Esso Norge AS

GEOLOGICAL COMPLETION REPORT

WELL 25/9-2S

Drilling Permit 1056 L

February 2004

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GEOLOGICAL COMPLETION REPORT

WELL 25/9-2S

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Petoro

GEOLOGICAL COMPLETION REPORT

WELL 25/9-2S

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1. GENERAL INFORMATION

1.0 Introduction

Exploration well 25/9-2S was drilled by the semi-submersible drilling unit Deepsea Trym to test the ISAK prospect in PL189. The well was located east of the Jotun and the Ringhorne fields and had the Middle Jurassic Brent reservoir in a stratigraphic pinchout trap as the primary target.

Initial “Shallow Hazard Site Survey” indicated moderate probability of shallow gas. The surface location was therefore moved 490 m to an area showing low probability of shallow gas. The result was the need to drill a deviated well with maximum sail angle of 26.44 degrees. A 9 5/8” slim hole well design was chosen instead of a 13 3/8” surface casing design, based on earlier experience in the field, and due to no production testing planned for the well.

Mobilization operation started July 15, 2003, and the well was spudded July 18, 2003. The well was drilled to a total depth of 2250 m MDRKB (2114 m TVDSS) in the Dunlin Group shales. A thin water-wet sand of Callovian age (Hugin Fm) was encountered. The Brent reservoir was not present as prognosed and no hydrocarbons were identified. MWD was the only logging program run in the well. No wireline program was run, and the well was permanently plugged and abandoned as a dry hole. The Final Rig Release (FRR) occurred on August 3, 2003 after a total of 18.9 days.

Figure 1.1 and 1.2 show the well location and well result versus prognosis.

PL189 Location Map

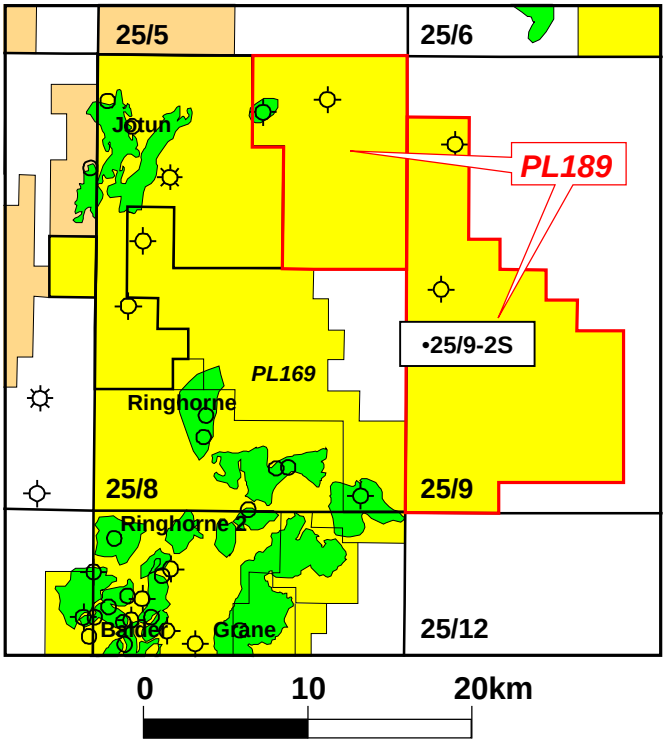


Figure 1.1

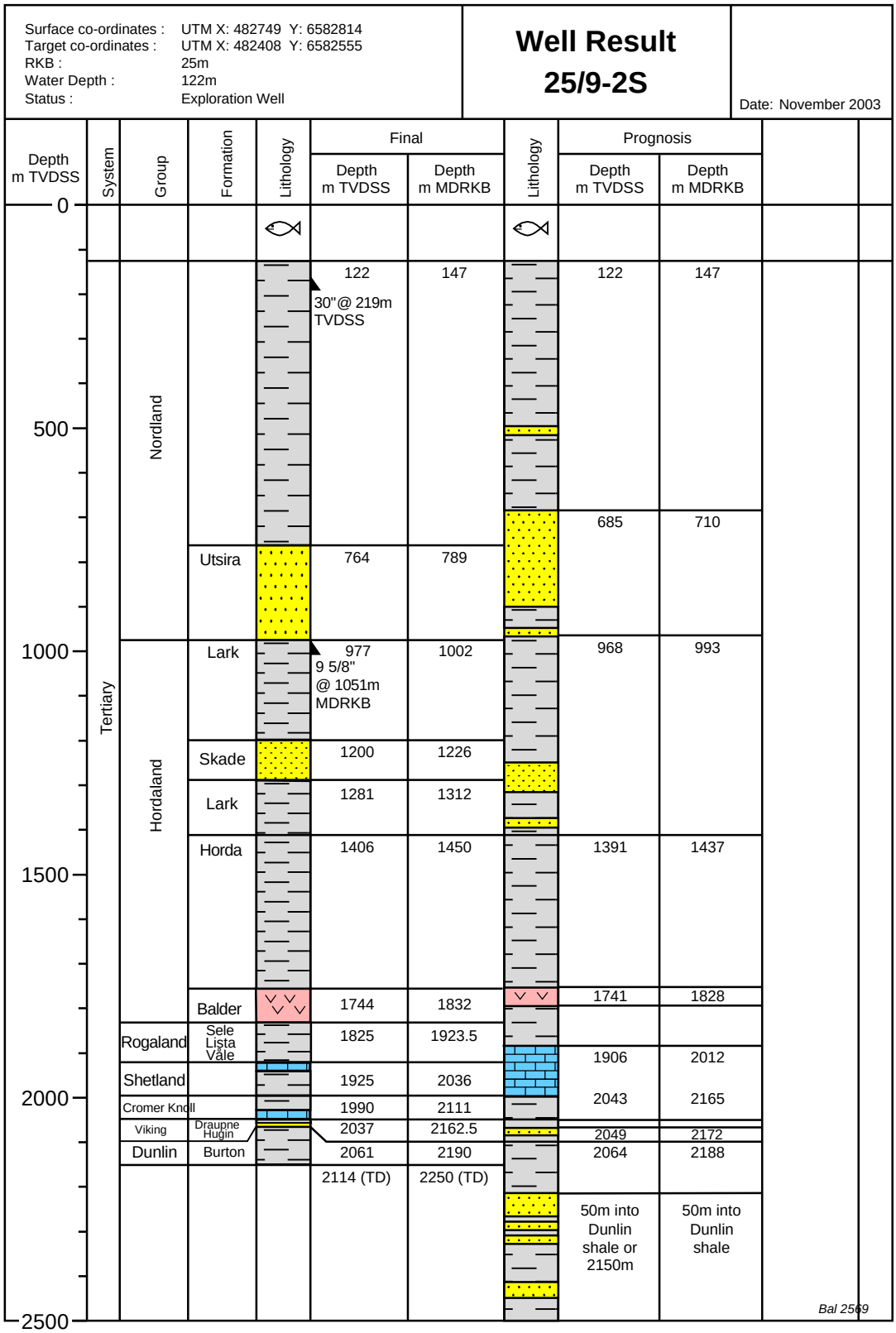

Surface co-ordinates : UTM X: 482749 Y: 6582814
Target co-ordinates : UTM X: 482408 Y: 6582555
RKB : 25m
Water Depth : 122m
Status : Exploration Well
Well Result
25/9-2S
Date: November 2003
Depth m TVDSS
System
Group
Formation
Lithology
Final
Depth m TVDSS
Depth m MDRKB
Lithology
Prognosis
Depth m TVDSS
Depth m MDRKB
0
500
1000
1500
2000
2500
Tertiary
Nordland
Hordaland
Rogaland
Shetland
Viking
Dunlin
Utsira
Lark
Skade
Lark
Horda
Balder
Sele
Lista
Våle
Cromer Knoll
Draupne
Hugin
Burton
122
147
30"@ 219m TVDSS
122
147
685
710
764
789
977
9 5/8" @ 1051m MDRKB
1002
968
993
1200
1226
1281
1312
1406
1450
1391
1437
1744
1832
1741
1828
1825
1923.5
1906
2012
1925
2036
2043
2165
1990
2111
2037
2162.5
2049
2172
2061
2190
2064
2188
2114 (TD)
2250 (TD)
50m into Dunlin shale or 2150m
50m into Dunlin shale
Bal 2569

Figure 1.2

1.1 Well Summary 25/9-2S

Prospect	ISAK			
Well Name	25/9-2S			
Drilling Permit	1056 L			
Production License	PL189			
Operator	Esso Norge AS (45 %)			
Partners	Petoro(45%) Norsk Hydro (10%)			
Drilling Rig	Deep Sea Trym			
Well Type	Exploration Well			
Wellhead Location	X= 482 749.29 m E Longitude: 02° 41 min 46.970 sec E Y= 6 582 814.21 m N Latitude: 59° 22 min 56.270 sec N			
Location at TD Depth	X= 482 375.34 m E Longitude: 02° 41 min 23.360 sec E Y= 6 582 529.47 m N Latitude: 59° 22 min 47.010 sec N			
RKB to Sea Level	25 m			
Water Depth	122 m			
Shallow Gas Pilothole	A shallow gas pilothole was drilled to 1057m MDRKB. The site survey indicated shallow gas at the original vertical hole location. The well location was moved to avoid the shallow gas. MWD logs did not show any gas during drilling.			
Well Objective	Mid Jurassic sandstones			
Top Reservoir Target,	2185 m MDRKB (-2056.9 m TVDSS)			
Rig on Location	July 17, 2003			
Spud	July 18, 2003			
Drilled to TD	July 30, 2003			
Plugged and Abandoned	Aug 4, 2003			
Total Depth	2250 m MDRKB (-2114 m TVDSS)			
Hole size, Depth Inches m MDRKB	Casing Depth Inches m MDRKB		Mud type / weight (sg)	Leakoff/Fm Intgr. (sg)
36 223.4 9 5/8 pilot 1057 12 ¼ 1055 8 ½ 2250	30 218.0 20, 9 5/8 1051.4 		WBM 1.00 WBM 1.00 WBM 1.20 OBM 1.40	 1.650
Well status:	Dry hole, plugged and abandoned			

Table 1.1 Well 25/9-2S Summary

1.2 Operations Summary

Operations began on July 15, 2003 with mobilization and inspection activities at CCB outside Bergen. After mooring up at the well location, a 36" hole was drilled and 30" conductor was successfully run and cemented at 219 m MDRKB. Due to nearby original surface location showing moderate probability of shallow gas, a 9 7/8" gas pilot hole was drilled. The hole was then opened to 12 ¼" before the 20"x 9 5/8" surface casing was run and cemented at 1051 m MDRKB (1051 m TVDRKB) in the top of the Hordaland shale.

The 8 1/2" section was then drilled to 2250 m MDRKB (2139 m TVDRKB) in the Middle Jurassic Brent Group reservoir. Based on results from MWD data and cuttings samples, the well was concluded to be dry. The well was finally permanently plugged and abandoned. Figure 1.3 shows a drilling days vs. depth chart.

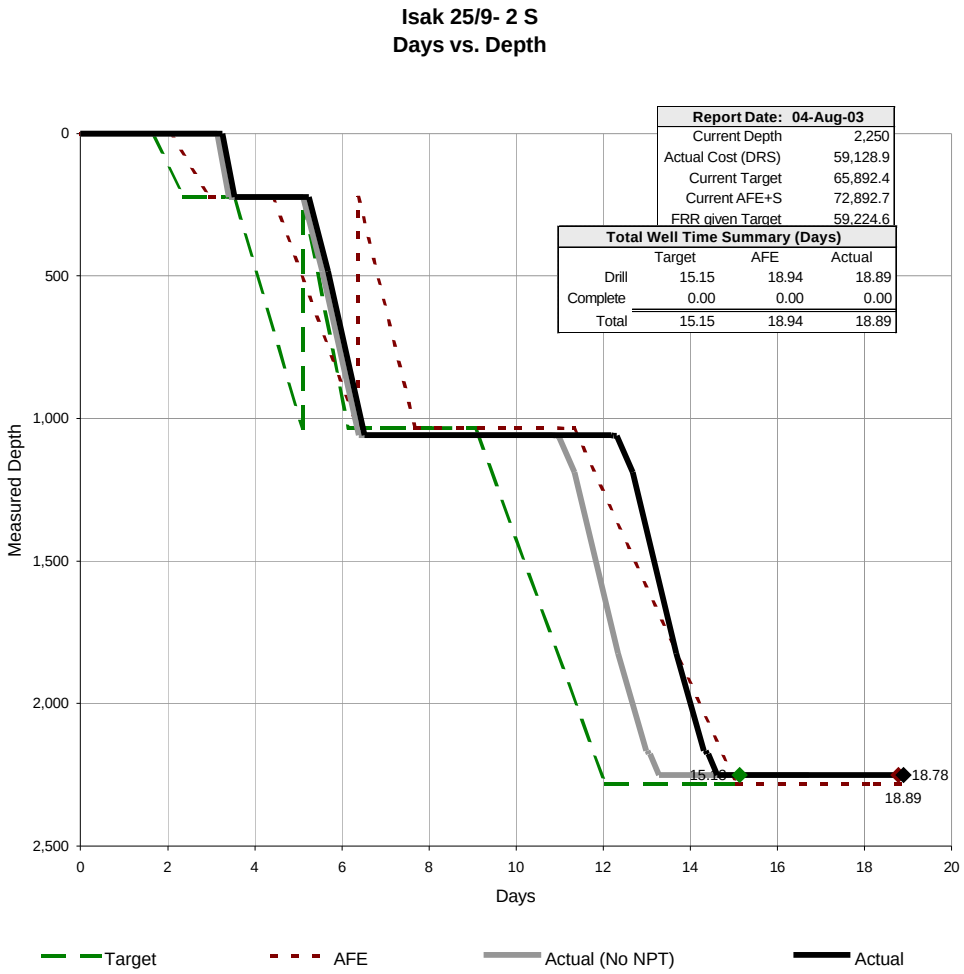


Figure 1.3

1.2.1 36" Hole Section

Interval:	147 m MDRKB (Seabed) – 223 m MDRKB
Inclination:	Vertical
Mud system:	Seawater + High viscosity polymer sweeps
Formations:	Nordland Gr (claystone with sandstone stringers)
Parameters:	100 - 130 RPM, 0 – 1 tons WOB, 4400 lpm.

The 36" hole section was drilled using a single stage 36” hole opener on top of a three stage (36” x 26” x 22”) hole opener and a 17 ½” bit. Seawater was pumped with a 8 m3 high-viscosity sweep every 15 meters to clean the hole. At TD, a 20 m3 high-vis sweep was pumped, before a wiper trip was performed to 9 m below mudline. When back on TD, the hole was displaced to 1,2 sg WBM. No boulders were encountered while drilling the 36” section, however drilled hard streak from 147 m – 154 m MDRKB.

Surveys were taken with the Anderdrift tool for directional control while drilling. The final well angle for the 36" hole was 0.5 degrees.

Average ROP during this section: 11,8 m/hr including connections.

The 30” conductor and Low Pressure Housing was then run with the Permanent Drilling Guide Base to 219 m MDRKB. The resulting Housing stick up was 2.0 meters above the seafloor.

1.53 sg Halliburton X-lite cement was used instead of standard +/- 1.92 sg cement when cementing the 30" surface casing. The potential was to get a better cement job, due to lightweight slurry having less probability of fracturing formation before reaching the surface. The cement job was planned performed with 200% excess, and with a dye in front to easier see returns to surface. Full returns during cement job was seen, however could not observe dye. Due to bad visibility cement returns could not be confirmed. No wellhead movement was seen before or during wellhead release. Later small vibrations were however seen while drilling. These vibrations were considered not significant.

1.2.2 9 7/8” Pilot Hole Section

Prior to running in with the 9 7/8” BHA, the cement was drilled out with a 26” bit and pumping high viscosity sweeps for hole cleaning. Following the drill out of cement the well was drilled with the 9 7/8” BHA to section TD at 1057 m MDRKB using seawater and pumping a high-viscosity sweeps every 15 meters. At TD a 20 m3 high viscosity sweep was pumped and circulated out of hole. The well was finally displaced to 1,20 sg WBM. No wiper trip was performed for this section.

ROP during this section was limited to 40 m/hrs, to aid shallow gas detection.

1.2.3 12 1/4" Hole Section

Interval:	223 m MDRKB-1055 m MDRKB (223 m TVDRKB-1055 m RKBTVD)
Inclination:	Vertical
Mud system:	Seawater and high viscosity polymer sweeps.
Formations:	Nordland Gr (shale), Utsira Fm (sand) and Lark Fm (shale)
Parameters:	140 RPM, 0-1 tons WOB, 3000 lpm, 75 bar.

The 9 7/8" hole was opened to 12 ¼" using a PDC hole opener and a bull nose. The 12 ¼" was drilled to TD at 1055 m MDRKB using seawater and pumping a high-viscosity sweep when required. At TD a 20 m3 high viscosity sweep was pumped and circulated out of hole. Before making a wiper trip, OH section was filled with a high viscosity pill. A high viscosity pill was again circulated when at TD, before hole finally was displaced to 1,20 sg WBM, before puling out of hole.

Average ROP of 60 m/hrs was achieved when drilling this section.

The 20"x 9-5/8" casing and 18 ¾" High Pressure Housing was run and landed on 5 ½" HWDP landing string with the shoe at 1049 m MDRKB. Full cement returns were obtained during displacement, however the cement plug did not bump.

