

AMOCO NORWAY OIL COMPANY

(FOREIGN CORPORATION)

6 FRIDTJOF NANSENS PLASS
OSLO - NORWAY

TELEPHONES: 42 32 05 - 42 56 38
CABLE: AMERINTOIL - OSLO
TELEX: 16 700 AMOCO N

Weekly Geological Report

Well: 7/1-1A

Report No.: 2

Coordinates: Latitude 57°47'52"N
Longitude 02°09'56"E

Date: 8 July, 1971

KBE: 112'

Geologist: F.W. Reuter

Waterdepth: 270'

Depth this week: 1958'

Spud Date: 3 July, 1971 @ 5.00 AM

Depth last week: 0'

Casing: 30" conductor to 504.18'
20" to 1205.88'

Progress: 1958'

Present status: Coming
out of hole to run
temperature survey.

Lithology: 0 - 1250' : Drilled without returns.
1250 - 1958' : Clay, very light grey, sl beige, slight to moderately silty, with up to 10% loose fine to medium grained, occ also coarse grained sand. Clay gen soft, creamy, soluable, moderately calc. Traces shell fragments. From 1440' downwards appearing slightly more grysh and slightly less calc. From 1530' to 1770' appearing increasingly sandy& silty with traces of light to medium grey very clayey Siltstone. Throughout this interval traces of glauconite, micro concretic pyrite and igneous material. At 1710' some light grysh Sandstone, gen fine to medium grained, moderately sorted, soft, friable, in gummy clayey matrix. Possible reworked sand pocket due to mud action. From 1770' to 1958' clay, generally descript as above but with slightly decreasing sand content.

Formation Tops: -

Hydrocarbon Shows: Below 20" casing in 26" rat hole section strong gas accumulation with up to 8% methane. Throughout entire interval gas readings of 0.53% to 1.56% methane - shale gas. Connection gas of average 2.0% on every connection.

Cores: -

DST: -

Logs:

Drilling Summary: Dressed off cement plug from 422' to 447'. Plugged back with 300 sks of cement with 3% Calcium chloride. Logged plug 6382'. Cut guide lines and moved rig 101' with

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Drilling Summary cont.;

heading 136°. Rig arrived on new location 2 July, 1971 @ 10.55 AM. Prepared base plate and template. Ran guide base to sea bed and ran survey @ 382' = 1/4°. Spudded well on 3 July, 1971 @ 5.00 AM. Drilled from 382' to 522' with sea water without returns. Ran survey @ 450' = 1/2°. Reamed from 480' to 511'. Ran survey @ 500' = 1/2°. Opened hole with 36" hole opener from 382' to 522'. Ran 3 joints of 30" Vetco Squinch joint casing with 1" wall, landed casing at 504.18'. Cemented 30" casing with 1400 sks of Class B cement with 2% Calcium chloride, mixed with sea water. Ran in with 26" hole opener, washed down from 432' to 502', drilled 30" shoe and formation from 522' to 554'. Drilled with bit #2/12 1/4" / Smith/SDS-open/ from 554' to 1195'. Drilled with sea water without returns. Ran survey @ 800' = 0° and @ 1150' = 1/4°. Ran in with 26" hole opener and opened hole from 554' to 672'. Worked tight spots @ 636' and @ 667'. Layed down 26" hole opener and ran in with bit #3/17 1/2" / HTC/OSC-3AJ. Cleaned hole from 530' to 672' and opened hole to 17 1/2" from 672' to 1195'. Drilled formation from 1195' to 1250' without returns. Opened hole from 17 1/2" to 26" over the interval 672' to 1250'. Ran 23 joints of 20" casing, weight 94#/ft., grade X-52, and landed casing at 1205.88'. Cemented casing with 800 sks Class B cement with 4% gel and 2% Calcium chloride, and 800 sks Class B cement neat. Displaced with 288 BEL mud. Ran 20" stack, rated 2000#. Nipped up. Ran in with bit #4/17 1/2" / HTC/OSC-3AJ. Drilled out cement and shoe washed down to bottom of 20" rat hole. Drilled formation from 1250' to 1958' = 708' in 7 hours. Tripped out to run temperature survey, pulled 30,000 to 50,000# overpull.

