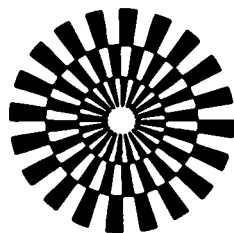


SAGA PETROLEUM A/S
PERMEABILITY/THIN SECTIONS
WELL: 31/3-2
DATE: SEPTEMBER 1984



GECO
GEOPHYSICAL COMPANY
OF NORWAY A/S

Denne rapport
tilhører



L&U DOK. SENTER

L. NR. 30284410021

KODE Well 31/3-2 nr. 33

Returneres etter bruk



COMMENTS

GENERAL: Core analyses including air permeability, thin rock section preparation and sample photography have been performed on refrozen, friable samples from well 31/3-2 at the depths requested by R. Gabrielsen, Saga Petroleum A/S. Porosity and grain density have, in addition, been measured for interest and reported together with the permeability data in TABLE I.

PREPARATION: The samples used in the preparation of thin sections were collected from the "A cut" slab of the core. Due to insufficient material, the "C cut" of the core was used with permission from Saga Petroleum for the permeability analysis. In order to be able to collect sample plugs for permeability analysis, the core material had to be rehydrated due to complete dehydration while being stored. The procedure used was as follows:

1. "C cut" sections were selected and all faults/cracks were marked with orange enamel so that they could be easily located again after hydrating and freezing. It may be noted that such structural features are rather difficult to observe on wet core material and nearly impossible to locate on frozen core.
2. "C cut" sections were placed gently in beakers with about 1-2 cm of simulated formation water (50 000 ppm NaCl). Each sample was thus saturated by its inherent capillary forces. See enclosed photographs.
3. Samples were removed carefully from the beakers and frozen. As the material never reaches 100 % saturation by this method, the water will expand freely in the pore space during the freezing process.
4. After 48 hours, core plugs were then drilled with a one inch bore at right angles to the indicated faults/cracks using liquid nitrogen as coolant. Plugs were trimmed to one inch length and mounted immediately while still frozen in Hassler-type holders at a confining pressure of 15 bar.
5. Once thawed, the plugs were cleaned with methanol, dried and thus ready for permeability measurement.



PERMEABILITY: Standard air permeability, k_a , was measured by injection of nitrogen gas at a net confining sleeve pressure of 15 bar and then converted empirically to liquid permeability, k_l , on all samples.

POROSITY AND GRAIN DENSITY: Pore volume was determined by injection of helium gas at a net confining sleeve pressure of 15 bar. After dismounting, grain volume values were determined by a Boyle's law porosimeter using helium. Knowing also the weight of the sample, porosity and grain density were calculated.

THIN SECTIONS: Thin section samples were selected at the requested locations from the "A cut". Each sample has been oriented with an arrow pointing up. A blue dye was incorporated in the epoxy used in impregnation to illustrate fracture and pore space.

PHOTOGRAPHY: A color slide series has been prepared of the sample plugs post measurement. It is not recommended to photograph such core plugs prior to measurement because of their friable nature and the risk of thawing.

ABBREVIATIONS: npp - no plug possible
nhpp - no horizontal plug possible
nvpp - no vertical plug possible
nmp - no measurement possible



CORE ANALYSIS

WELL: 31/3-2

Depth (m)	Horizontal permeability (md)		Porosity (%)	Grain density (g/cc)	Thin rock section
	ka	kl			
1567.50	4235	4112	32.0	2.80	x 1
1569.40	npp				x 1
1581.65	npp				x 1
1593.50	not requested				x 1
1597.30	not requested				x 2
1597.50	not requested				x 1
1608.50	18060	17758	35.6	2.67	x 1
1608.95	9292	9189	36.3	2.66	x 1
1614.75	not requested				x 1
1624.30	1215	1159	32.7	2.68	x 1
1635.60	11246	11020	34.8	2.68	x 1
1636.25	3259	3154	34.2	2.68	x 1