

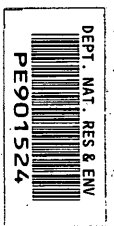
FLATHEAD - 1

901524 001

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# BASIC DATA

(W545)



PALYNOLOGICAL EXAMINATION OF BORE SAMPLE.

901524 002

Samples from the Esso Flathead Bore No. 1  
were treated by the hydrofluoric acid - Schulze's  
solution method, and the residues examined under the  
microscope for acid insoluble microfossils.

Sample Details.

<u>Bore No.</u>	<u>Rock Type</u>	<u>Depth</u>	<u>Microfossils.</u>
1		1576-1579ft.	Many sporomorphs including <u>Schizosporis</u> <u>reticulatus</u> <u>Pilosporites</u> <u>parvispinosus</u> <u>Cryptosporites</u> <u>striatus</u> <u>lycoperidiumsporites</u> <u>austroclavaticite</u> <u>Cicatricosisporite</u> <u>australiensis</u> <u>Cyathidites Sp.</u>
		1579-1582ft.	Outicular debris and sporomorphs as found at 1576-1579ft.

Remarks

This microflora is characteristic of the Speciosis  
Assemblage Zone of Dettmann (1963) found in Strzelecki Group  
sediments in the Gippsland Basin.

SENIOR

J. DOUGLAS.  
GEOLOGIST.

GIPPSLAND SHELFINTRODUCTION

Esso's Flathead 1 well was drilled during 1969 to test a prospect ~~on~~ towards the northern flank of the Gippsland Basin. The well was drilled close to the suspected northern edge of the Lower Cretaceous Strzelecki Basin (Fig. 1)

Cores 1 and 2, between 1545 and 1555 feet, intersected <sup>a loose</sup> quartzose conglomerate ~~and~~ <sup>fresh</sup> (with the core is of quartz sands, quartzite pebbles in a mud slurry) ~~and~~ traces of carbonaceous or coaly materials, believed to be Letiche Valley Group.

Core 3, at 1555 feet, cut a different lithology, ~~that~~ ~~is~~ a soft and weathered

(?) fine-grained muddy sandstone. It closely resembles the topmost beds of the Strzelecki Group seen by the writer in other Gippsland wells.

Continuous core with ~~practically~~ high order of recovery exists ~~to~~ down to 1714 feet (Core 6)

~~The~~ The cores are of interbedded sandstone, siltstone and mudstone

An examination of Cores 3 to 6, supplemented by palynological ~~examination~~ and petrographic examination of representative cores reveals that the cores are cut from the Strzelecki Group (Lower Cretaceous). This is of specific interest since the uppermost weathered sandstones are gas-bearing to a limited extent. Further details are given below.

CORE SECTION

~~The~~ Cores 3 to 6 ~~represent maximum recovery~~ range continuously from 1555 to 1714 feet and consist of interbedded and interlaminated sandstone, siltstone and mudstone/shale.

The mudstones are chloritic and often plant-bearing

Available at Oil + Gas Branch

Dear Sir,

E02/1A - Special Reports -  
Gippsland Drilling

We are forwarding under separate cover, two copies of the following palynology and paleontology reports on wells drilled in the Gippsland Basin:-

	<u>Palynology</u>	<u>Paleontology</u>
Bream -2 -3	"	"
-3	"	"
Barracouta -1	"	"
Barracouta-Marlin-Turrum	"	"
Flounder -1 -2 -3	"	"
Marlin -1 -2 -3	"	"
Mackerel -1	"	"
Salmon -1	"	"
Turrum -1	"	"
Groper -1	"	"
Trevally -1	"	"
Wahoo -1	"	"
Gurnard -1	"	"
Tuna Field	"	"
Snapper -1 -2 -3	"	"
Albacore -1	"	"
Emperor -1	"	"
Batfish -1	"	"