F. W. Reuter
F.W. Reuter

8 July, 1971

AMOCO NORWAY OIL COMPANY

WEEKLY GEOLOGICAL REPORT

Well No.:	7/1-1A	Report No.:	3
Coordinates:	57° 47' 52" N 02° 09' 56" E	Date:	15th July 1971
		Geologists:	F. Rønter B.T. Lee
KBE:	112'		
Water depth:	270'	Depth this week:	5250'
Spud date:	3rd July 1971	Depth last week:	1958'
Casing:	30" at 504' 20" at 1206'	Progress:	3292'
		Present status:	Logging.

Lithology.

- 1958' - 2131' Clay medium grey, very soft, sticky, slight to moderately calcareous. Scattered loose quartz grains common, fine to coarse grained sub-angular to sub-rounded. Traces of glauconite and pyrite.
- 2131' - 3540' Clay generally as above, becoming more pale olive green and consolidated, rarely blocky and subfissile, variably silty and sandy. At 2850' traces of Siltstone, light green, soft - firm, subfissile, glauconitic.
- 3540' - 3720' Claystone, mottled pale olive green - pale/medium brown, soft, sticky, variably silty, glauconite abundant and some Siltstone light green, glauconitic, firm to medium hard, blocky and fissile.
- 3720' - 4390' Clay grading to shale with depth, slightly greenish brown, firm to medium hard, calcareous variably silty with scattered loose quartz grain throughout. Below 3900 becoming increasingly silty grading to Siltstone glauconitic, micaceous, fossiliferous.
- 4390' - 5250' Shale with some clay as above becoming medium brownish and interbedded with thin stringers of limestone, light to medium brown, cryptocrystalline, hard to very hard, variably dolomitic. Traces of pyrite.

Formation Tops

Possible Tops picked from Gamma Ray log/sonic where available.

Top Pliocene	1355'	-	all depths are log depths
Top Miocene	1643'	-	
Top Oligocene	3557'		
Top Tocene	4620'		

Hydrocarbon shows No shows of interest. Average shale gas reading 1%.

Cores None

D.S.W.S. None

Logs

Induction Electrical	SP	5250' - 1205'
* Sonic	CBL Gamma Ray - Caliper	5250' - Surface
Temperature log		1205' - 500'
* Sonic log failed,	C.B. Log run from	1205' - 500' in 20" casing

Drilling Summary.

Ran temperature survey. Drilled 17 1/2" hole from 1958' - 2131', waited on mud materials then conditioned hole and mud. Drilled from 2131' to 4620' with short trips to keep hole clean. Tripped for Bit No. C at 4620' and drilled ahead with 17 1/2" bit to 5250'. Circulated to condition hole and then pulled out. Rigged up Schlumberger, the Weatherford motion arrester did not function. Ran Induction Electrical/S.P. log from 5250' - 1205' as the sonic panel had failed trying to run sonic log. Reran sonic log together with Gamma Ray/Caliper log from 5250' to surface. The sonic did not function properly and was switched to cement band mode in the 20" casing. A temperature survey was then run in 20" casing from 1205' - 500'. Rigged down Schlumberger.

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WEEKLY GEOLOGICAL REPORT

Well No.:	7/1-1A	Report No.:	4
Coordinates:	57°47' 52" N	Date:	22nd July, 1971
	02°09' 56" E	Geologists:	Brian Gee
KBE:	112'		Peter Gee
Water Depth:	270'	Depth this week:	6500'
Spud Date:	3rd July, 1971	Depth last week:	5250'
Casing:	30" at 504'	Progress:	1250'
	20" at 1206'	Present status:	Drilling
	13.3/8" at 5153'		

Lithology

5250' - 5400'	<u>Shale</u> Light to medium brown grey; soft to firm, calcareous micaceous, pyritic, some microfossils.
5400' - 6000'	<u>Shale</u> Medium to darker brown grey, soft to medium hard, becoming more fissile and less calcareous. Traces of <u>Limestone</u> pale to medium brown, medium hard to hard. Some scattered loose quartz grains clear to milky, sub angular, fine grained
6000' - 6420'	<u>Shale</u> , as above, becoming more fissile, non-calcareous, darker brown grey to grey in colour. Increasing traces of <u>Limestone</u> , as above - variably dolomitic.
6420' - 6500'	<u>Shale</u> , light green grey to grey, mottled in part, firm to medium hard, fissile, glauconitic, pyritic. Traces of <u>Limestone</u> variably dolomitic as above.

