Geochemical Report on
NOCS Well 6404/11-1

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NIGOGA Quality Control

SR-1 Norwegian Geochemical Standard

Appendix 1:

Tables

Standard gas chromatograms and fragmentograms can be found in the appropriate appendices

Chapter 1

INTRODUCTION

1.1 General comments on 6404/11-1

This well is the first well in the block. The section of the well from 2450 m down to 3650 m (TD) was drilled with a water based mud which included glycol (>10% by volume glycol in the mud).

1.2 Analytical program

Based on the instructions from BPAmoco, the following analyses were carried out.

Analysis type	*No. of samples*	*Table*
Headspace Gas Analysis	51	1a
Headspace Gas Isotope Analysis	63	2a
Gas composition of gas bags	10	1b
Gas Isotope Analysis - gas bags	10	2b
Gas composition of sealed SWC	2	1c
Gas Isotope Analysis - sealed SWC	2	2c
Washing of cuttings	11	-
Lithology Description	28	3
TOC	12	3,4
Rock-Eval Pyrolysis	12	4
Extraction	13	5a-e
Asphaltene separation	13	5a-e
MPLC separation	13	5a-e
EOM GC	4	-
Saturated hydrocarbon GC	13	6a-c
Aromatic hydrocarbon GC	13	7a-b
Saturated hydrocarbon GC-MS	9	8a-i
Saturated hydrocarbon MRM	2	8j-m
Aromatic hydrocarbon GC-MS	7	9a-m
$\delta^{13}C$ Bulk isotope composition	5 samples, 2 fractions per sample	10

Experimental Procedures

Headspace Gas Analysis

The analysis is performed using a Varian 3400 gas chromatograph with a 50 m Plot fused silica Al2O3/KCL column, loop injector and flame ionization detector.Helium is used as carrier gas and the column is run from 70oC to 200oC, at a rate of 12oC/min. Final hold time is 13 min. Two cm3 of headspace gas are removed from each sample can for chromatographic analysis of the C1 to C7 range of hydrocarbons.

Total Organic Carbon (TOC) and Total Carbon Analysis

This analysis is performed using a LECO CS244 Carbon Analyser. Hand-picked lithologies from cuttings samples are crushed with a mortar and pestle and approximately 200 mg (50 mg for coals) are accurately weighed into LECO crucibles. The samples are then treated three times with 10 % hydrochloric acid to remove oxidized (carbonate) carbon, and washed four times with distilled water. The samples are dried on a hotplate at 60 - 70^{o}C before analysis of total organic carbon.

Rock-Eval Pyrolysis

This analysis is performed by using a Rock-Eval VI Pyrolyser. Approximately 100 mg crushed whole rock is analysed. The sample is first heated at 325°C for three min to release the free hydrocarbons present (S1 peak) and then pyrolysed by increasing the temperature from 300°C to 650°C (temp. gradient 25°C/min) (S2 peak). Both the S1 and S2 yields are measured using a flame ionization detector (FID). In the temperature interval between 300°C and 390°C, the released gases are split and a proportion passed through a carbon dioxide trap, which is connected to an IR detector. The value obtained from the IR detector corresponds to the amount of oxygen contained in the kerogen of the sample and is reported as the S3 peak.

Iatroscan

Saturates, aromatics and polars are qualitatively and quantitatively assessed using Iatroscan TLC-FID and employing Chromarod S-III rods. EOM was dissolved in DCM/MeOH. 1-3 □l of the solution is spotted on the pre-activated rods, using an auto-spotter. The rods are developed in n-hexane (35 mins), followed by toluene (14 mins) and DCM/MeOH (4 mins) with 2 mins air-drying between every stage. The developed rods are introduced in a 60°C oven for 90 seconds. The rods are analysed using the Iatroscan and the data are collected and processed using Multichrom data system.

Whole Oil Gas Chromatography

Whole oil chromatography is performed on a Perkin Elmer Autosystem XL gas chromatograph fitted with a split injector, 50 m CPSIL-5 capillary column connected to FID. Approximately 0.2-0.4 microlitres of whole oil are injected and the temperature program on the chromatograph runs from –10°C to 300°C at 4°C/min.

Removal of Asphaltenes

The EOM is dissolved in n-pentane in a flask to precipitate the asphaltenes by ultrasonic bath for 3 min. The solution is then stored in the dark and at ambient temperature for at least 8 hours. The solution is then filtered (Baker 10-spe system) and the precipitated asphaltenes returned to the original flask by dissolution in dichloromethane. The solvent is removed by rotary evaporation at 200 mB and 30°C.

Chromatographic Separation of deasphaltened EOM

Chromatographic separation is performed using an MPLC system developed by the company. The EOM (minus asphaltenes) is injected into the MPLC and separated using hexane as an eluent. The saturated and aromatic hydrocarbon fractions are collected and the solvent removed using a rotary evaporator at 30°C. The fractions are then transferred to small pre-weighed vials and evaporated to dryness overnight. The vials are re-weighed to obtain the weights of both the saturated and the aromatic fractions. The weight of the NSO fraction which is retained on the column, is obtained by weight difference.

Gas Chromatographic Analyses

Saturated hydrocarbon fractions:
The instrument used for this analysis is a DANI 8510 Gas Chromatograph equipped with an FID detector and an OV1 (25m) column. The carrier gas is helium and the temperature program runs from 80°C to 300°C at a rate of 4°C/min. Final hold time is 20 mins. The saturated hydrocarbon fraction is diluted by 1:30 and a 1 microlitre aliquot of this is injected into the instrument.

Aromatic hydrocarbon fractions:
The instrument used is a Varian 3400 Gas Chromatograph with a 40 m SE 54 capillary column, split injector and a column splitter leading to FID and FPD detectors, which allows simultaneous analysis of co-eluting hydrocarbons and sulphur compounds. The carrier gas is

helium and the temperature program runs from 40°C to 290°C at a rate of 4°C/min. Final hold time is 10 mins. The aromatic hydrocarbon fraction is diluted by 1:30 and a 1 microlitre aliquot of this is injected into the instrument.

Combined Gas Chromatography - Mass Spectrometry (GC-MS)

The GC-MS analyses are performed on a Autospec Ultima system interfaced to a Hewlett Packard 5890 gas chromatograph. The GC is fitted with a fused silica SE54 capillary column (40 m x 0.22 mm i.d.) directly into the ion source. Helium (12 psi) is used as carrier gas and the injections are performed in splitless mode. The GC oven is programmed from 45°C to 150C at 35°C/min, at which point the programme rate is 2°C/min up to 310°C where the column is held isothermally for 15 min. For the aromatic hydrocarbons, the GC oven is programmed from 50°C to 310°C at 5°C/min. and held isothermally at 310°C for 15 min. The mass spectrometer is operated in electron impact (EI) mode at 70 eV electron energy, a trap current of 500 uA and a source temperature of 220°C. The instrument resolution used is 1500 (10 % value).

The data system used is a VG OPUS system. The samples are analysed in multiple ion detection mode (MID) at a scan cycle time of approximately 1.1 sec. Calculation of peak ratios is performed from peak heights in the appropriate mass fragmentograms.

Saturated Fractions

Terpanes

The most commonly used fragment ions for detection of terpanes are m/z 163 for detection of 25,28,30 trisnormoretane or 25,28,30 trisnorhopane, m/z 177 for detection of demethylated hopanes or moretanes, m/z 191 for detection of tricyclic, tetracyclic- and pentacyclic terpanes and m/z 205 for methylated hopanes or moretanes. The molecular ions m/z 370 and 384 are also recorded for identification of C_{27} and C_{28} triterpanes respectively.

Steranes

The most commonly used fragment ions for detection of steranes are m/z 149 to distinguish between 5α and 5β steranes, m/z 189 and 259 for detection of rearranged steranes, m/z 217 for detection of rearranged and normal steranes and m/z 218 for detection of 5α(H)14β(H) 17β(H) steranes and m/z 231 for detection of methyl steranes. The m/z 253 fragment ion is used to detect possible aromatic contamination of the saturated fraction.

Aromatic Fractions

Naphthalenes
Methyl naphthalenes are normally detected by the m/z 142 fragment ion, while C_2-naphthalenes are detected by m/z 156 and C_3-naphthalenes by m/z 170.

Benzothiophenes and Dibenzothiophenes

Benzothiophene can be detected, as mentioned above, by m/z 134. The m/z 198 and m/z 212 fragment ions are used for methyl-substituted dibenzothiophenes and dimethyl-substituted dibenzothiophenes respectively.

Phenanthrenes
Phenanthrene is detected using the m/z 178 fragment ion. Anthracene will, if present, also give a signal in the m/z 178 fragment ion. Methyl-substituted phenanthrenes give signals in the m/z 192 fragment ion, while the m/z 206 fragment ion shows the dimethyl-substituted phenanthrenes and the m/z 220 fragment ion shows the C_3 substituted phenanthrenes.

Aromatic Steranes
Monoaromatic steranes are detected using the m/z 253 fragment ion, while the triaromatic steranes are detected using the m/z 231 fragment ion.

Norwegian Standard Guide Annotation

Mass Fragmentograms representing Terpanes
(m/z 163, 177, 191, 205, 370, 384, 398, 412 and 426)

Peak Identification: (α and β refer to hydrogen atoms at C-17 and C-21 respectively unless indicated otherwise).

27Ts	18 α trisnorneohopane (T_s)	$C_{27}H_{44}$	(I)
27Tm	17 α trisnorhopane (T_m)	$C_{27}H_{46}$	(II, R=H)
28αβ	Bisnorhopane	$C_{28}H_{48}$	(IV)
25nor30αβ*	norhopane	$C_{29}H_{50}$	
29αβ	αβ norhopane	$C_{29}H_{50}$	(II, R=C_2H_5)
29Ts	norneohopane	$C_{29}H_{50}$	
29βα	βα norhopane	$C_{29}H_{50}$	(III, R=C_2H_5)
30αβ	αβ hopane	$C_{30}H_{52}$	(II, R=i-C_3H_7)
30O	Oleanane	$C_{30}H_{52}$	
30βα	βα hopane	$C_{30}H_{52}$	(III, R=i-C_3H_7)
31αβS	22Sαβ homohopane	$C_{31}H_{54}$	(II, R=i-C_4H_9)
31αβR	22Rαβ homohopane	$C_{31}H_{54}$	(II, R=i-C_4H_9)
30G	gammacerane	$C_{30}H_{52}$	
31βα	βα homohopane	$C_{31}H_{54}$	(III, R=i-C_4H_9)
32αβS	22Sαβ bishomohopane	$C_{32}H_{56}$	(II, R=i-C_5H_{11})
32αβR	22Rαβ bishomohopane	$C_{32}H_{56}$	(II, R=i-C_5H_{11})
33αβS	22Sαβ trishomohopane	$C_{33}H_{56}$	(II, R=i-C_5H_{11})
33αβR	22Rαβ trishomohopane	$C_{33}H_{58}$	(II, R=i-C_6H_{13})
34αβS	22Sαβ tetrakishomohopane	$C_{34}H_{60}$	(II, R=i-C_7H_{15})
34αβR	22Rαβ tetrakishomohopane	$C_{34}H_{60}$	(II, R=i-C_7H_{15})
35αβS	22Sαβ pentakishomohopane	$C_{35}H_{62}$	(II, Ri-C_8H_{17})
35αβR	22Rαβ pentakishomohopane	$C_{35}H_{62}$	(II, R=i-C_8H_{17})
23/3	Tricyclic terpane	$C_{23}H_{42}$	(V, R=i-C_4H_9)
24/3	Tricyclic terpane	$C_{24}H_{44}$	(V, R=i-C_5H_{11})
25/3	Tricyclic terpane (17R, 17S)	$C_{25}H_{66}$	(V, R=i-C_6H_{13})
24/4	Tetracyclic terpane	$C_{24}H_{42}$	(VI)
26/3	Tricyclic terpane (17R, 17S)	$C_{26}H_{48}$	(V, R=i-C_7H_{15})
21/3	Tricyclic terpane	$C_{21}H_{38}$	(V, R=C_2H_5)
22/3	Tricyclic terpane	$C_{22}H_{40}$	(V, R=C_3H_7)
25nor28	* 25,28,30-trisnorhopane/moretane	$C_{27}H_{46}$	(VII)
30d	Diahopane	$C_{30}H_{52}$	(VIII)

* Also identified and quantified in m/z 177 fragmentograms

Mass Fragmentograms representing Steranes
(m/z 149, 189, 217, 218, 259, 372, 386, 400 and 414)

Peak Identifications: α and β refer to hydrogen atoms at C-5, C-14 and C-17 in regular steranes and at C-13 and C-17 in diasteranes.

21α	5α sterane	$C_{21}H_{36}$	(VI, R=C_2H_5)
22α	5α sterane	$C_{22}H_{38}$	(VI, R=C_3H_7)
27dβS	20S βα diacholestane	$C_{27}H_{48}$	(I, R=H)
27dβR	20R βα diacholestane	$C_{27}H_{48}$	(I, R=H)
27dαS	20S αβ diacholestane	$C_{27}H_{48}$	(II, R=H)
27dαR	20R αβ diacholestane	$C_{27}H_{48}$	(II, R=H)
28dβS	20S βα 24-methyl-diacholestane	$C_{28}H_{50}$	(I, R=CH_3)
28dβR	20R βα 24-methyl-diacholestane	$C_{28}H_{50}$	(I, R=CH_3)
28dαR	20R αβ 24-methyl-diacholestane	$C_{28}H_{50}$	(II, R=CH_3)
27ααS	+ 20S ααα cholestane	$C_{27}H_{48}$	(III, R=H)
29dβS	20S βα 24-ethyl-diacholestane	$C_{29}H_{52}$	(II, R=C_2H_5)
27ββR*	+ 20R αββ cholestane	$C_{27}H_{48}$	(IV, R=H)
27ββS*	20S αββ cholestane	$C_{27}H_{48}$	(IV, R=H)
28dαS	+ 20S αβ 24-methyl-diacholestane	$C_{28}H_{50}$	(II, R=CH_3)
27ααR	20R ααα cholestane	$C_{27}H_{48}$	(III, R=H)
29dβR	20R βα 24-ethyl-diacholestane	$C_{29}H_{52}$	(I, R=C_2H_5)
29dαR	20R αβ 24-ethyl-diacholestane	$C_{29}H_{52}$	(II, R=C_2H_5)
28ααS	20S ααα 24-methyl-cholestane	$C_{28}H_{50}$	(III, R=CH_3)
28ββR*	20R αββ 24-methyl-cholestane	$C_{28}H_{50}$	(IV, R=CH_3)
29dαS	+ 20S αβ 24-ethyl-diacholestane	$C_{29}H_{52}$	(II, R=C_2H_5)
28ββS*	20S αββ 24-methyl-cholestane	$C_{28}H_{50}$	(IV, R=CH_3)
28ααR	20R ααα 24-methyl-cholestane	$C_{28}H_{50}$	(III, R=CH_3)
29ααS	20S ααα 24-ethyl-cholestane	$C_{29}H_{52}$	(III, R=C_2H_5)
29ββR*	20R αββ 24-ethyl-cholestane	$C_{29}H_{52}$	(IV, R=C_2H_5)
29ββS*	20S αββ 24-ethyl-cholestane	$C_{29}H_{52}$	(IV, R=C_2H_5)
29ααR	20R ααα 24-ethyl-cholestane	$C_{29}H_{52}$	(III, R=C_2H_5)
M30αα	αα 4-methyl-24-ethyl-cholestane	$C_{30}H_{54}$	
M30D	αα 4,23,24-trimethyl-cholestane	$C_{30}H_{54}$	
30ααS	20S ααα 24-propyl-cholestane	$C_{30}H_{54}$	(IV, R=C_3H_7)
30ββR*	20R αββ 24-propyl-cholestane	$C_{30}H_{54}$	(V, R=C_3H_7)
30ββS*	20S αββ 24-propyl-cholestane	$C_{30}H_{54}$	(IV, R=C_3H_7)
30ααR	20R ααα 24-propyl-cholestane	$C_{30}H_{54}$	(IV, R=C_3H_7)

- Compounds identified and quantified in m/z 218 fragmentograms

Mass Fragmentograms representing Monoaromatic Steranes (m/z 253)

Description of C-ring monoaromatic steroid hydrocarbons

Peak	Substituents R_1	R_2	R_3	R_4	Abbreviation of Compound
A1					$C_{21}M$
B1					$C_{22}MA$
C1	β(H)	CH_3	S(CH_3)	H	β$SC_{27}MA$
	β(H)	CH_3	R(CH_3)	H	β$RC_{27}MA$
D1	CH_3	H	R(CH_3)	H	$RC_{27}DMA$
	α(H)	CH_3	S(CH_3)	H	α$SC_{27}MA$
E1	β(H)	CH_3	S(CH_3)	CH_3	β$SC_{28}MA$
	CH_3	H	S(CH_3)	CH_3	$SC_{28}DMA$
F1	α(H)	CH_3	R(CH_3)	H	α$RC_{27}MA$
	α(H)	CH_3	S(CH_3)	CH_3	α$SC_{28}MA$
	β(H)	CH_3	R(CH_3)	CH_3	β$RC_{28}MA$
G1	CH_3	H	R(CH_3)	CH_3	$RC_{28}DMA$
	β(H)	CH_3	S(CH_3)	C_2H_5	β$SC_{29}MA$
	CH_3	H	S(CH_3)	C_2H_5	$SC_{29}DMA$
	α(H)	CH_3	R(CH_3)	CH_3	α$RC_{28}MA$
H1	β(H)	CH_3	R(CH_3)	C_2H_5	β$RC_{29}MA$
	CH_3	H	R(CH_3)	C_2H_5	$RC_{29}DMA$
I1	α(H)	CH_3	R(CH_3)	C_2H_5	α$RC_{29}MA$

Mass Fragmentograms representing Triaromatic Steranes

(m/z 231)

Description of ABC-ring triaromatic steroid hydrocarbons

Peak	Substituents R_1	R_2	Abbreviation of Compound
a1	CH_3	H	$C_{20}TA$
b1	CH_3	CH_3	$C_{21}TA$
c1	$S(CH_3)$	C_6H_{1-3}	$SC_{26}TA$
d1	$R(CH_3)$	C_6H_{13}	$RC_{26}TA$
	$S(CH_3)$	C_7H_{15}	$SC_{27}TA$
e1	$S(CH_3)$	C_8H_{17}	$SC_{28}TA$
f1	$S(CH_3)$	C_7H_{15}	$RC_{27}TA$
g1	$R(CH_3)$	C_8H_{17}	$RC_{28}TA$

Combined Gas Chromatography - Mass Spectrometry (GC-MS) MRM

The GC-MS analyses are performed on a Autospec Ultima system interfaced to a Hewlett Packard 5890 gas chromatograph. The GC is fitted with a fused silica SE54 capillary column (40 m x 0.22 mm i.d.) directly into the ion source. Helium (12 psi) is used as carrier gas and the injections are performed in splitless mode. The GC oven is programmed from 45°C to 150C at 35°C/min, at which point the programme rate is 2°C/min up to 310°C where the column is held isothermally for 15 min. The mass spectrometer is operated in electron impact (EI) mode. The instrument resolution used is 600.

