Oligocene as an accumulation of sediments of exceptional thickness. ~~The~~ The granite rubble which was encountered at intervals in the bore may be regarded as a gravel sheet derived from adjacent granite outcrops.

DEPTHS OF SAMPLES, WITH BREAKS INDICATED.

Surface to 1100 feet. No samples preserved.
 1100 feet to 1259 feet 6 inches, at reasonable intervals, then gap to 1466 feet.
 1466 feet to 2590 feet, at fairly reasonable intervals, then gap to 3203 feet, last sample available.

The driller's Log reports the bore to have reached 3400 feet, "in grey shale interbedded with felsitic bands". Until samples from these lower depths are forthcoming it is impossible to say what these lowest samples indicate.

PROBABLE AGES OF THE BEDS PASSED THROUGH.

No samples were apparently preserved down to the base of the Lower Miocene. From 1100 feet down to 1227 feet, at which depth "Oil Sands" were struck according to Lightner's log, the beds belong to the higher part of the Upper Oligocene, namely the Micaceous Shales of Zone A₂. An ample and typical foraminiferal fauna proves this. The fossil oysters met with at 1234 feet, Ostrea cf. hyotidoidea, range in other parts of Victoria from Upper Oligocene to Lower Miocene.

From 1227 feet to 1259 feet 6 inches the lower part of the Upper Oligocene is evident, namely the Glauconitic Series of Zone A₂, showing a thickness of 32 feet 6 inches.

From 1259 feet 6 inches there is a gap in the samples

available, the next being from 1466 to 2590 feet, or a thickness of 1124 feet, and to these beds I would ascribe a Lower Oligocene age (Zone A₁). These granitic sands are undoubtedly of sedimentary origin as they contain a distinct arenaceous to foraminiferal fauna. There is nothing leading one to suppose these terrigenous sands are of earlier age than Oligocene, excepting in perhaps the occurrence of cf. Agathammina which elsewhere denotes a Carboniferous to Permian age, but as these are doubtful they carry no weight.

The remainder of the foraminiferal genera present are found equally distributed through the Tertiary terrigenous deposits in many parts of the world, as well as in Recent marine muds from the North Atlantic to the Antarctic.

From 2590 feet to 3203 feet there is a gap in the samples available; at the latter depth the sample here examined is represented by granite rubble.

SIGNIFICANCE OF THE MID-WEST.NO.2 BORE.

This bore is of exceptional interest amongst the many put down in the Lakes Entrance area, since it reached the great depth of 3400 feet (See note on Depths of Samples, supra cit.).

Until this examination in detail of all the samples available from Mid West 2 was carried out, the only geological note on the bore was based on a single sample from 1810 feet to 1815 feet. It was written by the author of this report whilst Commonwealth Palaeontologist and sent to Canberra and to the Victorian Mines Department on 5/8/32. The note is as follows:-

"This material is in the nature of a fine greenish brown granitic sand. The washed material shows it to be detrital granite. The greenish colour is probably due to the accidental introduction of a certain amount of glauconite and limonitic sludge".

No sample from the above depth (1810 feet to 1815 feet) was available to me in this present series, but at 1780 feet the characters are very similar.

From my original description of the sample mentioned, as "granitic sand", it was apparently inferred by the Mines

Department that granite had been reached. It is now shown that from 1466 feet, and probably much higher (1302 feet in Lightner's log, where he records "white sand") the series most likely belongs to the Lower Oligocene series. It is of sedimentary origin, that is, often laid down under shallow marine conditions, though terrigenous or land-derived. Most of the samples from 1466 feet to 2590 feet contain foraminifera, usually very minute and with tests formed of fine sand grains. These foraminifera belong to genera usually characterising, though not exclusively, estuarine deposits, such as Psammonyx, Trochamminoides, Haplophragmoides, Ammomarginulina, Ammobaculites, Discamina, Placopsilina, Spiroplectamina, Trochamina.

The granitic sands themselves have been clearly derived from igneous rocks related to, or even identical with, the granodiorites and gneisses such as are found now exposed at Mt. Leinster and in the Benambra Highlands, the former about 72 miles due north of the East Gippsland (Lakes Entrance) region (see E. Broadhurst and J. D. Campbell, Proc. Roy. Soc. Vict. 1933, vol. XLV. pt. II. "The Geology and Petrology of the Mt. Leinster District, N.E. Victoria", pp. 219-240, pl. X.)

As early as 1903, the late Prof. J. W. Gregory referred to the granites (granodiorite) of northern Benambra as part of the primitive mountain chain of Victoria (Geography of Victoria, p. 75) and further that "the Benambra Highlands..... appear to be a greatly dissected pene-plain" (op. cit. p. 85).

Consequent river valleys would, in early Tertiary times, carry enormous quantities of debris from the highlands to the shore-line. If we assume that most of the East Gippsland area was once a submerged portion of that vast peneplain of granodiorite (of Devonian-carboniferous age) together with the still older (Ordovician) phyllite, then the present site of Mid West No. 2 will represent a confined valley cutting through the southerly extension of the peneplain. The arenaceous foraminifera found in the granitic sands in varying numbers testify that those Lower Oligocene sediments were at times distinctly tidal and so have put their seal upon the relation of these particular granitic sands to the adjacent shore-line of that remote period. In this direction this valley can be visualised as generally coinciding with the present Tambo River Valley, which even now drains a

similar region.

COMPARISON OF BOTTOM SAMPLES FROM TWO ADJACENT BORES
WHICH REACHED BEDROCK.

These are, Government Bore, No.1(3), which touched fairly solid Granodiorite at 1404 feet 6 inches, situated ¹⁴⁴150 chains to the S.W. of Mid West, 2, and the Lakes Entrance Development No.1 Bore, situated 200 chains E.N.E. which reached bedrock at 1215 feet, on what is probably Ordovician phyllite.

Having recently re-examined the core obtained by rotary drilling, from the bottom of the Govt. Bore 1(3), I make the following comments. The specimen is an almost cylindrical core, abraded by the drill and fractured on one side. It measures 65mm.x 70mm. The rock is a yellowish, speckled granodiorite with biotite, two feldspars and some quartz. It may represent a rounded boulder from a granite platform, but probably is close to bedrock.

The sediments lying immediately above the granite, at 1370 feet to 1390 feet, I have lately re-examined and now give the following amended description; having previously reported upon it on 9/3/29.-

A loose grey sand composed of fine and coarse quartz. A large percentage of the quartz grains are well rounded and wind-polished. Fragmentary fish remains, as bones and scales, together with teeth of Carcharias victoriae, C. (Priodon) aculeatus, Heterodontus coleridgensis, as well as neural spines and centra of vertebrae of teleostean fishes, and otoliths occur. The finer sand is composed of crystals of siderite. Numerous foraminifera are present, including Haplophragmoides, Ammomarginulina, Ammobaculites, Spiroplectammina, and Lituola, as well as the hyaline shelly form, Dyocibicides.

With regard to the bottom sediments from the Lake Bunga, Lakes Entrance Development No.1 Bore, I have re-examined the sample at 1210 feet, overlying ^{ly}schistose bedrock at 1215 feet, and report as follows:-

Sample consists of brown and green sandy material, splintery fragments of greenish sericitic schist, ironstone sand particles and shelly fragments. The foraminifera determined are,-

Guttulina cf. franki, Epistomina elegans, Cibicides victoriensis,
Globigerina bulloides, G. triloba, Haplophragmoides, Ammomarginulina,
Ammobaculites, Discammina neocomiana, Trochammina, cf. Martinottiella,
?Verneuilina.

OTHER GREAT THICKNESSES OF LOWER OLIGOCENE BEDS IN GIPPSLAND.