1.2.4 BOP Running Operation

In preparation for landing the BOP, the 18 ¾" VX, stainless steel ring gasket was installed on the High Pressure Housing using the work ROV and internal ring gasket expander tool. The 5" ITAG drillpipe was used for landing the BOP, which proved to give operational and safety benefits (traditionally a full length riser joint has been used when landing and unlocking the BOP from the Wellhead).

The BOP running and testing of casing and BOP's went as planned.

The 18 ¾", MS-700 Emergency Drillpipe Hang-off Tool (EDPHOT) was spaced out and assembled onshore to interface with the Deepsea Trym BOP stack, and the drillpipe connection being used. This assembly was racked in the derrick prior to 8 ½" drilling operation.

When starting to drill cement inside 9 5/8" casing, the end cover on the lower inner choke line fail safe valve dislodged from the actuator, resulting in the need to pull the BOP to surface. The turnaround time to carry out this repair and testing took 29 hours, including getting back to bottom with the BHA (1000m) and having the well displaced back to OBM. The PDC bit was also changed out during this trip, due to excessive wear when drilling cement.

1.2.5 8 1/2" Hole Section

Interval:	1055 m MDRKB - 2250 m MDRKB (1055 m TVDRKB - 2139 m TVDRKB)
Max Inclination:	28.1 deg
Mud system:	Versavert OBM
Formations:	Lark, Skade (sand), Horda, Balder, Lista, Sele, Våle, Tor (chalk), Tryggvason (chalk), Svarte, Rødby, Mime, Draupne, Heather, Hugin (sand), Burton Fms (shales)

70 meter of cement was drilled before entering open hole. The well was displaced to 1,4 sg Versavert OBM during drilling cement. 3 m of new formation was opened, and a LOT was performed to an equivalent mud weight of 1.65 sg.

The well was drilled with a rotary steerable assembly (AutoTrak) and a PDC bit. The open hole section was drilled in one run to TD at 2250 m MD RKB (2139 m TVD RKB). No coring or wireline logging were performed as no hydrocarbon sand was encountered. The hole was circulated clean before puling out of hole.

Average ROP during this section: 22 m/hrs, including connections.

1.2.6 P&A Operation

While tripping in hole to plug back open hole, the 3 1/2" cement stinger could not pass through a stringer/ledge at 1600 m MDRKB. A 8 1/2" assembly was run in hole to TD, however no indications of a ledge was seen. The 8 1/2" string was pulled out of hole, and the 3 1/2" string was run back to bottom.

Reservoir Cement Plugs # 1: Set from TD at 2250 m MDRKB to 2050 m MDRKB. This is 142 m TVDRKB above top of sand located in the reservoir.

Casing Shoe Cement Plug # 2: Set from 1101 m MDRKB to 901 m MDRKB, on top of a 200 m high viscosity pill. The plug was weight tested to 10 tons (TOC tagged at 910 m MDRKB) and successfully pressure tested to 135 bar for 10 minutes (70 bar above leak of pressure).

Surface Cement Plug # 3: The hole was displaced to seawater from 910 m. The final cement plug was set from 372 m on top of a 200 m water based high viscosity pill. TOC was later confirmed and tagged with 10 tons at 183 m MDRKB.

After the BOP was pulled, the 20” and 30” casings were cut at 153 m. using the MOST tool and cutting the subsea wellhead system in tension with a 5 1/2" HWDP pulling string.

2. STRATIGRAPHY

2.1 Lithostratigraphy

SYSTEM/SERIES	STAGE	GROUP	FORMATION	Final Depth m MDRKB	Final Depth m TVDSS	Final Depth m TVDKB		Prognosis Depth m MDRKB	Prognosis Depth m TVDSS
					25				
Plio/Pleistocene		Nordland	Seabed	147	122	147		147	122
Miocene			Utsira	789	764	789		710	685
		Hordaland	Lark	1002	977	1002		993	968
Oligocene			Skade	1226	1200	1225			
			Lark	1312	1281	1306			
Eocene			Horda	1450	1406	1431		1437	1391
			Balder	1832	1744	1769		1828	1741
Paleocene		Rogaland	Sele	1923.5	1825	1850			
			Lista	1975	1870	1895			
			Våle	2026.5	1916	1941			
Cretaceous	Maastrichtian	Shetland	Tor	2036	1925	1950		2012	1906
	Turonian		Tryggvason	2050.5	1939	1964			
	Cennomanian		Svarte	2066.5	1952	1977			
	Albian	Cromer Knoll	Rødby	2111	1990	2015			
	L Barremian		Mime	2153.5	2029	2054			
Jurassic	Volgian	Viking	Drupne	2162.5	2037	2062		2165	2043
	Oxfordian		Heather	2172.5	2045	2070			
	Callovian		Hugin	2183	2055	2080		2172	2049
	Pliensbachian	Dunlin	Cook	2190	2061	2086		2188	2064
		Total Depth (TD)		2250	2114	2139			

Table 2.1 Well 25/9-2S Lithostratigraphy

2.2 Chronostratigraphy

AGE	DEPTH (m MDRKB)
Lower Oligocene (top not seen)	1200m-1330m
---------- Stratigraphic break ----------	
Middle Eocene	1460m-1570m
Lower Eocene	1680m-1930m
Upper Paleocene	1980m-2020m
---------- Stratigraphic break ----------	
Upper Cretaceous (undiff.)	at 2040m
Upper Turonian-Middle Cenomanian	2050m-2070m
Lower Cenomanian	at 2110m
---------- ?Stratigraphic break ----------	
Upper Albian	2121m.-2142m
Middle Albian	at 2151m
---------- Stratigraphic break ----------	
Lower Barremian	at 2160m
---------- Stratigraphic break ----------	
Upper Ryazanian	at 2166m
Middle Volgian	at 2172m
---------- Stratigraphic break ----------	
Lower Oxfordian- ?Upper Callovian	2178m-2184m
---------- Stratigraphic break ----------	
Lower Pliensbachian (base not seen) Upper Sinemurian	2196m-2241m

Table 2.2 Well 25/9-2S Chronostratigrahpy

2.3 Lithology Descriptions

Detailed descriptions of cutting samples are included in Appendix 1.

Interval mMDRKB	%	Lithological description
		Lark Formation - Hordaland Group
1057-1226	90-100	CLAYSTONE: medium grey to dark-grey becoming olive black, firm to moderately hard, sub blocky, very hygroturgid, silty to very silty in parts, moderately calcareous, rare trace carbonaceous specks locally grading to silty claystone.
	Tr-10	SANDSTONE: loose quartz, clear, colorless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominantly sub-spherical, occasional feldspar, pale yellow orange, dark yellow orange – NO SHOWS.
1226-1312	100	**Skade Formation - Hordaland Group** SANDSTONE: loose qtz, clear, colorless, translucent, rarely frosted, predominantly medium to frequently coarse grains, moderate sorted, well rounded with good sphericity. Rare aggregates: medium light gray to light grey, very friable, weak silaceous cement, generally good inferred porosity – NO SHOWS. Local aggregates: pale gray, soft and very friable, very fine to fine, locally silt sized with occasional medium floating Qtz (crushed grains).
1312-1450	100	**Lark Formation - Hordaland Group**
	Tr	CLAYSTONE: olive black and generally homogenous, moderately hard, blocky, slightly silty to locally moderately silty, non calcareous, trace disseminated pyrite, trace carbonaceous specs. DOLOMITIC LIMESTONE: moderate yellowish brown to olive grey, soft to moderately hard, locally crumbly, very argillaceous, occurring as stringers, locally grading to LIMESTONE, no visible porosity – NO SHOWS.

1450-1832	100	**Horda Formation - Hordaland Group**
	Tr	CLAYSTONE: green grey, occasionally light green grey, dark green grey, brown grey, sub blocky to sub platy, crumbly, occasionally brittle, trace disseminated pyrite in places, non calcareous.
	Tr	LIMESTONE: light olive grey, soft to moderately hard, sub blocky to blocky, locally cubic, crumbly, cryptocrystalline, wackstone where seen, dolomitic, no visable porosity – NO SHOWS.
	Tr	SANDSTONE: loose quatrz, clear, colourless, translucent, rarely frosted, medium lower to medium upper, poor to moderate sorted, sub angular to well rounded, poor inferred porosity – NO SHOWS.
		TUFF: rare, pale green with dark green specks, soft, amorphous, blocky, sticky.
		Balder Formation - Hordaland Group
1832-1924	10-50	TUFF: medium blueish grey to medium grey becoming light grey to medium light grey mottled (tuff proper), firm, sub block to frequently crumbly, slightly calcareous, abundant flattened glass shards, very ashy, fine grained feldspars, trace very fine pyrite.
	50	CLAYSTONE 1: dark greenish grey to dusky blueish grey, moderately hard, blocky, waxy to ashy in parts, very calcareous grading to CALC CLST in parts, very abnt py, trace glauc, no silt.
	50-95	CLAYSTONE 2: predominatly olive grey to occasionally blueish grey, firm to moderately hard, blocky, rare ashy texture, non calcareous to locally slightly calcareous, rare trace pyrite , very slightly silty in parts.
	Tr-5	DOMOMITE: pale grey brown to yellowish brown, firm to moderately hard, sub blocky to crumbly, micro crystalline to locally medium when sucrosic, wackstone – packstone, calcareous and grading to LST in parts, no vis por – NO SHOWS
	Tr-10	LIMESTONE: off white to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone, chalky texture, generally clean, no vis por – NO SHOWS.

		Sele & Lista Formations - Rogaland Group
1924-2027	80-100 Tr-20 Tr	CLAYSTONE: predominantly olive grey, generally homogenous, firm to moderately hard, blocky, non calcareous to locally slightly calcareous, trace vf pyrite, rarely slightly silty. TUFF: light grey to medium light grey mottled, firm, sub block to frequently crumbly, very calcareous, abundant flattened glass shards, very ashy, fine grained feldspars, trace very fine pyrite. DOMOMITE: orange brown, firm to moderately hard, sub blocky sub angular locally crumbly, micro crystalline, slightly sucrosic, mudstone, no vis por – NO SHOWS
2027-2037	80-100	**Våle Formation - Rogaland Group** CLAYSTONE: vair-colour olive grey to medium blueish grey medium dark grey and rare dusky brown, firm to moderately hard, blocky, generally non calcareous, local trace vf pyrite, slightly silty in parts.
2037-2162	Tr-10 60-80 10-20 tr-20 90-100	**Tor, Tryggvason & Svarte Formations - Shetland Group** **Rødby & Mime Formations - Cromer Knoll Group** LIMESTONE: generally white to rarely off white and greyish orange pink, moderately hard, sub angular, very clean, chalky, mudstone, no vis porosity – NO SHOWS. LIMESTONE: greyish orange pink locally white, becoming moderate brown in parts, moderately hard, sub angular, locally clean to argillaceous when brownish, very chalky with a crunchy texture, mudstone, no vis porosity – NO SHOWS. CLAYSTONE: vair-colour olive grey to medium blueish grey medium dark grey, firm to moderately hard, blocky, slightly calcareous, no silt, becoming; CLAYSTONE: medium dark grey to dark grey, firm to moderately hard, blocky, very very calcareous locally grading to MARL, no silt. LIMESTONE: predominantly light olive grey with occasional clean white parts, moderately hard, chalky, mudstone texture, microcrystalline to locally fine grained, slightly argillaceous in parts.

		Draupne Formation - Viking Group
2163-2173		CLAYSTONE: dark grey to grey black, dark grey brown, firm to hard, sub blocky, brittle in parts, carboniferous streaks.
		Heather Formation - Viking Group
2173-2183		CLAYSTONE: medium dark grey, occasionally dark grey, firm to hard, sub blocky, brittle, decreasing carboniferous streaks, no modifiers seen.
		Hugin Formation - Viking Group
2183-2190		SANDSTONE: loose qurtz, clear, colourless, transparent, very fine to fine, occasionally medium, sub angular to sub rounded, moderate to well sorted, sub spherical to spherical, also cemented, light to medium grey, dirty appearance, occasional rockflour, firm cuttings, blocky, rounded appearance, crumbly break, siliceous cement, poor visable porosity, no cut, no crosh cut, oil base residue, grading to: SILTSTONE; medium grey, dark grey, occasionally dark grey black, firm, sub blocky, crumbly, non calcareous.
		Cook Formation - Dunlin Group
2190-2250	50-100 0-50 0-10 0-10 0-Tr	CLAYSTONE: medium dark grey to olive grey, firm sub blocky to crumbly locally brittle, slightly to locally moderately calcareous, common very fine disseminated pyrite, very silty to locally grading to; SILTSTONE: medium grey to medium dark grey, olive grey in parts, generally a/a. SANDSTONE: as thin intebeds in silt/claystone, rare loose grains: clear coulourless, translucent, very fine to silt, well sorted, occasionally as rock flour, cuttings are medium light grey to medium grey, very friable, weak calcite cement in parts. LIMESTONE: light brown grey, yellow grey, very light grey to white, firm to hard, blocky, brittle, microcrystalline, generally clean with local carbonaceous streaks, no visable porosity – NO SHOWS. DOLOMITE: orange brown, firm to moderately hard, sub blocky sub angular locally crumbly, micro crystalline, mudstone, very argillaceous, no vis por – NO SHOWS

3. FORMATION EVALUATION

3.1 Cuttings Samples

The following samples were collected every 10 m MD from first sample return below 9 5/8" casing shoe to 2025 m TVDRKB, then samples will be collected every 3 m MD to TD.

3 sets of wet samples;
- a) NPD (1,0 kg)
- b) Esso (1.0 kg)
- c) Esso (0.5 kg)

4 sets of washed and dried samples;
- a) NPD (50 g)
- b) Esso (20 g)
- c) Esso (20 g)
- d) Esso Drilling (30 g) for DCM samples every 10 (or 9 meters after 2025mtvdrkb)

3.2 Cores

No coring (sidewall or conventional) was performed in this well.

3.3 Logging Summary

Date	Run	Hole Size	Tool Suite, MWD	Mud	Interval (m mdrkb)
20-22. July, 2003	1	9,88	GR-Res-Dir	Seawater	223-1057
25-26 July, 2003	2	8,50	GR-Res- Dens- Neut	OBM	1057-1057*
27-30 July, 2003	3	8,50	GR-Res- Dens- Neut	OBM	1057-2250

* The BHA had to be pulled due to failure in the BOP.

Table 3.1 Well 25/9-2S MWD summary

3.3.1 MWD Log Quality

Run No 1, The MWD performed to spec, run No 2, no new formation logged, and Run no 3, The ORD sub transmitted zero's from time to time. The density and neutron curves were depth-shifted to the resistivity curves in Run 3. The bulk density log data from a back-reaming run was spliced into the density curve over the interval 2184-2186.5mMD to fill a bulk density gap in the Hugin interval. Other gaps remain unfilled.

3.3.2 Wireline Log Quality

No wireline program was run.

3.4 Composite Curve Set

Composite Log input curves were generated from the Baker Hughes Inteq LWD curves. The following curves are included:

Composite curve	LWD Curve	Description
CALI	CALM	Caliper
DEN	BDCFM	Bulk Density
GR	GRAFM	Gamma Ray
NEU	NPLFM	Neutron Porosity
RDEP	RACEHM	Deep Resistivity
RMED	RPCEHM	Medium Resis.
PEF	DPFM	Photoelectric fact.
BS	BS	Bit Size

Table 3.2 Composite Input Data

3.5 Petrophysical Interpretation

3.5.1 Standard Evaluation

A standard petrophysical evaluation was conducted on the log data to understand the reservoir quality and fluid content of the reservoir intervals. Shale volume was calculated by both linear GR and density-neutron separation methods, total porosity was estimated with the bulk density measurement, and water saturation was calculated with the Archie equation and formation resistivity. The petrophysical parameters shown in Table 3.3 were used.

3.5.2 Shale Volume

Shale volume was calculated in two ways. One method was from the total gamma response using equation 1 below. GRclean and GRshale were defined from inspection of the log data and shown in input parameters table.

$$VSHGR = (GR - GRclean) / (GRshale - GRclean) \quad \text{eqn. 1}$$

The second method is based on the separation between the neutron and density porosity curves and equation 2.

$$VSHDN = (NEUSS-PHIT)/DNDELTA \quad \text{eqn. 2}$$

Where NEUSS is neutron porosity on a sand matrix (NEU + 0.044), PHIT is density porosity (as calculated with equation 3) and DNDELTA is the typical amount of neutron-density separation in shale zones (from the input parameters table).
Over the Cretaceous Chalk interval, 2036-2162.5mMD, the non-shale portion of the reservoir is interpreted as carbonate.

3.5.3 Porosity

Total porosity has been determined from the density log:

PHIT = (RHOMA - DEN) / (RHOMA - RHOFL) eqn. 3

RHOMA, matrix density, and RHOFL, fluid density, are from the input parameters table. A version of the DEN curve (shown in red dash on the CPI logs) with missing Jurassic intervals sketched in by hand was used to calculate PHIT.

3.5.4 Water Saturation

The Archie equation, equation 5, was used to calculate total water saturation.

