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GEOLOGIC SUMMARY

COMPLETION REPORT

EXTENSION TEST

ESSO 25/11-2

ESSO 25/11-2

GEOLOGIC SUMMARY

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ESSO 25/11-2

GEOLOGIC HISTORY

I. Introduction:

A. Well Designation: Esso 25/11-2

B. Well Classification: Extension Test

C. Well Location:

1) Country: Norway, jurisdictional waters

2) License: ~~001~~

3) Coordinates:

Latitude 59° 13' 01.547"N

Longitude 02° 24' 35.098"E

4) Seismic Location:

Line SC 72, Shotpoint 6660

5) Water Depth: 427 feet (130 m)

II. Purpose of Well:

To define the continuity and reservoir thickness of the Lower Eocene oil bearing sands in a northward direction from well 25/11-1 and a southward direction from well 25/8-1.

III. Results of Well:

The well was drilled to a total depth of 5982 feet and bottomed in Paleocene age sediments. Only 97 feet of the Paleocene section was penetrated. Of this 97 feet penetrated the lower 22 feet is gray shale and the upper 75 feet sandstone. The sand is quartz with minor feldspar, fine to medium grained, subangular to subrounded, poor to fair sorting, clay and calcite cemented, unconsolidated, good to excellent intergranular porosity. The sand had no stain, no fluorescence and no cut.

The lower most Eocene section (5540 to 5885) consist of alternating sands and shales. A total of 14 sands, having a net thickness of 76 feet was present. The average thickness of each sand is about 7 feet, however, this is misleading as all the sands except 4 are only 6 feet thick or less. Two sands, one 24 feet thick and the other 10 feet thick are the only sands with significant thickness. The 10 foot sand (5840 to 5850) had no show while the 24 foot sand (5666 to 5690) had a good oil show in the upper half and a fair oil show in the lower half. Two of the 3 foot sands and one of the 4 foot sands had oil shows. Including the thin sands 38 feet of net oil sands are present. No

oil shows were present below 5730 feet.

Eocene sediments above 5540 to 4295 are primarily dark gray green soft shale. The lower portion of this interval grades to red, brown, silt, shales. No shows were encountered in this interval. The Eocene section is 1590 feet thick.

The Oligocene section, 1150 feet is predominantly olive dark gray clay with the upper 600 feet containing a large amount of sand. The sand is a quartz, clear, very fine, subrounded grains, fair sorted, slightly dolomitic, firm to friable. No shows were present in the Oligocene section.

The Miocene section, 1235 feet thick consist primarily of clay and sandstone. Traces of lignite occur throughout. The sand is very fine to very coarse grained, light gray, some feldspar, fair sorting and has a clay matrix. The clay is light gray, silty, sandy, calcareous, and soft. No shows were encountered in the Miocene.

Pliocene and younger age sediments is a clay and sandy section 1483 feet thick. Clays are light gray, silty, sandy, soft with fragments of macro fossils. Sands are very fine grained, light gray, subrounded grains and poorly sorted.

IV. Well History:

A. General

1) Spud date: 13 September, 1970
2) Completion date: 24 September, 1970
3) Status: Plugged and abandoned
4) Total Depth: 5982 feet

B. Contractor and Rig: Glomar Grand Isle

C. Casing:

30 inch at 573 feet
13-3/8 inch at 1272 feet
9-5/8 inch at 3099 feet

D. Mud Program:

Initial drilling from the sea floor to 573 feet was with sea water and gell. Below 573 feet to 3100 feet the mud system consisted of sea water - Spersene - XP-20 Salinex and from 3100 feet to TD at 5982 fresh water - Spersene - XP-20 mud was used.

E. Drilling Problems:

Drilling operations were normal and no lost time due to weather occurred.

F. Coring:

1) Conventional - No conventional cores were cut.