There is one other deep bore in Gippsland which compares in its excessive development of the Lower Oligocene with Mid West, No.2, namely Tanjil Pt. Addis No.2, at Glencoe South.

There the Lower Oligocene was met with at 1303 feet and continued down to 2740 feet, thus giving a thickness of 1437 feet.

The Lower Oligocene in the Mid West bore runs it very closely with its 1431 feet 6 inches.

In ~~the~~ former bore, however, ^{it} appears to be a purely marine deposit, whilst in the latter it is of shallow water and terrigenous origin.

Although the Goon Nure Bore, N. of Lake Victoria, is a fairly deep one, of 2929 feet, only the last 269 feet were in the Lower Oligocene. In these samples of greenish grey pyritised marls, lignitic coal and puggy clay predominated.

7. Chapman A.S.
 7.5. 1007 Rms.
 12/11/37
 etc. etc.

SAMPLE DESCRIPTIONS
AND PALEAONTOLOGY.

DETAILS OF SAMPLES.

REPORT ON MID-WEST BORE. No.2.

LAKES ENTRANCE, GIPPSLAND.

REPORT ON MID-WEST BORE, No.2. LAKES ENTRANCE, GIPPSLAND.

1100 feet. (earlier samples not available).

Description.- Greenish-grey, micaceous and glauconitic foraminiferal marl. Fine Washings rich in Foraminifera; coarser, with a few molluscan shell-fragments and numerous ovoid pellets averaging 1.75 mm. in longer diameter. Similar bodies have been variously ascribed to excreta of worms, holothuria or minute fishes.

Details of Organisms.- F. frequent. C. common. V.C. very common.
Foraminifera.- Glandulina laevigata; Cassidulina subglobosa;
Reussella spinulosa;
C. aff. crassa; Epistomina elegans; Anomalina glabrata;
Planulina ariminensis; Cibicides ungerianus; C.victoriensis;
Globigerina triloba C; Martinottiella communis C.
Anthozoa (Alcyonarian).- Mopsea sp.
Echinodermata.- Small spines of sea-urchins, indet.
Ostracoda.- Cytheropteron batesfordiense; Cytherella lata.

1109 feet 11 inches.

Description.- Chips of hard grey limestone bands, with debris. Washings of material associated with chips, rich in Foraminifera. Coarser washings contain numerous pellets, chiefly glauconitic, and shelly fragments. A thin section of the hard band shows a calcareously cemented foraminiferal ooze containing a small proportion of minute angular quartz sand. The foraminifera in this hard band comprise numerous Globigerinae, their tests often infilled with glauconite. Foraminifera in siftings are:- ?Dentalina soluta; Lenticulina articulata; Guttulina problema; Cassidulina subglobosa; C ; Discorbis bertheloti; Rotalia howchini; Epistomina elegans; Planulina wuellerstorfi; Cibicides refulgens; C.victoriensis; C. ungerianus; Hofkerina semiornata; Globigerina bulloides; Pulleniatina obliqueloculata; Elphidium verriculatum.

1121 feet.

1121 feet.

Description.- Greenish-grey, micaceous, glauconitic and sideritic foraminiferal marl.

Washings contain few foraminifera, an occasional echinid spine and test fragment, pieces of molluscan shells and polyzoan and an ostracod. No pellets.

Details of organisms.-

Foraminifera.- Cibicides victoriensis C; Martinottiella communis F.

Echinodermata.- Spines and test-fragments of salenids.

Polyzoa.- Canda fossilis.

Gasteropoda.- ?Personella

Ostracoda.- Bythocypris tumefacta.

1131 feet.

Description.- Greenish-grey, micaceous, glauconitic and sideritic, foraminiferal marl.

Washings contain few pellets and abundant Foraminifera.

Details of organisms.-

Foraminifera.- Lenticulina cultrata F; L. clericii; Trifarina tricarinata F; Cassidulina subglobosa; Epistomina elegans; Anomalina rotula; Cibicides ungerianus C; C. victoriensis C; Carpenteria proteiformis; Sphaeroidina bulloides V.C.; Globigerina triloba; Operculina sp.; Quinqueloculina vulgaris; Spiroloculina grata; Martinottiella communis F.

Echinodermata.- Salenid spines F.

Polyzoa.- Fragments of cheilostomate forms, indet.

Mollusca.- Shell fragments, indet.

1159 feet.

Description.- Grey micaceous foraminiferal marl, with ochreous stains.

Washings with minute Foraminifera and some glauconitic pellets.

Details of organisms.-

Foraminifera.- Epistomina elegans; Planulina wuellerstorfi; Cibicides victoriensis C.; Elphidium verriculatum.

1181 feet.

Description.- Greenish-grey, shelly and micaceous foraminiferal marl, with much glauconite.

Washings contain numerous ovoid pellets, chiefly in glauconite.

Details of Organisms.-

Foraminifera.- Lenticulina calcar; L.cf.gyrosalprum;
Cassidulina subglobosa; Anomalina rotula; Gibicides
victoriensis; Elphidium verriculatum.

1231 feet 6 inches.

Description.- Hard, yellowish-green, glauconitic sandstone.

Not examined in detail.

1234 feet.

Description.- Friable, glauconitic marl of a sage-green colour. Shelly fragments abundant, one more or less complete valve referable to Ostrea cf. hyotiodea. This shell ranges from Upper Oligocene to Lower Miocene. Washed material consist largely of glauconite grains, represented by ovoid pellets and casts of foraminifera; calcareous shelly fragments (bivalves); and also a few small rounded quartz grains. The finest washings consist mainly of minute foraminifera in siderite and glauconite.

1237 feet.

Description.- Hard, yellowish-green, glauconite sandstone.

Washings show numerous calcareous shelly fragments; pellets and foraminiferal casts in glauconite; also carapaces of ostracoda and tests of foraminifera.

Details of Organisms.- Foraminifera.-

Foraminifera.- Anomalina cf. glabrata.

Ostracoda.- Cythere sp; ?Bythocythere.

1239 feet.

Description.- Dull green, hard glauconitic sandstone, with shelly fragments on surface of rock.

Washings chiefly contain glauconitic casts of foram-

inifera and green platy fragments resembling vermiculite.

Details of Organisms.-

Foraminifera.- Cibicides ungerianus; C. victoriensis.

In both species the calcareous test is preserved.

Ostracoda.- Cytherella punctata (in glauconite).

1240 feet.

Description.- Dark brown, gritty, ferruginous rock.

Washings show a large proportion of angular quartz, associated with rusty flakes of hydrated iron oxide.

(This sample appears to have been contaminated by the accidental introduction of iron from outside). No glauconite seen.

1241 feet 6 inches.

Description.- Moderately hard to friable glauconitic sandstone, of a pale sage-green colour.

Coarse washings with shelly fragments (brachiopods) and rounded quartz grains.

Fine washings with numerous small foraminifera, having calcareous tests. Glauconite grains with casts.

Details of Organisms.-

Foraminifera.- Guttulina sp.; Cassidulina subglobosa; Gyroidina soldanii; Epistomina elegans; Planulina wuellerstorfi; Cibicides ungerianus; C. victoriensis; Pullenia sphaeroides; Pulleniatina obliquiloculata.

1243 feet 6 inches.

Description.- Hard, yellowish-green, slightly micaceous glauconitic sandstone.

Not examined in detail.
Not examined in detail.

1245 feet 6 inches.

Description.- Friable, micaceous glauconitic sandstone, sage-green in colour.

Washing

Washings contain some rounded and subangular quartz grains. Glauconite and siderite abundant; also some mica flakes. Foraminifera rare in the finer siftings.

Details of Organisms.-

Foraminifera.- Rotalia howchini; Cibicides ungerianus.

