SIMON PETROLEUM TECHNOLOGY

WELL: 6507/7-6

Print: 15536 **Units:** [✓ M] F

Length: 23 FT **Initials:** IC

Top	Bottom	Scale	TD
455	2525	1:500	2525

DIGITAL WIRELINE LOGS PACKAGE
1994
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SIMON PETROLEUM TECHNOLOGY

SPT

COMPLETION LOG

Mk.101.1

U-524 COMPLETION - Ø G

CONOCO NORWAY INC.

STATOIL/ARCO/TENNECO **WELL:** 6507/7-6

COMPOSITE WELL LOG

LOCATION :

Latitude : 65° 21' 30.03" N

Longitude : 07° 19' 10.34" E

ELEVATIONS :

K B Mean Sea Level : 25m

K B Sea Floor : 375m

Water Depth : 350m

Total Depth : 2525.0m RKB

Country : NORWAY

Area : HALTENBANKEN

Licence : PL 095

Field : HEIDRUN

Date Spudded : 23rd JULY 1986

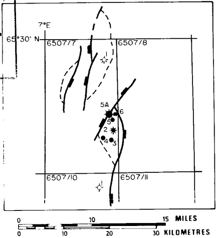
T D Date : 16th AUGUST 1986

Date Completed : 6th SEPTEMBER 1986

Completion Status : P & A OIL AND GAS WELL

- 6 MARS 1987
REGISTRERT
OLJEDIREKTORATET

LOCATION PLAT 1:500000



CONOCO GEOLOGISTS

OPERATIONS GEOLOGIST:	Thorbjørn Pedersen
WELLSITE GEOLOGISTS:	Atle Andresen Arild Skjervøy Ian Barron Carl F. Gyllenhammar

CONOCO ENGINEERS

SUPERVISING DRILLING ENGINEER:	Paul Heard
DRILLING SUPERVISORS:	Gary Motl Dale Hejnal
ASST. DRILLING SUPERVISORS:	Mick Page Steve Lewis

MUDLOG SERVICE

EXPLORATION LOGGING

DRILLING CONTRACTORS & RIG

NORCHEM DRILLING A/S

SCHLUMBERGER LOGS

TYPE	Run N.	INTERVAL	TEMP. °C / °F	HOURS SINCE CIRC.
DLL/MSFL/GR	1	2079.0-2521.5	57.2/135	6.55
LDL/CNL/NGL	1	2079.0-2525.0	60.0/140	10.20
DIL/SLS/GR/SP	1	2079.0-2524.0	61.1/142	14.50
SHDT	1	2079.0-2524.0	63.3/146	19.45
RFT-HP & Straingauge	1	2149.0-2504.0	70.6/159	28.40
CBL/VDL/GR/CCL	1	496.0-2045.5	61.1/142	31.45
CBL/VDL/GR/CCL	2	1700.0-2478.0	60.0/140	5.45
VSP (SAT)		1800.0-2475.0		
		ALL DEPTHS IN mRKB		

PLUG No	CEMENT	INTERVAL & PURPOSE
1	50 Sx "G"	CIR at 2402m 2411.5 - 2415.5m 2121.0 - 2424.0m SQUEEZE DST # 1 PERFORATIONS
2	100 Sx "G"	CIR at 2340m 2348 - 2365m SQUEEZE DST # 2 PERF.
3	230 Sx "G"	400-600m Balance plug in $9\frac{5}{8}$" CSG
4	175 Sx "G"	375-384m Filled Seabed Crater
5	840 Sx "G"	375-405m Filled Seabed Crater from lost surface hole.

MUD TYPE	INTERVAL
SEAWATER WITH PREHYDRATED GEL	SEAFLOOR - 1030m
KCL / POLYMER	1030m - 2525m

BIT SIZE	INTERVAL
26" with 36" Hole Opener	SEAFLOOR - 474m
$17\frac{1}{2}$" Pilot/26" Hole Opener	474m - 1030m
$17\frac{1}{2}$"	1030m - 2087m
$12\frac{1}{4}$"	2087m - 2525m

CASING

SIZE	SHOE	TYPE & CEMENT
30"	473	310 ppf, X-52 Lead: 640 Sx Class "G" Tail: 390 Sx Class "G"
20"	1024	310 ppf, X-56 Lead: 2800 Sx Class "G" Tail: 1000 Sx Class "G"
$13\frac{3}{8}$"	2080	72 ppf, N-80 Lead: 1515 Sx Class "G" Tail: 650 Sx Class "G"
$9\frac{5}{8}$"	2510	53.3 ppf, P-110 Lead: 88 Sx Class "G" Tail. 625 Sx Class "G"

WELLSITE CORE DATA

No.	INTERVAL	CUT (m)	REC (m)	%	LOG COR (m)
1	2129.0-2157.0	28.0	27.65	98.9	+1.6 - +1.8
2	2157.0-2185.0	28.0	27.74	99.0	+1.3
3	2305.0-2315.0	10.0	1.64	16.4	+0.8
4	2315.0-2344.0	29.0	26.90	92.8	+1.5 - +3.1
5	2344.0-2364.5	20.5	19.28	94.0	+1.7 - +1.5
6	2364.5-2392.5	28.0	25.92	92.6	+2.5 - +3.1
7	2392.5-2405.0	12.5	12.15	97.2	+1.0
8	2405.0-2424.0	19.0	14.84	78.0	+1.0 - +3.3
9	2424.0-2442.0	18.0	17.00	94.4	+1.8
10	2442.0-2462.0	20,0	18.33	91.7	+1.2 - +2.8
	ALL DEPTHS IN mRKB				

TESTING

No.	INTERVAL	RATE BOPD	GOR SCF/BBL	CHOKE	°API
1	2411.5-2415.5 2421.0-2424.0	4922	381	1.414"	22.5
2	2348.5-2365.0	4540	648*	2.000"	26.3

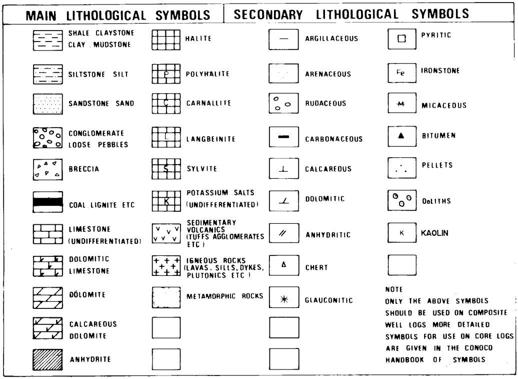
* Not representative of majority of the test, 490 SCF/BBL

AUTHORS: CARL F. GYLLENHAMMAR	**APPROVED:**
DRAFTED: H. LAWRENCE (EXLOG)	**DATE:**

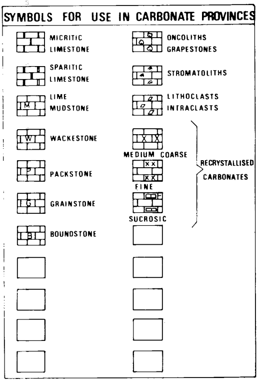
REMARKS:

MWD LOGS RUN FROM 473m TO T.D.