2) Sidewall

Number	Depth	Recovery (inch)
1	5539	1-3/4
2	5554	2
3	5560	1-3/4
4	5575	No recovery
5	5583	1
6	5613	1-3/4
7	5640	1-1/4
8	5654	1-3/4
9	5672	1-1/2
10	5679	1-1/4
11	5687	1-3/4
12	5694	1-1/4
13	5701	1-1/4
14	5708	1-3/4
15	5718	1-1/2
16	5722	1/2
17	5727	1-1/2
18	5732	1
19	5740	1-1/4
20	5754	1-3/4
21	5760	1
22	5776	1
23	5788	1-3/4
24	5800	1-3/4
25	5804	No recovery
26	5828	1-1/2
27	5832	1-3/4
28	5846	1-1/4
29	5862	1-3/4
30	5970	1-1/2

G. Logging:

1) Baroid	Interval (feet)
a. Drilling rate	1330 - 5982
b. Lithology (%)	1330 - 5982
c. Cuttings gas	1330 - 5982
d. Mud gas	1330 - 5982
e. Chromatograph	1330 - 5982

2) Schlumberger

Type Log	Depth (feet)	Run Number
a. Induction Electric	3099 - 5981	1
b. BHC Sonic-Gamma Ray	3099 - 5970	1
c. Gamma Ray (only)	449 - 3099	1
d. Formation Density	3099 - 5979	1

3) Velocity Survey

Seismograph Services Ltd. ran a Velocity Survey at TD. A quality control geophysicist from the North Sea Study Group was present to observe the survey.

H. Testing:

Four formation interval test were made. Two test, numbers 2 and 4 were made in the thickest sand (5666 to 5690). Test number 2 failed, however, oil and gas was recovered on test number 4. Test number 1 and 3 were made in a 6 foot sand near the base of the Eocene. Mud was recovered in both tests.

1) Production Test Results

No production tests were made.

2) Formation Interval Test Results

Test Number	Depth (feet)	Results
1	5777	Reverse fire - seal failed, recovered 3000 cc mud.
2	5672	Direct fire - seal failed, recovered 3000 cc mud.
3	5778	Reverse fire - seal failed, recovered 3000 cc mud.
4	5671	Reverse fire, Sampling time 36.5 minutes, recovered 11.5 cf gas, 6900 cc oil (26.5° API), 3250 cc oil and gas cut mud, GOR 265. Sampling pressure 2550 psi, Final shut in pressure 2675 psi, Hydrostatic pressure 3650 psi.

I. Abandonment:

The bottom hole cement plug was set in the open hole below 13-3/8 inch casing from 5932 to 5565 using 150 sacks of neat cement. A second plug was set in the open hole from 5565 to 5100 using 210 sacks of cement. Two plugs were set inside the 13-3/8 inch casing. Plugs number 3 and 4 were tagged for con-

firmation.

In addition to the above, normal openhole and cased pipe cement plugs, an additional 250 feet of cement was squeezed into the 13-3/8 inch and 9-5/8 inch casing annulus to isolate the possible uncemented annulus below the 13-3/8 inch casing shoe. The plugs are as follows:

Plug Number	Sacks Cement	Depth (feet)
1	150	5565 - 5982
2	210	5100 - 5565
3	150	2900 - 3250
4	160	800 - 1055

The well head and guide structure were left in place with the highest portion of the structure being 20 feet above the sea bed.

V. Stratigraphy

A. Table of Stratigraphy 25/11-2 (KB 33 feet)

Stratigraphic Unit	Drill Depth	Subsea Top (feet)	Thickness (feet)
Pliocene-Pleistocene/Recent	427-1910	(-384)	1483
Miocene	1910-3145	(-1877)	1235
Oligocene	3145-4295	(-3112)	1150
Eocene	4295-5885	(-4262)	1590
Paleocene	5885-5982 (TD)	(-5852)	97 +

B. Lithologic Descriptions

1) Sample descriptions (wellsite)

ESSO EXPLORATION NORWAY, INC.

ESSO 25/11-2

Wellsite Sample Descriptions.