1247-1249 feet.

Description.- Hard, light sage-green glauconitic ~~sandst~~ sandstone. Also a darker green and more friable ~~sample~~ sample; washed.

Washings consist of rather irregularly shaped glauconite grains. Some ovoid pellets in glauconite, well-rounded quartz grains and mica flakes. Foraminifera, minute.

Details of Organisms.-

Foraminifera.- Cibicides ungerianus.

1247 feet 6 inches.

Description.- Hard, pale sage-green glauconitic sandstone, with a few fragments of softer texture.

Not examined in detail.

1249 feet 6 inches - 1251 feet 6 inches.

Description.- Hard, fine-grained glauconitic sandstone, of a sage-green colour, slightly brown on the weathered surface.

Crushed material shows a large proportion of glauconite grains, several recognisable as foraminiferal ~~ex~~ casts (cf. Cibicides lobatulus and aff. Globigerina); a small percentage of rounded quartz pebbles averaging 1 mm. in diameter; numerous subspherical or ovoid pellets of a greenish-brown colour averaging .75 mm. in diameter; crushed fragments of fibrous or platy material resembling vermiculite averaging .75 mm. in cross section.

A thin section shows a cavernous matrix having a large proportion of glauconite (with brown tints ~~and~~ under transmitted light. Many of the grains show the form of the casts of internal chambers of foraminifera (rotalines, Globigerina, etc.). A fair quantity of angular, transparent quartz is present.

1250 feet.

N.B.- This sample is foreign to the glauconite horizon and appears to come near to the 1466 feet horizon.

Description.- A rust-coloured or pinkish sand, consisting of sharply angular quartz grains with some gypsum (dissolving in warm H Cl) and numerous flakes of green chloritic mineral. No glauconite. Casts of foraminifera in anhydrite.

Details of Organisms.-

Foraminifera.- Chalky isomorphs of Lenticulina planiuscula and ?Flabellina.

1251 feet 6 inches- 1252 feet 6 inches.

Description.- Friable, sage-green, slightly micaceous, glauconitic sandstone.

Coarse washings contain numerous, fairly large, rounded quartz grains and aggregated glauconitic particles. Finer washings with quartz, glauconite and remains of foraminiferal casts.

1253 feet 6 inches- 1254 feet 6 inches.

Description.- This sample includes two somewhat different types of rock. One of these is a friable, dark-green glauconitic marl, the other a more carbonaceous and smoky black variety. The latter partially burns away when heated on platinum foil, leaving a cavernous matrix.

Washings consist of glauconitic particles with some siderite and numerous rounded quartz grains, averaging 1 mm. in diameter.

1257 feet 6 inches.

Description.- Brownish-green, hard, glauconitic sandstone. Cut surface with a greasy lustre. Coarse washings with glauconite and siderite in aggregates. Numerous rounded and flattened quartz pebbles; also a few angular quartz grains. Pellets in glauconite not uncommon. Foraminifera as obscure casts.

1257 feet 6 inches- 1259 feet 6 inches.

Description.- Hard, pale-greenish glauconitic and calcareous sandstone.

Washings show numerous sideritic particles and fragments of dark-brown organic structures. Also some rotaline foraminifera, indet.

N.B. No samples available to bridge this long gap.

1466 feet.

Description.- White quartz sand, with limonite and chloritic flakes. Gypsum and apparently calcite or aragonite is present in these and other sand samples beneath, which probably represent the chemically changed calcareous tests of foraminifera, leaving only the minute arenaceous forms in these sands.

This particular sample seems to have been derived from a rock similar to a chloritic schist.

Fine washings consist of angular quartz sand and occasional arenaceous foraminifera.

Details of Organisms.-

Foraminifera.- Trochammina spp.

N.B. This sample may compare, in a general way, with the erroneously placed "1250".

1484 feet.2 inches.

Description.- The same as the preceding. With obscure foraminifera.

Details of Organisms.-

Foraminifera.- cf. Cassidulina; cf. Trochammina.

1487 feet 3 inches.

Description.- White and brown speckled sand, containing quartz, chlorite and mica.

Details of Organisms.-

Foraminifera.- Discorbis sp.; Planulina wuellerstorfi; Discammina sp.; Trochammina sp.
Pisces.- Scale of fish, indet.

1487 feet 6 inches.

Description.- White quartz sand with limonite.

W Washings show flakes of Biotite and chlorite in nearly equal proportion. The quartz is angular; some felspar present.

Details of Organisms.-

Foraminifera.- Trochammina sp.

Ostracoda.- Cast of carapace, indet.

1488 feet 11 inches.

Description.- White and brownish quartz and limonitic sand, with chlorite and biotite.

Details of Organisms.-

Foraminifera.- cf. Calcituba; cf. Trochammina.

1489 feet.

Description.- Fine grey quartz sand, with some limonite, biotite and a little chlorite. Also obscure foraminifera.

Details of Organisms.-

Foraminifera.- Ammonarginulina sp.

1491 feet.

Description.- Fine grey to brown sand. Fine angular quartz sand predominating; also limonite, and biotite abundant; occasional fragments of bright green chlorite; felspar(plagioclase) rare.

Details of Organisms.-

Foraminifera.- Psammonyx sp.; Discammina sp.; ?Placopsilina; Trochammina sp.

1493 feet.

Description.- Fine grey granitic sand, with angular quartz, pink felspar, and brown to greenish mica. This sample, with its chalky(?anhydrite) particles and arenaceous foraminifera, closely resembles the Lower Oligocene of other bores.

Details of Organisms.-

Foraminifera.- Ammobaculites sp.; Trochammina sp.

1530 feet.

Description.- Fine, grey, granitic sand, with chlorite.

Amongst the coarser particles fragments of pink gran-

ite occur.

Details of Organisms.-

Foraminifera.- Cancris sp. (casts); Elphidium crat-
spiculatum; Hyperammina sp.; Trochamminoides sp.; troch-
an Ammobaculites sp.; Discammina sp.

1554 feet.

Description.- Greyish brown granitic sand, of very fine texture. Containing quartz, chlorite, biotite and limonite. Arenaceous foraminifera frequent.

Details of Organisms.-

Foraminifera.- Ammobaculites sp.; Discammina sp.;
Trochammina sp.

1576 feet.

Description.- Speckled grey sand, containing limonite and biotite. Finer washings contain frequent tests of minute arenaceous foraminifera.

Details of Organisms.-

Foraminifera.- Ammobaculites sp.; Trochammina sp.;
Verneullina cf. tricarinata.

1584 feet.

Description.- Greyish-brown granitic sand with quartz, biotite and limonite.
Finer washings contain minute arenaceous foraminifera.

Details of Organisms.-

Foraminifera.- Trochammina sp. and other, indeterminate forms.

1607 feet 5 inches.

Description.- Fine rock debris of a granulitic character, consisting chiefly of quartz, plagioclase feldspar and biotite.

Fine washings contain minute crystals of gypsum, an occasional glauconite grain and some minute foraminifera.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1626 feet.

Description.- Fine greenish-grey granitic sand, with quartz grains, flakes of biotite and particles of limonite. Foraminifera in the finest washings.

Details of Organisms.-

Foraminifera.- Trochammina sp. frequent.

1626 feet 6 inches.

Description.- Fine brownish-grey granitic sand.

Occasional minute foraminifera.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1639 feet.

Description.- Dark brownish-grey granitic sand, with quartz, biotite, plagioclase feldspar and limonitic particles.

Details of Organisms.-

Foraminifera.- Trochamminoides sp. Ammomarginulina sp. Discammina sp.

1663 feet.

Description.- Grey granitic sand with ochreous tint. Quartz, much pink feldspar, biotite (green to brown) and chlorite. Minute foraminifera.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1674 feet.

