

Baroid Mud Log
will follow in 15/6-2

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GEOLOGICAL SUMMARY

COMPLETION REPORT

WILDCAT TEST

ESSO 15/6-1

September 1971

B

I Introduction

- A. Well Designation: Esso 15/6-1
- B. Well Classification: New Field Wildcat.
- C. Well Location:
 - 1) Country : Norway
 - 2) License: 028
 - 3) Coordinates:
 - Latitude : 58° 32' 48.3" N
 - Longitude: 01° 41' 32.8" E
 - 4) Seismic Location:
 - line SC 23, shotpoint 7493
 - 5) Water Depth: 379 feet.

II Purpose of Well

15/6-1 was drilled in order to:

- A) To evaluate a deep seated structural closure in the Scottish - Norwegian graben.
- B) To fulfill the drilling obligation to the Norwegian government.

III Results of the Well

15/6-1 reached a total depth of 5508 feet in Eocene and was plugged and abandoned due to problems with the casing seal assembly. The rig was moved approximately 1100 feet east and a second hole (15/6-2) was drilled.

The lithology of the Eocene penetrated (5235 to 5508') consisted of a medium light gray and pale brownish gray, very soft, silty, glauconitic clay. Pyrite occurred between 5440 feet and 5470 feet.

The Oligocene (4370 - 5235 feet) section is predominantly light gray and pale brownish gray, very soft, glauconitic clay. Micro-fossils are common.

The Miocene (2520-4370 feet) is composed of sandstone and clay. From 2520 to 3268 the section is a fine to medium grained, clear, medium sorted, unconsolidated sand. The grains are subrounded and abundant fossil fragments are present. From 3268 to 4370 feet the section is a medium brownish gray, soft, plastic clay with brown red and slightly calcareous firmer clays in places.

The Pliocene-Pleistocene (1210 - 2520 feet) section consisted of medium light gray to light gray, soft, sticky, very plastic clay.

No hydrocarbon shows were encountered.

Well HistoryA. General

- | | | |
|----|------------------|------------------------|
| 1) | Spud Date: | August 7, 1971 |
| 2) | Completion Date: | September 7, 1971 |
| 3) | Status: | Plugged and abandoned. |
| 4) | Total Depth: | 5508 feet. |

B. Contractor and Rig: Global Marine "Grand Isle".

C. Casing:

- | | | |
|---------|---|-----------|
| 30" | - | 498 feet |
| 20" | - | 1210 feet |
| 13 3/8" | - | 4018 feet |
| 9 5/8" | - | 5459 feet |

D. Mud Program

Initial drilling from the sea floor to 1260 feet was with sea water and gel. Below 1260 feet to a depth of 4090 feet the mud system consisted of sea water and Spersene XP-20 Salinex with drilling detergent. From 4090 to 5508 feet (T.D.) a fresh water Spersense XP-20 system was used.

E. Drilling Problems

No hole problems were encountered, however due to problems due to the casing seal assembly the well was abandoned at 5508 feet.

F. Coring

- 1) Conventional:
None taken.
- 2) Sidewall
None taken.

G. Logging1) Baroid

- | | | |
|----|---------------------------|-------------|
| a) | Drilling rate | 1210 - 5508 |
| b) | Lithology | " |
| c) | Cuttings Gas | " |
| d) | Mud Gas | " |
| e) | Chromatograph | " |
| f) | H ₂ S Detector | " |
| g) | Shale Density | " |

2) Schlumberger

<u>Type Log</u>	<u>Interval (feet)</u>	<u>Run Nos.</u>
a) Induction	1210' - 5504'	2
b) BHC-Sonic Gamma Ray	1210' - 5505'	2
c) Caliper	1210' - 4096'	1

3) Velocity Survey

None taken.

15/6-1

725-3

TJLH: FINAL WELL REP. - ERROR.
COMP. REP

IV Well History

A. General

- 1) Spud Date: August 7, 1971 ✓
- 2) Completion Date: September 8, 1971
- 3) Status: Plugged and abandoned. ✓
- 4) Total Depth: 5508 feet. ✓

B. Contractor and Rig: Global Marine "Grand Isle". ✓

C. Casing:

- 30" - 498 feet ✓
- 20" - 1210 feet ✓
- 13 3/8" - 4018 feet ✓
- 9 5/8" - 5459 feet ✓

D. Mud Program

Initial drilling from the sea floor to 1260 feet was with sea water and gel. Below 1260 feet to a depth of 4090 feet the mud system consisted of sea water and Spersene XP-20 Salinex with drilling detergent. From 4090 to 5508 feet (T.D.) a fresh water Spersense XP-20 system was used.