1330 - 1350	80%	Shale, light green-medium gray-red brown, slightly dolomitic, slightly carbonaceous, soft-firm.
	20%	Cement.
	TR	Chert, orange.
		NOTE: Sample not representative of formation being drilled.
1350 - 1380	60%	Cement.
	20%	Shale, as above.
	20%	Clay, light gray, sandy, calcareous, bentonitic, very soft.
1380 - 1440	40%	Clay, as above.
	30%	Shale, as above.
	30%	Cement.
	TR	Sand, clear, very fine-coarse, quartz, angular, poorly sorted, No Show.
1440 - 1500	100%	Clay, light gray, silty, sandy, calcareous, bentonitic, very soft.
	TR	Sand, as above, very fine-fine, No Show.
1500 - 1680	90%	Clay, as above.
	10%	Sand, as above, fair sorting, No Show.
	TR	Limestone, buff, micritic, firm.
	TR	Macrofossil, fragments.
1680 - 1770	80%	Clay, as above.
	10%	Sand, as above, No Show.
	10%	Macrofossil, fragments.
	TR	Limestone, as above.
1770 - 1860	90%	Clay, as above, very silty, very sandy.

Wellsite Sample Descriptions/cont'd....

	10%	Sand, as above, with some medium grains, subangular-subrounded, No Show.
	TR	Macrofossil, fragments.
1860 - 1950	50%	Clay, as above.
	40%	Macrofossil, fragments.
	10%	Sand, clear, very fine-fine, quartz, subangular-subrounded, fair sorting, No Show.
1950 - 2040	50%	Macrofossil, fragments (pelecypods, gastropods, etc.)
	30%	Clay, light gray, very silty, very sandy, calcareous, bentonitic, very soft.
	20%	Sand, as above, No Show.
	TR	Limestone, buff, micritic, dense.
2040 - 2190	50%	Sand-Sandstone, light gray, very fine-fine, quartz with feldspar, subangular, fair sorting, calcareous, slightly lignitic, clayey, very friable, No Show.
	50%	Clay, as above.
	TR	Macrofossil fragments.
2190 - 2250	40%	Sand-Sandstone, as above, No Show.
	40%	Clay, as above.
	20%	Limestone, buff- light orange, micritic, dense.
	TR	Glauconite, granules.
2250 - 2280	50%	Clay, as above.
	40%	Sand-Sandstone, as above, No Show.
	10%	Macrofossil, fragments.
2280 - 2430	60%	Clay, as above.
	40%	Sand-Sandstone, as above, No Show.
	TR	Macrofossil, fragments.
	TR	Glauconite, granules.

Wellsite Sample Descriptions/cont'd....

2430 - 2580	60%	Sand, clear, very fine-medium with some very coarse grains, mostly smokey quartz and some light green and light purple grains, subangular-subrounded, poorly sorted, calcareous, clayey, soft, No Show.
	40%	Clay, light gray-light brown, silty, sandy, calcareous, bentonitic soft.
	TR	Lignite.
	TR	Macrofossil, fragments.
2580 - 2700	70%	Clay, as above.
	30%	Sand, as above, subrounded, No Show.
	TR	Lignite.
	TR	Glauconite, granules.
2700 - 2880	70%	Clay, as above.
	20%	Sand, clear-frosted, very fine-coarse, quartz, sub-angular-subrounded, poorly sorted, No Show.
	10%	Silt, clear, quartz.
	TR	Lignite.
	TR	Glauconite, granules.
2880 - 2970	70%	Clay, as above.
	20%	Silt, as above.
	10%	Sand, as above, very fine-medium, No Show.
	TR	Lignite.
2970 - 3030	60%	Clay, as above.
	30%	Silt, as above.
	10%	Sand, as above, very fine-coarse, No Show.
	TR	Macrofossil, fragments.
3030 - 3060	40%	Clay, light gray-medium brown, silty, sandy, calcareous, bentonitic, soft.
	30%	Sand, as above, No Show.
	30%	Silt, as above.

