

U-649

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GEOCHEMICAL SCREENING
ANALYSES

Well NOCS 6306/10-1

BA91-133-1

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REGISTRERT
OLJEDIREKTORATET

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INTRODUCTION

One hundred and three cuttings samples (together with 11 core-chip and 14 sidewall core samples) covering the interval 2649 - 2992 m of well NOCS 6306/10-1 were received for screening analysis. At the request of the client, these were first analysed for TOC on a Leco instrument. For each cuttings sample, the interpreted in-situ lithology for analysis was picked with the aid of the cuttings log provided. Due to lack of material and/or the presence of contaminants one composite analysis using the samples from two depths had to be performed. No analyses were performed on samples which either obviously contained only caved components, or those where contamination was extreme. A total of 120 samples was analysed for TOC. In general the finer fractions of most of the samples provided were heavily contaminated by rust, metal shavings and fine fibres. Particularly regarding the loose sand/sandstone samples, these were difficult to remove entirely. The TOC results were used by the client to choose a total of 77 samples for Rock-Eval analysis.

No formation tops were supplied by the client, so the well is divided into five zones based on lithology, geochemistry and background knowledge of Mid-Norway geology:

Zone I	:	Samples 2649 - 2697 m
Zone II	:	Samples 2700 - 2751 m
Zone III	:	Samples 2754 - 2793 m
Zone IV	:	Samples 2796 - 2988.5 m
Zone V	:	Samples 2989 - 2992 m

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	% Lithology description		
2649.00				0002
		80 Other : m gy to drk gy, trbofgs		0002-1L
		20 Sh/Clst: lt gy to drk gy, slt		0002-2L
		tr Cont : prp, fib		0002-3L
2652.00				0001
		60 Other : m gy to drk gy, trbofgs		0001-1L
		40 Sh/Clst: lt gy to drk gy, slt		0001-2L
		tr Cont : prp, fib		0001-3L
2658.00				0003
		85 Sh/Clst: lt gy to drk gy, calc, slt, glauc		0003-2L
		10 Cont : cem, prp, fib		0003-3L
		5 Other : m gy to drk gy, trbofgs		0003-1L
		tr Ca : gy brn		0003-4L
2660.50 swc				0104
		100 Sltst : m gy to drk gy, mic		0104-1L
2661.00				0004
		80 Cont : prp, fib		0004-2L
		20 Sltst : lt gy to drk gy, calc, mic, glauc		0004-1L
		tr Ca : gy brn		0004-3L
2664.00				0005
		90 Cont : prp, fib		0005-2L
		10 Sltst : lt gy to drk gy, calc, mic, glauc		0005-1L
		tr Ca : gy brn		0005-3L

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Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	% Lithology description		
2668.50	swc			0105
		100 Sltst : drk gy, mic		0105-1L
2678.00	swc			0106
		100 Sltst : m gy to drk gy, mic		0106-1L
2679.00				0006
		80 Cont : prp, fib		0006-2L
		20 Sltst : m gy to drk gy, calc, mic, glauc		0006-1L
		tr Ca : gy brn		0006-3L
2682.00				0007
		95 Cont : prp, fib		0007-2L
		5 Sltst : m gy to drk gy, calc, mic, glauc		0007-1L
		tr Ca : gy brn		0007-3L
2685.00				0008
		90 Cont : cem, prp, fib		0008-2L
		10 Sltst : m gy to drk gy, calc, mic, glauc		0008-1L
		tr Ca : gy brn		0008-3L
2688.00				0009
		95 Cont : cem, prp, fib		0009-2L
		5 Sltst : m gy to drk gy, calc, mic, glauc		0009-1L
		tr Ca : gy brn		0009-3L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%		

	%	Lithology description	

2689.50	swc		0107
	100	Sltst : m gy to drk gy, mic	0107-1L
2691.00			0010
	90	Cont : cem, prp, fib	0010-2L
	10	Sltst : m gy to drk gy, calc, mic, glauc	0010-1L
	tr	Ca : gy brn	0010-3L
2694.00			0011
	90	Cont : cem, prp, fib	0011-2L
	10	Sltst : m gy to drk gy, calc, mic, glauc	0011-1L
	tr	Ca : gy brn	0011-3L
2695.70	swc		0108
	100	Sltst : m gy to drk gy to drk y brn, mic	0108-1L
2697.00			0012
	80	Cont : cem, prp, fib	0012-2L
	20	Sltst : m gy to drk gy, calc, mic, glauc	0012-1L
	tr	Ca : gy brn	0012-3L
2700.00			0013
	60	Cont : cem, prp, fib	0013-2L
	40	Sh/Clst: m gy to drk gy, dsk y brn to brn blk, carb, slt	0013-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%		

	%	Lithology description	

2703.00			0014
	70 Cont	: cem, prp, fib	0014-2L
	30 Sh/Clst:	m gy to drk gy, dsk y brn to brn blk, carb, slt	0014-1L
2709.00			0015
	80 Sh/Clst:	m gy to drk gy, dsk y brn to brn blk, carb, slt	0015-1L
	20 Cont	: prp, fib	0015-2L
	tr Coal	: blk	0015-3L
2710.50 swc			0109
	100 Sltst	: drk gy to drk y brn, mic	0109-1L
2712.00			0016
	90 Sltst	: gy brn to dsk y brn to brn blk, drk gy, s	0016-1L
	10 Cont	: prp, fib	0016-2L
	tr Coal	: blk	0016-3L
2715.00			0017
	100 Sltst	: gy brn to dsk y brn to brn blk, drk gy, s	0017-1L
	tr Cont	: prp, fib	0017-2L
	tr Coal	: blk	0017-3L
2715.50 swc			0110
	100 Sltst	: drk gy to drk y brn, mic	0110-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample	
Int Cvd	TOC%	%	Lithology description	
2720.00			0018	
	95 Sltst	:	gy brn to dsk y brn to brn blk, drk gy, s	0018-1L
	5 Cont	:	prp, fib	0018-2L
	tr S/Sst	:	w	0018-3L
2725.00			0019	
	80 S/Sst	:	w to brn gy, l	0019-3L
	15 Sltst	:	gy brn to dsk y brn to brn blk, drk gy, s	0019-1L
	5 Cont	:	prp, fib	0019-2L
2730.00			0020	
	100 Sltst	:	gy brn to dsk brn, s	0020-1L
	tr Cont	:	prp, fib	0020-2L
	tr S/Sst	:	w to brn gy, l	0020-3L
2735.00			0021	
	100 Sltst	:	gy brn to dsk brn, s	0021-1L
	tr Cont	:	prp, fib	0021-2L
	tr S/Sst	:	w to brn gy, l	0021-3L
2738.00			0022	
	85 Sltst	:	gy brn to dsk brn, s	0022-1L
	10 S/Sst	:	w to brn gy, l	0022-3L
	5 Cont	:	prp, fib	0022-2L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type		Trb	Sample	
Int	Cvd	TOC%	%	Lithology description	
2741.00				0023	
			95 Sltst	: gy brn to dsk brn, s	0023-1L
			5 Cont	: prp, fib	0023-2L
			tr S/Sst	: w to brn gy, l	0023-3L
2744.00				0024	
			100 Sltst	: gy brn to dsk brn, s	0024-1L
			tr Cont	: prp, fib	0024-2L
			tr S/Sst	: w to brn gy, l	0024-3L
2747.00				0025	
			100 Sltst	: gy brn to dsk brn to dsk y brn to brn blk, carb, s	0025-1L
			tr Cont	: prp, fib	0025-2L
			tr S/Sst	: w to brn gy, l	0025-3L
			tr Coal	: blk	0025-4L
2747.30	ccp			0118	
			100 S/Sst	: brn gy to dsk brn, slt, mic	0118-1L
2750.00				0026	
			100 Sltst	: gy brn to dsk brn to dsk y brn to brn blk, carb, s	0026-1L
			tr Cont	: prp, fib	0026-2L
			tr S/Sst	: w to brn gy, l	0026-3L
			tr Coal	: blk	0026-4L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2751.00			0027
	70	Sltst	: m gy to drk gy 0027-4L
	20	Cont	: prp, fib 0027-2L
	10	Sltst	: gy brn to dsk brn to dsk y brn to 0027-1L
			brn blk, carb, s
	tr	S/Sst	: w to brn gy, l 0027-3L
2752.50	ccp		0119
	100	S/Sst	: brn gy to dsk brn, slt, mic, f 0119-1L
2753.00	ccp		0120
	100	Coal	: dsk y brn to brn blk, cly 0120-1L
2754.00			0028
	55	S/Sst	: w to brn gy, l 0028-3L
	25	Cont	: prp, fib 0028-2L
	15	Sltst	: m gy to drk gy 0028-4L
	5	Sltst	: gy brn to dsk brn to dsk y brn to 0028-1L
			brn blk, carb, s
	tr	Other	: trbofgs 0028-5L
2757.00			0029
	55	S/Sst	: w to brn gy, l 0029-3L
	20	Other	: trbofgs 0029-5L
	10	Sltst	: gy brn to dsk brn to dsk y brn to 0029-1L
			brn blk, carb, s
	10	Cont	: prp, fib 0029-2L
	5	Sltst	: m gy to drk gy 0029-4L

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Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	% Lithology description		
2757.30	ccp			0122
		100 Sltst : dsk brn to dsk y brn, s, mic		0122-1L
2758.10	ccp			0121
		100 S/Sst : brn gy, calc, mic, f		0121-1L
2763.00				0030
		75 S/Sst : w to brn gy, slt, cem, l		0030-3L
		15 Cont : prp, fib		0030-2L
		10 Sh/Clst: dsk y brn to brn blk, carb, wx		0030-1L
		tr Sltst : m gy to drk gy		0030-4L
2763.30	swc			0111
		100 Sltst : drk gy to drk y brn, s, mic		0111-1L
2766.00				0031
		90 S/Sst : w to brn gy, slt, cem, l		0031-3L
		5 Sh/Clst: dsk y brn to brn blk, carb, wx		0031-1L
		5 Cont : prp, fib		0031-2L
		tr Sltst : m gy to drk gy		0031-4L
2769.00				0032
		45 S/Sst : w to brn gy, slt, cem, l		0032-3L
		40 Cont : prp, fib		0032-2L
		10 Sh/Clst: dsk y brn to brn blk, carb, wx		0032-1L
		5 Sltst : m gy to drk gy		0032-4L