The data system used is a VG OPUS system. The samples are analysed in metastable reaction monitoring mode (MRM). Calculation of peak ratios is performed from peak heights in the appropriate mass fragmentograms.

Saturated Fractions

Terpanes

The following transitions were employed:

Channel	Parent Mass	Daughter Mass	Ch Time (ms)	I/ch Time (ms)
9	370.4000	191.2000	60	40
10	384.4000	191.2000	60	40
11	398.4000	191.2000	60	40
12	412.4000	191.2000	60	40
13	426.4000	191.2000	60	40

Steranes

The following transitions were employed:

Channel	Parent Mass	Daughter Mass	Ch Time (ms)	I/ch Time (ms)
1	386.4000	231.2000	60	40
2	400.4000	231.2000	60	40
3	358.3000	217.2000	60	40
4	414.4000	231.2000	60	40
5	372.4000	217.2000	60	40
6	386.4000	217.2000	60	40
7	400.4000	217.2000	60	40
8	414.4000	217.2000	60	40

For Compounds monitored in 358-217 transition

peak	code	compound
1	24nordβS	20S 13β(H)17α(H) 24-nordiacholestane
2	24nordβR	20R 13β(H)17α(H) 24-nordiacholestane
3	27nordβS	20S 13β(H)17α(H) 27-nordiacholestane
4	27nordβR	20S 13β(H)17α(H) 27-nordiacholestane
5	24norααS	20S 14α(H)17α(H) 24-norcholestane
6	24norββR	20R 14β(H)17β(H) 24-norcholestane

7	24norββS	20S 14β(H)17β(H) 24-norcholestane
8	24norααR	20R 14α(H)17α(H) 24-norcholestane
9	21norββ+αα	14β(H)17β(H)+ 14α(H)17α(H) 21-norcholestane
10	27norααS	20S 14α(H)17α(H) 27-norcholestane
11	27norββR	20R 14β(H)17β(H) 27-norcholestane
12	27norββS	20S 14β(H)17β(H) 27-norcholestane
13	27norααR	20R 14α(H)17α(H) 27-norcholestane

Stable Carbon Isotope Ratio Mass Spectrometry

Carbon isotope analysis is performed on a dual inlet VG SIRA 10 instrument. The combustion of the samples is performed by a Carlo Erba EA 1108 element analyser directly connected to the inlet system of the mass spectrometer.

The combustion temperature is 1020¡C and the carrier gas used was Helium. After the combustion H_2O and CO_2 are trapped in individual cool traps. The CO_2 gas is then heated up before admission into the mass spectrometer. The whole operation is controlled by an IBM PC50 computer system.

δ-values

The isotope ratios are given as δ-values in ä versus the PDB-standard:

$$\delta^{13}C = (R\ sample - R\ standard/R\ standard) \times 1000$$
$$R = {}^{13}C/{}^{12}C$$

The PDB-standard (a marine chalk of the Pee Dee-formation, USA) was created by Craig 1957. All results of $^{13}C/^{12}C$-analysis of organic matter today are calculated (Craig correction) against this international standard.

Reproducibility

The precision of the combustion system and the mass spectrometer is controlled by determination of an international calibrated standard, NBS22 oil and a house standard carbon. Replicate analyses are also performed on samples.

Headspace Gas, Gas Bags and sealed SWC samples Carbon Isotope analysis of C1-C4 and CO2 –

Combined Gas Chromatography - Isotope Ratio Mass Spectrometry (GC-IRMS)

For the gas analyses the GC is fitted with a fused silica column of 25 metres length, 0.32 mm I.D., coated with PORAPLOT Q stationary phase leading directly into the combustion furnace. The GC is started at 40 C and held isothermally for 2.0 minutes, and then programmed to 140 C at 8 C/min and then to 200 C at 15 C/min and held isothermally for 5 min. Helium is used as a carrier gas and the injections are performed in splitless/split mode depending on the concentration of gas.

Inside the GC oven, a valve is used to direct the column effluent between the FID and the IRMS. At the exit from the GC oven, make-up carrier gas (helium) is added to the flow from the capillary column. This ensures that the full performance of the GC separation is preserved by maintaining the linear velocity of the carrier gas in the interface and the combustion furnace. The furnace is made of capillary-bore quartz tubing packed with platinised copper oxide. Before the gas enters the mass spectrometer, water is removed in a cold trap using liquid N2. The IRMS is operated at 100 eV electron energy, having a trap current of 400 µA.

For calculation purposes a CO2 reference gas is automatically introduced into the IRMS in series of pulses before and after the array of chromatogram peaks of interests.

List of abbreviations used for lithology description
(sorted alphabetically)

ang	=	angular
bar	=	Baryte (mud additive)
bit	=	bituminous
bl	=	blue/blueish
blk	=	black
br	=	brittle
brn	=	brown/brownish
Ca	=	Carbonate (limestone/chalk/dolomite/siderite)
calc	=	calcareous
carb	=	carbonaceous
cem	=	cement used as additive (under "cont") or to describe cemented S/Sst
Chert	=	Chert
chk	=	Chalk/chalky
cly	=	clayey/shaly
cngl	=	conglomeratic
Coal	=	Coal
Coal-ad	=	Coal-like additive (e.g. chromlignosulfonate)
Congl	=	Conglomerat
Cont	=	Contamination(s)
crs	=	coarse grained
dd	=	dried drilling mud
dol	=	Dolomite/dolomitic
drk	=	dark (colour)
dsk	=	dusk/dusky (colour)
evap	=	Salt/Gypsum/Halite (natural "Other" or as additive "Cont"
f	=	fine grained
fe	=	ferruginous
fib	=	fibres (mud additive/contamination)
fis	=	fissile
fos	=	fossiliferous
glauc	=	glauconite/glauconitic
gn	=	green/greenish
gy	=	grey/greyish
hd	=	hard
ign	=	Igneous (material derived from igneous source)
Kaolin	=	Kaolin(ite)
kln	=	kaolinitic
l	=	loose
lam	=	laminated/laminae
lt	=	light (colour)
m	=	medium (colour or grain size)
Marl	=	Marl (calcareous claystone/mudstone)
mic	=	micaceous
Mica-ad	=	Mica used as mud additive
mrl	=	marly
No Mat.	=	No material left over after washing
ns	=	nutshells (mud additive)

ol = olive
ool = Oolite/oolitic
or = orange
Other = Other lithology/mineral, specified after this word
pi = pink/pinkish
pl = pale (colour)
prp = paint/rust/plastic contaminations/additives
pu = purple
pyr = Pyrite/pyritic
red = red/reddish
rnd = round/rounded
s = sandy
sft = soft
S/Sst = Sand and/or sandstone
Sh/Clst = Shale and/or claystone
sid = Siderite/sideritic
sil = siliceous/cherty
slt = silty
Sltst = siltstone
st = stained (with natural oil or oil-like additive)
tar-ad = Tar-like additive (e.g. "Black Magic")
trbfgs = turbodrilled fragments
Tuff = Tuff
tuff = tuffaceous
v col = various colours
w = white
wx = waxy
y = yellow/yellowish

Further Abbreviations

General

GHM	=	Geofina Hydrocarbon Meter (Thermal extraction- & Pyrolysis- Gas Chromatography)
EOM	=	Extractable Organic Matter
GC-MS	=	Gas Chromatograph - Mass Spectrometer
HC	=	Hydrocarbons
MPLC	=	Medium Pressure Liquid Chromatograph
NSO	=	Nitrogen-, Sulphur- and Oxygen-compounds
TOC	=	Total Organic Carbon
VR(e)	=	Vitrinite Reflectance (equivalent)

In GAS CHROMATOGRAPHY

FID	=	Flame Ionisation Detector
FPD	=	Flame Photometric Detector
GC	=	Gas Chromatograph
CPI	=	Carbon Preference Index, $0.5 \times \frac{C25+C27+C29+C31+C33}{C24+C26+C28+C30+C32} + \frac{C25+C27+C29+C31+C33}{C26+C28+C30+C32+C34}$
Bph	=	Biphenyl
P	=	phenanthrene
MP	=	methyl phenanthrene
MDBT	=	methyl dibenzothiophene
DBT	=	dibenzothiophene
MNR	=	2/1 methylnaphthalenes
ENR	=	2/1 ethylnaphthalenes
DMNR	=	2,6+2,7/1,5 dimethyl naphthalenes
BphR	=	Biphenyl/1,6 dimethylnaphthalene
MPI 1	=	methyl phenanthrene index, 1.5x(3MP+2MP) / P+9MP+1MP
MPI 2	=	methyl phenanthrene index, 3x(2MP) / P+9MP+1MP
(3+2/1)MDBT	=	3+2/1 methyl dibenzothiophenes
(4/1)MDBT	=	4/1 methyl dibenzothiophenes
Rc	=	0,6 MPI 1 + 0.4 (where 2/1MP = <2.65)

In GC-MS

Triterpanes

C_{30} diahopane/C_{30} diahopane+C_{29} $\beta\alpha$ hopane – peaks X/(X+D) or 30d/(30d+29$\beta\alpha$)

C_{30} diahopane/C_{30} diahopane+C_{30} $\alpha\beta$ hopane – peaks X/(X+E) or 30d/(30d+30$\alpha\beta$)

Ts/(Ts+Tm) - C_{27} 22,29,30 18α trisnorneohopane / (C_{27} 22,29,30 17α trisnorhopane + C_{27} 22,29,30 18α trisnorneohopane) peaks A/(A+B) or 27Ts/(27TS+27Tm)

Bisnorhopane/(bisnorhopane+ C_{29} $\alpha\beta$ hopane) – peaks Z/(Z+C) or 28$\alpha\beta$/29$\alpha\beta$

Steranes

Ratio 1 C_{27} diasterane/C_{27} Diasterane+$C_{27}\alpha\alpha$20R - peaks a/(a+j)

Ratio 2 %C_{29} 20S - % 5α 14α 17α 20S/(20S+20R) ethylcholestanes– peaks q/(q+t)

Ratio 4 C_{27}/C_{29} diasteranes (peaks a+b+c+d)/(h+k+l+n)

Ratio 6 (C_{21}+C_{22})/ (C_{21}+C_{22}+ 5α 14β 17β + 5α 14α 17α 20S+20R) – peaks (a+b)/(a+b+q+r+s+t)

Ratio 8 C_{29} ββ/(αα+ββ) – 5α 14β 17β / (5α 14β 17β + 5α 14α 17α) (20S+20R) ethylcholestanes – peaks (r+s)/(q+r+s+t)

Triaromatic and monoaromatic sterane ratios see tables for definitions

Appendix 1 : Tables

Table 1a C1-C7 Headspace Gas Composition Data for NOCS well 6404/11-1 (Havsule)

BP

Lower depth (m)	C1	C2	C3	IC4	nC4	C5+	Sum C1-C4	Sum C2-C4	Wetness	iC4/nC4
2180	771	9	3		1	46	785	13	1.7	0
2210	7529	74	15	4	4	48	7625	96	1.3	1
2240	50088	196	27	6	4	86	50320	233	0.5	1.8
2270	43260	206	35	7	4	77	43512	252	0.6	1.52
2300	72824	355	51	9	6	116	73244	421	0.6	1.48
2330	26852	166	28	7	5	51	27078	226	0.8	1.48
2360	65456	361	42	11	7	112	65876	420	0.6	1.51
2390	37683	174	19	5	4	44	37885	202	0.5	1.3
2420	62862	309	26	6	9	322	63211	349	0.6	0.66
2445	10680	60	4			130	10744	64	0.6	
2451	25292	127	10	3	2	45	25434	142	0.6	1.23
2481	22742	205	19	7	5	83	22979	237	1	1.44
2511	23062	201	15	5	3	46	23285	223	1	1.82
2541	26517	331	11	13	3	90	26875	357	1.3	4.29
2571	38190	763	19	25	2	54	39000	810	2.1	11.03
2601	41164	1002	24	32	4	169	42226	1062	2.5	7.94
2631	55009	2302	50	79	7	109	57448	2439	4.2	10.64
2661	22353	987	43	62	11	125	23456	1103	4.7	5.41
2691	9623	242	36	24	16	76	9946	323	3.2	1.31
2721	9795	375	126	42	52	217	10390	595	5.7	0.81
2751	10282	555	300	54	78	100	11269	986	8.8	0.7
2781	14941	1153	731	149	208	274	17182	2242	13	0.71
2811	12499	1798	1730	428	567	830	17022	4523	26.6	0.75
2841	22520	2989	3281	844	1111	1463	30746	8225	26.8	0.76
2871	30254	3861	3905	970	1317	1942	40307	10053	24.9	0.74
2901	26682	7591	6161	1802	2432	3011	46668	19986	42.8	0.74
2931	12856	3552	3579	727	1049	1445	21762	8906	40.9	0.69
2961	19656	3859	2962	479	697	751	27662	7996	28.9	0.69
2991	9951	2088	1862	377	550	801	14828	4877	32.9	0.68
3021	15842	1957	1901	451	644	972	20795	4953	23.8	0.7
3051	13439	1569	1583	380	550	813	17521	4083	23.3	0.69
3081	14062	2009	1986	481	666	1180	19206	5143	26.8	0.72

Table 1a C1-C7 Headspace Gas Composition Data for NOCS well 6404/11-1 (Havsule)

BP

Lower depth (m)	C1	C2	C3	iC4	nC4	C5+	Sum C1-C4	Sum C2-C4	Wetness	iC4/nC4
3111	19163	3348	3962	1031	1606	3211	29109	9946	34.2	0.64
3141	24763	5106	5437	1288	1977	3569	38572	13809	35.8	0.65
3171	18902	3738	3489	740	1131	2034	27989	9087	32.5	0.66
3201	22379	4137	3681	773	1084	1711	32055	9675	30.2	0.71
3231	15408	2813	2426	487	684	1056	21817	6410	29.4	0.71
3261	51806	10963	10728	2829	3444	4661	79776	27964	35.1	0.82
3291	29152	7353	6054	1442	1793	2772	46796	16643	36.3	0.8
3321	18735	4377	2938	576	711	1017	27336	8601	31.5	0.81
3351	27630	5415	3066	528	685	1137	37524	9694	25.8	0.77
3381	9875	1959	1427	309	460	1093	14029	4154	29.6	0.67
3411	25489	5471	3022	531	670	1228	35183	9694	27.6	0.79
3441	20088	4723	2469	424	565	1043	28270	8182	28.9	0.75
3471	24354	4254	2184	340	465	864	31597	7243	22.9	0.73
3501	13263	3092	2371	443	614	987	19783	6520	33	0.72
3531	37496	6806	3256	436	607	963	48601	11105	22.8	0.72
3561	23259	5160	2742	366	539	1061	32066	8807	27.5	0.68
3591	39746	8271	4080	546	804	1610	53450	13703	25.6	0.68
3621	31049	6625	2894	354	439	651	41361	10312	24.9	0.81
3650	33370	7912	3587	445	571	1003	45886	12515	27.3	0.78

Table 1b C1-C7 Gas Composition Data (raw peak areas) for Bagged samples from NOCS well 6404/11-1 (Havsule) BP

Lower Depth (m)	C1	C2	C3	iC4	C4	C5+
2214	5866676	17833	2741	0	0	124704
2238	21818532	57873	3991	0	0	89466
2440	21005344	61623	4702	2605	1784	100731
2730	24115414	1361109	549515	95152	128843	229044
2747	16252933	737173	263061	45394	54995	194904
2748	22259922	963939	325630	50472	64393	154025
2751	28081060	1319910	456422	70236	89753	184894
2838	8847553	499453	199079	29718	36735	22811
3235	13154553	732054	318875	57847	84167	197177
3351	6374230	321681	119130	17557	33378	17648

Table 1b C1-C7 Gas Composition Data (ppm) for Bagged samples from NOCS well 6404/11-1 (Havsule) BP

Lower Depth (m)	C1	C2	C3	iC4	nC4	C5+	C1-C4	C2-C4	%wetness	iC4/nC4
2214	4450	7	1	0	0	24	4457	7	0.2	
2238	12858	17	1	0	0	13	12876	18	0.1	
2440	15932	30	1	1	0	19	15965	33	0.2	1.46
2730	14212	394	112	16	21	34	14756	544	3.7	0.74
2747	12327	275	69	10	12	37	12693	366	2.9	0.83
2748	13118	279	66	8	11	23	13483	365	2.7	0.78
2751	21299	492	120	15	19	35	21946	647	2.9	0.78
2838	54018	1503	421	51	63	34	56055	2037	3.6	0.81
3235	9977	273	84	12	18	36	10365	386	3.7	0.69
3351	38918	968	252	30	40	26	40207	1290	3.2	0.75

Table 1c C1-C9 Gas Composition Data (% area) BP
for Sealed SWC samples from NOCS well 6404/11-1 (Havsule)

