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TFE-23459

BP PETROLEUM DEVELOPMENT LTD., NORWAY U/A.

BP/STATOIL 29/6-1

GEOLOGICAL COMPLETION REPORT

by

R.P. RATTEY.

Approved by: A.M. Spencer

29/6-1 W.28

Stavanger,
May 1982.

DATA BANK SUMMARY SHEET

Coordinates of well 29/6-1 LAT: 60°32'17.94"N

LONG: 01°59'24.05"E

Country: Norway

Basin: Northern North Sea.

Stratigraphic range covered: Early Jurassic to Recent.

Report does contain significant well data.

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ENCLOSURES

SUMMARY

29/6-1 was spudded on the 12th October 1981. The primary objective was the Brent Formation in a separate fault block to the west of the gas condensate discoveries 30/4-2, 30/7-6 and 30/7-8. Secondary objective was the Lower Jurassic Statfjord Formation.

The Base Cretaceous unconformity was penetrated at 3805.0 m brt and a thick section of Upper Jurassic mudstones encountered. The Brent Formation clastic sediments were reached at 4204.5 m brt and found to be gas condensate bearing.The sandstones were highly overpressured and 15m of net pay was proved.The GWC was estimated at 4230 m brt (4164.2m TVD ss) using RFT data.

The Statfjord Formation was penetrated at 4729.0 m brt but was found to be water wet.

The well reached TD at 4832.0m brt on 12th March 1982 within the Statfjord Formation.

Note: All depths in this report are quoted as mbrt unless otherwise stated.

29/6-1
SUMMARISED WELL LOG

NOCS
SCALE 1:10,000

LOCATION: 60° 32' 17.94"N 01° 59' 24.05"E

Stratigraphy CHRONO STRAT.	Stratigraphy LITHO STRAT	Depth Drilled ft. & m.	Graphic Log	Cores	Shows	Description	Casing	Tests	Electric Logs	Remarks
						SEA LEVEL 24.23m				CHRONOSTRAT TAKEN FROM BP BIOSTRAT. REPORT
						SEA BED 148.93m				
TERTIARY TO QUATERNARY	? MIOCENE TO PLEISTOCENE	250					30" 287		GR	
		1000				SAND, clss qtz, f to c, lse, subang to subrnd, mod sort, grst, tr glauc, tr shell frags, occ sl to mod argil				
		500								
		2000				SAND, qtz, a.a., v glauc, tr calc cem.				
	705 MIOC					CLAY, lt to m gy, sft, stky, plastic text, sl silty, mod calc.				
	955	750				SANDSTONE, clss qtz, m to c, hd, ang to subrnd, poor sort, sl calc cem, glauc, occ pebbly				
		3000								
	OLIGOCENE TO E.MIOCENE	1000				SILTSTONE, lt brn, sft to firm, occ blocky fract, sl calc.				
	1105					LIMESTONE, bf, hd to mod hd, microxln, low vis por				
							18 5/8" 1103			
		4000 1250								
	OLIGOCENE					SANDSTONE, qtz, lt brn, m to c, occ v.f, fria, rnd, well sort, tr forams.				
	1430					DOLOMITE, bf to rd brn, firm, microxln, sl argil, zero vis por.				
		1500 5000								
		1750				LIMESTONE, bf, firm to hd, microxln, mdst text, mod dol, mod argil.				
						MUDSTONE, m gy to blu gy, mod hd, hygrofis, non-calc, sl silty, tr micromic, tr glauc.				
		6000				SANDSTONE, qtz, brn, m to c, fria, subrnd, well sort, weak calc cem.				
	1881 ROGALAND GP 1925					MUDSTONE, varicol, rd brn to purp, firm, abund tuffac specks.				
	EOCENE	2000				SANDSTONE, qtz, brn, mod hd, occ fria, subang to subrnd, mod sort, weak calc cem, tr glauc.				
	E.EOCENE 2060									
	PALAEOCENE 2340	7000 2250				MUDSTONE, m gy grn, sft to firm, non-swell, sl calc, occ thin LST laminae.				
						SANDSTONE, m gy, qtz, f, well sort, v argil, weak calc cem, low por.				
						MUDSTONE, m gy, firm, non-calc becoming v calc downhole grading to argil LST.				
	L. MAAS-TRICHTIAN 2535	8000 2500				MUDSTONE, lt to m gy, firm, v calc interlam w and intergrading to LIMESTONE, lt gy, firm, microxln, v argil.	13 3/8" 2541			
	E. MAAS-TRICHTIAN 2685					MUDSTONE, lt rd brn to purp, firm, v. calc grades to argil LST.				
	CAMPANIAN 2985	9000 2750				MUDSTONE, lt to m gy, firm to mod hd, blky to sub-fis fract, v. calc, grades to argil LST, tr pyr.				
						DOLOMITE, dk brn, sub-transluc, v hd, xln, sl. calc, low vis por.				
		3000 10000				MUDSTONE, m gy to gy grn, firm to mod hd, occ sub-fis, sl to v. calc grading to LST.				
						LIMESTONE, lt gy, sft to firm, mod to v. argil, mdst text, v low vis por, grades to MDST.				
		3250								
		11000				Interlam and Intergrad seq of v. calc MDSTS and v. argil LSTS, a.a.				
	L.CONACIAN-SANTONIAN 3493	3500				LIMESTONE, lt gy, firm, blocky to subfis, v. argil, sucrosic, grades to MDST.	3567			
		12000				LIMESTONE, wh, hd, cryptoxln, sl sndy.				
						MUDSTONE, lt gy, sft, v. slty, v. calc.				
		3750				MUDSTONE, dk gy, firm, sub-fis, dol, micropyr, microcarp.	9 5/8" 3772			
						MUDSTONE, dk gy brn to blk, sft, stky to subfis, non-calc, v carb, micropyr.				
	L.CALLOVIAN 4061	13000 4000				LIMESTONE, m brn, hd, blocky, microxln to cryptoxln, sl to mod dol, mod argil, grades to v calc lt gy MDST.				
						MUDSTONE, dk gy, mod hd, subfis, non-swell, sl slty, non to mod calc.				
		4250 14000				SANDSTONE, qtz, m gy brn, f to m, occ c, fria, su ang to subrnd, mod sort, gen SLT/CL matrix, occ clean w. weak calc cem, grst, gen v argil w. occ interbeds of MDST, SLST and COAL, gen v mic, sl carb, low to mod vis por.	7" 4375	DST 3 DST 2 DST 1 60 RFT POINTS		
		4500 15000				MUDSTONE, dk gy to blk, mod hd, subfis, gen non-calc, v carb, sl slty.				
						MUDSTONE, dk gy brn, mod hd, subfis, sl calc.				
						SANDSTONE, qtz, m gy, vf to f, occ m, fria, subang to subrnd, grst, mod vis por, v argil.				
		4750 16000				SANDSTONE, qtz, m gy, m to vvc, fria, ang to subrnd, poor sort, grst, sl calc cem, mod vis por.		8E 27 8E 30 8E 29 8E 24,28		
						T.D. 4832m brt				
		5000								

ISF/BHC/GR/SP — HRT

ISF/MSFL/BHC/GR/SP — HRT

ISF/BHC/GR/SP — ISF/MSFL/BHC/GR/SP — LDL/CNL/GR/CAL — FDC/CNL/GR/CAL — DLL/MSFL/BHC/SP/CAL — HDT — NGT — RFT/GR — CBL — VS

1881 1900 1921.5 BALDER FM. SELE FM. ROGALAND GP

3675	L.TURONIAN -E.CONIACIAN
3725	M.TURONIAN
3769	CENOMANIAN -M.TURON
3775	CENOMANIAN
3785	P-M
3816	CENOMANIAN
3851	M-KIMMERIDGE -M.PORTLAND
3894	E.OXFORDIAN
3921.5	L.CALLOVIAN -E.OXFORD

LATE CRETACEOUS — JURASSIC

4204.5	TARBERT MBR.
4330	NESS MBR.
	ETIVE MBR.
4457.5	RANNOCH MBR.
4477.5	
4488	BROOM MBR.
4499.5	
4544	DRAKE MBR.
4607	COOK MBR.
4645	BURTON MBR.
4729	AMUNDSEN MBR.
4785.5	NANSEN MBR.
	UNDIFF.

BRENT FORMATION — DUNLIN FM. — STATFJORD FM.

MAY 1982
R.P. RATTEY

DRWG. NO. 2886

WELL NOCS 29/6-1

LATITUDE 60°32'17.94"N

LONGITUDE 01°59'24.05"E

OPERATOR BP Pet. Dev. Ltd., Norway.

RTE 24.2 m.a.m.s.l.
148.9 m.a.s.b.

WATER DEPTH 124.70 m

TYPE OF RIG Semisubmersible

NAME Sedco 707

OBJECTIVES To test the Middle Jurassic Brent Formation in a previously undrilled tilted fault block to the west of the proven gas condensate discoveries 30/4-2, 30/7-6 and 30/7-8. Secondary objective was the Lower Jurassic Statfjord Formation sandstones.

DATE SPUDDED 12th October 1981

DATE COMPLETED 10th May 1982

DEPTH 4832.0 mbrt 4807.8 mss

WELL STATUS Plugged and abandoned as a gas condensate well

GEOLOGICAL DATA

	Tops		Thickness
Chronostratigraphy	mbrt	mss	m
Tertiary to Quaternary	148.9	124.7	556.1
?Miocene to Pleistocene	148.9	124.7	556.1
Tertiary	705.0	680.8	1670.0
Miocene	705.0	680.8	50.0
Oligocene to Early Miocene	755.0	730.8	350.0
Oligocene	1105.0	1080.8	325.0
Eocene	1430.0	1405.8	495.0
Early Eocene	1925.0	1900.8	135.0
Palaeocene	2060.0	2035.8	280.0
Early Palaeocene	2340.0	2315.8	35.0
Cretaceous	2375.0	2350.8	1441.0
Late Maastrichtian	2375.0	2350.8	160.0
Early Maastrichtian	2535.0	2510.8	150.0
Campanian	2685.0	2660.8	300.0
Indeterminate[X]	2985.0	2960.8	508.0
Late Coniacian to Santonian	3493.0	3468.8	182.0
Late Turonian to Early Coniacian	3675.0	3650.8	50.0
Middle Turonian	3725.0	3700.8	35.0
Cenomanian to Middle Turonian	3759.7	3735.8	15.0
Cenomanian	3775.0	3750.8	10.0
Early to Middle Cenomanian	3785.0	3760.8	31.0
Jurassic	3816.0	3791.8	761.0
Middle Kimmeridgian to Middle Portlandian	3816.0	3791.8	34.0
Early Oxfordian	3850.6	3826.4	43.4
Late Callovian to Early Oxfordian	3894.0	3869.8	27.5
Late Callovian	3921.5	3897.3	139.4
Indeterminate	4060.9	4036.7	400.6
?Late Toarcian to Bajocian	4461.5	4437.3	116.0
Indeterminate	4577.5	4553.3	254.5
TD	4832.0	4807.8	

NOTE Where there are gaps between biostratigraphical units (as quoted in BP biostratigraphical report) the upper and lower depths have been averaged and a mean depth to unit top quoted.

x Indeterminate age due to deformation of samples by diamond bit drilling with turbine.

Lithostratigraphy	Tops mbrt	Tops mss	Thickness m
Nordland and Hordaland Gps.	148.9	124.7	1732.1
Frigg Fm	1827.0	1802.8	54.0
Rogaland Gp	1881.0	1856.8	40.5
Balder Fm	1881.0	1856.8	19.0
Sele Fm	1900.0	1875.8	21.5
Montrose Gp	1921.5	1897.3	426.5
Upper Sandstone Mbr	1921.5	1897.3	161.5
Lower Sandstone Mbr	2198.0	2173.8	56.0
Shetland Gp	2348.0	2323.8	1457.0
Formation 'F'	2348.0	2323.8	24.5
Formation 'E'	2372.5	2348.3	305.0
Formation 'D'	2677.5	2653.3	954.5
Formation 'C'	3632.0	3607.8	44.0
Formation 'B'	3676.0	3651.8	7.5
Formation 'A'	3683.5	3659.3	121.5
Humber Gp	3805.0	3780.8	399.5
Kimmeridge Clay Fm	3805.0	3780.8	110.0
Heather Fm	3915.0	3890.8	289.5
Brent Fm	4204.5	4180.3	295.0
Tarbert Mbr	4204.5	4180.3	125.5
Ness Mbr	4330.0	4305.8	127.5
Etive Mbr	4457.5	4433.3	16.0
Rannoch Mbr	4473.5	4449.3	15.5
Broom Mbr	4489.0	4464.8	10.5
Dunlin Fm	4499.5	4475.3	229.5
Drake Mbr	4499.5	4475.3	44.5
Cook Mbr	4544.0	4519.8	63.0
Burton Mbr	4607.0	4582.8	38.0
Amundsen Mbr	4645.0	4620.8	84.0
Statfjord Fm	4729.0	4704.8	103.0+
Nansen Mbr	4729.0	4704.8	56.5
Undiff. Statfjord	4785.5	4761.3	46.5+
TD	4832.8	4807.8	

CORES

195 sidewall cores were attempted between 2565 m and 4815 m brt., of which 91 were recovered.

7 full cores were cut within the Brent Fm.

No.	Depth	Recovery	
1	4219.57 - 4238.00 m	18.43 m	(100%)
2	4238.00 - 4256.00 m	18.00 m	(100%)
3	4256.00 - 4274.00 m	18.00 m	(100%)
4	4274.00 - 4292.00 m	18.00 m	(100%)
5	4292.00 - 4310.00 m	18.00 m	(100%)
6	4310.00 - 4328.20 m	18.20 m	(100%)
7	4328.20 - 4339.65 m	11.45 m	(100%)

SHOWS

Age	Depth	Show	Lithology
Palaeocene	1830 m	Gas show - 100% C_1. Weak yellow fluorescence, slow cream stream cut fluorescence, no natural cut colour.	Sandstone
Early Cenomanian to Santonian	3610 - 3805 m	Weak yellow natural fluorescence, slow milky white stream cut fluorescence, no natural cut colour.	Limestone
Late Toarcian to Bajocian	4204.5 - 4499.5 m	Gas show - 85%C_1, 10%C_2, 5%C_3, trace iC_4, nC_4, C_5. Dull yellow fluorescence becoming very dull orange yellow downhole, fast yellow to milky white cut fluorescence becoming very slow downhole, no natural cut colour.	Sandstones (cored samples)

TESTS

RFT (Temperature corrected)

NO.	DEPTH (mbrt)	PRESSURE (psi)	COMMENT
6A-1	4206.0	11177	
6A-2	4213.0	11165	
6A-3	4226.7	11473	
6A-4	4235.5	11290	
6A-5	4206.0	11153	
6A-6	4209.5	11155	
6A-7	4213.0	11162	
6A-8	4216.0	11182	
6A-9	4224.0	11362	
7B-1	4207.0	11108	
7B-2	4210.2	11111	
7B-3	4213.7	11111	
7B-4	4216.7	11116	
7B-5	4258.0	11220	
7B-6	4250.5	11213	
7B-7	4270.0	11344	Tight
7B-8	4289.7	11215	
7B-9	4328.5	11424	
7B-10	4379.0	11382	
8C-1	4207.5	11156	
8C-2	4210.0	11155	
8C-3	4258.4	11272	Sand Plugging
8C-4	4270.0	-	No seal
8C-5	4279.4	-	Tight
8C-6	4278.5	-	Tight
8C7	4281.0	11467+	Still Building
8C-8	4296.5	11293+	Still Building
8C-9	4307.0	-	Tight
8C-10	4314.0	11471	
8C-11	4328.5	-	No Seal
8C-12s	4289.7	11280	Segregated sample - 1500 cc water

NO.	DEPTH (mbrt)	PRESSURE (psi)	COMMENT
8D-1	4289.7	11242	
8D-2	4314.0	-	No seal
8D-3	4314.5	11395	
8D-4s	4329.0	11512	Water sample 9200 cc
8E-1	4493.6	11890	
8E-2	4491.0	11886	
8E-3	4471.0	11857	
8E-4	4468.0	11815	
8E-5	4445.3	11814	
8E-6	4444.5	11815	
8E-7	4379.5	11448	
8E-8	4328.5	11559	
8E-9	4316.0	11554	
8E-10	4290.0	11289	
8E-11	4257.0	11298	
8E-12	4210.0	11191	
8E-13	4207.0	11182	
8E-14	4207.0	11180	
8E-15	4216.0	11196	
8E-16	4256.6	-	Seal Failure
8E-17	4257.5	11309	
8E-18	4290.0	11290	
8E-19	4296.5	-	Tight
8E-20	4328.5	11559	
8E-21	4379.5	11449	
8E-22	4445.5	11804	
8E-23	4460.5	11815	
8E-24	4468.0	11818	
8E-25	4491.0	11884	
8E-26	4820.5	-	Sela Failure
8E-27	4759.6	-	Tight
8E-28	4820.5	13010+	Still Building
8E-29	4810.6	11680+	Still Building
8E-30	4804.7	12981	Bad Seal

DST NO.	Interval	Results
DST 1	4287.0 - 4301.0	- Final flow rate 1210 BWPD through 4/64" surface choke. - WHFP 3250 psi. - Water salinity 71000 ppm NaCl
DST 2	4256.0 - 4260.0	- Final flow rate 279 BWPD through 4/64" surface choke. - WHFP 3690 psi.
DST 3	4208.5 - 4218.3	- Final flow rate 10.88 MM scfd, 1405 STBD condensate through 8/64" surface choke. - WHFP = 5160 psi. - Condensate/Gas ratio 138 STB/MM scf - Seperator gas gravity 0.71 SG - Oil gravity 44 API.