Sw = ([Rw*a]/[(PHIT^m)*Rt])^(1/n) eqn. 5

Where Rw is resistivity of the formation water, a = 1, PHIT is porosity from equations 3 and 4, 'm' and 'n' are from the parameter table, and Rt is true resistivity. The RDEP (RACEHM) was used for true resistivity. Water saturation was limited to fractional values between 0 and 1.

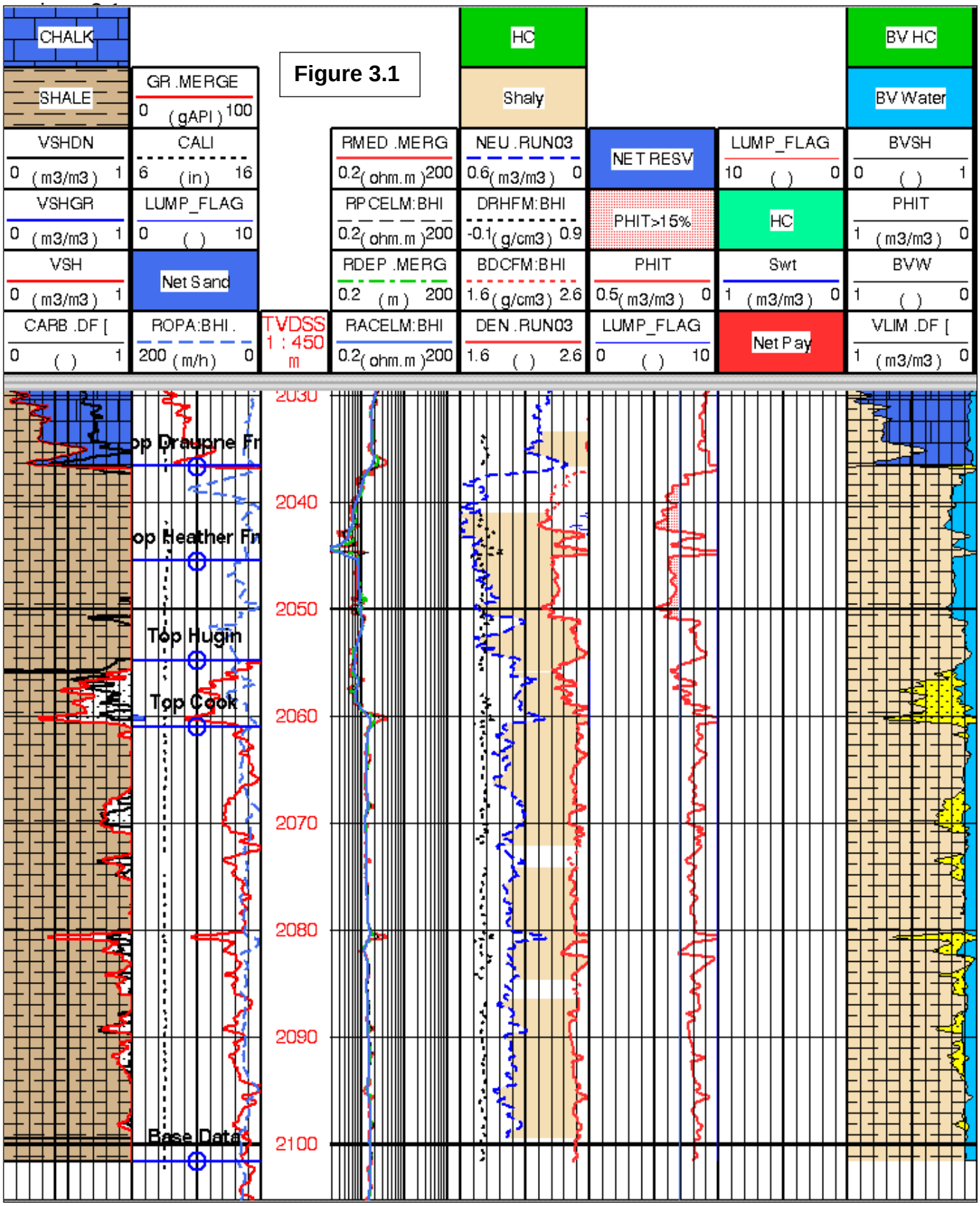
Parameter	Value Used	Comments
Zone	**Jurassic**	
Top Depth (mMD)	2162.5	
Base Depth (mMD)	2236	
GR Clean (gAPI)	25	
GR Shale (gAPI)	85	
ND Delta in 100% shale (frac phi)	0.30	
Main Vsh source	GR	
Matrix density (g/cm3)	2.65	
Fluid density (g/cm3)	0.9	
BHT (degC) at TD (mMD)	82 @ 2250	
Surf. Temp (degC) at Mudline (m)	5 @ 100	
Formation Water Salinity (kppm NaCl equiv.)	62	
Archie Porosity Exponent 'm'	1.7	
Archie Saturation Exp. 'n'	1.8	

Table 3.3 Petrophysical Input Parameters, Well 25/09-02S

3.5.5 Results and Reservoir Summation

Figure 3.1 is a log plot and Table 3.4 is a net summary showing the petrophysical evaluation of the Hugin interval penetrated by the well. It is interpreted that there is basically no reservoir present in the Hugin interval, though the interval is somewhat sandy, based on log responses.

Fig 3.1 **Isak 25/9-2S: Petrophysical Interpretation**



Fm	Interval	Gross Thkns	Net Resv	NTG
Hugin	2183-2190mMD	6.2m	0.0m	0%
	2054.9-2061.0mTVDSS			

Isak 25/09-02S

Net Summary for Geological Completion Report

Zone	Top MD	Base MD	Top TVDSS	Base TVDSS	Gross TVD Interval Thickness	Net Sand (TVD) (Vsh < 40%) Net Sand Thickness	Net Sand (TVD) (Vsh < 40%) Net to Gross Interval	Net Reservoir (TVD) (Vsh < 40% and PHIT > 15%) Net Reservoir Thickness	Net Reservoir (TVD) (Vsh < 40% and PHIT > 15%) Net to Gross Interval	Net Reservoir (TVD) (Vsh < 40% and PHIT > 15%) Avg. Vsh	Net Reservoir (TVD) (Vsh < 40% and PHIT > 15%) Avg. Porosity	Net Reservoir (TVD) (Vsh < 40% and PHIT > 15%) Porosity Thickness	Net Pay (TVD) (Vsh < 40%, PHIT > 15%, Sw </= 100) Net Pay Thickess	Net Pay (TVD) (Vsh < 40%, PHIT > 15%, Sw </= 100) Net to Gross Interval	Net Pay (TVD) (Vsh < 40%, PHIT > 15%, Sw </= 100) Avg. Vsh	Net Pay (TVD) (Vsh < 40%, PHIT > 15%, Sw </= 100) Avg. Porosity	Net Pay (TVD) (Vsh < 40%, PHIT > 15%, Sw </= 100) Avg. Sw	HCPV
	m	m	m	m	m	m	m	m	frac	frac	frac	m	m	frac	frac	frac	frac	m
Hugin	2183.0	2190.0	2054.9	2061.0	6.19	0.44	0.071	0.00	0.000			0.00	0.00	0.000				0.00

February 12, 2004

Table 3.4 Well 25/9-2S Reservoir Summary

4. GEOPHYSICS

4.1 Shallow Gas Evaluation

A potential shallow gas interval was identified pre-drill of 25/9-2 ISAK Prospect, by a seismic amplitude anomaly at approximately 930m MD.

The shallow section at 25/9-2S was drilled with a 9 7/8" pilot hole. No shallow gas was encountered.

The pilot hole was logged while drilling using a GR-Resitivity tool. The log response confirmed all penetrated sand intervals to be water wet.

4.2 VSP and Depth Conversion

No VSP was run. The pre-drill depth prognosis was accurate within the margins of error predicted. The Base Cretaceous Unconformity was 6m high to prognosis. The top reservoir (Hugin Fm) was 6m low and the base reservoir being 3m high to prognosis. This resulted in a thinner reservoir section overlain by a thicker Draupne Fm shale being penetrated by the wellbore.

Post-drill depth conversion consisted of local adjustments of depth grids within the vicinity of the 25/9-2S for the differences in pre- and post-drill depths. The map presented as Figure 4.1 is the post drill Top Hugin Depth Structure Map. A seismic line illustrating the 25/9-2S well tie is shown in Figure 4.2.

Top Hugin Depth Structure Map

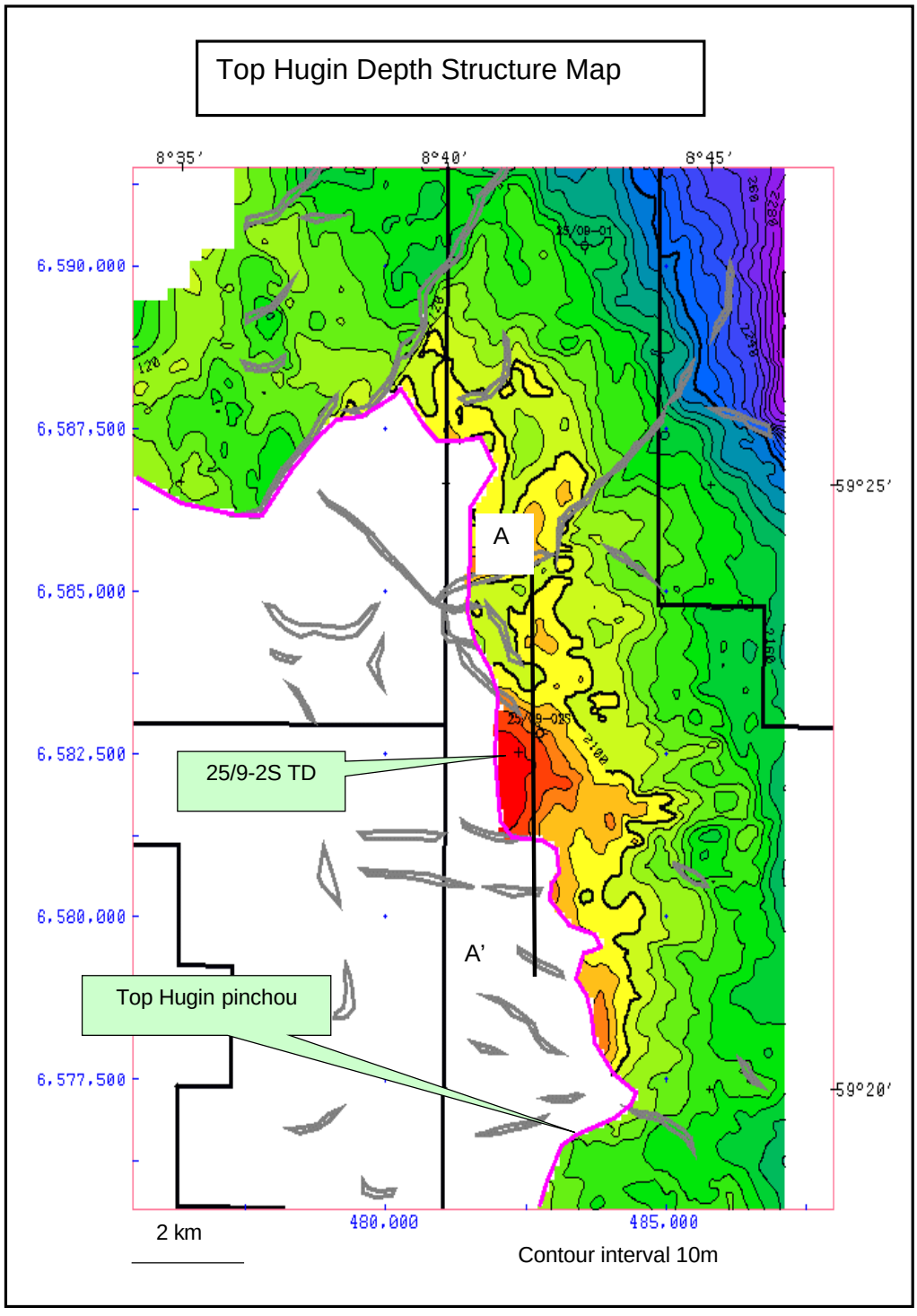


Figure 4.1

Well 25/9-2S Seismic Tie

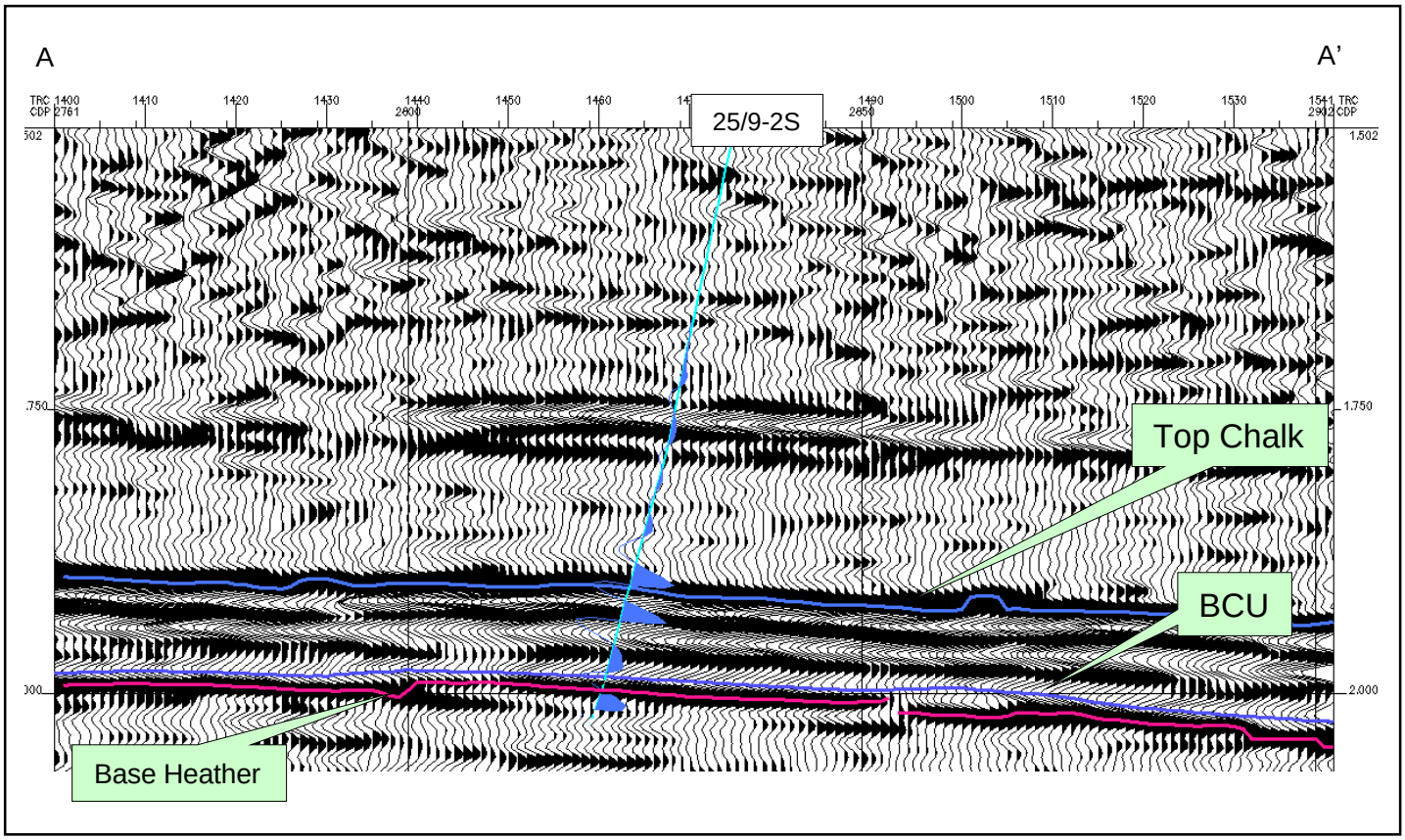


Figure 4.2

5. STANDARD AND SPECIAL STUDIES

Robertson Research

Biostratigraphy of the Interval 1200-2241 m, October, 2003

No geochemical anlysis has been done for this well.