Lower depth (m)	Methane	Ethane	Propane	Isobutane	Butane	Neopentane	2-methyl butane	Pentane	2,2-dimethyl butane	Methyl cyclo pentane
3241.3	27.5	9.6	14.4	5.6	10.4	0.2	6.8	6.7	0.3	1.9
3379.1	76.0	10.6	7.1	1.4	1.8	0.0	0.9	0.6	0.0	0.2

Table 1c C1-C9 Gas Composition Data (% area) BP
for Sealed SWC samples from NOCS well 6404/11-1 (Havsule)

Lower depth (m)	2- methyl pentane	3- methyl pentane	Hexane	Methyl cyclo hexane	2methyl hexane	Heptane	Benzene	2-methyl heptane	Octane	Toluene	% of Total C1-C9
3241.3	4.7	1.4	3.3	2.2	1.1	1.2	0.1	0.1	0.2	0.2	97.9
3379.1	0.4	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	99.8

Table 2a Headspace Gas Isotope Composition for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Methane	Ethane	Propane	i-Butane	n-Butane	CO2
2390	-26.35	-	-	-	-	-
2420	-41.32	-28.47	-	-	-	-7.09
2445	-43.82	-	-	-	-	-6.01
2451	-40.33	-26.47	-	-	-	-5.6
2481	-40.36	-25.24	-	-	-	-6.1
2511	-40.22	-24.28	-	-	-	-6.74
2541	-40.51	-24.33	-	-	-	-6.11
2571	-40.02	-26.91	-	(-21,86)	-	-5.78
2601	-41.72	-27.5	-	-	-	-6.47
2631	-40.51	-26.19	(-22,07)	(-23,45)	-	-9.38
2661	-41.5	-27.95	(-23,81)	(-25,89)	-	-10.32
2691	-41.96	-25.18	(-19,39)	(-23,33)	-	-8.77
2721	-41.07	-26.21	(-23,06)	(-24,16)	(-24,49)	-5.8
2751	-42.71	-30.71	-30.23	-29.80	-30.69	-8.82
2781	-41.65	-30.49	-30.84	-30.10	-29.74	-9.16
2811	-42.48	-30.66	-30.96	-29.24	-28.57	-8.83
2841	-41.80	-31.04	-31.00	-29.73	-29.82	-10.23
2871	-39.79	-30.17	-30.67	-30.07	-29.48	-13.24
2901	-43.02	-31.20	-31.16	-30.30	-30.67	-10.62
2931	-43.89	-33.08	-31.61	-30.99	-30.92	-13.16
2961	-41.19	-32.07	-31.77	-30.57	-30.28	-11.11
2991	-41.85	-31.78	-31.55	-28.90	-29.35	-10.36
3021	-41.50	-31.20	-31.25	-29.67	-30.00	-11.35
3051	-40.98	-30.41	-31.24	-29.45	-29.65	-11.82
3081	-42.00	-30.94	-31.55	-30.07	-30.35	-16.29
3111	-41.31	-30.94	-31.62	-30.61	-30.48	-13.83
3141	-41.51	-30.22	-32.13	-29.42	-29.82	-15.93
3171	-41.94	-31.02	-31.99	-30.40	-31.12	-11.05
3201	-41.88	-31.88	-30.97	-29.45	-29.75	-19.73

δ13C values in per mil
-: Not determined, low peak height
(): Low reliability, low peak/coelution

Table 2a Headspace Gas Isotope Composition for NOCS well 6404/11-1 (Havsule)

BP

Lower depth (m)	Methane	Ethane	Propane	i-Butane	n-Butane	CO2
3231	-42.42	-31.63	-32.27	-30.15	-30.15	-13.47
3261	-39.23	-32.20	-31.50	-30.75	-30.44	-13.13
3291	-41.25	-31.77	-31.82	-30.38	-30.13	-9.79
3321	-41.62	-32.37	-32.01	-30.65	-30.50	-12.84
3351	-42.07	-32.28	-31.57	-29.21	-29.64	-12.11
3381	-41.89	-30.87	-30.30	-	-	-11.11
3411	-43.62	-31.42	-30.68	-29.43	-29.64	-14.21
3441	-41.66	-31.05	-30.39	-28.82	-28.67	-12.40
3471	-39.70	-32.23	-31.07	-29.70	-29.57	-12.08
3501	-42.55	-31.50	-29.74	-28.99	-29.19	-12.93
3531	-41.42	-31.75	-30.66	-31.02	-29.94	-12.76
3561	-42.07	-32.53	-30.71	-28.94	-28.48	-10.45
3591	-40.39	-31.63	-30.40	-28.53	-28.76	-9.67
3621	-41.81	-31.57	-31.02	-28.34	-28.77	-13.23
3650	-40.73	-31.20	-30.37	-29.23	-28.92	-10.09

δ13C values in per mil
-: Not determined, low peak height
(): Low reliability, low peak/resolution

Table 2b Gas Isotope Composition of Bagged samples from NOCS well 6404/11-1 Havsule

BP

Lower depth (m)	Methane	Ethane	Propane	i-Butane	n-Butane	CO2
2214	(-32.71)	-	-	-	-	-9.00
2238	-47.61	-	-	-	-	-12.41
2440	-38.73	-	-	-	-	-9.77
2730	-35.42	-30.56	-29.44	(-27.43)	(-27.80)	-9.91
2747	-38.14	-29.91	-29.30	-	-	-9.37
2748	-38.74	-29.81	-28.70	-	-	-11.94
2751	-34.63	-29.10	-29.08	-	-28.00	-10.90
2838	-28.57	-28.39	-28.25	(-29.53)	(-28.73)	-11.61
3235	-40.21	-31.14	-29.23	-	-	-9.85
3351	-31.66	-29.53	-28.88	-27.45	-27.03	-9.72

Table 2c Gas Isotope Composition of Sealed SWC samples from NOCS well 6404/11-1

BP

Lower depth (m)	Methane	Ethane	Propane	i-Butane	n-Butane	CO2
3241.3m	-	(-27.65)	(-29.99)	(-28.62)	(-26.07)	-21.4
3379.1m	-48.47	-31.16	-30.56	-28.17	-28.04	-22.01

Table 3a Samples and Sample Descriptions for NOCS well 6404/11-1 Havsule

BP

Upper depth (m)	Lower depth (m)	Sample type	Desc	%Lithology	Sample number
2150	2180	cut	bulk fraction		U88/0001-0
2180	2210	cut	bulk fraction		U88/0002-0
2210	2240	cut	bulk fraction		U88/0003-0
2240	2270	cut	bulk fraction		U88/0004-0
2270	2300	cut	bulk fraction		U88/0005-0
2300	2330	cut	bulk fraction		U88/0006-0
2330	2360	cut	bulk fraction		U88/0007-0
2360	2390	cut	bulk fraction		U88/0008-0
2390	2420	cut	bulk fraction		U88/0009-0
2420	2445	cut	bulk fraction		U88/0010-0
2445	2451	cut	bulk fraction		U88/0011-0
2451	2481	cut	bulk fraction		U88/0012-0
2481	2511	cut	bulk fraction		U88/0013-0
2511	2541	cut	bulk fraction		U88/0014-0
2541	2571	cut	bulk fraction		U88/0015-0
2571	2601	cut	bulk fraction		U88/0016-0
2601	2631	cut	bulk fraction		U88/0017-0
2631	2661	cut	bulk fraction		U88/0018-0
2661	2691	cut	bulk fraction		U88/0019-0
2691	2721	cut	bulk fraction		U88/0020-0
2739.5	2739.5	swc	bulk fraction		U88/0025-0
2739.5	2739.5	swc	shale/claystone	100	U88/0025-1
2745.8	2745.8	swc	bulk fraction		U88/0026-0
2745.8	2745.8	swc	shale/claystone	100	U88/0026-3
2721	2751	cut	bulk fraction		-
2776.5	2776.5	swc	bulk fraction		U88/0027-0
2776.5	2776.5	swc	shale/claystone	85	U88/0027-1
2776.5	2776.5	swc	sandstone/sand	15	U88/0027-2
2751	2781	cut	bulk fraction		-
2781	2811	cut	bulk fraction		-
2826.7	2826.7	swc	bulk fraction		U88/0028-0
2826.7	2826.7	swc	siltstone	100	U88/0028-1

Table 3a Samples and Sample Descriptions for NOCS well 6404/11-1 Havsule

BP

Upper depth (m)	Lower depth (m)	Sample type	Desc	%Lithology	Sample number
2811	2841	cut	bulk fraction		-
2841	2871	cut	bulk fraction		-
2871	2901	cut	bulk fraction		-
2901	2931	cut	bulk fraction		-
2931	2961	cut	bulk fraction		-
2975.5	2975.5	swc	bulk fraction		U88/0029-0
2975.5	2975.5	swc	shale/claystone	100	U88/0029-1
2961	2991	cut	bulk fraction		-
2991	3021	cut	bulk fraction		-
3021	3051	cut	bulk fraction		-
3051.0	3051.0	swc	bulk fraction		U88/0030-0
3051.0	3051.0	swc	shale/claystone	100	U88/0030-1
3051	3081	cut	bulk fraction		-
3081	3111	cut	bulk fraction		-
3111	3141	cut	bulk fraction		-
3141	3171	cut	bulk fraction		-
3171	3201	cut	bulk fraction		U88/0036-0
3171	3201	cut	shale/claystone	95	U88/0036-1
3171	3201	cut	carbonate	5	U88/0036-2
3208.7	3208.7	swc	bulk fraction		U88/0031-0
3208.7	3208.7	swc	shale/claystone	100	U88/0031-1
3201	3231	cut	bulk fraction		U88/0037-0
3201	3231	cut	shale/claystone	90	U88/0037-1
3201	3231	cut	carbonate	5	U88/0037-2
3201	3231	cut	sandstone/sand	5	U88/0037-3
3241.3	3241.3	swc	bulk fraction		U88/0023-0
3241.3	3241.3	swc	shale/claystone	40	U88/0023-1
3241.3	3241.3	swc	sandstone/sand	60	U88/0023-2
3231	3261	cut	bulk fraction		U88/0038-0
3231	3261	cut	shale/claystone	60	U88/0038-1
3231	3261	cut	carbonate	tr	U88/0038-2
3231	3261	cut	sandstone/sand	40	U88/0038-3

Table 3a Samples and Sample Descriptions for NOCS well 6404/11-1 Havsule

BP

Upper depth (m)	Lower depth (m)	Sample type	Desc	%Lithology	Sample number
3261	3291	cut	bulk fraction		U88/0039-0
3261	3291	cut	shale/claystone	70	U88/0039-1
3261	3291	cut	carbonate	tr	U88/0039-2
3261	3291	cut	sandstone/sand	30	U88/0039-3
3291	3321	cut	bulk fraction		U88/0040-0
3291	3321	cut	shale/claystone	70	U88/0040-1
3291	3321	cut	carbonate	tr	U88/0040-2
3291	3321	cut	sandstone/sand	30	U88/0040-3
3321	3351	cut	bulk fraction		U88/0041-0
3321	3351	cut	shale/claystone	70	U88/0041-1
3321	3351	cut	carbonate	tr	U88/0041-2
3321	3351	cut	sandstone/sand	30	U88/0041-3
3379.1	3379.1	swc	bulk fraction		U88/0024-0
3379.1	3379.1	swc	shale/claystone	60	U88/0024-1
3379.1	3379.1	swc	sandstone/sand	40	U88/0024-2
3351	3381	cut	bulk fraction		U88/0042-0
3351	3381	cut	shale/claystone	70	U88/0042-1
3351	3381	cut	carbonate	5	U88/0042-2
3351	3381	cut	sandstone/sand	25	U88/0042-3
3381	3411	cut	bulk fraction		U88/0043-0
3381	3411	cut	shale/claystone	75	U88/0043-1
3381	3411	cut	carbonate	5	U88/0043-2
3381	3411	cut	sandstone/sand	20	U88/0043-3
3411	3441	cut	bulk fraction		U88/0044-0
3411	3441	cut	shale/claystone	75	U88/0044-1
3411	3441	cut	carbonate	5	U88/0044-2
3411	3441	cut	sandstone/sand	20	U88/0044-3
3441	3471	cut	bulk fraction		U88/0045-0
3441	3471	cut	shale/claystone	75	U88/0045-1
3441	3471	cut	carbonate	5	U88/0045-2
3441	3471	cut	sandstone/sand	20	U88/0045-3
3471	3501	cut	bulk fraction		U88/0046-0

Upper depth (m)	Lower depth (m)	Sample type	Desc	%Lithology	Sample number
3471	3501	cut	shale/claystone	85	U88/0046-1
3471	3501	cut	carbonate	5	U88/0046-2
3471	3501	cut	sandstone/sand	10	U88/0046-3
3501	3531	cut	bulk fraction		U88/0047-0
3501	3531	cut	shale/claystone	100	U88/0047-1
3501	3531	cut	carbonate	tr	U88/0047-2
3501	3531	cut	sandstone/sand	tr	U88/0047-3
3558.5	3558.5	swc	bulk fraction		U88/0032-0
3558.5	3558.5	swc	shale/claystone	100	U88/0032-1
3531	3561	cut	bulk fraction		U88/0048-0
3531	3561	cut	shale/claystone	100	U88/0048-1
3531	3561	cut	carbonate	tr	U88/0048-2
3531	3561	cut	sandstone/sand	tr	U88/0048-3
3577.4	3577.4	swc	bulk fraction		U88/0033-0
3577.4	3577.4	swc	siltstone	100	U88/0033-1
3561	3591	cut	bulk fraction		U88/0049-0
3561	3591	cut	shale/claystone	95	U88/0049-1
3561	3591	cut	carbonate	tr	U88/0049-2
3561	3591	cut	sandstone/sand	5	U88/0049-3
3593.2	3593.2	com	bulk fraction		U88/0035-0
3593.2	3593.2	swc	bulk fraction		U88/0034-0
3593.2	3593.2	swc	siltstone	50	U88/0034-1
3593.2	3593.2	swc	sandstone/sand	50	U88/0034-2
3591	3621	cut	bulk fraction		U88/0050-0
3591	3621	cut	shale/claystone	95	U88/0050-1
3591	3621	cut	carbonate	tr	U88/0050-2
3591	3621	cut	sandstone/sand	5	U88/0050-3
3621	3650	cut	bulk fraction		U88/0051-0
3621	3650	cut	shale/claystone	90	U88/0051-1
3621	3650	cut	carbonate	tr	U88/0051-2
3621	3650	cut	sandstone/sand	10	U88/0051-3

Table 3b Samples and %TOC for NOCS well 6404/11-1 (Havsule)

BP

Upper depth (m)	Lower depth (m)	Sample type	Desc	%Lithology	TOC	Sample number
2739.5	2739.5	swc	shale/claystone	100	1.00	U88/0025-1
2745.8	2745.8	swc	shale/claystone	100	0.47	U88/0026-3
2776.5	2776.5	swc	shale/claystone	85	0.70	U88/0027-1
2826.7	2826.7	swc	siltstone	100	0.74	U88/0028-1
2975.5	2975.5	swc	shale/claystone	100	0.38	U88/0029-1
3051.0	3051.0	swc	shale/claystone	100	0.52	U88/0030-1
3208.7	3208.7	swc	shale/claystone	100	0.72	U88/0031-1
3241.3	3241.3	swc	sandstone/sand	60	0.33	U88/0023-2
3379.1	3379.1	swc	sandstone/sand	40	0.26	U88/0024-2
3558.5	3558.5	swc	shale/claystone	100	0.97	U88/0032-1
3577.4	3577.4	swc	siltstone	100	0.49	U88/0033-1
3593.2	3593.2	swc com	bulk fraction		0.43	U88/0035-0

Table 3 : Lithology description for well NOCS 6404/11-1

Depth unit of measure: m

Depth		Type		Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description				
2739.50		swc						0025
	1.00		100	Sh/Clst: drk gy to dsk y brn, calc				0025-1L
2745.80		swc						0026
	0.47		100	Sh/Clst: brn gy to drk gy, pyr, mic, glauc				0026-3L
2776.50		swc						0027
	0.70		85	Sh/Clst: drk gy to dsk y brn, calc				0027-1L
			15	S/Sst : lt y brn, calc, slt, mic, f				0027-2L
2826.70		swc						0028
	0.74		100	Sltst : m gy to brn gy, s, argill, mic, fos, glauc				0028-1L
2975.50		swc						0029
	0.38		100	Sh/Clst: m gy, pyr				0029-1L
3051.00		swc						0030
	0.52		100	Sh/Clst: m gy to brn gy, mic				0030-1L
3201.00								0036
			95	Sh/Clst: lt gy to lt brn gy, lt gn gy, slt, s, mic				0036-1L
			5	Ca : gy brn to pl brn, w, dol				0036-2L
3208.70		swc						0031
	0.72		100	Sh/Clst: m gy to m drk gy, pyr				0031-1L

Table 3 : Lithology description for well NOCS 6404/11-1

Depth unit of measure: m

Depth		Type		Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description				
3231.00								0037
			90	Sh/Clst:		lt gy to lt brn gy, lt gn gy, slt, s, mic, glauc		0037-1L
			5	Ca	:	gy brn to pl brn, w, dol		0037-2L
			5	S/Sst	:	lt gy to w, slt, mic, glauc, f		0037-3L
3241.50	swc							0023
		0.32	60	S/Sst	:	w to lt y brn, slt, argill, mic, glauc, f		0023-2L
			40	Sh/Clst:		m gy to m drk gy, pyr		0023-1L
3261.00								0038
			60	Sh/Clst:		lt gy to lt brn gy, lt gn gy, slt, s, mic, glauc		0038-1L
			40	S/Sst	:	lt gy to w, slt, mic, glauc, f		0038-3L
			tr	Ca	:	gy brn to pl brn, w, dol		0038-2L
3291.00								0039
			70	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0039-1L
			30	S/Sst	:	lt gy to w, slt, mic, glauc, f		0039-3L
			tr	Ca	:	gy brn to pl brn, w, dol		0039-2L
3321.00								0040
			70	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0040-1L
			30	S/Sst	:	lt gy to w, slt, mic, glauc, f		0040-3L
			tr	Ca	:	gy brn to pl brn, w, dol		0040-2L
3351.00								0041
			70	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0041-1L
			30	S/Sst	:	lt gy to w, slt, mic, glauc, f		0041-3L
			tr	Ca	:	gy brn to pl brn, w, dol		0041-2L