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Depth unit of measure: m

Depth	Type		Trb	Sample	
Int	Cvd	TOC%	%	Lithology description	
2772.00				0033	
			45	Sltst : gy brn to dsk y brn, carb	0033-1L
			20	Cont : prp, fib	0033-2L
			20	S/Sst : w to brn gy, slt, cem, l	0033-3L
			15	Sltst : m gy to drk gy	0033-4L
2775.00				0034	
			75	Sltst : brn gy to gy brn to dsk y brn, carb, s	0034-1L
			15	Cont : prp, fib	0034-2L
			10	S/Sst : w to brn gy, slt, cem, l	0034-3L
			tr	Sltst : m gy to drk gy	0034-4L
2778.00				0035	
			80	S/Sst : w to brn gy, l	0035-3L
			15	Sltst : brn gy to gy brn to dsk y brn, s	0035-1L
			5	Cont : prp, fib	0035-2L
			tr	Sltst : m gy to drk gy	0035-4L
2780.00	swc			0112	
			100	Sh/Clst: dsk brn to dsk y brn	0112-1L
2781.00				0036	
			80	S/Sst : w to brn gy, l	0036-3L
			20	Sltst : brn gy to gy brn to dsk y brn, s	0036-1L
			tr	Cont : prp, fib	0036-2L
			tr	Sltst : m gy to drk gy	0036-4L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	% Lithology description		
2784.00				0037
		85 Sltst : brn gy to gy brn to dsk y brn, s		0037-1L
		15 S/Sst : w to brn gy, l		0037-3L
		tr Cont : prp, fib		0037-2L
		tr Sltst : m gy to drk gy		0037-4L
2787.00				0038
		65 Sltst : brn gy to gy brn to dsk y brn, s		0038-1L
		35 S/Sst : w to brn gy, slt, cem, l		0038-3L
		tr Cont : prp, fib		0038-2L
		tr Coal : blk		0038-4L
2789.50 swc				0113
		100 Sltst : drk gy to dsk brn, mic		0113-1L
2790.00				0039
		75 S/Sst : w to brn gy, l		0039-3L
		15 Cont : prp, fib		0039-2L
		5 Sltst : brn gy to gy brn to dsk y brn, s		0039-1L
		5 Sltst : drk gy		0039-5L
		tr Coal : blk		0039-4L
2793.00				0040
		55 S/Sst : w to brn gy, l		0040-3L
		30 Sltst : brn gy to gy brn to dsk y brn, drk gy		0040-1L
		15 Cont : prp, fib		0040-2L
		tr Coal : blk		0040-4L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	%		
Lithology description				
2796.00				0041
		50 Sltst	: brn gy to gy brn to dsk y brn, drk gy	0041-1L
		25 S/Sst	: w to brn gy, l	0041-3L
		15 Cont	: prp, fib	0041-2L
		10 Coal	: blk	0041-4L
2799.00				0042
		85 Sh/Clst	: brn blk, carb	0042-5L
		15 Cont	: prp, fib	0042-2L
		tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0042-1L
		tr S/Sst	: w to brn gy, l	0042-3L
		tr Coal	: blk	0042-4L
2802.00				0043
		40 Sh/Clst	: brn blk, carb	0043-5L
		35 Sltst	: brn gy to gy brn to dsk y brn	0043-1L
		10 S/Sst	: w to brn gy, l	0043-3L
		10 Coal	: blk	0043-4L
		5 Cont	: prp, fib	0043-2L
2805.00				0044
		65 Sh/Clst	: dsk y brn to brn blk, carb	0044-5L
		20 Coal	: blk	0044-4L
		15 Sltst	: brn gy to gy brn to dsk y brn	0044-1L
		tr Cont	: prp, fib	0044-2L
		tr S/Sst	: w to brn gy, l	0044-3L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2805.50	swc		0114
		100	sltst : dsk brn to dsk y brn, carb 0114-1L
2808.00			0045
		60	Sh/Clst: dsk y brn to brn blk, carb 0045-5L
		15	Slstst : brn gy to gy brn to dsk y brn 0045-1L
		15	Coal : blk 0045-4L
		10	S/Sst : w to brn gy, l 0045-3L
		tr	Cont : prp, fib 0045-2L
2811.00			0046
		70	Sh/Clst: dsk y brn to brn blk, carb 0046-5L
		15	Slstst : brn gy to gy brn to dsk y brn 0046-1L
		10	Coal : blk 0046-4L
		5	S/Sst : w to brn gy, l 0046-3L
		tr	Cont : prp, fib 0046-2L
2814.00			0047
		90	S/Sst : w to brn gy, slt, cem, l 0047-3L
		10	Slstst : brn gy to gy brn to dsk y brn 0047-1L
		tr	Cont : prp, fib 0047-2L
		tr	Coal : blk 0047-4L
		tr	Sh/Clst: dsk y brn to brn blk, carb 0047-5L
		tr	Other : trbofgs 0047-6L
2817.00			0048
		95	S/Sst : w to brn gy, slt, cem, l 0048-3L
		5	Other : trbofgs 0048-6L
		tr	Slstst : brn gy to gy brn to dsk y brn 0048-1L
		tr	Cont : prp, fib 0048-2L
		tr	Coal : blk 0048-4L
		tr	Sh/Clst: dsk y brn to brn blk, carb 0048-5L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample	
Int Cvd	TOC%	%	Lithology description	
2820.00			0049	
	60	S/Sst	: w to brn gy, slt, cem, l	0049-3L
	20	Cont	: prp, fib	0049-2L
	15	Sh/Clst	: dsk y brn to brn blk, carb	0049-5L
	5	Coal	: blk	0049-4L
	tr	Sltst	: brn gy to gy brn to dsk y brn	0049-1L
	tr	Other	: trbofgs	0049-6L
2823.00			0050	
	55	S/Sst	: w to brn gy, slt, cem, l	0050-3L
	25	Coal	: blk	0050-4L
	10	Cont	: prp, fib	0050-2L
	10	Sh/Clst	: dsk y brn to brn blk, carb	0050-5L
	tr	Sltst	: brn gy to gy brn to dsk y brn	0050-1L
	tr	Other	: trbofgs	0050-6L
2826.00			0051	
	55	Sh/Clst	: dsk y brn to brn blk, carb	0051-5L
	35	Coal	: blk, cly	0051-4L
	5	Cont	: prp, fib	0051-2L
	5	S/Sst	: w to brn gy, slt, cem, l	0051-3L
	tr	Sltst	: brn gy to gy brn to dsk y brn	0051-1L
	tr	Other	: trbofgs	0051-6L
2829.00			0052	
	55	Sh/Clst	: dsk y brn to brn blk, carb	0052-5L
	30	Coal	: blk, cly	0052-4L
	10	S/Sst	: w to brn gy, slt, cem, l	0052-3L
	5	Cont	: prp, fib	0052-2L
	tr	Sltst	: brn gy to gy brn to dsk y brn	0052-1L
	tr	Other	: trbofgs	0052-6L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2847.00			0057
		70 Coal	: blk, cly 0057-4L
		30 Sh/Clst:	dsk y brn to brn blk, carb 0057-5L
		tr Sltst	: brn gy to gy brn to dsk y brn 0057-1L
		tr Cont	: prp, fib 0057-2L
		tr S/Sst	: w to brn gy, slt, cem, l 0057-3L
2849.00			0058
		55 Coal	: blk, cly 0058-4L
		45 Sh/Clst:	dsk y brn to brn blk, carb 0058-5L
		tr Sltst	: brn gy to gy brn to dsk y brn 0058-1L
		tr Cont	: prp, fib 0058-2L
		tr S/Sst	: w to brn gy, slt, cem, l 0058-3L
2850.00			0059
		75 Coal	: blk, cly 0059-4L
		25 Sh/Clst:	dsk y brn to brn blk, carb 0059-5L
		tr Sltst	: brn gy to gy brn to dsk y brn 0059-1L
		tr Cont	: prp, fib 0059-2L
		tr S/Sst	: w to brn gy, slt, cem, l 0059-3L
2852.50 swc			0115
		100 Coal	: dsk y brn to brn blk, cly 0115-1L
2853.00			0060
		55 Sh/Clst:	dsk y brn to brn blk, carb 0060-5L
		45 Coal	: blk, cly 0060-4L
		tr Sltst	: brn gy to gy brn to dsk y brn 0060-1L
		tr Cont	: prp, fib 0060-2L
		tr S/Sst	: w to brn gy, slt, cem, l 0060-3L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2856.00			0061
	65	Sh/Clst:	dsk y brn to brn blk, carb 0061-5L
	35	Coal	: blk, cly 0061-4L
	tr	Sltst	: brn gy to gy brn to dsk y brn 0061-1L
	tr	Cont	: prp, fib 0061-2L
	tr	S/Sst	: w to brn gy, slt, cem, l 0061-3L
2862.00			0062
	80	Coal	: blk, cly 0062-4L
	20	Sh/Clst:	dsk y brn to brn blk, carb 0062-5L
	tr	Sltst	: brn gy to gy brn to dsk y brn 0062-1L
	tr	Cont	: prp, fib 0062-2L
	tr	S/Sst	: w to brn gy, slt, cem, l 0062-3L
2865.00			0063
	50	Coal	: blk, cly 0063-4L
	45	Sh/Clst:	dsk y brn to brn blk, carb 0063-5L
	5	S/Sst	: w to brn gy, cem, l 0063-3L
	tr	Sltst	: brn gy to gy brn to dsk y brn 0063-1L
	tr	Cont	: prp, fib 0063-2L
2868.00			0064
	50	S/Sst	: w to brn gy, cem, l 0064-3L
	20	Coal	: blk, cly 0064-4L
	20	Sh/Clst:	dsk y brn to brn blk, carb 0064-5L
	10	Cont	: prp, fib 0064-2L
	tr	Sltst	: brn gy to gy brn to dsk y brn 0064-1L
2871.00			0065
	50	S/Sst	: w to brn gy, cem, l 0065-3L
	20	Coal	: blk, cly 0065-4L
	20	Sh/Clst:	dsk y brn to brn blk, carb 0065-5L
	10	Cont	: prp, fib 0065-2L
	tr	Sltst	: brn gy to gy brn to dsk y brn 0065-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	% Lithology description		
2874.00				0066
		60 S/Sst : w to brn gy, cem, l		0066-3L
		15 Cont : prp, fib		0066-2L
		10 Sltst : brn gy to gy brn to dsk y brn, drk gy		0066-1L
		10 Sh/Clst: dsk y brn to brn blk, carb		0066-5L
		5 Coal : blk, cly		0066-4L
2877.00				0067
		70 Sh/Clst: dsk y brn to brn blk, carb		0067-5L
		15 Coal : blk, cly		0067-4L
		10 S/Sst : w to brn gy, cem, l		0067-3L
		5 Cont : prp, fib		0067-2L
		tr Sltst : brn gy to gy brn to dsk y brn, drk gy		0067-1L
2882.75 ccp				0123
		50 S/Sst : brn gy		0123-1L
		50 Coal : brn blk, cly		0123-2L
2883.60 ccp				0124
		100 Coal : brn blk		0124-1L
2884.00				0068
		40 Coal : blk, cly		0068-4L
		40 Sh/Clst: dsk y brn to brn blk, carb		0068-5L
		20 Cont : prp, fib		0068-2L
		tr Sltst : brn gy to gy brn to dsk y brn, drk gy		0068-1L
		tr S/Sst : w to brn gy, cem, l		0068-3L
		tr Other : trbofsgs		0068-6L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2884.60	ccp		0125
		100	Sltst : dsk brn to dsk y brn to brn blk, carb 0125-1L
2885.00	ccp		0126
		100	Sh/Clst: dsk y brn to brn blk, carb, slt 0126-1L
2886.00			0069
		45	Coal : blk, cly 0069-4L
		40	Sh/Clst: dsk y brn to brn blk, carb 0069-5L
		15	Cont : prp, fib 0069-2L
		tr	Sltst : brn gy to gy brn to dsk y brn, drk gy 0069-1L
		tr	S/Sst : w to brn gy, cem, l 0069-3L
		tr	Other : trbofgs 0069-6L
2886.90	ccp		0127
		100	Sltst : brn gy 0127-1L
2888.00	ccp		0128
		100	Sltst : brn gy to dsk brn 0128-1L
2890.00			0070
		80	Coal : blk, cly 0070-4L
		20	Sh/Clst: dsk y brn to brn blk, carb 0070-5L
		tr	Sltst : brn gy to gy brn to dsk y brn, drk gy 0070-1L
		tr	Cont : prp, fib 0070-2L
		tr	S/Sst : w to brn gy, cem, l 0070-3L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%		

	%	Lithology description	

2896.00			0071
	75	Coal : blk, cly	0071-4L
	20	Sh/Clst: dsk y brn to brn blk, carb	0071-5L
	5	Cont : prp, fib	0071-2L
	tr	Sltst : brn gy to gy brn to dsk y brn, drk gy	0071-1L
	tr	S/Sst : w to brn gy, cem, 1	0071-3L
2899.00			0072
	80	Coal : blk, cly	0072-4L
	20	Sh/Clst: dsk y brn to brn blk, carb	0072-5L
	tr	Sltst : brn gy to gy brn to dsk y brn, drk gy	0072-1L
	tr	Cont : prp, fib	0072-2L
	tr	S/Sst : w to brn gy, cem, 1	0072-3L
2902.00			0073
	70	Sh/Clst: dsk y brn to brn blk, carb	0073-5L
	30	Coal : blk, cly	0073-4L
	tr	Sltst : brn gy to gy brn to dsk y brn, drk gy	0073-1L
	tr	Cont : prp, fib	0073-2L
	tr	S/Sst : w to brn gy, cem, 1	0073-3L
2905.00			0074
	35	Coal : blk, cly	0074-4L
	35	Sh/Clst: dsk y brn to brn blk, carb	0074-5L
	20	Cont : prp, fib	0074-2L
	10	S/Sst : w to brn gy, cem, 1	0074-3L
	tr	Sltst : brn gy to gy brn to dsk y brn, drk gy	0074-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2908.00			0075
	35	Coal	: blk, cly 0075-4L
	30	Sh/Clst	: dsk y brn to brn blk, carb 0075-5L
	25	Cont	: prp, fib 0075-2L
	10	S/Sst	: w to brn gy, cem, l 0075-3L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0075-1L
2911.00			0076
	40	Cont	: prp, dd, fib 0076-2L
	40	S/Sst	: w to brn gy, cem, l 0076-3L
	10	Coal	: blk, cly 0076-4L
	10	Sh/Clst	: dsk y brn to brn blk, carb 0076-5L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0076-1L
2914.00			0077
	40	Cont	: prp, dd, fib 0077-2L
	40	S/Sst	: w to brn gy, cem, l 0077-3L
	15	Sh/Clst	: dsk y brn to brn blk, carb 0077-5L
	5	Coal	: blk, cly 0077-4L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0077-1L
2917.00			0078
	45	Coal	: blk, cly 0078-4L
	30	S/Sst	: w to brn gy, cem, l 0078-3L
	20	Sh/Clst	: dsk y brn to brn blk, carb 0078-5L
	5	Cont	: prp, dd, fib 0078-2L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0078-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type		Trb	Sample
Int Cvd	TOC%	%		
Lithology description				
2920.00				0079
		75 S/Sst	: w to brn gy, l	0079-3L
		15 Cont	: prp, dd, fib	0079-2L
		5 Coal	: blk, cly	0079-4L
		5 Sh/Clst	: dsk y brn to brn blk, carb	0079-5L
		tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0079-1L
2923.00				0080
		80 Sh/Clst	: dsk y brn to brn blk, carb	0080-5L
		10 S/Sst	: w to brn gy, l	0080-3L
		10 Coal	: blk, cly	0080-4L
		tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0080-1L
		tr Cont	: prp, dd, fib	0080-2L
2926.00				0081
		75 Coal	: blk, cly	0081-4L
		25 Sh/Clst	: dsk y brn to brn blk, carb	0081-5L
		tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0081-1L
		tr Cont	: prp, dd, fib	0081-2L
		tr S/Sst	: w to brn gy, l	0081-3L
2929.00				0082
		70 Sh/Clst	: dsk y brn to brn blk, carb	0082-5L
		25 Coal	: blk, cly	0082-4L
		5 S/Sst	: w to brn gy, l	0082-3L
		tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0082-1L
		tr Cont	: prp, dd, fib	0082-2L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2931.00	swc		0116
	100	Coal	: dsk y brn to brn blk, pyr, cly 0116-1L
2932.00			0083
	90	Sh/Clst:	dsk y brn to brn blk, carb 0083-5L
	10	Coal	: blk, cly 0083-4L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0083-1L
	tr	Cont	: prp, dd, fib 0083-2L
	tr	S/Sst	: w to brn gy, l 0083-3L
2935.00			0084
	50	Coal	: blk, cly 0084-4L
	30	S/Sst	: w to brn gy, l 0084-3L
	10	Cont	: prp, dd, fib 0084-2L
	10	Sh/Clst:	dsk y brn to brn blk, carb 0084-5L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0084-1L
2938.00			0085
	55	S/Sst	: w to brn gy, l 0085-3L
	25	Coal	: blk, cly 0085-4L
	15	Cont	: prp, dd, fib 0085-2L
	5	Sh/Clst:	dsk y brn to brn blk, carb 0085-5L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0085-1L
2941.00			0086
	70	S/Sst	: w to brn gy, l 0086-3L
	20	Cont	: prp, dd, fib 0086-2L
	5	Coal	: blk, cly 0086-4L
	5	Sh/Clst:	dsk y brn to brn blk, carb 0086-5L
	tr	Sltst	: brn gy to gy brn to dsk y brn, drk gy 0086-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type		Trb	Sample
Int	Cvd	TOC%	%	Lithology description
2944.00				0087
			45	Coal : blk, cly 0087-4L
			40	Sh/Clst: dsk y brn to brn blk, carb 0087-5L
			10	S/Sst : w to brn gy, l 0087-3L
			5	Cont : prp, dd, fib 0087-2L
			tr	Sltst : brn gy to gy brn to dsk y brn, drk gy 0087-1L
2947.00				0088
			75	Coal : blk, cly 0088-4L
			25	Sh/Clst: dsk y brn to brn blk, carb 0088-5L
			tr	Sltst : brn gy to gy brn to dsk y brn, drk gy 0088-1L
			tr	Cont : prp, dd, fib 0088-2L
			tr	S/Sst : w to brn gy, l 0088-3L
2950.00				0089
			40	S/Sst : w to brn gy, l 0089-3L
			40	Sh/Clst: dsk y brn to brn blk, carb 0089-5L
			15	Cont : prp, dd, fib 0089-2L
			5	Coal : blk, cly 0089-4L
			tr	Sltst : brn gy to gy brn to dsk y brn, drk gy 0089-1L
2953.00				0090
			40	Cont : prp, dd, fib 0090-2L
			40	S/Sst : w to brn gy, l 0090-3L
			15	Sh/Clst: dsk y brn to brn blk, carb, slt 0090-5L
			5	Coal : blk, cly 0090-4L
			tr	Sltst : brn gy to gy brn to dsk y brn, drk gy 0090-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%		
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-----	-----	-----	-----
2956.00			0091
	45 S/Sst	: w to brn gy, l	0091-3L
	35 Cont	: prp, dd, fib	0091-2L
	10 Coal	: blk, cly	0091-4L
	10 Sh/Clst	: dsk y brn to brn blk, carb, slt	0091-5L
	tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0091-1L
2959.00			0092
	45 Cont	: prp, dd, fib	0092-2L
	40 S/Sst	: w to brn gy, l	0092-3L
	10 Coal	: blk, cly	0092-4L
	5 Sh/Clst	: dsk y brn to brn blk, carb, slt	0092-5L
	tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0092-1L
2962.00			0093
	45 S/Sst	: w to brn gy, l	0093-3L
	35 Cont	: prp, dd, fib	0093-2L
	10 Coal	: blk, cly	0093-4L
	10 Sh/Clst	: dsk y brn to brn blk, carb, slt	0093-5L
	tr Sltst	: brn gy to gy brn to dsk y brn, drk gy	0093-1L
2964.00			0094
	70 S/Sst	: w to brn gy, l	0094-2L
	20 Sh/Clst	: dsk y brn to brn blk, carb, slt	0094-4L
	10 Cont	: prp, dd, fib	0094-1L
	tr Coal	: blk, cly	0094-3L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2965.00			0095
	45 Cont	: prp, dd, fib	0095-1L
	40 S/Sst	: w to brn gy, l	0095-2L
	15 Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt	0095-4L
	tr Coal	: blk, cly	0095-3L
2968.00			0096
	35 Cont	: prp, dd, fib	0096-1L
	35 Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt	0096-4L
	25 S/Sst	: w to brn gy, l	0096-2L
	5 Coal	: blk, cly	0096-3L
2971.00			0097
	45 S/Sst	: w to brn gy, l	0097-2L
	30 Cont	: prp, dd, fib	0097-1L
	15 Coal	: blk, cly	0097-3L
	10 Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt	0097-4L
2977.00			0098
	80 Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt	0098-4L
	20 Coal	: blk, cly	0098-3L
	tr Cont	: prp, dd, fib	0098-1L
	tr S/Sst	: w to brn gy, l	0098-2L
2980.00			0099
	70 Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt	0099-4L
	15 S/Sst	: w to brn gy, l	0099-2L
	15 Coal	: blk, cly	0099-3L
	tr Cont	: prp, dd, fib	0099-1L

