

Table 1 : Lithology description for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description			
1550.00						0028
	1.15	95	Sh/Clst: m gy to drk gy, slt 5 Sltst : lt gy			0028-1L 0028-2L
1750.00						0029
	0.88	95	Sh/Clst: m gy to drk gy, slt 5 Sltst : lt gy			0029-1L 0029-2L
1850.00						0030
	0.62	100	Sh/Clst: m gy to drk gy, slt tr Sltst : lt gy tr Ca : gy w, chk			0030-1L 0030-2L 0030-3L
1900.00						0001
	0.77	100	Sh/Clst: lt gy to m gy, slt			0001-1L
1930.00						0002
	0.47	100	Sh/Clst: lt gy to m gy, slt tr Ca : gy w, f			0002-1L 0002-2L
1960.00						0003
	1.14	85	Sh/Clst: m gy to brn gy, slt 10 Ca : gy w, f 5 Sltst : brn gy to m gy			0003-1L 0003-2L 0003-3L
1990.00						0004
	0.65	75	Sh/Clst: lt gy to m gy to brn gy, slt 20 Ca : gy w, f 5 Sltst : brn gy tr Cont : fib			0004-1L 0004-2L 0004-3L 0004-4L

Table 1 : Lithology description for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample	
Int Cvd	TOC%	%	Lithology description				
2020.00						0005	
	1.23	75	Sh/Clst: lt gy to m gy to brn gy, slt			0005-1L	
		25	Ca : gy w, f			0005-2L	
		tr	Sltst : brn gy			0005-3L	
		tr	Cont : fib			0005-4L	
2050.00						0006	
	0.75	85	Sh/Clst: lt gy to m gy to brn gy, slt			0006-1L	
		15	Ca : gy w, f			0006-2L	
		tr	Cont : fib			0006-3L	
2080.00						0007	
	1.79	90	Sh/Clst: lt gy to m gy to brn gy, slt			0007-1L	
		10	Cont : dd			0007-2L	
2110.00						0008	
	1.52	95	Sh/Clst: lt gy to m gy to brn gy, slt			0008-1L	
		5	Cont : dd			0008-2L	
2140.00						0009	
	3.07	95	Sh/Clst: lt gy to m gy to brn gy, slt			0009-1L	
		5	Cont : dd			0009-2L	
2170.00						0010	
	2.87	95	Sh/Clst: m gy to brn gy, slt			0010-1L	
		5	Cont : dd			0010-2L	
2200.00						0011	
	1.63	100	Sh/Clst: drk gy, slt			0011-1L	
		tr	Cont : dd			0011-2L	

Table 1: Lithology description for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
2230.00						0012
		0.77	100	Sh/Clst: m gy, slt tr Cont : dd		0012-1L 0012-2L
2239.00						0013
		1.22	85	Sh/Clst: m gy, slt 15 S/Sst : w, f, crs, l		0013-1L 0013-2L
2248.00						0014
		1.14	70	Sh/Clst: m gy, slt 15 S/Sst : w, f, crs, l 15 Ca : w, chk tr Cont : dd		0014-1L 0014-2L 0014-3L 0014-4L
2257.00						0015
		1.71	50	Sh/Clst: m gy, slt 30 S/Sst : w, f, crs, l 20 Ca : w, chk tr Cont : dd		0015-1L 0015-2L 0015-3L 0015-4L
2266.00						0031
		1.11	40	Sh/Clst: m gy to lt gy, calc, slt 30 S/Sst : w, f, crs, l 30 Cont : dd		0031-1L 0031-2L 0031-3L
2275.00						0032
		1.19	40	Sh/Clst: m gy to brn gy, calc, slt 30 S/Sst : w, f, crs, l 30 Cont : dd		0032-1L 0032-2L 0032-3L
2284.00						0033
		1.50	50	Sh/Clst: m gy to brn gy, calc, slt 30 S/Sst : w, f, crs, l 20 Cont : dd, fib		0033-1L 0033-2L 0033-3L

Table 1 : Lithology description for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
2293.00						0016
	2.56			50 Cont : dd		0016-1L
				40 Sh/Clst: m gy to drk gy, slt, trbofgs		0016-2L
				10 S/Sst : w, f, crs, l		0016-3L
2302.00						0017
	1.99			35 Sh/Clst: brn gy to drk gy, slt		0017-1L
				35 Sh/Clst: lt gy, slt		0017-2L
				10 Ca : gy w, chk		0017-3L
				10 S/Sst : w, f, crs, l		0017-4L
				10 Cont : dd		0017-5L
2311.00						0018
	1.19			40 Sh/Clst: brn gy to drk gy, slt		0018-1L
				20 Sh/Clst: lt gy, slt		0018-2L
				15 Ca : gy w, chk		0018-3L
				15 S/Sst : w, f, crs, l		0018-4L
				10 Cont : dd		0018-5L
2320.00						0019
	0.78			40 Sh/Clst: m gy to drk gy, slt		0019-1L
				30 Cont : dd		0019-4L
				20 Ca : gy w, chk		0019-2L
				10 S/Sst : w, f, crs, l		0019-3L
2329.00						0020
	0.90			50 Sh/Clst: m gy to drk gy, slt		0020-1L
				20 Cont : dd		0020-4L
				15 Ca : gy w, chk		0020-2L
				15 S/Sst : w, f, crs, l		0020-3L
2338.00						0021
	0.77			50 Sh/Clst: m gy to drk gy, slt		0021-1L
				30 Cont : dd		0021-4L
				15 S/Sst : w, f, crs, l		0021-3L
				5 Ca : gy w, chk		0021-2L

