NORSKE MURPHY 2/3-3

NORWEGIAN BLOCK: 2/3 Well No. 3

CLASSIFICATION: Exploratory

LOCATION: Norway offshore Seismic Line MG 12
Shot Point 450
Latitude 56°48' 15.6" North
Longitude 3°58' 09.6" East

DRILLING RIG: Ocean Tide

ELEVATION: RKB approximately 100 feet above MSL
Depth of water approximately 180 feet

PROJECTED TOTAL DEPTH: 10,000 feet (KB) or top Zechstein Salt

OBJECTIVES: Danian Limestone
Jurassic Sands

GEOLOGICAL SECTION:

Unit and Age	Interval (KB)
Miocene markers	3890' - 4360'
Oligocene sands	5790' - 6360'
Paleocene marker	7620'
Danian	7680'
Chalk Base	8900'
Jurassic	9495'
Top Salt	9990'

GEOLOGICAL COMMENT: The main objective is the Danian limestone which has proven to be oil productive in the Phillips Echo Fish area and Amoco's Torfelt area approximately twenty-six miles to the Southwest. In addition the Oligocene sands are potential gas bearing zones and the Jurassic also has potential hydrocarbon reservoirs.

CASING AND CEMENTING PROGRAM:

Hole Size	Casing Size	Weight	Grade	KB Setting Depth	Type and Volume Cement
38"	36"	1¼ & 1" wall	B	440'	Drill 38" hole to 110' below mudline and drive 36" to refusal with maximum 250 blows per foot.

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Hole Size	Casing Size	Weight	Grade	KB Setting Depth	Type and Volume Cement
26" (Note No. 1)	20"	94#/ft	X-52 H-40	900'	Cement w/ 1475 sacks Class "B" with 8% Bentonite mixed with seawater followed by 300 sacks Class "B" Neat cement.
17½" (Note No. 1)	13⅜"	68#/ft	J-55 ST&C	3600'	Cement w/ 1900 sacks Class "B" with 8% Bentonite with ·3 of 1% HR7 and tail in with 300 sacks of Class "B" neat cement.
12¼" (Note No. 1)	9⅝"	47#/ft	N-80 LT&C	10,000'	Cement program to be determined. Cover all potential pay zones with neat cement. Use DV Tool to insure proper cement job if more than one potential pay zone exist with distance between zones in excess 2000 feet.

Note No. 1:

After cementing run tubing outside of casing string set and wash out cement 20 feet below mud line hanger.

WELL HEAD EQUIPMENT:	Type	Size
	Cameron Iron Works	Surface Wellhead 20" x 13⅜" x 9⅝"
	Cameron Iron Works	Mudline Suspension System 20" x 13⅜" x 9⅝"

BLOW-OUT PREVENTORS:	Depth	Size	W.P.	Type
	KB - 900'	None		
	900'- 3600'	20"	2,000 psi	Hydril
	3600'- TD	13⅝"	10,000 psi	Hydril GK
		13⅝"	10,000 psi	Double Cameron Type U
		13⅝"	10,000 psi	Single Cameron Type U

The control equipment at the wellhead will be installed and tested before drilling out of the 20-inch casing and each subsequent string of casing that is set. BOP's are to be tested at regular intervals in accordance with good oilfield practice.

MUD PROGRAM:

Depth - (KB)	Weight						
0-390'	8.8	Viscous slurry - Drill 38-inch hole with seawater. Spot 250 barrels viscous slurry using 15 to 20 P.P.B. Bentonite and Salt Gel on a one to one basis. Pretreat seawater with caustic soda to increase yield of Gel.					
440'-900'	8.8	Viscous slurry - Drill 26-inch hole using seawater and slugs of viscous mud to combat filling. After drilling hole displace with viscous mud as above.					
	Weight	Viscosity	Fluid	Oil	PH	Alk	
900'-3600'	11.0-12.0	40-50	10-15	6-8%	10.5	1.0	
	Remarks:	After drilling cement commence conditioning mud to improve properties. Attempt to have mud weight at 11.5 ppq at 2500' with other properties as above.					
3600'-TD	12.0-13.0	45-50	6-8	6-8%	10-11		
	Remarks:	Drilling fluid should be well conditioned prior to drilling below 13⅜-inch casing. Build mud weight up to 12.5 ppm as rapidly as feasible and maintain properties to total depth. If hole conditions indicate higher mud weight is warranted such should be maintained.					
	Note:	Gas zones can be expected to be encountered below 3890'.					