Table 1 : Lithology description for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Type	Trb	Sample
Int Cvd	TOC%	%	Lithology description
2983.00			0100
	75	Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt 0100-4L
	15	S/Sst	: w to brn gy, l 0100-2L
	10	Coal	: blk, cly 0100-3L
	tr	Cont	: prp, dd, fib 0100-1L
2986.00			0101
	65	Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt 0101-4L
	20	S/Sst	: w to brn gy, l 0101-2L
	10	Coal	: blk, cly 0101-3L
	5	Cont	: prp, dd, fib 0101-1L
	tr	Other	: gy red, trbofgs 0101-5L
2988.50 swc			0117
	100	Sltst	: dsk brn to brn blk, carb 0117-1L
2989.00			0102
	70	Other	: gy red, w, trbofgs 0102-5L
	15	S/Sst	: w to brn gy, l 0102-2L
	15	Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt 0102-4L
	tr	Cont	: prp, dd, fib 0102-1L
	tr	Coal	: blk, cly 0102-3L
	tr	Sh/Clst:	gy red 0102-6L
2992.00			0103
	50	S/Sst	: w, l 0103-2L
	40	Other	: gy red, w, trbofgs 0103-5L
	10	Sh/Clst:	dsk y brn to brn blk, drk gy, carb, slt 0103-4L
	tr	Cont	: prp, dd, fib 0103-1L
	tr	Coal	: blk, cly 0103-3L
	tr	Sh/Clst:	gy red 0103-6L

Table 2 : Rock-Eval table for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2658.00	cut	Sh/Clst: lt gy to drk gy	0.04	0.25	0.52	0.48	1.01	25	51	0.3	0.14	447	0003-2L
2660.50	swc	Sltst : m gy to drk gy	0.09	0.46	0.32	1.44	1.24	37	26	0.6	0.16	457	0104-1L
2664.00	cut	Sltst : lt gy to drk gy	0.03	0.23	0.36	0.64	1.05	22	34	0.3	0.12	444	0005-1L
2668.50	swc	Sltst : drk gy	0.13	0.50	0.35	1.43	1.37	36	26	0.6	0.21	543	0105-1L
2678.00	swc	Sltst : m gy to drk gy	0.17	0.41	0.13	3.15	1.49	28	9	0.6	0.29	501	0106-1L
2682.00	cut	Sltst : m gy to drk gy	0.14	0.32	0.32	1.00	1.16	28	28	0.5	0.30	445	0007-1L
2685.00	cut	Sltst : m gy to drk gy	0.02	0.20	0.42	0.48	1.14	18	37	0.2	0.09	447	0008-1L
2689.50	swc	Sltst : m gy to drk gy	0.32	0.77	0.05	15.40	1.87	41	3	1.1	0.29	447	0107-1L
2691.00	cut	Sltst : m gy to drk gy	0.06	0.27	0.48	0.56	1.25	22	38	0.3	0.18	447	0010-1L
2695.70	swc	Sltst : m gy to drk gy to drk y brn	2.08	10.45	0.28	37.32	3.87	270	7	12.5	0.17	438	0108-1L
2697.00	cut	Sltst : m gy to drk gy	0.12	0.67	0.49	1.37	1.68	40	29	0.8	0.15	443	0012-1L
2700.00	cut	Sh/Clst: m gy to drk gy, dsk y brn to brn blk	0.07	0.57	0.41	1.39	1.33	43	31	0.6	0.11	445	0013-1L
2703.00	cut	Sh/Clst: m gy to drk gy, dsk y brn to brn blk	0.32	2.93	0.43	6.81	2.97	99	14	3.3	0.10	449	0014-1L

Table 2 : Rock-Eval table for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2710.50	swc	Sltst : drk gy to drk y brn	0.88	7.87	0.38	20.71	2.46	320	15	8.8	0.10	440	0109-1L
2712.00	cut	Sltst : gy brn to dsk y brn to brn blk, drk gy	0.52	5.43	0.29	18.72	3.32	164	9	5.9	0.09	449	0016-1L
2715.50	swc	Sltst : drk gy to drk y brn	0.95	10.26	0.32	32.06	2.69	381	12	11.2	0.08	441	0110-1L
2720.00	cut	Sltst : gy brn to dsk y brn to brn blk, drk gy	0.50	4.78	0.35	13.66	3.13	153	11	5.3	0.09	449	0018-1L
2730.00	cut	Sltst : gy brn to dsk brn	0.88	14.48	0.43	33.67	3.50	414	12	15.4	0.06	445	0020-1L
2738.00	cut	Sltst : gy brn to dsk brn	0.79	11.72	0.41	28.59	3.33	352	12	12.5	0.06	444	0022-1L
2744.00	cut	Sltst : gy brn to dsk brn	1.68	15.27	0.48	31.81	4.81	317	10	17.0	0.10	442	0024-1L
2747.00	cut	Sltst : gy brn to dsk brn to dsk y brn to brn blk	2.05	16.95	0.43	39.42	5.57	304	8	19.0	0.11	438	0025-1L
2747.30	ccp	S/Sst : brn gy to dsk brn	1.48	1.71	0.37	4.62	0.94	182	39	3.2	0.46	446	0118-1L
2750.00	cut	Sltst : gy brn to dsk brn to dsk y brn to brn blk	2.45	17.93	0.40	44.83	6.07	295	7	20.4	0.12	438	0026-1L
2753.00	ccp	Coal : dsk y brn to brn blk	1.32	13.39	3.01	4.45	8.58	156	35	14.7	0.09	455	0120-1L
2757.30	ccp	Sltst : dsk brn to dsk y brn	0.48	14.44	0.14	103.14	3.31	436	4	14.9	0.03	449	0122-1L
2763.30	swc	Sltst : drk gy to drk y brn	0.59	4.18	0.42	9.95	1.61	260	26	4.8	0.12	443	0111-1L

Table 2 : Rock-Eval table for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2772.00	cut	bulk	0.44	2.33	0.43	5.42	1.07	218	40	2.8	0.16	446	0033-0B
2775.00	cut	Sltst : brn gy to gy brn to dsk y brn	1.46	11.83	0.58	20.40	4.17	284	14	13.3	0.11	438	0034-1L
2780.00	swc	Sh/Clst: dsk brn to dsk y brn	0.75	6.85	0.39	17.56	2.19	313	18	7.6	0.10	445	0112-1L
2784.00	cut	bulk	0.52	9.14	0.67	13.64	2.67	342	25	9.7	0.05	441	0037-0B
2787.00	cut	Sltst : brn gy to gy brn to dsk y brn	1.12	11.07	0.75	14.76	3.96	280	19	12.2	0.09	442	0038-1L
2789.50	swc	Sltst : drk gy to dsk brn	0.65	13.85	0.38	36.45	3.40	407	11	14.5	0.04	440	0113-1L
2793.00	cut	bulk	0.29	2.88	0.47	6.13	2.44	118	19	3.2	0.09	449	0040-0B
2796.00	cut	bulk	2.17	16.62	0.33	50.36	6.74	247	5	18.8	0.12	445	0041-0B
2799.00	cut	Sh/Clst: brn blk	14.30	87.86	0.78	112.64	39.00	225	2	102.2	0.14	444	0042-5L
2802.00	cut	bulk	4.45	33.02	0.45	73.38	11.70	282	4	37.5	0.12	444	0043-0B
2805.50	swc	Sltst : dsk brn to dsk y brn	10.85	70.31	0.71	99.03	42.50	165	2	81.2	0.13	444	0114-1L
2808.00	cut	bulk	4.27	37.95	0.50	75.90	12.80	296	4	42.2	0.10	442	0045-0B
2811.00	cut	bulk	4.87	41.70	0.53	78.68	14.80	282	4	46.6	0.10	443	0046-0B
2820.00	cut	bulk	1.17	10.01	0.44	22.75	4.94	203	9	11.2	0.10	444	0049-0B

Table 2 : Rock-Eval table for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2823.00	cut	bulk	12.49	103.89	0.94	110.52	44.40	234	2	116.4	0.11	444	0050-0B
2826.00	cut	bulk	8.02	85.08	0.82	103.76	32.40	263	3	93.1	0.09	442	0051-0B
2832.00	cut	bulk	6.47	81.92	0.62	132.13	28.90	283	2	88.4	0.07	443	0053-0B
2838.00	cut	bulk	7.83	100.82	0.77	130.94	35.30	286	2	108.7	0.07	445	0055-0B
2847.00	cut	bulk	11.00	130.04	0.96	135.46	49.20	264	2	141.0	0.08	444	0057-0B
2850.00	cut	bulk	8.12	116.98	0.82	142.66	50.80	230	2	125.1	0.06	444	0059-0B
2852.50	swc	Coal : dsk y brn to brn blk	2.07	46.03	5.47	8.41	13.60	338	40	48.1	0.04	449	0115-1L
2856.00	cut	bulk	7.78	106.72	0.80	133.40	42.60	251	2	114.5	0.07	445	0061-0B
2862.00	cut	bulk	4.61	84.28	0.52	162.08	26.60	317	2	88.9	0.05	444	0062-0B
2868.00	cut	bulk	2.21	31.21	0.40	78.02	11.70	267	3	33.4	0.07	440	0064-0B
2871.00	cut	bulk	1.80	31.44	0.46	68.35	9.91	317	5	33.2	0.05	443	0065-0B
2874.00	cut	bulk	0.55	6.35	0.32	19.84	2.82	225	11	6.9	0.08	446	0066-0B
2877.00	cut	bulk	2.18	34.85	0.39	89.36	13.60	256	3	37.0	0.06	443	0067-0B
2882.75	ccp	bulk	1.59	29.90	1.03	29.03	9.19	325	11	31.5	0.05	444	0123-0B
2883.60	ccp	Coal : brn blk	6.20	164.82	1.72	95.83	58.50	282	3	171.0	0.04	444	0124-1L