COMMENTS

Hole deviation through the Heather and Brent formations reached 22° (HDT). Top Brent Formation was penetrated at 4204.5 m brt (4140.27 m TVD ss - HDT) with the sandstones highly overpressured and 15 m of gas condensate net pay. The GWC was estimated at 4230 m brt (4164.27 m TVD ss - HDT) using RFT data.

REFERENCES BP Completion Report 29/6-1 W28.

AUTHOR R.P. Rattey

DATE May 1982

BP PETROLEUM DEVELOPMENT OF NORWAY A.S.
LOCATION PLAT WELL 29/6-1

COUNTRY NORWAY
AREA - NORTH SEA

LICENCE NO. 043
BLOCK NO. 29/6

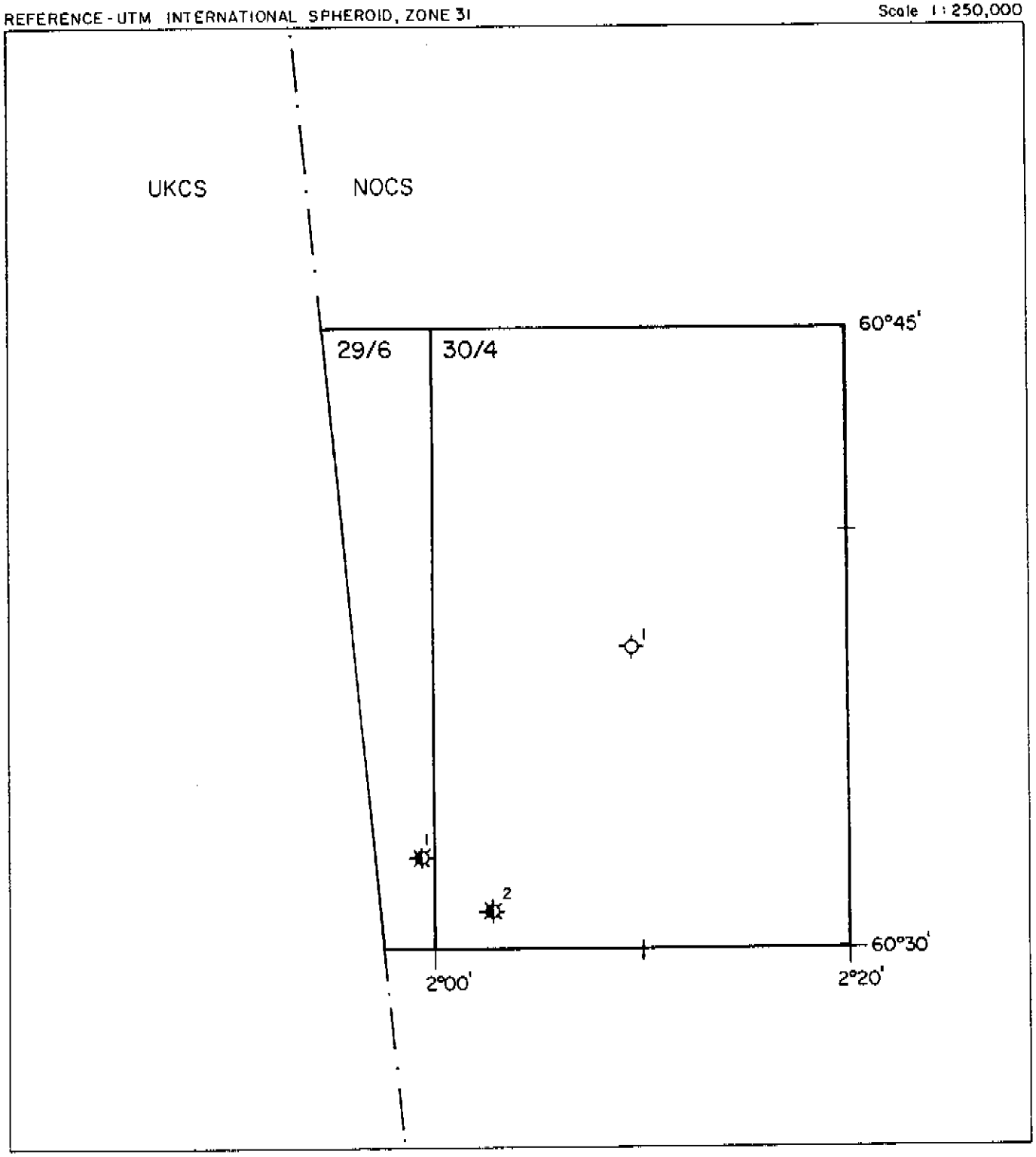
CO-ORDINATES: LAT. 60°32'17.94"N
LONG. 01°59'24.05"E

GRID REFERENCE N 6711948.1
E 444581.7

ELEVATION OF ROTARY TABLE 24.23 metres AMSL

REFERENCE - UTM INTERNATIONAL SPHEROID, ZONE 31

Scale 1:250,000



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SAMPLES AND CORES TAKEN

1. DITCH CUTTINGS SAMPLES

Depth (mbrt)	Sample interval (m)
287 - 3000	10
3000 - 3780	5
3780 - 4832	3

2. SIDEWALL CORES

Run 4A at 9 5/8" casing point

45 attempted

14 recovered

Run 8B,C,D,E,F at T.D.

150 attempted

77 recovered

3. CONVENTIONAL CORES

7 cores in the Jurassic Brent Formation

Core No. 1	4219.57 - 4238.00m;	18.43m recovered (100%)
Core No. 2	4238.00 - 4256.00m;	18.00m recovered (100%)
Core No. 3	4256.00 - 4274.00m;	18.00m recovered (100%)
Core No. 4	4274.00 - 4292.00m;	18.00m recovered (100%)
Core No. 5	4292.00 - 4310.00m;	18.00m recovered (100%)
Core No. 6	4310.00 - 4328.20m;	18.20m recovered (100%)
Core No. 7	4328.20 - 4339.65m;	11.45m recovered (100%)

GEOLOGY

The lithostratigraphic subdivisions used in this report are based on those defined by Deegan and Scull (1977). The chronostratigraphy is based on BP palaeontological and palynological data (Welsh, 1982).

All depths quoted are drilled depths in metres below rotary table.

1. HORDALAND AND NORDLAND GROUP (148.93 - 1881.0 m) (Eocene to Recent)

The top of the Nordland Group is the present seabed. The Hordaland and Nordland Groups comprise a thick section of marine sands and mudstones. The sands are quartzose, generally unconsolidated and commonly glauconitic. Grain size is predominantly fine to medium with fining upwards cycles in the interval 503 m to 977 m and a major coarsening and 'cleaning' upwards cycle between seabed and 503 m. The mudstones are very silty and vary in colour from light grey to grey green to grey brown. Thin stringers of microcrystalline dolomitic limestone also occur. At the base of the Hordaland Group there is a massive sandstone unit known as the Frigg Formation.

1.1 Frigg Formation. (1827.0-1881.0m). (Eocene)

The Frigg Formation consists of a massive, medium to coarse grained quartzose sandstones, weakly cemented with calcite and occasionally interbedded with thin grey green mudstones and cream coloured dolomitic limestone stringers.

The top of this formation is marked by a sharp downhole decrease in gamma ray response and increase in sonic velocity.

2. ROGALAND GROUP (1881.0 - 1921.5 m). (Eocene)

The Rogaland Group is divided into the Balder and Sele Formations.

2.1 Balder Formation (1881.0-1900.0m). (Eocene)

The Balder Formation is composed of slightly tuffaceous mudstones varying in colour from grey green to grey blue to red brown to purple, interbedded with, and occasionally grading to fine to coarse grained quartzose sandstones.

The top of the formation is marked by a downhole increase in gamma ray response and a change to a more irregular sonic response.

2.2 Sele Formation (1900.0-1921.5m) (Eocene)

The Sele Formation also consists of interbedded varicoloured tuffaceous mudstones and fine to coarse grained quartzose sandstones.

The formation top is marked by a sharp downhole increase in gamma ray response and decrease in sonic velocity.

3. MONTROSE GROUP (1921.5 - 2348.0m. (Early Palaeocene to Eocene).

The Montrose Group is a thick sequence of medium grey to grey green variably calcareous mudstones interbedded with quartzose sandstones. White to buff coloured limestone stringers frequently occur and are occasionally slightly dolomitic. The sandstones are informally divided into the Upper Sandstone Member and the Lower Sandstone Member.

3.1 Upper Sandstone Member (1921.5-2083.0m) (Palaeocene to Eocene)

The Upper Sandstone Member is an interbedded sequence of clean sandstones and slightly calcareous mudstones. The sandstones are medium to coarse grained with weakly developed 'fining upwards' cycles and sharp basal contacts. Cementation is generally weak and predominantly calcareous. Glauconite commonly occurs.

The top of the member is picked at a sharp downhole decrease in gamma ray response and increase in sonic velocity. The base of the member is picked at a downhole increase in gamma ray response and decrease in sonic velocity.

3.2 Lower Sandstone Member (2198.0-2254.0m). (Palaeocene)

The Lower Sandstone Member is a finely interbedded sequence of non-calcareous mudstones and very argillaceous sandstones. Sandstones are fine to medium grained, weakly cemented with calcite and slightly glauconitic.

The upper boundary of the member is marked by a downhole increase in sonic velocity and resistivity. The lower boundary is marked by a downhole increase in gamma ray response and a decrease in sonic velocity and resistivity.

4. SHETLAND GROUP (2348.0 - 3805.0 m). (Early Cenomanian to Early Palaeocene)

The Shetland Group comprises a thick monotonous sequence of calcareous mudstones which frequently grade to very argillaceous limestones. It is divided into five formations named 'A' to 'F'.

4.1 Formation 'F' (2348.0-2372-5m). (Early Palaeocene)

Formation 'F' comprises a sequence of intergrading light to medium grey very calcareous mudstones and light grey argillaceous limestones.

The formation top is picked at a gradual increase in gamma ray response, resistivity and sonic velocity.

4.2 Formation 'E' (2372.5-2677.5m). (Early Maastrichtian to Early Palaeocene)

Formation 'E' comprises two distinct lithological divisions. The upper division (2372.5-2607.0m) is an interlaminated and intergrading sequence of light to medium grey very calcareous mudstones and light

grey to white argillaceous limestones. Thin stringers and irregular patches of tan coloured dolomitic limestone also occur. The lower division (2607 - 2677.5 m) consists of light grey calcareous mudstones interlaminated with, but not grading to red brown very calcareous mudstones. The red brown mudstones frequently grade to very argillaceous microcrystalline limestones.

The top of the formation is picked at the downhole leveling off of the resistivity and sonic responses after the increase through Formation 'F'. The contact between upper and lower lithological divisions is marked by a downhole increase in resistivity and sonic velocity.

4.3 Formation 'D' (2677.5-3632.0m). (Late Coniacian to Early Maastrichtian)

Formation 'D' is a monotonous intergrading sequence of light to medium grey calcareous mudstones and argillaceous limestones. The section from 2795 m to 2904 m contains frequent thin stringers of dark brown dolomite.

The formation top is picked at a downhole increase in gamma ray response and decrease in resistivity.

4.4 Formation 'C' (3632.0-3676-0m). (Late Turonian to Santonian)

Formation 'C' comprises light to medium grey calcareous mudstones which are frequently very silty and are interlaminated and intergrading with variably argillaceous limestones. Sandy cryptocrystalline limestones occasionally occur and contain dark green ellipsoidal grains of glauconite.

The formation top is picked at a sharp downhole increase in gamma ray response and decrease in resistivity and sonic velocity. Log response in Formation 'C' is notably more variable than in the overlying Formation 'D'.

4.5 Formation'B' (3676.0-3683.5m). (Late Turonian to Early Coniacian)

Formation 'B' is a thin section of light to medium grey silty mudstones.

The top of Formation 'B' is picked at a downhole increase in gamma ray response and decrease in resistivity and sonic velocity.

4.6 Formation 'A' (3683.5-3805.0m). (Early Cenomanian to Late Turonian)

Formation 'A' consists of two distinct lithological divisions. The upper division (3683.5-3743.0m) is an interbedded and intergrading sequence of light to medium grey calcareous silty mudstones and very sandy cryptocrystalline limestones which are occasionally glauconitic. The lower division (3743.0m - 3805.0m) is a mixed sequence of light grey calcareous mudstones grading to argillaceous limestones and dark grey brown dolomitic mudstones. The dark grey brown mudstones frequently contain sub-hedral dolomite rhombs and are commonly micropyritic and microcarbonaceous.

The top of Formation 'A' is picked at a rapid decrease in gamma ray response and increase in resistivity and sonic velocity. The contact between the upper and lower divisions is marked by a sharp increase in gamma ray response and decrease in resistivity and sonic velocity.

5. HUMBER GROUP (3805.0 - 4204.5 m). (Late Callovian to Middle Portlandian)

The Upper Jurassic sediments belonging to the Humber Group are predominantly mudstones and are divided into the Kimmeridge Clay Formation and the Heather Formation.

5.1 Kimmeridge Clay Formation (3805.0-3915.0m). (Late Callovian to Middle Portlandian)

The Kimmeridge Clay formation is a sequence of dark brown to black, non-calcareous, occasionally very carbonaceous and micropyritic mudstones interlaminated with rare light grey argillaceous limestones.

These mudstones are typical "hot shales" with the formation top picked at a dramatic downhole increase in gamma ray response and decrease in sonic velocity.

5.2 Heather Formation (3915.0-4204.5m). (Late Callovian to Early Oxfordian)

The Heather Formation can be divided into two distinct lithological units. The upper unit (3915.0 -4072.0 m) is an intergrading sequence of medium brown very calcareous mudstones and very argillaceous limestones. Clasts of limestone commonly occur within the mudstone laminae. The limestones are frequently very dolomitic and grade to thin laminae of dark brown very hard calcareous dolomite. Thin stringers of fine to medium grain sized quartzose sandstone also occur and are commonly well cemented with calcite. The lower unit (4072.0 - 4204.5 m) comprises a monotonous sequence of medium to dark grey variably calcareous mudstones with rare stringers of brown very argillaceous limestone.

The formation top is picked at a sharp downhole decrease in gamma ray response and increase in sonic velocity.

6. BRENT FORMATION (4204.5 - 4499.5 m). (?Late Toarcian to Bajocian)

The Brent Formation is a thick clastic sequence with interbedded mudstones and coals. It is divided into five members: the Tarbert, Ness, Etive, Rannoch and Broom.

Only the Etive, Rannoch and Broom Members yielded diagnostic microfauna.

6.1 Tarbert Member (4204.5-4330.0m) (Undated)

The Tarbert is an interbedded sequence of variably argillaceous quartzose sandstones with minor laminae of dark grey carbonaceous mudstone and coal. The top 15.5m consists of a massive clean quartzose sandstone with very fine to very coarse grain size, poor sorting, poor siliceous cement and moderate visible porosity. The base of this sandstone is a quartz pebble lag highly cemented with calcite.

Beneath this unit the sandstones are generally very argillaceous with only thin interbeds of relatively clean sandstone. Grain size varies greatly but is predominantly fine to medium with moderate sorting. Cementation is generally poor with calcite the predominant type. Occasional patches are highly cemented with calcite. Visible porosity varies with the proportion of clay matrix; from good in the clean generally coarser grained sandstones with grainstone textures to very poor in the fine grained very argillaceous sandstones with clay supported wackestone textures. Micaceous laminae commonly occur. Vertical bioturbation is occasionally intense.