Table 1 : Lithology description for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample	
Int Cvd	TOC%	%	Lithology description				
2350.00						0022	
	0.86	40	Sh/Clst:	m gy to drk gy, slt		0022-1L	
		30	S/Sst	: w, f, crs, l		0022-2L	
		30	Cont	: dd		0022-3L	
2370.00						0023	
	1.16	40	Sh/Clst:	m gy to drk gy, slt		0023-1L	
		30	S/Sst	: w, f, crs, l		0023-2L	
		30	Cont	: dd		0023-3L	
		tr	Coal	: gy blk		0023-4L	
2390.00						0024	
	2.87	60	Sh/Clst:	lt gy to m gy, slt		0024-1L	
		20	Cont	: dd		0024-3L	
		15	Ca	: gy w to w, chk		0024-4L	
		5	S/Sst	: w, f, crs, l		0024-2L	
		tr	Coal	: brn blk		0024-5L	
2410.00						0025	
	0.90	60	Sh/Clst:	m gy to drk gy, slt		0025-1L	
		20	Ca	: gy w to w, chk		0025-2L	
		20	Cont	: dd		0025-3L	
2430.00						0026	
	0.42	50	Ca	: gy w to w, chk		0026-2L	
		30	Sh/Clst:	m gy to drk gy, slt		0026-1L	
		20	Cont	: dd		0026-3L	
2450.00						0027	
	0.59	50	Ca	: gy w to w, chk		0027-2L	
		40	Sh/Clst:	m gy to drk gy, slt		0027-1L	
		10	Cont	: dd		0027-3L	

Table 1 : Lithology description for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
2470.00						0034
	0.42	40	Ca	: w to gy w, chk		0034-1L
		40	Sh/Clst:	m gy to drk gy, slt		0034-2L
		20	Cont	: dd		0034-3L
2490.00						0035
	0.93	50	Ca	: w to gy w, chk		0035-1L
		25	Sh/Clst:	m gy to drk gy, slt		0035-2L
		20	Cont	: dd		0035-3L
		5	S/Sst	: w, f, crs, l		0035-4L
2510.00						0036
	1.08	60	Ca	: w to gy w, chk		0036-1L
		20	Sh/Clst:	m gy to drk gy, slt		0036-2L
		15	Cont	: dd		0036-3L
		5	S/Sst	: w, f, crs, l		0036-4L
2530.00						0037
	1.15	85	Ca	: w to gy w, chk		0037-1L
		5	Sh/Clst:	m gy to drk gy, slt		0037-2L
		5	Cont	: dd		0037-3L
		5	S/Sst	: w, f, crs, l		0037-4L
2550.00						0038
	0.56	80	Ca	: w to gy w, chk		0038-1L
		10	Sh/Clst:	drk gy to gy blk, slt		0038-2L
		5	Cont	: dd		0038-3L
		5	S/Sst	: w, f, crs, l		0038-4L
2570.00						0039
	0.45	55	Ca	: w to gy w, chk		0039-1L
		15	Sh/Clst:	drk gy to gy blk, slt		0039-2L
		15	Cont	: dd		0039-3L
		15	S/Sst	: w, f, crs, l		0039-4L

Table 1 : Lithology description for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
2590.00						0040
	0.25	50	Ca	: w to gy w, chk		0040-1L
		20	Sh/Clst:	drk gy to gy blk, slt		0040-2L
		20	S/Sst	: w, f, crs, l		0040-4L
		10	Cont	: dd		0040-3L

Table 2 : Rock-Eval table for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1550.00	cut	Sh/Clst: m gy to drk gy	3.59	1.30	0.76	1.71	1.15	113	66	4.9	0.73	373	0028-1L
1750.00	cut	Sh/Clst: m gy to drk gy	0.29	0.61	1.00	0.61	0.88	69	114	0.9	0.32	418	0029-1L
1850.00	cut	Sh/Clst: m gy to drk gy	0.34	0.46	0.95	0.48	0.62	74	153	0.8	0.43	420	0030-1L
1900.00	cut	Sh/Clst: lt gy to m gy	1.82	0.84	0.23	3.65	0.77	109	30	2.7	0.68	332	0001-1L
1930.00	cut	Sh/Clst: lt gy to m gy	1.37	0.50	0.08	6.25	0.47	106	17	1.9	0.73	329	0002-1L
1960.00	cut	Sh/Clst: m gy to brn gy	8.25	1.22	0.20	6.10	1.14	107	18	9.5	0.87	333	0003-1L
1990.00	cut	Sh/Clst: lt gy to m gy to brn gy	2.95	0.73	0.08	9.12	0.65	112	12	3.7	0.80	332	0004-1L
2020.00	cut	Sh/Clst: lt gy to m gy to brn gy	11.85	1.53	0.14	10.93	1.23	124	11	13.4	0.89	330	0005-1L
2050.00	cut	Sh/Clst: lt gy to m gy to brn gy	5.14	1.04	0.16	6.50	0.75	139	21	6.2	0.83	333	0006-1L
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	10.77	3.00	0.98	3.06	1.79	168	55	13.8	0.78	425	0007-1L
2110.00	cut	Sh/Clst: lt gy to m gy to brn gy	9.25	1.76	0.27	6.52	1.52	116	18	11.0	0.84	378	0008-1L
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	18.28	5.91	0.59	10.02	3.07	193	19	24.2	0.76	420	0009-1L
2170.00	cut	Sh/Clst: m gy to brn gy	18.02	5.20	0.63	8.25	2.87	181	22	23.2	0.78	424	0010-1L
2200.00	cut	Sh/Clst: drk gy	3.34	2.41	0.48	5.02	1.63	148	29	5.8	0.58	426	0011-1L
2230.00	cut	Sh/Clst: m gy	4.72	0.98	0.51	1.92	0.77	127	66	5.7	0.83	337	0012-1L
2239.00	cut	Sh/Clst: m gy	4.21	1.28	0.34	3.76	1.22	105	28	5.5	0.77	335	0013-1L