Table 3 : Lithology description for well NOCS 6404/11-1

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvs	TOC%	%	Lithology description				
3379.10	swc						0024
		60	Sh/Clst:		m gy to m drk gy, pyr		0024-1L
	0.26	40	S/Sst	:	w to lt y brn, calc, slt, argill, mic, glauc, f		0024-2L
3381.00							0042
		70	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0042-1L
		25	S/Sst	:	lt gy to w, slt, mic, glauc, f		0042-3L
		5	Ca	:	gy brn to pl brn, w, dol		0042-2L
3411.00							0043
		75	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0043-1L
		20	S/Sst	:	lt gy to w, slt, mic, glauc, f		0043-3L
		5	Ca	:	gy brn to pl brn, w, dol		0043-2L
3441.00							0044
		75	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0044-1L
		20	S/Sst	:	lt gy to w, slt, mic, glauc, f		0044-3L
		5	Ca	:	gy brn to pl brn, w, dol		0044-2L
3471.00							0045
		75	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0045-1L
		20	S/Sst	:	lt gy to w, slt, mic, glauc, f		0045-3L
		5	Ca	:	gy brn to pl brn, w, dol		0045-2L
3501.00							0046
		85	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0046-1L
		10	S/Sst	:	lt gy to w, slt, mic, glauc, f		0046-3L
		5	Ca	:	gy brn to pl brn, w, dol		0046-2L

Table 3 : Lithology description for well NOCS 6404/11-1

Depth unit of measure: m

Depth	Type		Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description				
3531.00							0047
		100	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0047-1L
		tr	Ca	:	gy brn to pl brn, w, dol		0047-2L
		tr	S/Sst	:	lt gy to w, slt, mic, glauc, f		0047-3L
3538.50	swc						0032
	0.97	100	Sh/Clst:		brn gy		0032-1L
3561.00							0048
		100	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0048-1L
		tr	Ca	:	gy brn to pl brn, w, dol		0048-2L
		tr	S/Sst	:	lt gy to w, slt, mic, glauc, f		0048-3L
3577.40	swc						0033
	0.49	100	Sltst	:	brn gy to gy w, s, argill, mic, glauc		0033-1L
3591.00							0049
		95	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0049-1L
		5	S/Sst	:	lt gy to w, slt, mic, glauc, f		0049-3L
		tr	Ca	:	gy brn to pl brn, w, dol		0049-2L
3593.20	swc						0034
		50	Sltst	:	brn gy to gy w, s, argill, mic, glauc		0034-1L
		50	S/Sst	:	gy w to w, slt, mic, glauc, f		0034-2L
3621.00							0050
		95	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0050-1L
		5	S/Sst	:	lt gy to w, slt, mic, glauc, f		0050-3L
		tr	Ca	:	gy brn to pl brn, w, dol		0050-2L

Table 3 : Lithology description for well NOCS 6404/11-1

Depth unit of measure: m

Depth		Type		Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description				
3650.00								0051
			90	Sh/Clst:		lt gy to lt brn gy, brn gy, slt, s, mic, glauc		0051-1L
			10	S/Sst	:	lt gy to w, slt, mic, glauc, f		0051-3L
			tr	Cs	:	gy brn to pl brn, w, dol		0051-2L

Table 4 Rock-Eval data for NOCS well 6404/11-1 (Havsule)

BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%Lith.	S1	S2	S3	TOC	Tmax	S2/ S3	HI	OI	PP	PI	Sample number	corrected S2	corrected Tmax
2739.5	2739.5	swc	shale/claystone	100	1.56	2.52	1.25	1.00	343	2.02	252	125	4.1	0.38	U88/0025-1	1.2	424
2745.8	2745.8	swc	shale/claystone	100	0.92	1.39	1.34	0.47	336	1.04	296	285	2.3	0.40	U88/0026-3	<1	-
2776.5	2776.5	swc	shale/claystone	85	2.06	1.76	2.40	0.70	356	0.73	251	343	3.8	0.54	U88/0027-1	<1	420
2826.7	2826.7	swc	siltstone	100	0.89	1.23	1.20	0.74	352	1.02	166	162	2.1	0.42	U88/0028-1	<1	-
2975.5	2975.5	swc	shale/claystone	100	0.47	1.04	0.78	0.38	342	1.33	274	205	1.5	0.31	U88/0029-1	-	-
3051	3051	swc	shale/claystone	100	0.47	1.27	0.71	0.52	350	1.79	244	137	1.7	0.27	U88/0030-1	-	-
3208.7	3208.7	swc	shale/claystone	100	0.63	1.33	1.15	0.72	350	1.16	185	160	2.0	0.32	U88/0031-1	0.7	415
3241.3	3241.3	swc	sandstone/sand	60	2.25	2.21	1.56	0.33	353	1.42	670	473	4.5	0.50	U88/0023-2	<1	-
3379.1	3379.1	swc	sandstone/sand	40	1.44	0.91	1.44	0.26	357	0.63	350	554	2.4	0.61	U86/0024-2	<1	-
3558.5	3558.5	swc	shale/claystone	100	0.41	2.09	0.69	0.97	432	3.03	215	71	2.5	0.16	U88/0032-1	1.6	432
3577.4	3577.4	swc	siltstone	100	0.36	0.96	0.73	0.49	351	1.32	196	149	1.3	0.27	U88/0033-1	0.6	432
3593.2	3593.2	swc com	bulk fraction		0.45	0.96	0.79	0.43	353	1.24	228	184	1.4	0.31	U88/0035-0	0.5	428

Rock-Eval and %TOC
corrections applied using Rock-Int software

Table 5a-c Extraction and Fractionation (MPLC) Data (weights) for NOCS well 6404/11-1 (Havsule)

BP

Table 5a

Upper depth (m)	Lower depth (m)	Sample type	Description	% Lith.	Rock extracted (g)	EOM (mg)	Sat (mg)	Aro (mg)	NSO (mg)	Asph (mg)	TOC(e)	HC	Non-HC	Sample number
3171	3201	cut	shale/claystone	95	10.38	47.7	0.58	0.87	34.92	11.32	0.72	1.46	46.24	U88/0036-1
3201	3231	cut	sandstone/sand	5	10.21	64.9	0.99	0.49	42.24	21.17	0.7	1.48	63.42	U88/0037-3
3241.3	3241.3	swc	sandstone/sand	60	10.6	144.1	2.79	1.29	51.2	88.83	0.33	4.07	140.03	U88/0023-2
3231	3261	cut	sandstone/sand	40	6.28	41.5	1.3	0.65	32.52	7.03	0.49	1.95	39.55	U88/0038-3
3261	3291	cut	sandstone/sand	30	6.61	40.3	0.73	0.24	32.76	6.57	0.68	0.97	39.33	U88/0039-3
3291	3321	cut	sandstone/sand	30	10.32	76.5	0.68	1.14	50.87	23.8	0.66	1.83	74.67	U88/0040-3
3321	3351	cut	sandstone/sand	30	10.43	66.7	0.47	0.94	36.62	26.68	0.77	1.4	65.3	U88/0041-3
3379.1	3379.1	swc	sandstone/sand	40	10.24	84.6	1.79	1.79	29.26	51.75	0.26	3.58	81.02	U88/0024-2
3351	3381	cut	sandstone/sand	25	10.21	54.2	0.67	0.67	39.77	13.08	0.74	1.35	52.85	U88/0042-3
3381	3411	cut	sandstone/sand	20	10.52	52	0.67	0.9	32.13	18.29	0.59	1.57	50.43	U88/0043-3
3411	3441	cut	sandstone/sand	20	10.14	53	0.73	1.21	32.97	18.09	0.72	1.94	51.06	U88/0044-3
3441	3471	cut	sandstone/sand	20	9.41	55.7	0.49	1.23	37.75	16.24	0.65	1.72	53.98	U88/0045-3
3561	3591	cut	sandstone/sand	5	1.6	2.9	0.34	0.51	1.35	0.7	0.42	0.85	2.05	U88/0049-3

Table 5a-c Extraction and Fractionation (MPLC) Data (weights) for NOCS well 6404/11-1 (Havsule) BP

Table 5b

Upper depth (m)	Lower depth (m)	Sample type	Description	% Lith.	EOM (ppm)	Sat (ppm)	Aro (ppm)	NSO (ppm)	Asph (ppm)	SAT/ ARO	HC ppm	non-HC ppm
3201	3201	cut	shale/claystone	95	4595	56	84	3364	1091	1.98	141	4455
3231	3231	cut	sandstone/sand	5	6357	97	48	4137	2073	1.89	145	6212
3241.3	3241.3	swc	sandstone/sand	60	13694	263	122	4630	8380	1.86	384	13310
3261	3261	cut	sandstone/sand	40	6608	207	104	5178	1119	1.86	311	6298
3291.00	3291.00	cut	sandstone/sand	30	6097	110	36	4956	994	1.16	147	5950
3321.00	3321.00	cut	sandstone/sand	30	7413	66	110	4929	2306	1.78	177	7235
3351.00	3351.00	cut	sandstone/sand	30	6395	45	90	3703	2556	1.23	134	6261
3379.1	3379.1	swc	sandstone/sand	40	8262	175	175	2857	5054	1.73	350	7912
3381	3381	cut	sandstone/sand	25	5309	66	66	3895	1281	1.78	132	5176
3411	3411	cut	sandstone/sand	20	4943	64	86	3054	1739	3.42	149	4794
3441	3441	cut	sandstone/sand	20	5227	72	119	3251	1784	1.16	191	5036
3471	3471	cut	sandstone/sand	20	5919	52	131	4012	1726	1.54	183	5736
3591	3591	cut	sandstone/sand	5	1813	213	319	844	438	0.95	531	1281

Table 5a-c Extraction and Fractionation (MPLC) Data (weights) for NOCS well 6404/11-1 (Havsule) BP

Table 5c

Upper depth (m)	Lower depth (m)	Sample type	Description	% Lith.	EOM (mg/gTOC)	Sat (mg/gTOC)	Aro (mg/gTOC)	NSO (mg/gTOC)	Asph (mg/gTDC)
3201	3201	cut	shale/claystone	95	638.2	7.8	11.6	467.2	151.5
3231	3231	cut	sandstone/sand	5	908.1	13.9	6.9	591.0	296.2
3241.3	3241.3	swc	sandstone/sand	60	4119.5	79.8	36.9	1463.7	2539.5
3261	3261	cut	sandstone/sand	40	1348.6	42.2	21.1	1056.8	228.5
3291.00	3291.00	cut	sandstone/sand	30	896.6	16.2	5.3	728.8	146.2
3321.00	3321.00	cut	sandstone/sand	30	1123.2	10.0	16.7	746.9	349.4
3351.00	3351.00	cut	sandstone/sand	30	830.5	5.9	11.7	480.9	332.2
3379.1	3379.1	swc	sandstone/sand	40	3177.6	67.2	67.2	1099.0	1943.7
3381	3381	cut	sandstone/sand	25	717.4	8.9	8.9	526.4	173.1
3411	3411	cut	sandstone/sand	20	837.8	10.8	14.5	517.7	294.7
3441	3441	cut	sandstone/sand	20	725.9	10.0	16.6	451.6	247.8
3471	3471	cut	sandstone/sand	20	910.7	8.0	20.1	617.2	265.5
3591	3591	cut	sandstone/sand	5	431.5	50.6	75.9	200.9	104.2

Table 6a Saturated Hydrocarbon GC data (Peak Areas) for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	% Lith	nC15	nC16	Nor - pristane	nC17	Pristane	nC18	Phytane
3171	3201	cut	shale/claystone	95	5121986	2998534	631158	1845786	1117359	1393895	367210
3201	3231	cut	sandstone/sand	5	2987976	2104188	473293	1516487	892926	1089232	287845
3241.3	3241.3	swc	sandstone/sand	60	3122502	3729492	877386	4299021	2315618	5091194	1095872
3231	3261	cut	sandstone/sand	40	816557	1203785	354040	1826270	938302	2268746	483535
3261	3291	cut	sandstone/sand	30	523833	842248	246405	1415693	665480	1745134	366501
3291	3321	cut	sandstone/sand	30	2236506	1837298	433947	1784628	977610	1980031	414497
3321	3351	cut	sandstone/sand	30	2373202	1412001	330315	893026	699946	792564	256796
3379.1	3379.1	swc	sandstone/sand	40	244834	396243	157999	599966	465592	779509	224822
3351	3381	cut	sandstone/sand	25	2257332	1755799	444904	1600078	1264755	1651868	514332
3381	3411	cut	sandstone/sand	20	2428662	1090883	282324	530202	641658	496116	239174
3411	3441	cut	sandstone/sand	20	1872780	842512	238672	561452	647634	418657	192397
3441	3471	cut	sandstone/sand	20	1299687	681674	285041	765173	905072	827036	458222
3561	3591	cut	sandstone/sand	5	96495	192306	99216	364084	251175	360007	182854

Table 6a Saturated Hydrocarbon GC data (Peak Areas) for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	nC19	nC20	nC21	nC22	nC23	nC24	nC25	nC26	nC27	nC28
3201	cut	shale/claystone	1032857	686000	550452	522023	599971	477046	592566	462676	619486	285309
3231	cut	sandstone/sand	671822	564758	398822	341119	346904	266273	323192	252618	346722	163634
3241.3	swc	sandstone/sand	5007591	4774805	4181562	3568567	2839940	2173398	1519257	874641	533394	337708
3261	cut	sandstone/sand	3719708	2496869	2172829	1754386	13675832	979320	646183	431175	253298	171842
3291	cut	sandstone/sand	2172745	1887467	1577989	1225056	906377	625940	407873	287106	169040	101236
3321	cut	sandstone/sand	2029319	1631587	1258687	934150	696947	476651	335003	269192	185715	121007
3351	cut	sandstone/sand	641458	451966	317465	253122	204888	172195	124838	105184	119131	78815
3379.1	swc	sandstone/sand	602711	517487	377159	328665	267143	252708	182760	147956	123691	89294
3381	cut	sandstone/sand	1520995	1105473	845665	653360	548299	407414	356660	269050	268037	151000
3411	cut	sandstone/sand	394800	258012	191843	176565	172124	152136	141843	160738	128192	100145
3441	cut	sandstone/sand	340292	238898	192159	179766	181369	160925	164954	148861	150500	109736
3471	cut	sandstone/sand	705438	457541	345816	290968	316167	232884	296761	245134	305945	163002
3591	cut	sandstone/sand	333669	207616	170359	221363	261162	205250	130500	92271	79294	60768

Table 6a Saturated Hydrocarbon GC data (Peak Areas) for NOCS well 6404/11-1 (Havsule)

BP

Lower depth (m)	Sample type	Description	nC29	nC30	nC31	nC32	nC33	nC34	Sample number
3201	cut	shale/claystone	573914	338920	295131	118407	171275	66800	U88/0036-1
3231	cut	sandstone/sand	315969	156216	159759	76479	96104	35444	U88/0037-3
3241.3	swc	sandstone/sand	249560	170225	125508	102293	94947	75830	U88/0023-2
3261	cut	sandstone/sand	182857	160240	189312	145208	164333	89653	U88/0038-3
3291	cut	sandstone/sand	110753	87559	68003	39172	37409	17137	U88/0039-3
3321	cut	sandstone/sand	174577	109212	111935	57564	69087	25924	U88/0040-3
3351	cut	sandstone/sand	152476	120596	109360	46374	71941	16966	U88/0041-3
3379.1	swc	sandstone/sand	88783	83527	53407	31301	35282	17379	U88/0024-2
3381	cut	sandstone/sand	273262	140978	133332	67877	90797	33075	U88/0042-3
3411	cut	sandstone/sand	135757	129563	77656	60542	65775	21188	U88/0043-3
3441	cut	sandstone/sand	173914	104422	97383	61390	75107	39444	U88/0044-3
3471	cut	sandstone/sand	321982	116187	153326	88902	103256	27776	U88/0045-3
3591	cut	sandstone/sand	91400	94589	50408	38171	30484	26046	U88/0049-3

Table 6b Saturated Hydrocarbon Gas Chromatography Quantitative Data (mg/g SAT) for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	% Lithology	nC15	nC16	iC18	nC17	Pr	nC18	Ph	nC19
3171	3201	cut	shale/claystone	95	132.6	77.6	16.3	47.8	28.9	36.1	9.5	26.7
3201	3231	cut	sandstone/sand	5	60.8	42.8	9.6	30.8	18.2	22.1	5.9	17.7
3241.3	3241.3	swc	sandstone/sand	60	21.5	25.7	6.0	29.6	15.9	35.0	7.5	24.5
3231	3261	cut	sandstone/sand	40	16.6	24.5	7.2	37.2	19.1	46.2	9.9	55.4
3261	3291	cut	sandstone/sand	30	12.5	20.0	5.9	33.7	15.8	41.5	8.7	51.7
3291	3321	cut	sandstone/sand	30	61.2	50.3	11.9	48.9	26.8	54.2	11.3	55.6
3321	3351	cut	sandstone/sand	30	77.5	46.1	10.8	39.2	22.9	25.9	8.4	21.0
3379.1	3379.1	swc	sandstone/sand	40	2.7	4.4	1.8	6.7	5.2	8.7	2.5	6.7
3351	3381	cut	sandstone/sand	25	50.5	39.3	10.0	35.9	28.3	37.0	11.5	34.0
3381	3411	cut	sandstone/sand	20	60.6	27.2	7.0	13.2	16.0	12.4	6.0	9.9
3411	3441	cut	sandstone/sand	20	52.8	23.7	6.7	15.8	18.3	11.8	5.4	9.6
3441	3471	cut	sandstone/sand	20	41.2	27.9	9.0	24.3	28.7	26.2	14.5	22.4
3561	3591	cut	sandstone/sand	5	3.6	7.2	3.7	13.6	9.4	13.5	6.8	12.5