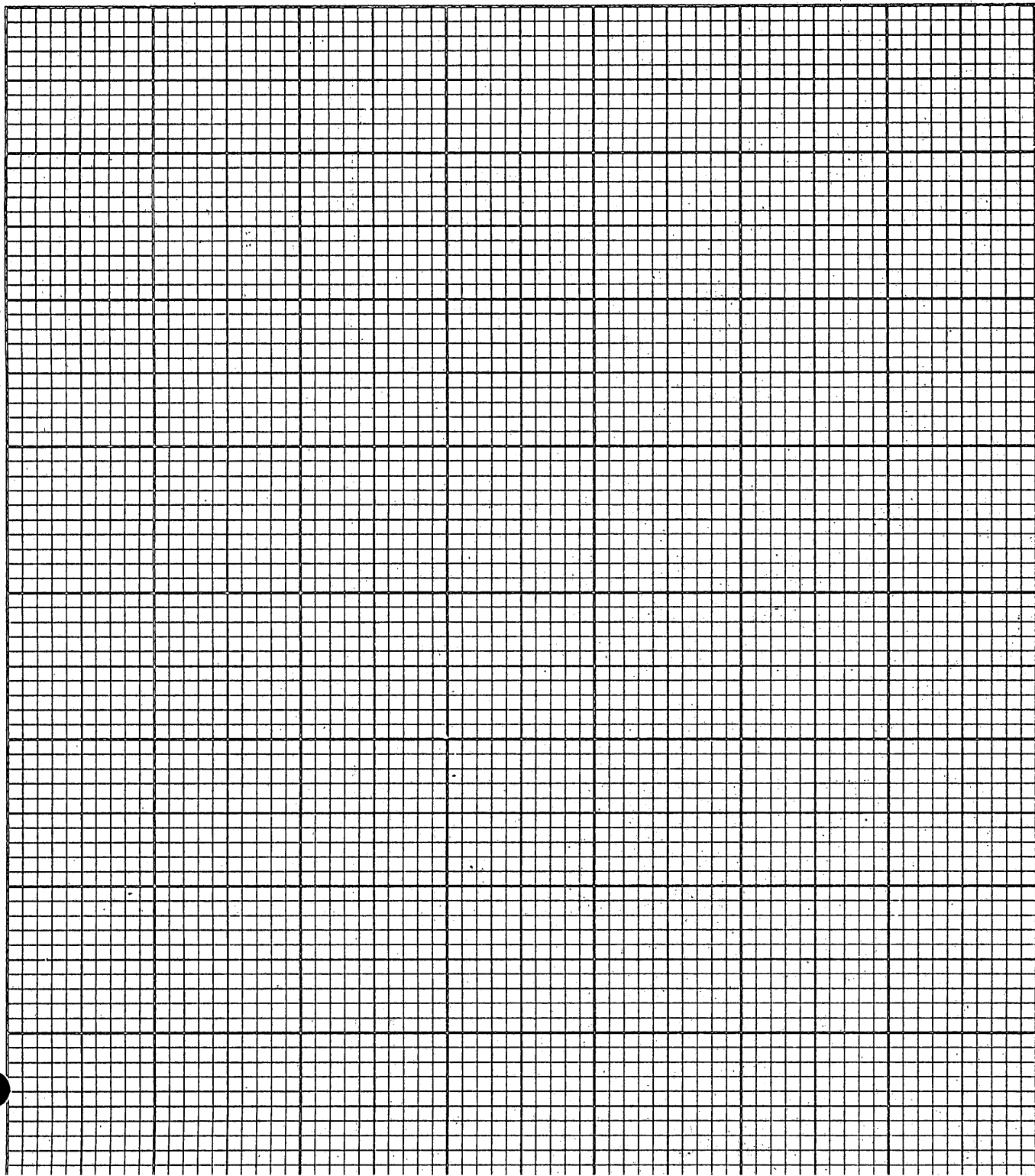
- 2 -

	<u>Palynology</u>	<u>Paleontology</u>
Flathead -1	"	"
Groper -2	"	"
Tailor -1	"	"
Bonita 1a	"	"
Perth -1	"	"
Tuna -1	"	"
Kingfish -1 -2 -3	"	(1) only
Dolphin -1	"	"
Cod -1	"	"
Halibut -1	"	"

You will note that we have not received several of the paleontology reports from Esso and we have initiated enquiries as to whether they are available. Mackerel is the only well required to complete the set of palynology reports.

Lithomphile based on rapid  
examination of cores

901524 005



901524 006

Note RAPID LOGGING FLATHEAD

Core 1 Int 1545-48: Conglom, loose still in mud slurry qz sand + qzite pebbles + subord (faceted) shell in a mud slurry

cf Conglom in Duck Bay nr top of Lehole

~~SILICEOUS STRZ Include in (his) remarks re Yarraparr outcrop (IS sometimes) -? Golden Beach 1A?~~

Core 2 1549-52: sandy + muddy mat - seemingly contain core some Conglom - also sand + rocky mat. 1552-55: Conglom - also sand + rocky mat. Lethole on Gold, brown sand, though

Core 3: 1555-58: Df. Strz sst, soft + weathered.