Table 2 : Rock-Eval table for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2248.00	cut	Sh/Clst: m gy	9.06	1.57	0.27	5.81	1.14	138	24	10.6	0.85	342	0014-1L
2257.00	cut	Sh/Clst: m gy	12.86	2.13	0.39	5.46	1.71	125	23	15.0	0.86	339	0015-1L
2266.00	cut	Sh/Clst: m gy to lt gy	5.89	1.36	1.03	1.32	1.11	123	93	7.3	0.81	338	0031-1L
2275.00	cut	Sh/Clst: m gy to brn gy	3.74	1.50	0.82	1.83	1.19	126	69	5.2	0.71	400	0032-1L
2284.00	cut	Sh/Clst: m gy to brn gy	6.85	1.61	1.44	1.12	1.50	107	96	8.5	0.81	368	0033-1L
2293.00	cut	Sh/Clst: m gy to drk gy	22.38	2.86	0.50	5.72	2.56	112	20	25.2	0.89	426	0016-2L
2302.00	cut	Sh/Clst: brn gy to drk gy	18.03	3.28	1.00	3.28	1.99	165	50	21.3	0.85	422	0017-1L
2311.00	cut	Sh/Clst: brn gy to drk gy	3.51	1.20	0.95	1.26	1.19	101	80	4.7	0.75	407	0018-1L
2320.00	cut	Sh/Clst: m gy to drk gy	0.66	0.56	0.23	2.43	0.78	72	29	1.2	0.54	418	0019-1L
2329.00	cut	Sh/Clst: m gy to drk gy	0.70	0.66	0.33	2.00	0.90	73	37	1.4	0.51	420	0020-1L
2338.00	cut	Sh/Clst: m gy to drk gy	0.16	0.43	0.42	1.02	0.77	56	55	0.6	0.27	421	0021-1L
2350.00	cut	Sh/Clst: m gy to drk gy	1.52	0.81	0.42	1.93	0.86	94	49	2.3	0.65	415	0022-1L
2370.00	cut	Sh/Clst: m gy to drk gy	2.64	0.77	0.41	1.88	1.16	66	35	3.4	0.77	413	0023-1L
2390.00	cut	Sh/Clst: lt gy to m gy	28.68	4.45	0.59	7.54	2.87	155	21	33.1	0.87	421	0024-1L
2410.00	cut	Sh/Clst: m gy to drk gy	2.68	0.86	0.39	2.21	0.90	96	43	3.5	0.76	412	0025-1L
2430.00	cut	Ca : gy w to w	0.64	2.04	0.55	3.71	0.42	486	131	2.7	0.24	446	0026-2L

Table 2 : Rock-Eval table for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2450.00	cut	Ca : gy w to w	3.83	3.02	0.73	4.14	0.59	512	124	6.8	0.56	444	0027-2L
2470.00	cut	Ca : w to gy w	0.70	2.92	0.62	4.71	0.42	695	148	3.6	0.19	443	0034-1L
2490.00	cut	Ca : w to gy w	12.65	3.01	0.65	4.63	0.93	324	70	15.7	0.81	443	0035-1L
2510.00	cut	Ca : w to gy w	21.19	4.04	0.63	6.41	1.08	374	58	25.2	0.84	445	0036-1L
2530.00	cut	Ca : w to gy w	27.32	3.16	0.56	5.64	1.15	275	49	30.5	0.90	444	0037-1L
2550.00	cut	Ca : w to gy w	2.66	2.31	0.50	4.62	0.56	413	89	5.0	0.54	445	0038-1L
2570.00	cut	Ca : w to gy w	2.14	1.95	0.54	3.61	0.45	433	120	4.1	0.52	440	0039-1L
2590.00	cut	Ca : w to gy w	0.34	0.67	0.35	1.91	0.25	268	140	1.0	0.34	436	0040-1L

Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	6.48	21.02	51.94	20.55	5.91	0009-1L
2170.00	cut	bulk	3.10	17.92	51.77	27.20	5.20	0010-0B
2302.00	cut	Sh/Clst: brn gy to drk gy	4.10	21.59	51.18	23.12	3.28	0017-1L
2390.00	cut	Sh/Clst: lt gy to m gy	3.61	18.32	52.33	25.74	4.45	0024-1L

Table 4 a: Weight of EOM and Chromatographic Fraction for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	Rock Extracted (g)	EOM (mg)	Sat (mg)	Aro (mg)	Asph (mg)	NSO (mg)	HC (mg)	Non-HC (mg)	TOC (e) (%)	Sample
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	2.8	6.7	5.2	0.3	0.5	0.8	5.5	1.3	1.84	0007-1L
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	4.9	89.8	82.1	0.7	1.3	5.8	82.8	7.1	2.26	0009-1L
2170.00	cut	Sh/Clst: m gy to brn gy	7.4	161.4	149.0	0.9	0.7	10.8	149.9	11.5	2.12	0010-1L
2338.00	com	Composite sample - see table 4 e	2.3	4.3	3.1	0.1	0.3	0.8	3.2	1.1	1.09	0044-0B
2470.00	com	Composite sample - see table 4 e	6.2	8.9	7.1	0.2	0.2	1.4	7.3	1.6	0.47	0045-0B
2510.00	cut	Ca : w to gy w	7.2	120.4	110.4	0.6	1.5	7.9	111.0	9.4	0.55	0036-1L
2530.00	cut	Ca : w to gy w	10.1	224.7	214.6	1.0	0.6	8.4	215.6	9.0	0.51	0037-1L