Table 6b Saturated Hydrocarbon Gas Chromatography Quantitative Data (mg/g SAT) for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	nC20	nC21	nC22	nC23	nC24	nC25	nC26	nC27	nC28	nC29
3201	cut	shale/claystone	17.8	14.3	13.5	15.5	12.4	15.3	12.0	16.0	7.4	14.9
3231	cut	sandstone/sand	11.5	8.1	6.9	7.1	5.4	6.6	5.1	7.0	3.3	6.4
3241.3	swc	sandstone/sand	32.9	28.8	24.6	19.5	15.0	10.5	6.0	3.7	2.3	1.7
3261	cut	sandstone/sand	50.9	44.3	35.7	278.6	20.0	13.1	8.8	5.2	3.5	3.7
3291	cut	sandstone/sand	44.9	37.5	29.1	21.5	14.9	9.7	6.8	4.0	2.4	2.6
3321	cut	sandstone/sand	44.7	34.5	25.6	19.1	13.1	9.2	7.4	5.1	3.3	4.8
3351	cut	sandstone/sand	14.8	10.4	8.3	6.7	5.6	4.1	3.4	3.9	2.6	5.0
3379.1	swc	sandstone/sand	5.8	4.2	3.7	3.0	2.8	2.0	1.7	1.4	1.0	1.0
3381	cut	sandstone/sand	24.7	18.9	14.6	12.3	9.1	8.0	6.0	6.0	3.4	6.1
3411	cut	sandstone/sand	6.4	4.8	4.4	4.3	3.8	3.5	4.5	3.2	2.5	3.4
3441	cut	sandstone/sand	6.7	5.4	5.1	5.1	4.5	4.6	4.1	4.2	3.1	4.9
3471	cut	sandstone/sand	14.5	11.0	9.2	10.0	7.4	9.5	7.7	9.7	5.2	10.2
3591	cut	sandstone/sand	7.8	6.4	8.3	9.8	7.7	4.9	3.5	3.0	2.3	3.4

Table 6b Saturated Hydrocarbon Gas Chromatography Quantitative Data (mg/g SAT) for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	nC30	nC31	nC32	nC33	nC34	Sample number
3201	cut	shale/claystone	6.2	7.6	3.1	4.4	1.7	U88/0036-1
3231	cut	sandstone/sand	3.2	3.2	1.6	2.0	0.7	U88/0037-3
3241.3	swc	sandstone/sand	1.2	0.9	0.7	0.7	0.5	U88/0023-2
3261	cut	sandstone/sand	3.3	3.9	3.0	3.3	1.8	U88/0038-3
3291	cut	sandstone/sand	2.1	1.6	0.9	0.9	0.4	U88/0039-3
3321	cut	sandstone/sand	3.0	3.1	1.6	1.8	0.7	U88/0040-3
3351	cut	sandstone/sand	3.9	3.6	1.5	2.3	0.6	U88/0041-3
3379.1	swc	sandstone/sand	0.9	0.6	0.3	0.4	0.2	U88/0024-2
3381	cut	sandstone/sand	3.2	3.0	1.5	2.0	0.7	U88/0042-3
3411	cut	sandstone/sand	3.2	1.9	1.5	1.6	0.5	U88/0043-3
3441	cut	sandstone/sand	2.9	2.7	1.7	2.1	1.1	U88/0044-3
3471	cut	sandstone/sand	3.7	4.9	2.8	3.3	0.9	U88/0045-3
3591	cut	sandstone/sand	3.5	1.9	1.4	1.1	1.0	U88/0048-3

Table 6c Saturated Hydrocarbon GC data (Ratios from peak areas) for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	% Lith.	Prist/ nC17	Prist/ Phyt	(Prist./nC17)/ (Phyt./nC18)	CPI 1	Phyt/ nC18	nC17/ (nC17+nC27)	(Pristane+ Phytane)/ (nC17+nC18)	Sample number
3171	3201	cut	shale/claystone	95	0.61	3.04	2.3	1.65	0.26	0.75	0.46	U88/0036-1
3201	3231	cut	sandstone/sand	5	0.59	3.1	2.23	1.57	0.26	0.81	0.45	U88/0037-3
3241.3	3241.3	swc	sandstone/sand	60	0.54	2.11	2.5	1.16	0.22	0.89	0.38	U88/0023-2
3231	3261	cut	sandstone/sand	40	0.51	1.94	2.41	1.06	0.21	0.88	0.35	U88/0038-3
3261	3291	cut	sandstone/sand	30	0.47	1.82	2.24	1.06	0.21	0.89	0.33	U88/0039-3
3291	3321	cut	sandstone/sand	30	0.55	2.38	2.62	1.14	0.21	0.91	0.37	U88/0040-3
3321	3351	cut	sandstone/sand	30	0.78	2.73	2.42	1.25	0.32	0.88	0.57	U88/0041-3
3379.1	3379.1	swc	sandstone/sand	40	0.76	2.07	2.69	1.03	0.29	0.83	0.5	U88/0024-2
3351	3381	cut	sandstone/sand	25	0.79	2.46	2.54	1.35	0.31	0.86	0.55	U88/0042-3
3381	3411	cut	sandstone/sand	20	1.21	2.68	2.51	0.94	0.48	0.81	0.86	U88/0043-3
3411	3441	cut	sandstone/sand	20	1.15	3.37	2.51	1.26	0.46	0.79	0.86	U88/0044-3
3441	3471	cut	sandstone/sand	20	1.18	1.98	2.13	1.60	0.55	0.71	0.86	U88/0045-3
3561	3591	cut	sandstone/sand	5	0.69	1.37	1.36	1.00	0.51	0.82	0.6	U88/0049-3

Table 7a Aromatic Hydrocarbon GC data (peak areas) for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Desc	1,3,5 TMN	1,4,6+2,3,6 TMN	P	3MP	2MP	9MP	1MP	DBT	4MDBT	2+3 MDBT	1MDBT	Sample number
3201	cut	shale/claystone	18991	18224	31059	14884	9495	7440	11034	0	0	0	0	U88/0036-1
3231	cut	sandstone/sand	10947	16045	31909	11062	4205	9089	11859	0	0	0	0	U88/0037-3
3241.3	swc	sandstone/sand	33451	56047	38626	17405	13174	19107	15285	0	0	0	0	U88/0023-2
3261	cut	sandstone/sand	11029	12668	23438	0	0	7567	5931	0	0	0	0	U88/0038-3
3291	cut	sandstone/sand	6553	11781	19923	8807	7027	5447	6544	0	0	0	0	U88/0039-3
3321	cut	sandstone/sand	64498	56346	79555	31520	24243	36867	23339	0	0	0	0	U88/0040-3
3351	cut	sandstone/sand	37797	25751	50938	15116	19620	26004	21513	0	0	0	0	U88/0041-3
3379.1	swc	sandstone/sand	11738	11962	39007	9871	15785	16139	13273	0	0	0	0	U88/0024-2
3381	cut	sandstone/sand	19943	17731	42747	12615	18888	20940	11012	0	0	0	0	U88/0042-3
3411	cut	sandstone/sand	24706	19827	61094	19401	28428	32660	25077	0	0	0	0	U88/0043-3
3441	cut	sandstone/sand	23069	21368	62263	17653	21255	34179	25959	0	0	0	0	U88/0044-3
3471	cut	sandstone/sand	29281	26109	61031	19222	19539	29094	17093	0	0	0	0	U88/0045-3
3591	cut	sandstone/sand	4176	3539	20376	10116	12346	5519	11358	0	0	0	0	U88/0049-3

Table 7b Aromatic Hydrocarbon GC Data (Ratios from peak areas) for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%Lith.	MNR	DMNR	BPhR	2/1MP	MPI1	MPI2	Rc	DBT/Ph	4/1 MDBT	(3+2)/1 MDBT	F1	F2	Sample number
3171	3201	cut	shale/claystone	95	0.00	1.80	0.00	0.66	0.74	0.58	0.84	0.00	0.00	0.00	0.57	0.22	U88/0036-1
3201	3231	cut	sandstone/sand	5	0.00	1.13	0.00	0.35	0.43	0.24	0.66	0.00	0.00	0.00	0.42	0.12	U88/0037-3
3241.3	3241.3	swc	sandstone/sand	60	1.19	1.38	0.19	0.86	0.63	0.54	0.78	0.00	0.00	0.00	0.47	0.20	U88/0023-2
3231	3261	cut	sandstone/sand	40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	U88/0038-3
3261	3291	cut	sandstone/sand	30	0.00	0.00	0.00	1.07	0.74	0.66	0.85	0.00	0.00	0.00	0.57	0.25	U88/0039-3
3291	3321	cut	sandstone/sand	30	0.73	2.86	0.45	1.04	0.60	0.52	0.76	0.00	0.00	0.00	0.48	0.21	U88/0040-3
3321	3351	cut	sandstone/sand	30	0.74	2.65	0.22	0.91	0.53	0.60	0.72	0.00	0.00	0.00	0.42	0.24	U88/0041-3
3379.1	3379.1	swc	sandstone/sand	40	1.10	1.99	0.00	1.19	0.56	0.69	0.74	0.00	0.00	0.00	0.47	0.29	U88/0024-2
3351	3381	cut	sandstone/sand	25	0.68	2.21	0.90	1.72	0.63	0.76	0.78	0.00	0.00	0.00	0.50	0.30	U88/0042-3
3381	3411	cut	sandstone/sand	20	0.56	2.50	0.34	1.13	0.60	0.72	0.76	0.00	0.00	0.00	0.45	0.27	U88/0043-3
3411	3441	cut	sandstone/sand	20	0.60	2.42	0.18	0.82	0.48	0.52	0.69	0.00	0.00	0.00	0.39	0.21	U88/0044-3
3441	3471	cut	sandstone/sand	20	0.00	2.51	0.04	1.14	0.54	0.55	0.73	0.00	0.00	0.00	0.46	0.23	U88/0045-3
3561	3591	cut	sandstone/sand	5	0.00	0.00	0.00	1.09	0.90	0.99	0.94	0.00	0.00	0.00	0.57	0.31	U88/0049-3

Table 7a Aromatic Hydrocarbon GC data (peak areas) for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Desc	%Lith.	2MN	1MN	BPh	2EN	1EN	2,6+ 2,7DMN	1,6DMN	1,5DMN	1,3,7 TMN	1,3,6 TMN
3171	3201	cut	shale/claystone	95	0	0	0	0	0	9971	7625	5646	3675	23619
3201	3231	cut	sandstone/sand	5	0	0	0	0	0	7406	7349	6647	0	0
3241.3	3241.3	swc	sandstone/sand	60	59114	49682	9825	20166	20787	39166	51022	28471	14783	42819
3231	3261	cut	sandstone/sand	40	0	0	0	0	0	0	4512	0	0	0
3261	3291	cut	sandstone/sand	30	0	0	0	0	0	0	0	0	0	0
3291	3321	cut	sandstone/sand	30	10830	14838	23995	0	0	68761	53828	24056	16971	49852
3321	3351	cut	sandstone/sand	30	13137	17675	10274	0	0	47088	46009	17752	20226	37241
3379.1	3379.1	swc	sandstone/sand	40	17036	15553	0	11132	6639	19018	26162	9551	7759	17602
3351	3381	cut	sandstone/sand	25	9427	13831	28359	17750	8036	31542	31497	14260	11968	22540
3381	3411	cut	sandstone/sand	20	6871	11787	11364	12510	9015	35458	33542	14174	18439	34595
3411	3441	cut	sandstone/sand	20	7504	12418	7687	13025	10589	37193	42376	15358	18331	36259
3441	3471	cut	sandstone/sand	20	0	6123	1313	10282	7415	29906	35868	11899	20728	36837
3561	3591	cut	sandstone/sand	5	0	0	0	0	0	0	0	0	2297	4240

Table 8a Triterpane Peak Heights from m/z 191 fragmentograms BP
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	19/3	20/3	21/3	22/3	23/3 (P)	24/3 (Q)	25/3 (R)	24/4 (S)
3171	3201	cut	shale/claystone	95	53234.3	31387.7	23124.9	4468.8	18556.2	8803.8	3763.6	22043.1
3241.3	3241.3	swc	sandstone/sand	60	35364.3	21267.8	18136.8	4043.1	16716.2	9491.2	3830.7	15839.1
3231	3261	cut	sandstone/sand	40	44368.6	27178.1	22835.3	2716	21195	11991.7	4158.9	19730.2
3261	3291	cut	sandstone/sand	30	41639.9	26225.6	21531.5	2107.6	17652.6	8942.1	3126.1	19195.3
3291	3321	cut	sandstone/sand	30	64891	37811.6	34008.5	6089.6	28844.8	13221	4566.8	22807.5
3379.1	3379.1	swc	sandstone/sand	40	3585.8	3128.4	3225.3	692.6	3183.4	1566.4	663.8	1853.5
3351	3381	cut	sandstone/sand	25	47921.8	27535.6	25002.5	5420.9	21515.2	11102.7	4249.6	22216.3
3381	3411	cut	sandstone/sand	20	39562.7	31212.3	20283.8	4005.6	18068.4	7965.8	3140.9	20740.4
3411	3441	cut	sandstone/sand	20	59405.4	26911	19754.2	3727.7	18343.6	9566.5	4094.7	34272

Table 8a Triterpane Peak Heights from m/z 191 fragmentograms BP
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

Lower depth (m)	Sample type	Description	26/3R (T)	26/3S (T)	28/3R	28/3S	29/3R	29/3S	27Ts (A)	27Tm (B)	28ab (Z)	25nor30ab (Z1)
3201	cut	shale/claystone	2670.6	3170.3	1769.9	2278.7	2123.8	3455.1	11492.4	147814.5	10928	2065.9
3241.3	swc	sandstone/sand	3573.5	3331.1	4666.5	4687.6	4482.4	4502.2	24419.2	21726.2	19000.3	3275.2
3261	cut	sandstone/sand	3626.5	3663.9	1692.2	3058.6	3325.5	3428.3	18945.4	25003.4	22824	4258.7
3291	cut	sandstone/sand	3287.1	3164.1	1661.6	3473.9	3255.5	4930.9	21208.7	33413.3	27929.3	3809.9
3321	cut	sandstone/sand	3820.6	3708.1	1869.1	2600.3	3257.4	4482.6	18470.4	46653.9	86087.2	3601.7
3379.1	swc	sandstone/sand	446	446.4	650.9	759.2	752.2	1336.7	3254.9	4733.3	10670.5	451.9
3381	cut	sandstone/sand	3573.2	4043.3	3079.9	3944.9	4067.4	27780.7	27138.7	107186.1	24519	10437.3
3411	cut	sandstone/sand	2089.9	2784.9	2508.7	3072.2	3764.5	13872.6	29217.9	91260.4	77406.1	6358.3
3441	cut	sandstone/sand	3117.7	3797.9	3609.1	3610.6	5965.4	24789.6	53751.1	125056.9	162008.5	11551.2

Table 8a Triterpane Peak Heights from m/z 191 fragmentograms BP
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

Lower depth (m)	Sample type	Description	29ab (C)	29Ts (C1)	30d (X)	29ba (D)	30O	30ab (E)	30ba (F)	30G	31abS (G)	31abR (H)
3201	cut	shale/claystone	259602.3	14706.8	5513.6	143497.4	0	493711.8	203594.5	0	148699.8	361393.1
3241.3	swc	sandstone/sand	79843.5	30517.9	5423.8	26003.9	1020.8	151506.8	19595.4	3326.6	44005.4	43300.9
3261	cut	sandstone/sand	85374.1	32485.5	5352.1	35067.4	0	154117.8	21362.1	0	35488.4	39745.9
3291	cut	sandstone/sand	97925.1	32110.8	5736.6	36031.9	0	169058.7	28913.2	0	38772.8	50740.5
3321	cut	sandstone/sand	115520.3	30964.2	7464.1	50062.4	0	213810.4	47806.5	0	58119.6	93374.9
3379.1	swc	sandstone/sand	13063.7	4494.9	703.5	5180.4	0	24744	4527.6	876.8	6691.1	8654.5
3381	cut	sandstone/sand	207061.4	35830.6	11344.5	122847.7	0	415351.8	127677.6	0	107571.6	260125.5
3411	cut	sandstone/sand	186556.4	46688.2	11886.1	93567.9	0	377707.6	94504.6	0	119751.8	184241.7
3441	cut	sandstone/sand	348627.1	105125.2	18349.9	175056.6	0	691363.8	144354	0	182246.8	288447.3

Table 8a Triterpane Peak Heights from m/z 191 fragmentograms BP
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

Lower depth (m)	Sample type	Description	31ba (I)	32abS (J1)	32abR (J2)	33abS (K1)	33abR (K2)	34abS (L1)	34abR (L2)	35abS (M1)	35abR (M2)	Sample number
3201	cut	shale/claystone	110904.5	26313.5	70426.9	11761.3	17473.6	4256.5	6423.2	2852.4	3159.1	U88/0036-1
3241.3	swc	sandstone/sand	10636	21428.5	19791.1	11990.4	9808.1	7874.2	6331.6	5551	4700	U88/0023-2
3261	cut	sandstone/sand	9971.8	16052.8	14493.5	6319.4	5660	4005.9	3361	2475.1	2582.2	U88/0038-3
3291	cut	sandstone/sand	12957.5	12106.8	13440.7	4184.8	4327	2126	2127.2	1203.4	1336.7	U88/0039-3
3321	cut	sandstone/sand	25492.4	15744.9	23490	6053.8	7177.8	2838.1	3558	1663.8	1900.1	U88/0040-3
3379.1	swc	sandstone/sand	2459.2	1987.4	2698.5	1055	1349.2	699.8	721.3	482.4	601.3	U88/0024-2
3381	cut	sandstone/sand	78688.5	21216.2	49077.7	24267.7	13348.2	3567.9	5356.3	1816.8	2665	U88/0042-3
3411	cut	sandstone/sand	57637.1	23371.1	41043.8	8056.5	12453.4	3930.8	5303	2019.1	2489.2	U88/0043-3
3441	cut	sandstone/sand	89849.9	40323.4	71447.9	13711.4	23537.7	8322.8	11395.5	4459.4	5896.7	U88/0044-3