Description.- Grey granitic sand with quartz, biotite and chlorite. Arenaceous foraminifera common.

Details of Organisms.-

Foraminifera.- Flabellammina sp.; Discammina sp. Trochammina sp.
Ammonia sp.

1679 feet.

Description.- Grey granitic sand with reddish tint, consisting of quartz, pink feldspar, and biotite. Arenaceous foraminifera rare.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1752 feet.

Description.- Grey granitic sand, with a large proportion of floury quartz sand. When tested proves to be slightly calcareous.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1752 feet, 11 inches.

Description.- Similar to preceding.

Details of Organisms.- cf. Trochammina.

1779 feet.

Description.- Pinkish brown, fine and coarse granitic sand, containing quartz, pink and white felspar, biotite and limonite as deposit on grains. Finer washings contain foraminifera.

Details of Organisms.-

Foraminifera.- cf. Discorbis; cf. Psammonyx; Ammomarginulina sp.; Spiroplectammina sp.

1780 feet.

Description.- Fine, whitish, detrital sand, with larger fragments of quartz and biotite. Also irregular lumps of pale greenish concretions, reacted upon by cold HCl.

Foraminifera excessively minute.

Details of Organisms.-

Foraminifera.- Haplophragmoides sp.; Trochammina sp.

1787 feet

Description.- A grey, granitic sand, with quartz and biotite. Foraminifera in the finest siftings.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1842 feet.

Description.- Fragments of ?hypabyssal rock, possibly Epidiorite, containing altered pyroxene and a little quartz.

1844 feet.

Description.- A detrital, granitic rubble, showing

quartz, pink felspar and much biotite; also some pyroxene.

1846 feet.

Description.- Similar to preceding, but in larger fragments.

1852 feet.

Description.- Grey, granitic sand, with much biotite and limonitic encrustation.

Details of Organisms.-

Foraminifera.- Trochamminoides sp.; Discammina sp.

1870 feet.

Description.- Grey, granitic sand, similar to above. Arenaceous foraminifera present, indet.

1875 feet.

Description.- Similar to above.

1883 feet.

Description.- Granitic sand, with the addition of pink felspar.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1885 feet.

Description.- Grey, granitic sand, with quartz, pink felspar and biotite.

Details of Organisms.-

Foraminifera.- Discammina sp.; Trochammina sp.

1894 feet 6 inches.

Description.- Grey, granitic sand as above, with obscure foraminifera, indet.

1895 feet.

Description.- Pink, granitic sand, with quartz, felspar, biotite and chlorite. Showing a slight reaction with cold HCl.

Details of Organisms.-

Foraminifera.- Discammina sp.; Trochammina sp.

1901 feet.

Description.- Grey speckled granitic sand, consisting of quartz (angular and rounded), white and red felspar, biotite and chlorite.

Details of Organisms.-

Foraminifera.- ~~Agathammina~~ ^{Discammina} ? Trochammina sp.

1903 feet.

Description.- Ditto. Foraminifera fairly common.

Details of Organisms.- cf. Trochammina, etc.

1908-9 feet.

Description.- Ditto. Foraminifera frequent.

Details of Organisms.-

Foraminifera.- Trochamminoides sp.; Haplophragmoides sp.; Ammomarginulina sp.; ides sp.; ? Globivalvulina.

1913 feet.

Description.- Ditto.

Details of Organisms.-

Foraminifera.- Trochamminoides sp.; Haplophragmoides sp.; Ammomarginulina sp.; Discammina sp.; ? Placopsilina.

1916 feet.

Description.- Ditto.

Details of Organisms.-

Foraminifera.- Haplophragmoides sp.; Ammomarginulina sp.; Ammobaculites sp.; ? Placopsilina.

1926 feet.

Description.- Coarse, grey, speckled granitic sand, with occasional foraminifera.

Details of Organisms.-

Foraminifera.- Trochammina sp.

1951 feet.

Description.- Excessively fine, white sand, with angular quartz and felspar, both orthoclase and plagioclase, with perthite structure not uncommon, and

a few flakes of biotite. Some calcareous matter present. No foraminifera seen.

1951 feet 6 inches.

Description.- Grey, granitic sand, fine and coarse. Quartz, felspar (some pink fragments) and biotite. Minute foraminifera present.

Details of Organisms.- of

Foraminifera.- cf. Trochammina.

1960 feet.

Description.- Grey speckled granitic sand with angular quartz, pink felspar and biotite.

Details of Organisms.-

Foraminifera.- Psammonyx sp.; Discammina sp.

1961 feet.

Description.- Pinkish-grey speckled granitic sand, with angular quartz, pink felspar, biotite and a little limonite in pustulate particles.

Details of Organisms.-

Foraminifera.- Discammina sp.; cf. Trochammina.

1962 feet.

Description.- Grey, granitic sand, with quartz, some felspar, biotite and chlorite. Amongst the finer sand occurred a doubly terminated zircon.

Details of Organisms.-

Foraminifera.- cf. Discorbis (glauconite cast); Lit-uotuba sp.; Haplophragmoides sp.; cf. Placopsilina.

1968 feet.

Description.- Grey speckled, granitic sand, with angular quartz, some felspar and much biotite. Occasional foraminiferal casts in glauconite and arenaceous forms.

Details of Organisms.-

Foraminifera.- cf. Flabellamina; Discammina sp;

Trochammina sp.

1970 feet.

Description.- Grey to pink coarse and fine granitic sand, with angular quartz, some felspar (pink and white) and biotite, and a little chlorite and sericite. Arenaceous foraminifera frequent.

Details of Organisms.-

Foraminifera.- ~~cf. Agathammina~~; Ammomarginulina sp.;
cf. Flabellamina; Discamina sp.

1978 feet.

Description.- Grey to pink, coarse and fine granitic sand, with angular quartz, felspar and biotite.

Details of Organisms.-

Foraminifera.- cf. Agathammina; ?Haplophragmoides.

1980 feet.

Description.- Grey speckled granitic sand, with angular quartz, felspar and mica.

Details of Organisms.-

Foraminifera.- Discorbis sp.; ?Psammonyx; cf. Agathammina; Spiroplectamina sp.

1982 feet.

Description.- Grey speckled granitic sand, with chiefly angular quartz and biotite; also occasionally felspar and rarely actinolite.

Details of Organisms.- cf. Agathammina; Discamina sp.;
Trochamina spp.

2001 feet.

Description.- Grey granitic sand with much fine detritus. Effervesces in cold HCl.

Details of Organisms.- cf. Ammomarginulina; cf. Flabellamina; Discamina sp.

2083 feet.

Description.- Grey detrital mud, yielding after washing a fine granitic sand, with small aggregated particles of limonite, and minute arenaceous foraminifera.

A large percentage of carbonate of lime present.

Details of Organisms.-

Foraminifera.- Ammobaculites sp.; Ammosphaeroidina sp.
cf. Valvulammina.

2101 feet.

Description.- Grey speckled granitic sand. Angular quartz, biotite and some limonite. A small quantity of calcareous matter present.

Details of Organisms.-

Foraminifera.- Heronallenia cf. lingulata; Haplophragmoides sp.; Discammina sp.; Trochammina sp.

2109 feet.

Description.- Greenish-grey granitic sand. Sand grains ~~shown~~ obscured with fine detritus. Washed material shows quartz, chloritic and micaceous flakes, limonite and probably fragments of pink felspar. Numerous minute foraminifera. Some small, ovoid or flattened pellets of a pale green colour present, bearing resemblance to casts of ostracod carapaces.

Details of Organisms.-

Foraminifera.- Ammobaculites sp.; Discammina sp.; Trochammina sp.