Table 4 b: Concentration of EOM and Chromatographic Fraction (wt ppm rock) for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	2442	1884	94	181	282	1978	463	0007-1L
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	18407	16815	147	264	1180	16963	1444	0009-1L
2170.00	cut	Sh/Clst: m gy to brn gy	21869	20192	121	93	1462	20314	1555	0010-1L
2338.00	com	Composite sample - see table 4 e	1874	1350	56	129	337	1406	467	0044-0B
2470.00	com	Composite sample - see table 4 e	1445	1155	25	38	225	1181	264	0045-0B
2510.00	cut	Ca : w to gy w	16718	15327	87	201	1101	15415	1302	0036-1L
2530.00	cut	Ca : w to gy w	22199	21208	98	61	831	21307	892	0037-1L

Table 4 c: Concentration of EOM and Chromatographic Fraction (mg/g TOC(e)) for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	132.72	102.39	5.12	9.85	15.36	107.51	25.20	0007-1L
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	814.50	744.05	6.53	11.70	52.23	750.58	63.92	0009-1L
2170.00	cut	Sh/Clst: m gy to brn gy	1031.60	952.47	5.75	4.41	68.97	958.22	73.38	0010-1L
2338.00	com	Composite sample - see table 4 e	171.97	123.91	5.16	11.91	30.98	129.08	42.89	0044-0B
2470.00	com	Composite sample - see table 4 e	307.60	245.87	5.52	8.28	47.93	251.39	56.21	0045-0B
2510.00	cut	Ca : w to gy w	3039.65	2786.87	15.91	36.62	200.25	2802.78	236.87	0036-1L
2530.00	cut	Ca : w to gy w	4352.86	4158.53	19.38	12.01	162.95	4177.90	174.96	0037-1L

Table 4 d: Composition of material extracted from the rock (%) for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	Sat	Aro	Asph	NSO	HC	Non-HC	Sat	HC	Sample
			EOM	EOM	EOM	EOM	EOM	EOM	EOM	Aro	
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	77.15	3.86	7.42	11.57	81.01	18.99	2000.00	426.56	0007-1L
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	91.35	0.80	1.44	6.41	92.15	7.85	11418	1174.18	0009-1L
2170.00	cut	Sh/Clst: m gy to brn gy	92.33	0.56	0.43	6.69	92.89	7.11	16487	1305.92	0010-1L
2338.00	com	Composite sample - see table 4 e	72.06	3.00	6.93	18.01	75.06	24.94	2400.00	300.93	0044-0B
2470.00	com	Composite sample - see table 4 e	79.93	1.79	2.69	15.58	81.73	18.27	4456.25	447.24	0045-0B
2510.00	cut	Ca : w to gy w	91.68	0.52	1.20	6.59	92.21	7.79	17630	1183.26	0036-1L
2530.00	cut	Ca : w to gy w	95.54	0.45	0.28	3.74	95.98	4.02	21231	2387.93	0037-1L

Depth unit of measure: m

NOTE: Depths shown in tables 4 a to d correspond to the composite samples' lower depth.

<u>Upper depth</u>	<u>Lower depth</u>	<u>Typ</u>	<u>Sample</u>	<u>Depth</u>	<u>Typ</u>	<u>Lithology</u>	<u>Sample</u>
2311.00	2338.00	com	0044-0B is composed of:	2311.00	cut	Sh/Clst: brn gy to drk gy, slt	0018-1L
				2320.00	cut	Sh/Clst: m gy to drk gy, slt	0019-1L
				2329.00	cut	Sh/Clst: m gy to drk gy, slt	0020-1L
				2338.00	cut	Sh/Clst: m gy to drk gy, slt	0021-1L
2430.00	2470.00	com	0045-0B is composed of:	2430.00	cut	Ca : gy w to w, chk	0026-2L
				2450.00	cut	Ca : gy w to w, chk	0027-2L
				2470.00	cut	Ca : w to gy w, chk	0034-1L



Table 5: Saturated Hydrocarbon Ratios for well NOCS 25/8-8S

Depth unit of measure: m			Pristane	Pristane	Pristane/nC17	Phytane		nC17	
Depth	Typ	Lithology	nC17	Phytane	Phytane/nC18	nC18	CPI1	nC17+nC27	Sample
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	0.41	1.07	1.11	0.37	1.04	1.00	0007-1L
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	0.35	1.21	1.12	0.31	1.05	1.00	0009-1L
2170.00	cut	Sh/Clst: m gy to brn gy	0.40	1.13	1.13	0.36	1.29	1.00	0010-1L
2338.00	com	bulk	0.34	1.76	1.33	0.25	-	1.00	0044-0B
2470.00	com	bulk	0.36	1.11	1.14	0.32	1.09	0.98	0045-0B
2510.00	cut	Ca : w to gy w	0.38	1.11	1.12	0.34	1.52	1.00	0036-1L
2530.00	cut	Ca : w to gy w	0.33	1.22	1.18	0.28	1.36	1.00	0037-1L