1561-67 (2 bags) - as above

1567-70 - as above

1570-71 Conglom, inc qz + pyritised qz sandstone (not well rd.)

STRZ CONTD

Core 4 1576-79 } Chloritic spherule-bearing mudstones 1579-82

1582-85 } one bag, as above

1585-88

1588-91 - grading to siltstone + VP sst.

Graded bedding (?)

DEFINITE OR COLOR

1591-94 sandstone VF + crossbedding etc. SUITABLE SAMPLE AT BASE, shinner than before.

Core 5 1612-15 } interbedded siltst + mudst, hard to some ext.

1615-18 } + sst. seems darker gr. than above (SUIT. SAMPLE @ BASE)

1607-09 } as above (some interest! sed structures here below) more carb streaks, etc.

1609-11

1594-97 } mostly chloritic mudstone 1597-1600 sandstone, some mudst.

FE (PROMPT)

1600-1603 sandst + mudst. interbeds + interlaminae

st. still tending to be partially soft + breakable

1603-06 as above, mudst. inc megaplants

1606-09 as above, mudst. appears darker, hard + blocky

increased chertiness of tray

- also Core 5, etc. (denser cores espec. mudstones?)

An example of ~~vertical profile~~ Environmental Reconstruction  
 using a vertical Profile: Straloch's Group, Flathead Prospect,  
 (Lower Cretaceous)  
 Gipsland Shelf

Bonnelog  
 - sed. structures logging  
 (symbols)

901524 007

Flathead 1 (contd.)

1618-21 : interbedded siltstone & mudst, gy mudst heavy predom hard as before, dominantly

1621-24 : sst. dominates (NOTE beautiful mud clasts in 2 lowest cores)

1624-27 : mostly sst (> above)

1627-30 : all sst

1630-33 : all sst

1633-36 : all sst

1636-39 : " " } broken only by a

1639-42 : " " } few coal streaks & clasts

1642-45 : " "

1645-48 : sandst (p/rd/c) @ base → mudst/sh at middle (coal @ top of mudst)

1648-51 : mudst mid-ly. (some plant material, v. ch. in pl.)

1651-54 : mudst & some coal

1654-57 : mudst

1657-60 : "

CORE 6: 1660-63 : "

1663-66 : "

1666-69 : "

1669-72 : " " occas sd. lam<sup>ns</sup>

1672-75 : } minor v.f. sst in both (NOTE beautiful vert sd-filled burrow several inches deep in 1675-88 core)

1675-78 : }

1678-81 : seems all mudst/sh

1681-84 : mudst, minor sd. nr. base

1684-87 : mostly mudst

1687-1690 : mudst & minor sst

increasing sst 1690-93 : sst & mudst laminae & clasts

1693-96 : mostly sst (sst tends to be more gy than gn.)

1696-99 : sst.

1699-1702 : sst. | gy again.

1702-05 : "

1705-08 : "

1708-11 : lower half is calcareous & one calcite vein

1711-14 : "

Interesting sd. structures continue at shale base etc.

Refer

901524 009

HILLIP 1958

Photo + description  
of arksose

EDWARDS & BAKER

Descript<sup>n</sup> of arksoses

esp p. 204

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901524 008

Flathead 1

Sli. 9665 - 1714-1717 ft.

Components:

Quartz

Matrix

Note also: - gn. contacts - fabric

Feldspar <sup>K</sup>  
<sub>plag.</sub>

partly

gn. size variation on thin section

Mica

RF<sup>12</sup> - sed.

- Volc

- M

Fe ore

Heavy min<sup>ls</sup>.

Zoned minerals

Strzelecki Gp. definitive characteristics.