LOGGING PROGRAM:

Log	Run	Interval
SP - Dual Laterolog	1	TD - 3600'
Gamma Ray - Sonic - Caliper	1	TD - 3600' 3600' - Mudline (GR)
Gamma Ray - FDC - Caliper	1	TD - 3600'
**Proximity Log - Caliper	1	Selected Intervals
**GR - Sidewall Neutron Porosity	1	Selected Intervals
Continuous Dipmeter (Four Arm High Resolution)	1	TD - 3600'
Cement Bond Log	2	TD - Above Top Pay
Velocity Survey	2	Selected Shots

Note: * On previous wells in the area all attempts to run logs at the 13⅜" casing setting depth have been unsuccessful. Therefore, the Gamma Ray log will be used for correlation purposes for the section to 3600 feet after 13⅜-inch casing is set to save rig time.

** These logs will be run only if hydrocarbon shows are indicated.

FORMATION LOGGING:

A Core Laboratories hydrocarbon and sample logging unit will be in operation from mudline to total depth. All samples will be given standard examination regarding lithology, porosity, grain size, fluorescence and hydrocarbon shows.

Ditch cuttings are to be collected at 30 foot intervals from mudline to the 13⅜-inch casing point and at 15 foot intervals thereafter. The wellsite Geologist will set out the number of samples to be collected for use by Norske Murphy.

CORING:

Sidewall cores will be taken exclusively for lithological details and reservoir samples in sand sections. Conventional diamond cores will be taken through indicated hydrocarbon bearing carbonate reservoirs after 30 to 50 feet of hydrocarbon shows are indicated by drilling.

TESTING PROGRAM:

All testing will be conducted through perforation in casing. Any potential carbonate reservoir will be acidized to obtain conclusive test results. A detail testing program will be set up provided potential reservoirs are encountered.

Schlumberger wire line tests may be conducted if such is required to evaluate whether further specific tests are warranted.

DEVIATION:

Directional readings will be taken as convenient but not any more frequent than 500 foot intervals.

Deviation will be limited to the following:

4^{o} at 500 feet
7^{o} at 500 feet to TD

The deviation angle should not exceed 1^{o} per 100 feet below conductor pipe.

GENERAL POLICY:

Drilling is to be controlled at a rate not to exceed 90 feet per hour when good hole conditions prevail. Where problems are encountered with gumbo further restrictions may be placed on the drilling rate as determined between Contractor and Company representatives.

NORSKE MURPHY

DRILLING PROGNOSIS CHART.

WELL 2/3-2 "C" STRUCTURE

D.C.