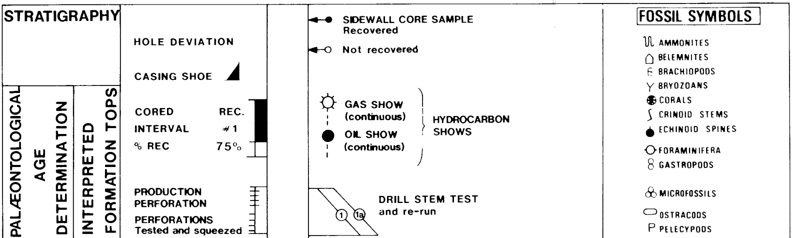
WIRELINE LOGS (EXCEPT CBL/VDL/GR/CCL) RUN FROM 2079m TO T.D.



NOTE
ONLY THE ABOVE SYMBOLS SHOULD BE USED ON COMPOSITE WELL LOGS MORE DETAILED SYMBOLS FOR USE ON CORE LOGS ARE GIVEN IN THE CONOCO HANDBOOK OF SYMBOLS



LITHOLOGY



◄ 1 REPEAT FORMATION TEST

SHELL FRAGMENTS

SYSTEM

SUB-SYSTEM

STAGE

GROUP

FORMATION

GAMMA RAY LOG
A.P.I. UNITS
0 150
150 300

DEPTH
SCALE
1:500

GRAPHIC
LITHO-
LOGY

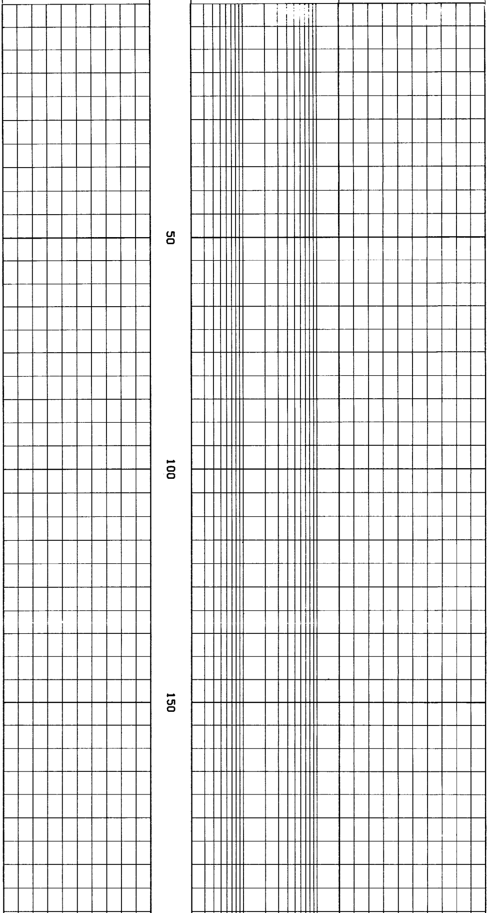
RESISTIVITY LOG
SFLU
0.2 ohmm 20
ILD
0.2 ohmm 20
BACKUP x 100

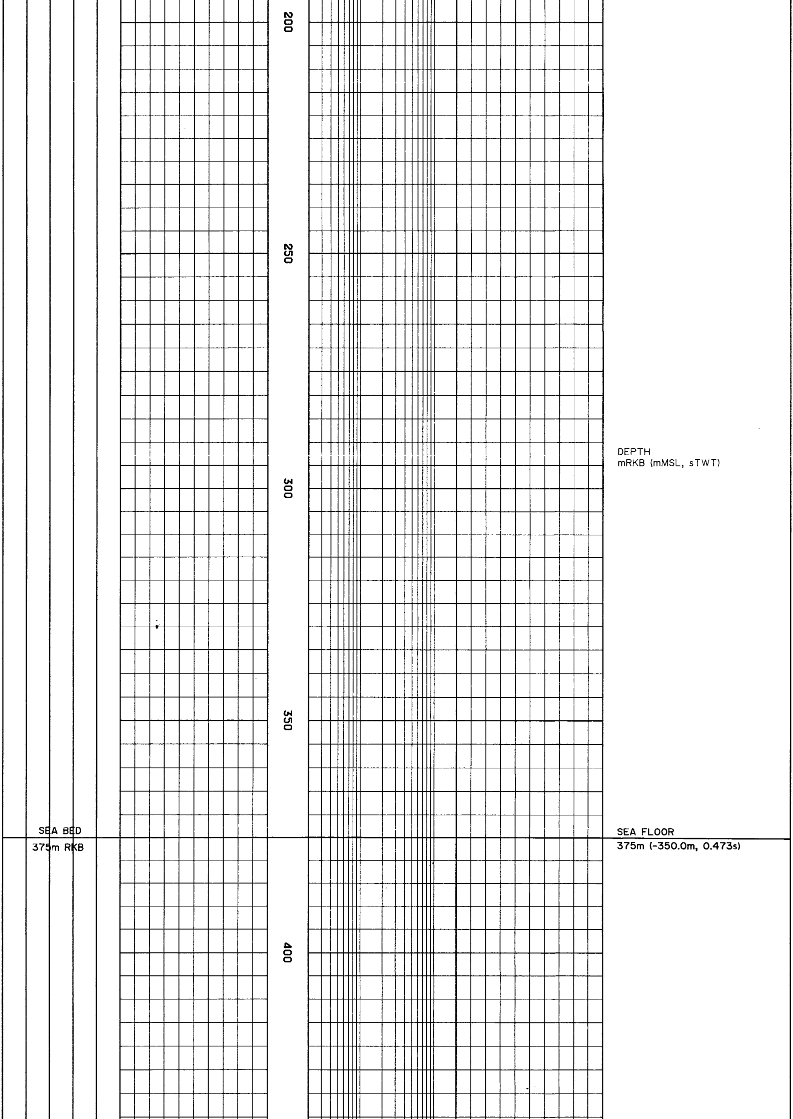
INTERVAL TRANSIT
TIME
Δt
μ sec/ft
140 40
240 140