Table 6 : Thermal Maturity Data for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
1550.00	cut	Sh/Clst: m gy to drk gy	0.36	20	0.04	-	-	373	0028-1L
1850.00	cut	Sh/Clst: m gy to drk gy	0.39	20	0.05	-	-	420	0030-1L
1900.00	cut	Sh/Clst: lt gy to m gy	0.40	20	0.05	-	-	332	0001-1L
2020.00	cut	Sh/Clst: lt gy to m gy to brn gy	0.49	7	0.07	-	3.5-4.0(?)	330	0005-1L
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	0.43	20	0.05	-	4.0(?)	425	0007-1L
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	0.44	7	0.06	-	3.5	420	0009-1L
2170.00	cut	Sh/Clst: m gy to brn gy	0.39	8	0.03	-	4.0	424	0010-1L
2311.00	com	bulk	-	-	-	-	4.5	-	0041-0B
2390.00	cut	Sh/Clst: lt gy to m gy	0.40	11	0.03	-	4.0-4.5(?)	421	0024-1L

Table 7 : Visual Kerogen Composition Data for well NOCS 25/8-8S

Depth unit of measure: m

Depth	Typ	Lithology	L	A	L	S	C	D	I	S	I	M	S	V	C	V	A	Sample				
			%	L	t	l	l	n	e	l	t	L	%	n	s	t	n		o	I	%	n
2020.00	cut	Sh/Clst: lt gy to m gy to brn gy	80	*	**	*		* *	20	*				TR		*		0005-1L				
2080.00	cut	Sh/Clst: lt gy to m gy to brn gy	75	*	**	*		* *	15	*			10	*	**			0007-1L				
2140.00	cut	Sh/Clst: lt gy to m gy to brn gy	90	*	**	*		* *	10	*			TR		*		0009-1L					
2170.00	cut	Sh/Clst: m gy to brn gy	90	*	**	*		* *	5	*			5	*	**			0010-1L				
2311.00	com	bulk	75	*	**	* *		* *	10	*	**		15	*	**			0041-0B				
2390.00	cut	Sh/Clst: lt gy to m gy	NDP	*	**	* ?		* *	NDP	*			NDP		*			0024-1L				

Table 8A: Tabulation of carbon isotope data for EOM/EOM - fractions for well NOCS 25/8-8S

Depth unit of measure: m

<u>Depth</u>	<u>Typ</u>	<u>Lithology</u>	<u>EOM</u>	<u>Saturated</u>	<u>Aromatic</u>	<u>NSO</u>	<u>Asphaltenes</u>	<u>Kerogen</u>	<u>Sample</u>
2140.00	cut	Sh/Clst	-	-26.69	-26.32	-	-	-	0009-1
2170.00	cut	Sh/Clst	-	-26.79	-26.85	-	-	-	0010-1
2530.00	cut	Ca	-	-26.42	-25.99	-	-	-	0037-1

Table 8B: Tabulation of cv values from carbon isotope data for well NOCS 25/8-8S

Depth unit of measure: m

<u>Depth</u>	<u>Typ</u>	<u>Lithology</u>	<u>Saturated</u>	<u>Aromatic</u>	<u>cv value</u>	<u>Sample</u>
2140.00	cut	Sh/Clst	-26.69	-26.32	-2.55	0009-1
2170.00	cut	Sh/Clst	-26.79	-26.85	-3.48	0010-1
2530.00	cut	Ca	-26.42	-25.99	-2.51	0037-1

Table 9a: Variation in Triterpane Distribution (peak height) SIR for Well NOCS 25/8-8S

Depth unit of measure: m

Depth	Lithology	Ratio1	Ratio2	Ratio3	Ratio4	Ratio5	Ratio6	Ratio7	Ratio8	Ratio9	Rat.10	Rat.11	Rat.12	Rat.13	Rat.14	Sample
2140.00	Sh/Clst	1.18	0.54	0.07	0.36	0.27	0.02	-	-	-	0.04	0.94	0.34	0.19	31.52	0009-1
2170.00	Sh/Clst	1.54	0.61	0.03	0.17	0.14	-	-	-	-	0.03	0.96	0.19	0.10	38.63	0010-1
2530.00	Ca	0.89	0.47	0.17	0.86	0.46	0.05	-	-	-	0.39	0.91	0.46	0.10	72.86	0037-1

List of Triterpane Distribution Ratios

Ratio 1:  $B / A$

Ratio 2:  $B / B+A$

Ratio 3:  $B / B+E+F$

Ratio 4:  $C / E$

Ratio 5:  $C / C+E$

Ratio 6:  $X / E$

Ratio 7:  $Z / E$

Ratio 8:  $Z / C$

Ratio 9:  $Z / Z+E$

Ratio 10:  $Q / E$

Ratio 11:  $E / E+F$

Ratio 12:  $C+D / C+D+E+F$

Ratio 13:  $D+F / C+E$

Ratio 14:  $J1 / J1+J2$  (%)

Table 9b: Variation in Sterane Distribution (peak height) SIR for Well NOCS 25/8-8S

Depth unit of measure: m

<u>Depth</u>	<u>Lithology</u>	<u>Ratio1</u>	<u>Ratio2</u>	<u>Ratio3</u>	<u>Ratio4</u>	<u>Ratio5</u>	<u>Ratio6</u>	<u>Ratio7</u>	<u>Ratio8</u>	<u>Ratio9</u>	<u>Ratio10</u>	<u>Sample</u>
2140.00	Sh/Clst	0.12	11.00	60.63	0.68	0.88	0.15	0.13	0.44	0.12	0.87	0009-1
2170.00	Sh/Clst	0.10	5.66	50.93	0.87	0.90	0.15	0.13	0.34	0.06	0.55	0010-1
2530.00	Ca	0.22	26.67	69.24	1.54	0.81	0.67	0.55	0.53	0.36	1.53	0037-1