Appendix I

Sample Description 25/9-2S

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1060	80	CEMENT												
	20	CLAYSTONE: medium to dark grey, firm, sub blocky, sticky, subfissile, crumbly.												
1070	90	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange.												
	10	CEMENT												
	tr	CLAYSTONE: medium to dark grey, firm, sub blocky, sticky, subfissile, crumbly.												
1080	90	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange.												
	10	CEMENT:												
	tr	CLAYSTONE: medium to dark grey, firm, sub blocky, sticky, subfissile, crumbly.												
1090	90	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS.												
	10	CEMENT:												
	tr	CLAYSTONE: medium to dark grey, firm, sub blocky, sticky, subfissile, crumbly.												
1100	80	CLAYSTONE: medium to medium dark grey, soft to firm, sub blocky, sticky, subfissile, crumbly.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
	20	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS												
1110	100	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS												
	tr	CLAYSTONE: medium to medium dark grey, soft to firm, sub blocky, sticky, subfissile, crumbly.												
1120	50	CLAYSTONE: medium to medium dark grey, soft to firm, sub blocky, sticky, subfissile, crumbly.												
	50	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS.												
1130	50	CLAYSTONE: medium to medium dark grey, soft to firm, sub blocky,												
	50	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS.												
1140	50	CLAYSTONE: light medium to medium grey, occasionally medium blue grey, soft to firm, sub blocky, sticky, subfissile, crumbly, grading to Siltstone.												
	30	SILTSTONE: light medium to medium grey, occasionally medium blue grey, soft to firm, sub blocky, sticky, subfissile, crumbly,grading to Claystone												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
	20	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS.													
1150	80	CLAYSTONE: light medium to medium grey, occasionally medium blue grey, soft to firm, sub blocky, sticky, subfissile, crumbly, grading to													
	20	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS.													
1160	90	CLAYSTONE: light medium to medium grey, occasionally medium blue grey, soft to firm, sub blocky, sticky, subfissile, crumbly.													
	10	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS.													
1170	90	CLAYSTONE: medium grey to medium dark grey, soft to firm, sub blocky, sticky and locally amorphous, silty to frequently very silty with local good Trace floating Qtz, moderately calcareous,													
	10	SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS.													
1180	100	CLAYSTONE: medium grey to medium dark grey, soft to firm, sub blocky, sticky and locally amorphous, silty to very silty in parts, slightly to moderately calcareous. **NOTE: SAMPLES NOW WASHED IN BASE OIL ONLY.**													

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S	AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1190	100	CLAYSTONE: olive black to dark grey, generally firm, sub blocky, very hygroturgid, silty to very silty in parts, moderately calcareous, rare trace carbonaceous specks, generally homogenous.												
		LIMESTONE: off white to light olive grey, moderately hard, blocky microcrystalline, mudstone, slightly argillaceous in parts as stringers, no visible porosity - NO SHOWS,												
1200	100	CLAYSTONE: olive black to dark grey, generally firm, sub blocky, very hygroturgid, silty to very silty in parts, moderately calcareous, rare trace carbonaceous specks locally grading to Silty Claystone.												
1210	100	CLAYSTONE: olive black to dark grey, firm to moderately hard, sub blocky, very hygroturgid, silty to very silty in parts, slightly calcareous, rare trace carbonaceous spec, rare sandy horizons.												
	tr	SANDSTONE: loose quartz, clear, colourless, translucent, occasional frosted appearance, fine to rarely medium,, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, NO SHOWS.												
1220	100	CLAYSTONE: olive black to dark grey, generally firm, sub blocky, very hygroturgid, silty, slightly calcareous, rare trace carbonaceous.												
1230	30	CLAYSTONE: olive black to dark grey, generally firm, sub blocky, very hygroturgid, silty to very silty in parts, slightly calcareous, rare trace carbonaceous.												
	70	SANDSTONE: predominantly as loose Qtz: clear, colourless, translucent, rarely frosted, medium to course with occasional very course grains, moderate to well sorted, well rounded with good spericity, rare trace course glauconite, rare trace feldspar. Rare aggregates with weak silaceous cement, good inferred porosity, NO SHOWS.												
1240	100	SANDSTONE: as loose Qtz: clear, colourless, translucent, rarely frosted, medium to course with occasional very course grains, moderate to well sorted, well rounded with good spericity. Rare aggregates with weak silaceous cement, good inferred porosity, NO SHOWS.												
1250	100	SANDSTONE: medium to fine grained with moderate to well sorting else as 1240m.												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION													
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003										Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1260	100	SANDSTONE: as loose Qtz: clear, colourless, translucent, rarely frosted, fine upper to medium upper occasional very course grains, poor to moderate sorted, well rounded with good spericity. Rare aggregates: medium light grey to light grey, very friable, weak silaceous cement, good inferred porosity, NO SHOWS.													
1270	100	SANDSTONE: unconsolidated, rare weal calcite cement, else as 1260m.													
1280	100	SANDSTONE: as loose Qtz: clear, colourless, translucent, rarely frosted, medium upper to course upper, rare fine, moderate to well sorted, well rounded with good spericity. Rare aggregates: medium light grey to light grey, very friable, weak silaceous cement, good inferred porosity, NO SHOWS.													
1290	100	SANDSTONE: sub elongated to rounded grains, medium lower to medium upper, well sorted else a/a.													
1300	100	SANDSTONE: as loose Qtz: clear, colourless, translucent, rarely frosted, medium lower to medium upper, moderate to well sorted, well rounded with good spericity, rare trace glauconitic overgrowths. Rare aggregates: medium light grey to light grey, very friable, weak silaceous cement, good inferred porosity, NO SHOWS.													
1310	100	SANDSTONE: as loose Qtz: clear, colourless, translucent, rarely frosted, medium lower to medium upper, moderate to well sorted, well rounded with good spericity, rare trace glauconitic overgrowths. Rare aggregates: medium light grey to light grey, very friable, weak silaceous cement, good inferred porosity, NO SHOWS.													
1320	60	SANDSTONE: common as aggregates: pale yellowish brown with mottled greys, soft and very friable, very fine to fine, locally silt sized with occasional medium floating Qtz (crushed grains), glauconitic in parts. Common loose Qtz: medium to rarely fine, subrounded to sub elongated, rare trace feldspar.													
	20	CLAYSTONE: olive black, moderately hard, blocky, very hygroturgid, varying silt, non calcareous, rare trace granular pyrite LOCALY grading to…													
	20	SILTSTONE: generally as above with higher silt content.													