Table 2 : Rock-Eval table for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2884.60	ccp	Sltst : dsk brn to dsk y brn to brn blk	1.60	22.00	0.27	81.48	8.38	263	3	23.6	0.07	444	0125-1L
2885.00	ccp	Sh/Clst: dsk y brn to brn blk	1.03	17.72	0.21	84.38	6.54	271	3	18.8	0.05	446	0126-1L
2886.90	ccp	Sltst : brn gy	0.11	1.42	0.17	8.35	1.05	135	16	1.5	0.07	452	0127-1L
2888.00	ccp	Sltst : brn gy to dsk brn	0.24	2.72	0.54	5.04	1.77	154	31	3.0	0.08	447	0128-1L
2896.00	cut	bulk	4.13	30.29	0.46	65.85	30.90	98	1	34.4	0.12	444	0071-0B
2902.00	cut	bulk	5.05	84.36	0.61	138.30	43.00	196	1	89.4	0.06	447	0073-0B
2917.00	cut	S/Sst : w to brn gy	0.21	1.45	0.85	1.71	1.47	99	58	1.7	0.13	448	0078-3L
2923.00	cut	bulk	1.84	37.13	0.38	97.71	11.60	320	3	39.0	0.05	443	0080-0B
2926.00	cut	bulk	6.23	106.09	0.85	124.81	33.60	316	3	112.3	0.06	445	0081-0B
2931.00	swc	Coal : dsk y brn to brn blk	2.35	36.86	0.39	94.51	21.80	169	2	39.2	0.06	452	0116-1L
2932.00	cut	bulk	4.90	84.27	0.63	133.76	32.90	256	2	89.2	0.05	445	0083-0B
2935.00	cut	S/Sst : w to brn gy	0.43	3.51	0.92	3.82	2.73	129	34	3.9	0.11	449	0084-3L
2944.00	cut	bulk	4.34	77.49	0.38	203.92	35.40	219	1	81.8	0.05	446	0087-0B
2947.00	cut	bulk	5.69	106.61	0.62	171.95	51.40	207	1	112.3	0.05	446	0088-0B

Table 2 : Rock-Eval table for well NOCS 6306/10-1

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2950.00	cut	bulk	0.67	13.90	0.27	51.48	5.88	236	5	14.6	0.05	443	0089-0B
2953.00	cut	bulk	0.56	8.25	0.26	31.73	4.47	185	6	8.8	0.06	447	0090-0B
2968.00	cut	bulk	0.43	5.59	0.27	20.70	3.59	156	8	6.0	0.07	443	0096-0B
2977.00	cut	bulk	1.61	28.99	0.21	138.05	12.60	230	2	30.6	0.05	444	0098-0B
2980.00	cut	bulk	1.07	22.03	0.16	137.69	8.15	270	2	23.1	0.05	445	0099-0B
2983.00	cut	bulk	0.79	14.87	0.15	99.13	5.19	287	3	15.7	0.05	447	0100-0B
2986.00	cut	bulk	0.58	9.01	0.11	81.91	3.78	238	3	9.6	0.06	444	0101-0B
2988.50	swc	sltst : dsk brn to brn blk	0.17	1.38	0.13	10.62	1.40	99	9	1.5	0.11	452	0117-1L



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Title
**GEOCHEMICAL EVALUATION
OF WELL 6306/10-1.**

BA91-1199-1
18 JUNI 1991
REGISTRERT
OLJEDIREKTORATET

Summary/Conclusion//Recommendation

Keywords
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RockEval/TOC

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1. INTRODUCTION

Well 6306/10-1, operated by Shell, was spudded on 7. september 1990 and reached TD at 3186 m in basement.

The well location is given in Fig. 1.1. and a preliminary well summary is given in Fig. 1.2.

This report comprises the petroleum geochemical analyses of drillcuttings from 2631 m to 2998 m and core chips from cores 1-4. All depths are drillers depth (mRKB).

The vitrinite reflectance work has been undertaken by Geooptics (Newcastle upon Tyne, U.K.). All other analyses, and compilation of this report have been undertaken by Norsk Hydro Research Center in Bergen.



LIST OF ABBREVIATIONS AND TERMS

Kerogen

Insoluble organic matter which is preserved in sedimentary rocks. Under the increasing influence of temperature and time (maturation), most kerogen produce hydrocarbons.

TOC

Total Organic Carbon: a measure of the organic carbon in a rock, expressed as weight per cent. Used as a fundamental parameter in source rock classification.

RockEval

A commercial technique for the anhydrous pyrolysis of source rocks developed by IFP. It enables the chemical composition of kerogen and hence its hydrocarbon potential, to be determined.

S₁

This is a measure of the already generated oil in source rocks, or oil content in a reservoir. In units of kg/t rock.

S₂

This is a measure of the remaining hydrocarbon potential. In units of kg/t rock.

Tmax

The temperature, in °C, at which the pyrolytic yield of hydrocarbons from a rock sample reaches its maximum, using RockEval.

Hydrogen Index (HI)

A parameter derived from RockEval which measures the hydrogen richness of kerogen. $HI = 100 \cdot S_2 / TOC$. It has a direct relationship with the H/C ratio, and is measured in mg of hydrocarbons/g TOC

Production Index (PI)

A maturity parameter derived from RockEval, which is the ratio of already generated hydrocarbons (or migrated hydrocarbons) to potential hydrocarbons. $PI = S_1 / S_1 + S_2$

Immature samples have values of 0.1 or less, mature samples, 0.1 to 0.4.

The PI is high in reservoirs.

Maturation

The process of chemical change in sedimentary organic matter induced by increasing time and temperature. These chemical reactions produce oil and hydrocarbon gases from the appropriate organic matter. The major maturity subdivisions are:

- immature
- early mature
- peak mature
- late mature
- post mature

Vitrinite

The type of organic matter derived from the lignified tissues of higher land plants.

Vitrinite reflectance

A maturity parameter based on the change in the reflectance of polished vitrinite particles with increasing time and temperature. Widely used values for maturity zones are:

- <0.55 %, immature
- 0.55-1.3 %, mature for oil generation
- >1.3 %, post mature for oil generation
- 0.7-3.0 %, mature for gas generation

EOM (Extractable Organic Matter)

Oil and oil-like products removed from rock samples using organic solvents. The amount of extract may be used to determine the level of maturation.

Saturated Hydrocarbons

Hydrocarbons which contain only carbon-carbon single bonds (alkanes).

Aromatic hydrocarbons

Unsaturated hydrocarbons and containing one or more rings with conjugated carbon-carbon double and single bonds.

NSO compounds

Fraction of oils or extracts containing heteroatoms like sulphur, oxygen and nitrogen.

Asphaltenes

The heavy molecular weight components of crude oils and sediment extracts which is soluble in CS₂ and insoluble in n-pentane.

n-C₁₇

n-alkane with 17 carbon atoms

n-alkane carbon number maximum

n-C₁₇ maximum indicates algal input

n-C₁₆ to n-C₂₄ indicates bacterial input

n-C₂₇, n-C₂₉, n-C₃₁ indicates higher plant input

Isoprenoids

Isoprenoids are branched and/or cyclic hydrocarbons built from multiples of the isoprene unit and are dominantly derived from plant and bacterial sources.

Pristane

C₁₉ regular acyclic isoprenoid derived from the side chain of chlorophyll.

Phytane

C₂₀ regular acyclic isoprenoid derived mainly from the side chain in chlorophyll, but have also been found in methanogenic bacteria and archaeobacteria.

Pristane/phytane ratio

>3 = oxic conditions

<0.5 = anoxic conditions

The ratio may be affected by many factors

CPI (Carbon Preference Index)

The ratio of abundance of odd carbon number n-alkanes to even number n-alkanes. The preference decreases with increasing maturity until CPI = 1.0.

CPI > 1.1 means oil or extract is of low maturity.

CPI < 1.0 in carbonate source rocks.

Biodegradation

Degradation of oils by bacteria. Normal alkanes are generally the first to be attacked and removed.

GC-MS (Gas chromatography-mass spectrometry)

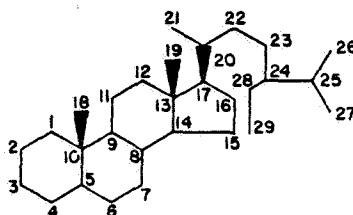
Method for identification of constituents in complex mixtures or for analysis of trace components using Single Ion Monitoring (SIM).

Biomarkers

Compounds found in petroleum or rock extracts which indicate an unambiguous link with a natural product.

Steranes

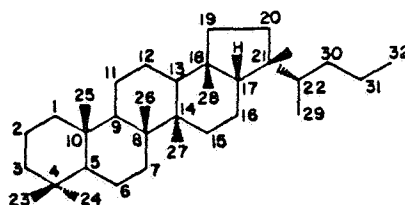
The alkanes derived from steroid natural products. Monitored by GC-MS of M/z 217 and 218.



Sterane

Triterpanes

C_{27} to C_{35} five ring cyclic alkanes derived from triterpenoid hydrocarbons in bacteria, fungi, algae and higher plants. Monitored by GC-MS of M/z 191.



Pentacyclic triterpane

Hopanes

C_{27} to C_{35} pentacyclic alkanes which dominate the triterpanes found in sediments and crude oils. They originate from bacteria.

M/z, m/e

The mass to charge ratio of fragment of molecules from GC-MS.

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TABLE 2.1

Average Vitrinite Reflectance

Table 2.1 VITRINITE REFLECTANCE DATA WELL 6306/10-1
Average values



Depth	Group/Fm	Population I	Population II	Population III	SCI
650.00		0.34 (20)			
770.00		0.38 (21)			
850.00		0.37 (21)			
990.00		0.39 (20)			
1040.00		0.40 (20)			
1170.00		0.37 (20)			
1370.00		0.42 (20)	0.00 (0)	0.00 (0)	0
1470.00		0.42 (20)			
1540.00		0.45 (8)			
1620.00		0.45 (3)			
1710.00		0.40 (4)			
1790.00		0.49 (6)			
1900.00		0.49 (5)			
2000.00		0.51 (3)			
2090.00		0.48 (9)			
2140.00		0.59 (5)			
2270.00		0.57 (8)			
2370.00		0.53 (8)			

Table 2.1 VITRINITE REFLECTANCE DATA WELL 6306/10-1 (cont'd)
Average values



Depth	Group/Fm	Population I	Population II	Population III	SCI
2490.00		0.62 (3)			
2679.00		0.64 (6)			
2715.00		0.53 (20)			
2805.00		0.71 (22)	0.00 (0)	0.00 (0)	0
2847.00		0.82 (22)			
2890.00		0.88 (22)			
2905.00		0.78 (22)			
2944.00		0.94 (22)			
2980.00		0.93 (22)			

TABLE 2.2

Rock Eval/TOC Results

Table 2.2 SOURCE ROCK SCREENING DATA WELL 6306/10-1



Depth (m)	Group/Fm	%	Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
1152.90		100	SST	COCH	3.4	0.1	0.0	0.4	33	0	0.96	340	F-BERGEN
1167.90		100	SST	COCH	13.4	0.2	0.0	1.2	14	0	0.99	336	F-BERGEN
1169.40		100	SST	COCH	14.0	0.2	0.0	1.3	18	0	0.98	335	F-BERGEN
1169.90		100	SST	COCH	0.1	0.0	0.0	0.0			0.90	344	F-BERGEN
2631.00		0		DCD	0.1	0.3	0.0	0.6	48	0	0.15	438	F-BERGEN
2637.00		0		DCD	0.1	0.3	0.0	0.6	42	0	0.17	436	F-BERGEN
2643.00		0		DCD	0.1	0.3	0.0	0.7	41	0	0.15	438	F-BERGEN
2661.00		0		DCD	0.1	0.2	0.0	0.8	29	0	0.18	444	F-BERGEN
2679.00		0		DCD	0.1	0.4	0.0	1.1	37	0	0.15	447	F-BERGEN
2709.00		0		DCD	0.9	7.1	0.0	4.1	173	0	0.11	447	F-BERGEN
2715.00		0		DCD	0.8	8.1	0.0	2.5	322	0	0.09	441	F-BERGEN
2720.00		0		DCD	0.9	8.4	0.0	2.4	351	0	0.10	447	F-BERGEN
2725.00		0		DCD	1.0	6.5	0.0	2.0	327	0	0.13	444	F-BERGEN
2735.00		0		DCD	0.8	10.3	0.0	2.5	413	0	0.07	446	F-BERGEN
2741.00		0		DCD	1.7	13.8	0.0	3.9	353	0	0.11	443	F-BERGEN
2744.00		0		DCD	1.4	11.8	0.0	3.7	320	0	0.11	439	F-BERGEN
2748.30		100	SST	COCH	0.1	0.0	0.0	0.0			0.63	352	F-BERGEN
2749.70		100	SST	COCH	0.7	0.3	0.0	0.1	310	0	0.70	523	F-BERGEN

Table 2.2 SOURCE ROCK SCREENING DATA WELL 6306/10-1 (cont'd)

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Depth (m)	Group/Fm	%	Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
2750.85		100	SST	COCH	0.8	0.4	0.0	0.1	390	0	0.67	537	F-BERGEN
2751.00		0		DCD	0.6	4.0	0.0	2.4	165	0	0.14	449	F-BERGEN
2751.75		100	SST	COCH	3.0	7.6	0.0	3.4	222	0	0.28	444	F-BERGEN
2752.95		100	CLYST	COCH	1.3	12.9	0.0	5.0	258	0	0.09	441	F-BERGEN
2754.25		100	SST	COCH	0.5	0.4	0.0	0.3	130	0	0.57	446	F-BERGEN
2755.25		100	SST	COCH	0.4	0.2	0.0	0.1	200	0	0.64	505	F-BERGEN
2756.60		100	SST	COCH	0.6	0.2	0.0	0.1	230	0	0.74	477	F-BERGEN
2757.00		0		DCD	0.5	3.2	0.0	1.7	189	0	0.13	446	F-BERGEN
2757.50		100	CLYST	COCH	0.2	5.9	0.0	1.4	421	0	0.03	443	F-BERGEN
2763.00		0		DCD	1.1	7.1	0.0	2.9	244	0	0.13	444	F-BERGEN
2772.00		0		DCD	0.9	8.5	0.0	2.9	292	0	0.10	448	F-BERGEN
2775.00		0		DCD	1.3	9.9	0.0	3.5	283	0	0.11	446	F-BERGEN
2781.00		0		DCD	0.9	6.4	0.0	2.1	305	0	0.12	445	F-BERGEN
2787.00		0		DCD	2.7	20.5	0.0	6.1	336	0	0.11	442	F-BERGEN
2793.00		0		DCD	0.9	6.6	0.0	3.2	207	0	0.12	447	F-BERGEN
2805.00		0		DCD	8.1	64.7	0.0	25.7	252	0	0.11	443	F-BERGEN
2811.00		0		DCD	8.1	75.9	0.0	28.8	263	0	0.10	443	F-BERGEN
2823.00		0		DCD	11.3	76.2	0.0	35.2	216	0	0.13	445	F-BERGEN
2829.00		0		DCD	6.9	66.5	0.0	29.9	222	0	0.09	443	F-BERGEN