List of Sterane Distribution Ratios

Ratio 1:  $a / a+j$

Ratio 2:  $q / q+t$  (%)

Ratio 3:  $2*(r+s) / (q+t + 2*(r+s))$  (%)

Ratio 4:  $a+b+c+d / h+k+l+n$

Ratio 5:  $r+s / r+s+q$

Ratio 6:  $u+v / u+v+q+r+s+t$

Ratio 7:  $u+v / u+v+i+m+n+q+r+s+t$

Ratio 8:  $r+s / q+r+s+t$

Ratio 9:  $q / t$

Ratio 10:  $r+s / t$

Table 9c: Raw triterpane data (peak height) m/z 191 SIR for Well NOCS 25/8-8S

Depth unit of measure: m

Depth	Lithology	P	Q	R	S	T	A	B	Z	C	Sample
		X	D	E	F	G	H	I	J1	J2	
		K1	K2	L1	L2	M1	M2				
2140.00	Sh/Clst	43.6 6.4 9.7	16.2 73.6 10.1	5.8 374.7 4.4	11.7 22.5 5.4	2.8 27.1 5.5	24.0 70.7 9.1	28.4 11.4	0.0 11.4	135.6 24.7	0009-1
2170.00	Sh/Clst	45.2 0.0 5.1	19.3 59.7 14.0	0.0 733.9 3.2	9.6 26.9 4.9	0.0 27.2 5.1	17.5 43.0 8.8	27.1 9.7	0.0 12.8	123.4 20.4	0010-1
2530.00	Ca	4821.9 217.2 401.6	1762.4 388.3 277.8	664.2 4573.0 193.4	1035.4 437.5 138.6	351.4 1268.4 152.1	1193.3 1032.1 109.2	1060.9 183.2	0.0 1838.0	3922.8 684.7	0037-1

Table 1d: Raw sterane data (peak height) m/z 217 SIR for Well NOCS 25/8-8S

Depth unit of measure: m

Depth	Lithology	u	v	a	b	c	d	e	f	g	Sample
		h	i	j	k	l	m	n	o		
		p	q	r	s	t					
2140.00	Sh/Clst	18.4	8.0	13.2	13.7	4.8	12.8	8.8	6.4	25.1	0009-1
		50.4	11.9	8.7	94.1	14.5	23.0	3.7	16.4	5.9	
2170.00	Sh/Clst	16.6	7.7	14.9	11.2	4.5	13.2	6.1	7.2	37.3	0010-1
		49.9	10.5	7.8	127.2	11.0	8.4	8.8	20.5	7.3	
2530.00	Ca	1796.4	756.5	1066.7	706.3	204.5	292.3	410.2	213.1	1926.5	0037-1
		218.0	513.2	295.9	3886.7	505.1	131.9	186.9	319.9	341.3	

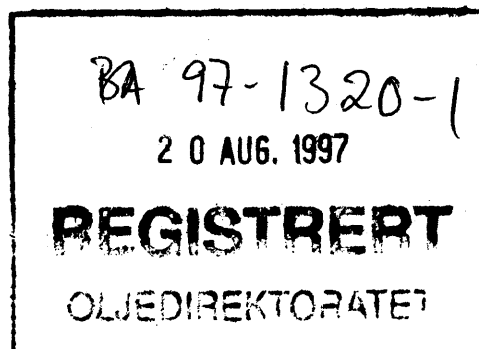
**Exxon Production Research Company**

**Characterization of Oil and Gas and Degree of Reservoir  
Compartmentalization within the Elli-Tau (Jotun) Fields,  
Norwegian North Sea**

**P. J. Mankiewicz  
G. H. Isaksen**

This study of hydrocarbon evaluation falls under the OIMS-TP category,  
Petroleum Geochemistry, of the EPR Geoscience Excluded List.

**Integrated Basin Analysis Division  
EPR.99ES.96  
November 1996**



# Characterization of Oil and Gas and Degree of Reservoir Compartmentalization within the Elli-Tau Fields

---

## Study Objective

Preliminary analyses of the PVT data from samples collected at Elli and Tau suggested possible compartmentalization of the reservoir. This effort of gas and oil analyses was initiated to assess the degree, if any, of fluid homogeneity in the reservoir(s). More specifically, the objectives of this work were to:

- characterize the geochemistry of the oils and gases within the Elli and Tau Fields in terms of source facies, maturity and alteration,
  - determine the degree of reservoir compartmentalization,
  - relate geochemistry data to engineering PVT data, and
  - determine if the Tau gas cap contained oil in the past.
- 

## Introduction

The Elli and Tau fields are located in the northernmost part of the Utsira High (blocks 25/7 and 25/8) in the Norwegian North Sea (**Figure 1**). Gases and oils were received in pressurized cylinders from five wells, 25/7-3 (Elli-South), 25/8-6 and 5S (Elli) and 25/8-8A,8B, and 8S (Tau). The location of samples with respect to stratigraphic zone is shown in **Figures 2** and **3**. The following report describes the type of analyses conducted and the interpretation of the results with respect to the study objectives.

---

## Samples Analyzed

Gases were analysed for their stable carbon isotope ratios and composition. The oils were analysed for bulk properties, whole oil and C<sub>4</sub>-C<sub>19</sub> gas chromatography, biomarker analyses (GC/MS and GC/MS/MS), and limited carbon isotope ratio analyses of the bulk saturate and aromatic fractions as well as individual components in the C<sub>4</sub>-C<sub>19</sub> range (IR-GCMS). The analyses performed on any given sample are listed in **Table 1**.