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION													
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003										Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
	tr	DOLOMITE: yellowish brown to dark yellowish orange, form to crumbly, very argillaceous.												
1330	90	CLAYSTONE: olive black, moderately hard, blocky, moderately silty in parts, non calcareous, trace carbonaceous specs, rare trace granular pyrite.												
	10	SANDSTONE: as aggregates and rare loose Qtz: as 1320m												
	Gd tr	DOLOMITIC LIMESTONE: moderate yellowish brown to olive grey, soft to frm, locally crumbly, very argillaceous, occuring as stringers, no visible porosity and NO SHOWS.												
1340	70	CLAYSTONE: olive black, moderately hard, blocky, varying silt, non calcareous, good trace very fine to fine granular anhedral pyrite.												
	30	SILTSTONE: olive black, moderately hard, blocky, trace disseminated pyrite, grading to CLST in parts.												
	Tr	QUARTZITE: colourless to translucent grey, very hard, friable when broken, heavily cemented.												
1350	100	CLAYSTONE: olive black and homogenous, moderately hard, blocky, slightly silty, non to occasionally slightly calcareous, trace very very fine disseminated pyrite.												
1360	90	CLAYSTONE: as 1350m												
	10	DOLOMITE: moderate yellowish brown to olive grey, soft to frm, locally crumbly, very argillaceous, locally grading to Dolomitic Limestone.												
1370	95	CLAYSTONE: olive black and generally homogenous, moderately hard, blocky, slightly silty, non calcareous.												
		LIMESTONE: light olive grey, soft to moderately hard, locally crumbly, very argillaceous, locally calcareous grading to Dol Lst in parts, no visible porosity and NO SHOWS.												
1380	100	CLAYSTONE: olive black and generally homogenous, moderately hard, blocky, slightly silty to locally moderately silty, non calcareous, rare trace globular fine grained pyrite, trace carbonaceous specs.												
1390	100	CLAYSTONE: as 1380m.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1400	100	CLAYSTONE: olive black and generally homogenous, moderately hard, blocky, slightly silty to locally moderately silty, non calcareous, trace disseminated pyrite, trace carbonaceous specs.												
	tr	LIMESTONE: light olive grey, soft to moderately hard, locally crumbly, very argillaceous, locally calcareous grading to Dol Lst in parts, no visible porosity and NO SHOWS.												
1410	100	CLAYSTONE: olive black and generally homogenous, moderately hard, blocky, slightly silty to locally moderately silty, non calcareous, trace disseminated pyrite, trace carbonaceous specs.												
	tr	LIMESTONE: as 1400m												
1420	100	CLAYSTONE: olive black and generally homogenous, moderately hard, blocky, slightly silty to locally moderately silty, non calcareous, trace disseminated pyrite, trace carbonaceous specs.												
1430	100	CLAYSTONE: olive black, moderate firm to hard, blocky to sub blocky, homogenous, slightly silty.												
	tr	DOLOMITIC LIMESTONE: light olive grey, soft to moderately hard, sub blocky, locally cubic.												
1440	100	CLAYSTONE: as 1430m												
	tr	LIMESTONE: as 1400m												
1450	100	CLAYSTONE: dark grey-olive black, green grey, dark green grey, firm, sub blocky, crumbly, trace disseminaated pyrite.												
	tr	LIMESTONE: light olive grey, soft to moderately hard, locally crumbly, very argillaceous, locally calcareous grading to Dol Lst in parts, no visible porosity and NO SHOWS.												
1460	100	CLAYSTONE: dark grey-olive black, green grey, dark green grey, firm, sub blocky, crumbly, trace disseminated pyrite.												
	tr	LIMESTONE: light olive grey, soft to moderately hard, locally crumbly, very argillaceous, locally calcareous grading to Dol Lst in parts, no visible porosity and NO SHOWS.												
1470	100	CLAYSTONE: green grey, occasionally light green grey, dark green grey, brown grey, sub blocky to sub platy, crumbly, occasionally brittle, trace disseminated pyrite, non calcareous.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1480	100	CLAYSTONE: green grey, occasionally light green grey, dark green grey, brown grey, sub blocky to sub platy, crumbly, occasionally brittle, trace disseminated pyrite, non calcareous.												
1490	100	CLAYSTONE: green grey, grey brown, firm, sub blocky to sub platy, crumbly, occasionally brittle, trace disseminated pyrite.												
1500	100	CLAYSTONE: green black, firm to occasionally hard, sub blocky to sub platy, sub fissile to crumbly, slightly silty in parts, non calcareous.												
	Good tr	LIMESTONE: light olive grey, soft to moderately hard, sub blocky to blocky, locally cubic, crumbly, cryptocrystalline, wackstone where seen, dolomitic in parts, no visable porosity, NO SHOWS.												
1510	100	CLAYSTONE: green black, firm to occasionally hard, sub blocky to sub platy, sub fissile to crumbly, slightly silty in parts, non calcareous.												
	tr	LIMESTONE: light olive grey, soft to moderately hard, sub blocky to blocky, locally cubic, crumbly, cryptocrystalline, wackstone where seen, dolomitic, no visable porosity, NO SHOWS.												
1520	100	CLAYSTONE: green black, firm to occasionally hard, sub blocky to sub platy, sub fissile to crumbly, slightly silty in parts, non calcareous.												
	tr	LIMESTONE: light olive grey, soft to moderately hard, sub blocky to blocky, locally cubic, crumbly, cryptocrystalline, wackstone where seen, dolomitic, no visable porosity, NO SHOWS.												
1530	100	CLAYSTONE: green black, olive black, firm to occasionally hard, sub blocky to sub platy, sub fissile to crumbly, slightly silty in parts, non calcareous.												
	tr	LIMESTONE: yellow grey, soft to moderately hard, sub blocky to blocky, locally cubic, crumbly, cryptocrystalline, wackstone where seen, dolomitic, no visable porosity, NO SHOWS.												
1540	100	CLAYSTONE: green black, olive black, firm to occasionally hard, sub blocky to sub platy, sub fissile to crumbly, slightly silty in parts, non												
	tr	LIMESTONE: yellow grey, soft to moderately hard, sub blocky to blocky, locally cubic, crumbly, cryptocrystalline, wackstone where seen, dolomitic, no visable porosity, NO SHOWS.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1550	100	CLAYSTONE: dark green grey, brown grey, medium grey, sub platy, sub fissile to crumbly, non calcareous.												
1560	100	CLAYSTONE: dark green grey, dark blue grey, dark grey, olive black in parts, firm, sub blocky to sub platy, sub fissile to crumbly, rare disseminated pyrite.												
	tr	SANDSTONE: loose quatrz, clear, colourless, translucent, rarely frosted, medium lower to medium upper, poor to moderate sorted, sub angular to well rounded, poor inferred porosity, NO SHOWS.												
1570:	100	CLAYSTONE: dark green grey, dark blue grey, dark grey, olive black in parts, firm, sub blocky to sub platy, sub fissile to crumbly, rare disseminated pyrite.												
	tr	SANDSTONE: as 1560m												
1580	100	CLAYSTONE: olive black, medium blue grey, dark green grey, firm to occasionally hard, sub blocky, brittle to crumbly.												
	tr	LIMESTONE: dark orange grey, light olive grey, firm, blocky, crumbly-brittle, micro-cryptocrystalline, mudstone-wackstone. NO SHOW												
1590		Missed sample												
1600	100	CLAYSTONE: olive black, medium blue grey, dark green grey, firm to occasionally hard, sub blocky, brittle to crumbly.												
	tr	LIMESTONE: Light olive grey, yellow grey, firm, sub platy, crumbly, occationally cubic, mudstone, dolomitic, NO SHOW												
1610	100	CLAYSTONE: medium-medium dark grey, firm, sub platy, sub fissile-crumbly, trace dissaminated pyrite												
	tr	LIMESTONE: dark yellow orange, dark orange grey, firm, sub blocky-blocky, crumbly, micro crystalline, mudstone, NO SHOW												
1620	100	CLAYSTONE: medium-medium dark grey, firm, sub platy, sub fissile-crumbly, trace dissaminated pyrite												
	tr	LIMESTONE: dark yellow orange, dark orange grey, firm, sub blocky-blocky, crumbly, micro crystalline, mudstone, NO SHOW												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION													
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003										Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1630	100	CLAYSTONE: as 1620m												
	tr	LIMESTONE:as 1620m												
1640	100	CLAYSTONE: medium dark grey, occasionally medium grey, homogenous, firm, sub blocky, sub fissile to crumbly, occasionally splintery.												
	tr	LIMESTONE: light olive grey, medium grey, yellow grey, soft to firm, blocky, crumbly, cryptocrystalline, wackstone where visable, no visable porosity, NO SHOW.												
1650	100	CLAYSTONE: medium dark grey, green grey, occasionally light medium grey, homogenous, firm, sub blocky, sub fissile to crumbly, occasionally splintery.												
	tr	LIMESTONE: light olive grey, medium grey, yellow grey, soft to firm, blocky, crumbly, cryptocrystalline, wackstone where visable, no visable porosity, NO SHOW.												
1660	100	CLAYSTONE: medium dark grey, occasionally medium grey, homogenous, firm, sub blocky, sub fissile to crumbly, occasionally splintery.												
	tr	LIMESTONE: as 1650m												
1670	100	CLAYSTONE: medium dark grey, occasionally medium grey, homogenous, firm, sub blocky, sub fissile to crumbly, occasionally												
	tr	LIMESTONE: as 1650m												
1680	100	CLAYSTONE: medium dark grey, occasionally medium grey, homogenous, firm, sub blocky, sub fissile to crumbly, occasionally splintery.												
	tr	LIMESTONE: light olive grey, yellow grey, orange grey, firm to hard, blocky, crumbly to brittle, cryptocrystalline, predominently packstone, No visable porosity, NO SHOW												
1690	100	CLAYSTONE: as 1680m												
1700	100	CLAYSTONE: as 1680m												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003								Sheet No. 1				
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
	tr	LIMESTONE: grey orange, light olive grey, firm to hard, blocky, crumbly to brittle, cryptocrystalline, predominently packstone, No visable porosity, NO SHOW												
1710	100	CLAYSTONE: medium grey, medium dark grey, medium grey brown, homogenous, firm, sub blocky, sub fissile to crumbly.												
	Good Tr	LIMESTONE: very pale orange, grey orange, firm, blocky, crumbly, micro to cryptocrystalline, packstone, argillaceous, no visable porosity, NO SHOW.												
1720	100	CLAYSTONE: as 1710m												
	Good tr	LIMESTONE: as 1710m												
1730	100	CLAYSTONE: medium to dark grey, occasionally blu grey, rarely pale green, firm, sub blocky to sub platy, crumbly,												
	Tr	LIMESTONE: as 1710m												
	Tr	TUFF: rare, pale green with dark green specks, soft, amorphous, blocky, sticky.												
1740	100	CLAYSTONE: medium to dark grey, occasionally blue grey, rarely pale green, firm, sub blocky to sub platy, crumbly,												
	Tr	LIMESTONE: as 1710m												
1750	100	CLAYSTONE: olive grey, green grey, occasionally medium grey, firm, sub blocky to sub platy, sub fissile to crumbly, tr glauconitic specks.												
	Tr	LIMESTONE: as 1710m												
1760	100	CLAYSTONE: dark greenish grey and olive grey, firm to moderately hard, sub blocky, slightly calcareous, moderately silty, abundant glauconite specks in green CLST, good trace very very fine disseminated pyrite.												
	tr	LIMESTONE: very pale orange, grey orange, firm, blocky, crumbly, micro to cryptocrystalline, wackstone, no visable porosity, NO SHOW.												
1770	100	CLAYSTONE: dark greenish grey and ulive grey, else a/a.												
	tr	LIMESTONE: as 1760m.	`											
1780	100	CLAYSTONE: predominantly dark greenish grey else a/a.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1790	100	CLAYSTONE: dark greenish grey to dusky blueish grey, firm to moderately hard, sub blocky, slightly calcareous, moderately silty, abundant glauconite specks, good trace very very fine disseminated pyrite.												
	Gd tr	LIMESTONE: off white to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone texture, locally grading to Dolomite which has a medium grained sucrosic texture in parts.												
1800	90	CLAYSTONE: as 1790m.												
	10	DOLOMITIC LIMESTONE: pale grey brown, sucrosic, wackstone – packstone, very argillaceous, else a/a.												
1810	90	CLAYSTONE: as 1790m except very abundant very fine pyrite and becoming slightly ashy in texture, locally grading to TUFF.												
	10	DOLOMITIC LIMESTONE: pale grey brown, firm to moderately hard, sub blocky to crumbly, micro crystalline to locally medium when sucrosic, wackstone – packstone, no vis por – NO SHOWS.												
1820	30	TUFF: medium blueish grey to medium grey, firm, crumbly, ashy texture, rare impregnated glass shards, very calcareous grading to CLST in parts, gd trace glauconite and abundant very very fine disseminated py.												
	20	LIMESTONE: off white to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone, chalky texture, generally clean, no vis por – NO SHOWS.												
	50	CLAYSTONE: dark greenish grey to dusky blueish grey, moderately hard, blocky, waxy to ashy in parts, moderately calcareous to calcareous, very abnt py, trace glauc, no silt.												
1840	40	TUFF: as 1830m.												
	10	LIMESTONE: as 1830m												
	50	CLAYSTONE: dark greenish grey to dusky blueish grey, moderately hard, blocky, waxy to ashy in parts, very calcareous grading to CALC CLST in parts, very abnt py, trace glauc, no silt.												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION													
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003										Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1840	80	CLAYSTONE: predominatly olive black/grey to occasionally greenish grey, moderately hard, blocky, ashy texture in parts, very calcareous, very abnt py, trace glauc, no silt.												
	20	TUFF: medium blueish grey to medium grey, firm, crumbly, ashy texture, very calcareous, abundant very very fine disseminated py												
1850	95	CLAYSTONE: predominatly olive black/grey, firm to moderately hard, blocky, rare ashy texture, non calcareous, very abnt pyrite , very slightly silty in parts.												
	5	DOMOMITE: pale grey brown to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline to locally medium when sucrosic, wackstone – packstone, calcareous in parts, no vis por – NO SHOWS												
	Tr	TUFF: medium blueish grey to medium grey, firm, crumbly, ashy texture, very calcareous, abundant very very fine disseminated py												
1860	100	CLAYSTONE: as 1850m.												
	Gd tr	DOLOMITE: as 1850m.												
1870	20	TUFF: light grey to medium light grey mottled, firm, sub block to frequently crumbly, very calcareous, abundant flattened glass shards, very ashy, fine grained feldspars, trace very fine pyrite. Good example of tuff!												
	5	DOMOMITE: pale grey brown to yellowish brown, firm to moderately hard, sub blocky to crumbly, micro crystalline to locally medium when sucrosic, wackstone – packstone, calcareous and grading to LST in parts, no vis por – NO SHOWS												
	75	CLAYSTONE: predominatly olive black/grey, firm to moderately hard, blocky, rare ashy texture, non calcareous, very abnt pyrite , very slightly silty in parts.												
1880	60	TUFF: proper as 1870m – moderately calc to calcareous.												
	40	CLAYSTONE: predominatly olive grey to occasionally blueish grey, firm to moderately hard, blocky, rare ashy texture, non calcareous to locally slightly calcareous, rare trace pyrite , very slightly silty in parts.												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION													
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003										Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1890	50	TUFF: light grey to medium light grey mottled, firm, sub block to frequently crumbly, very calcareous, abundant flattened glass shards, very ashy, fine grained feldspars, trace very fine pyrite.												
	50	CLAYSTONE: predominatly olive grey, firm to moderately hard, blocky, rare ashy texture, non calcareous to locally slightly calcareous, no silt.												
1900	40	TUFF: as 1890m.												
	50	CLAYSTONE: as 1890m.												
	10	LIMESTONE: off white to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone, chalky texture, generally clean, no vis por – NO SHOWS.												
1910	80	CLAYSTONE: predominatly olive grey to olive black, firm to moderately hard, blocky, local ashy texture, non calcareous to locally slightly calcareous, abnt pyrite i/p, no silt.												
	20	TUFF: as 1890m.												
	tr	LIMESTONE: a/a												
1920	80	CLAYSTONE: predominatly olive grey, generally homogenous, firm to moderately hard, blocky, non calcareous to locally slightly calcareous, trace pyrite, locally very slightly silty.												
	20	TUFF: as 1890m.												
1930	90	CLAYSTONE: as 1920m.												
		TUFF: as 1920m.												
1940	100	CLAYSTONE: predominatly olive grey, generally homogenous, firm to moderately hard, blocky, non calcareous to locally slightly calcareous, trace vf pyrite, rarely slightly silty.												
	Gd tr	DOMOMITE: orange brown, firm to moderately hard, sub blocky sub angular locally crumbly, micro crystalline, slightly sucrosic, mudstone, no vis por – NO SHOWS												
1950	100	CLAYSTONE: predominatly olive grey to olive black, generally homogenous, firm to moderately hard, blocky, non calcareous to locally slightly calcareous, local trace vf pyrite, rarely slightly silty.												
1960	100	CLAYSTONE: as 1950m.												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION													
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003										Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
1970		MISSED												
1980	100	CLAYSTONE: predominatly olive grey to medium blueish grey, firm to moderately hard, blocky, non calcareous, local trace vf pyrite, slightly silty in parts.												
	Tr	TUFF: a/a												
1990	90	CLAYSTONE: vair-colour olive grey to medium blueish grey medium dark grey and rare dusky brown, firm to moderately hard, blocky, non calcareous, local trace vf pyrite, slightly silty in parts												
	10	LIMESTONE: off white to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone, chalky, slightly argillaceous in parts, no vis por – NO SHOWS.												
2000	100	80% CLAYSTONE: dusky brown to black brown, firm to moderately hard, blocky, silty lo locally very sily, rare trace vf pyrite, trace mic-mic, moderately calc. CLAYSTONE 2:blueish green grey, no silt, predominantly non calcareous.												
2010	10	LIMESTONE: off white to olive grey, pale brown i/p, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone, chalky, slightly argillaceous in parts, no vis por – NO SHOWS.												
	90	60% CLAYSTONE: dusky brown to black brown, firm to moderately hard, blocky, silty lo locally very sily, rare trace vf pyrite, trace mic-mic, moderately calc. CLAYSTONE 2:blueish green grey, no silt, predominantly non calcareous.												
2020	100	CLAYSTONE: vair-colour olive grey to medium blueish grey medium dark grey and rare dusky brown, firm to moderately hard, blocky, generally non calcareous, local trace vf pyrite, slightly silty in parts.												
2030	90	CLAYSTONE: vair-colour olive grey to medium blueish grey medium dark grey and rare dusky brown, firm to moderately hard, blocky, slightly calcareous, local trace vf pyrite, slightly silty in parts.												
	10	LIMESTONE: generally white to rarely off white and greyish orange pink, moderately hard, sub angular, very clean, chalky, mudstone, no vis porosity – NO SHOWS.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
2040	80	LIMESTONE: greyish orange pink locally white, moderately hard, sub angular, very clean, chalky with a crunchy texture, mudstone, no vis porosity – NO SHOWS.												
	20	CLAYSTONE: vair-colour olive grey to medium blueish grey medium dark grey, firm to moderately hard, blocky, slightly calcareous, no silt.												
2050	60	LIMESTONE: greyish orange pink locally white, becoming moderate brown in parts, moderately hard, sub angular, locally clean to argillaceous when brownish, very chalky with a crunchy texture, mudstone, no vis porosity – NO SHOWS.												
	20	LIMESTONE: generally white to rarely off white and greyish orange pink, moderately hard, sub angular, very clean, chalky, cryptocrystalline, mudstone, no vis porosity – NO SHOWS.												
	20	CLAYSTONE: medium dark grey to dark grey, firm to moderately hard, blocky, very very calcareous locally rading to MARL, no silt												
2060	10	LIMESTONE: white and pinkish a/a.												
	90	LIMESTONE: varicolour greys light grey to dark grey, firm to moderately hard, blocky to locally crumbly, mudstone, locally very argillaceous, frequently grading to MARL: rare glauconite.												
2070	80	LIMESTONE: predominantly light olive grey with occasional clean white parts, moderately hard, chalky, mudstone texture, microcrystalline to locally fine grained, slightly argillaceous in parts.												
	20	CLAYSTONE: medium dark grey to dark grey, firm to moderately hard, blocky, very very calcareous locally rading to MARL, no silt.												
2080	90	LIMESTONE: predominantly light olive grey with occasional clean white parts, moderately hard, chalky, mudstone texture, microcrystalline to locally fine grained, slightly argillaceous in parts.												
	10	CLAYSTONE: medium dark grey to dark grey, firm to moderately hard, blocky, very very calcareous locally rading to MARL, no silt.												
2090		LIMESTONE: predominantly light olive grey to light brown grey , moderately hard, chalky, mudstone texture, microcrystalline, slightly argillaceous in parts. No visible porosity – NO SHOWS.												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S	AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
2100	100	LIMESTONE: blue white, very pale blue, rarely pale orange, firm to hard, blocky, brittle, crumbly, argillaceous streaks, microcrystalline, chalky texture in parts.												
2110	90	SILTSTONE: medium grey, occasionally dark grey brown, rarely dark grey green, sub blocky, sub fisslie to crumbly, trace disseminated pyrite, grading to CLAYSTONE.												
	10	LIMESTONE; as 2100m												
2120	80	SILTSTONE; as 2110m												
	20	LIMESTONE:as 2100												
3 Metre sampling program														
2124	90	SILTSTONE: medium grey, occasionally dark grey brown, rarely dark grey green, sub blocky, sub fisslie to crumbly, trace disseminated pyrite, grading to CLAYSTONE.												
	10	LIMESTONE: blue white, very pale blue, rarely pale orange, firm to hard, blocky, brittle, crumbly, argillaceous streaks, microcrystalline, chalky texture in parts.												
2127	100	SILTSTONE: medium grey, occasionally dark grey brown, becoming medium dark grey, sub blocky, sub fisslie to crumbly, trace disseminated pyrite, grading to CLAYSTONE.												
2130	90	SILTSTONE; medium grey, also grey black, medium grey, occasionally green grey, firm to hard, sub blocky to blocky, crumbly to brittle, common carboniferous streaks.												
	10	LIMESTONE: blue white, very pale blue, rarely pale orange, firm to hard, blocky, brittle, crumbly, argillaceous streaks, microcrystalline, chalky texture in parts.												
2133		Sample missed												
2136	70	SILTSTONE: dark grey, also medium grey, sub blocky to blocky, brittle, occasionally crumbly, grading to CLAYSTONE.												
	30	LIMESTONE; light brown grey, yellow grey, pink grey, firm to hard, blocky, brittle, microcrystalline, no visable porosity, NO SHOWS.												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION													
WELL : 25/9-2S		AREA : ISAK	Spud Date : 18h July 2003										Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
2139	100	SILTSTONE: as 2136m												
	Good tr	LIMESTONE: AS 2136m												
2142	100	CLAYSTONE: medium grey, medium grey green, occasionally light grey, firm to hard, sub blocky, crumbly, very calcareous, trace nodular pyrite.												
	tr	LIMESTONE as 2136m												
2145	100	CLAYSTONE: medium grey, medium grey green, occasionally light grey,												
	tr	LIMESTONE as 2136m												
2148	100	CLAYSTONE: medium grey, medium grey green, occasionally light grey, firm to hard, sub blocky, crumbly, very calcareous, trace nodular pyrite, silty in parts.												
	tr	LIMESTONE as 2136m												
2151	100	CLAYSTONE: medium grey, occasionally dark grey, also moderate brown, light brown in parts, firm, blocky to sub blocky, crumbly, silty in parts, trace nodular pyrite												
2154		Sample missed												
2157	100	CLAYSTONE: medium dark grey, occasionally dark grey, firm to hard, sub blocky, brittle, decreasing carboniferous streaks, no modifiers seen.												
2160	100	CLAYSTONE: medium dark grey, occasionally dark grey, firm to hard, sub blocky, brittle, decreasing carboniferous streaks, no modifiers seen.												
2163		Missed sample												
2166	70	CLAYSTONE: as 2160m												
	30	LIMESTONE: light grey, light blue grey, firm to hard, blocky, brittle, microcrystalline.												
2169	100	CLAYSTONE: medium dark grey, occasionally dark grey, firm to hard, sub blocky, brittle, good traces carboniferous streaks, no modifiers seen.												
2172	100	CLAYSTONE: as 2169m												
2175	100	CLAYSTONE: as 2169m												
2178	100	CLAYSTONE: as 2169m, becoming medium dark grey.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
2181		Sample missed												
2184	30	SANDSTONE: loose qurtz, clear, colourless, transparent, very fine to fine, occasionally medium, sub angular to sub rounded, moderate to well sorted, sub spherical to spherical, also cemented, light to medium grey, dirty appearance, occasional rockflour, firm cuttings, blocky, rounded appearance, crumbly break, siliceous cement, poor visible porosity, no cut, no crush cut, oil base residue, grading to:												
	70	SILTSTONE; medium grey, dark grey, occasionally dark grey black, firm, sub blocky, crumbly, non calcareous.												
2187	40	SANDSTONE: as 2184, slightly higher rockflour content.												
	60	SILTSTONE; medium grey, dark grey, occasionally dark grey black, firm, sub blocky, crumbly, non calcareous.												
2190	90	CLAYSTONE: olive grey, medium grey, rarely dark grey, firm to hard, sub blocky, crumbly to brittle, carboniferous streaks,												
	10	SANDSTONE: as 2184m with higher rockflour content.												
2193	60	CLAYSTONE: olive grey, medium grey, rarely dark grey, firm to hard, sub blocky, crumbly to brittle, carboniferous streaks,												
	40	SANDSTONE: loose qurtz, clear, colourless, transparent, very fine to fine, occasionally medium, sub angular to sub rounded, moderate to well sorted, sub spherical to spherical, also cemented, light to medium grey, dirty appearance, common soft rockflour, firm cuttings, blocky, rounded appearance, crumbly break, siliceous cement, poor visible porosity, no cut, no crush cut, oil base residue, silty with rockflour.												
2196	90	CLAYSTONE: medium grey, occasionally dark grey, homogenous, firm, sub blocky, crumbly to brittle, trace disseminated pyite, very silty in parts.												
	10	SANDSTONE: as 2193m												
2199	100	CLAYSTONE: medium grey, medium blue grey, firm, blocky to sub blocky, very silty in parts, trace disseminated and nodular pyrite.												
	tr	SANDSTONE: as 2193m												
2202	100	CLAYSTONE: as 2199m												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
	tr	LIMESTONE: yellow grey, light olive grey, rarely medium brown, firm, blocky, crumbly, microcrystalline.												
2205	100	CLAYSTONE: as 2199m												
	tr	LIMESTONE: AS 2202m												
2208	100	CLAYSTONE: as 2199m												
	tr	LIMESTONE: AS 2202m												
2211		Sample missed												
2214	70	CLAYSTONE: medium dark grey to olive grey, firm sub blocky to crumbly locally brittle, slightly to locally moderately calcareous, common very fine disseminated pyrite, very silty to locally grdaing to SILTSTONE.												
	30	SILTSTONE: medium grey to medium dark grey, olive grey in parts, generally a/a.												
	Gd tr	SANDSTONE: as thin intebeds in silt/claystone, rare loose grains: clear coulourless, translucent, very fine to silt, well sorted, occasionaly as rock flour, cuttings are medium light grey to medium grey, very friable, weak calcite cement in parts.												
	Gd tr	LIMESTONE: light brown grey, yellow grey, very light grey to white, firm to hard, blocky, brittle, microcrystalline, generally clean with local carbonaceous streaks, no visable porosity, NO SHOWS.												
2217	90	CLAYSTONE: medium dark grey to olive black, firm sub blocky to crumbly locally brittle, slightly calcareous, common very fine disseminated pyrite, very silty to locally grdaing to SILTSTONE.												
	10	LIMESTONE: as 2214m												
2220	70	CLAYSTONE: medium dark grey to olive black, firm sub blocky to crumbly locally brittle, slightly calcareous, frequent carbonaceous laminae, common very fine disseminated pyrite, very silty.												
	30	SILTSTONE: a/a.												
2223	50	CLAYSTONE: non to slightly calc else as 2217m grading into the SLTST.												
	50	SILTSTONE: as 2217m.												

ESSO NORGE A/S				WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S		AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
	Gd tr	SANDSTONE: as thin intebeds in silt/claystone, rare loose grains: clear coulourless, translucent, very fine to silt, well sorted, occasionaly as rock flour with floating Qtz grains, cuttings are medium light grey to medium grey, very friable, weak calcite cement in parts.												
	tr	LIMESTONE: as 2214m												
2226		MISSED												
2229	70	CLAYSTONE: medium dark grey to olive black, firm sub blocky to crumbly locally brittle, very slightly calcareous, frequent specks carbonaceous, common very fine disseminated pyrite, very silty.												
	30	SILTSTONE: grading from CLST as above.												
	tr	LIMESTONE: light brown grey, yellow grey, very light grey to white, firm to hard, blocky, brittle, microcrystalline, generally clean to slightly argillilaceous in parts, no visable porosity, NO SHOWS.												
2232	80	CLAYSTONE: locally very silty, gran pyrite, floating Qtz, else a/a.												
	20	SILTSTONE: grading from CLST as above.												
2235		MISSED												
2238	100	CLAYSTONE: dark grey to grey black, firm sub blocky to crumbly locally brittle, very slightly calcareous, frequent specks carbonaceous, common very fine disseminated pyrite, rare white calcite veining, very silty locally grading to SLTST.												
	Tr	LIMESTONE: a/a very thinly bedded in CLST												
2241	100	CLAYSTONE: predominantley olive black else as 2238m												
	Gd tr	DOLOMITE: orange brown, firm to moderately hard, sub blocky sub angular locally crumbly, micro crystalline, mudstone, very argillaceous, no vis por – NO SHOWS												
2244		MISSED.												
2247	100	CLAYSTONE: olive black, homogenous firm sub blocky to crumbly locally brittle, slightly to locally moderately calcareous, frequent specks carbonaceous, common very fine disseminated pyrite, very silty locally grading to SLTST.												