2128 feet.

Description.- Grey speckled granitic sand, with quartz, biotite and felspar. Occasional ovoid, greenish mud pellets.

Details of Organisms.-

Foraminifera.- ?Psammonyx; Discammina sp. F.

2132 feet.

Description.- Grey speckled granitic sand, with quartz, biotite and some felspar; also particles and encrustations of limonite.

Details of Organisms.-

Foraminifera.- Heronallenia cf. lingulata; Psammonyx sp.; Discammina sp.; Trochammina sp.

2138 feet.

Description.- Grey speckled granitic sand, with quartz, biotite and some felspar; also occasional particles of

limonite.

Details of Organisms.-

Foraminifera.- Ammomarginulina sp.; Discammina sp.; ~~xx~~
Trochammina sp.

2139 feet.

Description.- Ditto, with both calcareous and arenaceous foraminifera.

Details of Organisms.-

Foraminifera.- ?Lenticulina(mineral replacement); cf. Siphonina sp.; cf. Globorotalia; cf. Stacheia.

2142 feet.

Description.- Ditto, with pink felspar and ?garnet. Also calcareous and arenaceous foraminifera.

Details of Organisms.-

Foraminifera.- Epistomina sp.; cf. Siphonina; cf. Amphistegina; Discammina sp.; Spiroplectammina sp.; ?Trochammina.

2143 feet.

Description.- Fine grey, granitic sand, chiefly angular quartz and some biotite. Washings show both calcareous and arenaceous foraminifera.

Details of Organisms.-

Foraminifera.- ?Heronallenia(glauconite cast); Cibicides cf. lobatulus; Psammonyx sp.; cf. Nubecularia; Ammomarginulina sp.; Discammina sp.; Spiroplectammina sp.; ?Spiroplectinata.

Ostracoda.- Cythere sp.

2152 feet.

Description.- Fine granitic sand of a pinkish tinge. Quartz, biotite and some chlorite. Foraminifera rare.

Details of Organisms.-

Foraminifera.- Casts of rotalines, indet.; cf. Discammina; Spiroplectammina sp.

2156 feet.

Description.- Fine, grey, granitic sand, with quartz, pink felspar and biotite.

Details of Organisms.-

Foraminifera.- Discammina sp.; Spiroplectammina sp.;
Trochammina sp.

2162 feet.

Description.- Very fine white quartz sand, with a few flakes of biotite. No foraminifera.

2174 feet.

Description.- White speckled granitic sand, with quartz, felspar, biotite and some chlorite. Foraminifera very rare.

Details of Organisms.-

Foraminifera.- Trochammina sp.

2181 feet.

Description.- White speckled, granite sand, with quartz, white felspar, biotite and some limonite. Foraminiferal east, indet.

2196 feet.

Description.- Fine to rubbly, pink and green granitic sand. Larger particles up to 8 mm. in diameter. Examined in detail, the larger pieces appear to be referable to a green augite syenite, with pink orthoclase and white, partially kaolinised felspars, enclosing allotriomorphic quartz. Patches of a dark green fibrous mineral may be referred to ~~partially kaolinised~~ ^{hornblende} augite passing into ~~quartzite~~. Other fragments, showing a dull green colour and waxy texture, may be of the nature of epidote. Similar rocks to these fragments have lately been described by Messrs. E. Broadhurst and J. D. Campbell (Proc. Roy. Soc. Vict. 1933, vol. XLV. pt. II. pp. 223, 224) under the heading of Granodiorites and Associated Gneisses, from the Mt. Leinster region of N.E. Gippsland.

The finer siftings from this depth, the samples of which in Lightner's log as "very changeable", consist of angular to subangular sand grains, with smaller rounded ones,

also numerous pale-green granules of rounded or ovoid contour, resembling casts of foraminifera in glauconite. A few arenaceous foraminifera.

Details of Organisms.-

Foraminifera.- ?Marginulina(transparent cast); cf.Hemigordius; ?Discammina; ?Spiroplectammina; (also a ?cast of the latter in glauconite).

2200 feet.

Description.- Fine, grey, speckled granitic sand, with angular quartz, fragments of pink and white felspar, biotite and vivid green chlorite. No foraminifera noted.

2204 feet.

Description.- Ditto.

2206 feet.

Description.- Ditto. Foraminifera minute and rare.

Details of Organisms.-

Foraminifera.- cf. Trochammina sp.

2210 feet.

Description.- Very fine, grey, granitic sand.

Details of Organisms.-

Foraminifera.- Trochammina sp.

2212 feet.

Description.- Ditto.

Details of Organisms.-

Foraminifera.- ?Discammina; Trochammina sp.

2216 feet.

Description.- Fine, grey, granitic sand, with angular quartz, Orthoclase and plagioclase felspar, olive green to brown mica, apatite and chlorite. The felspar often shows perthite structure. Foraminifera fairly frequent.

Details of Organisms.-

Foraminifera.- cf. Virgulina; Hemidiscus sp.; cf. Agathammina; Discammina sp.; Spiroplectammina sp.; Trochammina sp.

2220 feet.

Description.- Fine, grey, granitic sand, with quartz, felspar and mica (biotite abundant, muscovite rare).

Details of Organisms.-

Foraminifera.- cf. Agathammina.

2221 feet.

Description.- Ditto.

Details of Organisms.-

Foraminifera.- Ammomarginulina sp.; cf. Discammina;
cf. Trochammina.

2228 feet.

Description.- Ditto.

Details of Organisms.-

Foraminifera.- ?Agathammina; Placopsilina aff. cenomana;
?Spiroplectammina; Trochammina sp.

2237 feet.

Description.- Grey speckled granitic sand, with angular quartz, brown and occasionally white mica. Foraminifera minute, numerous.

Details of Organisms.- Reussella sp.; Discorbis sp.; Ammobac-
Foraminifera.-

ulites sp.; Discammina sp.

2250 feet.

Description.- Grey quartz sand with biotite; excessively fine, with numerous foraminifera.

Details of Organisms.-

Foraminifera.- Hemidiscus sp.; Ammomarginulina sp.;
Discammina sp.; Arenobulimina sp.

2255 feet.

Description.- Fine grey quartz sand with biotite, a little chlorite and ?augite. Foraminifera rare.

Details of Organisms.-

Foraminifera.- Discammina sp.; Trochammina sp.

2460 feet.

Description.- Greyish brown granitic sand, with quartz, some felspar, abundant biotite and chlorite. Much limonitic staining of particles.

Details of Organisms.-

Foraminifera.- Discammina sp. F.;

2478 feet.

Description.- Rubbly particles, up to 1 cm. in diameter, consisting of decomposed granodiorite and gneiss.

2490 feet.

Description.- Coarse, speckled, granitic sand, apparently ~~and~~ derived from the same source as the preceding sample; ~~and~~ containing abundant quartz, some plagioclase and orthoclase (pink), biotite and chlorite.

2528 feet.

Description.- Grey speckled sand, with much clear angular quartz, biotite flakes (not associated with chlorite), some kaolinised felspar, hornblende and augite.

Details of Organisms.-

Foraminifera.- Discammina sp.

2560 feet.

Description.- Ochre-coloured quartz sand, with biotite, ~~and~~ decomposed felspar and limonite. Foraminifera very rare.

Details of Organisms.-

Foraminifera.- Discammina sp.

2566 feet.

Description.- Grey, excessively fine to gritty sand. In the coarser portion the quartz is rounded to subangular; some mica (biotite) and chlorite. Arenaceous foraminifera frequent.

Details of Organisms.-

Foraminifera.- Haplophragmoides sp.; Ammobaculites ~~sp.~~ sp.; Discammina sp.; Trochammina sp.

2590 feet.