---

**Table 1: Analyses conducted on fluid samples from Elli-Tau.**

Field	Well	Well Code	Depth (m)	EPR #	Cylinder #	Gas Isotopes	C4-C19 GC	C4-C19 IR-GCMS	Whole Oil GC	GC-MSMS
Elli	25/8-6	6-1	2082.2	201917	TS-10314	√	√		√	√
Elli	25/8-6	6-2	2122.1	201921	TS-98-14	√	√		√	√
Elli	25/8-5S	5S-1	2018-2049*	201914	TS-8302	√	√	√	√	√
Elli	25/8-5S	5S-2	2018-2049*	201936	3884A	√				
Elli-South	25/7-3	ES-3		202086			√		√	√
Tau	25/8-8A	8A-3	2445.1	201925	TS-11020	√				
Tau	25/8-8A	8A-4	2430	201918	TS-11612	√				
Tau	25/8-8A	8A-1	2457.7	201911	TS-11510	√	√		√	√
Tau	25/8-8A	8A-2	2453	201926	TS-10604	√	√		√	√
Tau	25/8-8B	8B-1	2414	201915	TS-10506	√	√	√	√	√
Tau	25/8-8B	8B-2	2428.6	201916	TS-10702	√	√	√	√	√
Tau	25/8-8B	8B-3	2387.8	201922	TS-10507	√	√		√	√
Tau	25/8-8B	8B-4	2401.5	201924	TS-10907	√	√		√	√
Tau	25/8-8S	8S-1	2260	201923	TS-10313	√	√	√	√	√
Tau	25/8-8S	8S-2	2244.2	201912	TS-0822	√				
Tau	25/8-8S	8S-3	2258-2267*	201920	0081-AA	√	√		√	√
Tau	25/8-8S	8S-4	2276.6	210927	AA 0094	√	√		√	√
	25/5-5	Area 5		202085			√		√	√

\* designates DST samples. All other samples from the Jotun area were wireline (MDT) samples.

## a. Whole-Oil Gas Chromatography, Continued

**Degree of diesel contamination** The oil from Tau (8B-2) shows elevated distribution of n-alkanes between nC<sub>13</sub> and nC<sub>19</sub>, indicative of diesel contamination. [Estimates of the degree of contamination of individual samples are discussed in a later section.] In contrast, the samples from the Elli 5S well show a smooth distribution of n-alkanes, decreasing with increasing carbon number (*note: this is a DST sample and should be contamination-free*). The GC from the Tau sample differs from Elli in having a greater proportion of the higher carbon-number alkanes. Pristane/phytane ratios range between 1.5 and 2.0 and are suppressed (lower) in those samples having high amounts of diesel (i.e. sample 8B-2).

**Table 2: List of oils analyzed and isoprenoid ratios**

Field	Well	Well code	Depth (m)	EPR #	Cyclinder #	nC17/ Pristane	nC18/ Phytane	pristane/ phytane
Elli	25/8-6	6-1	2082	201917	TS-10314	1.53	2.51	1.67
Elli	25/8-6	6-2	2122	201921	TS-98-14	1.76	2.88	1.84
Elli	25/8-5S	5S	2018-2049	201914	TS-8302	1.58	2.85	2.04
Elli-South	25/7-3	ES-3		202086		1.62	2.88	1.85
Tau	25/8-8A	8A-1	2457.7	201911	TS-11510	1.58	2.26	1.70
Tau	25/8-8A	8A-2	2453	201926	TS-10604	1.51	2.44	1.79
Tau	25/8-8B	8B-1	2414	201915	TS-10506	1.54	2.54	1.89
Tau	25/8-8B	8B-2	2428.6	201916	TS-10702	1.67	1.94	1.41
Tau	25/8-8B	8B-3	2387.8	201922	TS-10507	1.60	2.87	1.75
Tau	25/8-8B	8B-4	2401.5	201924	TS-10907	1.53	2.46	1.81
Tau	25/8-8S	8S-1	2260	201923	TS-10313	1.46	2.38	1.77
Tau	25/8-8S	8S-3	2258-2267	201920	0081-AA	1.56	3.00	1.95
Tau	25/8-8S	8S-4	2276.6	210927	AA 0094	1.55	2.98	1.90
Area 5	25/5-5	Area 5		202085		2.02	1.35	0.74