The top of the member is picked at a sudden downhole decrease in gamma ray response and increase in both resistivity and sonic velocity.

6.2 Ness Member (4330.0-4457.5m). (Undated)

The Ness Member is a interbedded and interlaminated sequence of grey brown argillaceous sandstones, dark grey silty mudstones and black coals. Sandstones are quartzose, fine to medium grained and moderately sorted with low to moderate visible porosity.

The top of the Ness Member is picked at the first prominent mudstone bed beneath the Tarbert and corresponds to a downhole increase in gamma ray response and a decrease in both resistivity and sonic velocity.

6.3 Etive Member (4457.5-4473.5m) (?Late Toarcian to Bajocian)

The Etive Member is a massive fine to medium grained quartzose sandstone. It is moderately sorted, weakly cemented with calcite, generally non-argillaceous and has moderate visible porosity. There are occasional thin laminae highly cemented with calcite which have very low porosities.

The top of the member is picked at the base of the lowest significant mudstone in the Ness Member. This is marked by a downhole decrease in gamma ray response and resistivity together with an increase in sonic velocity.

6.4 Rannoch Member (4473.5-4489.0m). (?Late Toarcian to Bajocian)

The Rannoch Member is a massive sandstone similar to the Etive Member but is more argillaceous and micaceous. Cementation with calcite is also stronger but is more evenly distributed through the sandstone with few distinct calcite bands.

The top of the Rannoch Member is picked at a downhole increase in gamma ray response and resistivity.

6.5 Broom Member (4489.0-4499.5m) (?Late Toarcian to Bajocian)

The Broom Member is a massive quartzose sandstone which is generally fine to medium grained but has a coarse pebbly base that is well cemented with calcite.

The member top is picked at a sharp downhole decrease in gamma ray response.

7. DUNLIN FORMATION (4499.5 - 4729.0 m). (?Late Toarcian to Bajocian)

The Dunlin Formation is a thick sequence of silty carbonaceous mudstones with minor interbeds of siltstone and argillaceous sandstones. It is divided into four members: the Drake, Cook, Burton and Amundsen. The Cook and Amundsen Members contain minor clastic sediments while the Drake and Burton Members are predominantly argillaceous.

Only the Drake Member produced a diagnostic microfauna and the rest of the formation is undated.

Significant sticking problems were encountered during the logging of this section. The ISF/SONIC run used to produce the composite log is severely affected and member tops were picked using a combination of the LDL/CNL and NGS logs.

7.1 Drake Member (4499.4-4544.0m). (?Late Toarcian to Bajocian)

The Drake Member is a sequence of dark grey to black silty mudstones which occasionally grade to siltstones. They are moderately carbonaceous, slightly pyritic and generally non-calcareous. Thin light brown grey argillaceous limestone laminae also occur.

The member top is picked at a sudden downhole increase in gamma ray response and decrease in resistivity and sonic velocity corresponding to the major lithological change from the overlying clastic sediments of the Brent Formation.

7.2 Cook Member (4544.0-4607.0m). (Undated)

The Cook Member is a finely interbedded and intergrading sequence of dark grey silty mudstones, brown grey siltstones and very fine argillaceous sandstones. The sandstones are grey brown and moderately cemented with calcite producing very low visible porosities.

The member top is marked by a downhole decrease in gamma ray response and neutron porosity together with an increase in formation density.

7.3 Burton Member (4607.0-4645.0m) (Undated)

The Burton Member is a sequence of dark grey to dark grey brown slightly silty and carbonaceous mudstones. They are generally non-calcareous but thin stringers of very argillaceous limestone occur occasionally.

The top of the Burton Member is picked at a downhole increase in gamma ray response together with an increase in neutron porosity and formation density.

7.4 Amundsen Member (4645.0-4729.0m). (Undated)

The Amundsen Member is a interbedded and intergrading sequence of medium grey brown very fine grained argillaceous sandstones, dark grey moderately calcareous siltstones and dark grey to black pyritic, carbonaceous mudstones. The sandstones are micaceous and are well cemented with calcite producing low visible porosities. The member becomes progressively more argillaceous towards the base.

The member top is picked at a downhole decrease in gamma ray response, neutron porosity and formation density.

8. STATFJORD FORMATION (4729.0 - T.D. 4832.0m). (Undated)

The Statfjord Formation is a thick clastic sequence with minor interbeds of siltstone and mudstone. An upper massive sandstone unit is recognised as the Nansen Member while the rest of the formation is undifferentiated.

The base of the Statfjord Formation was not drilled and the well reached T.D. at 4832m within the undifferentiated section.

8.1 Nansen Member (4729.0-4785.5m. (Undated)

The Nansen Member is a massive quartzose sandstone unit with rare mudstone partings. The sandstone is medium grey, medium to coarse grained, poorly sorted and weakly cemented with calcite giving moderate visible porosity.

The top of the Nansen Member is picked at a sharp downhole decrease in gamma ray response and increase in sonic velocity corresponding to the rapid lithological change from the overlying mudstones to the massive sandstones.

8.2 Statfjord Formation Undifferentiated (4785.0-T.D.4832.0m)

(Undated)

This section comprises a sequence of thick quartzose sandstones interbedded with dark grey to black micromicaceous and carbonaceous mudstones. The sandstones are medium to coarse grained, moderately sorted grainstones with poor calcareous cementation giving moderate visible porosities.

The top of this unit is picked at a sharp downhole increase in gamma ray response corresponding to the first significant mudstone beneath the Nansen Member.

Age	Depth	Gas Show	Oil Show				Lithology
			Natural fluor	Cut speed	Cut Fluor	Natural Cut Colour	
Palaeocene	1830 m	TG 1.04% C_1 100%	Weak yellow	Slow	Cream	None	Sandstone
Early Cenomanian to Santonian	3610 - 3805 m	TG 0.01 to 1.94% C_1 84 - 96% C_2 4 - 12% C_3 Tr - 6% C_4 Tr	Weak yellow	Slow	Milky White	None	Thin Limestones
?Late Toarcian to Bajocian	4204.5 - 4499.5 m.	TG Max 1.7% C_1 85% C_2 10% C_3 5% C_4 Tr	Dull yellow becoming very dull orange yellow downhole	Fast becoming very slow downhole	Yellow to milky white	None	Sandstone (core samples)

HYDROCARBON SHOWS

ELECTRIC LOGS

RUN No.	DEPTH (m)	TYPE	BHT (°C)
1A	149 - 1190	ISF/BHC/GR/SP	21.1
2A	10 - 981	HRT/CCL	17.2
3B	1182 - 2550	ISF/MSFL/BHC/GR/SP	52.8
4C	2536 - 3778	ISF/BHC/GR/SP	94.4
5B	10 - 2585	HRT/CCL	64.0
6D	3775 - 4252	ISF/BHC/GR/SP	113.0
6A	3772 - 4256	RFT/GR	122.4
7E	4100 - 4415	ISF/BHC/GR/CAL	116.9
7A	4140 - 4416	LDL/CNL/GR/CAL	116.9
7A	4100 - 4455	DLL/MSFL/GR/SP/CAL	122.4
7A	4150 - 4457	CYBERLOOK	-
7B	3772 - 4457	RFT/GR	130.2
8F	4350 - 4832	ISF/MSFL/BHC/GR/SP/CAL	136.3
8B	4300 - 4830	LDL/CNL/GR/CAL	143.0
8C	4300 - 4831	FDC/CNL/GR/CAL	133.0
8A	3775 - 4830	NGT	143.0
8A	3775 - 4832	HDT	142.4
8A	3775 - 4832	CYBERDIP	-
8A	3775 - 4832	CALIPER	142.4
8C	3772 - 4832	RFT/GR	134.7
8A	530 - 4832	VS	-
8D	3772 - 4832	RFT/GR	134.7
8E	3772 - 4832	RFT/GR	134.7
9A	3570 - 4338	CBL/VDL/GR	-
10B	3500 - 4338	CBL/VDL/GR	-
11C	3570 - 4338	CBL/VDL/GR	-
15D	4150 - 4280	CBL/VDL/GR	-

WELL 29/6-1 SIDEWALL CORE DESCRIPTIONS

NO.	DEPTH (mbrt)	LITHOLOGY
1	3780.0	LIMESTONE, light to medium grey, firm, sub-fissile, very argillaceous with slightly sucrosic texture, low visible porosity, grades to thin (1mm) laminae of dark grey very calcareous MUDSTONE.
2	3777.0	LIMESTONE, light grey, firm, sub-fissile, very argillaceous, mudstone texture, occasionally slightly sucrosic, Slight hydrocarbon odour, no natural hydrocarbon fluorescence, very weak slow cream crush cut fluorescence.
3	3774.0	LIMESTONE, light grey, firm, sub-fissile, very argillaceous with slightly sucrosic texture, very low visible porosity.
4	3772.0	NO RECOVERY.
5	3769.5	MUDSTONE, dark grey to dark grey brown, firm, occasionally moderately hard, sub-fissile, trace micropyritic and micro-carbonaceous, generally non-calcareous. Moderate hydrocarbon odour no natural fluorescence, very slow dull cream crush cut fluorescence.
6	3750.0	LIMESTONE, light grey, firm to moderately hard, very argilla-ceous and grades to very calcareous MUDSTONE, sub-fissile, predominantly mudstone texture, occasionally slightly sucrosic, very low visible porosity.
7	3699.9	LIMESTONE, light grey, moderately hard, cryptocrystalline, occasionally moderately sucrosic, blocky fracture, slightly argillaceous, very low visible porosity, possible fracture porosity.
8	3650.0	LIMESTONE, light grey, firm, blocky to sub-fissile, very argillaceous and frequently grades to very calcareous MUDSTONE, slightly sucrosic texture, trace micromicaceous, very low visible porosity.
9	3549.9	LIMESTONE, light grey, firm, very argillaceous and grades to very calcareous MUDSTONE, slightly sucrosic texture, occasionally cryptocrystalline, very low visible porosity.
10	3500.0	LIMESTONE, light grey, firm to moderately hard, very argilla-ceous, moderate sucrosic texture, trace micromicaceous (?mus-covite), very low visible porosity.
11	3450.0	MISFIRE.
12	3400.0	MISFIRE.
13	3350.0	MISFIRE.
14	3300.0	MISFIRE.
15	3249.9	MISFIRE.
16	3199.7	MISFIRE.
17	3149.9	MISFIRE.
18	3100.0	MISFIRE.
19	3050.0	MISFIRE.
20	2999.9	MISFIRE.
21	2950.0	MISFIRE.
22	2900.0	MISFIRE.
23	2850.0	MISFIRE.
24	2800.0	MISFIRE.
25	2750.0	MUDSTONE, light grey, moderately hard, sub-fissile, non-calcareous, trace micropyritic filling in thin irregular fractures producing low fracture porosity.
26	2699.9	LOST.
27	2649.9	MUDSTONE, light purple grey, firm, plastic texture, occasionally slightly sucrosic, non-fissile, very calcareous and grades to very argillaceous LIMESTONE, trace micromicaceous (?muscovite), very low visible porosity.
28	2599.9	MUDSTONE, light to medium grey, firm, plastic texture, non-fissile, non-calcareous, trace micromicaceous (?muscovite) and micropyritic.

NO.	DEPTH (mbrt)	LITHOLOGY
29	2565.0	MUDSTONE, light to medium grey, firm, plastic texture, non-fissile, non-calcareous, trace micromicaceous (?muscovite) and micropyritic.
30	3775.5	LOST.
31	3751.1	LIMESTONE, light grey, moderately hard to hard, very argillaceous and grades to very calcareous MUDSTONE, sub-fissile, slight sucrosic texture, very low visible porosity.
32	3701.0	MISFIRE.
33	3600.1	MISFIRE.
34	3501.1	MISFIRE.
35	3451.1	LOST.
36	3401.1	MISFIRE.
37	3351.1	MISFIRE.
38	3301.1	MISFIRE.
39	3251.0	MISFIRE.
40	3151.2	MISFIRE.
41	3101.2	MISFIRE.
42	3002.2	MISFIRE.
43	2952.2	MISFIRE.
44	2851.2	MISFIRE.
45	2802.2	MISFIRE.
46	4815.0	SANDSTONE, quartzose, colourless to yellow grey quartz, medium to coarse grained, sug-angular to sub-rounded, moderately sorted, grainstone texture with a poor slightly calcareous cement, moderate visible porosity, slightly argillaceous. No shows.
47	4785.0	SANDSTONE, quartzose, colourless to yellow grey quartz, fine to medium grained, sub-angular to sub-rounded, moderately sorted, generally loose but occasionally poorly cemented with calcite, moderate porosity, slightly argillaceous and micaceous. No shows.
48	4764.7	SANDSTONE, quartzose, colourless to yellow grey quartz, fine to medium grained, sub-angular to sub-rounded, moderately sorted, generally loose but occasionally poorly cemented with calcite, packstone texture, slightly argillaceous.
49	4734.9	MISFIRE.
50	4725.0	SILTSTONE, dark grey, firm, sub-fissile, moderately calcareous, very argillaceous, micromicaceous.
51	4705.0	LOST.
52	4680.0	LOST.
53	4655.0	LOST.
54	4630.0	MISFIRE.
55	4605.0	LOST.
56	4579.0	LOST.
57	4555.1	MUDSTONE, dark brown, soft, sub-fissile, slightly calcareous, slightly carbonaceous and micromicaceous. No shows.
58	4530.1	LOST.
59	4510.0	LOST
60	4499.9	LOST.
61	4490.0	MISFIRE.
62	4465.0	SANDSTONE, quartzose, colourless to white to light grey quartz, medium grained, occasionally coarse, generally loose, sub-angular to sub-rounded, moderately sorted, moderate porosity, grainstone to packstone texture, poorly cemented with calcite, slightly micaceous and argillaceous. No shows.

NO.	DEPTH (mbrt)	LITHOLOGY
63	4450.0	LOST.
64	4425.0	LOST.
65	4400.0	LOST.
66	4375.0	SANDSTONE, quartzose, colourless to white to yellow grey, fine grained, occasionally medium, friable, sub-angular to sub-rounded, grainstone texture, well sorted, low porosity with predominantly siliceous cement, occasional calcareous cement, micromicaceous. Weak yellow fluorescence, no cut, slow weak crush cut fluorescence.
67	4350.0	SANDSTONE, quartzose, colourless to white to light grey, quartz, fine to medium grained, friable to loose, sub-angular to sub-rounded, moderately sorted, packstone texture, low to moderate porosity with poor siliceous cement, occasionally calcareous cement, slightly argillaceous and carbonaceous. Dull yellow fluorescence, slow milky white stream cut and fast blue-white crush cut fluorescence.
68	4215.0	SANDSTONE, quartzose, colourless to yellow brown quartz, fine to medium grained, friable to loose, sub-angular to sub-rounded, moderately sorted, grainstone to packstone texture, moderate porosity, slightly calcareous cement, slightly argillaceous. Dull yellow fluorescence, no cut fluorescence, slow pale yellow-white crush cut fluorescence.
69	4212.4	LOST.
70	4210.0	SANDSTONE, quartzose, colourless to light yellow brown, fine to medium, friable to loose, sub-angular to sub-rounded, poorly to moderately sorted, grainstone to packstone texture, moderate porosity, poorly to moderately cemented with calcite, slightly argillaceous. Very dull yellow natural fluorescence, no cut, slow blue-white crush cut fluorescence.
71	4206.0	LOST.
72	4204.2	LOST.
73	4202.0	LOST.
74	4197.9	LOST.
75	4195.0	LOST.
76	4208.0	SANDSTONE, quartzose, colourless to yellow brown quartz, fine to medium grained, friable to loose, sub-angular to sub-rounded, moderately sorted, packstone texture, poorly cemented with silica, low porosity, occasionally very argillaceous. No natural or cut fluorescence, slow milky white crush cut fluorescence.
77	4202.9	MUDSTONE, dark grey, soft to firm, sub-fissile, slightly calcareous, micromicaceous, very silty. No natural or cut fluorescence, dull blue-white crush cut fluorescence.
78	4200.0	NO RECOVERY.
79	4196.9	MUDSTONE, medium to dark grey, soft to firm, sub-fissile, cryptofissile to non-swelling, very silty, moderately calcareous, micromicaceous. No natural or cut fluorescence, slow milky white crush cut fluorescence.
80	4190.0	LOST.
81	4183.0	LOST.
82	4165.1	NO RECOVERY.
83	4155.1	MUDSTONE, medium to dark grey, soft to firm, sub-fissile, non-swelling to cryptofissile, moderately calcareous, micromicaceous, very silty. No natural or cut fluorescence, weak milky white crush cut fluorescence.
84	4147.6	MUDSTONE, medium to dark brown grey, firm, cryptofissile to non-swelling, very calcareous, very silty, micromicaceous. No natural or cut fluorescence, weak milky white crush cut fluourescence.
85	4136.1	NO RECOVERY.
86	4125.1	MUDSTONE, dark grey, firm, cryptofissile to non-swelling, moderately calcareous, silty and micromicaceous. No natural or cut fluorescence, slow milky white crush cut fluorescence.
87	4115.0	MUDSTONE, dark brown grey, firm, sub-fissile, non-swelling to cryptofissile, slightly to moderately calcareous, slightly silty, micromicaceous.
88	4105.1	NO RECOVERY.