Wellsite Sample Descriptions/cont'd.....

3060 - 3150	60%	Clay, as above.
	30%	Silt, as above.
	10%	Sand, as above, No Show.
	TR	Lignite.
	TR	Glauconite, granules.
3[illegible]0 - 3210	100%	Cement.
3210 - 3420	100%	Clay, olive gray-gray brown, very silty, very sandy, sticky, very soft.
	TR	Sand-Sandstone, clear, very fine-medium, quartz, subangular-subrounded, fair sorting, dolomitic, friable-firm, No Show.
	TR	Siltstone, medium gray, firm.
	TR	Limestone, gray, micritic, firm.
3420 - 3660	100%	Clay, as above, with some Lignite.
	TR	Sand, as above, No Show.
3660 - 3870	100%	Clay, olive gray-dark gray, very silty, very sandy, soft.
	TR	Sand, as above, very fine-coarse, subrounded, poorly sorted near base of interval, No Show.
3870 - 4020	90%	Clay, as above.
	10%	Shale, dark gray, very silty, slightly calcareous.
	TR	Sand, clear, very fine-medium, quartz, subangular-subrounded, fair sorting, No Show.
4020 - 4140	100%	Clay, as above.
	TR	Sand, as above, No Show.
4140 - 4260	90%	Clay, olive gray-dark gray, very silty, very sandy, soft.

Wellsite Sample Descriptions/cont'd....

	10%	Shale, dark gray, very silty, slightly calcareous.
	TR	Sand, clear, very fine-medium, quartz, subangular-subrounded, fair sorting, No Show.
4260 - 4500	80%	Clay, as above.
	20%	Shale, as above.
	TR	Sand, as above, No Show.
[illegible]00 - 4650	90%	Clay, as above, with some Lignite, at base of interval.
	10%	Shale, as above.
	TR	Sand, as above, No Show.
4650 - 4920	60%	Clay, as above.
	40%	Shale, as above.
	TR	Limestone, white, micritic, soft.
4920 - 5190	60%	Clay, as above, with some Pyrite at 4950 ft.
	40%	Shale, as above, dark gray-gray green, very soft, with a trace of red brown at 5040 ft.
	TR	Sand, clear, very fine-medium, quartz, subangular-subrounded, fair sorting, No Show.
	TR	Limestone, as above.
5190 - 5280	60%	Shale, medium-dark gray-green gray, silty, firm.
	40%	Clay, as above.
	TR	Limestone, white, micritic, soft.
5280 - 5360	50%	Shale, as above, with a trace of red brown, silty shale at 5320 ft.
	50%	Clay, as above.
	TR	Sand, clear, very fine-medium, quartz, subangular-subrounded, fair sorting, No Show.
	TR	Limestone, as above.

NOTE: First significant occurrence of heavy gases,

Wellsite Sample Descriptions/cont'd....

(C_2, C_3) at 5300 ft. with (C_4) at about 5400 ft.

5360 - 5460	80%	Shale, as above, light gray green, very silty with slight trace of red brown at 5420 ft.
	20%	Clay, olive gray-dark gray, very silty, very sandy, soft.
	TR	Limestone, white, micritic, firm.
	TR	Lignite, at 5420 ft.
5460 - 5480	50%	Shale, medium gray-light green gray, silty.
	40%	Clay, as above.
	10%	Limestone, light tan-cream, grained, hard.
5480 - 5500	60%	Shale, as above, with some light blue green and (10% red brown, firm).
	30%	Clay, as above.
	10%	Limestone, as above.
5500 - 5580	90%	Shale, as above, (with 20% red brown).
	10%	Clay, as above.
	TR	Limestone, as above.
5580 - 5640	60%	Shale, medium gray-gray green, very silty (with 10% red brown.)
	40%	Clay, olive gray-dark gray, very silty, very sandy, soft.
	TR	Limestone, light tan-cream, grained, hard.
	TR	Tuff(?), gray green, very silty, shaley, with mineral fluorescence, no cut, and No Show.
5640 - 5700	50%	Clay, as above.
	40%	Shale, medium gray-light green gray, silty.
	10%	Sandstone, light gray, very fine-fine, some coarse grains, quartz with feldspar, subangular, poorly sorted, slightly calcareous, slightly clayey,