Formation Tops From samples, Top Palaeocene 6420'

Hydrocarbon Shows No shows of interest. Average background gas 0.25% methane.

Cores None

DSE's None

Logs None

Drilling
Summary

Ran in hole with 17.1/2" bit to circulate to condition the hole and mud. Made wiper trip. Ran 13.3/8" casing to 5153' and cemented. Change stacks and pressured up. Leak in Cameron clamp was noticed by divers who tightened same. Circulated to condition hole then drilled cement from 4980'. Circulated to condition hole below shoe to TD. Ran in hole with 12.1/4" S.33 bit and drilled. Periodic circulation was necessary to condition hole and mud.

Well File
7/1-1a

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Weekly Geological Report

Well number : 7/1-1A
Coordinates : 57°47'52"N
 : 02°09'56"E

KBE : 112'
Water depth : 270'
Spud date : 3 July 1971
Casing : 30" at 504'
 : 20" at 1206'
 : 13 3/8" at 5153'

Report no.: 5
Date : 31 July 71
Geologists: B. Lee
 F.W. Reut

Depth this week: 9211'
Depth last week: 6500'
Progress : 2711'
Present status :
Finishing velocity
survey.

Lithology:

- 6500-6580' Shale, light grey to grey interbedded, firm to med hard, fissil. Some shale grey brown, soft-med hard, traces of shale bright green, medium hard, fissilic. Traces of Limestone, variable dolomitic, beige, hard, micro crystalline.
- 6580-6780' Shale, as above, occ purple in colour and slightly silty. Slight increase in Limestone and dolomitic Limestone, light to medium brown, hard to very hard.
- 6780-6820' Shales as above, with dolomitic Limestone as above. Minor amount of Shale, brickred, soft to medium hard, slightly calcareous.
- 6820-6860' As above. 50% of the samples are Marl, light to dark grey, mottled, soft to medium hard.
- 6860-7280' Shales, multicoloured and interbedded as above with thin interbeds of limestone and Dolomitic Limestone as above. Traces pyrite.
- 7280-7950' Chalk, white-cream, fine grained, rarely argil and slightly darker colored, md hard-hard, earthy texture. Occ with stylolite surfaces and hairline fractures, unorientated and ranging from subhorizontal to subvertical and filled with medium olivgreen gry moderately silty Shale, in parts very fossiliferous. At the intervals of 7400', 7600' and 7910' massiv appearance of microfossil was observed and partly identified as Foraminifers of the groupe Bolivina and Neoflabellina. Around 7730' to 7760' Chalk is appearing slightly silic, white-bluesh tone, v hard with waxy fracture surfaces. No visible porosity, no hydrocarbon flur, no cut, no stain.
- 7950-8590' Chalk, gradually changing to Chalky Limestone, white-cream, fine grained, lititic texture, very hard, splintery, dense, appears tight with no visible porosity. Throughout entire interval with micro-fine hairline fractures, shale filled and occ (8180') with micro-fine pyrite concretions. At 8150' appearing occ as Siliceous Limestone, white with slight light bluesh tone, very hard, splintery and conchoidal fracturing. Thin streaks of Chert were observed at 8350', general appearing very light grey bluesh, milky and opaque, splintery and conchoidal fractured, occ with some questionable Spicules. Between 8210'-8250' and from 8400' downwards appearing less consolidated and grading to earthy, soft and soluble Chalk.

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Lithology cont.:

Slightly argil in genral, rarely very argil and grading to Marl.

Towards base of interval thin streaks of very hard, dense chalky Limestone, generally descript as above alternating irregularly with whitish, light grey and occ medium grey very argil Chalk, increasingly grading to Marl, general earthy, increasingly soft & sticky with rare micro-fine pyrite concretions. From 8570' with increasing light brnsh tone and slightly dolomitic.

During entire interval no hydrocarbon fluorescence, no stain or cut was encountered.

8590-8632' Chalky Marl, lbrnsh rd, soft, sticky, slightly dolomitic, with some loose scattered quartz grains and sand size calcite fragments, fine to medium grained, moderately sorted and sub-angular. Occ alternating with thin streaks and stringers of light brnsh, occ tan chalky Limestone, fine grained, dense, tight, in parts very dolomite and very hard.