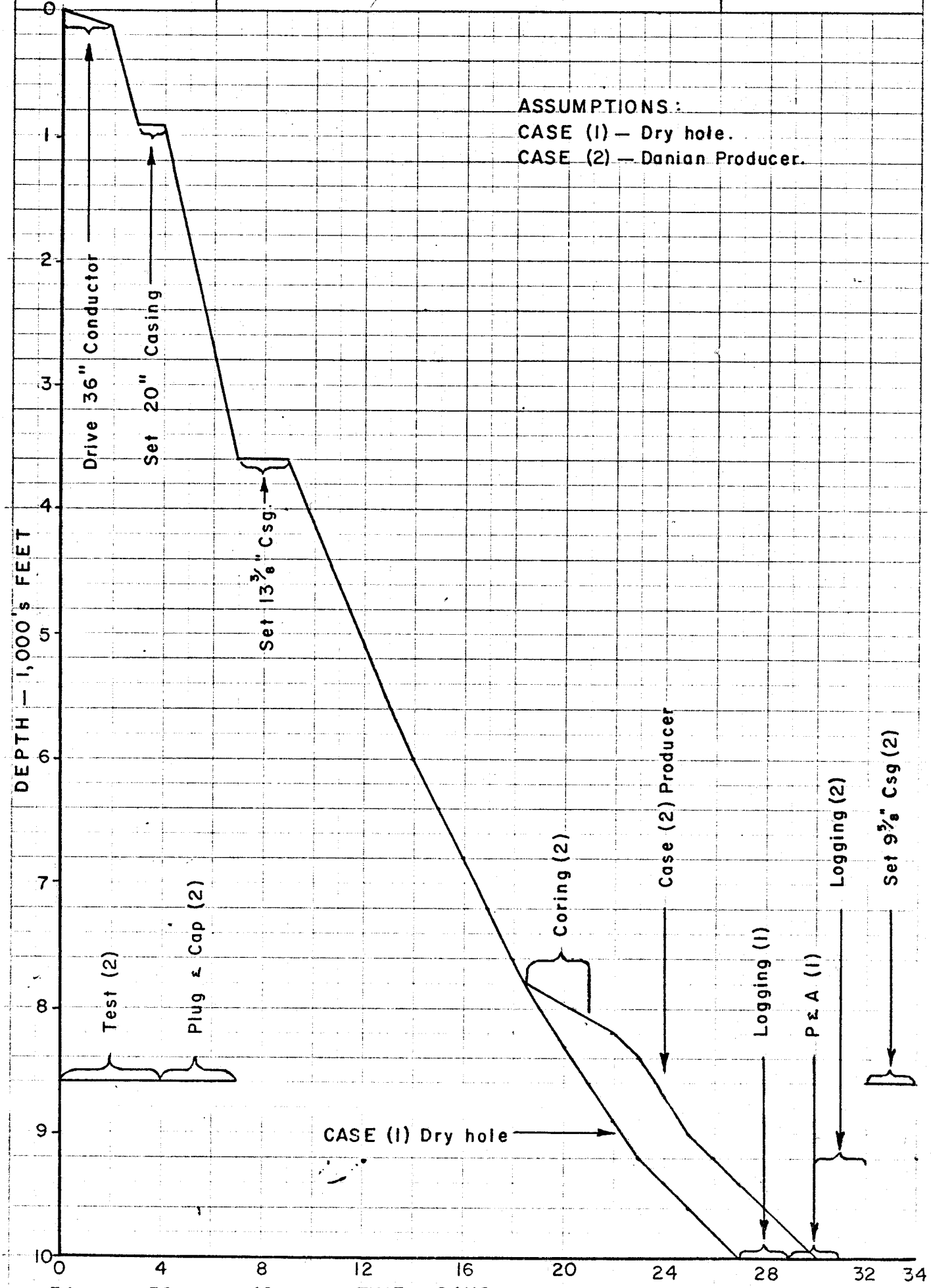
10,000 TEST

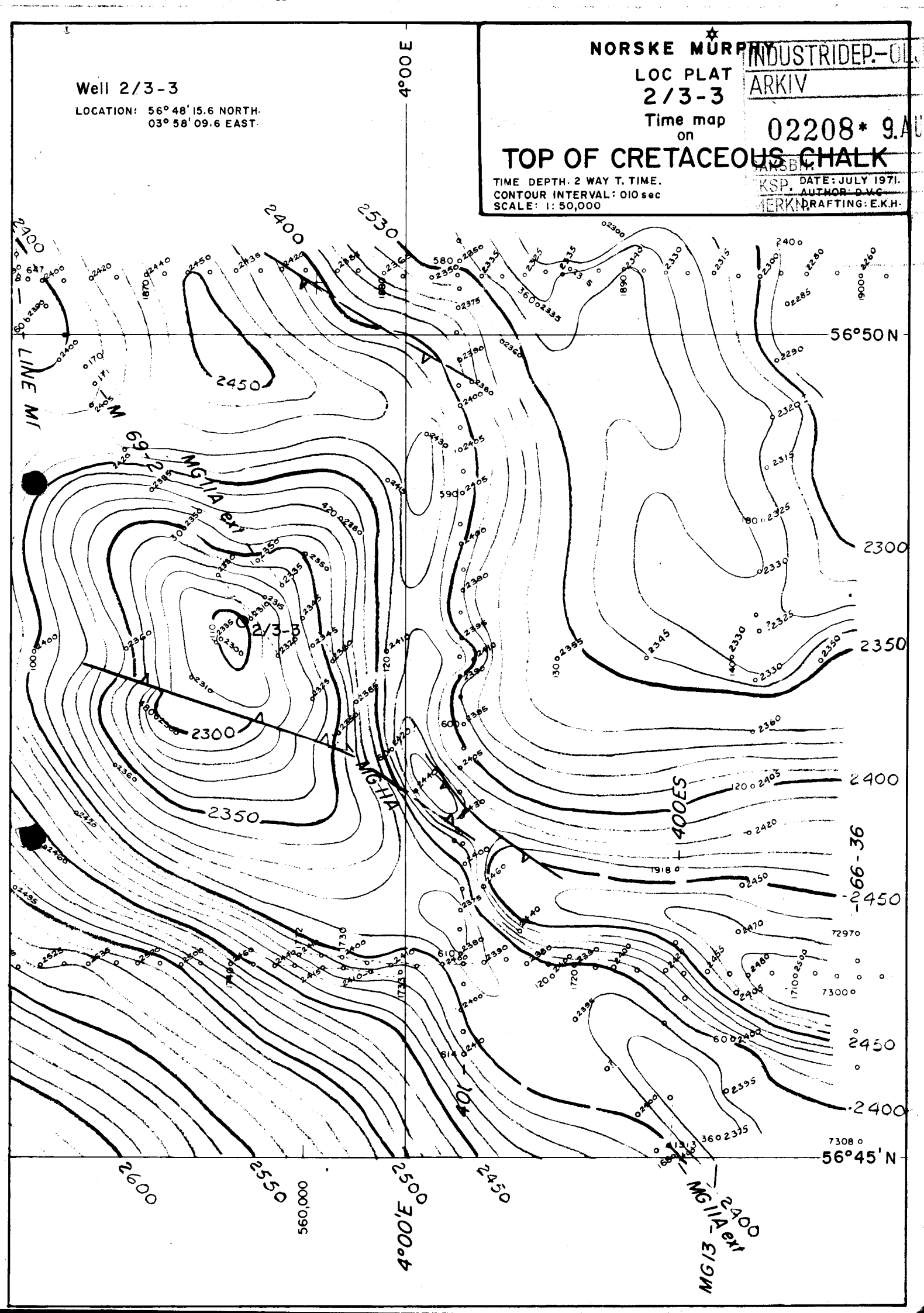
6/21/71

ASSUMPTIONS:

CASE (1) — Dry hole.

CASE (2) — Danian Producer.




NORSKE MURPHY
LOC PLAT
2/3-3
Time map
on
TOP OF CRETACEOUS CHALK
TIME DEPTH. 2 WAY T. TIME.
CONTOUR INTERVAL: 010 sec
SCALE: 1:50,000
DATE: JULY 1971.
AUTHOR: D.V.C.
DRAFTING: E.K.H.
INDUSTRIDEP.-OL
ARKIV
02208* 9.A
Well 2/3-3
LOCATION: 56° 48' 15.6 NORTH
03° 58' 09.6 EAST
4°00 E
56°50 N
56°45' N
4°00'E
560,000
2/3-3
MG 11A ext
MG 11A
MG 13
LINE MI
66-36
2600
2550
2500
2450
2400
2350
2300