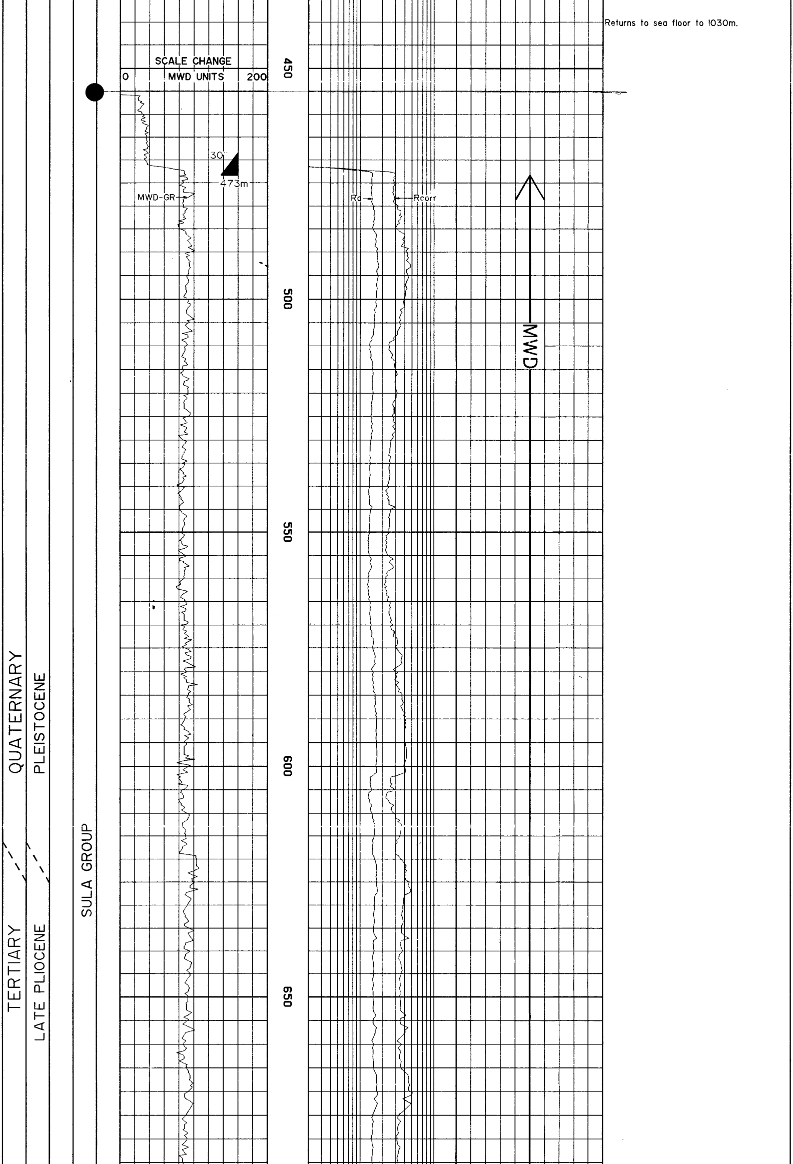
CUTTINGS
LITHOLOGY
AND REMARKS

BIOSTRATIGRAPHY

BY STRATLAB



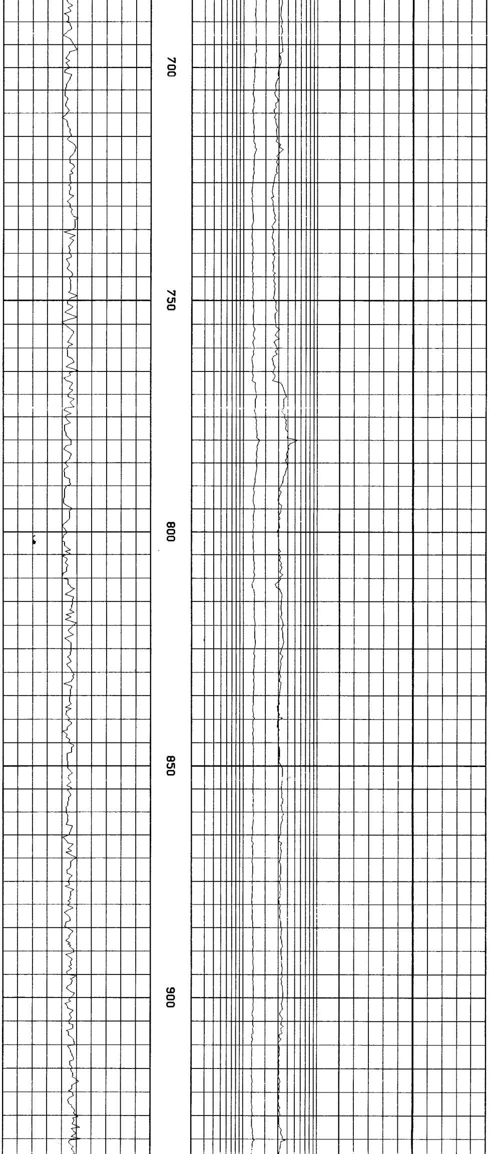


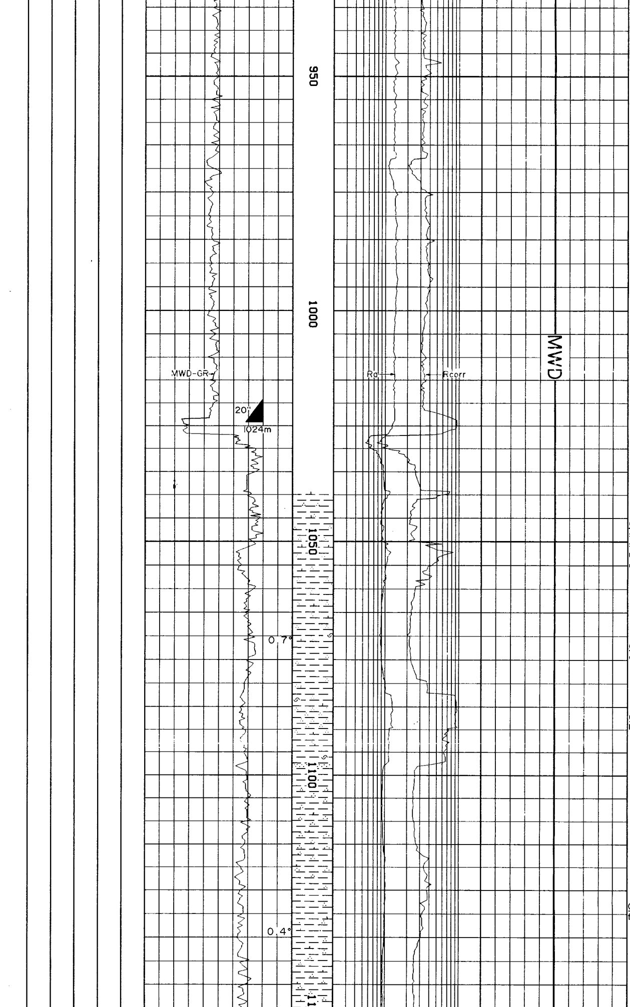


TERTIARY

LATE PLIOCENE

SULA GROUP





CLAY: grey, soft, sticky, clay to coarse sand, sand, very poorly sorted, calcareous, sand content approximately 20%, subangular, moderate sphericity, clear, colourless quartz.

CLAY: as above, with less coarse sand, occasional shell fragments.