ESSO NORGE A/S			WELLSITE SAMPLE DESCRIPTION												
WELL : 25/9-2S	AREA : ISAK		Spud Date : 18h July 2003									Sheet No. 1			
DEPTH	%	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT		CUT FLUOR		RES	Rating
(m)		Colour, hardness, texture, mineralogy, modifiers, cement		DIST	COL	DIST	INTEN	COL	INTEN	COL	INTEN	COL	COL	
2250	100	CLAYSTONE: olive black, homogenous firm sub blocky to crumbly locally brittle, slightly calcareous, frequent specks carbonaceous, tarce very fine disseminated pyrite, very silty locally grading to SLTST												
		TD 2250 MDRKB (2139.13TVDRKB)												

Wellsite Geologist (s)___Guy Watts / Graham Heyes_____

Appendix II

Deviation Survey 25/9-2S

Report Date:
Report Type: Openworks Directional Data Transfer Report
Report Version: Sysdrill Ltd., v2.0
IDEAS Version: Director v2.2.2 2003/06/19 09:55:04
Ellipse Version: Sysdrill v2
Location Name: North sea, Norwegian sector.
Field Name: EXPLORATION ISAK 25/9
Structure Name: Deepsea Trym 25/9-2 S
Slot Name: 25/9-2 S
Well Name: 25/9-2 S
Wellpath Name: Definitive 25/9-2 S (TD@2250m Md)
Unique Well Identifier: 25/9-2 S
Wellpath Reference: s59698
Wellpath Date Created:
Wellpath Last Revised:
Co-ordinate System Name: European Datum 1950 / UTM Zone 31 N
Co-ordinate System Datum: Europe - west - Spain; France - offshore; United Kingdom - UKCS; Netherlands - offshore;\nGermany - offshore North Sea; Denmark; Norway; Turkey.\nMean Values
Co-ordinate System Projection: Transverse Mercator or Gauss Kruger Projection
Co-ordinate System Units: METER
Co-ordinate System Origin: N0 0 0.0000,E3 0 0.0000
Co-ordinate System False Origin: 500000.00,0.00
Co-ordinate System Central Meridian: E3 0 0.0000
Co-ordinate System LSF at CM: 0.999600
Well Surface Location X Co-ordinate: 482749.2918
Well Surface Location Y Co-ordinate: 6582814.2081
KB Elevation: 25.00
KB Elevation Units: Metres
Wellhead Elevation Type: Installation Vertical Datum
Local Grid Orientation: Grid North
Grid Convergence: -0.26 Degrees
Local Grid Units: Metres
True Vertical Depth Reference: Installation Centre
Position Uncertainty Confidence: 99.48 (1D)

MD	Inc	Dir	TVD-RKB	Grid E	Grid N	East-West Offset	North-South Offset	Semi-Major	Semi-Minor	Vertical Rotn
147.00	0.00	0.00	147.00	482749.29	6582814.21	0.00	0.00	0.00	0.00	N/A
240.70	0.33	164.85	240.70	482749.36	6582813.95	0.07	-0.26	0.22	0.22	N/A
269.00	0.34	187.21	269.00	482749.37	6582813.79	0.08	-0.42	0.29	0.29	N/A
297.80	0.17	164.36	297.80	482749.37	6582813.66	0.08	-0.55	0.36	0.36	N/A
326.80	0.17	166.84	326.80	482749.40	6582813.58	0.10	-0.63	0.43	0.43	N/A
357.10	0.11	215.31	357.10	482749.39	6582813.51	0.10	-0.70	0.50	0.50	N/A
386.60	0.17	201.02	386.60	482749.36	6582813.45	0.07	-0.76	0.57	0.57	N/A

417.30	0.17	174.58	417.30	482749.34	6582813.36	0.05	-0.85	0.64	0.64	N/A	0.76
445.60	0.19	194.92	445.60	482749.34	6582813.27	0.04	-0.94	0.71	0.71	N/A	0.83
475.00	0.11	161.11	475.00	482749.33	6582813.20	0.04	-1.01	0.78	0.78	N/A	0.92
504.50	0.09	148.39	504.50	482749.35	6582813.15	0.06	-1.06	0.85	0.85	N/A	1.00
533.50	0.14	198.99	533.50	482749.35	6582813.10	0.06	-1.11	0.92	0.92	N/A	1.08
563.30	0.10	166.63	563.30	482749.35	6582813.04	0.06	-1.17	0.99	0.99	N/A	1.16
592.80	0.13	164.21	592.80	482749.36	6582812.98	0.07	-1.23	1.06	1.06	N/A	1.25
622.40	0.20	211.42	622.40	482749.35	6582812.90	0.05	-1.30	1.13	1.13	N/A	1.33
651.70	0.16	193.86	651.70	482749.31	6582812.82	0.02	-1.39	1.20	1.20	N/A	1.41
681.20	0.07	168.47	681.20	482749.30	6582812.76	0.01	-1.45	1.27	1.27	N/A	1.49
710.70	0.25	176.92	710.70	482749.31	6582812.68	0.02	-1.53	1.34	1.34	N/A	1.58
740.20	0.15	196.42	740.20	482749.30	6582812.58	0.01	-1.63	1.41	1.41	N/A	1.66
769.70	0.10	129.77	769.70	482749.31	6582812.53	0.02	-1.68	1.48	1.48	N/A	1.74
799.30	0.07	261.99	799.30	482749.31	6582812.51	0.02	-1.70	1.55	1.55	N/A	1.82
829.00	0.06	98.57	829.00	482749.31	6582812.50	0.02	-1.71	1.62	1.62	N/A	1.91
857.50	0.35	164.07	857.50	482749.35	6582812.42	0.06	-1.79	1.69	1.69	N/A	1.99
888.10	0.53	171.15	888.10	482749.40	6582812.19	0.11	-2.02	1.76	1.76	N/A	2.07
917.70	0.68	114.09	917.70	482749.58	6582811.98	0.29	-2.23	1.83	1.83	N/A	2.15
947.20	0.49	147.70	947.19	482749.81	6582811.80	0.51	-2.41	1.90	1.90	N/A	2.24
976.70	0.52	100.90	976.69	482750.00	6582811.67	0.71	-2.54	1.97	1.97	N/A	2.32
1005.52	0.34	96.52	1005.51	482750.22	6582811.64	0.93	-2.57	2.04	2.04	N/A	2.40
1035.60	0.37	100.56	1035.59	482750.40	6582811.61	1.11	-2.60	2.11	2.11	N/A	2.48
1046.40	0.37	89.44	1046.39	482750.47	6582811.60	1.18	-2.61	2.14	2.14	N/A	2.51
1065.10	1.39	116.36	1065.09	482750.73	6582811.50	1.44	-2.71	2.14	2.14	N/A	2.57
1095.60	4.03	129.62	1095.55	482751.89	6582810.65	2.60	-3.56	2.14	2.14	N/A	2.65
1123.70	4.62	170.54	1123.58	482752.84	6582808.91	3.55	-5.30	2.15	2.14	N/A	2.73
1153.90	5.81	220.73	1153.67	482752.04	6582806.55	2.75	-7.66	2.16	2.15	N/A	2.81
1183.20	7.32	249.30	1182.78	482749.33	6582804.77	0.04	-9.45	2.17	2.16	250.35	2.90

1212.70	10.68	259.24	1211.92	482744.88	6582803.59	-4.41	-10.62	2.18
2.17	251.99	2.98						
1241.90	15.84	249.12	1240.33	482738.50	6582801.67	-10.80	-12.55	2.22
2.18	248.86	3.06						
1271.30	18.75	238.29	1268.41	482730.73	6582797.75	-18.57	-16.46	2.30
2.20	244.57	3.14						
1300.70	20.70	234.23	1296.08	482722.50	6582792.23	-26.81	-21.98	2.41
2.23	240.99	3.22						
1330.10	21.99	235.54	1323.46	482713.75	6582786.08	-35.56	-28.14	2.57
2.26	239.11	3.29						
1359.60	23.94	238.02	1350.63	482704.12	6582779.79	-45.19	-34.43	2.78
2.29	238.47	3.37						
1389.20	27.03	241.06	1377.34	482693.14	6582773.35	-56.18	-40.87	3.04
2.33	238.62	3.45						
1419.10	27.39	239.17	1403.93	482681.29	6582766.54	-68.03	-47.68	3.35
2.37	238.70	3.53						
1452.50	27.80	237.99	1433.54	482668.09	6582758.48	-81.23	-55.75	3.74
2.41	238.56	3.62						
1478.30	27.86	235.77	1456.35	482658.01	6582751.90	-91.32	-62.33	4.05
2.45	238.27	3.68						
1507.80	27.63	232.15	1482.46	482646.92	6582743.83	-102.42	-70.40	4.42
2.50	237.68	3.76						
1535.90	28.01	230.92	1507.32	482636.65	6582735.68	-112.68	-78.56	4.77
2.55	237.03	3.84						
1566.30	28.02	231.72	1534.15	482625.51	6582726.76	-123.83	-87.48	5.17
2.61	236.48	3.92						
1596.70	28.02	232.17	1560.99	482614.27	6582717.96	-135.08	-96.29	5.57
2.67	236.08	4.00						
1626.23	27.94	233.79	1587.07	482603.21	6582709.62	-146.14	-104.63	5.97
2.73	235.86	4.08						
1656.60	27.90	233.20	1613.90	482591.79	6582701.16	-157.57	-113.09	6.38
2.79	235.66	4.16						
1686.70	27.88	230.88	1640.51	482580.69	6582692.51	-168.67	-121.75	6.79
2.85	235.38	4.24						
1715.30	27.72	230.66	1665.81	482570.36	6582684.08	-179.00	-130.18	7.18
2.92	235.09	4.32						
1744.90	27.69	232.36	1692.01	482559.60	6582675.51	-189.77	-138.75	7.59
2.98	234.90	4.40						
1774.10	27.83	233.31	1717.85	482548.76	6582667.30	-200.61	-146.96	8.00
3.05	234.80	4.48						
1802.80	27.67	232.62	1743.25	482538.10	6582659.26	-211.27	-155.01	8.39
3.12	234.69	4.56						
1832.20	26.71	229.67	1769.40	482527.64	6582650.84	-221.74	-163.43	8.79
3.19	234.49	4.64						
1861.70	27.86	228.73	1795.62	482517.41	6582642.01	-231.97	-172.27	9.19
3.26	234.23	4.72						
1890.70	27.77	229.05	1821.27	482507.22	6582633.11	-242.17	-181.17	9.59
3.34	234.00	4.80						
1920.20	27.85	229.23	1847.36	482496.82	6582624.11	-252.58	-190.17	10.01
3.41	233.79	4.88						
1949.70	27.66	229.36	1873.47	482486.41	6582615.16	-262.99	-199.13	10.42
3.49	233.60	4.97						
1979.20	27.73	230.88	1899.59	482475.89	6582606.37	-273.51	-207.92	10.83
3.56	233.47	5.05						
2008.10	27.75	231.95	1925.17	482465.38	6582597.98	-284.03	-216.31	11.24
3.64	233.40	5.13						

2037.60	27.65	233.02	1951.29	482454.51	6582589.64	-294.90	-224.66	11.65	3.72	233.38	5.21	
2068.10	27.89	233.83	1978.28	482443.10	6582581.17	-306.31	-233.13	12.09	3.80	233.39	5.30	
2096.40	27.75	234.54	2003.31	482432.39	6582573.45	-317.02	-240.86	12.50	3.88	233.42	5.38	
2126.10	28.02	234.41	2029.56	482421.09	6582565.38	-328.33	-248.93	12.92	3.96	233.45	5.46	
2154.90	27.84	233.12	2055.00	482410.22	6582557.41	-339.21	-256.90	13.34	4.04	233.45	5.54	
2184.90	27.80	232.16	2081.53	482399.09	6582548.92	-350.34	-265.40	13.77	4.12	233.42	5.62	
2214.20	28.11	230.54	2107.42	482388.37	6582540.34	-361.06	-273.98	14.19	4.21	233.34	5.71	
2238.60	27.79	229.71	2128.97	482379.60	6582533.01	-369.84	-281.31	14.53	4.27	233.26	5.78	
2250.00	27.79	229.71	2139.05	482375.55	6582529.58	-373.89	-284.74	14.67	4.28	233.22	5.80	

MD	TVD	Grid E	Grid N	Target Name

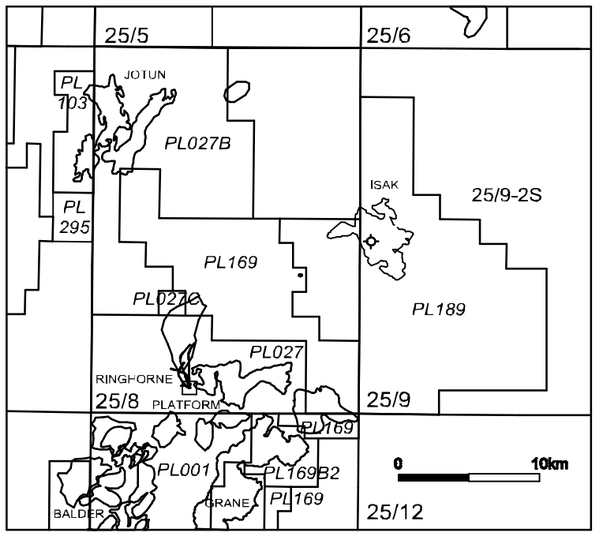
Appendix IV

Composite Log 25/9-2S

ESSO NORGE AS
COMPOSITE LOG 1:500

WELL : 25/9-2S
LICENSE : PL189

REGIONAL MAP

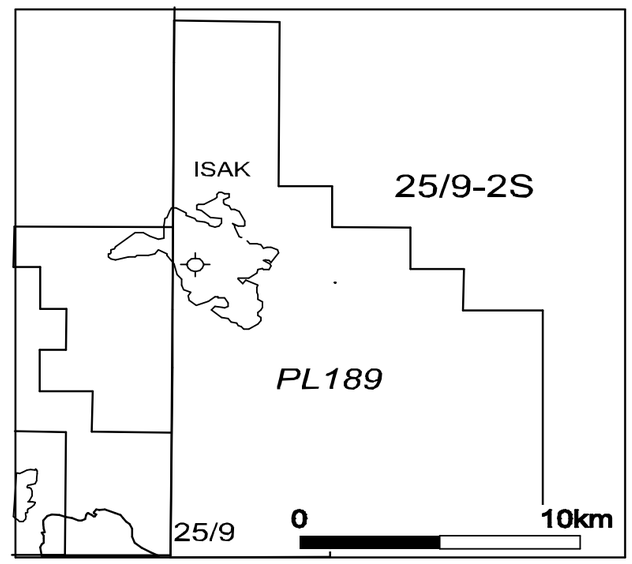


COUNTRY	:	NORWAY
BASIN	:	North Sea
BLOCK	:	25/9
LICENSE	:	PL189
OPERATOR	:	ESSO NORGE AS
PRE-DRILL STATUS	:	EXPLORATION
RIG NAME/TYPE	:	Deep Sea Trym
STATUS	:	Dry Hole, P&A

OBJECTIVES

PRIMARY : Brent Group

LOCATION MAP



RIG DATA

RIG PICK UP DATE	:	July 17 2003	RKB - MSL	:	25 m
SPUD DATE	:	July 18 2003	RKB - SB	:	147 m
DRILLING COMPLETED	:	July 30 2003	WATER DEPTH	:	122 m
RIG RELEASED	:	4 August 2003	TD (Driller)	:	2250 m MDRKB
TOTAL DAYS	:	17 days	TVD	:	(-2114 m TVDSS)

LOCATION DATA

SURFACE LATITUDE	:	59°22 56.270" N
SURFACE LONGITUDE	:	02°41'46.970" E
ZONE ED UTM	:	482749.29 m E
		6582814.21m E
TD LATITUDE	:	59° 22' 47.010" N
TD LOGITUDE	:	02 41' 23.360" E
ZONE ED UTM	:	482375.34m E
		6582529.47m N

PARTNERS

ESSO NORGE AS (OPERATOR):	45%
NORSK HYDRO:	45%
PETORO:	10%

CONTRACTORS

DRILLING	:	ODDFJELL
WELLSITE GEOLOGY	:	CAMBRIAN
MUDLOGGING	:	GEOSERVICE
WIRELINE	:	BAKER ATLAS
DIRECTIONAL	:	BHI
MWD/LWD	:	BHI
MUD	:	MI
CASING	:	WEATHERFORD
CEMENT	:	HALIBURTON
BIOSTRATIGRAPHY	:	Robertson Research