Table 2.2 SOURCE ROCK SCREENING DATA WELL 6306/10-1 (cont'd)



Depth (m)	Group/Fm	%	Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
2835.00		0		DCD	9.3	97.3	0.0	43.0	226	0	0.09	441	F-BERGEN
2841.00		0		DCD	10.3	125.4	0.0	54.6	230	0	0.08	446	F-BERGEN
2847.00		0		DCD	13.1	151.4	0.0	75.1	202	0	0.08	442	F-BERGEN
2853.00		0		DCD	10.0	117.8	0.0	46.9	251	0	0.08	443	F-BERGEN
2865.00		0		DCD	6.6	80.8	0.0	35.9	225	0	0.08	444	F-BERGEN
2871.00		0		DCD	5.9	73.8	0.0	29.0	254	0	0.07	441	F-BERGEN
2877.00		0		DCD	5.6	87.6	0.0	34.1	257	0	0.06	442	F-BERGEN
2881.10		100	SST	COCH	0.3	0.2	0.0	0.1	230	0	0.60	436	F-BERGEN
2883.35		100	SST	COCH	1.1	4.7	0.0	2.7	175	0	0.18	441	F-BERGEN
2883.60		100	COAL	COCH	3.0	72.4	0.0	27.2	266	0	0.04	444	F-BERGEN
2886.00		0		DCD	6.3	92.2	0.0	32.4	285	0	0.06	441	F-BERGEN
2886.50		100	CLYST	COCH	0.1	0.5	0.0	0.8	63	0	0.09	448	F-BERGEN
2890.00		0		DCD	9.5	143.3	0.0	53.3	269	0	0.06	442	F-BERGEN
2896.00		0		DCD	8.4	116.8	0.0	46.7	250	0	0.07	442	F-BERGEN
2902.00		0		DCD	10.7	139.5	0.0	57.5	243	0	0.07	446	F-BERGEN
2914.00		0		DCD	1.6	25.7	0.0	14.1	182	0	0.06	443	F-BERGEN
2920.00		0		DCD	3.4	43.4	0.0	23.6	184	0	0.07	444	F-BERGEN
2926.00		0		DCD	7.7	123.1	0.0	59.0	209	0	0.06	444	F-BERGEN
2938.00		0		DCD	2.2	31.7	0.0	17.1	185	0	0.07	444	F-BERGEN

Table 2.2 SOURCE ROCK SCREENING DATA WELL 6306/10-1 (cont'd)

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Depth (m)	Group/Fm	%	Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
2944.00		0		DCD	5.8	92.6	0.0	48.1	192	0	0.06	445	F-BERGEN
2950.00		0		DCD	4.5	52.7	0.0	29.6	178	0	0.08	445	F-BERGEN
2956.00		0		DCD	2.6	37.2	0.0	21.7	171	0	0.07	445	F-BERGEN
2962.00		0		DCD	2.3	24.1	0.0	14.4	168	0	0.09	444	F-BERGEN
2968.00		0		DCD	1.7	20.2	0.0	14.8	137	0	0.08	444	F-BERGEN
2974.00		0		DCD	1.5	9.7	0.0	9.5	102	0	0.14	445	F-BERGEN
2980.00		0		DCD	2.1	25.9	0.0	13.3	195	0	0.08	445	F-BERGEN
2986.00		0		DCD	1.3	17.6	0.0	9.4	188	0	0.07	446	F-BERGEN
2992.00		0		DCD	0.7	8.4	0.0	5.5	154	0	0.08	444	F-BERGEN
2998.00		0		DCD	0.3	1.3	0.0	1.2	109	0	0.17	444	F-BERGEN

TABLE 2.3

Methyl Phenanthrene Index
Tmax from Rock Eval
Calculated Vitrinite Reflectance
Measured Vitrinite Reflectance

TABLE 2.3

MATURITY PARAMETERS OF AROMATIC FRACTION WELL 6306/10-1
METHYL-PHENANTRENE INDICES AND CALCULATED VITRINITE REFLECTANCE.

DEPTH M	SAMPLE TYPE	MPI 1	MPI 2	Tmax
2715.00	DC CLYST	0.71	0.80	441
2741.00	SC CLYST	0.57	0.63	443
2749.70	COCH SST	0.84	0.93	
2752.95	COCH CLYST	0.61	0.68	441
2756.60	COCH SST	0.90	1.00	
2787.00	DC CLYST	0.59	0.65	442
2811.00	DC CLYST	0.61	0.70	443
2883.60	COCH COAL	0.62	0.71	444

TABLE 2.4

Sterane Isomerisation

TABLE 2.4

BIOMARKER RATIOS WELL 6306/10-1
STERANE ISOMERISATION

DEPTH M	SAMPLE TYPE	C29-20S %aaa	C29-20S+R % abb
1167.9 M	COCH SST	31	35
1169.4 M	COCH SST	30	37
2712-15 M	DC	55	56
2738-41 M	DC	48	57
2749.7 M	COCH SST	52	60
2752.95 M	COCH CLYST	47	50
2756.6 M	COCH SST	52	62
2784-87 M	DC	52	54
2808-11 M	DC	61	61
2883.6 M	COCH COAL	49	56
BIOM.STD.	OIL	46	62

TABLE 2.5

Triterpane Ratios and Isomerisation

TABLE 2.5

BIOMARKER RATIOS WELL 6306/10-1
TRITERPANE ISOMERISATION

DEPTH M	SAMPLE TYPE	Ts/Tm	NOR/ NOR+HOP	BNOR/ BNOR+NOR	MORET/ HOPANE	C32-22S %
1167.9 M	COCH SST	0.7	0.38	0.22	0.18	57
1169.4 M	COCH SST	0.7	0.38	0.22	0.17	57
2712-15 M	DC	0.9	0.31		0.15	61
2738-41 M	DC	0.4	0.34		0.15	60
2749.7 M	COCH SST	0.7	0.34		0.17	62
2752.95 M	COCH CLYST	0.3	0.34		0.22	58
2756.6 M	COCH SST	0.8	0.28		0.14	62
2784-87 M	DC	0.5	0.35		0.15	61
2808-11 M	DC	0.2	0.41		0.12	58
2883.6 M	COCH COAL	0.1	0.42		0.13	58
BIOM.STD.	OIL	1.3	0.29	0.35	0.12	59

TABLE 3.1

Extraction Yields and latroscan
Group Type Separation

Table 3.1 SOURCE ROCK EXTRACTION DATA I WELL 6306/10-1

Depth(m)	Group/Fm	EOM(mg)	EOM(%)	Hydrocarbons			Non Hydrocarbons		
				SAT(%)	ARO(%)	TOTAL(%)	NSO(%)	ASPH(%)	TOTAL(%)
1167.90		42.10	1.62	59	32	91	6	3	9
1169.40		53.00	1.77	56	34	90	7	3	10
2715.00		21.20	0.28	10	34	44	46	10	56
2741.00		47.50	0.40	5	36	41	50	9	59
2749.70		36.30	0.18	49	31	80	17	3	20
2752.95		48.80	0.49	2	44	46	48	6	54
2756.60		31.40	0.16	38	41	79	17	4	21
2787.00		23.50	0.67	3	27	30	53	17	70
2811.00		30.20	1.51	2	25	27	59	14	73
2883.60		28.80	1.15	4	32	36	53	11	64

TABLE 3.2

Calculated Ratios from Iatroskan
Group Type Separation.



Table 3.2 SOURCE ROCK EXTRACTION DATA II WELL 6306/10-1

Depth(m)	Group/Fm	TOC (%)	EOM(%) / TOC(%)	SAT(%) / TOC(%)	SAT(%) / ARO(%)	HC/non HC
1167.90		1.20	1.35	49.17	1.84	10.11
1169.40		1.30	1.36	43.08	1.65	9.00
2715.00		2.50	0.11	4.00	0.29	0.79
2741.00		3.90	0.10	1.28	0.14	0.69
2749.70		0.10	1.79	490.00	1.58	4.00
2752.95		5.00	0.10	0.40	0.05	0.85
2756.60		0.10	1.57	380.00	0.93	3.76
2787.00		6.10	0.11	0.49	0.11	0.43
2811.00		28.80	0.05	0.07	0.08	0.37
2883.60		27.20	0.04	0.15	0.13	0.56

TABLE 3.3

Molecular Ratios Saturated Fraction

Table 3.3 SATURATED FRAC., MOLECULAR RATIOS WELL 6306/10-1



Depth	Group/Fm	Pr/n-C17	Pr/Ph	CPI-I	CPI-II	n-C15+/Total	n-C20/n-C25
2715.00		0.50	3.20	1.20	1.20		
2741.00		0.60	4.90	1.20	1.20		
2749.70		0.70	4.60	1.10	1.10		
2752.95		0.80	4.70	1.00	1.10		
2756.60		0.40	3.40	1.10	1.10		
2787.00		0.70	4.40	1.20	1.20		
2811.00		0.90	6.70	1.30	1.20		
2883.60		2.00	8.20	1.10	1.00		

VISUAL VOLUME PERCENTAGE ESTIMATION

Norway, 6306/10-01

Date : 4-MAR-91

Sample(s)

2753.00 m/R
 2757.30 m/R
 2794.80 m/S
 2882.75 m/R
 2883.60 m/R
 2885.00 m/R
 2886.90 m/R
 2898.50 m/S
 2922.00 m/S
 2980.00 m/C

ORGANIC MATTER													MINERAL MATTER															
SOM			VITRINITE					LIPTINITE						INERTINITE		MINERAL MATTER												
DENSE	LOAD BEARING		DIFFUSE / INTERGRANULAR	NON-L. B.	VIT.-1			VIT.-2		SPORINITE (MICRO-)	SPORINITE (MEGA-)	CUTINITE	SUBERINITE	RESINITE (+ FLUORINITE)	LIPTODETRINITE	ALGAE			EXSUDATINITE (FLUORESCING)	EXSUDATINITE (NON-FLUORESCING) S. HYDR.	SCLEROTINITE	(SEMI-) FUSINITE (+ INERTODETRINITE)	MICRINITE (+ OXY-MICRINITE)	UNDEFINED MINERALS	FRAMBOIDAL PYRITE	AGGREGATES / CRYSTALS	PYRITE	
	LAYERS	LENSES			LAYERS / LENSES	TELOCOLLINITE	TELOCOLLINITE	LENSES	TELINITE							LAYERS / LENSES	DESMOCOLLINITE	DESMOCOLLINITE										BOTRYOCOCCUS
5	10						1	4	3					3	<1									3	C	66	2	3
	2	5	3				<1	<1	3					5	1								1	C	74	5	1	
				20			55	5	5				2	3									10	C	5		<1	
	2	3	3	5			8	2	<1		1			<1									2	C	74	<1	<1	
				20			5	5	8		<1		4	4	<1								45	C	9		<1	
		3	5	3			2	3	3		1			2									2	C	76	<1	<1	
		1	1				<1	1	<1					1									2	F	96	<1	<1	
				30			50		3					2									5	C	10	<1	<1	
	5	5	5	30			20	10	5					5									1	C	13	<1	1	
	3	5	5	10			15	5	3					3									5	C	42	3	1	

Page : 1

L i s t i n g o f C o m m e n t l i n e s

Country : Norway
 Well/Outcrop : 6306/10-01

```

=====
Depth Sample Comment
(m) Type
=====
2753.00 R SOM partly micrinised
Sample oxidised
Pyrite shows oxidation features
Desmocollinite grades into SOM associated with fram. pyrite
Desmocollinite grades into (semi-)fusinite
Yellow to yellow/dark brown fluorescing liptinites

2757.30 R SOM partly micrinised
Sample slightly oxidised
Pyrite shows oxidation features
Yellow to dark yellow fluorescing liptinites

2794.80 S Migration features - Resinite is fluorinite
Weak brown fluoresc. vitrinite resulting in lower VR-value

2882.75 R SOM partly micrinised
Desmocollinite grades into SOM
Desmocollinite grades into (semi-)fusinite
Desmocollinite / telocollinite

2883.60 R Resinite is fluorinite in fusinite
Migration features - Yellow to yell./brown fluorescence

2885.00 R SOM partly micrinised
Sample slightly oxidised
Pyrite shows oxidation features
Yellow brown fluorescing liptinites

2886.90 R SOM partly micrinised

2898.50 S Yellow brown fluoresing liptinites

2922.00 S Partly coarse grained impregnated with exsudatinite (HC)
Rare fluid inclusions(blue fluor.) - Migration features

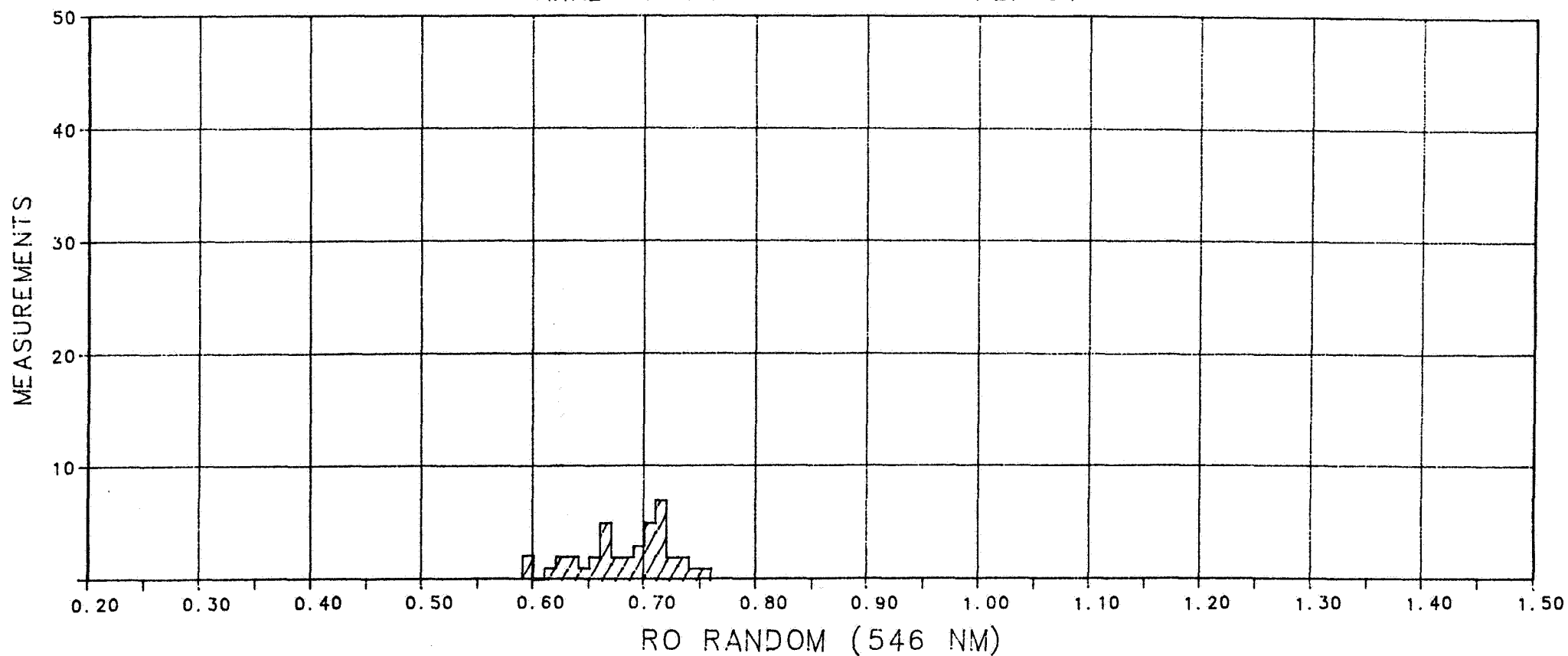
2980.00 C SOM partly micrinised
Sample partly oxidised
Desmocollinite grades into SOM associated with fram. pyrite
  