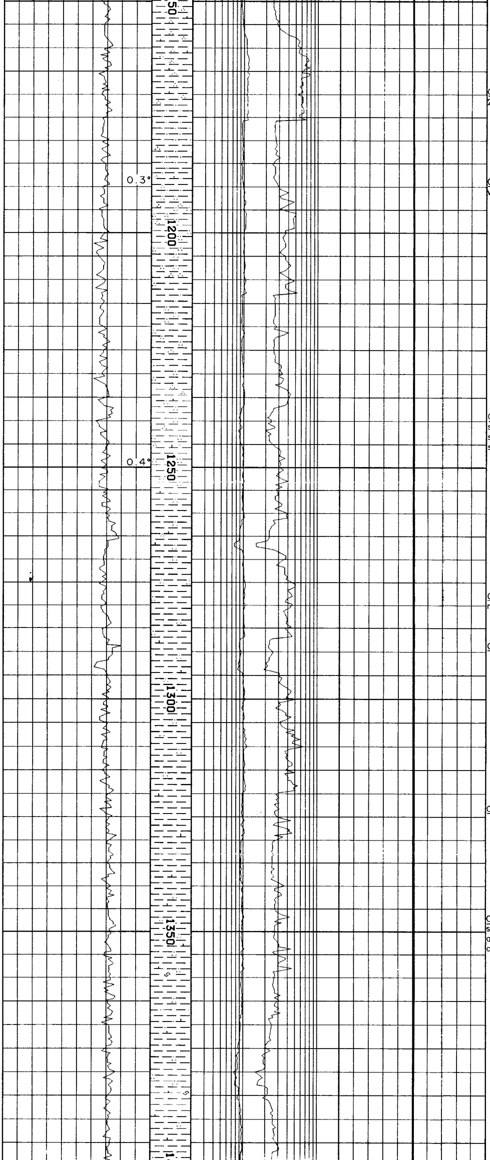
CLAY: as above, approximately 40% sand, lithic fragments, shell fragments.

CLAY: as above, few coarse sand grains, few rock fragments.

TERTIARY

LATE PLIOCENE

SULA GROUP



CLAY: as above, much less sand, (approx. 20%) slightly calcareous.

CLAY: as above, with approx. 50% sand, very slightly calcareous.

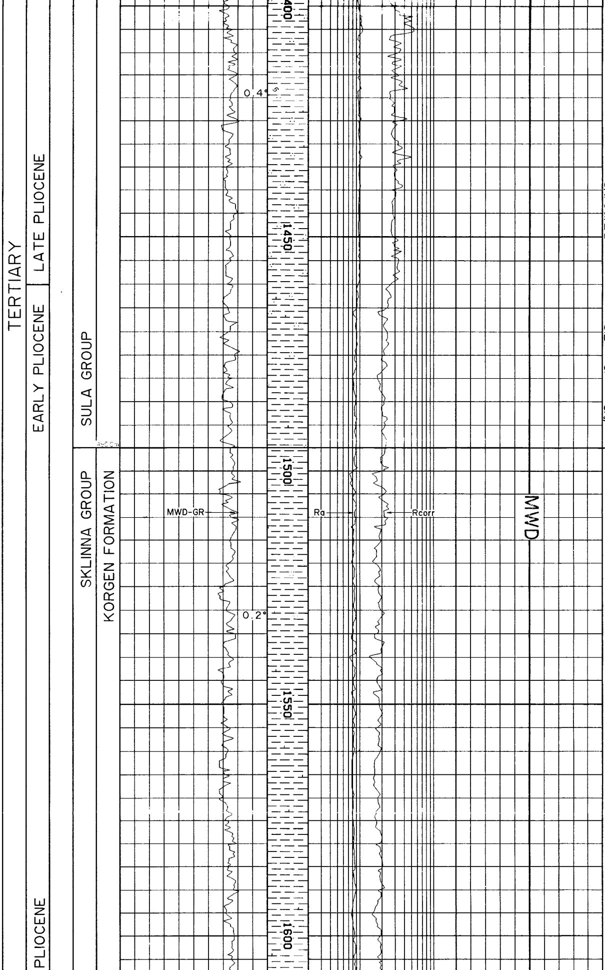
CLAY/ARGILLACEOUS SAND: grey, soft, sticky, clay to coarse sand, very poorly sorted, SAND grains, angular to subangular, subspherical, calcareous.

CLAY: as above, sand very fine to medium, more clay.

CLAY: as above, more fine sand.

CLAY: as above, more clay.

CLAY: grey, soft, sticky, clay to medium sand, very poorly sorted, quartz grains angular to subangular, subspherical, calcareous, rare coarse sand.



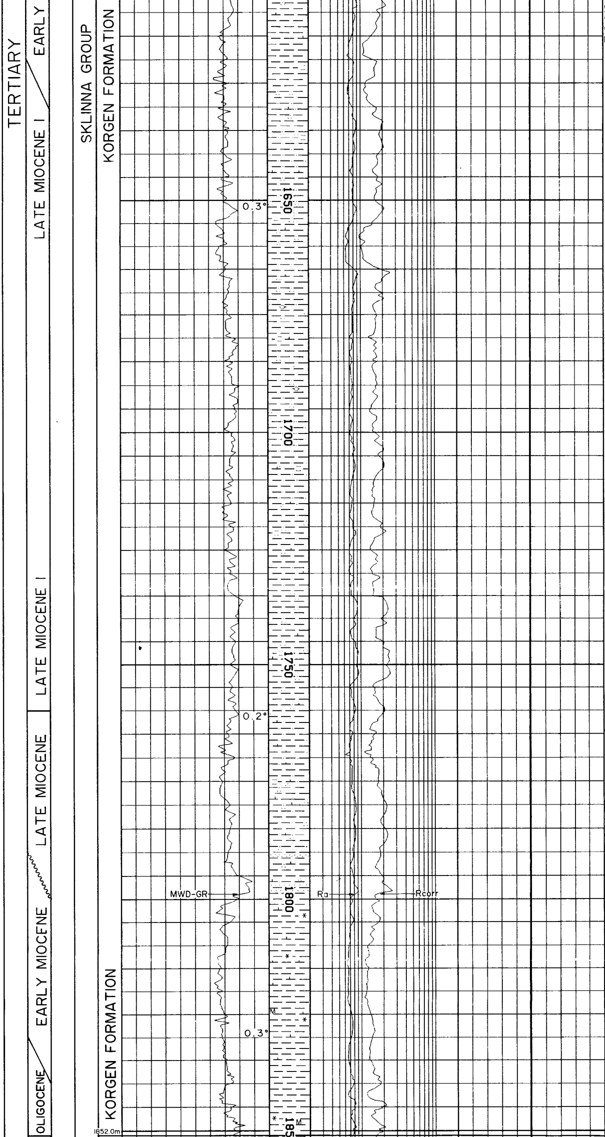
CLAY: grey, occasionally very slightly green soft, sticky, clay to coarse sand, calcareous.
SAND: angular to subangular, subspherical, predominantly quartz with some metamorphic rock fragments.