8632-8670' Marl, bright reddishbrown, moderately dolomitic, soft & sticky, mottled with flakes of whtsh Chalk, a/a, increasingly consolidated and less soluble towards base of interval, occ with mostard colored limonitic streaks and patches. Gradually becoming gryviolet and mottled with whtsh chalky and reddish Marl, showing variable amount of fine to medium grained loose quartz grains.

8670-8729' Marl, bright brickred, dolomitic, mottled with occ chalky-white gryviolet Marl, descrabt as above, soft & sticky. Towards base of interval increasingly grading to calc Shale, sl silty, soft-firm, also very silty and sandy in parts and with thin streaks of redbrown, dkredbrown Shale, firm to medium hard, fissile and slightly flaky, slightly dolomitic.

8729-9211' Loose fine to medium, occ coarse grained Quartz grains, light orange red, pink with reddish Fe-coating, minor clear, some rare sand size calcite fragments. Generally poor to moderately sorted, predomenately subang, slightly frosted. Quartz grains rarely appearing cemented with predomenately cley/slightly dolomitic matrix and appearing as Sandstone, light reddish-pale reddish, very friable. Estimated visable porosity 16-18%, sandstone fragments appearing leached out and water wet. No hydrocarbon flor, no cut, no stain. Between 8840-8850' occ with whitish streaks and patches of soft, amorph and rarely sucrosic Anhydrite. At 8900' appearing very mica with large flakes of biotite and muskovite. From 8970' towards base of interval slight changes in matrix to anhydritic/dolomitic and slightly more consolidated, firm to medium hard. The change continues and solid pieces of Sandstone showing more dark reddish color, suggesting a change in matrix to anhydritic/shaly. At 9050' a slight increase in coarse grain size is observed and sorting becomes very poor, the visable porosity is increasing up to 25%. No hydrocarbon flor, no stain, no cut. From 9090' towards base of section sec Sandstone fragments appear more cley cemented and with patches and streaks of of whtsh amph Anhydrite, generally increasing vis porosity.

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Formation Tops: Upper Cretaceous - Danian? at 7280'
Lower Cretaceous - Albian at 8632'
Triassic - Bunter Sandstone at 8729'

Hydrocarbon Shows: 6500-6950' Average methane reading 0.2%
Maximum methane readings of 0.29% at 7110' and
0.37% at 7290'.
7290-7440' Average methane reading 0.1%. Below
7440' gradually decreasing to 0.08% methane be-
tween 7440-7620', 0.05% methane between 7620-
8030', ~~0.03%~~ 0.03% methane between 8030-8200' and
0.02% methane between 8200-8340'.
Below 8340' towards TD average gas shows were
varying between 0.02% and 0.05% methane.
The following maximum readings were registered
between 7290' and TD.

0.15% methane at 7450'
0.10% " " 7710'
0.06% " " 8520'
0.05% " " 8720'
0.06% " " 9030'

Indications of higher hydrocarbons registered were
based on diesel oil which was added to the mud
system.

Cores:

Core no. 1
Interval : 7360 - 7420'
Recovery : 25' = 41.7%
Recovered interval: 7360 - 7385'
Remark : See attached core description

Core no. 2
Interval : 8042 - 8100'
Recovery : 58' = 100%
Recovered interval: 8042 - 8100'
Remark : See attached core description

DST: -

<u>Logs:</u>	<u>Log type</u>	<u>Interval recorded</u>	<u>Scales</u>
	IES	5154' - 9220'	1:200 & 1:500
	BHC-CR	5154' - 9210'	1:200 & 1:500
	FDC	7000' - 9220'	1:200 & 1:500
	SNP	7000' - 9220'	1:200 & 1:500
	HDT	5157' - 9220'	1:200

Remark: TD Schlumberger 9221'
TD Driller 9211'

A velocity survey using an air source was run at following
intervals:

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Logs cont.:

A velocity survey using an air source was run at the following intervals:

4499' (Dummy & test run)
9217'
8742'
8633'
8035'
7362'
6860'
6422'
4500'
2502'

Drilling Summary: Drilling was performed using 12 1/4" bits as registered below. A diamond core head with 60' barrel was run over the intervals 7360 - 7420' and 8042 - 8100'. Both core holes were reamed to 12 1/4". Tight hole with overpull up to 140000 lbs was encountered at various depths. To ensure free hole travel short trips were made of average up to 5 stands. After reaching TD = 9211' the hole was circulated clean and bit was pulled for Schlumberger surveys.