```

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10-1
DEPTH/SAMPLE NR. : 2753 M
SAMPLE TYPE : CORE SAMPLE

MEAN : 0.68
DEVIATION : 0.04
MODE : 0.71
MEASUREMENTS: 40

ANALYST: KMR D. D. 26-FEB-91



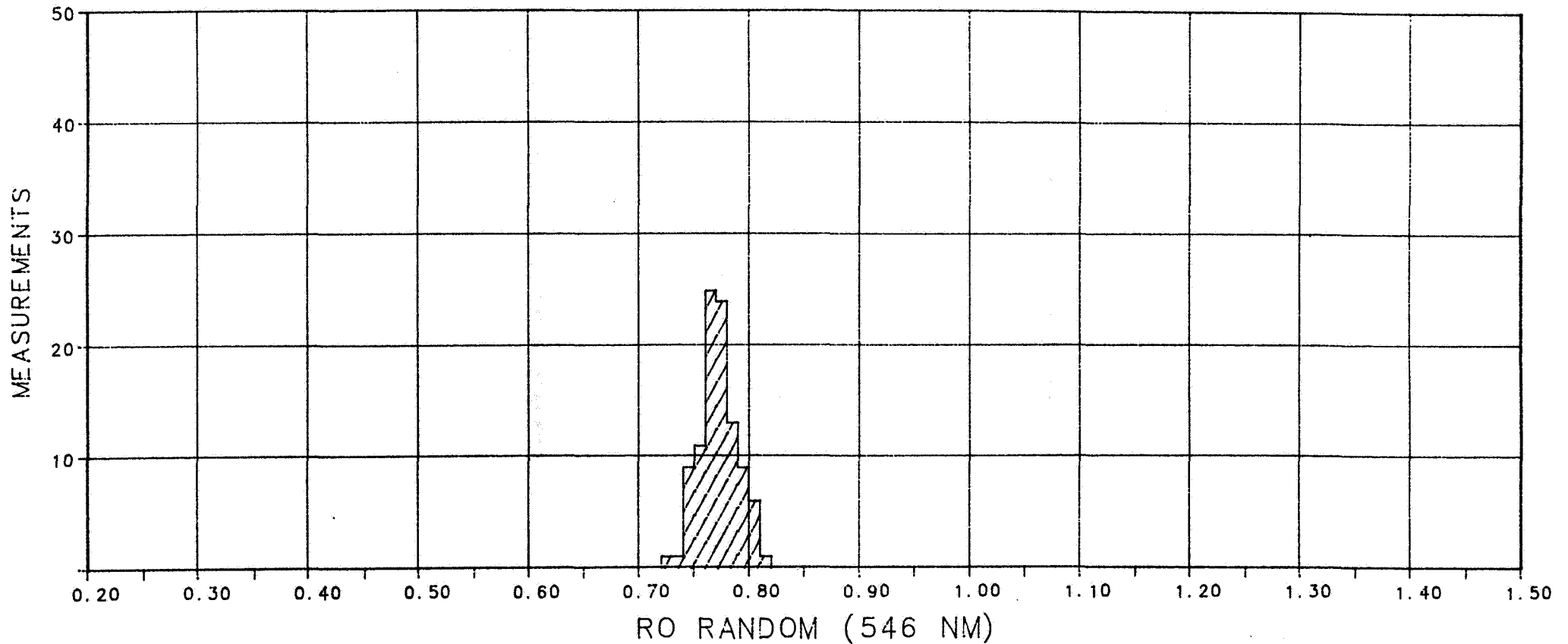
DETRITAL DESMOCOLLINITE IN SOM MATRIX

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10--1
DEPTH/SAMPLE NR. : 2794 M
SAMPLE TYPE : SIDEWALL SAMPLE

MEAN : 0.77
DEVIATION : 0.02
MODE : 0.76
MEASUREMENTS: 100

ANALYST: KMR D. D. : 22-FEB-91



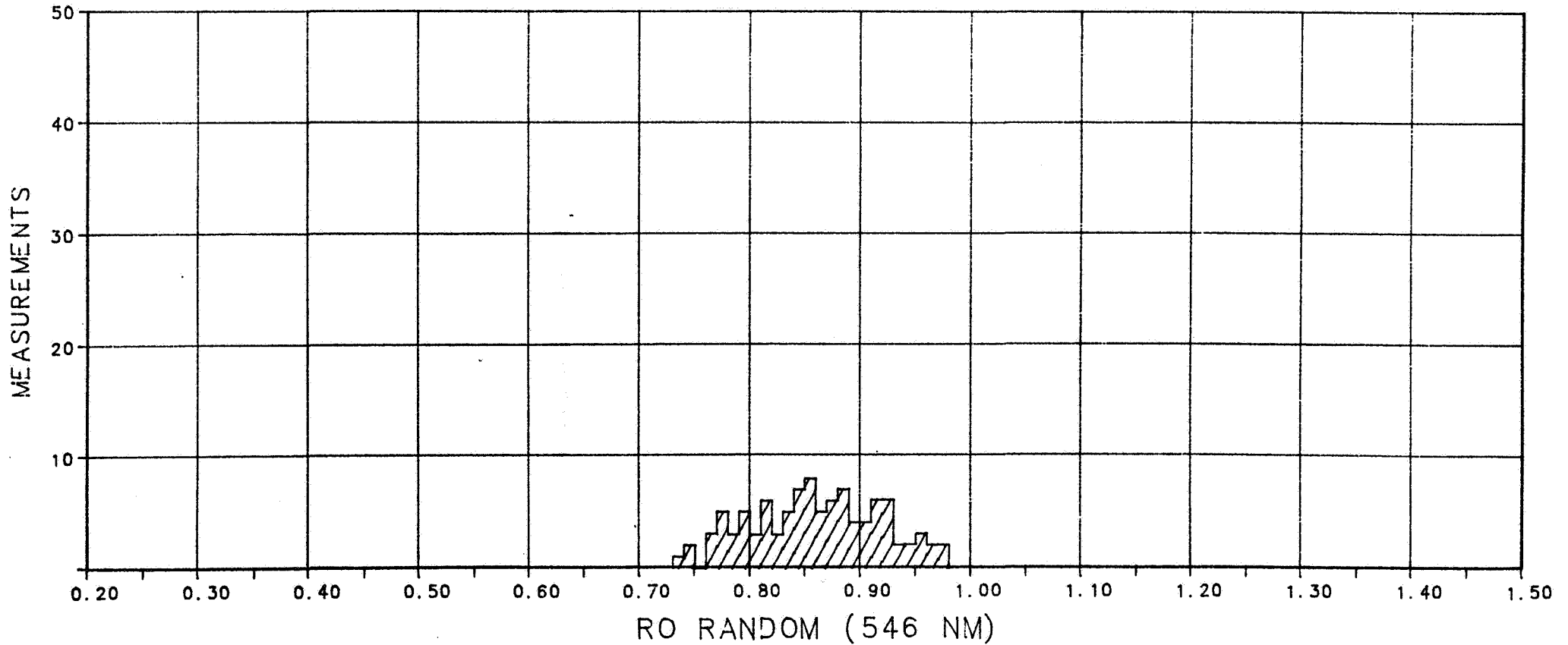
DEPTH: 2794.8 M; FLUORESCING TELOCOLLINITE (DESMOCOLLINITE)

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10-1
DEPTH/SAMPLE NR. : 2882 M
SAMPLE TYPE : CORE SAMPLE

MEAN : 0.85
DEVIATION : 0.06
MODE : 0.85
MEASUREMENTS: 100

ANALYST: KMR D.D.: 4-MAR-91



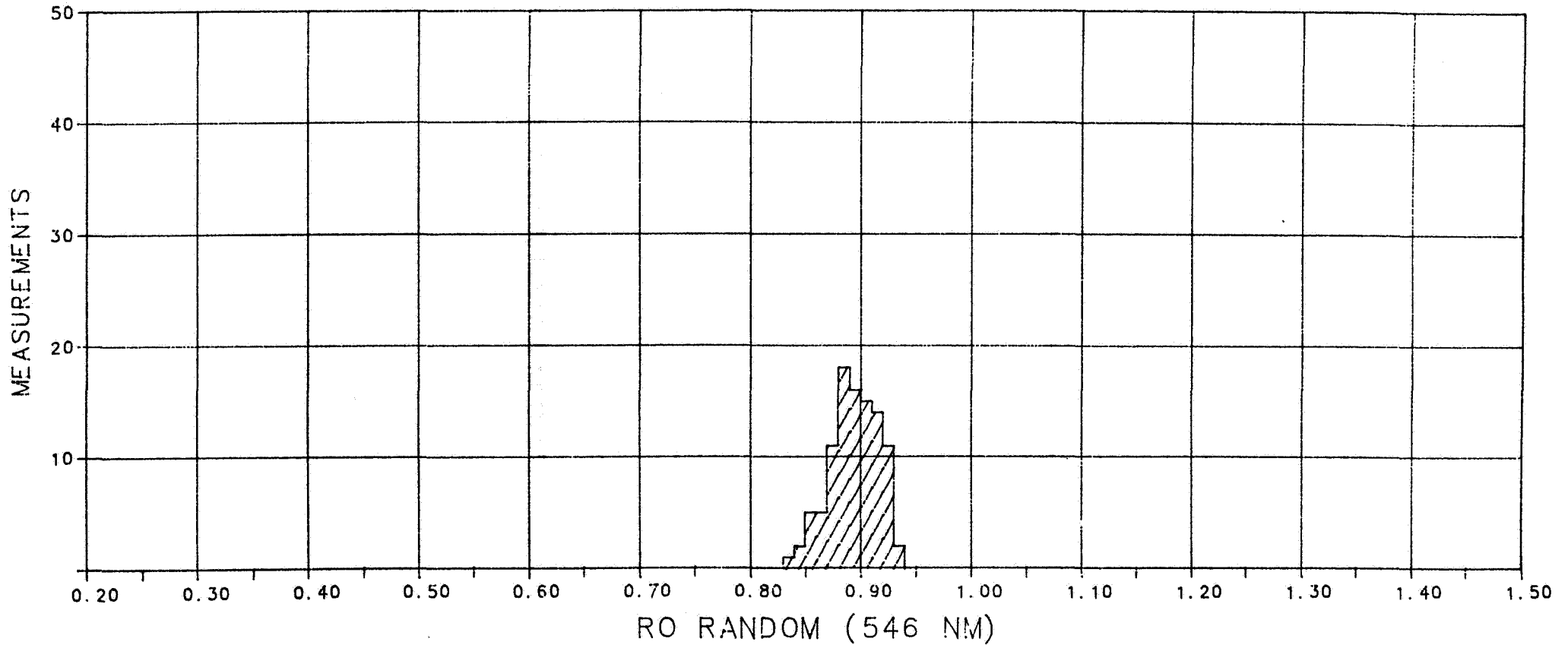
DEPTH: 2882.75 M; DESMOLLINITE /TELOCOLLINITE

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10--1
DEPTH/SAMPLE NR. : 2883 M
SAMPLE TYPE : CORE SAMPLE