CLAY: as above, very slightly calcareous, less sand.

CLAY: as above, less than 10% sand.

CLAY: as above, very little sand, slightly sticky.

TOP KORGEN FORMATION
1495m (-1470m, 1.456s)



CLAY/ARGILLACEOUS SILTSTONE: light grey to grey, black specks, soft in part, occasionally sticky, clay to medium sand, poorly sorted, calcareous, pyritic.

ARGILLACEOUS SILTSTONE: as above with rare forams.

ARGILLACEOUS SILTSTONE: with more calcite.

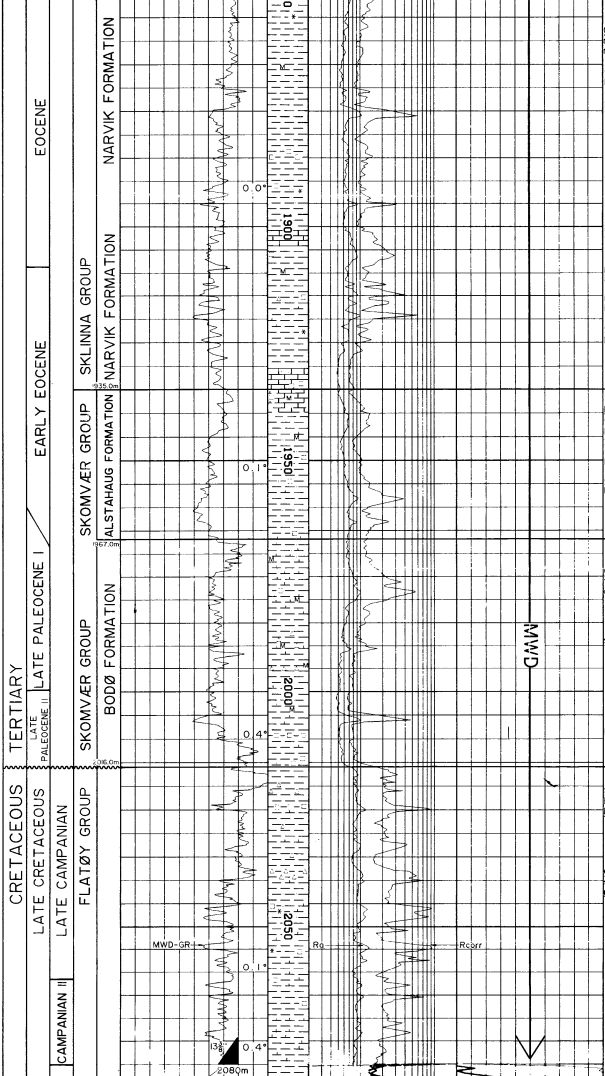
ARGILLACEOUS SILTSTONE: with more loose quartz, rock fragments.

ARGILLACEOUS SILTSTONE: with 10% quartz, rock fragments, coarse sand size, hard, angular, elongate to subspherical, melanocratic ancillary minerals.

CLAYSTONE: mid green grey, crumbly to blocky, moderately sorted, firm, slightly calcareous, micaceous, trace quartz grains.
TR CLAYSTONE: dark olive grey, very common black specks, firm, waxy, well sorted, bimodal, non calcareous, glauconite.

CLAYSTONE: white to light grey, soft to firm, blocky, non calcareous.

TOP NARVIK FORMATION



1852.0m (-1827.0m, 1.77s)

CLAYSTONE: dark olive grey, blocky, firm, non calcareous, slightly glauconitic, trace mica.

CLAYSTONE: dark olive grey, very common black specks, firm, waxy, bimodal, non calcareous, glauconitic.
CLAYSTONE: mid orange brown, hard, splintery, non calcareous, micromicaceous.

Pyritic.

SILTSTONE: light grey, olive brown, brown grey, sucrosic, crumbly, medium sorting, argillaceous, pyritic, glauconitic.

CLAYSTONES: as above.

LIMESTONE: white, moderately hard, blocky to firm, crumbly.

CLAYSTONES: varicloured, predominantly purple, orange, brown, occasionally olive brown, translucent, firm to hard, non to slightly calcareous, pyritic, occasionally micromicaceous, occasional glauconite, in part silty, in part cherty.

CLAYSTONES: as above, becoming predominantly purple grey.

TOP ALSTAHAUG FORMATION

1935m (-1910m, 1.851s)

LIMESTONE: white to buff, soft, argillaceous, occasionally silty, quartzitic, pyritic.
CALCAREOUS CLAYSTONE: copper brown, crumbly, soft, occasionally silty, calcareous, pyritic, banded micromica.

CLAYSTONES: as above, predominantly light grey / purple grey.

TOP BODØ FORMATION

1967m (-1942m, 1.877s)

CALCAREOUS CLAYSTONE: copper brown to light brown, firm to moderately hard, occasionally silty, pyrite, micromica.

SILICIFIED CLAYSTONE: buff to light grey, translucent in part, splintery, hard to very hard, banded micromica, cherty.

Nodular pyrite.

TOP FLATØY GROUP

2016m (-1991m, 1.916s)

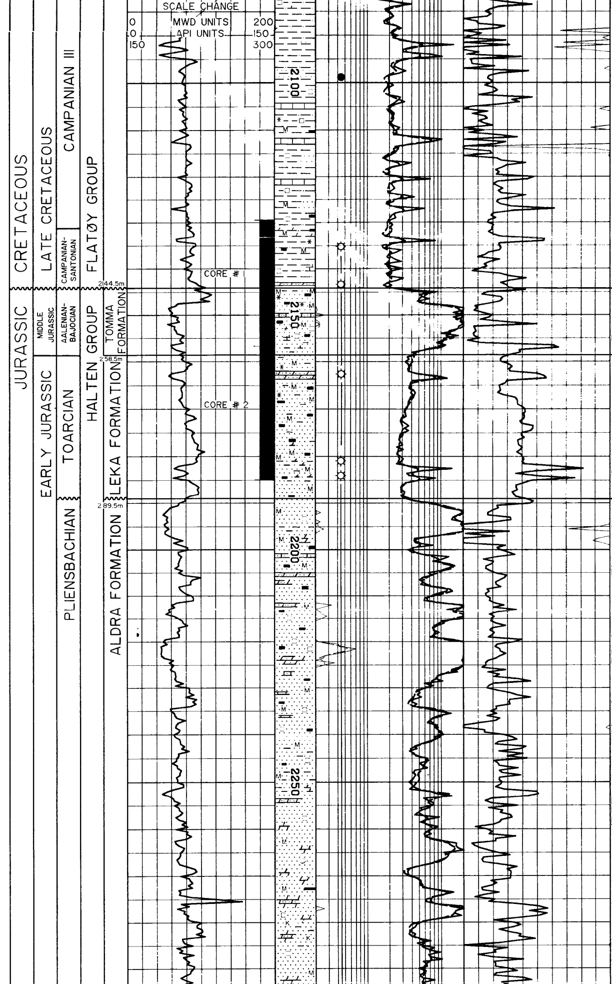
SILICIFIED CLAYSTONE: copper brown, brown, moderately hard, siliceous cement.
NODULAR PYRITE: 10% of all cuttings.