Wellsite Sample Descriptions/cont'd....

		friable, poor stain, bright yellow fluorescence, bright blue-white cut.
	TR	Limestone, as above.
5700 - 5730	60%	Clay, as above.
	40%	Shale, as above.
	TR	Sand-Sandstone, clear -light gray, very fine-fine, quartz with feldspar, subangular-subrounded, poorly sorted, calcareous, clayey, friable-firm with poor stain, fair fluorescence, and poor cut.
	TR	Limestone, as above.
	TR	Lithic, fragments, gray, grained (altered volcanic ash?).
5730 - 5790	80%	Clay, as above.
	20%	Shale, as above.
	TR	Limestone, as above.
	TR	Sand-Sandstone, as above, No Show.
5790 - 5850	90%	Clay, olive gray-dark gray, very silty, very sandy, soft.
	10%	Shale, medium-dark gray, silty.
	TR	Limestone, as above.
	TR	Sand, clear-white, very fine-coarse, quartz with a trace of feldspar with some milk quartz, subangular-subrounded, poorly sorted, No Show.
5850 - 5910	70%	Clay, as above.
	20%	Shale, as above.
	10%	Sand, as above, No Show.
	TR	Limestone, as above.
5910 - 5970	50%	Clay, as above.
	40%	Shale, as above.
	10%	Sand, as above, No Show.

Wellsite Sample Descriptions/cont'd....

	TR	Limestone, buff-tan, dense.
	TR	Siltstone, white, soft.
	TR	Pyrite.
5970 - 5982	60%	Clay, as above.
(Total Depth)	30%	Shale, as above.
	10%	Sand, as above, No Show.
	TR	Limestone, as above.

2) Core Description (conventional)

No conventional cores were cut.

3) Sidewall Core Descriptions

ESSO EXPLORATION NORWAY, INC.

WELL 25/11-2

Sidewall Core Descriptions from 5539 ft. to 5970 ft.

Run No. 1. : Shot 30 : Recovered 28.

Depth	Recovery Inches	Description
5539	1 3/4	Shale, red brown and blue gray bands, no distinct colour boundary, very waxy appearance, poor to no shale structure, plastic to firm.
5554	2	Shale, blue gray, waxy, silty, slightly bentonitic(?), firm.
5560	1 3/4	Shale, medium-dark gray, waxy, carbonaceous flecks, firm-hard, silty.
5575	No recovery	
5583	1	Shale, as above.
5613	1 3/4	Shale, as above.
5640	1 1/4	Shale, as above, soft.
5654	1 3/4	Shale, as above, firm.
5672	1 1/2	Sand, quartz with feldspar (10-15 %) with lenses of medium gray shale, subangular-subrounded, poor-fair sorting very fine-medium grained, 80/20 grain - cement matrix of clay and shale, poor induration,

Sidewall Core Descriptions/cont'd....

		poor-fair intergranular porosity, good oil stain, excellent bright gold/yellow fluorescence, excellent bright blue-white cut.
5679	1 1/4	Sand, quartz and feldspar, very fine-medium grained, as above, 90/10 ratio grain to cement matrix, fair-good integranular porosity, excellent stain, excellent fluorescence, excellent cut.
5687	1 3/4	Sand as above, poor to fair porosity, good stain, good bright yellow fluorescence, excellent cut.
5694	1 1/4	Shale, medium gray with thin light coloured streaks of silt, firm, pyrite.
5701	1 1/4	Clay, blue gray, slightly calcareous slightly bentonitic, very slightly silty, very soft, sticky.
5708	1 3/4	Shale, medium-dark gray, silty, firm.
5718	1 1/2	Sand, quartz and fledspar, very fine-fine grained, with some medium grains, subrounded-subangular, poor sorting, lenses of clay/shale, 70/30 ratio grain-cement matrix, clay/shale matrix, poor induration, fair-good intergranular porosity, good stain, good fluorescence, good cut.
5722	1/2	Sand, as above, very poor sorting, 60/40 ratio grain-cement matrix, fair porosity, good stain, good fluorescence, good cut.
5727	1 1/2	Shale, medium gray with very thin laminae silt, light gray, firm.
5732	1	Clay, medium gray, very soft, with chunks siltstone, firm, calcareous.
5740	1 1/4	Shale, medium gray, slightly bentonitic, waxy, firm.