- Q<sub>2</sub> low
- Gn size generally  $\leq M$
- No rounding of grains
- Biotite dominant mica
- VR<sup>12</sup>
- Gn. contacts close - often in thin film zoned mineral

(1) Quartz

- ↑ 0.5 mm across, med  $\approx$  0.2 mm, not well sorted
- angular-subangular
- sli. many extinction
- occas bubble trails, inclusion seen rare (eg. occas. euhedral of zircon)
- almost entirely monocr<sup>l</sup>line
- no evidence of overgrowths

(a) Chert, rare (eg. 111/135)

(2) Feldspar (a) K. Consists of: ~~orthoclase~~

089/555

orthoclase  
 single strong cleavage

microcline

microperthite ? or plag.

ang<sup>l</sup> - subrd.

ang<sup>l</sup> ↑ 0.4 mm

may be sli. ser<sup>d</sup>  
 = partially katoised.

alt. strongly → kaol

↑  $\approx$  0.4 mm

↑ spec of comparable size range, max sli. & quartz.

11

(b) Plag.

Ext<sup>l</sup> angles: 10°, 12°, 10°, 12°, 25°, 13°, 18°

↑ 0.4 mm gen. subang<sup>l</sup> ang<sup>l</sup>.

- may be sli. seritised. (108/543)

- (3) Mica (a) Biotite 0.25  
[v. uncommon] bent to fit grain contact
- (b) Chloritised mica  
virt. col<sup>d</sup> (- pale gr)  
→ blue color

↑ almost 0.5 mm length  
(pleochroic, etc)

(4) Rock Fragments

- (a) Sedimentary: tend to be mostly subrd - ~~rd~~ range subsep - rd.  
- shales mudstones, siltstones, occ. sdy., or v. sandy sst & VF micax  
- mostly argillaceous, but occ<sup>ly</sup> & fine v. cherty-looking base (cf. Gold Beach 1A)  
- usually little more than 0.5 mm  
- may be partially carbonaceous  
- some qns have a cloudy, gy. black stain due to ? leucax

(b) Volcanic - recognised by abundance of feldspar lathes, often aligned

- feldsp: sizes max 0.025 ← can be v. lg. (? dyke rock)
- 0.05 ext<sup>d</sup>: 12 1/2
- 0.06 ? v. fine feldsp
- 0.15 ?
- 0.08 ?
- 0.10 ?
- 0.15 30 (??)
- variable types, gen. very diff. to determine because of
  - (i) too little
  - (ii) altered
  - (iii) no ext<sup>d</sup> readings

comment on pseudo-extinction (very ext<sup>d</sup>)

- occ. have pale gn. - but microX<sup>ll</sup> via gn. - chlor<sup>d</sup>, & some unusual X<sup>ll</sup> patterns - devitr. glass
- occ. & small vesicles(?) filled & vermic. chlor.
- over & gn. chlor. patches + anhedral - euhedr. leucax  
(note: most seem to be little more than feldsp)
- some qns stained by ? leucax

(c) MRF<sup>o</sup> - Quartz siltstone - osc. musc., not uncomm.  
Mica may be etched suggesting  
? schistose habit  
Mg. qtz & br. mica.  
- one 0.3 mm  
subang.

(5) Fe oia

Fine eq + 0.2 mm, prob. ilm frequently altered to leucosane  
- andrus ->

(6) Heavy Minerals

Zircon subrd  
" "  
Tourmaline 220/655  
Pleoch. 94 - col.,  
angular  
Garnet 219/648  
" "  
- (too high relief for sp.) 198/610

one qz: 175/663  
0.25 mm - across  
micro qz<sup>tic</sup> is abundant H<sub>2</sub>N<sup>o</sup>  
brown, high bir. relief, no pleoch.  
- P.T.O.

(7) Secondary minerals

Minor (?) calcite 100/663: filling & void or washout (has clear rhomboid habit could be det.)  
" 215/662

Chlorite

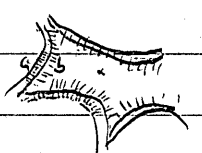
(8) Matrix chlor. 170/650

Vermic. chlor. gn. ? deriv. from vdc rock?

Surrounding most qz, & dividing them is a film of:

(a) <sup>bn</sup> light purple tinge, (b) colourless + fibrous  
material: <sup>scamplly</sup> low birefr., st. ext., length slow

29  
x 194/658



Elsewhere have fine qz material & higher birefr., obviously chlorite  
- could well all be chlorite

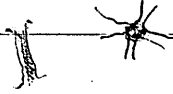
Gr. Fabric Porosity

Textured change, but no special pattern.