NO.	DEPTH (mbrt)	LITHOLOGY
89	4095.1	MUDSTONE, medium to dark grey, moderately hard, sub-fissile to blocky fracture, micromicaceous, slightly calcareous and silty.
90	4085.1	NO RECOVERY.
91	4080.1	MUDSTONE, dark grey, moderately hard, sub-fissile, crypto-fissile to non-swelling, moderately calcareous, slightly silty, micromicaceous. No natural or cut fluorescence, slow dull milky white crush cut fluorescence.
92	4075.0	MUDSTONE, medium to dark grey, firm, sub-fissile, crypto-fissile swelling, moderately calcareous, slightly silty, micromicaceous. No natural or cut fluorescence, slow milky white crush cut fluorescence.
93	4070.1	NO RECOVERY.
94	4065.1	MUDSTONE, medium to dark grey brown, soft to firm, sticky, hygroturgid, moderately calcareous, trace micromicaceous. No natural or cut fluorescence, slow milky white crush cut fluorescence.
95	4055.1	MUDSTONE, dark grey, firm, non-swelling to slightly hygroclastic, moderately calcareous, slightly silty, trace plant remains. No natural or cut fluorescence, slow milky white crush cut fluorescence.
96	4044.9	MUDSTONE, medium to dark grey brown, soft, sticky, hygroturgid, very calcareous, slightly silty. No natural fluorescence, slow dull milky white cut fluorescence and crush cut fluorescence.
97	4035.1	MUDSTONE, medium grey brown, soft, sticky, hygroturgid, very calcareous with interclasts of MUDSTONE - dark grey brown, moderately hard, sub-fissile, cryptofissile swelling, moderately calcareous, slightly micromicaceous. No natural fluorescence, very slow milky white cut fluorescence and crush cut fluorescence.
98	4025.0	NO RECOVERY.
99	4015.0	NO RECOVERY.
100	4005.0	NO RECOVERY.

NO.	DEPTH (mbrt)	LITHOLOGY
101	3995.0	MUDSTONE, medium brown, soft, sticky, hygroturgid, very calcareous and very finely interlaminated with MUDSTONE - medium to dark grey brown, moderately hard, sub-fissile to fissile, non to slightly calcareous, slightly micromicaceous.
102	3985.0	MUDSTONE, medium brown, soft, sticky, hygroturgid, very calcareous.
103	3975.0	MUDSTONE, medium brown, soft, sticky, hygroturgid, very calcareous and MUDSTONE, medium to dark grey brown, firm to moderately hard, sub-fissile, slightly carbonaceous, slightly silty and calcareous.
104	3964.9	NO RECOVERY.
105	3955.0	MUDSTONE, dark grey, firm to moderately hard, sub-fissile, hygrofissile, moderately calcareous, slightly micromicaceous with interclasts of LIMESTONE - light brown, moderately hard, very argillaceous. No natural fluorescence, very slow dull milky white cut fluorescence and crush cut fluorescence.
106	4445.0	SANDSTONE, quartzose, colourless to white to yellow quartz, fine to medium, friable to loose, sub-angular to sub-rounded, grainstone to packstone texture, poorly cemented with silica, moderate porosity, slightly argillaceous, moderately silty, occasionally very micaceous. Very dull yellow fluorescence, no cut, very slow yellow-white crush cut fluorescence.
107	4415.0	NO RECOVERY.
108	4205.0	MUDSTONE, medium to dark grey, soft, sticky, hygroturgid, moderately calcareous, slightly micromicaceous with interclasts of MUDSTONE - medium to dark grey, moderately hard, sub-fissile, non-calcareous, trace micromicaceous, slightly silty. No natural or cut fluorescence, very slow yellow-white crush cut fluorescence.
109	4190.0	LOST.
110	4176.9	LOST.
111	4160.1	MUDSTONE, dark grey, soft, sticky, hygroclastic, moderately calcareous, slightly micromicaceous with irregular interclasts of MUDSTONE - dark grey, firm to moderately hard, blocky to sub-fissile fracture, non-swelling to cryptofissile, slightly calcareous, slightly micromicaceous and silty. No shows.
112	4129.8	LOST.
113	4100.0	LOST.
114	4020.0	LOST.
115	3935.0	LOST.

NO.	DEPTH (mbrt)	LITHOLOGY
116	3928.0	LOST.
117	3922.0	LOST.
118	3918.0	MUDSTONE, medium to dark grey, moderately hard, blocky to sub-fissile fracture, non-swelling, moderately calcareous, micromicaceous, slightly silty. No natural fluorescence or cut colour, very slow yellow white stream and crush cut fluorescence.
119	3911.9	LOST.
120	3908.0	LOST.
121	3900.0	LOST.
122	3895.0	LOST.
123	3885.0	LOST.
124	3875.0	LOST.
125	3865.0	LOST.
126	3855.0	LOST.
127	3845.0	LOST.
128	3835.0	MUDSTONE, dark grey to black, soft to firm, occasionally : sticky, hygroclastic, non-calcareous, slightly micromicaceous. No natural fluorescence or cut colour, slow blue white stream and crush cut fluorescence.
129	3825.0	LOST.
130	3814.9	LOST.
131	3805.0	LOST.
132	3795.0	LOST.
133	3810.5	MUDSTONE, medium to dark grey, firm, fissile, hygroclastic, moderately calcareous, slightly micromicaceous. No natural fluorescence or cut colour, slow blue white stream and crush cut fluorescence.
134	3800.0	MUDSTONE, light grey green, firm, non-swelling to crypto-fissile, sub-fissile to blocky fracture, non to slightly calcareous. No natural fluorescence or stream cut, slow very dull yellow white crush cut fluorescence.
135	3807.5	LOST.
136	4192.0	MUDSTONE, grey brown, soft, sub-fissile, hydroturgid, slightly silty, trace micromicaceous, slightly calcareous. No shows.
137	4180.0	MUDSTONE, grey brown, soft, sub-fissile, hydroturgid, slightly silty, slightly calcareous, trace micromicaceous. No shows.
138	4169.9	MUDSTONE, grey brown, soft, sub-fissile, hydroturgid, slightly to moderately calcareous, slightly silty, slightly micro-micaceous and carbonaceous. No shows.
139	4140.0	MUDSTONE, medium grey to grey,brown, soft, blocky to sub-fissile, non-swelling to hydroturgid, slightly silty, moderately calcareous, slightly micromicaceous. No shows.
140	4112.0	MUDSTONE, medium grey, soft, sticky, sub-fissile, slightly calcareous, slightly silty and carbonaceous. No shows.
141	4026.9	MUDSTONE, grey brown, firm, sub-fissile, non-swelling, slightly calcareous and micromicaceous. No shows.
142	4016.0	MUDSTONE, medium brown, soft to firm, hydroturgid, amorphous texture, very calcareous and grades to very argillaceous LIMESTONE. No natural fluorescence, slow milky white stream and crush cut fluorescence.
143	4007.0	MUDSTONE, medium brown, soft, amorphous texture, hydroturgid, very calcareous, slightly carbonaceous and micromicaceous. No natural fluorescence, slow milky white stream and crush cut fluorescence.
144	3979.0	LOST.

NO.	DEPTH (mbrt)	LITHOLOGY
145	3963.0	MUDSTONE, dark grey, soft, sticky, amorphous texture, hydroturgid, very calcareous, slightly carbonaceous and micromicaceous, occasionally grading to very argillaceous LIMESTONE. No natural fluorescence, fast milky white stream and crush cut fluorescence.
146	3945.0	VERY POOR RECOVERY.
147	3932.0	MUDSTONE, dark grey, soft, amorphous texture, very poor recovery.
148	3923.5	MUDSTONE, medium grey, soft, amorphous texture, hydroturgid, slightly micromicaceous, slightly carbonaceous and calcareous. No natural fluorescence, fast milky white stream and crush cut fluorescence.
149	3916.0	MUDSTONE, medium to dark grey, firm, sub-fissile, occasionally amorphous, non-swelling, very calcareous, very micromicaceous, slightly carbonaceous. No natural fluorescence, slow milky white stream and crush cut fluorescence.
150	3914.0	LOST.
151	3909.9	LOST.
152	3903.5	MUDSTONE, dark grey to black, firm, blocky fracture, non-swelling, non-calcareous, very carbonaceous, slightly silty and micromicaceous. No natural fluorescence, slow milky white stream and crush cut fluorescence.
153	3890.0	MUDSTONE, dark grey, firm, blocky fracture, non-swelling, non-calcareous, slightly silty and carbonaceous. No natural fluorescence, dull yellow stream and crush cut fluorescence.
154	3880.0	LOST.
155	3870.0	MISFIRE.
156	3860.0	LOST.
157	3849.0	LOST.
158	3840.0	LOST.
159	3830.0	MISFIRE.

NO.	DEPTH (mbrt)	LITHOLOGY
160	3820.0	MISFIRE.
161	3806.0	MISFIRE.
START 162	3803.0	MISFIRE.
163	3798.0	MISFIRE.
164	3794.0	MISFIRE.
165	3790.0	MISFIRE.
166	4740.0	SANDSTONE, quartzose, colourless to light brown quartz, medium grained, occasionally fine, friable to loose, sub-angular to sub-rounded, moderately sorted, grainstone to packstone texture, weakly cemented with silica, moderate porosity, slightly argillaceous and micaceous. Very dull yellow natural fluorescence, very slow milky white stream and crush cut fluorescence.
167	4720.0	SANDSTONE, quartzose, colourless to brown, very fine to fine grained, occasionally medium, loose to friable, angular to sub-rounded, poorly sorted, moderate silica cement, trace slightly calcareous cement, slightly micaceous and argillaceous. No shows.
168	4695.0	SANDSTONE, quartzose, grey brown, colourless quartz, very fine grained, occasionally medium, loose to friable, angular to sub-rounded, poorly sorted, moderate calcareous cement, occasionally micaceous, generally very argillaceous. No natural fluorescence or stream cut, very slow milky white crush cut fluorescence.
169	4670.0	SANDSTONE, quartzose, grey brown, colourless quartz, very fine to fine grained, occasionally medium, loose to friable, sub-angular to sub-rounded, poorly sorted, moderate calcareous cement, occasionally micaceous, generally very argillaceous. No natural fluorescence, no stream cut, very slow milky white crush cut fluorescence.
170	4657.0	MUDSTONE, medium grey brown, soft to firm, non-swelling, moderately calcareous, very silty, trace micromicaceous. No shows.
171	4637.0	VERY POOR RECOVERY.

NO.	DEPTH (mbrt)	LITHOLOGY
172	4615.0	MUDSTONE, dark grey, firm, non-swelling, non-calcareous, slightly silty and carbonaceous. No shows.
ST 173	4590.0	SANDSTONE, quartzose, grey brown, very fine grained, sub-angular to sub-rounded, very low porosity, moderately calcareous cement, very argillaceous and grades to SILTSTONE. No shows.
174	4564.8	MUDSTONE, dark grey to black, firm to moderately hard, sub-fissile, slightly calcareous, slightly silty, slightly micromicaceous and carbonaceous. No natural fluorescence or stream cut, very slow milky white crush cut fluorescence.
175	4540.0	MUDSTONE, dark grey, soft, sub-fissile, non-calcareous, slightly micromicaceous and carbonaceous. No natural fluorescence or stream cut, very slow milky white crush cut fluorescence.
176	4527.0	MUDSTONE, dark grey, soft, sub-fissile, hygroturgid, non-calcareous, slightly carbonaceous and micromicaceous. No shows.
177	4505.0	MUDSTONE, dark grey, firm, blocky fracture, non-calcareous, slightly carbonaceous and micromicaceous. No shows.
178	4493.5	SANDSTONE, quartzose, light grey, colourless quartz, fine to medium grained, occasionally coarse, sub-angular to sub-rounded, moderately sorted, grainstone texture, moderately micaceous. No natural fluorescence, slow cream coloured stream and crush cut fluorescence.
179	4427.5	MUDSTONE, dark grey, firm, non-swelling, slightly calcareous and silty. No shows.
180	4396.1	MUDSTONE, dark grey brown, soft, non-swelling, slightly calcareous, slightly silty and micromicaceous. No shows.
181	3924.9	MUDSTONE, dark grey, firm, non-swelling, very calcareous and micromicaceous. No natural fluorescence, very slow milky white stream and crush cut fluorescence.
182	3912.5	MUDSTONE, dark grey, firm to hard, non-swelling, non-calcareous, slightly carbonaceous, very micromicaceous. No natural fluorescence, slow milky white stream and crush cut fluorescence.
183	3908.3	LOST.
184	3882.0	MUDSTONE, dark grey, firm, sub-fissile, non-swelling, non-calcareous, slightly silty, slightly micromicaceous and carbonaceous. No shows.
185	3872.0	MUDSTONE, dark grey to black, firm to hard, sub-fissile, non-swelling, non-calcareous, slightly micromicaceous and carbonaceous. No shows.
186	3861.9	MUDSTONE, dark grey to black, firm to hard, sub-fissile to blocky, non-swelling, non-calcareous, slightly micromicaceous and carbonaceous. No natural fluorescence, slow dull white stream and crush cut fluorescence.
187	3851.9	LOST.
188	3829.9	MUDSTONE, dark grey to black, firm to moderately hard, sub-fissile, non-swelling, non-calcareous, slightly carbonaceous and micromicaceous. No natural fluorescence, slow dull white stream and crush cut fluorescence.
189	3820.0	MUDSTONE, dark grey to black, firm to hard, sub-fissile, non-swelling, non-calcareous, slightly micromicaceous and carbonaceous. No natural fluorescence, slow milky white stream and crush cut fluorescence.
190	3806.0	LOST.
191	3803.0	LIMESTONE, light grey green, firm to moderately hard, blocky fracture, mudstone texture, occasionally cryptocrystalline, zero visible porosity, very argillaceous, trace pyritic. Pale yellow natural fluorescence, slow milky white stream and crush cut fluorescence.
192	3789.0	LIMESTONE, grey green, firm to moderately hard, blocky fracture, mudstone texture, occasionally cryptocrystalline, very argillaceous, zero visible porosity. No shows.
193	3794.0	LIMESTONE, light grey brown, firm to moderately hard, blocky to sub-fissile fracture, zero visible porosity, mudstone texture, very argillaceous, trace pyritic.
194	3792.0	LIMESTONE, light grey green, firm to moderately hard, sub-fissile to blocky fracture, mudstone texture, occasionally cryptocrystalline, zero visible porosity, very argillaceous grading to very calcareous MUDSTONE. No shows.
195	3790.0	MUDSTONE, medium to dark grey, firm, blocky fracture, non-swelling, slightly micromicaceous and carbonaceous, very calcareous. No shows.

REFERENCES

Deegan, C.E. & Scull, B.J.	1977	A standard lithostratigraphic nomenclature for the Central and Northern North Sea. Rep. Inst. Geol. Sci., No. 77/25; Bull. Petrol. Direct., No. 1. (GL/NO/098).
Welsh, A.	1982	BP biostratigraphy report, NOCS well 29/6-1. W. 22/23 (In prep.).