CHERT: light grey, translucent, hard, splintery, occasional pyrite, argillaceous in part.

CLAYSTONE: variable, brown, grey, green, buff, soft to firm, occasionally silty, calcareous in part, pyrite, rare glauconite.

CALCAREOUS CLAYSTONE/LIMESTONE: off white, buff, soft, very calcareous, argillaceous.

CLAYSTONE: predominantly brown, soft to firm, silty, slightly calcareous in part, rare pyrite.



CLAYSTONE: light to medium grey, soft, black specks, non to very slightly calcareous.

SANDSTONE: light brown oil stain, silt to medium sand, poorly sorted, angular to subangular, well cemented, non calcareous, MEDIUM SHOW, LIGHT BROWN/YELLOW, SLOW STREAMING CREAM TO WHITE CUT.

LIMESTONE: medium grey, very hard, amorphous.

CLAYSTONE: medium grey, soft, sticky, sandy, silty, black specks, mica, slightly to moderately calcareous.

SAND: loose transparent quartz, very fine to fine, occasionally coarse, rounded.
TR PYRITE.

SHALE: dark grey to dark brown grey, trace silt and sand, mica, black specks, fissile to subfissile, non calcareous.

TOP TOMMA FORMATION

2144.5m (-2119.5m, 2.017s)

SANDSTONE: light brown, loose to friable, very fine, subangular to subrounded, poorly to moderately cemented, mica, glauconite, black specks, SLOW FAINT CRUSH CUT.

TOP LEKA FORMATION

2158.5m (-2133.5m, 2.027s)

ARGILLACEOUS SANDSTONE: dark grey brown, very fine, friable, silty, subangular to subrounded, moderately sorted, moderate cement, glauconite, mica, non calcareous, TR CUT.

DOLOMITIC SILTSTONE: dark brown grey, very hard, very sandy, mica, dolomitic matrix.

TOP ALDRA FORMATION

2189.5m (-2164.5m, 2.048s)

SANDSTONE: light brown, soft, fine to very fine, coarse in part, subrounded, poorly sorted, mica, pyrite.

TR COAL

DOLOMITE/DOLOMITIC SANDSTONE: light brown to brown, hard, sandy, occasionally amorphous.

SANDSTONE: light yellow, very fine to very coarse, predominantly moderately sorted, rounded, occasional dolomite matrix, pyrite, PINPOINT FAINT YELLOW FLUORESCENCE

TR LIMESTONE: light grey, hard, amorphous.

ARGILLACEOUS SANDSTONE: light grey, soft, very fine, silty, pyritic, mica, black specks.

DOLOMITIC SANDSTONE: light brown, very hard to hard, amorphous, possibly SANDY DOLOMITE.

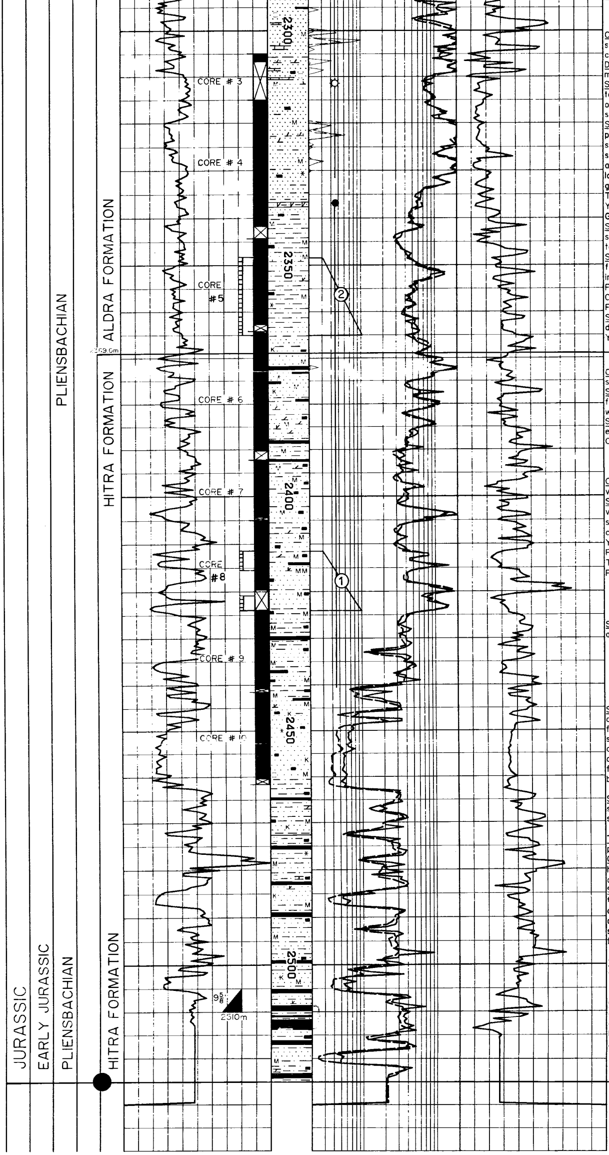
SANDSTONE: light grey, very fine to coarse, predominantly fine, rounded, pyrite, mica.

TR COAL

DOLOMITE: light brown, very hard, very sandy, amorphous.

SANDSTONE: white, light grey, soft, fine to very fine, occasionally very fine to very coarse, subrounded, occasional argillaceous /kaolinitic matrix, mica, pyrite.

TR LIMESTONE/COAL.



CLAY: medium grey, soft, sticky, black specks, micropyrite, sandy, moderately calcareous.
DOLOMITIC SANDSTONE: light yellow brown medium to coarse, good dolomite cement.
SANDSTONE: light grey to white, very fine to very coarse, predominantly medium, occasional moderate calcite cement, black specks, mica, pyrite.
SANDSTONE: light grey, loose to firm, predominantly fine, moderately to well sorted, subangular to subrounded, moderate sphericity, mica, black specks, very slightly argillaceous, occasional COAL and mica laminae, occasional dolomite cement, glauconite, SPOTTY TO PATCHY FAINT TO MEDIUM FLUORESCENCE, FAINT YELLOW STREAMING CUT, POOR TO GOOD VISIBLE POROSITY.
SILTSTONE: medium grey, occasional oil stain, friable to moderately hard, subfissile to blocky, argillaceous, mica, black specks.
SANDSTONE: brown oil stain to grey, very fine to fine, silty, argillaceous, calcareous in part, mica, UNIFORM BRIGHT YELLOW FLUORESCENCE, STREAMING MEDIUM CREAM CUT, PATCHY YELLOW RESIDUE, FAIR VISIBLE POROSITY.
SILTSTONE: as above, trace calcite/ dolomite, trace glauconite, brown oil stain, YELLOW FLUORESCENCE, WHITE CUT.