Bits used:

<u>Bit no.</u>	<u>Size</u>	<u>Make</u>	<u>Type</u>	<u>Interval</u>	<u>Performance</u>
8	12 1/4"	Sec	S33-J	6011-7101'	1090' in 17 hrs.
9	"	Sec	S33-J	7101-7360'	259' in 4 1/2 hrs.
CB 10	8 15/32	Christ	MC22fd	7360-7420'	60' in 4 hrs.
11	12 1/4"	Sec	S44-J	7420-7821'	401' in 10 3/4 hrs.
12	"	Sec	S44-J	7821-8042'	221' in 7 1/2 hrs.
RCB10	8 15/32	Christ	MC22fd	8042-8100'	58' in 6 hrs.
13	12 1/4"	Sec	S44-J	8100-8350'	250' in 15 hrs.
14	"	Smith	V2H-J	8350-8711'	361' in 17 1/2 hrs.
15	"	Sec	S33-J	8711-9211'	500' in 6 1/2 hrs.

Deviation Surveys:

7320' = 3/4°
7780' = 1/4°
8000' = 1/2°
9200' = 1/4°

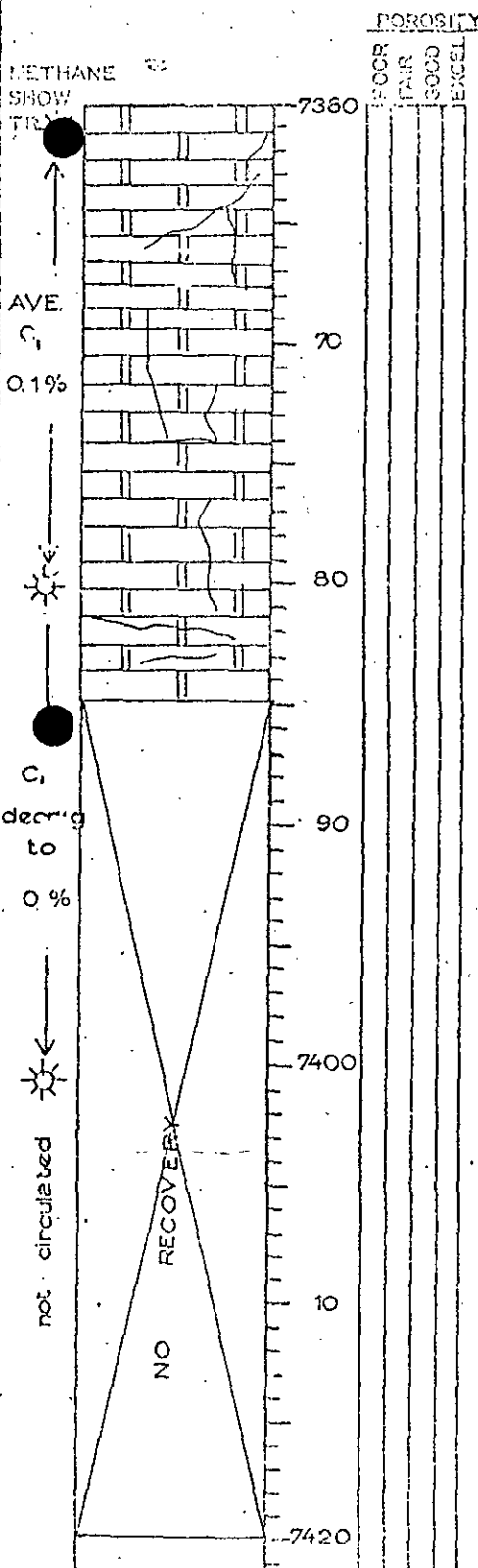
F.W. Reuter
F.W. Reuter

31 July 1971

AMOCO NORWAY OIL COMPANY
CORE DESCRIPTION

WELL NUMBER 7/1-1A
 AMOUNT AND INTERVAL CORED 60' 7360-7420'
 AMOUNT AND INTERVAL RECOVERED 25' 7360-7385'
 CORE BIT SIZE AND MAKE 8 15/32" X 3 Christensen
 CORE BIT TYPE M C 22 fd
 CORE DIAMETER 3"

CORE NUMBER 1
 MUD WT. 12.9
 MUD VISC. 52
 MUD WL. 4.2
 WEIGHT ON BIT 15-18,000
 R. P. M. 100-120
 PUMP PR. 1200 PSI
 DRILLING TIME 4 hrs 5 mins
 DESCRIBED BY Brian T. Lee



DESCRIPTION

Chalk - medium hd to hd. creamy white to white with common sub-horizontal stylolites - when fractured along these lines of weakness the stylolites are seen to be very thin bands of impurity giving a black appearance. Some fossil fragments are visible. The chalk has a pale blue-violet mineral fluorescence, no cut, no oil stain, no visible porosity.