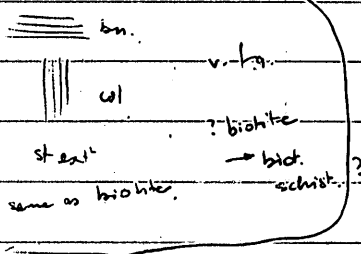
Grains are closely-packed, and leap contacts are the most common.

- separated by thin film of ?

- pores are ~~not~~ uncommon porosity is low, though there may be perhaps along grain contacts, or at grain corner contacts.



claw section



FLATHEAD 1, 1555-5.8 ft

Sci. 9.666



Components: Quartz  
 Feldspar →  
                   → Plag.  
 Mica  
 RF's — sil  
           — volc  
           — M  
 Fe ore  
 Heavy minerals  
 Secondary minerals  
 Carbonaceous mat<sup>l</sup>

(1) Quartz q ≈ 0.5 mm, mode betw. 0.2 to 0.25 mm, mod. poorly sorted  
 • exp<sup>t</sup> - subang.  
 • st - sh. wavy ext<sup>n</sup>  
 • bubbles inclusions minimal  
 • almost entirely monocrystalline  
 • no evidence of overgrowths

(1a) Chert

(3) Feldspar K Sim. size to qz.  
 - ang<sup>t</sup> - sub-ang<sup>t</sup>, prax cleavage  
 - may be partially to severely kaol<sup>d</sup>.  
 [See 2<sup>nd</sup> MIN.]  
 microperthite:  
 rare, partially kaol<sup>d</sup>.  
 granulated appearance, low biref.,  
 pinkish appearance under + nicols +  
 may inc. small "batches" of kaol.

(6) Plag. Ext<sup>n</sup> exfol: 10°, 11°, 13°, 16° ↑ 0.35  
 - may be sh. kaol<sup>d</sup> or seric<sup>d</sup>.  
 - ang<sup>t</sup>.

(4) Mica Gn br biot, uncommon as tabular flakes

901524 014

Rock Fragments

(a) Sedimentary  
shale f 0.2mm long  
siltstone fine  
mudstone

generally coarser grained than quartz, made x 0.4mm

(b) Volcanic  
uncommon

one example: (227/610) seemingly untwinned feldsp lath, sub// f 0.1mm long in s seemingly chlor base

(ii) bn. feldspars poorly disting<sup>d</sup>, f 300.5mm, virt. isotropic (probably glass)  
(213/548)

— some have feldspars c pseudo-law (but wavy) extinction.

(c) Mmic.

Heavy Minerals

Zircon: subord (dkt. color<sup>n</sup>)

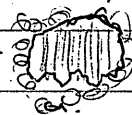
Fe ore

Secondary minerals

Calcite is not uncommon in a granular but not often euhedral, x<sup>l</sup> time form.

— appears assoc c "blotchy" gas, darkened under + -icols, which could be replaced (replaced feldspar)

surrounding ore def. c a very irreg contact



Carbonaceous material

901524 015

Matrix tends to be v. lt. brown color, finely x'lined, low birefr. grey, kad.  
— or may be simple x'b, fibrous, sometimes partially radiating (— cf. 123, 1545)

MESOWIL - OFFSHORE

CORES

1576 = 1607 : Core 4

Top: Mesozoic

THICKEN PEN.

Flatherhead

? 1556 (encs)

TOP

Core 5 1607-60 (?)

1660-176

Core 6 (?)  
Core 7 : SSt (arkosic)  
3472-3444

Wahoo

1970-  
(1987)

TO  
3494

1940

Core 3 h 2017-47  
(29 in out of 30)

17' sst  
12' shale

TO  
2446 = 460

? Golden Beach 1A

expect weathering  
top : check logs

901524 016

\* Core 3 1555-75

1' compans  
sst. 93 wader

60' 93 sst. lithics.  
Pelsop, etc

1556

Define *Strezleckii*

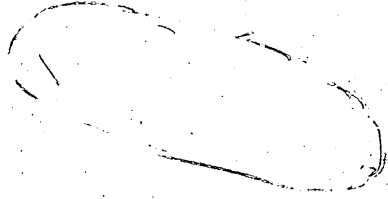
— especially top



Parch

TOP	TD	APPROX
5840	9406	lithe scr
← 000 →		Core

ON WY  
8726-8764  
lithe without  
core



901524 017