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 1 From 4219.57m To 4238.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, m gy brn, v.f to c,hd, QTZ - clss to frosted wh to gy blu, poor sort, occ gravel grade, subrnd to ang, grnst text, sl. silic. cem, abund clay matrix, mod vis por, sl argil, tr fldspr as euhedral laths and kaol clay, occ v. mic, tr carb, grades to thin partings of v. carb, sndy MDST.	4219.57			whispy carb and mic Laminae. v pebbly sst horizons	sl. gas bleed, dull yel fluor and strm. cut in sst.	3°	No faulting	20%
		4220.0							
		4220.5			abund v mic v argil and v carb partings.				
	SANDSTONE, qtz, m gy brn, m to c, occ v. pebbly, A/A, gen non-calc, rapidly becoming less argil downhole.				Rapidly gradational contact.				15%
	SANDSTONE, qtz, lt gy, c, v hd, well sort, subrnd, grnst text, mod v calc cem, low vis por, QTZ - gen. clss to frosted wh, occ blu. gy, gen non-argil, tr fldspr (euhedral etch-pitted laths and kaol clay)	4221.0			Uni-directional cross-bedding in clean well sorted sst.	sl. gas bleed, v sporadic golden yel fluor with dull yel v. slow strm. cut.	forsets dip up to 30°	No faulting	5-10%
		4221.5							
	SANDSTONE, qtz, dk gy, to gy brn, f to m, hd, mod sort, occ well sort, subrnd, abund clay matrix, v. argil. freq grades to thin irreg partings of v mic, v carb, sndy mdst.				Abund v argil, v carb and v mic partings Clean sst w discordant sedimentary contact to argill sst.	sl. gas bleed, dull blu-wh fluor and fast blue wh strm cut in sst, shows v poor in mdst partings.	Lam 20° sst contact irreg.	occ sub-horiz fracts parallel to carb and mic partings	15%
		4222.0							
		4222.5							15%
	MUDSTONE, dk gy, fis to subfis , hd, non-swell, v. micromic, v slty, v carb, sl micropyr, gen non-calc.				Highly fissile MDST w abund carb frags - occ rootlets, bedding and sed strs not visible	no gas bleed.	fissility horiz to 3°	sub-horiz fracture marks contact	
		4223.0				Dull. blu-wh fluor, v fast blu wh milky strm and crush cut.		fissil. in mdst produces freq low angle fract.	<5%
		4223.5					fissil 4° to 5°.		
	SANDSTONE, qtz, dk gy brn to dk gy, f to vf, clss to lt brn QTZ, mod sort, subrnd to subang, v. argil, dom pkst text, occ wkst w. qtz set in v mic MDST matrix.	4224.0			Rapidly gradational contact.	sl gas bleed, dull blu-wh fluor and fast blu-wh strm cut.	4°	none	none 20%
		4224.5							

POROSITY% (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

Md O GRAIN SIZE 6 0: 0 1 2 3 4

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by RATTEY/MADLAND Date 15/12-82

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 1 From 4219.57m To 4238.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, dk gy. brn to dk gy, QTZ-clss to lt brn, f to v.f, hd, mod sort, subrnd to subang, dom grnst text, mod vis por, v. argil w. abund clay matrix, mod mic (musc), mod carb.	4224.5			Vague partings of v. carb, v. mic. MDST	Sl. gas bleed, dull blu-wh fluor, fast blu-wh strm cut, shows v. weak in MDST partings		No faults	
	SANDSTONE, qtz, dk gy brn, a/a, freq grading to thin partings of MDST - dk gy, hd, fis., v. mic, v micromic, v. carb, tr slty.	4225.0					Sub-horiz to 5°		20%
		4225.5							
	SANDSTONE, qtz, dk gy brn, f, hd, mod to well sort, grnst text, occ wkst text w. abund clay matrix, tr fldspr, tr kaol, occ v. mic (musc), occ. v. carb, occ. v. argil, grading to thin partings of MDST, dk gy, hd, fis, v. mic, v. carb, v. sndy, non-calc.	4226.0			MDST filled oblique burrows				20%
		4226.5						Minor fractures along MDST partings. No faults	
	SANDSTONE, qtz, dk gy brn, f to v. f., hd, mod sort, subrnd, mod vis por, grnst text grading to wkst text w. argil matrix, v. mic, occ v. micromic, mod to v. carb, tr plant frags, freq thin MDST partings a/a.	4227.0			Relatively homog sst w. abund v. thin carb. MDST partings	Sl. gas bleed, mod blu-wh fluor (only within sst) and fast blu-wh strm cut	Sub-horiz		15%
		4227.5							
		4228.0						No faults	
	SANDSTONE, qtz, dk gy brn to dk gy, f, hd, mod sort, subrnd to ang, mod vis por, gen grnst text, occ wkst text w. clay matrix, v. mic, mod carb, qtz-gy. to to gy. brn.	4228.5			Abund v. f carb and mic MDST partings				20%
	SANDSTONE, qtz, dk gy to gy brn, f, hd, subrnd, well sort, mod vis por, tr calc cem, grnst text, mod to v. argil, mod mic, mod carb, tr fldspr.	4229.0				Sl. gas bleed, mod blu-wh fluor, fast blu-wh strm and crush cut	Sub-horiz	Minor fractures along MDST partings No faults	15%
		4229.5							

POROSITY % (He) 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0·5 0·1 ·05 ·01

Md 0 GRAIN SIZE 6 0 0 2 3 4

BULK DENSITY GM/CC (HORIZONTAL) 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by RATTEY/MADLAND Date 15/12-82

End

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 1 From 4219.57m To 4238.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
		4229.5								
	SANDSTONE, qtz, m to dk gy brn, f, hd, well to mod sort, subrnd, v. argil w. abund clay matrix, gen grnst text, occ wkst, low to mod vis por, occ v sl calc cem, occ v mic, v. carb, and grades to thin MDST partings - dk gy, hd, subfis, non-swell, non-calc, v. mic, v. carb, sl to mod sndy.	4230.0			Whispy MDST partings w. abund mic. and carb.	Sl gas bleed, mod blu-wh fluor, fast blu-wh strm cut	Sub-horiz to 5°	None	15%	
		4230.5			Occ thin partings of v. coarse mica (musc)					
		4231.0						Occ breaks parallel to MDST partings. No faulting	15%	
	SANDSTONE, qtz, dk gy brn, v f to m, QTZ-clss to m brn, mod sort, subang to subrnd, v. argil, low to mod. vis. por, gen grnst text but grades to wkst w. qtz grains set in mdst matrix, gen sl to mod mic, occ mod carb, tr sl to mod calc cem.	4231.5			Occ v thin lam of less argil SST	Sl gas bleed, mod brt blu wh fluor, fast blu-wh strm cut	5°		15%	
		4232.0								
		4232.5				Sl gas bleed, mod brt blu-wh fluor, fast blu-wh strm cut, no fluor from MDST partings but fast blu-wh strm and crush cut	5°	None	15%	
	SANDSTONE, qtz, dk gy brn, m, hd, mod sort, low to mod vis por, v. argil, tr calc cem, dom grnst text, tr fldspr, tr kaol clay cem, mod mic (muscovite), tr carb, grades to MDST partings a/a.	4233.0			Irreg patches of MDST in SST, poss due to bioturb. Abund thin MDST partings w. mic and carb.					
	SANDSTONE, qtz, occ subark, m to dk gy brn, f to m, subrnd to subang, v. mic in part, v. argil, a/a.	4233.5						Core fractured at contact.		
		4234.0			v. fine carb lam in clean SST.	Patchy dull blu-wh fluor, v fast blu/w strm cut, sl gas bleed.	10°		10%	
	SANDSTONE, qtz, m. gy brn to lt. gy, hd to vhd, f to vf, occ m, QTZ - clss to frosted wh, mod sort, low vis por due to strong calc cem, subang to subrnd, grnst, gen clean.	4234.5						None		

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

Md O GRAIN SIZE 6 0: 1 0 2 3 4 / 6 0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

Prepared by RATTEY/MADLAND Date 15/12-82

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 1 From 4219.57m To 4238.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
		4234.5			A/A	A/A	10°		10%
	SANDSTONE, qtz, m to dk gy, occ lt gy lam, f to v.f, occ m, qtz-clss to lt brn, mod sort, subrnd to subang, gen mod vis por, occ v. argil w. abund clay matrix and low vis por, gen grnst text, occ wkst text, gen non to v.sl calc cem, occ v.carb, tr fldspr.	4235.0			Homog mod. argil SST w. thin MDST partings	Sl. gas bleed, dull blu/wh to yel fluor, v. fast blu/wh strm cut	5°	occ. minor cracks parallel to MDST par-tings No faul-ting	15%
	SANDSTONE, qtz, lt. gy, f to v.f, occ m, a/a, w. abund partings of MDST - dk gy, hd, subfis, v.mic, v.carb, v. sndy, grading to argil SST.	4235.5							
		4236.0			Thin v. carb whisps.		5°		
		4236.5						None	
	SANDSTONE, qtz, m. gy brn, f to m, hd, subang to subrnd, mod sort, mod argil, low to mod vis por, grading to thin MDST partings a/a, tr fldspr - highly weathered, tr kaol.	4237.0			Thin parallel lam of v. mic MDST.	Sl. gas bleed, dull blu/wh to yel fluor, v. fast mlky blu-wh strm cut, weaker shows in MDST lam.	3°	None	15%
		4237.5			Homog a/a				
		4238.0						Rubble	

POROSITY % (He) 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0.5 0.1 0.05 0.01

Md 0 GRAIN SIZE 6.0 1 0 2 3 4 0 2

BULK DENSITY GM/CC (HORIZONTAL) 2.2 2.3 2.4 2.5 2.6 2.7 2.8

REMARKS

RATTEY/MADLAND Date 15/12-82

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 2 · From 4238.00m To 4256.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, dk gy brn, hd, f, mod sort, mod to low vis por, gen subrnd, v argil w abund clay matrix, tr fldspr and kaol clay, mod mic, mod carb.	4238.0				mod gas bleed, sporadic blu-wh fluor w v dull mlky wh strm cut	Partings Horiz.	minor breaks along v mic. partings	15%
		4238.5			Whispy v mic, v carb MDST partings				
		4239.0					Horiz.		
	SANDSTONE, qtz, lt gy, v hd, f to v f, well sort, subrnd to subang, grnst to wkst text, good calc cem, low vis por, tr mic, tr carb, QTZ - clss to frosted wh, cem - wh, tr kaol.	4239.5			Bi-directional cross-bedding in cleaner sst w v f mdst partings	sl gas bleed, v sporadic and dull blu-wh fluor, no cut.	cross-lam 15° 5° cross-lam 30°	no faults none	5%
		4240.0							
	SANDSTONE, qtz, dk gy brn, hd, f, mod to well sort, mod vis por, subrnd, dom grnst text, v argil, abund clay matrix, mod mic, mod carb, grading to thin partings of v mic, v carb MDST.	4240.5				sl to mod gas bleed, brt blu-wh fluor and v dull blu wh strm cut, no shows in mdst lam.	sub-horiz	minor breaks along MDST partings	
					Fine mdst partings at 30° angle to gen lam.		sub-horiz.	minor fractures parallel to discordant carb partings	15%
	SANDSTONE, qtz, m to dk gy brn, f, well sort, subrnd to subang, grnst text, low to mod vis por, v argil, abund clay matrix, v mic, v micromic, mod carb, grading to thin partings of v mic MDST - dk gy, hd, subfis, v sndy, v carb, gen non-calc.	4241.0							
		4241.5				sl gas bleed, sporadic brt blu-wh fluor in sst w v dull mod fast blu-wh strm cut		no faults	
		4242.0			Whispy v mic, v carb MDST partings		sub-horiz		15%
	SANDSTONE, qtz, m to dk gy brn, f, well sort, subrnd to subang, grnst text, occ wkst text w clay matric, v argil, occ v. mic, v carb, occ thin partings of dk gy MDST - A/A, gen v poor silic cem, low to mod vis por.	4242.5						minor frac parallel to MDST partings	
		4243.0							

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

Md 0 GRAIN SIZE 6.0: 1 0 2 3 4 — 0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by RATTEY/MADLAND Date 17/2-82

Page 1

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 2 From 4238.00m To 4256.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
		4243.0			Whispy v carb, v mic, MDST partings		Sub-horiz	No faults		
		4243.5						Minor fractures parallel to MDST partings	15%	
	SANDSTONE, qtz, m to dk gy brn, f to v f, hd, occ sl fria, subang to subrnd, well sort, low to mod vis por, v argil w. abund clay matrix, tr silic cem, gen non-calc, occ v mic, occ v carb, grades to thin partings of MDST-dk gy, hd, subfis, non-swell, v mic, v micromic, v carb, non-calc, occ v sndy.	4244.0			Oblique mud lined burrow with irreg margins and muddy sand infilling, (burrow at 60°)	Sl gas bleed, sporadic brt blu-wh fluor in sst, v dull slow blu-wh strm cut and crush cut				
		4244.5					Sub-horiz	No faults		
		4245.0			High angle mud lined burrow-poss u-shaped but ill-defined	Sl gas bleed, sporadic specks of blu-wh fluor w. v dull, v slow to mod fast strm cut.				
	SANDSTONE, qtz, dk to m brn, f to v f, hd, subang to subrnd, grnst text, well sort, low to mod vis por, v argil w. abund clay matrix, occ v mic, occ v carb, grades to thin MDST partings, a/a.	4245.5						Minor fractures parallel to MDST partings.	15%	
	SANDSTONE, qtz, dk brn to gy brn, f to v f, hd, subang to subrnd, well sort, low vis por, grnst text, occ wkst text w. v argil matrix, tr kaol, tr fldspr laths (well etched), gen v mic, v carb, occ sl mic, freq grading to dk gy, v mic MDST partings	4246.0			Whispy partings of v mic, v carb, MDST.					
		4246.5				Sl gas bleed, v rare specks of blu-wh fluor in SST w. v dull slow strm cut, gen v. weak shows	Sub-horiz	Minor fractures parallel to MDST partings	15%	
		4247.0			Common mdst partings a/a.					
	SANDSTONE, qtz, dk gy brn, v f, hd, subang to subrnd, well sort, low vis por, grnst to wkst text, v argil, abund clay matrix, gen v mic, v carb, grading to v mic. MDST, a/a.	4247.5				Sl gas bleed, v dull blu-wh fluor throughout SST, fast blu-wh strm cut, no shows in MDST.			15%	
		4248.0								

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 05 01 005 001

Md 0 GRAIN SIZE 6 0: 1 0 2 3 4 — 0 2

BULK DENSITY GM/CC (HORIZONTAL): 22 23 24 25 26 27 28

RATTEY/MADLAND 17/2-82

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 2 From 4238.00m To 4256.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, dk gy brn, v f, v argil, a/a, occ v carb.	4248.0			Sharp non-grad contact.	v weak fluor a/a. Strong gas bleed, v patchy dull blu fluor, no cut	Sub-horiz	None	15%
	COAL, blk, shiny , blky, often v crumbly, tr rootlets, occ conch fract, tr slty				Massive, blocky			Not faulted	
							Sub-horiz	Rubble	0%
	MUDSTONE, dk gy, hd, subfis , non-swell, v carb w. freq thin coal seams, tr slty, non-calc, occ sl to mod sndy, grades down to sndy MDST to muddy SST.	4248.5			Non-grad contact			Not faulted	
						No fluor, slow dull blu-wh crush cut	Fissility sub-horiz	Common sub-horiz fractures parallel to fissility in MDST.	<5%
		4249.0			Irreg mud filled burrow.				
	SANDSTONE, qtz, dk gy brn to m brn, hd, v f, well sort, subrnd to subang, low to mod vis por, grnst text grading to wkst text w abund clay matrix, grades to thin partings of MDST, dk gy, hd, subfis, v carb, v mic, v micromic, mod slty.	4249.5			Sharply grad contact w vert sst filled burrow. Traces of oblique bioturbation. Whispy carb MDST lam.	V dull blu-wh fluor, fast blu-wh mlky strm cut from SST, sl gas bleed.	Sub-horiz		
		4250.0						Common sub-horiz fractures parallel to MDST lam.	15%
		4250.5			Irreg mud filled burrows.				
	SANDSTONE, qtz, dk brn to m brn, hd, v f, well sort, subrnd to subang, grnst to wkst text, low vis por, abund clay matrix, tr kaol, v argil and freq grades to thin mdst partings a/a.	4251.0			Sharply grad contact w. load casting	Poor shows, patchy brt blu-wh fluor w fast blu-wh strm cut, gen no shows.	Sub-horiz	Contacts not fractured	10%
	SANDSTONE, qtz, m brn to gy brn, hd, v f, well sort, subrnd to subang, grnst text but abund clay matrix-occ grnst, low to mod vis por, v argil, tr kaol, tr fldspr, occ v sl calc cem, freq thin v carb MDST partings a/a.	4251.5			Common MDST lam.		5°	Common sub-horiz fractures parallel to MDST lam.	15%
		4252.0							
		4252.5			Poorly defined vertical burrows. Common MDST lam up to 1 cm thick.	Sl gas bleed dull yel fluor from sst, fast blu-wh strm cut.	Sub-horiz		15%
	SANDSTONE, qtz, m to dk brn, v f, well sort, v argil, a/a, grading laterally and vertically to dk gy slst a/a.	4253.0							

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

GRAIN SIZE Md 0 1 2 3 4 6.0 0 2

BULK DENSITY GM/CC (HORIZONTAL): 22 23 24 25 26 27 28

REMARKS

CORE ANALYSIS

SCALE 1:20

Well No. 29/6-1

Core No. 2 From 4238.00m To 4256.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
	MUDSTONE, dk gy, hd, subfis to fis, non-swell, non-calc, mod slty, mod to v. carb, abund dissem carb frags, occ mod sndy and grades up and down to v. argil SST.	4253.0			Sharply grad contact		Sub-horiz	Fracture parallel to fiss in MDST	15% 5%	
	SANDSTONE, qtz, dk gy brn, v.f, hd, well sort, subrnd to subang, low to mod vis por, v. argil, abund clay matrix, dom grnst text, occ wkst text, mod carb, mod mic, occ grading to partings of MDST, dk gy, hd, subfis, v mic, v carb, A/A, SST becomes progressively more slty downhole.	4253.5			Grad contact	Sl. gas bleed, v. dull yel fluor, fast dull blu-wh strm and crush cut		None		
		4254.0			Whispy MDST partings freq. broken up by gioturb				15%	
		4254.5			Irreg shaped MDST lenses. v.f.SST, grades down to sndy SLST highly bioturbated (mainly vertical)		Sub-horiz	Minor fractures parallel to MDST partings		
	SANDSTONE/SILTSTONE, dk gy brn to dk gy, v.f, freq slt grade, hd, well sort, occ subfis, v. slty, v.argil, low vis por, dom wkst text w. abund dk gy clay matrix, occ v. carb, occ v. mic, grades to sndy SLST - dk gy, hd, subfiss, non-swell, non-calc, v. micromic, v. microcarb, mod sndy.	4255.0				Sl. gas bleed, v. dull yel to blu-wh fluor, fast blu-wh mlky strm cut		No faults	10%	
		4255.5						Rubble		
		4256.0			Highly bioturbated		Sub-horiz	Rubble	10%	

Described by RATTEY/MADLAND Date 17/2-82

CORE ANALYSIS

Well No. 29/6-1.