Description.- Fine speckled grey granitic sand, with quartz and biotite in nearly equal proportions. Arenaceous foraminifera common.

Details of Organisms.-

Foraminifera.- Haplophragmoides sp.; Ammomarginulina sp.;
Discammina sp.; Trochammina sp.

3203 feet.

Description.- Decomposed granodiorite with pink felspar and much chlorite and biotite.

F. Chapman
A.L.S., 795, Am. F.R.M.S.

LITHOLOGY & PETROGRAPHY

0 - 60	Yellow sandy clay
60 - 64	Calcareous sandstone
64 - 275	Bluish grey marl
275 - 325	Polyzoal limestone
325 - 861	Grey Marl
861 - 865	Limestone
865 - 987	Grey marl. Limestone band at 946'
987 - 1227	Brown Clay, with 5 hard limestone bands.
1227 - 1255	Oil Sand
1255 - 1287'6"	Fine grey micaceous sand
1287'6" - 1290	Hard greenish grey limestone
1290 - 1290'9"	Gravel, clay, & shells
1290'9" - 1291'9"	Silt & sand
1291'9" - 1294	Hard grey limestone & shells
1294 - 1294'6"	Hard shell band
1294'6" - 1295'4"	Grey sand with large shells
1295'4" - 1297'5"	Hard shell band
1297'5" - 1302	Sandy green marls with shells
1302 - 1305	White sand
1305 - 1314'6"	Loose limestone
1314'6" - 1317'9"	Coarse white sand and gas
1317'9" - 1323	Puggy grey marl & gas
1323 - 1330	Hard & soft sandstone bands with shells
1330 - 1378'7"	Hard grey & red formation with gas
1378'7" - 1389'10"	Hard grey formation; fossils, gas, & oil films
1389'10" - 1391'4"	Hard white formation
1391'4" - 1393'8"	Grey sandstone & limestone
1393'8" - 1407'8"	Alternating hard & soft grey sandstones
1407'8" - 1423'4"	Hard red, brown, & green conglomerate
1423'4" - 1445	Hard brown & grey sandstone, with shale at 1439'9"
1445 - 1467	Fine grey sandstone with taste of salt & large percentage of limestone.
1467 - 1470	Small drift sand
1470 - 1680	Fine to coarse grey sandstone, with thin hard bands
1680 - 1691	Limey marl
1691 - 1707	Conglomerate containing granite pebbles
1707 - 1770	Quartz formation & soft bands
1770 - 1780	Softening marl, with gas & water
1780 - 1782	Oil showing. Redrilled hole
1782 - 1784	Quartz & sandstone
1784 - 1786	Stratified formation. Conglomerate & quartz pebbles
1786 - 1788'5"	Quartz sandstone, stratified conglomerate & marl
1788'5" - 1815	Conglomerates
1815 - 1825	Steeply tilted formation
1825 - 1840	Good looking sand, gas (petroliferous). Some ironstone
1840 - 1880	Hard formation. Quartz & felspar, limestone in evidence
1880 - 1931	Same as 1840-1880, hard & compact
1931 - 2025	Resembling red Permian beds. Well worn felspar & quartz shows signs of travel.
2025 - 2067	Very sandy & highly cemented, some small pebbles
2067 - 2108	Granitic sands; very little mica
2108 - 2110	Fine & coarse limestones
2110 - 2147	Conglomerate with crystalline limestone
2147 - 2180	Much softer formation
2180 - 2202	Very changeable
2202 - 2205	Water sand resembling old creek bed
2205 - 2240	Fine granitic sand with limestone
2240 - 2252	Greyish blue shale
2252 - 2275	Granitic sands
2275 - 2290	Conglomerate of sand & pebbles
2290 - 2340	Hard flinty rock
2340 - 2370	Rotten greenstone & gas
2370 - 2408	Hard flinty rock
2408 - 2422	Sandy cemented formation
2422 - 2440	Water washed pebbles, sand & gas
2440 - 2500	Quartz, pebbles, conglomerate, gas
2500 - 2560	Grey rock with limestone veins
2560 - 2582	Conglomerates, pebbles, limestone, gas
2582 - 2640	Conglomerate, gas
2640 - 2656	Hard & flinty
2656 - 2680	Hard & flinty rock

Midwest Bore No 2, continued

2680 - 2691	Grey shale, apparently tilted. Gas
2691 - 2736	Soft granitic formation
2736 - 2880	Fine granitic sand. Hard & soft layers; gas
2880 - 3400	Grey shale interbedded with felsite bands.

Note : This log was copied from records held by the Head
Driller at Foster's Bore, May 1936

MIDWEST No.2. BORE.

W416

Elevation 130'.

Surface to 60' yellow sandy clay.

- 60' to 64' - calc sandstone
- 64' " 85' - yellow sandy clay
- 85' " 275' - marl, bluish clay

Casing 8", set at 139 feet.

- 275' to 325' - lime (polyzoal)
- 325' " 857' - grey marl

Gas slight flow at 750'.

" fairly strong flow at 789'.

- 857' to 865' - limestone band
- 865' " 946' - grey sticky marl

Gas strong flow at 871'.

" " ,caving, marl at 924'.

- 946' to 947' - limestone band (very strong gas)
- 947' " 987' - grey caving marl
- 987' " 1225' - brown clay

Limestone hard band 9" at 1058'.

Gas very strong at 1082'.

Limestone hard band 6" at 1118'

- " " " 6" " 1126'
- " " " 6" " 1136'
- " " " 12" " 1205' to 1206'

1227' struck glauconite, very strong gas.

Casing 6" set at 1227 feet.

1227' to 1255' - oil sand.

Cored to 1228'1" very good show of oil - gas very strong to oil sand, and increased after coring 1'. Reamed to about 10" before cementing casing.

1231' - gas pressure blew the glauconite an additional 3'6" causing casing to slip down the extra depth. Recemented casing at 1231'. Splendid showing oil and gas.

1241'6" - drilled through cement, water shut off - cored 10'6" into oil sand and reamed to 10" - splendid show of oil.

1255' - water shut off, cored 27'6" into rich oil sand and reamed 10" - bailed 260 gals. fluid for 200 gallons oil.

1257' - bailed 370 gals. fluid for 270 gals oil in 5 days - cored

2' deeper into oil sand.

1257' to 1287'6" - fine micaceous sandy clay
1287'6" " 1290' - hard greenish grey limestone
1290' " 1290'8" - gravel, clay and shells
1290'8" " 1291'9" - silt and sand
1291'9" " 1294' - hard grey limestone (with shells)
1294' " 1294'6" - hard shell band and hard grey limestone
1295'4" " 1296' - grey sand with large shell to 1295'
1297'6" " 1303' - sandy green marl with shell to 1302 feet
1303' " 1305' - white sand
1305' " 1314'6" - loose limestone

1314' - bailed 75 gals. oil, drilled 7" hole to 1314' in fine and coarse sand - gas very strong and burns in bailer.

1314'6" to 1315'6" - hard limestone band
1315'6" " 1317'9" - white coarse sand and gas
1317'9" " 1323' - grey puggy marl, fine sand and gas
1323' " 1330' - alternating hard bands white sandstone and soft sandstone with shells
1330' " 1378'7" - hard red and grey formation, with occasional gas showing and burns in bailer.
1378'7" " 1389'10" - hard grey formation showing small fossils - gas and oil films and particles of lime.

Casing 5" set at 1336'4".