MEAN : 0.89
DEVIATION : 0.02
MODE : 0.88
MEASUREMENTS: 100

ANALYST: KMR D.D. : 22-FEB--91



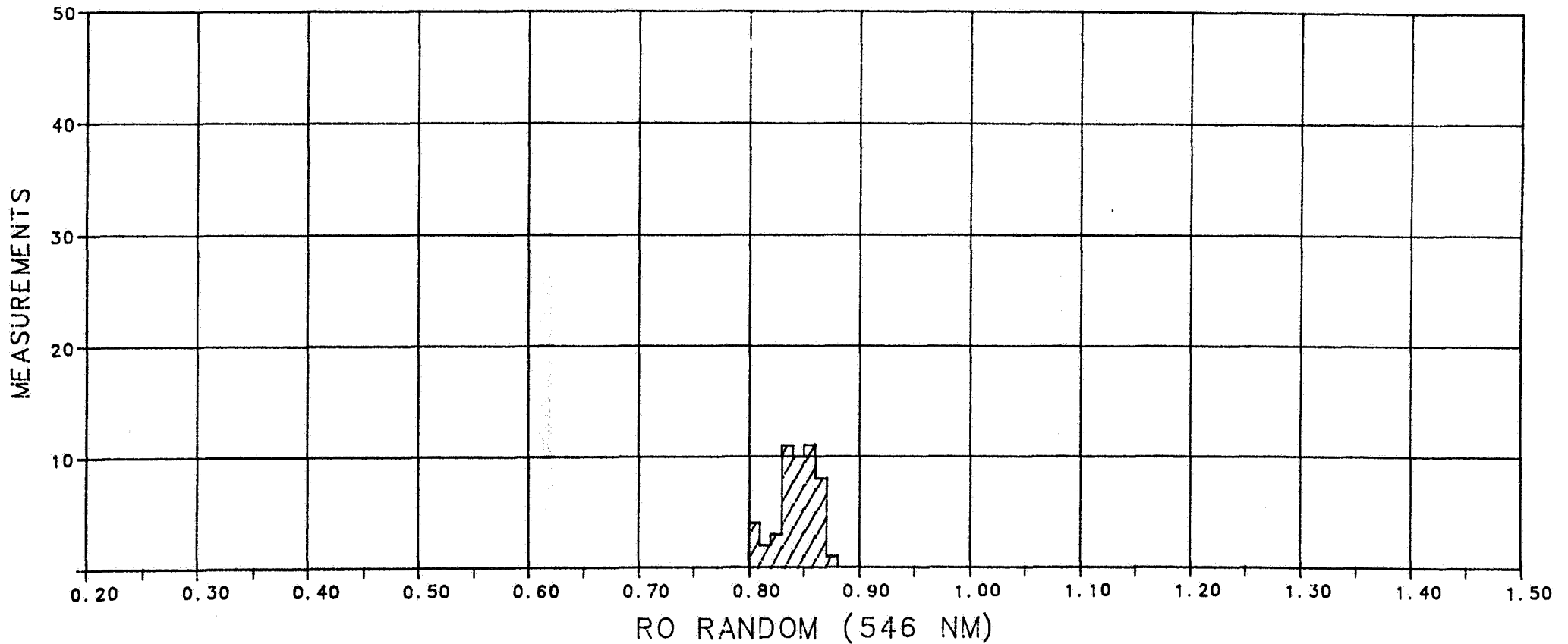
DEPTH: 2883.6 M; TELOCOLLINITE

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10-1
DEPTH/SAMPLE NR. : 2885 M
SAMPLE TYPE : CORE SAMPLE

MEAN : 0.84
DEVIATION : 0.02
MODE : MULTI
MEASUREMENTS: 50

ANALYST: KMR D.D. 26-FEB-91



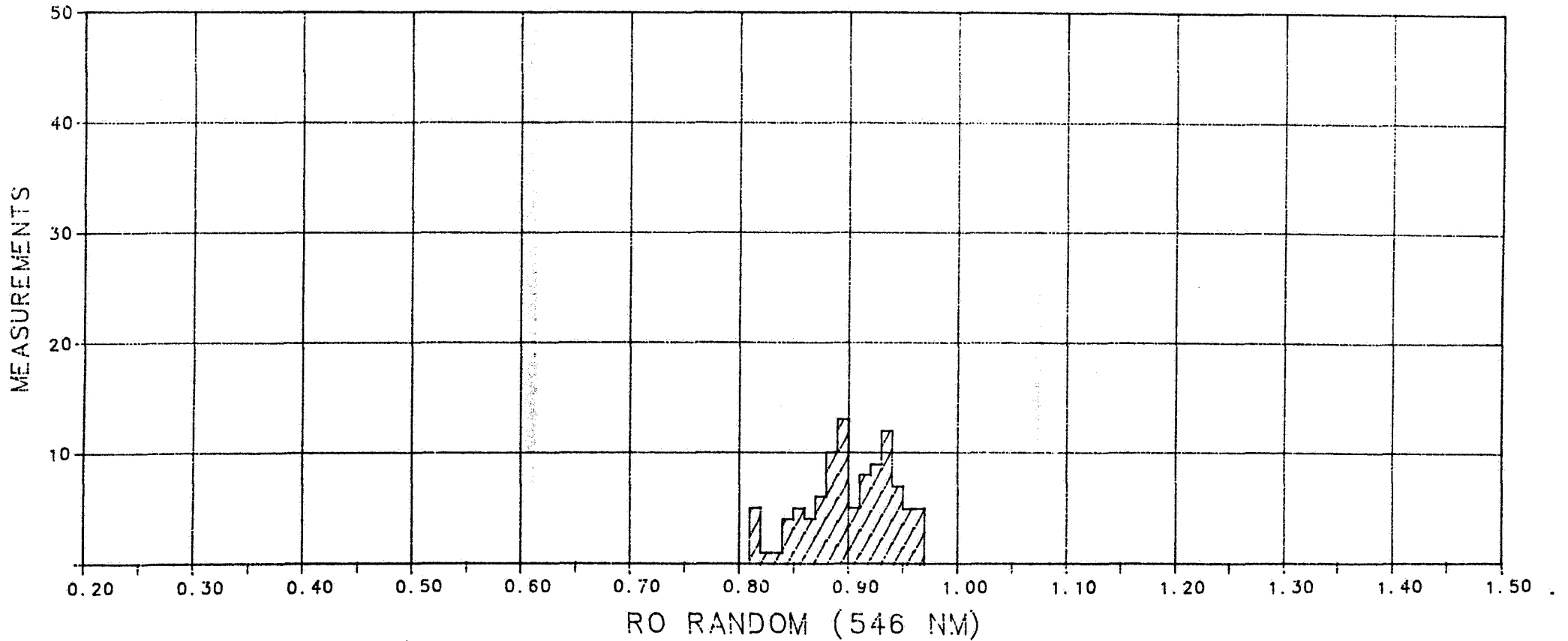
DESMOCOLLINITE (TELOCOLLINITE IN SOM MATRIX)

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10-1
DEPTH/SAMPLE NR. : 2898 M
SAMPLE TYPE : SIDEWALL SAMPLE

MEAN : 0.90
DEVIATION : 0.04
MODE : 0.89
MEASUREMENTS: 100

ANALYST: KMR D.D. 22-FEB-91



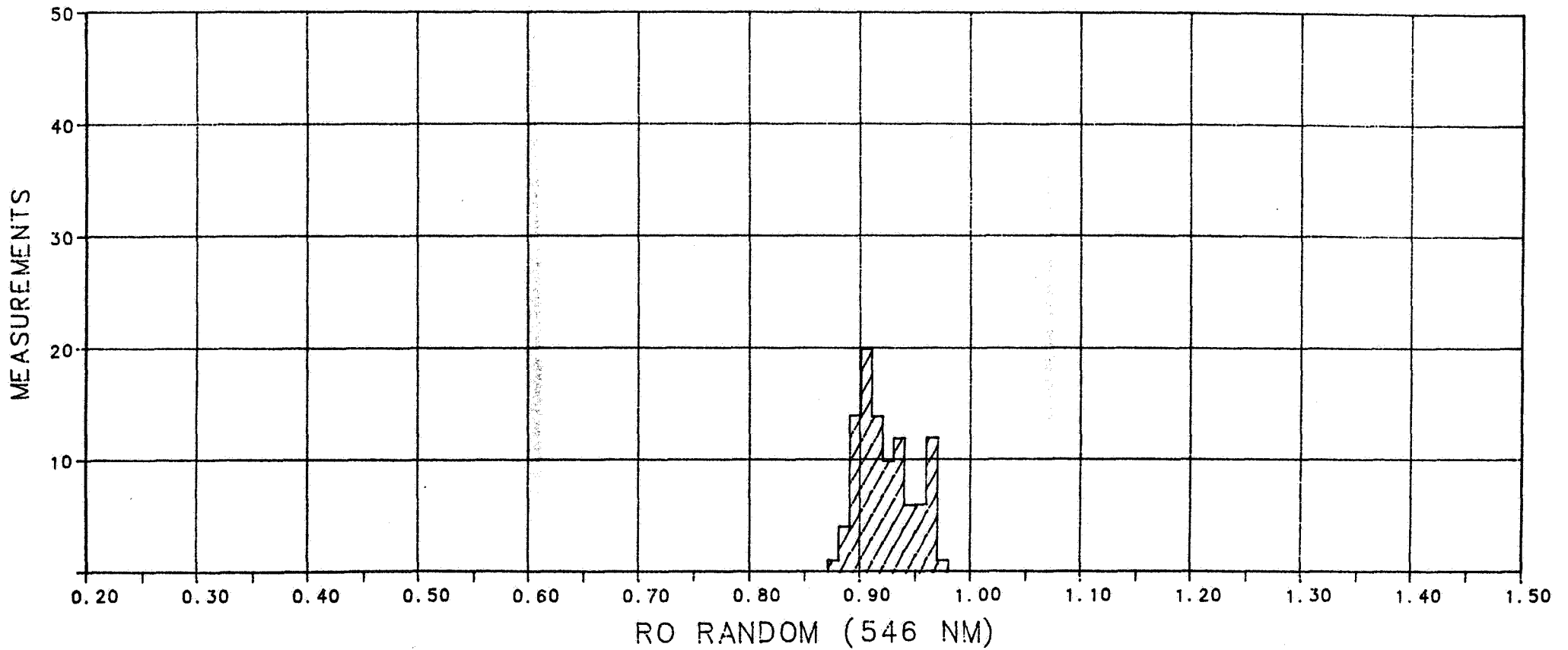
DEPTH: 2898.5 M; TELOCOLLINITE

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10-1
DEPTH/SAMPLE NR. : 2922 M
SAMPLE TYPE : SIDEWALL SAMPLE

MEAN : 0.92
DEVIATION : 0.02
MODE : 0.90
MEASUREMENTS: 100

ANALYST: KMR D. D. : 26-FEB-91



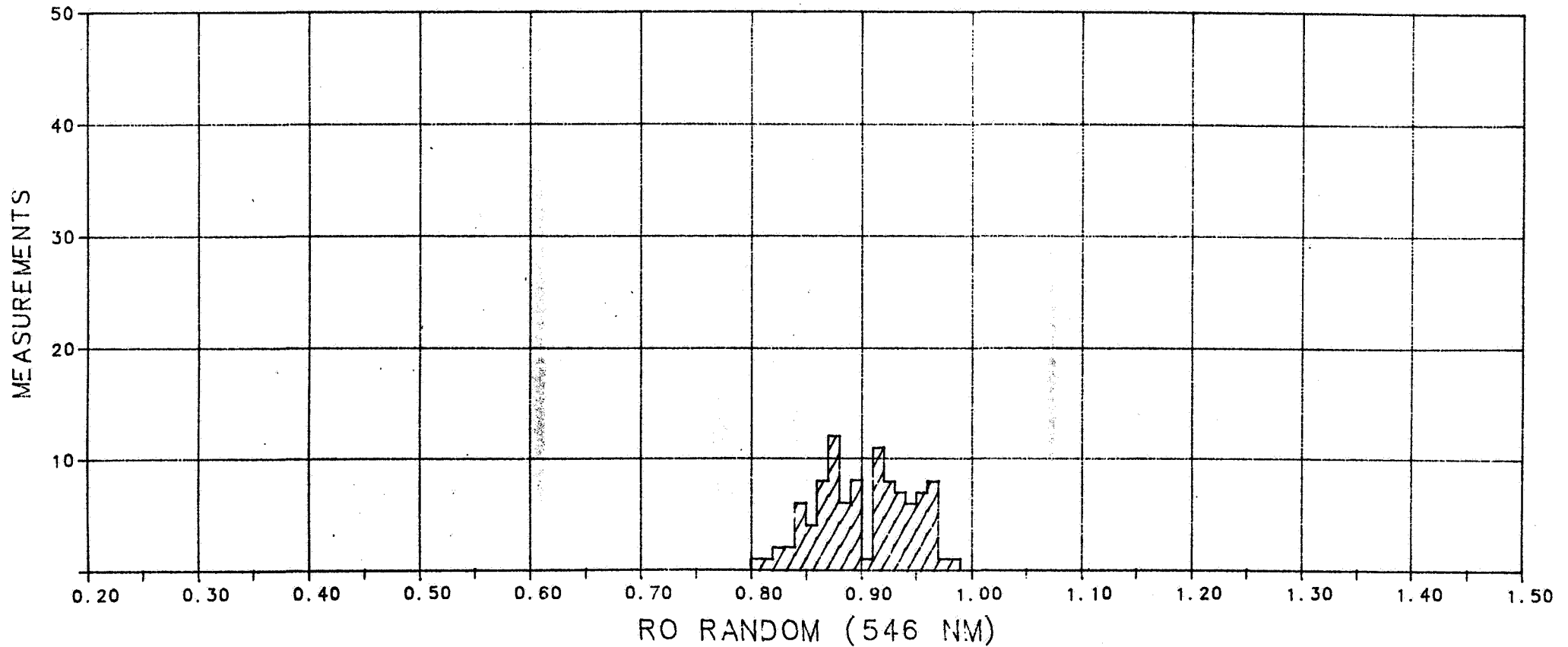
TELOCOLLINITE

REFLECTANCE HISTOGRAM

COUNTRY : NORWAY
WELL/OUTCROP : 6306/10-1
DEPTH/SAMPLE NR. : 2980 M
SAMPLE TYPE : CUTTING SAMPLE

MEAN : 0.90
DEVIATION : 0.04
MODE : 0.87
MEASUREMENTS: 100

ANALYST: KMR D. D. : 4-MAR-91



DESMOCOLLINITE / TELOCOLLINITE

BA-93-608-1

19 MAR 1993

RECEIVED

OLDFIELD UNIT

WELL 6306/10-1

GEOCHEMICAL SUMMARY PL 155

(includes Well 6205/3-1, R Norsk Hydro)

**WELL 6306/10-1
GEOCHEMICAL SUMMARY PL 155
(includes well 6205/3-1,R Norsk Hydro)**

1.0 Introduction

This report has been prepared for use in the PL 155 block evaluation and contains a geochemical summary of well 6306/10-1 (Skalmen). Available geochemical data from well 6205/3-1,R has also been included, mainly for correlation purposes. All depth references are metres bdf.