TOP HITRA FORMATION

2369m (-2344m, 2.183s)

COAL: black, firm to moderately hard, subfissile, lustrous.
SANDSTONE: brown oil stain, friable, very fine to medium, moderately to well sorted, with abundant COAL laminae.
SILTSTONE: as above, no direct fluorescence, occasional SPOTTY-PATCHY FAINT CUT.

CLAYSTONE: organic rich, coal inclusions, very hard.
SANDSTONE: brown oil stain, loose to firm, very fine to medium, moderately to well sorted, subangular to subrounded, mica, carbonaceous fragments, UNIFORM BRIGHT YELLOW TO CREAM FLUORESCENCE, FAST EVEN STREAMING BRIGHT YELLOW TO CREAM CUT, FAIR TO EXCELLENT POROSITY.

SANDSTONE, SILTSTONE, CLAYSTONE and COAL: generally as above.

SANDSTONE: off white to light grey, abundant pink quartz, loose to firm and friable, moderately to very well sorted, subangular to rounded, rarely argillaceous and poorly sorted, occasional kaolin, occasional mica, abundant carbonaceous fragments, circular pyrite concretions at base, trace glauconite, no show.

SILTSTONE: dark brown grey, firm, crumbly subfissile, micromicaceous, black and brown specks in part.

TR DOLOMITE: light grey brown, nodular pyrite.
COAL/LIGNITE: brown to black, moderately hard to firm, vitreous, occasional lustre, occasional subconchoidal fracture.
SANDSTONE: clear, loose to hard, very fine to very coarse, predominantly fine to coarse, subangular to subrounded, occasional calcite/dolomite cement, rare silica cement, well sorted, kaolin in part, trace glauconite, no show.

SANDSTONE: generally as above, less cement.

COAL: black, occasionally brown, soft, occasionally firm to moderately hard, occasional subconchoidal fracture, fibrous, blocky
SILTSTONE: varicoloured, soft to moderately hard, blocky, rarely subfissile, micromica, carbonaceous specks. occasional coal. laminations.

TD 2525.0m RKB

DST #1

TEST RESULTS SUMMARY

Date of Test : 22 -25 August 1986
Formation : HITRA Sands (Three)
Perforated Intervals : 2411.5 - 15.5 and 2421 - 24 Meters LDL/CNL
Mid-Perforation Depth : 2417.75 Meters
Initial Flow Period : 45 Meters
Initial Buildup Period : 6 Hours 47 Minutes
Second Flow Period (Sampling Flow) : 31 Hours 4 Minutes
Second Buildup Period : 6 Hour 38 Minutes
Final Flow Period (Sand Sensitivity Test) : 18 Hours 33 Minutes
Final Buildup Period : 8 Hours 5 Minutes

FLOW PERIOD RESULTS

	Downhole Sampling	Separator Sampling
Surface Choke - Inches	12/64"	12/64"
Oil Rate - STBOPD	461	460
Separator Gas Rate - MSCF/D	159	155
BS & W - %	Trace	0
Separation GOR - SCF/Bbl	346	337
Estimated Total GOR - SCF/Bbl	366	359
Wellhead Pressure: Ave. - psig	851.9	852.1
Wellhead Temperature: Ave. - °F	48.4	48.3
Ave. Separation Pressure - psig	114	111
Ave. Separation Temperature - °F	119	108
Downhole Pressure: Ave. - psig	3620.9	3613.7
Downhole Temperature: Avg. - °F	176.4	178.5
Oil Gravity - °API at 60°F	22.3	22.5
Separator Gas Gravity	0.628	0.624
H_2S (Max. Reading) - PPM	-	0
CO_2 (Max. Reading) - %	3.0	3.0
Calculated Cum Oil Production STBbls	339	400

BUILDUP ANALYSIS RESULTS

Formation Pressure at Mid-Perfs : 3561.2 psia = 3435.4 psig ± 7 pis
Pressure Gradient : 0.4631 psi/ft ± 0.0009 psi/ft
Mud Weight Equivalent : 8.92 ppg ± 0.017 ppg

Formation Temperature : 191°F (Best Estimate)
Temperature Gradient : 2.21°F/100 ft (Ref: 32°F at Mudline)

Formation Flow Capacity - $k_o h$(md-ft) : 126,000

Oil Permeability - k_o(md) : 4500md (IF h = 8.5 meters)

Skin Factor - S (Dimensionless) : - 1.53

Effective Wellbore Radius - r_{we} : 2.37ft.

Distance to Nearest Linear Boundary : 300 - 350 ft

Ratio of Last Tangent Slope to "Kh" Slope: 8.76

"Apparent" Depletion Indicated by Last Tangent Slope: 60.5 psi

Theoretical PI a Well 1500' from Nearest Boundary - STBOPD/psi: 57

DST #2A

TEST RESULTS SUMMARY

Dates of Test : 27-30 August 1986
Formation : ALDRA (5 Porosity Stingers)
Perforated Interval : 2348.5-2365 Meters LDL/CNL
Mid-Perforation Depth : 2356.75m
First Flow : 12 Minutes
First Buildup : 2 Hours, 3 Minutes
Final Flow : 55 Hours, 17 Minutes
Final Buildup : 9 Hours, 11 Minutes
High Rate Portion : 6 Hours, 30 Minutes

FLOW PERIOD RESULTS

	SAMPLING PORTION			High Rate
Surface Choke - Inches	12/64	16/64	8/64	Portion
Oil Rate - STBOPD	418	570	135	4540
Separation Gas Rate - MSCF/D	201	282	60.6	2631
BS&W - %	TR Sand	0-5H_2O/Tr Sand	TR Sand	TR Sand
Separation GOR-SCF/Bbl.	480	494	449	580
Estimated Total GOR-SCF/Bbl	531	524	454	648
Wellhead Pressure - Psig	738.3	665.8	714.0	375.7
Wellhead Temperature - F°	50.6	50.9	51.6	103.3
Separation Pressure - psig	118	120	83	327
Separation Temperature - F°	113	111	105	94.4
Downhole Pressure - Psia	3100.5	2933.3	3100.0	1998.2
Downhole Temperature - F°	170.8	172.8	171.8	174.2
Oil Gravity - °API 60°F	26.2	27.0	26.7	26.6
Separation Gas Gravity	0.666	0.658	0.669	0.614
CO2 (Max. Reading) - %	2.2	2.2	2.3	1.7
H2S - PPM	0	0	0	0
Cum. Oil Produced - STBbls	520	613	730	1528

BUILDUP ANALYSIS RESULTS

Formation Pressure At Mid Perfs : 3583.4 psia
Pressure Gradient : 0.4665 psi/ft
Mud Weight Equivalent : 8.98 ppg