SCALE 1:20

Core No. 3 From 4256.00m To 4274.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SILTSTONE, dk, hd, subfis, non-swell, v argil, v carb, occ sl sndy, tr micromic, occ mod mic, non-calc.	4256.0			Slty/sndy lam grading to MDST.	Strong gas bleed, no fluor, fast mkly wh strm and crush cut.	Fissility sub-horiz	Minor fractures parallel to fissility	< 5%
		4256.5							
	SANDSTONE, subark, m gy speckled wh, hd, qtz-m brn to clss, mod sort, subrnd, abund weathered fldspr w tr kaol, v argil w abund MDST matrix, mod mic, tr carb, mod vis por.	4257.0			Rapidly grad contact	Strong gas bleed, sporadic fluor.	Sub-horiz	None	20%
					Grad contact		Sub-horiz	None	
	SANDSTONE, qtz, m brn, hd, f to m, mod sort to well sort, subang to subrnd, mod silic cem, grnst text, mod to high vis por, tr calc cem, tr argil, tr fldspr, tr kaol, tr mic, tr carb.	4257.5				Strong gas bleed, weak sporadic blu-wh fluor, fast blu-wh mlky cut.			25%
		4258.0			Homog SST w v rare carb MDST partings		5°		
								None	
	SANDSTONE, qtz, m brn, hd, m to f, mod to well sort, subrnd, occ ang, silic cem, mod to high vis por, grnst text, QTZ-clss to lt brn, tr clay matrix, tr fldspr, gen non-mic, tr calc cem, occ thin streaks of argil sst.	4258.5			Occ lt gy strks of SST w mod calc cem.	Strong gas bleed, sporadic blu-wh fluor, fast dull blu-wh mlky cut.	3°		
		4259.0						None	
					Homog sst.				
		4259.5					3°		25%
								None	
	SANDSTONE, qtz, m brn, m, hd, well sort, subrnd to subang, occ ang, mod calc cem, tr silic cem, mod vis por, grnst text, tr argil, occ thin streaks of argil sst, tr fldspr.	4260.0			Sub-horiz contact w change in type of cem to calcite. Irreg mdst partings- the result of weak bioturb	Mod. gas bleed, gen no fluor, occ sporadic blu-wh fluor w. fast dull mkly wh strm cut.	Sub-horiz		15%
								None	
	SANDSTONE, qtz, m to dk brn, v f to f, occ m, hd, mod sort, subrnd, grnst text, occ mod argil, low to mod vis por, tr fldspr, tr kaol, tr carb, sl mic.	4260.5			V f irreg. MDST lam.	Strong gas bleed, v dull blu-wh fluor, v dull fast blu-wh strm cut.	3°	None	20%
		4261.0							

POROSITY % (He): 40 30 20 10 0

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 0·05 0·01

GRAIN SIZE Md 0 1 2 3 4 6 0

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by RATTEY/MADLAND Date 18/2-82

End

CORE ANALYSIS

Core No. 3 From 4256.00m To 4274.00m Recovery 100%

SCALE 1:20

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH BRT METRES DRILLED	DEPTH BRT METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
		4261.0							
	SANDSTONE, qtz, m to dk brn, hd, v f to f, well sort, subang to subrnd, mod silic cem, sl clay matrix, mod vis por, tr calc cem, qtz-clss to lt brn, occ mod argil and mod mic grading to thin streaks of MDST. However gen mod 'clean'.	4261.5			Thin irreg MDST lam up to 1cm thick. Finely interlam SST and dk gy MDST, lam are often irreg in shape, non planar, no signifi-cantly dis-rupted by vertical bioturb.	Sl gas bleed, patchy brt blu-wh fluor, fast v dull blu-wh strm cut.	Sub-horiz 6°	None	20%
	SANDSTONE, qtz, lt gy brn to m brn, v f, well sort, subang to subrnd, grnst text, mod calc cem, low to mod vis por, sl clay matrix, occ mod argil and mod mic grading to thin MDST streaks.	4262.0				Sl gas bleed, v dull gold yel fluor, fast straw yel strm cut.	4°	None	10%
	SANDSTONE, qtz, m brn, f to m, hd, mod sort, subrnd to subang, grnst text, mod to high vis por, tr sl calc cem, dom silic and clay matrix, tr kaol, occ patches of mod calc cem, tr micromic, tr carb, v rare carb MDST whisps.	4262.5			Parallel MDST lam and rare vague par-tings.	Sl gas bleed, v dull gold fluor, fast v dull yel strm cut.			20%
		4263.0					Sub-horiz	None	
	SANDSTONE, qtz, m brn, m, occ f, hd to v hd, mod sort, subrnd, grnst text, v calc cem, mod vis por, tr argil, tr mic w thin mic streaks, tr kaol.	4263.5			Contact marking change in cem type at angle to bedding.	Sl gas bleed, v dull gold fluor, fast v dull yel strm cut.	3°	None	15%
		4264.0						None	
	SANDSTONE, qtz, m brn, f to v f, hd, mod sort, subang to subrnd, grnst w tr clay in pores, tr sl calc cem, mod to high vis por, QTZ - lt brn to clss, tr mic (muscovite), sl argil, occ grades to thin lam of v calc, v clean SST.	4264.5			1-2cm thick lam of v calc clean sst with bi-direct cross-bedding.	Sl gas bleed, v dull gold yel fluor, fast v dull yel strm cut.			20%
		4265.0					Sub-horiz	None	
	SANDSTONE, qtz, m gy, v f, hd, well sort, subang to subrnd, grnst text, mod to v argil, abund clay matrix, mod carb, occ v carb grading to coal lam.				Sharp con-tact. Whispy carb lam.	Dull gold yel fluor, fast strm cut.			10%
	COAL, blk, shiny; hd, brittle, gen blky, occ subfis, tr slty, tr rootlets, occ grading into thin irreg lam and lenses of MDST, lt gy, v hd, subfis, non-swell, v pyr, v carb.	4265.5			Lt gy mdst lam set in coal mat-rix, lam often have irreg con-tacts and shapes.	No fluor, mod fast blu-wh strm and crush cut, rapid gas bleed.	Horiz	None occ br-eaks along fissi-lity.	None <5%
		4266.0							

POROSITY % (He): 40 30 20 10 0

HORIZONTAL PERMEABILITY MCS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01 0

Md GRAIN SIZE: 0 2 3 4; 6·0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by RATTEY/MADLAND Date 18/2-82

CORE ANALYSIS

Well No. 29/6-1.

Core No. 3 From 4256.00m To 4274.00m Recovery 100

SCALE 1:20

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	COAL, blk, v hd, brittle, occ subfis, tr slty, occ MDST lam a/a.	4266.0			Fewer MDST lenses than above.	Strong gas bleed, no fluor, fast mod brt blu-wh strm cut.		None	<5%
	SANDSTONE, qtz, m brn, occ dk gy brn, f to v f, occ m, mod sort, subrnd to subang, grnst text, occ wkst w MDST matrix, mod mic, grades to thin lam of MDST - dk gy, hd, subfis, v mic, v carb, non-swell.	4266.5					2°		
		4267.0			Common thin mdst lam.	Sl gas bleed, dull gold yel fluor, mod fast yell strm cut.		None	20%
		4267.5					Horiz	Occ subparallel to MDST lam	
		4268.0			Fine parallel carb partings. Weak bioturb.	Sl gas bleed, dull gold yel fluor, mod fast yel strm cut.	Sub-horiz	None	15%
	SANDSTONE, qtz, m brn gy, f, occ m, mod to well sort, subrnd to subang, grnst text, sl to mod argil w mdst matrix, low to mod vis por, mod mic, sl carb, occ grades to v mic whisps	4268.5							
	SANDSTONE, qtz, m brn, f to m, mod sort, subrnd to subang, grnst to wkst text w MDST matrix, sl argil, low to mod vis por, sl mic, sl carb, non-calc, tr kaol, gen v weak silic cem.	4269.0			Thin lam of v. clean sst				
		4269.5					Horiz	None	
	SANDSTONE, qtz, m brn to dk gy brn, v f to v c, poor sort, subrnd to ang, variable highly disrupted text from grnst to wkst, occ v argil, low to high vis por, tr to sl mic, sl carb - highly reworked.	4270.0			V highly bioturbated sst, burrows predom vertical, some oblique, tr faecal pellets.	Sl. gas bleed, v dull gold yel fluor, mod fast yel strm cut.			V. variable up to 20%
	SANDSTONE, qtz, lt to m brn, f to m, mod sort, subang, occ subrnd, grnst text, sl silic cem, qtz-clss to lt brn, mod to high vis por, tr fldspr, tr mic, gen sl argil.	4270.5				Sl gas bleed, v dull yel fluor, mod fast yel strm cut.	Horiz	Broken parallel to mdst lam.	20%
		4271.0							

POROSITY % (He) 40 30 20 10

HORIZONTAL PERMEABILITY MCS (AIR) 50 10 5 1 0·5 0·1 ·05 ·01 0

Md 0 GRAIN SIZE 6·0 0 1 2 3 4

BULK DENSITY GM/CC (HORIZONTAL) 2 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by RATTEY/MADLAND Date 18/2-82

CORE ANALYSIS

Well No. 29/6-1.

Core No. 3 From 4256.00m To 4274.00m Recovery 100%

SCALE 1:20

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	POROSITY % (He) 40 30 20 10	HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0·5 0·1 ·05 ·01	Md 0 GRAIN SIZE 6 0 1 0 2 3 4 0 2	BULK DENSITY GM/CC (HORIZONTAL) 2·2 2·3 2·4 2·5 2·6 2·7 2·8	REMARKS
	SANDSTONE, qtz, m to dk brn, f to v c, hd, poor sort, subrnd to subang, variably argil from non to mod, variable vis por - gen mod to high, grnst text, tr clay matrix, tr kaol, occ mod mic, occ v f MDST partings, non-calc, occ thin lam SST, lt gy f to v c, v hd, poor sort, subang, v calc cem, low vis por, non-argil.	4271.0			Homog sst w thin MDST partings.	sl gas bleed, v dull gold yel fluor, mod fast v dull yel strm cut.			variable 15% to 25%					
		4271.5			occ thin lam of v clean SST.		3%	none						
		4272.0					sub-horiz							
	SANDSTONE, qtz, m to dk brn, dom f, occ m, hd, mod sort, subrnd to subang, mod argil w abund mdst matrix, dom grnst text, occ wkst text grading to thin lam of v mic MDST - sl to mod mic, sl carb, non-calc.	4272.5			SST becomes grad more argil downhole.			occ breaks parallel to v fine MDST partings.	15%					
		4273.0			whispy MDST partings set in argil SST.	sl gas bleed, v dull yel fluor, slow to mod fast v dull yel strm cut and mod fast yel crush cut.		no faulting						
		4273.5			weak bioturb.									
	SANDSTONE, qtz, locally subark, m brn occ speckled wh, f to m, hd, mod sort, subrnd to subang, mod argil w abund mdst matrix. Dom grnst, abund weathered fldspr freq degraded to kaol clay, low to mod vis por, mod mic.	4274.0				sl gas bleed, v dull to no fluor, a/a, fast blu-wh strm and crush cut.	sub-horiz	rubble	15%					

Described by RATTEY/MADLAND Date 18/2-82

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 4 From 4274.00m To 4292.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, m to dk brn, f, occ m, hd, well sort, subrnd to subang, sl argil, occ v argil grading to thin lam of v mic, v carb MDST, gen sl calc cem and mod vis por, occ abund clay matrix and low vis por, gen mod mic (Muscovite).	4274.0			Homog argil sst	gas bleed, dull yel fluor, mod fast v dull yel strm cut.		none	
		4274.5			occ thin irr mdst partings		sub-horiz		15%
		4275.0			Homog sst	good gas bleed.		none	10%
	SANDSTONE, qtz, m gy to m brn, f to m, hd, mod sort, subrnd to subang, sl. argil, occ sl mic, v calc cem, low to mod vis por, occ abund clay matrix, tr kaol.	4275.5			thin irr MDST part. cross bedding in calc sst.	v dull yel fluor, bright yel strm cut.	sub-horiz cross-bedding 20° sub-horiz		15% 10%
		4276.0			thin irreg mdst part.			none	
		4276.5							15%
	SANDSTONE, qtz, m to dk brn, v f to f, hd, mod to well sort, subrnd to subang, sl argil, occ v argil grading to thin lam of v mic v carb MDST - dk gy, hd, subfiss. SST - v sl calc cem, mod vis por, occ abund clay matrix and low por, gen mod mic (Muscovite), tr plant remains.	4277.0			cross bedding	sl gas bleed, no fluor, mod yel strm cut	sub-horiz x-bed 20°		10%
		4277.5			Homog sst occ thin irr mdst part		sub-horiz	none	
		4278.0			cross-bedding		cross-bed 15°		
					cross-bedding	sl gas bleed, v dull yel fluor, mod yel strm cut	sub-horiz		15%
	SANDSTONE, qtz, m brn, f, hd, mod to well sort, subrnd to subang, grnst text, mod vis por, clay matrix, sl to mod argil, v sl calc, sl carb, tr feldspar, occ pebbly.	4278.5			Homog sl argil SST.				
		4279.0							