1389'10" to 1391'4" - hard white formation
1391'4" " 1393'8" - grey sandstone with lime
1393'8" " 1407'8" - alternating hard and soft bands grey sandstone and lime
1407'8" " 1423'9" - hard red, brown and green conglomerate
1423'9" " 1439'9" - hard grey sandstone with brown pebbles
1439'9" " 1440'3" - band of shale with particles of sandstone
1440'3" " 1445' - brown and grey sandstone with little lime
1445' " 1467' - very fine grey sandstone (with taste of salt) and big percentage of lime
1467' " 1470' - small drift sand.
1470' " 1488'11" - coarse sandstone changing to grey and coarse grey
1488'11" " 1526' - fine grey sandstone with big percentage of lime
1526' " 1574' - grey sandstone, softening with thin hard bands.

1574'	to 1680'	- grey sandstone
1680'	" 1691'	- marl, limey
1691'	" 1707"	- conglomerate, containing granite pebbles
1707'	" 1770'	- quartzoe formation with soft bands
1770'	" 1775'	- softening marl, good gas surged water over top of casing. Used gelignite to break up granite boulder which was causing trouble and deflecting bore
1775'	" 1780'	- oil showing - redrilled hole
1780'	" 1782'	- quartzoe sandstone
1782'	" 1784'	- stratified formation, conglomerate quartzoe
1784'	" 1786'	- pebbles with lime
1786'	" 1788'5"	- stratified conglomerate and marl
1785'5"	" 1815'	- conglomerate
1815'	" 1825'	- steeply tilted formation - good gas pressure - cuttings show rich traces of oil - this was after 5" casing was set at 1366'.
1825'	" 1840'	- good looking sand, active gas - petroliferous, some ironstone, good oil showing.
1840'	" 1880'	- hard formation - quartzoe and felspar with lime in evidence.
1880'	" 1931'	- very fine and compact - same formation as at 1840' to 1850' - cuttings showed oil and gas (wet gas) for first time in history of field (from 1902'3" to 1926'9")
1931'	" 2025'	- resembling red permian beds - well worn felspar, and quartzoe, show signs of travel.
2025'	" 2067'	- very sandy and highly cemented - same small pebbles.
2067'	" 2108'	- granitic sands - very little mica - also show signs of travel by the rounded corners of the grains - much lime and active gas.
2108'	" 2110'	- alternating fine and coarse - very limey
2110'	" 2147'	- conglomerate, with crystalline of lime
2147'	" 2180'	- much softer formation, cuttings not settling in water very rapidly
2180'	" 2203'	- very changeable
2203'	" 2205'	- water sand, resembling old creek bed
2205'	" 2240'	- fine granitic sand, with lime
2240'	" 2252'	- greyish blue shale
2252'	" 2275'	- granitic sand
2275'	" 2290'	- conglomerate of sand and pebbles

- 2290' to 2340' - hard flinty rock
 - 2340' " 2370' - rotten green stone and gas
 - 2370' " 2408' - hard flinty grey rock
 - 2408' " 2422' - sandy cemented formation
 - 2422' " 2440' - water washed pebbles, sand with gas
 - 2440' " 2483' - quartz, pebbles, conglomerate and more gas
 - 2483' " 2500' - same as 2440' to 2483'
 - 2500' " 2560' - grey rock, showing lime veins
 - 2560' " 2582' - conglomerate pebbles with lime
 - 2582' " 2640' - conglomerate, gas
 - 2640' " 2680' - hard and flinty, lost drilling tools, but were recovered, hole went crooked and was redrilled from 2671'.
 - 2680' " 2691' - grey shale apparently tilted - gas.
- Casing 4" was set at 2656'10".
- 2691' to 2736' - granitic formation (not hard)
 - 2736' " 2880' - fine granitic sand with hard and soft bands, and at 2752' gas burns on tub when bailer dumped.
 - 2880' - working into change
 - 3300' - blue grey interlaced with thin bands of felspar - gas strong
 - 3379' - same formation, cuttings appear like sandy grey shale. Water level here dropped to 400' from surface.
 - 3400' - similar formation, water level dropped to 560' from surface, indicating that the formation is taking water. Previous to this decrease, the water level was within 100' of top of casing. Cuttings similar to 3379' - appear like sandy grey shale.

Drilling ceased at 3400' on May 5th, 1935, with string of tools which were abandoned at bottom.

As shown on Log, this well had been drilled into oil sand at 1227' on to 1255 feet into bottom water, but before taking steps to plug off this water, the new Superintendent desired to drill ahead to test the underlying structure as to whether it was bedrock or not. He was definite in his opinion that his experience overseas justified him in forming other conclusions and that a further testing of the lower strata was justified.

Mr. Frederick Chapman's report on the samples of structure down to 2,590' may yet prove the correctness of the aforesaid conclusion. The total depth drilled reached 3,420 feet.

In course of time, this Company had to suspend operations temporarily. On resuming, it was decided to plug off the well immediately above the bottom water and test the oil sand for production.

Tests are now being carried out in this direction and a steady improvement is taking place.

From 16/8/37 to 6/12/37, bailed 11,518 gals. fluid, 2,070 gals. oil.

Samples and Rock Chips from Mid West Bore No.2 (depth, 1742 ft.).

Collected by Mr. J.W. Binney.

Slide Nos. 2780, 2781 & 2786

2786

The larger pieces were ground and mounted. Under the microscope these are undoubtedly a granite. The rock consists essentially of feldspar, mica and quartz. The feldspar is saussuritized and oligoclase, microcline and orthoclase are present. The mica is an olive brown variety which shows alteration to chlorite. In some cases this alteration has proceeded a great deal; in others the mica is untouched. Apatite and iron ores occur as accessories.

2780-2781

The sand was treated with dilute hydrochloric acid. The effervescence was very small so that the amount of carbonates was very small. After washing, the sand was treated with a magnet to separate the large amount of iron filings that are present. Some of the effervescence with hydrochloric acid is probably due to the action of the acid on the iron.

The sand was dried and then separated by bromoform into a light and heavy fraction.

Sl. 2780 - Light Fraction. This consists essentially of angular grains of plagioclase, with fine albite twinning, and some orthoclase and quartz. Biotite and chlorite are present in small amounts.

Sl. 2781 - Heavy Fraction. This consists of a dark brown mica (biotite with a pseudo-uniaxial interference figure) chloritized mica, chlorite. Common hornblende and a pale epidote occur sparingly.

All the minerals present are normal for the granite and there is no doubt that the sand is the crushed granite represented by Sl. 2786.

This rock was compared with the granite outcropping near Colquhoun North (Sl. 2106) and that occurring at the bottom of Bore 2 (Lake Bunga) near Lakes Entrance, and under the microscope the rocks are identical.

Some of the granite from Bore 2, Lakes Entrance, was crushed and treated in the same manner as the sand from Mid West Bore No. 2.

Sl. 2776 - Light Residues

This consists of angular quartz, plagioclase, microcline and a little biotite.

Sl. 2777 - Heavy Residues

A flood of olive brown biotite, in part altered to a green chlorite.

Under the microscope, these slides cannot be separated from those of Mid West Bore No. 2.

Some of the undoubted sand lying on top of the granite at Bore No. 1, Colquhoun North, was examined. This sand is undoubtedly derived from a granite but Sl. 2785 (heavy fraction), Bore No. 1, Colquhoun North, is a much lighter crop and shows a much greater proportion of zircon, apatite than mica. In the lighter residue the percentage of quartz is greater than in Mid West Bore.

Several other slides of the sandy limestone from some of the other bores were examined.

The sand from the Mid West Bore No. 2 (depth 1742 ft.) is undoubtedly derived from the rock represented by Sl. 2786. This granite is identical with that outcropping at Colquhoun North, at that obtained at the bottom of Bore No. 2, Colquhoun North, and No. 1.

W 416

-2-

Bore, Lakes Entrance. In the proportion of the heavy minerals present it is different from any of the sands obtained in the bore.