Sidewall Core Descriptions/cont'd....

5754	1 3/4	Shale, light gray and very light gray, mottled grainy appearance, waxy, very calcareous, firm-hard.
5760	1	Shale, light gray, silty, waxy appearance firm-hard, trace dark soft material - may be carbonaceous or possibly dead oil.
5776	1	Shale, as above.
5788	1 3/4	Clay, blue gray, calcareous, trace very poor shale structure, very soft.
5800	1 3/4	Shale, dark gray with thin laminae silt, bentonitic, slightly waxy, firm.
5804	No recovery	
5828	1 1/2	Shale, as above.
5832	1 3/4	Shale, as above.
46	1 1/4	Sand, quartz with minor feldspar, fine-medium grained, subangular-subrounded, poor-fair sorting, clay and calcite cement, very poor induration to unconsolidated, good-excellent intergranular porosity, no stain, no fluorescence, no cut.
5862	1 3/4	Shale, medium-dark gray, bentonitic, slightly carbonaceous, soft-firm.
5970	1 1/2	Shale, as above, very soft.

VI. Reservoirs:

The best reservoir found in the well was a 75 foot thick Paleocene sand between 5885 and 5960. The sand contained water.

Sand reservoirs in the Lower Eocene section between 5530 and 5885 are thin. Thickness ranges from 3 feet to 24 feet and all sands between 5730 and 5885 carried water.

VII. Conclusion:

The well was drilled to define the continuity and reservoir thickness of the Lower Eocene oil bearing sands in a northward direction from well 25/11-1 and southward from well 25/8-1.

The Lower Eocene section contained 14 thin sands which have a net thickness of 76 feet. Only three of these sands contained oil, all others were wet. The total net oil sand is 38 feet. The charactor of the sands indicate that they are not continuous with other sands in the area and that reservoir thickness does not increase in this direction.

PROPRIETARY EXPLORESO

ESSO EXPLORATION NORWAY INC.

COMPLETION LOG

Scale 1:500

LIBRARY COPY

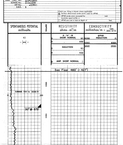
Well Name: 25/11-2		Status: Cased and Abandoned	
Rig: Sea Eagle (Pelican Drilling)	Spud Date/Operation: 25 Jan 1974	Completion Date/Operation: 1 Feb 1974	Original Rig Release: 1 February 1974
Location: 60° 47' 40.0"N 02° 27' 40.0"E	Water Depth: 70 m	Drill Floor Elevation: 25 m	Water Depth: 95 m
Total Depth: 2500 m	Total Depth Operation: 1 Feb 1974	Total Depth Date: 1 Feb 1974	Total Depth: 2500 m
Drilling Operations Summary: Spud Date: 25 Jan 1974	Completion Date: 1 Feb 1974	Total Days: 7	Completion Days: 7
Drilling Contractor: Pelican Drilling	Rig Type: Semi Sub.	Rig Name: Sea Eagle	Drilling Rig Release Date: 1 February 1974

Casing Shoe: 2500 m	Casing Shoe TVD: 2500 m	Casing Shoe Date: 1 Feb 1974	

Casing Data

30 in	2500 m	1 Feb 1974	

Casing Shoe Test

Casing Shoe Test	

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