Table 8b Sterane peak heights from m/z 217 fragmentograms BP
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	21a (u)	22a (v)	27dbS (a)	27dbR (b)	27daR (c)	27daS (d)	28dbS (e)
3171	3201	cut	shale/claystone	95	31269.3	9124.6	16282.6	22281.0	4747.4	8462.4	9135.2
3241.3	3241.3	swc	sandstone/sand	60	37157.3	10403.0	43534.3	34830.1	11218.5	11025.0	25811.4
3231	3261	cut	sandstone/sand	40	58677.9	13334.3	65157.5	58433.6	17360.6	17239.7	36412.8
3261	3291	cut	sandstone/sand	30	54998.1	11870.2	53503.5	52414.3	15975.2	14818.7	31709.1
3291	3321	cut	sandstone/sand	30	82588.0	16917.4	54654.6	57982.9	19189.2	18147.3	38203.3
3379.1	3379.1	swc	sandstone/sand	40	6666.0	1340.2	5063.5	6382.5	1704.9	1509.7	4541.1
3351	3381	cut	sandstone/sand	25	74100.3	14864.1	47762.9	56532.9	17241.6	17573.5	35994.5
3381	3411	cut	sandstone/sand	20	83711.6	14840.0	54359.8	73035.7	23820.9	17680.4	51277.0
3411	3441	cut	sandstone/sand	20	159520.8	25186.6	111109.5	148454.6	50616.6	38126.1	117417.5

Table 8b Sterane peak heights from m/z 217 fragmentograms BP
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

Lower depth (m)	Sample type	Description	28dbR (f)	28daR +27aaS (g)	29dbS +27bbR (h)	28daS +27bbS (i)	27aaR (j)	29dbR (k)	29daR (l)	28aaS (m)
3201	cut	shale/claystone	9359.3	47984.8	18306.4	8947.7	165824.6	10680.5	4508.3	6881.7
3241.3	swc	sandstone/sand	18374.9	16066.5	26996.4	13131.1	41627.7	16760.8	6502.9	6802.7
3261	cut	sandstone/sand	28327.4	30564.9	33278.7	16747.6	82675.7	20909.0	8149.7	7933.9
3291	cut	sandstone/sand	24792.5	28888.3	26901.0	15539.5	75587.7	19407.0	6862.0	6549.9
3321	cut	sandstone/sand	30363.5	29420.6	31985.7	19554.6	79322.5	23285.9	8991.1	7170.1
3379.1	swc	sandstone/sand	3592.6	5214.3	3718.3	1896.9	13046.5	2880.1	899.2	747.1
3381	cut	sandstone/sand	32324.0	46542.4	36726.2	21405.9	148689.5	28527.3	11342.5	12871.3
3411	cut	sandstone/sand	45508.8	40103.5	42654.2	26141.1	107314.0	35335.0	11942.0	6992.6
3441	cut	sandstone/sand	108911.5	74947.6	85939.4	57820.5	197839.0	81563.1	28716.7	21283.8

Table 8b Sterane peak heights from m/z 217 fragmentograms
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

BP

Lower depth (m)	Sample type	Description	29daS +28bbR (n)	28bbS (o)	28aaR (p)	29aaS (q)	29bbR (r)	29bbS (s)	29aaR (t)	Sample number
3201	cut	shale/claystone	31922.5	9579.3	74690.6	7772.1	37111.7	9291.2	140744.0	U88/0036-1
3241.3	swc	sandstone/sand	12850.6	9637.2	24447.3	8228.4	13145.2	7489.1	25884.6	U88/0023-2
3261	cut	sandstone/sand	18293.7	9130.4	39632.6	7872.7	14191.2	5830.6	43123.0	U88/0038-3
3291	cut	sandstone/sand	15530.4	8261.6	30010.0	6711.3	12883.6	5878.3	30675.7	U88/0039-3
3321	cut	sandstone/sand	21220.4	10875.1	37675.5	7367.0	18051.8	8208.6	43868.7	U88/0040-3
3379.1	swc	sandstone/sand	2554.4	1228.1	4561.7	691.7	2044.4	886.2	4581.0	U88/0024-2
3381	cut	sandstone/sand	41264.0	18118.1	93639.4	9183.9	35378.4	14346.6	113727.1	U88/0042-3
3411	cut	sandstone/sand	30508.2	16238.8	47159.4	7404.6	25789.8	14011.5	61095.7	U88/0043-3
3441	cut	sandstone/sand	72080.1	38187.8	126287.8	16018.4	53898.9	24556.6	139257.8	U88/0044-3

Table 8c Sterane peak heights from m/z 218 fragmentograms
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	27bbR (h)	27bbS (i)	28bbR (n)	28bbS (o)	29bbR (r)	29bbS (s)	30bbR (x)	30bbS (y)	Sample number
3171	3201	cut	shale/claystone	95	18611.2	10003.3	25828.1	14259.7	24391.3	13736.4	3667.3	4715.7	U88/0036-1
3241.3	3241.3	swc	sandstone/sand	60	23830.0	15729.2	16973.9	14904.3	16858.4	13816.5	3694.5	3044.3	U88/0023-2
3231	3261	cut	sandstone/sand	40	23317.1	13622.3	18631.7	13585.9	13895.8	10079.5	1335.0	1634.0	U88/0038-3
3261	3291	cut	sandstone/sand	30	20290.6	12824.7	16010.3	11801.0	12748.7	9040.2	1352.1	1541.1	U88/0039-3
3291	3321	cut	sandstone/sand	30	24320.2	14955.3	22803.3	16478.1	17635.1	12452.0	1945.0	2427.5	U88/0040-3
3379.1	3379.1	swc	sandstone/sand	40	2977.8	1743.7	2825.4	2105.2	2176.8	1663.3	309.0	336.0	U88/0024-2
3351	3381	cut	sandstone/sand	25	38560.1	18695.6	36668.5	25167.7	32489.5	22673.3	7061.0	7177.9	U88/0042-3
3381	3411	cut	sandstone/sand	20	29465.6	19208.0	35196.4	26721.4	27908.6	22031.1	3495.4	5486.8	U88/0043-3
3411	3441	cut	sandstone/sand	20	51852.8	34332.2	71725.4	52856.3	50837.0	38055.1	8005.0	10299.3	U88/0044-3

Table 8d Triterpane Peak Heights from m/z 177 fragmentograms
(Saturated Hydrocarbon Fraction GC-MS SIR analysis) for NOCS well 6404/11-1 (Havsule)

BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	25nor28ab	25nor30ab	Sample number
3171	3201	cut	shale/claystone	95	4223.1	1422.6	U88/0036-1
3241.3	3241.3	swc	sandstone/sand	60	30962.4	2278.4	U88/0023-2
3231	3261	cut	sandstone/sand	40	45499.3	2369.9	U88/0038-3
3261	3291	cut	sandstone/sand	30	47579.6	2029.2	U88/0039-3
3291	3321	cut	sandstone/sand	30	49032.6	2686.3	U88/0040-3
3379.1	3379.1	swc	sandstone/sand	40	756.0	346.6	U88/0024-2
3351	3381	cut	sandstone/sand	25	5152.9	5331.7	U88/0042-3
3381	3411	cut	sandstone/sand	20	4030.5	5219.7	U88/0043-3
3411	3441	cut	sandstone/sand	20	6677.6	11435.9	U88/0044-3

Table 8e Amount of triterpanes in ng/g (ppb) from m/z 191 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	19/3	20/3	21/3	22/3	23/3 (P)	24/3 (Q)	25/3 (R)	24/4 (S)	26/3R (T)
3171	3201	cut	shale/claystone	95	1139.1	671.6	494.8	95.6	397.1	188.4	80.3	471.7	57.1
3241.3	3241.3	swc	sandstone/sand	60	1625.1	977.3	833.5	185.6	768.2	436.2	176.0	727.9	164.2
3231	3261	cut	sandstone/sand	40	3168.4	1940.8	1630.7	194.0	1513.5	856.3	297.0	1408.9	259.0
3261	3291	cut	sandstone/sand	30	2015.2	1269.2	1042.0	102.0	854.3	432.8	151.3	929.0	159.1
3291	3321	cut	sandstone/sand	30	1661.3	968.1	870.7	155.9	738.5	338.5	116.9	583.9	97.8
3379.1	3379.1	swc	sandstone/sand	40	293.1	255.7	263.6	56.6	260.2	128.0	45.3	151.5	36.5
3351	3381	cut	sandstone/sand	25	1185.4	661.1	618.5	134.1	532.2	274.6	105.1	549.6	86.4
3381	3411	cut	sandstone/sand	20	751.1	402.7	385.1	76.0	343.0	151.2	59.6	393.7	39.7
3411	3441	cut	sandstone/sand	20	1140.3	516.6	379.2	71.6	352.1	183.6	78.6	657.9	59.8

Table 8e Amount of triterpanes in ng/g (ppb) from m/z 191 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	26/3S (T)	28/3R	28/3S	29/3R	29/3S	27Ts (A)	27Tm (B)	28ab (Z)	25nor30ab (Z1)
3201	cut	shale/claystone	67.8	37.9	48.8	45.4	73.9	245.9	3162.9	233.8	44.2
3241.3	swc	sandstone/sand	153.1	214.4	215.4	206.0	206.9	1122.2	998.4	873.1	150.5
3261	cut	sandstone/sand	261.6	120.8	218.4	237.5	244.8	1352.9	1785.5	1637.0	304.1
3291	cut	sandstone/sand	153.1	80.4	168.1	157.6	239.1	1026.4	1617.1	1351.7	184.4
3321	cut	sandstone/sand	94.9	47.9	66.6	83.4	114.8	472.9	1194.4	2204.0	92.2
3379.1	swc	sandstone/sand	36.5	53.2	62.1	61.5	109.3	266.0	386.9	872.2	36.9
3381	cut	sandstone/sand	100.0	76.2	97.6	100.6	687.2	671.3	2651.5	606.5	258.2
3411	cut	sandstone/sand	52.9	47.6	58.3	71.5	263.4	554.7	1732.5	1469.5	120.7
3441	cut	sandstone/sand	72.9	69.3	69.3	114.5	475.9	1031.8	2400.5	3109.9	221.7

Table 8e Amount of triterpanes in ng/g (ppb) from m/z 191 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	29ab (C)	29Ts (C1)	30d (X)	29ba (D)	30O	30ab (E)	30ba (F)	30G	31abS (G)	31abR (H)
3201	cut	shale/claystone	5554.9	314.7	118.0	3070.5	0.0	10564.4	4356.5	0.0	3181.9	7733.1
3241.3	swc	sandstone/sand	3669.1	1402.4	249.2	1195.0	46.9	6962.4	900.6	152.9	2022.2	1989.9
3261	cut	sandstone/sand	6096.6	2319.8	382.3	2504.2	0.0	11005.6	1525.5	0.0	2534.2	2838.3
3291	cut	sandstone/sand	4739.2	1554.0	277.6	1743.6	0.0	8181.8	1399.3	0.0	1876.5	2455.7
3321	cut	sandstone/sand	2957.6	792.7	191.1	1281.7	0.0	5474.0	1223.9	0.0	1486.0	2390.6
3379.1	swc	sandstone/sand	1067.6	367.4	57.5	423.4	0.0	2022.5	370.1	71.7	546.9	707.4
3381	cut	sandstone/sand	5122.1	886.3	280.6	3038.9	0.0	10274.5	3158.4	0.0	2661.0	6434.7
3411	cut	sandstone/sand	3541.7	836.3	225.7	1776.3	0.0	7170.6	1794.1	0.0	2273.4	3497.7
3441	cut	sandstone/sand	6692.1	2017.9	352.2	3360.3	0.0	13271.2	2771.0	0.0	3498.3	5536.9

Table 8e Amount of triterpanes in ng/g (ppb) from m/z 191 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	31ba (I)	32abS (J1)	32abR (J2)	33abS (K1)	33abR (K2)	34abS (L1)	34abR (L2)	35abS (M1)	35abR (M2)	Sample number
3201	cut	shale/claystone	2373.1	563.1	1507.0	251.7	373.9	91.1	137.4	61.0	67.6	U88/0036-1
3241.3	swc	sandstone/sand	498.0	984.7	909.5	551.0	450.7	361.9	291.0	255.1	216.0	U88/0023-2
3261	cut	sandstone/sand	712.1	1146.3	1035.0	451.3	404.2	286.1	240.0	176.7	184.4	U88/0038-3
3291	cut	sandstone/sand	627.1	585.9	650.5	202.5	209.4	102.9	102.9	56.2	64.8	U88/0039-3
3321	cut	sandstone/sand	652.7	403.1	601.4	155.0	183.8	72.7	91.1	42.6	46.6	U88/0040-3
3379.1	swc	sandstone/sand	201.0	162.4	220.6	66.2	110.3	57.2	59.0	39.4	49.1	U88/0024-2
3381	cut	sandstone/sand	1897.0	524.8	1214.0	600.3	330.2	88.3	132.5	44.9	65.9	U88/0042-3
3411	cut	sandstone/sand	1094.2	443.7	779.2	152.9	236.4	74.6	100.7	38.3	47.3	U88/0043-3
3441	cut	sandstone/sand	1724.7	774.0	1371.5	263.2	451.8	159.8	218.7	85.6	113.2	U88/0044-3

Triterpane Quant. (ng/g) m/z 191
For peak identification see Experimental section

Table 8f Amount of steranes in ng/g (ppb) from m/z 217 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	21a (u)	22a (v)	27dbS (a)	27dbR (b)	27daR (c)	27daS (d)	28dbS (e)	28dbR (f)	28daR +27aaS (g)
3171	3201	cut	shale/claystone	95	669.1	196.2	348.4	476.8	101.6	181.1	195.5	200.3	1020.8
3241.3	3241.3	swc	sandstone/sand	60	1707.5	478.1	2000.6	1600.6	515.5	906.6	1186.1	844.4	738.3
3231	3261	cut	sandstone/sand	40	4190.2	952.2	4652.9	4172.8	1239.7	1231.1	2600.2	2022.9	2182.6
3261	3291	cut	sandstone/sand	30	2661.7	574.5	2589.4	2536.7	773.1	717.2	1534.6	1199.9	1398.1
3291	3321	cut	sandstone/sand	30	2114.4	433.1	1389.3	1484.5	491.3	464.6	978.1	777.4	753.2
3379.1	3379.1	swc	sandstone/sand	40	544.9	109.5	413.9	521.7	139.4	123.4	371.2	293.6	426.2
3351	3381	cut	sandstone/sand	25	1833.0	367.7	1181.5	1398.5	426.5	434.7	890.4	799.6	1151.3
3381	3411	cut	sandstone/sand	20	1589.2	281.7	1032.0	1386.5	452.2	335.7	973.5	864.0	761.3
3411	3441	cut	sandstone/sand	20	3082.1	483.5	2132.6	2849.7	971.6	731.9	2253.9	2090.6	1421.4

Table 8f Amount of steranes in ng/g (ppb) from m/z 217 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	29dbS +27bbR (h)	28daS +27bbS (i)	27aaR (j)	29dbR (k)	29daR (l)	28aaS (m)	29daS +28bbR (n)	28bbS (o)	28aaR (p)
3201	cut	shale/claystone	391.7	191.5	3548.3	228.5	96.5	147.3	683.1	205.0	1598.2
3241.3	swc	sandstone/sand	1240.6	603.4	1913.0	770.2	298.8	312.6	590.5	442.9	1123.5
3261	cut	sandstone/sand	2378.3	1186.6	5903.9	1493.1	582.0	566.6	1306.4	652.0	2830.2
3291	cut	sandstone/sand	1301.9	752.1	3658.2	939.2	332.1	317.0	751.6	399.8	1452.4
3321	cut	sandstone/sand	818.9	500.6	2030.8	596.2	230.2	183.6	543.3	278.4	964.6
3379.1	swc	sandstone/sand	303.9	155.0	1066.4	235.4	73.5	61.1	208.8	100.4	372.9
3381	cut	sandstone/sand	908.5	529.5	3678.1	708.2	280.6	318.4	1020.7	448.2	2316.4
3411	cut	sandstone/sand	809.8	496.3	2037.3	670.8	226.7	132.8	579.2	308.3	895.3
3441	cut	sandstone/sand	1649.7	1109.9	3797.6	1565.7	551.2	408.6	1383.6	733.0	2424.2

Table 8f Amount of steranes in ng/g (ppb) from m/z 217 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	29aaS (q)	29bbR (r)	29bbS (s)	29aaR (t)	Sample number
3201	cut	shale/claystone	166.3	784.1	198.8	3011.6	U88/0036-1
3241.3	swc	sandstone/sand	378.1	604.1	344.2	1189.5	U88/0023-2
3261	cut	sandstone/sand	562.2	1013.4	416.4	3079.4	U88/0038-3
3291	cut	sandstone/sand	324.8	623.5	284.5	1484.6	U88/0039-3
3321	cut	sandstone/sand	188.6	462.2	210.2	1123.1	U88/0040-3
3379.1	swc	sandstone/sand	56.5	167.1	72.4	374.4	U88/0024-2
3381	cut	sandstone/sand	227.2	875.2	354.9	2813.3	U88/0042-3
3411	cut	sandstone/sand	140.6	489.6	266.0	1159.9	U88/0043-3
3441	cut	sandstone/sand	307.5	1036.5	471.4	2673.1	U88/0044-3

Table 8g Amount of Triterpanes in ng/g (ppb) from m/z 177 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	25nor28ab	25nor30ab	Sample number
3171	3201	cut	shale/claystone	95	90.4	30.4	U88/0036-1
3241.3	3241.3	swc	sandstone/sand	60	1422.8	104.7	U88/0023-2
3231	3261	cut	sandstone/sand	40	3249.1	169.2	U88/0038-3
3261	3291	cut	sandstone/sand	30	2302.7	98.2	U88/0039-3
3291	3321	cut	sandstone/sand	30	1024.9	68.8	U88/0040-3
3379.1	3379.1	swc	sandstone/sand	40	61.8	28.3	U88/0024-2
3351	3381	cut	sandstone/sand	25	127.5	131.9	U88/0042-3
3381	3411	cut	sandstone/sand	20	76.5	99.1	U88/0043-3
3411	3441	cut	sandstone/sand	20	128.2	219.5	U88/0044-3