There is thus no doubt that the sand represents a crushed granite.

(S'd) D.E. THOMAS

9/4/32.


NOTES OF AN EXAMINATION OF A SAMPLE OF "SLURRY" OBTAINED
FROM THE BAILER AFTER CEMENTING OFF AT THE 1255'ft. LEVEL.

The sample now examined has been previously subjected to boiling, to obtain material free from oily constituent. This material is pale grey, fine-grained and powdery for the most part. It has less than 20% of coarser aggregated particles which measure up to 0.5 mm. The excessively fine material, microscopically examined, in some ways resembles finely ground cement ("Bull-dog Brand" examined for comparison), but that the latter is untouched by weak, cold HCl, whilst the slurry sample is in the main dissolved by the reagent, which leaves a residue of fine terrigenous granules.


The intermediate, coarser, portion of the slurry, about 50% consists almost entirely of foraminiferal shells, such as are met with in the micaceous series above the glauconite sandstone.

The glauconitic band from Govt. Bore No. 1 was examined for comparison, but this yielded very few tests of foraminifera and did not in any way compare with the slurry, where glauconite was almost entirely wanting or only represented by very minute grains.

CONCLUSION.- The slurry is an almost pure deposit of organic particles, mainly tests of foraminifera, together with a few echinoid spines, sponge spicules and other fossil fragments. The only evidence for the presence of cement possibly lies in a small percentage, perhaps 1 or 2% of the fine powdery part of the sample.

The bulk of the slurry, therefore, seems to have been derived from the micaceous sands above the glauconite bed. 

It may be remarked, in addition, that in the log of Mid-West No. 1, at 1260' "Strong gas" is noted. This section is succeeded downward by dark clay with little sand to 1280', when 30 feet of Glauconite oil-sand is recorded.

J. Chapman 8/8/37 

PRODUCTION RECORDS

4 Derby Street,
CAMBERWELL E.6
24/9/1937

C.S.Demaine Esq.,
Acting Managing Director
Austral Oil Syndicate,
MELBOURNE.

W 4/6

Dear Mr Demaine,

At Mr Chapman's request, I am forwarding herewith a copy of the log of the Midwest No. 2 bore. It is just as I copied it from Lightner's record, & I have made no attempt to make it more intelligible. Personally, I think that the log has very little practical value, as some of the determinations have obviously been made by someone quite unfamiliar with geological terms. However, there it is, for what it is worth.

I think I am now in a position to suggest some bore sites near Foster's bore, or perhaps it would be more correct to say that I could advance a few reasons why bores should be located at some points in preference to others. I would like to be able to be more definite, but you are as aware of the inadequacy of the records as I am, and will appreciate the difficulty.

I had a chat with Mr Chapman on Tuesday, and I find that our figures agree on all material points except for the No. 8 bore, where there is a variation of 50 feet between his figures and mine. He has taken the figures given in the Departmental publication, whilst I have taken those supplied to me by Messrs Imray & Lightner last year, and which, I think, fit in better with the data from adjoining bores.

With kind regards,
Yours faithfully

I.C.H. Croll

I.C.H. CROLL

enc H.G. Peggatt 1940 "Oil Parasitism in the Lake Ontario Area"

Mid-west No 2.

Baiting tests Aug - Dec 1937 → .6 galls/hour increasing
to 1 gallon for the best 3 months of the test.

Baity Test July 1938 - July 1940 3 or 4 tons a week
→ .23 galls/hour or 5.5 galls/day.

(not counting water per oil).

See R.L. Wood Report.

FIELD NOTES DRILLING MIDWEST No.2. BORE

From 11/9/31 to 12/9/32.

W 4 16

1931			
Sept.	11	1227'	Struck oil sand - cored to 1228 ft. with very good show of oil - gas very strong to oil sand and increased after coring one ft. Reaming hole to 10 inches before cementing. Cemented 11th instant.
	18	1231'	Gas pressure blew the glauconite out additional 3' 6" causing casing to slip down for that distance. Recementing at 1231 - splendid show of oil and gas.
Oct.	2	1241' 6"	Drilled through cement - water shut off - Cored 10 ft. 6 ins. into oil-sand and reamed hole to 10 inches. Splendid show of oil.
	9	1255	Water shut off. Cored 27' 6" into rich oilsand and reamed to 10". Bailed 260 gallons fluid for 200 gallons oil.
	16	1257	Bailed 370 gals. fluid for 270 gals. oil in 5 days. Cored 2 ft. deeper into oilsand.
	24	1314	Bailed 75 gallons oil on 16th. Cored and drilled 7" hole to 1314 in fine and coarse sand - gas very strong and burns in bailer.
	30	1345' 7"	5" casing to 1339' 4" - 1339' 4" to 1345' 7" very hard grey formation. Gas burns in bailer.
Nov.	6	1361'	Hard red and grey formation - gas.
	13		Mr. Lightner fired 2 charges.
	21		Filled to 1334' 6" aa casing would not turn. Redrilled to 1347'.
	27		Redrilled to 1359
Dec.	4	1364	In hard red and grey formation.
	11	1366' 10"	" " " " " " Tools have tendency to follow old hole - very hard - 6" in 12 hours. Gas in bailer.
1932			
May	3	1770'	Shooting to break up boulder which is giving trouble by causing bore to go crooked.
		1812'	Steeply pitched formation - good gas pressure - cuttings show rich traces of oil.
Sept.	5	{ 1902' 3" - 1926' 9"	Cuttings showed oil and gas - <u>wet gas</u> for first time in history of field.
	12	1963'	Fishing and splicing rope.

MIDWEST NUMBER TWO (contd.)

DATE	Depth of fluid before bailing. Feet	Quantity fluid bailed Gals.	Average fluid bailed per hour Gals.	Oil recovered Gals.	Oil to fluid Percentage. Gals.	Oil yield per hour Gals.	Test Inflow of fluid in dry hole.	
							Hrs.	Gals.
1937								
Dec. 1	98	165	6.87	27	16.36	1.125	4½	30
2	100	175	7.29	29	16.57	1.208	4½	40
3	100	175	7.29	28	16.00	1.166	4½	40
4	100	135	5.62	25	18.51	1.041	ran bailer twice only	
6	2 days 240	280	5.83	54	19.28	1.125	600' 2" pipe & sealed head	

Name of Company	Core No.	Tarich	Glauconite	Bedrock
Tanjil No. 3 Co.	1	Colquhoun	31' at 1390'	Granite at 1390'. About 10 gall. per day. Abandoned.
do.	2	do.	30' at 1380'	Bottomed at 1510'. About 10 gall. per day. Abandoned.
Midfield Co.	1	do.	33' at 1370'	Bottomed at 1405'. Small quantity of oil. Abandoned
do.	2	do.	33' at 1380'	Bottomed at 1508'. Small quantity oil. Abandoned.
<u>Mid West</u>	1	do.	40' at 1280'	Granite at 1520'. Small quantity oil. Abandoned.
do.	2	do.		<u>In progress</u> in 1932?
Lake View	1	do.	37' at 1170'	Metamorphic at 1207'. About 20 gall. per day. Abandoned.
do.	2	do.	39' at 1302'	Bottomed at 1341'. About 30 gall. per day. Abandoned.
do.	3	do.	30' at 1255'	Bottomed at 1285'. 20 gall. per day. Abandoned.
Oil Search	1	do.	25' at 1160'	About 20 gall. per day. No pump installed.
do.	2	do.	37' at 1155'	About 30 gall. per day. No pump installed.
Carpenter's	1	do.	36' at 1165'	No pump installed.
Texland	1	do.	39' at 1245'	No pump installed.

NOTE: Quantity of oil given by company;

Amount of water present in emulsion not given.

1932