GEOLOGISTS

OPERATIONS	:	TORUNN VALHEIM
	:	HAAKON LEDJE
WELLSITE	:	G. HAYES
	:	G. WATTS

LOG COMPILER(S)

DATE : November 2003

LITHOSTRATIGRAPHIC TOPS

GROUP	FORMATION	MEMBER	SEQUENCE/ CYCLE	DEPTH (MDRKB)	DEPTH (TVDSS)
Nordland	Seabed				147
	Utsira			789	764
Hordaland	Lark			1002	977
	Skade			1226	1200
	Lark			1312	1281
	Horda			1450	1406
	Balder			1832	1744
Rogaland	Lista			1923.5	1825
	Sele			1975	1870
	Våle			2026.5	1916
Shetland	Tor			2036	1925
	Tryggvason			2050.5	1939
	Svarte			2066.5	1952
Cromer Knoll	Rødby			2111	1990
	Mime			2153.5	2029
Viking	Draupne			2162.5	2037
	Heather			2172.5	2045
	Hugin			2183	2055
Dunlin	Burton			2190	2061

WIRELINE LOGS

DATE	RUN No.	LOGGING SUITE	INTERVAL
		NONE	

	TD			2250	2114						

CASING DATA

BIT SIZE	INTERVAL	CASING	SHOE DEPTH	MUD SYSTEM
36"	147-223	30"	218	WBM
9 5/8" Pilot	223-1057			WBM
12.25"	223-1055	20" 9 5/8"	1051.4	WBM

CONVENTIONAL CORES

CORE	INTERVAL	RECOVERY
	NONE	

BIOSTRATIGRAPHIC TOPS

SERIES	STAGE	ZONE	DEPTH from (MD)	DEPTH to (MD)
L.Oligocene			1200	1330
Stratigraphic Break	----------	----------	---------	----------
M.Eocene			1460	1570
L.Eocene			1680	1930
U.Paleocene			1980	2020
Stratigraphic Break	----------	----------	---------	----------
U.Cretaceous			2040	
	U.Turonian-M.Cen.		2050	2070
	L.Cenomanian		2110	
Stratigraphic Break	----------	----------	---------	----------
	U.Albian		2121	2142
	M.Albian		2151	
Stratigraphic Break	----------	----------	---------	----------
	L.Barremian		2160	
Stratigraphic Break	----------	----------	---------	----------
	U.Ryazanian		2166	
	M.Volgian		2172	
Stratigraphic Break	----------	----------	---------	----------
	L.Oxfordian-U.Call.		2178	2184
Stratigraphic Break	----------	----------	---------	----------
	L.Pliensbachian		2196	2241

DRILLSTEM TESTS

DST No	INTERVAL	FLOW	CHOKE	WHP
1	2222-2275	2098 bopd	28/64"	2103

MISCELLANEOUS

MISCELLANEOUS

SIDEWALL CORES

RUN	SHOT	DEPTH	RECOVERY	RUN	SHOT	DEPTH	RECOVERY

RFT DATA

RUN	DEPTH (RKB)	HYDROSTATIC PRESS (psi)	FORMATION PRESS (psi)	COMMENT	FORMATION

LITHOLOGY SYMBOLS

CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
CLAY
CLAYSTONE
SHALE
CALCAREOUS
CLAYSTONE
MARL
CHALK
NO RETURNS

LIMESTONE
ARGILLACEOUS
LIMESTONE
DOLOMITIC
LIMESTONE
OOLITIC
LIMESTONE
DOLOMITE
CALCAREOUS
DOLOMITE
ANHYDRITE
GYPSUM
COAL

HALITE
POLYHALITE
VOLCANICS
TUFF
INTRUSIVE
IGNEOUS
EXTRUSIVE
IGNEOUS
METAMORHPIC
BASEMENT
CEMENT

ACCESSORY SYMBOLS

CONGLOMERATIC
SANDY
SILTY
ARGILLACEOUS
SHALY
MARLY
CALCAREOUS
DOLOMITIC
LIMESTONE
STRINGER
ANHYDRITIC
GYPSIFEROUS
VOLCANICS
TUFFACEOUS

Ca CALCITIC
CHERTY
GLAUCONITIC
Fe FERRUGINOUS
PYRITIC
CARBONACEOUS
M MICACEOUS
K FELDSPATHIC
Ph PHOSPHATIC
OOLITIC

MACROFOSSILS
UNDIFF
MICROFOSSILS
UNDIFF
AMMONITES
BELEMNITES
CORALS
ECHINOIDS
GASTROPODS
BIOTURBATED
ROOTS
PLANT
REMAINS

OPERATIONAL SYMBOLS

9 5/8" 9805 CASING SHOE

CEMENT PLUG

BRIDGE PLUG

14000
14153
2 DST
14158
14200

BIT DATA
DATE
NB NEW BIT
RRB RERUN BIT
CB CORE BIT

8950
No1
(SHIFT)
RECOVERY
8970
8980
CORE
(NO REC)

SIDEWALL CORES

RUN.SHOT
(RECOVERED)
RUN.SHOT
(NOT RECOVERED)

RFT/FMT

RUN SAMPLE TAKEN
RUN PRESSURE TEST

DIP DIPMETER

322
3° DEVIATION
SURVEY

INTERVAL
MARKER
eg. FMS

CHRONO/LITHO STRATIGRAPHY	GAMMA RAY	DEPTH AND LITH	RESISTIVITY	POROSITY	LITHOLOGY DESCRIPTION

SYSTEM | SERIES | STAGE | GROUP | FORMATION | MEMBER

GRAFM(API) 0 — 150

100

RPCELM(Ohm.m) 0.20 — 20

RPCEHM(Ohm.m) 0.20 — 20

RACELM(Ohm.m) 0.20 — 20

RACEHM(Ohm.m) 0.20 — 20

BDCFM(g/cm3) 1.95 — 2.95

DT(msec/ft) 140 — 40

NPLFM(pu) 0.45 — -0.15

DRHFM() -0.25 — 0.25

200

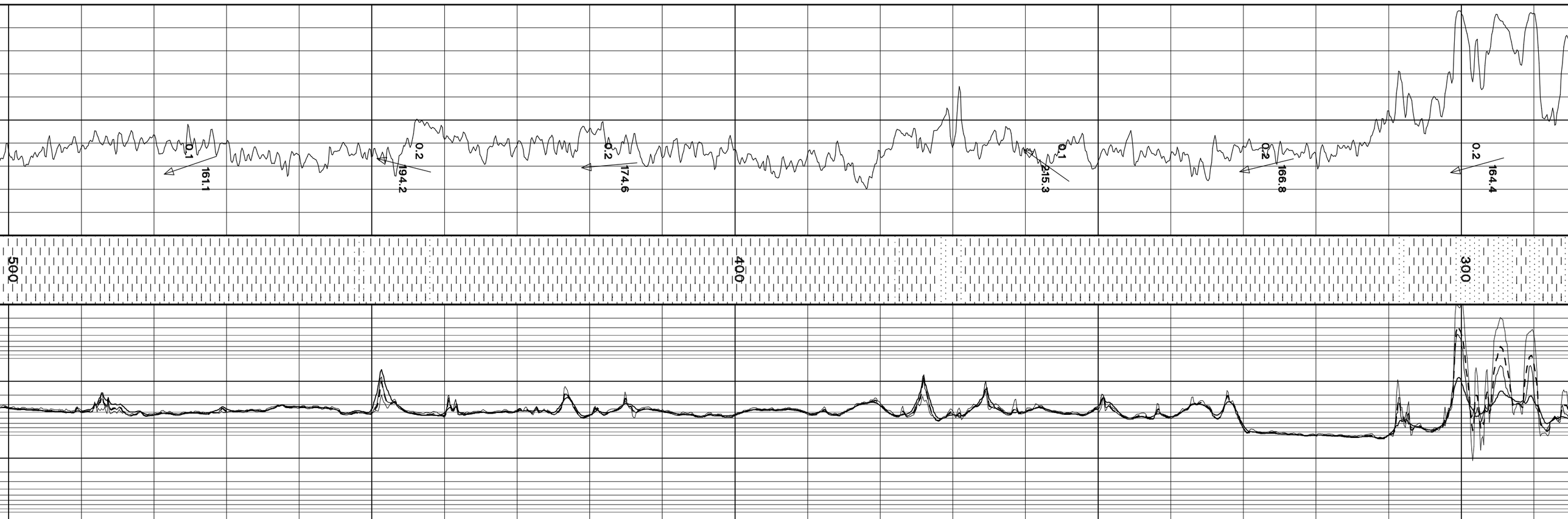
30 ”
219m

164.8
0.3

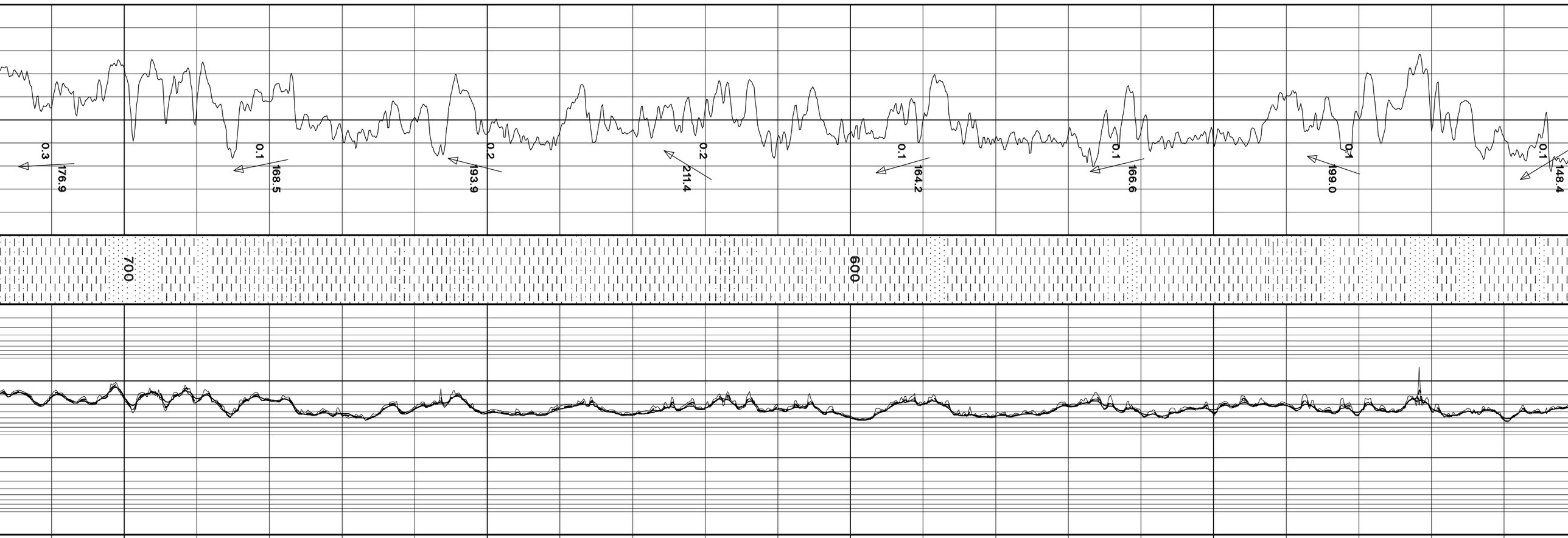
0.3
187.2

Seabed at 147m

9 5/8 Pilot Hole drilled to 1057m with seawater and 1.20sg High Vis Sweeps.
Returns to Seabed - No Riser.
Hole then opened to 17.5”.
ROP shown from Pilot Hole

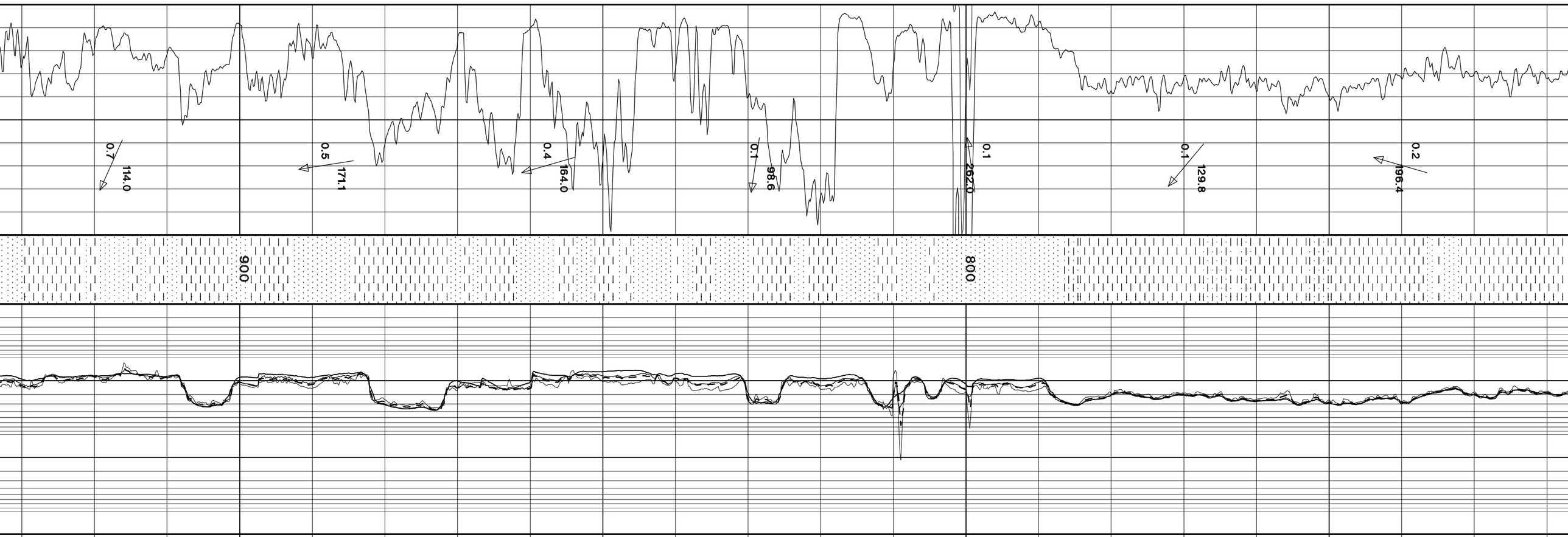

0.1
161.1
0.2
194.2
0.2
174.6
0.1
215.3
0.2
166.8
0.2
164.4
500
400
300

TERTIARY


0.3
176.9
0.1
168.5
0.2
193.9
0.2
211.4
0.1
164.2
0.1
166.6
0.1
199.0
0.1
148.4
700
600

TERTIARY

UTSIRA



Top UTSIRA Fm 789m MDRKB
(-764m TVDSS)

HORDALAND

LARK UTSIRA

147.7
0.5

100.9
0.5

1000

96.5
0.3

100.6
0.4

0.4
89.4

9⅝"
1051m

116.4
1.4

129.6
4.0

1100

170.5
4.6

Top LARK Fm 1002m MDRKB
(-977m TVDSS)

First samples on surface from 1057m.

CLAYSTONE: medium to dark grey, firm, sub blocky, sticky, subfissile, crumbly.

SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange.

CLAYSTONE: medium to medium dark grey, soft to firm, sub blocky, sticky, subfissile, crumbly.

SANDSTONE: loose quartz, clear, colourless, translucent to transparent, occasional frosted appearance, fine to medium, occasionally coarse, angular to sub rounded, occasionally rounded, poor to moderately sorted, predominently subspherical, occasional feldspar, pale yellow orange, dark yellow orange, NO SHOWS

CLAYSTONE: light medium to medium grey, occasionally medium blue grey, soft to firm, sub blocky, sticky, subfissile, crumbly, grading to SILTSTONE.

TERTIARY

OLIGOCENE

HORDALAND

SKADE

5.8
220.7

7.3
249.3

1200

10.7
259.2

15.8
249.1

18.7
238.3

20.7
234.2

1300

22.0
235.5

23.9
238.0

SILTSTONE: light medium to medium grey, occasionally medium blue grey, soft to firm, sub blocky, sticky, subfissile, crumbly,grading to CLAYSTONE.

CLAYSTONE: medium grey to medium dark grey, soft to firm, sub blocky, sticky and locally amorphous, silty to frequently very silty with local good Trace floating Qtz, moderately calcareous,

LIMESTONE: off white to olive grey, moderately hard, blocky, microcrystalline, mudstone, slightly argillaceous in parts, as stringers, no visible porosity - NO SHOWS.

CLAYSTONE: olive black to dark grey, generally firm, sub blocky, very hygroturgid, silty to very silty in parts, moderately calcareous, rare trace carbonaceous specks locally grading to Silty Claystone.

Top SKADE Sand 1226m MDRKB (-1200m TVDSS)

SANDSTONE: as loose Qtz: clear, colourless, translucent, rarely frosted, medium to course with occasional very course grains, moderate to well sorted, well rounded with good spericity. Rare aggregates with weak silaceous cement, good inferred porosity, NO SHOWS.

SANDSTONE: unconsolidated Qtz: clear, colourless, translucent, rarely frosted, fine upper to medium upper occasional very course grains, poor to moderate sorted, well rounded with good spericity. Rare aggregates: medium light grey to light grey, very friable, weak silaceous cement to rare calcite cement, good inferred porosity, NO SHOWS.