Triterpane Quant. (ng/g) m/z 177
For peak identification see Experimental section

Table 8h Amount of Steranes in ng/g (ppb) from m/z 218 fragmentograms for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	27bbR (h)	27bbS (i)	28bbR (n)	28bbS (o)	29bbR (r)	29bbS (s)	30bbR (x)	30bbS (y)	Sample number
3171	3201	cut	shale/claystone	95	398.2	214.0	552.6	305.1	621.9	293.9	78.5	100.9	U88/0036-1
3241.3	3241.3	swc	sandstone/sand	60	1095.1	722.8	780.9	684.9	774.7	634.9	169.8	139.9	U88/0023-2
3231	3261	cut	sandstone/sand	40	1665.1	972.8	1330.5	970.2	992.3	719.8	98.3	116.7	U88/0038-3
3261	3291	cut	sandstone/sand	30	982.0	625.5	774.8	571.1	617.8	437.5	65.4	74.6	U88/0039-3
3291	3321	cut	sandstone/sand	30	622.6	382.9	583.8	421.9	451.5	316.8	49.8	62.1	U88/0040-3
3379.1	3379.1	swc	sandstone/sand	40	243.4	142.5	230.9	172.1	177.9	136.0	25.3	27.4	U88/0024-2
3351	3381	cut	sandstone/sand	25	706.5	462.5	907.0	623.1	603.9	565.8	174.7	177.6	U88/0042-3
3381	3411	cut	sandstone/sand	20	559.4	364.6	668.2	507.3	529.8	418.2	66.2	104.2	U88/0043-3
3411	3441	cut	sandstone/sand	20	995.3	659.0	1376.8	1014.6	975.8	730.5	153.7	197.7	U88/0044-3

Table 8i Amount of Standard and EOM weights for Saturated Hydrocarbon GC-MS for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	Standard (peak height)	Amount (µg)	EOM (mg)	Weight	Sample number
3171	3201	cut	shale/claystone	95	2153619.0	2.000	43.4		U88/0036-1
3241.3	3241.3	swc	sandstone/sand	60	368516.0	2.000	118.1		U88/0023-2
3231	3261	cut	sandstone/sand	40	1157321.0	2.000	24.2		U88/0038-3
3261	3291	cut	sandstone/sand	30	1320288.0	2.000	31.3		U88/0039-3
3291	3321	cut	sandstone/sand	30	1157313.0	2.000	67.5		U88/0040-3
3379.1	3379.1	swc	sandstone/sand	40	353593.1	2.000	69.2		U88/0024-2
3351	3381	cut	sandstone/sand	25	1757626.0	2.000	46.0		U88/0042-3
3381	3411	cut	sandstone/sand	20	2246260.0	2.000	46.9		U88/0043-3
3411	3441	cut	sandstone/sand	20	2265006.0	2.000	46.0		U88/0044-3
					standard is D4 cholestane				

Table 8j MRM Triterpane peak heights for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	27Ts (A)	27Tm (B)	28ab (Z)	29ab (C)	30d (X)	29ba (D)	30ab (E)	30ba (F)
3241.3	3241.3	swc	sandstone/sand	60	31768.1	30449.3	34997.8	127049.5	9284.7	38916.8	219183.5	19274.2
3379.1	3379.1	swc	sandstone/sand	40	3916.4	5644.8	18980.4	19476.2	946.1	7371.5	32887.2	4297.7

Table 8j MRM Triterpane peak heights for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	31abS (G)	31abR (H)	31ba (I)	Sample number
3241.3	swc	sandstone/sand	55687.1	55091.8	10195.9	U88/0023-2
3379.1	swc	sandstone/sand	7808.1	9627.2	2717	U88/0024-2

Table 8k MRM Steranes (peak heights) for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	27dbS (a)	27dbR (b)	27daR (c)	27daS (d)	28dbS (e)	28dbR (f)	28daR (g)
3241.3	3241.3	swc	sandstone/sand	60	149118.6	119100.6	26987.5	28113.3	71116.8	52870.3	23969
3379.1	3379.1	swc	sandstone/sand	40	15522.5	19814.3	3517.9	3179.1	11309.5	9059.8	4053.5

Table 8k MRM Steranes (peak heights) for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	27aaS (g')	29dbS (h)	27bbR (h')	28daS (i)	27bbS (i')	27aaR (j)	29dbR (k)	29daR (l)	28aaS (m)
3241.3	swc	sandstone/sand	38595.4	60161.8	23284.6	17102.7	18367.1	96226.4	36785	10860.3	11178.6
3379.1	swc	sandstone/sand	11903.1	7464.9	2444.9	1671.6	3404.7	28395.4	5290	1467.6	1319.9

Table 8k MRM Steranes (peak heights) for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	29daS (n)	28bbR (n')	28bbS (o)	28aaR (p)	29aaS (q)	29bbR (r)	29bbS (s)	29aaR (t)	Sample number
3241.3	swc	sandstone/sand	25684.6	14621.8	13962.3	50124.5	11318.9	23694.7	13540.1	44081.9	U88/0023-2
3379.1	swc	sandstone/sand	5196.8	1811.1	2027.2	9311.5	1077.6	3992	1602.7	7750.4	U88/0024-2

Table 8l MRM Norcholestane peak heights from 358-217 transition for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith	24norαβS	24norαβR	27norαβS	27norαβR	24norααS	24norββR	24norββS	24norααR	21nor
3241.3	3241.3	swc	sandstone/sand	60	4766.5	3892.6	5036.6	3634.4	1044.8	1044.8	1263.4	3056.7	1294
3379.1	3379.1	swc	sandstone/sand	40	441.3	393.2	439.3	328.1	358.3	183.1	216.3	471.4	207.1

Table 8l MRM Norcholestane peak heights from 358-217 transition for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	27norααS	27norββR	27norββS	27norααR	Sample number
3241.3	swc	sandstone/sand	1422.2	922.6	771.6	1789.7	U88/0023-2
3379.1	swc	sandstone/sand	147.2	106.9	88	190.4	U88/0024-2

Table 8m Norcholestane ratios (peak heights) Age-specific biomarkers for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	Ratio D	Ratio N	Ratio A	Sample number
3241.3	3241.3	swc	sandstone/sand	60	0.53	0.62	0.67	U88/0023-2
3379.1	3379.1	swc	sandstone/sand	40	0.61	0.66	0.63	U88/0024-2

Norcholestane age specific biomarker ratios definitions BP
NOCS 6404/11-1 (Havsule)

Ratio D: (24nor dβS + 24nor dβR) /(24nor dβS + 24nor dβR + 27nor dβS + 27nor dβR)

Ratio N: (24 ααS + 24 ββR + 24 ββS + 24 ααR) / (24 ααS + 24 ββR + 24 ββS + 24 ααR + 27 ααS + 27 ββR + 27 ββS + 27 ααR)

Ratio A: (24nor dβS + 24nor dβR + 24 ααS + 24 ββR + 24 ββS + 24 ααR) /
(24nor dβS + 24nor dβR + 24 ααS + 24 ββR + 24 ββS + 24 ααR + 27nor dβS + 27nor dβR + 27 ααS + 27 ββR + 27 ββS + 27 ααR)

Table 9a: C1-C2 naphthalene peak heights from m/z 142/156 of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	2MN	tMN	2EN	1EN	2.6+2.7-DMN	1.3+1.7-DMN
3171	3201	cut	shale/claystone	95	21844.8	26791.3	9205.4	19622.5	66002.1	267094.1
3231	3261	cut	sandstone/sand	40	11691.3	11344.7	1903.2	3071.8	14798.7	59529.6
3261	3291	cut	sandstone/sand	30	19268.3	16496.1	2772.8	4384.2	18662.5	89900.3
3291	3321	cut	sandstone/sand	30	28910.9	72881.5	33697.9	45276.0	122929.3	421645.4
3351	3381	cut	sandstone/sand	25	45454.4	77784.6	45652.8	43883.3	140221.7	376214.5
3381	3411	cut	sandstone/sand	20	30631.4	60067.7	35455.6	35292.4	123279.7	377030.3
3411	3441	cut	sandstone/sand	20	40120.7	78717.8	43022.6	44353.8	156965.9	465657.4

Table 9a: C1-C2 naphthalene peak heights from m/z 142/156 of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Lower depth (m)	Sample type	Description	1.6-DMN	2.3+1.4-DMN	1.5-DMN	1.2-DMN	Sample number
3201	cut	shale/claystone	205530.3	129230.4	129993.7	157050.7	U88/0036-1
3261	cut	sandstone/sand	44084.2	33747.7	24109.3	30713.2	U88/0038-3
3291	cut	sandstone/sand	60833.7	51101.9	38850.9	47186.4	U88/0039-3
3321	cut	sandstone/sand	230418.6	139216.9	101010.6	116136.8	U88/0040-3
3381	cut	sandstone/sand	288623.2	199715.0	102491.7	124288.9	U88/0042-3
3411	cut	sandstone/sand	241972.4	175886.5	86588.4	117707.3	U88/0043-3
3441	cut	sandstone/sand	274546.9	195752.3	97775.7	132413.2	U88/0044-3

Table 9b: C3-naphthalene peak heights from m/z 170 of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	1.3.7-TMN	1.3.6-TMN	1.3.5+ 1.4.6 TMN	2.3.6-TMN	1.6.7+ 1.2.7 DMN	1.2.6-TMN	1.2.4- TMN	1.2.5-TMN	Sample number
3171	3201	cut	shale/claystone	95	171106.5	319634.4	388289.1	196320.5	435741.5	493369.2	158868.6	2716347.0	U88/0036
3231	3261	cut	sandstone/sand	40	156243.9	296918.4	288750.6	147064.3	206331.0	178488.9	69533.2	638396.4	U88/0038
3261	3291	cut	sandstone/sand	30	229749.5	403904.9	346043.4	256540.9	341196.8	268194.6	116295.9	800302.3	U88/0039
3291	3321	cut	sandstone/sand	30	149045.3	262893.9	213874.1	115668.6	168868.4	133167.8	63106.7	464552.0	U88/0040
3351	3381	cut	sandstone/sand	25	125045.8	316976.5	243056.5	144936.6	197146.2	159203.5	64325.7	483298.3	U88/0042
3381	3411	cut	sandstone/sand	20	138893.0	322372.7	229325.7	140020.2	188216.0	134259.6	63502.6	378005.0	U88/0043
3411	3441	cut	sandstone/sand	20	169483.6	378181.7	252325.7	160677.7	209167.3	142261.4	65733.2	317999.2	U88/0044

Table 9c: Phenathrene and methyl phenanthrene peak heights from m/z 178/192 fragmentograms of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	P	3MP	2MP	9MP	1MP	Sample number
3171	3201	cut	shale/claystone	95	2043675.0	388918.4	518141.1	740485.3	792221.1	U88/0036-1
3231	3261	cut	sandstone/sand	40	1736612.0	456396.1	566261.8	537035.2	464561.2	U88/0038-3
3261	3291	cut	sandstone/sand	30	3349261.0	888465.1	1199877.0	1415467.0	1013561.0	U88/0039-3
3291	3321	cut	sandstone/sand	30	1125668.0	237076.1	267585.3	374548.4	273625.6	U88/0040-3
3351	3381	cut	sandstone/sand	25	1569566.0	359541.4	414226.6	584631.6	453234.8	U88/0042-3
3381	3411	cut	sandstone/sand	20	1583365.0	363087.5	404678.0	546942.7	422601.1	U88/0043-3
3411	3441	cut	sandstone/sand	20	1829780.0	395323.8	455104.8	621795.2	455350.0	U88/0044-3

Table 9d: Dibenzothiophene peak heights from m/z 184/198 of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%litho.	DBT	4 MDBT	2+3 MDBT	1 MDBT	Sample number
3171	3201	cut	shale/claystone	95	222942.7	160675.1	60560.7	100766.6	U88/0036-1
3231	3261	cut	sandstone/sand	40	100547.1	77322.6	41348.6	53131.6	U88/0038-3
3261	3291	cut	sandstone/sand	30	324513.3	194991.1	82667.6	103291.4	U88/0039-3
3291	3321	cut	sandstone/sand	30	58731.9	35714.4	19613.3	29122.1	U88/0040-3
3351	3381	cut	sandstone/sand	25	81649.7	47365.7	23490.9	33088.7	U88/0042-3
3381	3411	cut	sandstone/sand	20	62441.2	36081.4	19736.9	28387.4	U88/0043-3
3411	3441	cut	sandstone/sand	20	70088.0	34314.3	22409.0	33041.2	U88/0044-3

Table 9e Triaromatic Sterane peak heights from m/z 231 fragmentograms of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	a1	b1	c1	d1	e1	f1	g1	Sample number
3171	3201	cut	shale/claystone	95	63469.4	51874.0	70669.4	445203.8	101850.5	257603.5	101665.2	U88/0036-1
3231	3261	cut	sandstone/sand	40	11085.5	11000.3	6333.9	19035.8	13388.1	10037.2	12099.8	U88/0038-3
3261	3291	cut	sandstone/sand	30	22085.7	18563.1	11274.9	49353.5	16074.6	26402.1	15764.0	U88/0039-3
3291	3321	cut	sandstone/sand	30	11711.2	9447.2	6867.9	30125.0	8230.6	17211.8	8329.2	U88/0040-3
3351	3381	cut	sandstone/sand	25	17710.5	12866.9	11104.6	50541.4	10992.6	27420.3	12035.8	U88/0042-3
3381	3411	cut	sandstone/sand	20	14803.0	11643.2	7640.6	31486.9	7612.9	18022.7	7340.9	U88/0043-3
3411	3441	cut	sandstone/sand	20	16846.5	13776.8	8530.5	34587.6	8570.7	20183.8	8698.7	U88/0044-3

Table 9f Monoaromatic Sterane peak heights from m/z 253 fragmentograms of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	A1	B1	C1	D1	E1	F1	G1	H1	I1	Sample number
3171	3201	cut	shale/claystone	95	63339.9	29518.1	43326.3	49378.7	283532.1	70451.0	191306.1	127771.1	36592.5	U88/0036-1
3231	3261	cut	sandstone/sand	40	112830.4	60919.7	111097.4	96875.9	371243.0	82672.2	264613.8	146372.8	34486.0	U88/0038-3
3261	3291	cut	sandstone/sand	30	193117.7	100261.2	128744.2	114521.4	606931.4	105759.1	379047.4	199442.0	44901.9	U88/0039-3
3291	3321	cut	sandstone/sand	30	48314.7	25753.3	32301.4	32994.8	185597.4	34960.5	119577.1	61532.9	13252.2	U88/0040-3
3351	3381	cut	sandstone/sand	25	43133.6	22827.9	34721.9	37138.2	255107.9	37543.3	194135.8	124863.1	31672.7	U88/0042-3
3381	3411	cut	sandstone/sand	20	23560.7	12848.5	16051.4	15005.0	102125.7	19999.5	83491.1	42386.3	9664.7	U88/0043-3
3411	3441	cut	sandstone/sand	20	36733.4	21518.4	27676.1	31434.4	213561.3	39050.5	181718.6	103644.0	22431.2	U88/0044-3

Table 9g: Amount of C1-C2-naphthalenes in ng/g from m/z 142/156 of ARO FRACTION for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	2MN	1MN	2EN	1EN	2.6+2.7-DMN	1.3+1.7-DMN	1.6-DMN	2.3+1.4DMN	1.5-DMN	1.2-DMN	Sample number
3171	3201	cut	shale/claystone	95	190.6	233.8	80.3	171.2	567.2	2330.7	1793.5	1127.7	1134.3	1370.4	U88/0036-1
3231	3261	cut	sandstone/sand	40	160.2	155.4	26.1	42.1	202.7	815.6	603.9	462.3	330.3	420.7	U88/0038-3
3261	3291	cut	sandstone/sand	30	145.6	124.6	21.0	33.1	141.0	679.3	459.6	386.1	293.5	356.5	U88/0039-3
3291	3321	cut	sandstone/sand	30	437.3	1102.3	509.7	664.8	1859.2	6377.2	3485.0	2105.5	1527.7	1756.5	U88/0040-3
3351	3381	cut	sandstone/sand	25	749.6	1282.6	752.9	707.2	2312.4	6204.3	4759.8	3293.6	1690.2	2049.7	U88/0042-3
3381	3411	cut	sandstone/sand	20	761.2	1492.6	881.0	877.0	3063.4	9368.9	6012.8	4370.5	2151.6	2924.9	U88/0043-3
3411	3441	cut	sandstone/sand	20	1056.3	2072.5	1132.7	1167.7	4132.6	12257.1	7228.2	5153.7	2574.2	3486.1	U88/0044-3

BP

Table 9h: Amount of C3-naphthalenes in ng/g from m/z 170 of ARO FRACTION for NOCS well 6404/11-1 (Havsule)

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	1.3.7-TMN	1.3.6-TMN	1.3.5+ 1.4.6 TMN	2.3.6-TMN	1.6.7+ 1.2.7 DMN	1.2.6-TMN	1.2.4-TMN	1.2.5-TMN	Sample number
3171	3201	cut	shale/claystone	95	1493.1	3789.1	3388.2	1713.1	3802.3	4305.1	1386.3	23702.9	U88/0036-1
3231	3261	cut	sandstone/sand	40	3140.3	4067.3	3855.4	2014.6	2826.4	2445.0	952.5	8745.1	U88/0038-3
3261	3291	cut	sandstone/sand	30	1735.9	3051.8	2614.6	1938.3	2978.0	2177.6	878.7	6046.8	U88/0039-3
3291	3321	cut	sandstone/sand	30	2254.2	3976.1	3234.7	1749.4	3554.0	3014.1	954.5	7026.1	U88/0040-3
3351	3381	cut	sandstone/sand	25	2072.1	5227.4	4008.3	2390.2	3251.2	2625.5	1060.8	7970.2	U88/0042-3
3381	3411	cut	sandstone/sand	20	3451.4	8010.7	5698.5	3479.4	4577.0	3336.2	1578.0	9393.1	U88/0043-3
3411	3441	cut	sandstone/sand	20	4462.1	9956.7	6643.2	4230.3	5506.9	3745.4	1730.6	8372.2	U88/0044-3