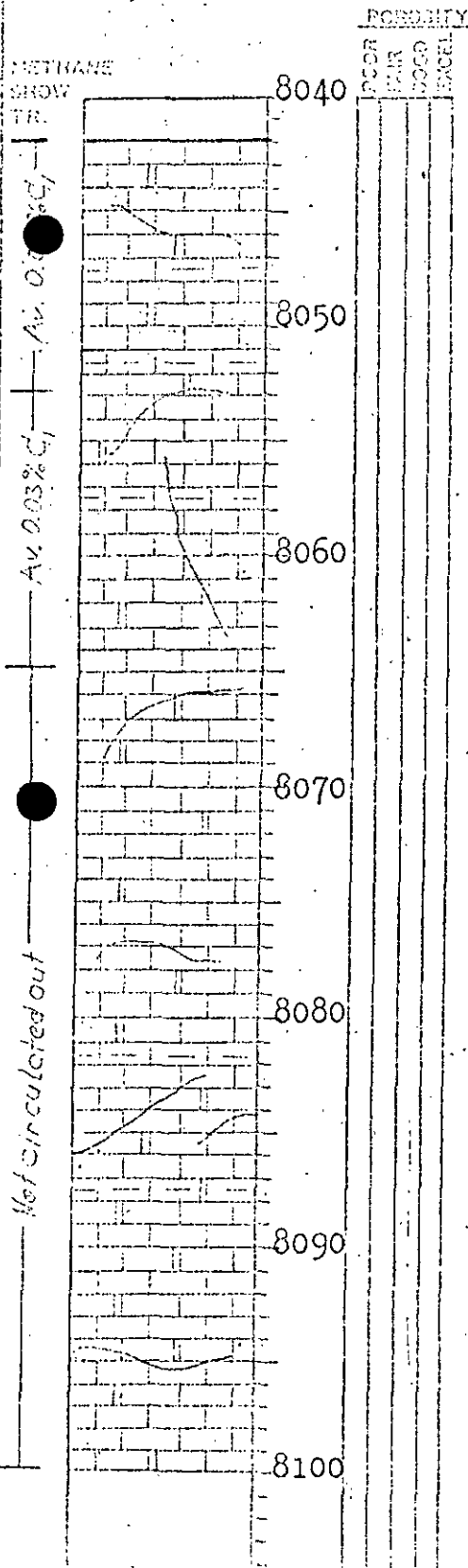
Fractures common throughout core - sub-vertical to horizontal, the latter usually being along stylolites. No visible bedding.

ARLCO NORWAY OIL COMPANY

CORE DESCRIPTION

WELL NUMBER 7/1-1A
 DEPTH AND INTERVAL CORED 58' 8042-8100'
 DEPTH AND INTERVAL RECOVERED 58' 8042-8100'
 CORE BIT SIZE AND MAKE 8 15/32" Christensen
 CORE BIT TYPE MC 22fd
 CORE DIAMETER 3"

CORE NUMBER 2
 MUD WT. 12.4
 MUD VISC. 52
 MUD WL. 2.5
 WEIGHT ON BIT 22000 lbs.
 R. P. M. 120
 PUMP PR. 1000 PSI
 DRILLING TIME 6 hrs
 DESCRIBED BY F.W. Reuter



DESCRIPTION

Chalky Limestone: white, cream, occ very light gry, fine grained (lititic texture), very hard, splintery, dense, tight, no visable porosity. Partly with subhorizontal shale lenses up to 1" thick, mainly lolivgry, slightly silty, firm to medium hard, subfissile, very calcé and fair fossil (mainly Bolivinoidea, Bolivina and Neoflabellina). Core shows also throughout entire interval subhorizontal stylolites and unorientated hairline fractures ranging from subhorizontal to subvertical, filled with dkgrýsh-blackish shale and showing on surface areas waxy appearance. Limestone showing throughout entire interval pale blue-violet mineral/natural fluorescene. No stain, no cut, no hydrocarbon fluorescene.