Formation Temperature : 174°F
Temperature Gradient : 2.19°F/100ft (0.0719°/m) (Ref.:32°F At Mudline)

Formation Flow Capacity, $K_o h$: 3660 md-ft

Oil Permeability, K_o : 130 md. (If h = 10m = 32.8 ft)

Skin Factor, S : - 2.49

Effective Wellbore Radius, r_{we} : 6.15 ft

Distance To Nearest Type Boundary: 250 ft

Ratio Of Last Tangent Slope To "Kh" Slope: 3.60

"Apparent" Depletion Indicated By Last Tangent Slope: 240 psi

Theoretical PI for a Well 1500' from Nearest Boundary - STBOPD/psi: 2.4

CORE CHIP DESCRIPTION (NON SHIFTED DEPTHS)

CORE NO. 1 Cored 2129.0-2157.0m (28m) Rec. 98.9%

2129.0-2143.0m CLAYSTONE/SHALE: dk gy-dk bn, frm-mod hd, blky-fis, slty, bk specks, mica, occ pyr, occ sl calc, tr fnt cut from 2136m, tr show from 2139m.

2143.0m DOLOMITIC SANDSTONE: m gy-bn, VF sd, sl slty, SA, mod-w srtd, vw cmtd, dol cmt, v hd, bk specks, mica, no show.

2144.0-2156.65m SANDSTONE: lt bn, VF-F sd, SA SR, w srtd, fri-los, p cmtd, occ v hd w/calc cmt, bk specks, mica, glau, slow fnt cruch cut.

CORE NO. 2 Cored 2157.0-2185.0m (28m) Rec. 99%

2157.0-2184.72m SANDSTONE: m gy- gy bn, fri-mod hd, VF-Fsd, mod srtd, mod cmtd, OCC v hd w/dol cmt, slty, mica, occ glau, occ bk specks, arg, ptch, fnt show, tr cut.

CORE NO. 3 Cored 2305-2315.0m (10m) Rec. 16.4%

2305.0-2306.0m CLAYSTONE: m gy, sft, stky, slty, v sdy, VF sd, bk specks, micro pyr, v sdy, VF sd, occ M sd, m calc, tr show, tr cut.

2306.0-2306.25m DOLOMITIC SANDSTONE: lt yl, bn, M-C sd, SR, w srtd, vw cmtd, dol cmt, v hd, bk specks, tr mica. P-P, bn yl fluor, slow, streaming, fnt, crm, cut.

2306.25-2307.64m SANDSTONE: lt gy, sft, stky, VF sd w srtd, slty, arg, fri, tr calc cmt, bk specks, mica, sl calc, tr show.

CORE NO. 4 Cored 2315.0-2344.0m (29m) Rec. 92.6%

2315.0-2335.0m SANDSTONE: lt gy, frm, F-VF sd, SA-SR, w srtd, sl arg, sl calc ip, bk specks, mica, glau ip, w/claystone lams. Unf, fnt, yl, fluor, slow, stream-even, fnt,crm, cut.

2335.0-2341.9m SILTSTONE and SANDSTONE:
SLTS: m gy, lt bn oil stain ip, fri-mod hd, blky-sb fis, arg mtx, mica, bk specks, Unf-Str, m, yl, fluor, slow, fnt-m, crm, cut.
SDST: lt bn oil stain, VF sl, w srtd, fri, m cmtd, fri, mica, bk specks, non calc, w/ coal lam ip.

CORE NO. 5 Cored 2344.0-2364.5m (20.5m) Rec. 94%

2344.0-2363.28m SILTSTONE: dk gy, bn gy, occ bn oil stain, mod hd-hd, sbfis-fis, mica, bk specks, arg, glau ip, occ sl calc/dol, v calc ip, occ sndy. Unf, m-bri, yl fluor, streaming, m, crm, cut.

CORE NO.6 Cored 2364.5-2392.5 (28m) Rec. 92.6%

2364.5-2390.42m SANDSTONE: interbedded w/SHALE & COAL:
lt yl-lt gy, bn oil stain, fri-mod hd, F-VF sd, M sd ip, w-mod srtd, p srtd ip, m-w cmtd, kao mtx, dol mtx ip, slty, bk specks, mica, sl calc ip, Unf, bri, yl, fluor, fast, even, bri, yl-crm cut.
SHALE: bk, dk gy-bn, sbfis-fis, frm, slty, mica, sl dol, carb mat.
COAL: bk, frm-m hd, sbfis, bri.

CORE NO. 7 Cored 2392.5-2405.0m (12.5m) Rec. 97.2%

2392.5-2404.65m SILTSTONE & SANDSTONE interbedded w/COAL:
SLTSD: m gy, m bn gy, mod hd, sbfis, occ sdy, mica, sl dol, coal linses, no show.
SDST: bn oil stain, clr gr, VF-F sd, M sd ip, SR-SA, mod srtd, sl calc cmt ip, bk specks, mica, coal linses, arg ip.
Unf, bri, yl fluor, fast, even, bri, yl, crm, cut.
COAL: bk, fis, erty-silty, frm, sb conch.

CORE NO. 8 Cored 2405.0-2424.0 (19m) Rec. 78%

2405.0-2414.0m SILTSTONE w/SANDSTONE Beds & COAL linses
SLTST: m bn gy-m gy, frm-mod hd, sb fis, mica, sl dol, bk specks, coal linses, no show.
SDST: bn oil stain, sft-frm, mod-p cmtd, VF-F sd, SA, non-v sl calc, mica, arg. bk specks, no show to Unf, bri, yl, fluor, fast even, bri, crm, cut.

2415.0-2419.85m SANDSTONE: bn oil stain, clr gr, sft-frm, v hd ip, dol mtx ip, crs-VF sd, w srtd, SA-SR, bk specks, mica, coal linses.

CORE NO. 9 Cored 2424.0-2442.0m (18m) Rec. 94.4%

2424.0-2442.0m SILTSTONE & SANDSTONE Interbedded:
SLTST: m-dk gy, frm-hd, sbfis, sdy, mica, coal linses, non calc, pos silicified, tr show.
SDST: lt yl bn oil stain, sft-fri, mod cmtd, M-VF sd, mod-w srtd, mod-w rnd, n-v calc, mica, v mica ip, coal, unf, m-bri, crm, fluor, fast, even-strmg, crm, cut.
COAL bed: bk, frm, fis, vit, non calc.

CORE NO. 10 Cored 2442.0-2462.0m (20m) 91.7%.

2442.0-2443.0m ARGILLACEOUS SILTSTONE w/COAL bed: gy-bn gy, mod hd, blky-splty, sbfis, v mica, v carb, n calc.

2440-2460.33m SANDSTONE: lt gy-off wh, lse-fri, F-Msd, crs sd ip, w srtd, p-mod srtd ip, calc/dol cmt ip, kao, mica, bk specks, glau ip, pyr ip, no show.