POROSITY % (He): 40 30 20 10 5.0 1.0 0.5 0.1 0.05 0.01 0

HORIZONTAL PERMEABILITY MDS (AIR): 1 0 2 3 4

Md 0 GRAIN SIZE 6.0 2

BULK DENSITY GM/CC (HORIZONTAL): 2.2 2.3 2.4 2.5 2.6 2.7 2.8

REMARKS

Described by MADLAND/RATTEY Date 20/2-82

CORE ANALYSIS

Well No. 29/6-1

Core No. 4 From 4274.00m To 4292.00m Recovery 100%

SCALE 1:20

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, m to dk brn, f to occ v f, hd, mod sort, subrnd to subang, sl argil, occ v argil, occ v argil grading into thin lam of v mic occ v carb MDST - dk gy, hd, subfis . SST v sl calc cem, mod clay matrix, poor vis por, gen mod mic.	4279.0			Mostly homog sst, occ irr mdst partings	sl gas bleed, v dull yel fluor, dull yel strm cut	Sub-Horiz	None	15%
		4279.5							
		4280.0			Cross bedding		15° x-bed 10° x-bed		5%
	SANDSTONE, qtz, m gy to m brn, clss QTZ, f to v f, mod to well sort, subrnd to subang, sl argil, occ grading into thin lam of mic MDST, dk gy, hd, subfis . SST - non calc cem, mod clay matrix, poor vis por.	4280.5			Homog argil sst.		Sub-Horiz		10-15%
		4281.0				sl gas bleed		None	
	SANDSTONE, qtz, m brn, v f, occ f, mod sort, subrnd to subang, sl argil, grading into thin lam or v. mic occ v carb MDST, mod to v calc cem, sl to mod clay matrix, mod vis por.	4281.5			Cross bedding. Irr. calc patches		20° x-bed 20° x-bed		10%
					Homog argil sst w/occ mdst bands		15° mdst bands	None	15%
		4282.0			Calcite cemtd bands lie at angle to bedding				
	SANDSTONE, qtz - clss, lt. gy, occ m brn, f to v f, mod sort, subrnd to subang, sl to occ mod argil, v calc cem, sl to mod clay matrix, low vis por.	4282.5				sl gas bleed, v dull yel fluor, fast dull yel strm cut.	Sub Horiz		15%
	COAL, blk, hd, brittle, conch fract.	4283.0			Sharp contact	No fluor		None	< 5%
					Sharp contact				15%
	COAL, blk, v hd, brit, shiny, vit Lustre.	4283.5			Sharp contact	No fluor			< 5%
	SILTSTONE, m gy, hd, subfis, non-swell, non-calc, v. argil, mod to v carb, mod micromic.				Fining up cycle		Sub Horiz	Fracts sub-parallel to fissility	< 5%
		4284.0							

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 0·05 0·01

Md 0 GRAIN SIZE 6 0: 1 0 1 2 3 4 | 0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by MADLAND/RATTEY Date 20/2-82

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 4 From 4274.00m To 4292.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH BRT METRES DRILLED	DEPTH BRT METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, m gy, clss QTZ, v f to f, hd, well sort, subrnd to subang, sl argil to occ v arg, non-calc cem, mod clay matrix, poor vis por.	4284.0			coarsening up cycle	no to v sl dull yel fluor, dull yel fast strm cut.	sub horiz.	none	10% < 5%
	SILTSTONE, m gy, hd, subfis , non calc, v argil, mod to v carb, mod micromic	4284.5			v f SLST/ SST lam, occ very bioturb.				
	SANDSTONE, qtz, m gy to m brn, v f, well sort, subrnd, sl to v argil, non-calc cem, abund clay matrix, poor vis por, grading into:	4285.0				sl gas bleed			
	SILTSTONE, m gy, hd, subfis , non calc v argil, mod to v carb, mod micromic.	4285.5			v f SLST and MDST lam.		sub-horiz		
	SILTSTONE, m gy, hd, subfis , non-calc v argil, mod to v carb, mod micromic	4286.0				sl gas bleed, no fluor, dull wh fast strm cut.		none	< 5%
		4286.5							
	COAL, blk, hd, brit, shiny	4287.0			sharp contact		sub-horiz		< 5%
	SANDSTONE, qtz, m gy, clss QTZ, m to c, hd, poor sort, subrnd to subang, sl argil, silica cem, sl to mod carb, tr feldspar, occ pebbly	4287.5			Homog sst, coarse, occ pebbly	sl gas bleed, no fluor, dull yel fast strm cut.		none	20%
		4288.0					sub-horiz		
	SANDSTONE, qtz, m gy, c to v c, hd, poor sort, subrnd to subang, sl argil, sl to mod carb, occ pebbly.	4288.5			Homog sst, coarse occ pebbly	sl gas bleed, no fluor dull yel fast strm cut.		none	20%
		4289.0							

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

GRAIN SIZE Md 6·0: 1 0 1 2 3 4 | 0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by MADLAND/RATTEY Date 20/2-82

End.

CORE ANALYSIS

Well No. 29/6-1

Core No. 4 From 4274.00m To 4292.00m Recovery 100%

SCALE 1:20

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	SANDSTONE, qtz, m gy, clss QTZ, c to v c, hd, poor sort, subrnd to subang, sl argil, sl carb, sl calc cem, mostly silica cem, v pebbly, good vis por.	4289.0			Homog sst, coarse and pebbly	sl gas bleed, no fluor, fast dull yel strm cut.	sub-horiz.	none	20%
	SANDSTONE, qtz, clss to wh QTZ, m gy, c to v c, occ v pebbly, hd, poor sort, subrnd to subang, sl argil, sl carb, sl calc cem, mostly silica cem, good vis por.	4289.5							
		4290.0							
		4290.5							
	SANDSTONE, qtz, m gy, f to m, few pebbles, hd, mod sort, subang to subrnd, sl to mod argil, sl carb, silica cem.	4291.0			Homog sst, less pebbly	sl gas bleed	sub-horiz.	none	10-15%
		4291.5							
		4292.0							

POROSITY % (He) 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0·5 0·1 0·05 0·01

Md 0 1 2 3 4 GRAIN SIZE G 0 2

BULK DENSITY GM/CC (HORIZONTAL) 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by MADLAND/RATTEY Date 20/2-82

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CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 5 From 4292.00m To 4310.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
		4292.0			Pebbly SST bands	Sporadic sl. degassing	Horiz	None		
	SANDSTONE, qtz, m. gy, clss QTZ, occ dk brn, f to m, occ pebbles, hd, mod sort, subang to subrnd, sl to mod argil, sl carb, sl to mod calc cem, mostly silica cem.	4292.5			Erosional base Fining up cycle	V. dull yel flor. Dull yel fast strm cut and crush cut fluor.	10° Horiz		Mod	
		4293.0			Homog					
	SANDSTONE, qtz, m. gy, occ dk brn, clss QTZ, f to m, hd, mod sort, subang to subrnd, sl to mod argil, sl carb, sl calc cem, mostly silica cem.	4293.5			Pebbly SST	V. dull yel fluor.	Horiz			
		4294.0			Homog	V. slow yel strm cut and crush cut fluor			Mod to poor	
					MDST clasts		Horiz	None	Poor	
	SANDSTONE, qtz, m gy brn, clss QTZ, f to m, hd, mod sort, subang to subrnd, sl to mod argil, sl micromic, silica cem, non-calc.	4294.5			Pebble bands w. bioturb					
		4295.0				Occ. v. slow degassing		None		
					Occ MDST clasts		90°			
	SANDSTONE, qtz, m. gy, clss QTZ, occ m brn, f to m, hd, mod sort, subang to subrnd, mod argil, sl carb, sl micromic, v sl calc, silica cem.	4295.5				V. weak dull yel flour.			Poor	
		4296.0			Gen Homog w. occ coal clasts	V. slow yel strm cut and crush cut flour.	Horiz	coal filled open fractures		
	COAL, thin seam (1 cm)							Coal filled fracture		
	SANDSTONE, qtz, m. gy, occ m brn, clss QTZ, f to m, hd, mod sort, subang to subrnd, mod argil, sl micromic, non-calc, silica cem, occ irr lam of v carb MDST, dk gy to bk, hd, subfis.	4296.5				V. weak dull yel flour. V. slow yel strm cut and crush cut fluor			Poor	
	COAL, (2 cm) black, shiny, brittle	4297.0								

POROSITY % (He) 40 30 20 10 50 10 5 1 0·5 0·1 ·05 ·01

HORIZONTAL PERMEABILITY MCS (AIR)

Md 0 1 2 3 4

GRAIN SIZE 6.0 0 2

BULK DENSITY GM/CC (HORIZONTAL) 2·2 2·3 2·4 2·5 2·6 2·7 2·8

Described by Date

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 5 From 4292.00m To 4310.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
		4297.0			Abund. calc nodules	V. sl. degassing	Horiz	Minor fracts 70° dip	
	SANDSTONE, qtz, m gy, occ m brn, clss QTZ, f to m, hd, mod sort, subrnd to subang, sl argil, sl carb, sl mic (muscovite), mostly silica cem, occ calc cem.	4297.5			Occ. calc nodules	V. weak dull yel fluor, slow dull yel strm cut and crush cut			Poor to mod
		4298.0			Calc cemented patches	fluor.	Horiz to 5°	None	
					Channel cut through beds defined by light + dk gy bands	V sl degassing, v. weak dull yel fluor, slow dull yel strm cut and crush cut	Erosion surface dips 60° Horiz		Poor
	SANDSTONE, qtz, m gy to m brn, clss QTZ, m, occ f, hd, mod sort, subrnd to subang, sl argil, sl carb, sl mic (muscovite), mostly silica cem, sl to occ v calc cem, occ thin irr lam of MDST - dk gy-brn, subfis , hd, v. carb, non to sl calc.	4298.5							
		4299.0			Load casting, cross bedding		10°		
					Abund.calc cemtd patches	No degassing	Horiz	None	
		4299.5					Irreg, horiz to 10°		Poor
	SANDSTONE, qtz, lt gy, clss QTZ, m to c, hd, poor sort, grnst, subrnd to subang, v. sl argil, sl mic, strong calc cem.				Calc cemtd lenses				
		4300.0			Homog SST, no calc nodules		Horiz		
	SANDSTONE, qtz, m. gy, clss QTZ, f to m, hd, mod sort, subrnd to subang, sl argil, occ carb, micromic, abund clay matrix, non-calc, silica cem.	4300.5				No fluor, no cut fluor, slow dull yel strm cut and crush cut fluor	Horiz to 3°	Irreg coal filled fracts	
		4301.0			Coal infills		Horiz		Poor
	SANDSTONE, qtz, m gy, clss QTZ, f to m, hd, mod sort, subrnd to subang, sl argil with thin irr lam of micaceous MDST.				COAL + SST slumped into caotic breccia	Dull yel fluor in sst lenses yel mod strm cut and crush cut fluor	V. irreg. Horiz to 5°	None	
	MUDSTONE, dk gy to blk, hd subfis , non-swell, v mica, v carb.	4301.5			Calc CST lenses				
		4302.0							

POROSITY % (He): 40 30 20 10 50 10 5 1 0·5 0·1 ·05 ·01 0

HORIZONTAL PERMEABILITY MCS (AIR): 0 2 3 4

Md 0 GRAIN SIZE 6.0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by Tveiten/Madland Date 21/2/82.

End

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 5 From 4292.00m To 4310.00m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
		4302.0			Channel cutting				
	SANDSTONE, qtz, m gy, clss QTZ, f to m, hd, mod sort, subrnd to subang, sl argil, silica cem, occ calc cem, with thin irr lam of v. micaceous MDST.	4302.5			Cross bedding (low angle) Irreg coal seam Chaotic breccia of sst and mudst and coal, slumping	No bleed	Horiz to 5°	Minor sub-horizontal frac, open or coal filled	Poor
	MUDSTONE, dk gy to blk, hd, subfiss, non-swell, v mic, v carb, non-calc	4303.0			Low angle cross bedding	V. weak degassing	Horiz to 5°	90°	
	SANDSTONE, qtz, lt gy, clss QTZ, f to m, hd, mod sort, subang to subrnd, sl argil, sl micromic, occ carb, silica cem, non-calc.	4303.5			Homog	V. weak dull yel flour, slow strm	Horiz		
		4304.0			Slumped breccia	dull yel cut and crush cut flour	Irreg	Irreg fract, occ coal filled	Poor
	SANDSTONE, qtz, lt gy, clss QTZ, f to m, occ c, poor sort, ang to subrnd sl argil, v. good silica cem, with thin irr interbedded MDST ie:	4304.5			Homog	Fair-good gas bleed	Horiz		
	MUDSTONES, dk gy to blk, hd, subfiss, non-swell, v. mica, v. carb, non-calc.	4305.0			Abund Slump structures (breccia)		Irreg		Poor
	SANDSTONE, qtz, lt gy, clss QTZ, f to m, occ c, poor sort, ang to subrnd sl argil, occ carb, v. strong silic cem, occ layers of strong calc cem, with thin irreg interbedded MDSTs ie:	4305.5			Irreg cross-bedding	No shows	Horiz to 5°	Irreg fracts, open or occ coal filled	
	MUDSTONES, dk gy to blk, hd, subfis , non-swell, v mica, v carb, non-calc.	4306.0			Homog, occ thin MDST laminae	Some degassing			
	SANDSTONE, qtz, lt gy, clss QTZ, f to m, occ v.f, poor sort, ang to sub-rnd, sl argil, occ carb, strong silica cem, thin irr lam of MDST- dk gy to blk, hd, subfis , non-swell, v. carb, occ grades into coal.	4306.5				No flour, no cut flour, v. dull mlk wh crush cut			
		4307.0							

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

Md 0 GRAIN SIZE 6 0: 0 1 2 3 4

BULK DENSITY GM/CC (HORIZONTAL): 2 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

CORE ANALYSIS

Well No. 29/6-1

Core No. 5 From 4292.00m To 4310.00m Recovery 100%

SCALE 1:20

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
		4307.0			Minor cross-bedding and ripples, SST and COAL interfingering Homog SST	V. sl gas bleed	Horiz	Irreg fract w.COAL	Poor	
	SANDSTONE, qtz, m. brn, clss QTZ, m to f, occ vf, hd, poor sort, subrnd to subang, sl argil, sl carb, v sl. calc cem, occ mic.	4307.5					Cross lam 10°			
						No flour, no cut flour, v weak yel-wh crush cut	Horiz to 5°			
		4308.0			Thin beds of sst + mudst, some slumping and loading, occ sst lenses			None		
	SANDSTONE, qtz, m. gy, clss QTZ, m to f, occ vf, hd, poor sort, subrnd to subang, v sl argil, strong calc cem, interbedded with:	4308.5							Poor	
	MUDSTONE, dk gy to blk, hd, subfis , non-swell, v mic, v carb.	4309.0				No bleed from rock, sl bleed from fractures, no flour, no cut flour, no crush cut	Horiz to 5°	None		
	SANDSTONE, qtz, lt gy, clss QTZ, m to f, occ v.f, hd, poor sort, subrnd to subang, v. sl argil, mod calc cem, interbedded w. MDST - dk gy to blk, hd, subfis , non-swell, v. mic, v. carb.	4309.5							Poor	
		4310.0								

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

GRAIN SIZE Md O: 1 0 2 3 4; 6 O 0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

Described by

Date 21/2/82

Encl

CORE ANALYSIS

SCALE 1:20

Well No. 29/6-1

Core No. 6 From 4310.00m To 4328.20m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
	SANDSTONE, qtz, wh to m gy, f to m, mod sort, subang to subrnd, hd, silica cem, mod vis por, with thin beds of MDST - m gy, firm to mod hd, non-swell, mic, non-calc.	4310.0			MDST lenses	Occ sl gas bleed from spots	Horiz to 5°	45° 10 cm throw		
		4310.5				Mod orange yel flour, v. weak slow milky wh strm and crush cut	5°		Mod	
					Sand lens within MDST band.		Horiz to 5°			
	MUDSTONE, m gy, firm to mod hd, non swell, non-calc, v mic.	4311.0			MDST interfingering into SST					
					Homog SST	Occ v. sl gas bleed, v weak slow milky wh cut and crush cut		None		
		4311.5								
	SANDSTONE, qtz, m gy, clss to wh QTZ, f to m, subang to subrnd, silica cem, mod sort with thin layers of mdst, A/A.	4312.0			V. homog SST, occ MDST clasts	Weak orange yel flour, v weak slow milky wh cut and crush cut	Horiz to 5°	None	Poor	
		4312.5								
	SANDSTONE, qtz, m gy, clss to wh QTZ, f to m, mod hd, subang to subrnd, silica cem, occ sl calc cem, sl to mod argil, with thin layers of MDST, A/A.	4313.0				Orange yel flour, weak slow milky wh cut and crush cut, occ v sl gas bleed				
		4313.5			MDST seam as boundary between lt gy and dk gy SST		Horiz to 5°			
		4314.0						None		
	SANDSTONE, qtz, m gy, clss to wh QTZ, f to m, occ c, subang to subrnd poor to mod sort, silica cem, occ sl calc cem, mod hd.	4314.5			Homog SST occ MDST clasts	Orange yel fluor, weak slow milky wh crush cut, v weak cut	Horiz to 5°		Poor to mod	
		4315.0								

Described by [illegible] Date 22/2/82

POROSITY % (He) 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0·5 0·1 ·05 ·01