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No hole problems were encountered, however due to problems due to the casing seal assembly the well was abandoned at 5508 feet.

F. Coring

- 1) Conventional:
None taken.
- 2) Sidewall
None taken.

G. Logging

1) Baroid

- a) Drilling rate 1260
- b) Lithology 4210 - 5508
- c) Cuttings Gas "
- d) Mud Gas "
- e) Chromatograph "
- f) H2S Detector "
- g) Shale Density "

2) Schlumberger

Type Log	Interval (feet)	Run Nos.
a) Induction	1210' - 5504'	2 ✓
b) BHC-Sonic Gamma Ray	1210' - 5505' 5491	2 ✓
c) Caliper	1210' - 4096'	1 ✓

3) Velocity Survey

None taken.

H. Testing:

None taken.

I. Abandonment:

Cement plugs were set as follows:

Plug no. 1 perforated 9 5/8" csg. at 3990-3994 feet & 4018-4020 feet and cemented with 250 sacks of neat cement, leaving 300 feet of cement in 9 5/8" casing from 3698 to 3998 and 500' cement outside 9 5/8" by 13 3/8" annulus from 3498 to 3998 feet.

Plug no. 2 140 sacks neat cement from 1000 to 600 feet.

The well head and base structure were left in place and marked with a Northern Lighthouse Board Buoy. The well head will be destroyed at a later date.

V A. Table of Stratigraphy 15/6-1 (RT. 31 feet)

<u>Stratigraphic Unit</u>	<u>Drill Depth feet</u>	<u>Subsea Top</u>	<u>Thickness</u>
Pliocene/Pleistocene	1210' ?	- 1175'	1310'
Miocene	2520'	- 2499'	1850'
Oligocene	4370'	- 4339'	865'
Eocene	5235'	- 5204'	273 +

Note: Subject to Paleontological Revision

B. Lithologic Descriptions

1) Sample Descriptions

410 to 5508 feet.

Wellsite Sample Descriptions.

<u>Depth</u>		<u>Description</u>
0 - 31'	-	R.T. to sea level.
	<u>Note:</u>	R.T. elevation : + 31' Water depth: - 379'
31 - 410'	-	Sea level to sea floor
410 - 1260'	-	Probably silt, sand and clay section. Section was drilled without mud riser, with returns to the sea floor.
	<u>Note:</u>	Section based on drilling characteristics and on G.R. log
1260 - 1570	100 %	<u>Clay</u> , med. light gray to light bluish-gray, soft, sticky plastic (gumbo type), very slightly to non calcareous.
	Tr occas	<u>Limestone</u> , buff to tan, chalky-micritic, mod. hard.
1570 - 1750	100 %	<u>Clay</u> , med. light gray to med. gray; soft, sticky plastic, slightly silty in places, non calcareous.
	Tr	<u>Megafossil debris</u>
	occas Tr	<u>Siltstone</u> , white to very light gray, very muddy, friable.
1750 - 1900	95%	<u>Clay</u> , med, gray, very finely sandy, soft, sticky non calcareous.
	5 to Tr	<u>Loose Quartz grains</u> , fine to coarse, subangular; glauconite pellets and also small lithic fragments of various origin (igneous, metamorphic)
	Tr	<u>Megafossil debris</u>
1900 - 2050	100 %	<u>Clay</u> , as above, less sandy.
2050 - 2260	90 %	<u>Clay</u> , as above, slightly to fairly sandy.
	10 to 5 %	<u>Loose quartz grains</u> , fine to very coarse, subangular and various lithic fragments as above.