References

1. Geochemical Screening Well 6306/10-1 (December 1990) by Geolab Nor.
2. Geochemical Investigation of two crude oil samples from well 6306/10-1 by J.M.A. Buiskool Toxopeus and F.A.M. de Gier. RKTR.91.039.
3. Geochemical Investigation of two impregnations from well 6306/10-1 by J.M.A. Buiskool Toxopeus and F.A.M. de Gier. RKTR.92.017

4. Geochemical Investigation of a gas sample from well 6306/10-1 by F.A.M. de Gier and R. Berhitoe. RKTR.91.043
5. Geochemical Investigation of four source rock extracts from well 6306/10- 1 by J.M.A. Buiskool Toxopeus and F.A.M. de Gier. RKTR.91.051
- 6 .Photometric Spore colour, Sporinite Fluorescence and Vitrinite Reflectance of 13 samples from well 6306/10-1 (February 1991) by T. Throndsen & K. Aasgaard, IFE.
7. Geochemical Evaluation of well 6205/3-1 (31.05.90) by N.Telnaes & L. Aakvaag, Norsk Hydro
8. Geochemical Evaluation of well 6205/3-1R (31.03.91) by N.Telnaes & L. Aakvaag, Norsk Hydro
9. Screening Organic geochemistry, Well 6205/3-1 (05/03/90) by N. Telnaes & L. Akvaag, Norsk Hydro
10. Geochemical investigation of five impregnations from well 6205/3-1,R, Norway. J.M.A. Buiskool Toxopeus and F.A.M. de Gier. RKTR.92.147.

Well 6205/3-1, R

kerogen description

		ORGANIC MATTER													
		SOM		VITRINITE				LIPTINITE				INERTINITE	MINERAL MATTER		
		LOAD BEARING		VIT.-1		VIT.-2									
		DENSE LAYERS	LENSES	DIFFUSE/INTERGRANULAR		NON L. B		LAYERS/LENSES TELOCOLLINITE		DETRITAL TELOCOLLINITE		LAYERS/LENSES TELLINITE		DETRITAL TELLINITE	
				LAYERS/LENSES DESMOCOLLINITE		DETRITAL DESMOCOLLINITE		SPORINITE (MICRO-)		SPORINITE (MEGA-)		CUTINITE		SUBERINITE	
				RESINITE (+FLUORINITE)		LIPTODETRINITE		BOTRYOCOCCUS		TASMANITES		OTHER ALGAE		MICROPLANKTON	
				EXSUDATINITE (FLUORESCING)		EXSUDATINITE (NON-FLUORESING) S.HYDR		SCLEROTINITE		(SEMI-) FUSINITE (+INERTODETRINITE)		MICRINITE (+OXY-MICRINITE)		UNDEFINED MATERIALS	
				FRAMBOIDAL PYRITE		AGGREGATES/CRYSTAL PYRITE									
4323.27	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4332.27	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4337.53	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4449.85	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4451.76	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4965.4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4977.45	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5253.42	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5261.25	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5262.12	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

SAMPLES:
(all core samples)

depth in mBDF

LEGEND	
*	Abundant
+	Common
/	Few
-	Rare

Table 4.

VITRINITE DATA ,Well 6306/10-1 (Measured (M) and calculated(E))

Depth (m)	Sample Type	VR/M	VR/E St. Dev.	Maceral
1000	cutt		0.30*	sporecol
1130	cutt		0.36*	sporecol
1167.75	MPI1=0.38		0.63\$	
1169.4	MPI1=0.39		0.63\$	
1290	cutt		0.29*	sporecol
1450	cutt		0.36*	sporecol
1610	cutt		0.42*	sporecol
1770	cutt		0.38*	sporecol
1930	cutt		0.41*	sporecol
2090	cutt		0.46*	sporecol
2250	cutt		0.53*	sporecol
2410	cutt		0.60*	sporecol
2430-35	cutt	0.41		telo
2560	cutt		0.58*	sporecol
2695.7	MPI1=0.64		0.78\$	
2720	cutt		0.51*	sporecol
2753	core	0.68		desmo
2757.3	MPI1=0.51		0.71\$	
2794	SWC	0.77		telo/desmo
2794.8	SWC	0.69		telo
2805.3	core	0.75		telo
2882	core	0.85		desmo/telo
2882.8	MPI1=0.52		0.71\$	
2883	core	0.89		telo
2883.6	core	0.81		telo
2885	core	0.84		desmo/telo
2898	SWC	0.90		telo
2898.5	SWC	0.76		telo
2922	SWC	0.92		telo
2980	cutt	0.90		desmo/telo
2980	MPI1=0.52		(0.71\$)	

*=IFE spore colour, \$=MPI1 derived

	2176-2827m	2695.7m	2757.3m	2882.8m	2980m
Origin	DST#2	Extr.	Extr.	Extr.	Extr.
API	46.8	-	-	-	-
Sulphur %	0.0	-	-	-	-
Vanadium (ppm)	0.0	-	-	-	-
Nickel (ppm)	0.0	-	-	-	-
Pristane/Phytane	3.2	2.5	3.7	6.0	6.0
Pristane/n-C17	0.4	0.7	0.4	1.6	1.2
Phytane/n-C18	0.1	0.2	0.2	0.3	0.2
Gasoline fraction (%)	30.2	-	-	-	-
C7 ALKANES:					
normal (%)	59	23	31	100	n.d
monobranched (%)	32	39	26	0	n.d
polybranched (%)	9	38	43	0	n.d
C7 ALKANES/NAPHTHENES:					
normal (%)	18	7	14	47	n.d
naphthenes (%)	69	72	55	53	n.d
branched (%)	13	21	31	0	n.d
STERANES/TRITERPANES:					
iso-steranes (%)	28	14	22	26	17
rearranged steranes (%)	51	24	30	29	24
triterpanes (%)	21	62	48	45	59
STERANE CONVERSION:					
iso-steranes (%)	37	36	37	41	40
rearranged steranes (%)	45	42	34	30	38
normal steranes (%)	18	22	29	29	22
STERANE CARBON NUMBER:					
C27 steranes (%)	32	35	32	24	21
C28 steranes (%)	34	21	26	21	22
C29 steranes (%)	34	44	42	55	57
Carbon isotope ratios (ppm):					
total oil	-26.5	-26.1	-27.0	-25.0	-25.2
saturates	-27.5	-	-	-	-
aromatics	-25.0	-25.4	-26.9	-24.7	-24.7

Table 6

WELL/ FM	Pr/Ph	C30X	Reg. Ster. Triterp.				Bisn.	Gammac.	bi/naph. (ppm)	C7 VR/E (KSEPL)	VR/M	Ts/Tm	20S/ 20S+20S	iso/ iso+reg	MPI1	COM.S
6306/10-1																
DST	3.2	-	32	34	34	0.38	*	-	1.23(4261)	0.89	-	0.75	0.53	0.61	0.53	
I 1167	n.d	-	34	39	37	0.24	**	?	0.03(6)	n.d	-	0.59	0.40	0.42	0.38	
I 1169	n.d	-	31	39	30	0.14	**	?	0.02(4)	n.d	-	0.54	0.40	0.42	0.39	
E 2695	2.5	-	35	21	44	0.04	-	-	1.49(11789)	1.04	0.68	0.45	0.49	0.6	0.64	
E 2757	3.7	-	32	26	42	0.06	-	-	1.16(11664)	>1.1	-	0.68	0.43	0.57	0.51	
E 2883	6.0	-	24	21	55	0.09	-	-	0.22(2035)	n.d	0.85	0.18	0.47	0.62	0.52	
E 2980	6.0	-	21	22	57	0.03	-	-	0.74(6350)	n.d	0.9	0.47	0.52	0.61	0.52	
6205/3-1, R																
I 3405	3.3	*	n.d	n.d	n.d	n.d	-	-	n.d	n.d	-	n.d	0.42	n.d	n.d	
I 4310	1.5	-	n.d	n.d	n.d	n.d	-	*	n.d	n.d	-	0.9	0.53	0.59	0.99	
I 4333	0.5	-	42	29	29	0.58	(*)	-	n.d	0.81	-	1.24	0.52	0.64	n.d	
I 4335.7	0.8	-	n.d	n.d	n.d	n.d	-	?	n.d	n.d	-	1.1	0.55	0.44	n.d	
I 4336	1.3	-	40	28	32	0.39	-	-	n.d	0.98	-	1.6	0.50	0.63	n.d	
I 4338.7	1.4	-	n.d	n.d	n.d	n.d	-	(*)	n.d	n.d	-	1.0	0.56	0.44	n.d	
I 4339	1.8	-	39	21	40	n.d	-	*	n.d	1.1	-	0.78	0.49	0.64	n.d	
I 4787	n.d	-	35	33	32	0.61	(*)	-	n.d	1.05	-	0.63	0.49	0.61	n.d	
I 4787.6	1.4	-	n.d	n.d	n.d	n.d	*	-	n.d	n.d	-	1.5	0.65	0.50	1.25	
I 4789.0	1.4	-	n.d	n.d	n.d	n.d	*	-	n.d	n.d	1.66	1.1	0.60	0.47	1.22	
I 4789#	0.7	-	40	33	27	0.58	(*)	-	n.d	0.95	-	1.2	0.51	0.61	n.d	
I 4789.5	1.32	-	n.d	n.d	n.d	0.3	*	-	n.d	n.d	-	0.9	0.63	0.47	n.d	
I 5020.9	1.1	-	n.d	n.d	n.d	n.d	*	-	n.d	n.d	-	1.4	0.62	0.47	n.d	
I 5021	1.1	-	n.d	n.d	n.d	n.d	*	-	n.d	n.d	1.63	1.3	0.55	0.48	1.0	
I 5262.8	0.9	-	n.d	n.d	n.d	n.d	-	-	n.d	n.d	1.85	0.4	0.52	0.47	1.0	

I =Impregnation, *=present, Bi/Naph.=biphenyl/naphthalene ratio

E = Source Rock Extract, C30X=diahopane, Bisn.=bisnorhopane, Gammac.=gammacerane

	2716-2827m	1167 m	1169 m
Origin	DST	Impr.	Impr.
API	46.8	-	-
Sulphur (%)	0.0	-	-
Vanadium (ppm)	0.0	-	-
Nickel (ppm)	0.0	-	-
Pristane/Phytane	3.2	n.d	n.d
Pristane/n-C17	0.4	n.d	n.d
Phytane/n-C18	0.1	n.d	n.d
Gasoline fraction (%)	30.2	-	-
C7 ALKANES:			
normal (%)	59	n.d	n.d
monobranched (%)	32	n.d	n.d
polybranched (%)	9	n.d	n.d
C7 ALKANES/NAPHTENES:			
normal (%)	18	n.d	n.d
naphthenes (%)	69	n.d	n.d
branched (%)	13	n.d	n.d
STERANES/TRITERPANES:			
iso-steranes (%)	28	13	12
rearranged steranes (%)	51	67	69
triterpanes (%)	21	20	19
STERANE CONVERSION:			
iso-steranes (%)	37	16	17
rearranged steranes (%)	45	59	62
normal steranes (%)	18	25	21
STERANE CARBON NUMBER:			
C27 steranes (%)	32	34	31
C28 steranes (%)	34	39	39
C29 steranes (%)	34	27	30
Carbon isotope ratios (ppm):			
total oil	-26.5	-27.1	-27.2
saturates	-27.5	-27.0	-27.3
aromatics	-25	-26.9	-27.1

	4333m	4336m	4339m	4787m	4789m
Origin	Imp.	Imp.	Imp.	Imp.	Imp.
Pristane/Phytane	0.5	1.3	1.8	n.d	0.7
Pristane/n-C17	0.4	0.7	0.7	n.d	0.6
Phytane/n-C18	0.6	0.6	0.4	n.d	0.6
C7 ALKANES:					
normal (%)	49	36	42	22	38
monobranched (%)	33	21	28	14	20
polybranched (%)	18	43	30	64	42
C7 ALKANES/NAPHTENES:					
normal (%)	31	23	24	19	31
naphthenes (%)	36	36	43	15	17
branched (%)	33	41	33	66	52
C7 VR/E	0.81	0.98	1.1	1.05	0.95
STERANES/TRITERPANES:					
iso-steranes (%)	33	32	45	43	28
rearranged steranes (%)	56	57	42	44	66
triterpanes (%)	11	11	13	13	6
STERANE CONVERSION:					
iso-steranes (%)	37	37	47	45	32
rearranged steranes (%)	42	45	29	31	51
normal steranes (%)	21	18	24	24	17
STERANE CARBON NUMBER:					
C27 steranes (%)	42	40	39	35	40
C28 steranes (%)	29	28	21	33	33
C29 steranes (%)	29	32	40	32	27
3R/3R+5R terpanes	0.58	0.39	0.0	0.61	0.35
Ts/Tm	1.24	1.60	0.78	0.63	1.2
20S/20R+S C29 steranes	0.52	0.5	0.49	0.49	0.51
iso/iso+normal steranes	0.64	0.63	0.64	0.61	0.61
Sterane VR/E	0.97	0.94	n.d	0.94	0.91
Carbon isotope ratios (ppm):					
total oil	-27.5	-27.4	-28.7	-27.7	-28.8

TABLE 10:

GAS ANALYSIS DATA

	<u>TOTAL GAS (mole %)</u>	<u>(HC only)</u>
Methane	91.57 %	(92.42 %)
Ethane	4.31 %	(4.35 %)
Propane	1.72 %	(1.73 %)
i- Butane	0.24 %	(0.24 %)
n- Butane	0.45 %	(0.45 %)
i- Pentane	0.12 %	(0.12 %)
n- Pentane	0.15 %	(0.15 %)
C6+ hydrocarbons	0.52 %	(0.53 %)
Nitrogen	0.85 %	
Carbon dioxide	0.08 %	
del13C CH4 (per mil)	-35.7	
del13C C2H6 (per mil)	-29.4	

Table 11

WELL	SAMPLE	DEPTH (m)	CONTR.	del C13 (whole)	del C13 (sat.)	del C13 (arom.)	NSO	Asph.
6306/10-1	DST 2	2716-2827	KSEPL	-26.5	-27.5	-25.0		
	Imp.	1167	a/a	-27.2	-27.3	-26.9		
	a/a	1169	a/a	-27.1	-27.0	-25.4		
	Extr.	2695	a/a	-26.1	-	-25.4		
	a/a	2757	a/a	-27.0	-	-26.9		
	a/a	2883	a/a	-25.0	-	-24.7		
	a/a	2980	a/a	-25.2	-27.0	-24.7		
6205/3-1,R	Imp	4333	a/a	-27.5				
	Imp	4336	a/a	-27.4				
	Imp	4339	a/a	-28.7				
	Imp	4787	a/a	-27.7				
	Imp	4789	a/a	-28.8				