SANDSTONE: as loose Qtz: clear, colourless, translucent, rarely frosted, medium lower to medium upper, moderate to well sorted, well rounded with good spericity, rare trace glauconitic overgrowths. Rare aggregates: medium light grey to light grey, very friable, weak silaceous cement, good inferred porosity, NO SHOWS.

Base SKADE Sand 1312m MDRKB (-1281m TVDSS)

DOLOMITIC LIMESTONE: moderate yellowish brown to olive grey, soft to frm, locally crumbly, very argillaceous, occuring as stringers, no visible porosity and NO SHOWS.

CLAYSTONE: olive black, moderately hard, blocky, very hygroturgid, varying silt, non calcareous, rare trace granular pyrite, rare trace glauconitic specks, locally grading to SILTSTONE

DOLOMITIC LIMESTONE: moderate yellowish brown to olive grey, soft to frm, locally crumbly, very argillaceous, occuring as stringers, no visible porosity and NO SHOWS.

CLAYSTONE: olive black and homogenous, moderately hard, blocky, slightly silty, non to occasionally slightly calcareous, trace very very fine disseminated pyrite.

TERTIARY

EOCENE

HORDALAND

HORDA

LARK

27.0
241.0

1400

27.4
239.1

27.8
238.0

27.9
235.8

1500

27.6
232.2

28.0
230.0

28.0
231.7

CLAYSTONE: olive black and generally homogenous, moderately hard, blocky, slightly silty to locally moderately silty, non calcareous, trace disseminated pyrite, trace carbonaceous specs.

LIMESTONE: light olive grey, soft to moderately hard, locally crumbly, microcrystalline, mudstone, very argillaceous, grading to DOLOMITIC LIMESTONE in parts, no visible porosity and NO SHOWS.

Top HORDA Fm 1450m MDRKB (-1406m TVDSS)

CLAYSTONE: dark grey-olive black, green grey, dark green grey, firm, sub blocky, crumbly, trace disseminated pyrite

CLAYSTONE: green grey, occasionally light green grey, dark green grey, brown grey, sub blocky to sub platy, crumbly, occasionally brittle, trace disseminated pyrite, non calcareous.

LIMESTONE: light olive grey becoming yellow grey, soft to moderately hard, sub blocky to blocky, locally cubic, crumbly, cryptocrystalline, wackstone where seen, dolomitic in parts, no visable porosity, NO SHOWS.

CLAYSTONE: dark green grey, dark blue grey, dark grey, olive black in parts, firm, sub blocky to sub platy, sub fissile to crumbly, rare disseminated pyrite.

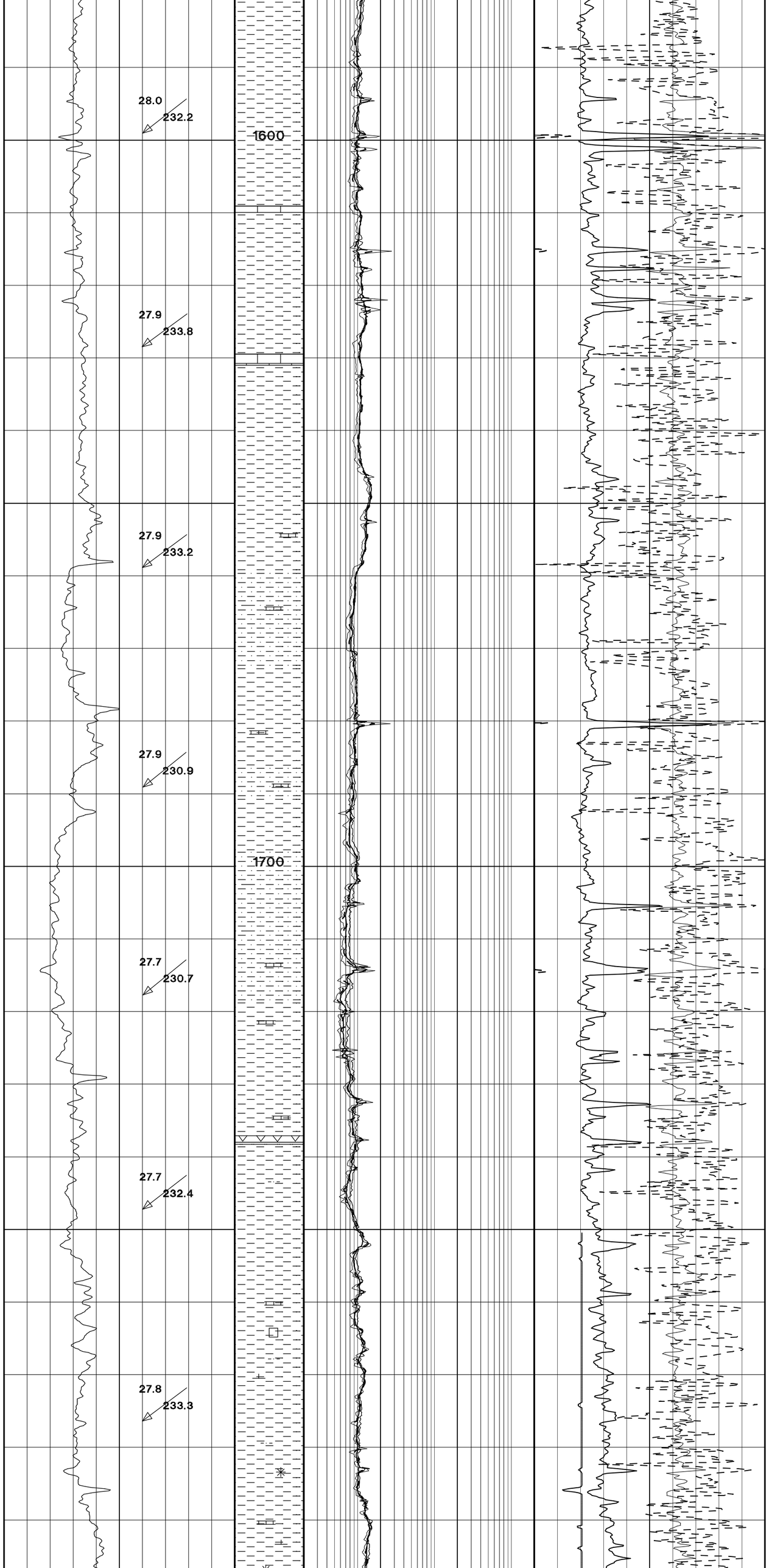
SANDSTONE: loose quatrz, clear, colourless, translucent, rarely frosted, medium lower to medium upper, poor to moderate sorted, sub angular to well rounded, poor inferred porosity, NO SHOWS.

TERTIARY

EOCENE

HORDALAND

HORDA



CLAYSTONE: olive black, medium blue grey, dark green grey, firm to occasionally hard, sub blocky, brittle to crumbly.

LIMESTONE: dark orange grey, yellow grey and light alive grey, firm, blocky, crumbly-brittle, micro-cryptocrystalline, mudstone-wackstone. NO SHOW

CLAYSTONE: medium dark grey, occasionally medium grey, homogenous, firm, sub blocky, sub fissile to crumbly, occasionally splintery.

LIMESTONE: light olive grey, medium grey, yellow grey, soft to firm, blocky, crumbly, cryptocrystalline, wackstone where visable, no visable porosity, NO SHOW.

LIMESTONE: very pale orange, grey orange, firm, blocky, crumbly, micro to cryptocrystalline, packstone, argillaceous, no visable porosity, NO SHOW.

CLAYSTONE: medium grey, medium dark grey, medium grey brown, homogenous, firm, sub blocky, sub fissile to crumbly

Trace TUFF: rare, pale green with dark green specks, soft, amorphous, blocky, sticky.

CLAYSTONE: dark greenish grey and olive grey, firm to moderately hard, sub blocky, slightly calcareous, moderately silty, abundant glauconite specks in green CLST, good trace very very fine disseminated pyrite.

Good Trace LIMESTONE: off white to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone texture, locally grading to Dolomite which has a medium grained sucrosic texture in parts.

CLAYSTONE: dark greenish grey to dusky blueish grey, firm to

TERTIARY

PALEOCENE

ROGALAND

BALDER

SELE

LISTA

1800

1900

2000

27.7
232.6

26.7
229.7

27.9
228.7

27.8
229.0

27.8
229.2

27.6
229.4

27.3
230.0

27.8
231.9

moderately hard, sub blocky, slightly calcareous, moderately silty, abundant glauconite specks, good trace very very fine disseminated pyrite.

DOLOMITIC LIMESTONE: pale grey brown, firm to moderately hard, sub blocky to crumbly, micro crystalline to locally medium when sucrosic, wackstone - packstone, no vis por - NO SHOWS.

TUFF: medium blueish grey to medium grey, firm, crumbly, ashy texture, rare impregnated glass shards, very calcareous grading to CLST in parts, gd trace glauconite and abundant very very fine disseminated py

Top BALDER Fm 1832m MDRKB (-1744m TVDSS)

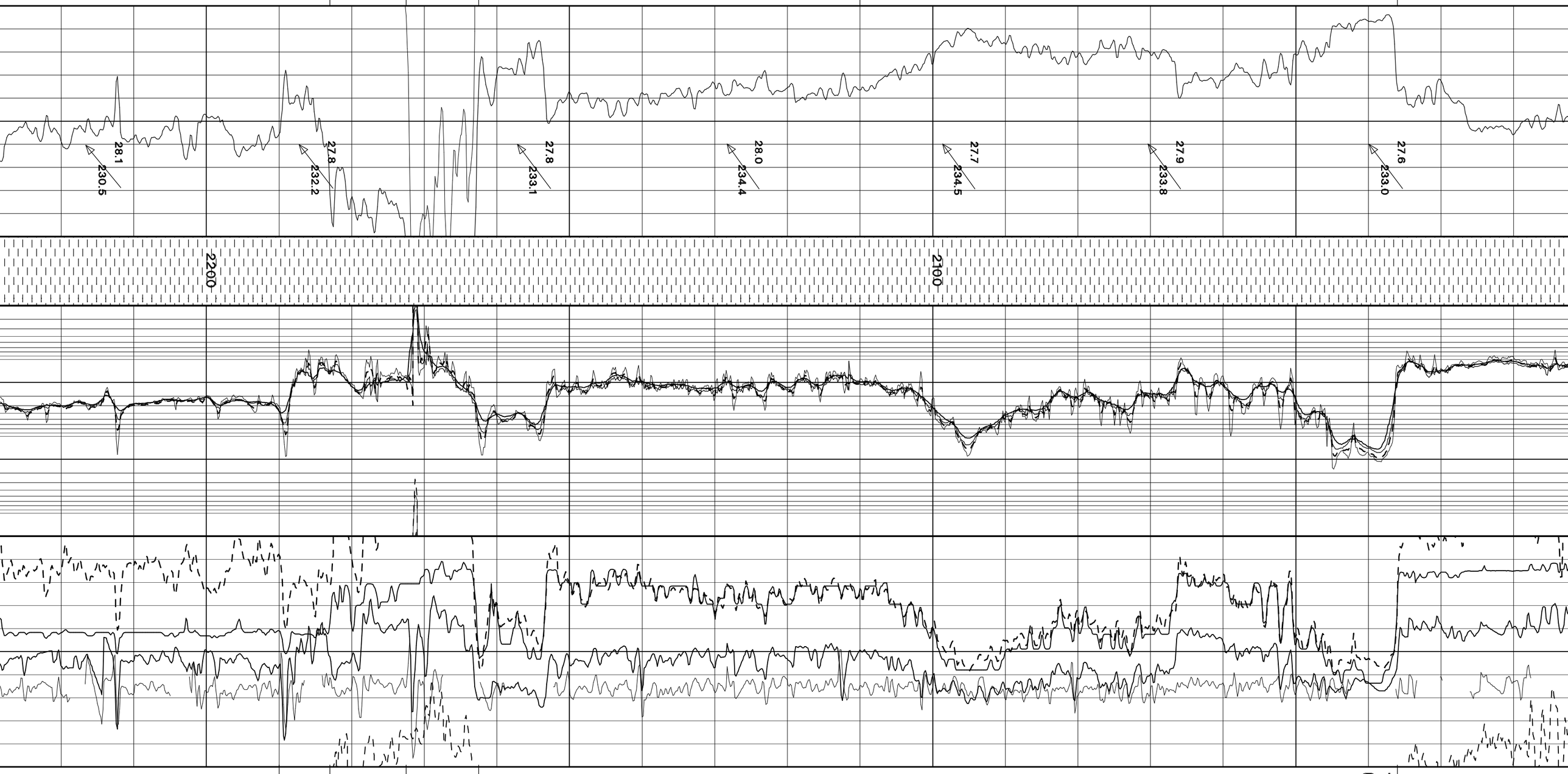
CLAYSTONE: predominatly olive black/grey, firm to moderately hard, blocky, rare ashy texture, non calcareous, very abnt pyrite , very slightly silty in parts.
tr DOMOMITE: pale grey brown to olive grey, firm to moderately hard, sub blocky to crumbly, micro crystalline to locally medium when sucrosic, wackstone - packstone, calcareous in parts, no vis por - NO SHOWS tr TUFF: medium blueish grey to medium grey, firm, crumbly, ashy texture, very calcareous, abundant very very fine disseminated pyrite

CLAYSTONE: predominatly olive grey, generally homogenous, firm to moderately hard, blocky, non calcareous to locally slightly calcareous, trace pyrite, locally very slightly silty.
TUFF: light grey to medium light grey mottled, firm, sub block to frequently crumbly, very calcareous, abundant flattened glass shards, very ashy, fine grained feldspars, trace very fine pyrite.

Top LISTA Fm 1923.5m MDRKB (-1825m TVDSS)

CLAYSTONE: dusky brown to black brown, firm to moderately hard, blocky, silty lo locally very sily, rare trace vf pyrite, trace mic-mic, moderately calc, often blueish green grey, no silt, predominantly non calcareous.
LIMESTONE: off white to olive grey, pale brown i/p, firm to moderately hard, sub blocky to crumbly, micro crystalline, mudstone to wackstone, chalky, slightly argillaceous in parts, no vis por - NO SHOWS.

JURASSIC				CRETACEOUS						
LOWER	UPPER			LOWER		UPPER				
PLIENSBACHIAN	L.OXFORDIAN/U.CALLOVIAN		VOLGIAN	L.Barremian	ALBIAN	CENNOMANIAN		TURONIAN	MAASTRICHTIAN	
DUNLIN	VIKING			CROMER KNOLL		SHETLAND				
BURTON	HUGIN	HEATHER	DRAUPNE	MIME	RØDBY	SVARTE		TRYGGVASON	TOR	VÅLE



Top SHETLAND Gr 2036m MDRKB
(-1925m TVDSS)

LIMESTONE: greyish orange pink locally white, becoming moderate brown in parts, moderately hard,sub angular, locally clean to argillaceous when brownish, very chalky with a crunchy texture, mudstone, no vis porosity - NO SHOWS.

CLAYSTONE: medium dark grey to dark grey, firm to moderately hard, blocky, very very calcareous locally rading to MARL, no silt

SILTSTONE: medium grey, occasionally dark grey brown, rarely dark grey green, sub blocky, sub fissile to crumbly, trace disseminated pyrite, grading to CLAYSTONE.

CLAYSTONE: medium grey, occasionally dark grey, also moderate brown, light brown in parts, firm, blocky to sub blocky, crumbly, silty in parts, trace nodular pyrite

Top DRAUPNE Fm 2162.5m
(-2037m TVDSS)

Top HEATHER Fm 2172.5m MDRKB
(-2045m TVDSS)

Top HUGIN Fm 2183m MDRKB
(-2055m TVDSS)

Top DUNLIN Gr 2190m MDRKB
(-2061m TVDSS)

CLAYSTONE: olive grey, medium grey, rarely dark grey, firm to hard, sub blocky, crumbly to brittle, carboniferous streaks

SANDSTONE: loose qurtz, clear, colourless, transparent, very fine to fine, occasionally medium, sub angular to sub rounded, moderate to well sorted, sub spherical to spherical, also cemented, light to medium grey, dirty appearance, common soft rockflour, firm cuttings, blocky, rounded appearance, crumbly break, siliceous cement, poor visible porosity, no cut, no crush cut, oil base residue, silty with rockflour.

27.8

229.7

2300

CLAYSTONE: olive black, homogenous firm sub blocky to crumbly locally brittle, slightly calcareous, frequent specks carbonaceous, tarce very fine disseminated pyrite, very silty locally grading to SLTST

TD at 2250m MDRKB
(-2114m TVDSS)

SYSTEM	SERIES	STAGE	GROUP	FORMATION	MEMBER	GAMMA RAY	DEPTH AND LITH	RESISTIVITY	POROSITY	LITHOLOGY DESCRIPTION
CHRONO/LITHO STRATIGRAPHY						GAMMA RAY	DEPTH AND LITH	RESISTIVITY	POROSITY	LITHOLOGY DESCRIPTION

GRAFM(API): 0 — 150

RACEHM(Ohm.m): 0.20 — 20

RACELM(Ohm.m): 0.20 — 20

RPCEHM(Ohm.m): 0.20 — 20

RPCELM(Ohm.m): 0.20 — 20

DRHFM(): -0.25 — 0.25

NPLFM(pu): 0.45 — -0.15

DT(msec/ft): 140 — 40

BDCFM(g/cm3): 1.95 — 2.95

Appendix V

Log analysis 25/9-2S