	occas Tr	<u>Sandstone</u> , light gray, very muddy, fine grained subrounded, friable.
	occas Tr	<u>Megafossil</u> debris, abundant <u>Pyrite</u> .
2260 - 2440	100 %	<u>Clay</u> , as above.
	Tr	<u>Loose Quartz grains</u> as above.
	Tr	<u>Megafossil</u> debris and <u>Pyrite</u> .
	<u>Note:</u>	Poor Samples; shaker constantly washed off to avoid flow-line plugging.
2440 - 2470	90 %	<u>Clay</u> , med. gray, slightly silty, soft, plastic, non calcareous
	10 %	<u>Shale</u> , brownish gray and med. gray-green, soft to firm, slightly fissile, non calcareous.
	Tr	<u>Loose quartz grains</u> as above.
2470 - 2530	80 %	<u>Clay</u> , as above.
	10 %	<u>Loose Sand</u> , fine to med. subrounded, mod. sorted, clear.
	10 %	<u>Megafossil</u> debris.
	Tr	<u>Sandstone</u> , light gray, fine grained, subrounded, very muddy, friable.
2530 - 2740	95 %	<u>Clay</u> , as above.
	Tr	<u>Loose Sand</u> , as above.
	5 to Tr	<u>Megafossil</u> debris
2740 - 3160	65 %	<u>Clay</u> , as above, in places very sandy.
	30 %	<u>Loose Sand</u> , clear, fine to med. occasionally coarse, subrounded, moderately to poorly sorted, occurs in places with abundant, light bluish gray clay matrix, very friable.
	5 %	<u>Megafossil</u> debris (mostly Pelecypods)
	Tr	<u>Lignite</u> - <u>Pyrite</u> .

3160 - 3250	80 %	<u>Clay</u> , med. gray to med. light gray, finely sandy, soft to slightly firmer, non-calcareous.
	10 %	<u>Loose Sand</u> , as above.
	10 %	<u>Lignite</u> , black, mod. hard occasionally dark brown and fibrous.
3250 - 3490	100 %	<u>Clay</u> , med. gray to med. greenish, gray, slightly sandy to silty, with abundant disseminated, glauconite in places.
	Tr	<u>Loose Sand</u> , as above.
3490 - 3670	100 %	<u>Clay</u> , med. gray to med. brownish gray, slightly firmer, silty, ranging to a <u>Mudstone</u> in places.
3670 - 4090	100 %	<u>Clay</u> , dominantly med. brownish gray, soft and plastic; occasionally med. brownish-red, firmer, slightly calcareous, with granular aspect.
4090 - 4480	80 %	<u>Clay</u> , brownish gray, soft, silty, partly calcareous, glauconitic.
	20 %	<u>Siltstone</u> , brownish gray to brown, clayey, moderately firm, partly calcareous, glauconitic, common microfossils (forams)
	Tr	<u>Sandstone</u> , white, very fine, hard, with very small fragments of fossils.
	Tr	<u>Megafossils</u> and <u>Lignite</u> .
4480 - 4810	100 %	<u>Clay</u> , medium light gray and pale brownish gray, very soft, silty, glauconitic, non calcareous, common microfossils (forams)
	Tr	<u>Siltstone</u> , as above.
	Tr	<u>Sand</u> , fine to coarse quartz grains, subangular to rounded, poorly sorted, No Show.
	Tr	<u>Limestone</u> , micritic, tan, dense.

4810 - 4990	100 %	<u>Clay</u> , as above, with about 10% of clay firming up to a mudstone.
	Tr	<u>Sand</u> , as above.
	Tr	<u>Limestone</u> , as above, and brown, micritic, dense
4990 - 5080	90 %	<u>Clay</u> , as above, with about 10% firm, as above.
	10 %	<u>Limestone</u> , micritic, tan, dense.
5080 - 5230	70 %	<u>Clay</u> , as above, with some white clay, very soft, calcareous.
	20 %	<u>Shale</u> , soft, but with shale fissility, predominantly brownish gray, very finely micaceous, slightly silty, with some medium gray and green gray.
	10 %	<u>Limestone</u> , as above, and buff-white, clayey, soft.
5230 - 5508	70 %	<u>Clay</u> , as above, with decrease in glauconite.
	30 %	<u>Shale</u> , as above.
	Tr	<u>Limestone</u> , micritic, buff, soft to firm.
	Tr	<u>Pyrite</u> , (common from 5440 to 5470)
	Tr	<u>Lignite</u> and <u>glauconite</u> .

2) Core Description (conventional)

None Taken

3) Sidewall Core Descriptions

None taken.

VI Reservoirs:

The only reservoir penetrated was a thick Miocene sand section between 2520 and 3268 feet. The principal objective reservoirs were not reached.

VII Hydrocarbon shows:

No hydrocarbon shows were recorded.

VIII Conclusions

The 15/6-1 was drilled on a deep seated structural closure in the Scottish-Norwegian graben with the primary objective being the Eocene sands. Due to casing seal assembly problems the well was plugged and abandoned at 5508 (upper-most Eocene) and skidded approximately 1100 feet east for redrilling. The second hole was designated as 15/6-2.

Note: See 15/6-2 for Baroid Log.