Md 0 GRAIN SIZE 6.0 1 0 1 2 3 4 0 2

BULK DENSITY GM/CC (HORIZONTAL) 2·2 2·3 2·4 2·5 2·6 2·7 2·8

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 6 From 4310.00m To 4328.20m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
	SANDSTONE, qtz, m gy, clss to wh QTZ, f to m, occ c, hd, subang to subrnd poor sort, sl calc cem, mostly sil cem.	4315.0			Homog SST	Orange yel fluor, v weak milky cut and crush cut, occ v. sl. bleed of gas	Horiz to 3°		Poor to mod	
		4315.5			Occ MDST clasts					
		4316.0						None		
	SANDSTONE, qtz, m gy, clss to wh QTZ, m, occ c, hd, subang to subrnd, poor to mod sort, sl calc cem, mod vis por, sl mic, sl argil.	4316.5			V. homog	Or yell fluor, weak milky wh cut and crush cut			Poor to mod	
		4317.0					Horiz to 3°			
	SANDSTONE, qtz, m gy to clss to wh QTZ, f to m, hd, subang to subrnd mod sort, mod calc cem, sl carb, sl mic, with v thin layers of COAL and MDST ie:	4317.5			Freq. MDST clasts at base of SST	Occ sl. gas bleed		None	Mod	
		4318.0								
	MUDSTONE, m to dk gy, firm to mod hd, non-swell, non to sl calc, mic, subfis to fis .				SST cut into MDST		Horiz to 5°			
	SANDSTONE, qtz, clss to wh to m gy, QTZ, f, occ m, hd, subang to subrnd, poor sort, silica cem, v argil with thin layers of parallel orientated mica.	4318.5			Abund cross-bedding (low angle)	Or yell fluor, v weak milky wh cut and crush cut			Poor	
		4319.0						None		
	SANDSTONE, qtz, clss to wh to m gy QTZ, f to m, hd, subang to subrnd, poor sort, silica cem, v argil with thin layers of parallel orientated mica.	4319.5				Or yel fluor, mod milky wh crush cut and v weak milky wh cut	Up to 5°		Poor	
		4320.0								

POROSITY % (He): 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01

Md 0 GRAIN SIZE 6.0: 1 0 2 3 4 — 0 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

Described by Date

End

CORE ANALYSIS

Well No. 29/6-1

Core No. 6 From 4310.00m To 4328.20m Recovery 100%

SCALE 1:20

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
	MUDSTONE, m to dk gy, firm to mod hd, non-swell, non-calc, mic.	4320.0			Common cross-bedding SST cuts into underlying rocks. Occ SST lenses.		Horiz to 5°		
		4320.5						None	
		4321.0			Thin coal	Occ sl gas bleed			
	SILTSTONE, m-dk gy, hd, mod argil, v sndy, sl mic.	4321.5			V. homog	No fluor, v weak milky wh crush cut, no cut	Horiz		Poor
		4322.0			Slump structures		Irreg		
	SANDSTONE, qtz, clss to wh to m gy QTZ, f to m, hd, subang to subrnd, sl to mod calc cem, mic, gen silic cem.	4322.5		T	Homog SST w. vague bedding	No fluor, v weak milky wh crush cut, no cut		None	Poor
		4323.0		T			2-3°		
	SANDSTONE, qtz, clss to wh to m gy QTZ, f to m, subang to subrnd, mod sort, silicem, sl calc cem, sl mic, with thin layers of parallel orientated mica.	4323.5		T		Occ v sl gas bleed, no fluor, no cut, v weak milky wh crush cut			Poor
		4324.0		T T	SST cut into MDST			None	
	COAL, blk, shiny, brittle.	4324.5					Horiz		
		4325.0							

POROSITY % (He): 40 30 20 10 0

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0.5 0.1 .05 .01 0

Md 0 GRAIN SIZE 6.0 0 2 3 4 2

BULK DENSITY GM/CC (HORIZONTAL): 2.2 2.3 2.4 2.5 2.6 2.7 2.8

REMARKS

Described by T.W./P.O. Date 22/2/82

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No.6 From 4310.00m To 4328.20m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY
		4325.0					Horiz to 10°	45° open	
	MUDSTONE, m gy to dk gy, firm to mod hd, non-swell, non-calc, micromic, occ sl carb, occ coal frags, sub-fis to fis .	4325.5			MDST w SST lenses, bedding v irreg w abund slump strs minor bio-turb	V sl gas bleed, no fluor, no cut, weak milky wh crush cut			Mod in SST
		4326.0				No fluor in mudst, orange fluor in SST, no cut fluor in MDST, weak dull milky wh cut fluor in SST, crush cut is dull milky wh in MDST and SST	Horiz to 10°		
	MUDSTONE, m gy to dk gy, firm to mod hd, non-swell, non-calc, occ sl calc, micromic, occ mic, w patches and beds of SST ie:	4326.5							Mod in SST
	SANDSTONE, qtz, clss-wh-m gy QTZ, f, subang-subrnd, non-mic, mod sort, sl calc cem, pred sil cem, pack-stone text, hd.	4327.0							
	SANDSTONE, qtz, clss to wh to m gy QTZ, hd, m, subang to subrnd, mod sort, gen silic cem, sl calc cem, non-mic.	4327.5		T	Homog SST w occ vague bedding planes	V sl gas bleed, no fluor, weak milky wh cut, fair strm crush cut	Horiz		Poor to mod
		4328.0		T					
		4328.20							

POROSITY % (He) 40 30 20 10

HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0·5 0·1 ·05 ·01

Md 0 GRAIN SIZE 6 0 1 0 2 3 4 0 2

BULK DENSITY GM/CC (HORIZONTAL) 2·2 2·3 2·4 2·5 2·6 2·7 2·8

REMARKS

Described by Tveiten/Ree Date 22/2/82.

Encl

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 7 From 4328.20m To 4339.65m Recovery 100%

FORMATION / AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	POROSITY % (He) 40 30 20 10	HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0·5 0·1 ·05 ·01	GRAIN SIZE Md 0 1 2 3 4 6.0	BULK DENSITY GM/CC (HORIZONTAL) 2 22 23 24 25 26 27 28	REMARKS
?	SANDSTONE, qtz, occ feldspar, clss to brn gy, vf to f, ang to subang, mod to poorly sort, packst text, hd to v hd, gen poor por, occ spots w/ mod por, v well cem, sl calc cem, v silic cem, v to mod argill, occ sl carb, occ v calc lam.	4328.2			Homog SST	Occ sl gas bleed, v weak yel fluor, v weak slow milky wh cut,	Horiz	None	Poor				
		4328.5			Thin MDST clasts	mod milky wh crush cut	Horiz to 5°							
		4329.0												
	MUDSTONE, black, soft to firm, subfis to fis , non-swell, non-calc, v carb.				Black MDST splits into thin flakes, v good fissility, no other structures	No fluor, no cut, tr crush cut fluor	Horiz		V poor					
		4329.5												
	MUDSTONE, dk gy to black, firm, occ sft, subfis to fis , non-swell, non-calc, v carb, occ micromic.	4330.0				No fluor, no cut, weak milky wh crush cut								
		4330.5				Occ sl gas bleed		Core splits along slickensided surfaces in MDST						
		4331.0												
	SILTSTONE, m to dk brn gy, mod hd to hd, v argill, occ carb, occ grad into v f SST.				Structureless	No fluor, no cut fluor, mod milky wh crush cut fluor	Horiz							
		4331.5												
		4332.0							Irreg V poor					
						Occ sl gas bleed		open fract						
		4332.5												
					SST bases in MDST		Horiz to 2°							
		4333.0												

Ree/Tveiten 23/2/82.

CORE ANALYSIS

SCALE 1:20

Well No. 29/6-1

Core No 7 From 4328.20m To 4339.65m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	REMARKS
	MUDSTONE, sandy grading into v argil SLST, m gy to dk gy, firm, subfis to fis , non-swell, non-calc, occ carb, micromic, occ mic.	4333.0			Finely laminated SST and MDST. sst lenses in mdst Fining up	Occ sl gas bleed, orange fl, no cut fl, mod milky wh crush cut fl	Horiz to 2°			
	SANDSTONE, grading into sandy MDST, m gy, f, ang, well silic cem.	4333.5								
	MUDSTONE, m gy, firm, subfis to fis non-swell, non-calc, sandy, mic and micromic, occ carb.	4334.0					Horiz to 10°	Open frac	Poor	
					Lenses of sandy MDST in MDST	Orange fl, weak milky wh cut fl, mod slow streamy milky wh crush cut fluor.	Horiz			
		4334.5								
		4335.0								
	SANDSTONE, qtz, wh to med gy, vf, occ f, ang, mod to well sort, packst text, hd, well silic cemtd, non-calc, occ some mica flakes.				MDST bands in SST	Fair red-dish or-ange fl, v weak milky wh cut fl,	5°	None	V poor	
	MUDSTONE, m gy, firm to mod hd, subfiss, non-swell, micromic, occ thin laminae of v mic MDST, non-calc, sl to non-carb.	4335.5				weak-mod milky wh crush cut fl, no nat cut colour.			Poor	
		4336.0								
	COAL, blk, shiny, brittle.				Plant roots	Occ sl gas bleed	Horiz			
		4336.5								
	MUDSTONE, m gy, firm, subfis , non-swell, micromic, occ mic, sandy, non-calc.	4337.0			Homog	Fair red-dish or-ange fl, no cut, weak-mod milky wh crush cut fl, no nat cut colour	Horiz	Open 45°	V poor	
	MUDSTONE, dk gy to blk, soft to firm, subfis , non-swell, non-calc, micromic, carb to v carb.	4337.5								
	MUDSTONE, m gy, soft to firm, subfis , non-swell, non-calc, micromic to sl mic, sandy, carb.	4338.0				Occ sl gas bleed				

POROSITY % (He): 40 30 20 10 5 0

HORIZONTAL PERMEABILITY MDS (AIR): 50 10 5 1 0·5 0·1 ·05 ·01 0

Md G GRAIN SIZE: 0 2 3 4; G D 2

BULK DENSITY GM/CC (HORIZONTAL): 2·2 2·3 2·4 2·5 2·6 2·7 2·8

Described by Pae/Tveiten Date 23/2/82.

CORE ANALYSIS

Well No. 29/6-1

SCALE 1:20

Core No. 7 From 4328.20m To 4339.65m Recovery 100%

FORMATION /AGE	LITHOLOGIC DESCRIPTION	DEPTH B.R.T. METRES DRILLED	DEPTH B.R.T. METRES LOG	GRAPHIC LITHOLOGY	SEDIMENTARY STRUCTURES	HYDROCARBON INDICATIONS	DIP OF BEDDING	FRACTURES	VISIBLE POROSITY	POROSITY % (He) 40 30 20 10	HORIZONTAL PERMEABILITY MDS (AIR) 50 10 5 1 0·5 0·1 ·05 ·01	Md 0 GRAIN SIZE 6 0 1 0 1 2 3 4 0 2	BULK DENSITY GM/CC (HORIZONTAL) 2·2 2·3 2·4 2·5 2·6 2·7 2·8	REMARKS
	SILTSTONE, m to dk gy, mod hd to hd, subfis , argill, occ carb, occ v f sandy.	4338.0			V homog	Reddish orange fluor, no cut, weak to mod milky wh crush cut	Horiz		V poor					
		4338.5												
	MUDSTONE, v silty, grad to SLST, dk gy, fm to mod hd, subfis , non-swell, non-calc, sl mic and micromic, abund coal frags.	4339.0			Plant frags			Open 30°						
		4339.5												
		4339.65	4339.65											

Described by Reed/Preston Date

End

EXLOG

FORMATION EVALUATION

BIT DATA RECORD

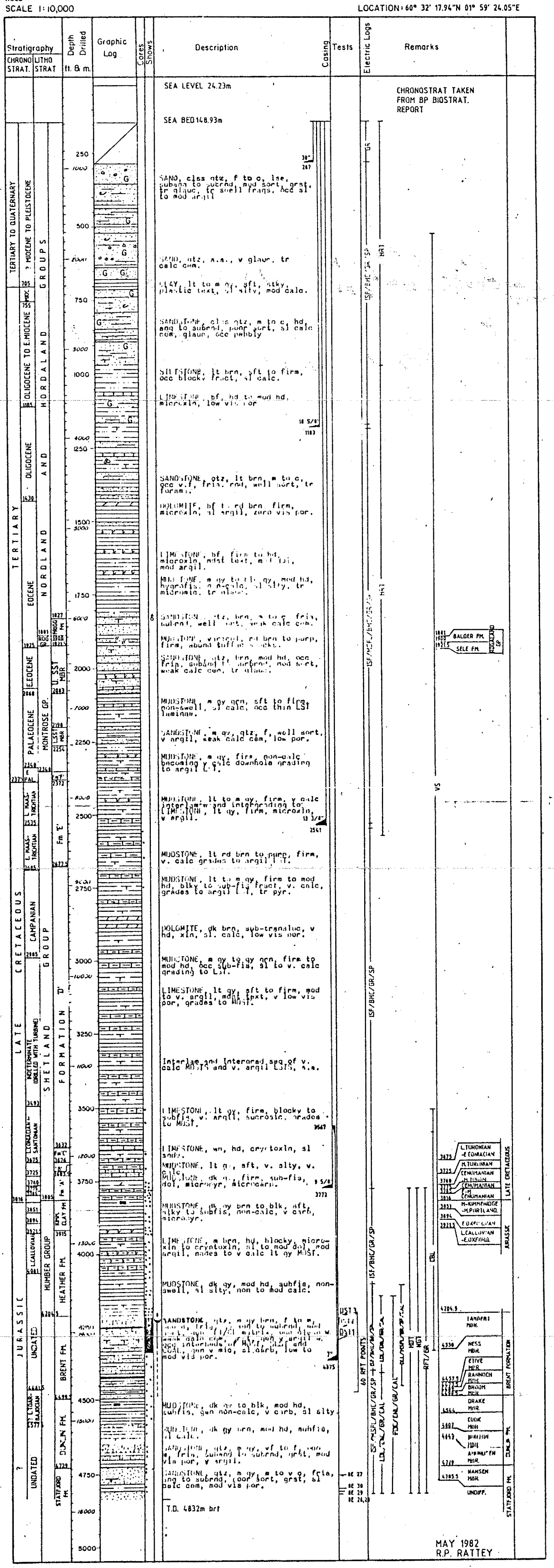
29/6-1

SUMMARISED WELL LOG

NOCS

SCALE 1:10,000

LOCATION: 60° 32' 17.94"N 01° 59' 24.05"E



DRWG. NO. 2886

BP PET. DEV. LTD. NORWAY U/A

EXPLORATION LIBRARY

STATOL

NOCS 29/6-1

COMPOSITE LOG

NOCS 29/6-1

TERTIARY — QUATERNARY

PLEISTOCENE TO RECENT

UNDIFFERENTIATED NORDLAND AND HORDALAND GROUPS

TERTIARY

OLIGOCENE TO EARLY MIOCENE

EOCENE

UNDIFFERENTIATED NORDLAND AND HORDALAND GROUPS

TERTIARY

EOCENE

UNDIFFERENTIATED NORDLAND AND HORDALAND GROUPS

TERTIARY

EOCENE

PALAEOCENE

EARLY EOCENE

MONTROSE GROUP

CRETACEOUS

LATE CRETACEOUS

CAMPANIAN

EARLY MAASTRICHTIAN

SHETLAND GROUP

CHALK FORMATION

CRETACEOUS

LATE CRETACEOUS

LATE MAASTRICHTIAN

SHETLAND GROUP

CHALK FORMATION

PALAEOCENE

MONTROSE GROUP

JURASSIC

MIDDLE JURASSIC

LATE JURASSIC

HUMBER GROUP

KIMMERIDGE CLAY FORMATION

JURASSIC

MIDDLE JURASSIC

HUMBER GROUP

HEATHER FORMATION

JURASSIC

LATE JURASSIC TO MIDDLE JURASSIC

BRENT FORMATION

TRIASSIC

UNCONFORMITY

DUNLIN FORMATION

STATFJORD FORMATION

UNCONFORMITY

PALAEOZOIC

UNDIFFERENTIATED

BP

BP PET. DEV. LTD. NORWAY U/A

EXPLORATION LOGGING

Well No. 29/6-1

LITHOLOGICAL LOG

Scale 1 : 500

LATITUDE 60°47'26.64"N LONGITUDE 02°28'25.62"E

UTM Zone 31 6738683.7 N 470645.1 E

LOCATION MAP

Rig Name & Type: Sedco 704

Operator: BP NORWAY

Spud Date: 8 OCT 1989

TD: 3820.0 MD

Completed Drilling: 15 MAR 1990

Total Depth: 4035m MD

SYMBOLS

LITHOLOGY

CHRONOSTRATIGRAPHY

WELL STATUS

DRILLING PARAMETERS

SHOWS

GAS

CORE

DST

CASING

MUD