BP

Table 9i: Amount of phenanthrenes in ng/g from m/z 178/192 of ARO FRACTION for NOCS well 6404/11-1 (Havsule)

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	P	3MP	2MP	9MP	1MP	Sample number
3171	3201	cut	shale/claystone	95	17833.2	3393.7	4521.3	6461.5	6912.9	U88/0036-1
3231	3261	cut	sandstone/sand	40	23788.9	6251.9	7756.9	7356.6	6363.8	U88/0038-3
3261	3291	cut	sandstone/sand	30	25306.0	6713.0	9065.9	10694.8	7658.1	U88/0039-3
3291	3321	cut	sandstone/sand	30	17025.1	3585.7	4047.1	5664.8	4138.4	U88/0040-3
3351	3381	cut	sandstone/sand	25	25684.2	5929.3	6831.2	9641.4	7474.4	U88/0042-3
3381	3411	cut	sandstone/sand	20	39345.2	9022.4	10055.9	13591.0	10501.3	U88/0043-3
3411	3441	cut	sandstone/sand	20	48173.5	10408.0	11981.9	16370.5	11988.3	U88/0044-3

Table 9j: Amount of dibenzothiophenes in ng/g from m/z 184/198
of ARO FRACTION for NOCS well 6404/11-1 (Havsule)

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	DBT	4 MDBT	2+3 MDBT	1 MDBT	Sample number
3171	3201	cut	shale/claystone	95	1946.4	1402.1	528.5	879.3	U88/0036-1
3231	3261	cut	sandstone/sand	40	1377.3	1059.2	566.4	727.8	U88/0038-3
3261	3291	cut	sandstone/sand	30	1696.4	1473.3	624.6	780.4	U88/0039-3
3291	3321	cut	sandstone/sand	30	888.3	540.2	296.6	440.5	U88/0040-3
3351	3381	cut	sandstone/sand	25	1346.5	761.1	387.4	560.5	U88/0042-3
3381	3411	cut	sandstone/sand	20	1551.6	896.6	490.4	705.4	U88/0043-3
3411	3441	cut	sandstone/sand	20	1845.3	903.4	590.0	869.9	U88/0044-3

Table 9k: Amount of triaromatic steranes in ng/g from m/z 231
of ARO FRACTION for NOCS well 6404/11-1 (Havsule)

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	a1	b1	c1	d1	e1	f1	g1	Sample number
3171	3201	cut	shale/claystone	95	553.8	452.7	618.4	3884.9	888.8	2247.9	887.1	U88/0036-1
3231	3261	cut	sandstone/sand	40	152.0	150.7	86.8	260.8	183.4	137.5	165.7	U88/0038-3
3261	3291	cut	sandstone/sand	30	166.9	140.3	85.2	372.9	121.5	199.5	119.1	U88/0039-3
3291	3321	cut	sandstone/sand	30	177.1	142.9	103.9	455.6	124.5	260.3	126.0	U88/0040-3
3351	3381	cut	sandstone/sand	25	292.1	212.2	183.1	833.5	181.3	452.2	198.5	U88/0042-3
3381	3411	cut	sandstone/sand	20	367.8	289.3	189.9	782.4	189.2	447.8	182.4	U88/0043-3
3411	3441	cut	sandstone/sand	20	443.5	362.7	224.6	910.6	225.6	531.4	229.0	U88/0044-3

Table 9l: Amount of monoaromatic steranes in ng/g from m/z 253 of ARO FRACTION for NOCS well 6404/11-1 (Havsule)

BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	A1	B1	C1	D1	E1	F1	G1	H1	I1	Sample number
3171	3201	cut	shale/claystone	95	465.4	257.6	378.1	430.9	2474.1	614.8	1669.3	1114.9	319.3	U88/0036-1
3231	3261	cut	sandstone/sand	40	1545.6	834.5	1521.9	1327.1	5085.5	1132.5	3624.8	2005.1	472.1	U88/0038-3
3261	3291	cut	sandstone/sand	30	1459.1	757.5	972.8	865.3	4585.8	799.1	2864.0	1506.9	339.3	U88/0039-3
3291	3321	cut	sandstone/sand	30	730.7	389.5	488.5	499.0	2807.1	528.8	1808.5	930.7	200.4	U88/0040-3
3351	3381	cut	sandstone/sand	25	711.3	376.5	572.6	612.5	4207.1	619.1	3201.6	2059.2	522.3	U88/0042-3
3381	3411	cut	sandstone/sand	20	585.5	319.3	398.9	372.9	2537.7	497.0	2074.7	1053.3	240.2	U88/0043-3
3411	3441	cut	sandstone/sand	20	967.1	566.5	733.9	827.6	5623.1	764.8	4784.2	2728.7	590.6	U88/0044-3

Table 9m. Amount of standard and weight EOM for Well NOCS 6404/11-1 Havsule

BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	Standard (peak height)	Amount (µg)	Weight (mg)	Sample number
3171	3201	cut	shale/claystone	95	6231689.00	2.360	43.4	U88/0036-1
3231	3261	cut	sandstone/sand	40	7119087.00	2.360	24.2	U88/0038-3
3261	3291	cut	sandstone/sand	30	9979158.00	2.360	31.3	U88/0039-3
3291	3321	cut	sandstone/sand	30	2311682.00	2.360	67.5	U88/0040-3
3351	3381	cut	sandstone/sand	25	3110987.00	2.360	46.0	U88/0042-3
3381	3411	cut	sandstone/sand	20	2025016.00	2.360	46.9	U88/0043-3
3411	3441	cut	sandstone/sand	20	1948679.00	2.360	46.0	U88/0044-3
					standard is D12 Chrysene			

Table 10 Carbon Isotope data ($\delta^{13}C$) of C_{15}+ fractions from MPLC for NOCS well 6404/11-1 (Havsule) BP

Upper depth (m)	Lower depth (m)	Sample type	Description	%lith.	Wh. oil	EOM/Top.oil	Sat.	Aro.	NSO	Asph.	Kerogen	CV	Sample number
3171	3201	cut	shale/claystone	95	-	-	-24.22	-27.80	-	-	-	-	U88/0036-1
3241.3	3241.3	swc	sandstone/sand	60	-	-	-26.83	-28.33	-	-	-	-	U88/0023-2
3231	3261	cut	sandstone/sand	40	-	-	-25.13	-27.45	-	-	-	-	U88/0038-3
3379.1	3379.1	swc	sandstone/sand	40	-	-	-25.14	-29.57	-	-	-	-	U88/0024-2
3381	3411	cut	sandstone/sand	20	-	-	-24.11	-28.82	-	-	-	-	U88/0043-3

Table 11a Biomarker ratios used in report for NOCS well 6404/11-1 (Havsule) BP

in Discussion	Triterpanes	Steranes
	27Ts/(27Ts+27Tm)	29ααS/(29ααS+29ααR)
	30d/29βα	(29ββR+29ββS)/(29ααS+29ββR+29ββS+29ααR)
	28αβ/29αβ	
	%32αβS/ (32αβS+32αβR)	
	%33αβS/ (33αβS+33αβR)	

see also experimental section

Table 11b Biomarker ratio data used in report BP

Lower depth (m)	27Ts/ (27Ts+27Tm)	30d/ (30d+29ba)	28ab/ 28ab+29ab)	%32abS/ (32abS+32abR)	%33abS/ (33abS+33abR)	%29aa (S/S+R)	29bb/ (29bb+aa)
3201.0	0.07	0.04	0.04	0.27	0.40	5.23	0.24
3241.3	0.53	0.17	0.19	0.52	0.55	24.12	0.38
3261.0	0.43	0.13	0.21	0.53	0.53	15.44	0.28
3291.0	0.39	0.14	0.22	0.47	0.49	17.95	0.33
3321.0	0.28	0.13	0.43	0.40	0.46	14.38	0.34
3379.1	0.41	0.12	0.45	0.42	0.44	13.12	0.36
3381.0	0.20	0.08	0.11	0.30	0.65	7.47	0.29
3411.0	0.24	0.11	0.29	0.36	0.39	10.81	0.37
3441.0	0.30	0.09	0.32	0.36	0.37	10.32	0.34

Table 11b Biomarker ratio data used in report BP

Lower depth (m)	Sum 27+ hopanes ng/g	Sum 27+ steranes ng/g	C27+sterane/ C27+hopane
3201.0	44007	13791	0.31
3241.3	26252	17204	0.66
3261.0	38922	40080	1.03
3291.0	29012	23371	0.81
3321.0	22014	14479	0.66
3379.1	8182	5537	0.68
3381.0	40942	20762	0.51
3411.0	28011	14018	0.50
3441.0	49427	30564	0.62

Quality Control Sheet: TOC (LECO)

GEOLAB NOR

Control analysis specification			Acceptance criteria and control analysis results		
			TOC (% wt of rock)		
Date	Project(s)	Reference Sample	NIGOGA 4	Geolab Nor Result	Geolab Nor Rating
19-04-2001	62590	SR-1	2.16 - () - 2.64	2.16	ok
20-04-2001	62590	SR-1	2.16 - () - 2.65	2.16	ok

Quality Control Sheet: ROCK-EVAL 6

GEOLAB NOR

Control analysis specification				Acceptance criteria and control analysis results											
				TOC (% wt of rock)			S1 (mg/g rock)			S2 (mg/g rock)			Tmax (°C at 25°C/min.)		
Date	Project(s)	Analysis ID/info	Reference Sample	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating
18-04-2001	62590	12345	SR-1	2.16 - () - 2.64	2.35	ok	0.9 - () - 1.2	0.9	ok	5 - (5.4) - 6.1	5.3999	ok (-)	433 - (435) - 440	440	ok (+)
19-04-2001	62590	12348	SR-1	2.16 - () - 2.64	2.16	ok	0.9 - () - 1.2	1	ok	5 - (5.4) - 6.1	5.6	ok (+)	433 - (435) - 440	439	ok (+)

Quality Control Sheet: SOLVENT EXTRACTION (EOM)

GEOLAB NOR

Control analysis specification				Raw data						Acceptance criteria and control analysis results					
				Weight of rock	Weight of EOM	Weight of EOM to asphaltene precipitation ("ny EOM")	Weight of asphaltenes (ASP)	Weight of maltenes (MLT)	EOM - (ASP + MLT) = un-recovered	EOM / rock (µg/g)			ASP / (OIL or EOM) (% of peak area)		
Date	Project(s)	Analysis ID/info	Reference Sample	g	mg	mg	mg	mg	mg	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	(% of peak area)	Geolab Nor Result	Geolab Nor Rating
14-03-2002	62590	W13, 5-0	SR-1	9.21	44.6	42.1	9.8	32.1	1.2	4300 - (4800) - 5800	4843	ok (+)	6 - (16) - 21	20.9	ok (+)
23-04-2002	62590	W13, 6-0	SR-1	10.12	42	37.7	6.2	31.3	0.2	4300 - (4800) - 5800	4150	low	6 - (16) - 21	16.4	ok (+)

Quality Control Sheet: MPLC

GEOLAB NOR

Control analysis specification				Raw data					Acceptance criteria and control analysis results								
				Weight of Maltenes (MLT) injected	Weight SAT	Weight ARO	Weight POL	Control: Weight of non-eluted material	SAT / (SAT+ARO+POL) (% wt of maltenes)			ARO / (SAT+ARO+POL) (% wt of maltenes)			POL / (SAT+ARO+POL) (% wt of maltenes)		
Date	Project(s)	Analysis ID/info	Reference Sample	mg	mg	mg	mg	mg	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating
14-03-2002	62590	W13,5-0	SR-1	21.4	7.9	3.8	6.9	2.8	40 - (41) - 43	42.5	ok (+)	17 - (20) - 22	20.4	ok (+)	36 - (40) - 42	37.1	ok (-)
23-04-2002	62590	W13,6-0	SR-1	20.9	7.2	3.9	7	2.8	40 - (41) - 43	39.8	low	17 - (20) - 22	21.5	ok (+)	36 - (40) - 42	38.7	ok (-)

Quality Control Sheet: SAT GC-FID

ontrol analysis specification				Raw data					
				n-C15	n-C17	Pristane	n-C20	n-C27	n-C30
Date	Project(s)	Analysis ID/info	Reference Sample	peak area	peak area	peak area	peak area	peak area	peak area
4-03-2002	62590	W13, 5-0	SR-1	1535040	1313749	2562003	1103452	331704	217827
3-04-2002	62590	W13, 6-0	SR-1	1742664	1509179	2924325	1222989	363468	255721

Quality Control Sheet: SAT GC-FID

GEOLAB NOR

cceptance criteria and control analysis results											
Pristane/n-C17 (peak area ratio)			n-C15/n-C20 (peak area ratio)			n-C30/n-C20 (peak area ratio)			n-C17/(n-C17+n-C27) (peak area ratio)		
NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating
2 - (2.15) - 2.3	1.95	low	1.1 - (1.3) - 1.5	1.39	ok (+)	0.1 - (0.18) - 0.2	0.20	ok (+)	0.72 - (0.77) - 0.8	0.80	ok (+)
2 - (2.15) - 2.3	1.94	low	1.1 - (1.3) - 1.5	1.42	ok (+)	0.1 - (0.18) - 0.2	0.21	high	0.72 - (0.77) - 0.8	0.81	high

Quality Control Sheet: SAT GCMS

Control analysis specification				Raw data											
				[23/3] (191)	[27Ts] (191)	[27Tm] (191)	[30ab] (191)	[35abR] (191)	[25nor28ab] (177)	[25nor30ab] (177)	[27dbS] (217)	[29aaR] (217)	[27bbR] (218)	[29bbS] (218)
Date	Project(s)	Analysis ID/info	Reference Sample	peak height			peak height	peak height	peak height	peak height	peak height	peak height	peak height	peak height
20-03-2002	62590	w13-1-0	SR-1	63.25	35.99	16.64	242.14	20.3	0	0	50.29	14.05	38.71	38.45
23-05-2002	62590	w13-6-0-4.kjøring	SR-1	358.39	143.89	80.31	826.27	34.03	0	0	205.69	40.53	136.93	103.69

Quality Control Sheet: SAT GCMS

Acceptance criteria and control analysis results								
[23/3]/[30ab] in m/z 191 (peak height ratio)			[27Ts]/[27Tm] in m/z 191 (peak height ratio)			[35abR]/[30ab] in m/z 191 (peak height ratio)		
NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	Geolab Nor Limits	27Ts / 27Tm	Geolab Nor	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating
0.1 - (0.28) - 0.4	0.26	ok (-)			.	0.02 - (0.04) - 0.08	0.08	low
0.1 - (0.28) - 0.4	0.43	high				0.02 - (0.04) - 0.08	0.04	ok (+)

Quality Control Sheet: SAT GCMS

GEOLAB NOR

[25nor30ab]/[25nor28ab] in m/z 177 (peak height ratio)			[29aaR]/[27dbS] in m/z 217 (peak height ratio)			[29bbS]/[27bbR] in m/z 218 (peak height ratio)		
NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating
		.	0.21 - (0.26) - 0.39	0.28	ok (+)	0.6 - (0.8) - 1.3	0.99	ok (+)
- () -	- () -	.	0.21 - (0.26) - 0.39	0.20	low	0.6 - (0.8) - 1.3	0.76	ok (-)

Quality Control Sheet: ARO GCMS

Control analysis specification				Raw data					
				P (178)	1-MP (192)	a1 (231)	d1 (231)	A1 (253)	E1 (253)
Date	Project(s)	Analysis ID/info	Reference Sample	peak height	peak height	peak height	peak height	peak height	peak height
18-03-2002	62594	w13-1-0	SR-1	190.820	130.000	2.100	1.440	0.280	0.260
24-05-2002	62590	W13-6-0	SR-1	9555400	7861704	150825	119607	20590	26205

Quality Control Sheet: ARO GCMS

GEOLAB NOR

Acceptance criteria and control analysis results								
1-MP (192)/P(178) (peak height ratio)			A1/E1 in m/z 253 (peak height ratio)			a1/d1 in m/z 231 (peak height ratio)		
NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating
0.6 - (0.7) - 0.9	0.68	ok (-)	0.2 - (1) - 1.3	1.08	ok (+)	0.3 - (0.8) - 1.3	1.46	high
0.6 - (0.7) - 0.9	0.82	ok (+)	0.2 - (1) - 1.3	0.79	ok (-)	0.3 - (0.8) - 1.3	1.26	ok (+)

Quality Control Sheet: OIL/EOM FRACTION ISOTOPES

Control analysis specification				Acceptance criteria and control analysis results								
				d13C SAT (‰ PDB)			d13C ARO (‰ PDB)			d13C NSO (‰ PDB)		
Date	Project(s)	Analysis ID/info	Reference Sample	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating
15-05-2002	62590	12348	SR-1	-33.5 (-33.3) -32.8	-33.5	ok (-)	-32.5 (-32.1) -31.9	-32	ok (+)	-32.5 (-32.3) -32.2	no data	.
03-06-2002	62590	w13, 5-0	SR-1	-33.5 (-33.3) -32.8	-33.0	ok (+)	-32.5 (-32.1) -31.9	-32.0	ok (+)			

Quality Control Sheet: OIL/EOM FRACTION ISOTOPES

GEOLAB NOR

d13C ASP (‰ PDB)			d13C TOPPED OIL OR EOM (‰ PDB)			d13C WHOLE OIL (‰ PDB)			Comments
NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4 Limits	Geolab Nor Result	Geolab Nor Rating	NIGOGA 4	Geolab Nor Result	Geolab Nor Rating	
-32.3 (-32) -31.9	no data	.	-32.7 (-32.6) -32.3	no data	.	#REF!	no data	.	