*Continued on next page*

**Table 3: Carbon isotope ratios for gases from Elli-Tau Field.**

Field	Well	Well Code	Depth (m)	EPR #	Cylinder #	Methane (‰)	Ethane (‰)	Propane (‰)	iButane (‰)	nButane (‰)
Elli	25/8-6	6-1	2082.2	201917	TS-10314	-47.30	-30.05	-28.67	-28.89	-28.33
Elli	25/8-6	6-2	2122.1	201921	TS-98-14	-47.09	-30.38	-28.62	-28.34	-27.68
Elli	25/8-5S	5S-1	2018-2049	201914	TS-8302	-45.28	-28.98	-28.38	-27.98	-27.69
Elli	25/8-5S	5S-2	2018-2049	201936	3884A	-47.78	-30.04	-28.64	-27.27	-27.67
Tau	25/8-8A	8A-3	2445.1	201925	TS-11020	-44.14	-29.15	-27.11	-27.16	-27.03
Tau	25/8-8A	8A-4	2430	201918	TS-11612	-43.82	-29.08	-27.02	-27.52	-27.16
Tau	25/8-8A	8A-1	2457.7	201911	TS-11510	-43.43	-28.99	-27.16	-27.32	-27.01
Tau	25/8-8A	8A-2	2453	201926	TS-10604	-42.86	-28.54	-26.91	-26.88	-26.97
Tau	25/8-8B	8B-1	2414	201915	TS-10506	-43.28	-28.92	-28.16	-28.08	-27.51
Tau	25/8-8B	8B-2	2428.6	201916	TS-10702	-43.29	-28.89	-27.66	-27.98	-26.99
Tau	25/8-8B	8B-3	2387.8	201922	TS-10507	-43.44	-29.05	-27.36	-26.63	-26.55
Tau	25/8-8B	8B-4	2401.5	201924	TS-10907	-44.00	-28.52	-27.15	-26.50	-27.07
Tau	25/8-8S	8S-1	2260	201923	TS-10313	-43.59	-28.60	-27.30	-27.32	-26.69
Tau	25/8-8S	8S-2	2244.2	201912	TS-0822	-43.01	-28.60	-27.59	-28.06	-27.11
Tau	25/8-8S	8S-3	2258-2267	201920	0082-AA	-44.58	-28.52	-27.35	-26.79	-26.65
Tau	25/8-8S	8S-4	2276.6	210927	AA 0094	-43.42	-27.98	-27.05	-	-26.57

Note: Precision of analysis is  $\pm 0.2\text{‰}$



## e. Saturate Biomarker Analyses, Continued

Figure 16: Multivariate analysis of biomarker abundances for Jotun, Balder and 25/5-5 oils.

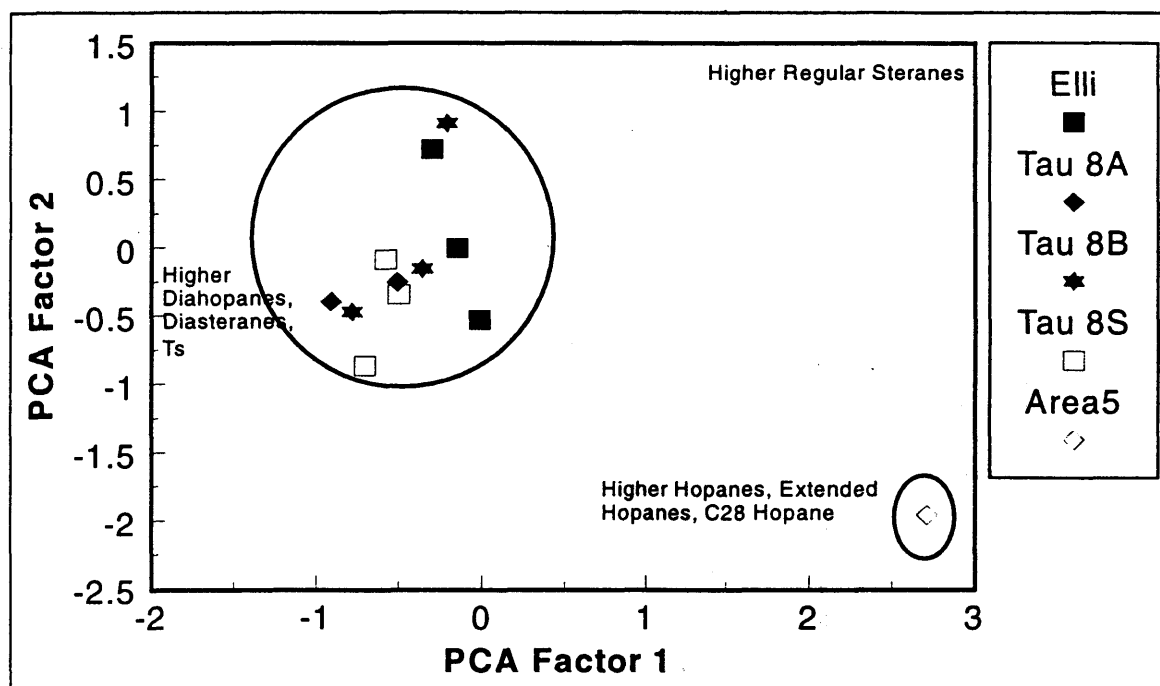


Table 4: Representative triterpane ratios for the oils.

Sample	Zone	Well	TX/T30*	T28/T30	T35/T34	T29/T30	Ts/Tm	ExtH/PC**	TC19,20/ TC21-25
201917	4	Elli 6-1	0.17	0.09	0.83	0.47	2.20	1.35	0.43
201921	2	Eli 6-2	0.18	0.10	0.85	0.43	2.21	1.47	0.43
201914	4	Elli 5S-1***	0.16	0.14	0.74	0.43	2.07	0.89	0.55
202086	4	ElliS-3***	0.18	0.18	0.73	0.53	2.14	0.94	0.47
201911	2	Tau 8A-1	0.20	0.17	0.71	0.46	2.27	1.02	0.54
201926	2	Tau 8A-2	0.20	0.12	0.73	0.49	2.03	1.26	0.30
201915	3	Tau 8B-1	0.21	0.17	0.65	0.46	2.32	1.12	0.64
201916	2	Tau 8B-2	0.22	0.12	0.71	0.42	2.27	1.48	0.48
201922	4	Tau 8B-3	0.20	0.13	0.73	0.53	2.12	1.21	0.31
201924	3	Tau 8B-4	0.19	0.12	0.75	0.52	1.84	1.13	0.25
201923	3	Tau 8S-1	0.20	0.11	0.79	0.50	1.99	1.30	0.25
201920	3	Tau 8S-3***	0.21	0.12	0.75	0.53	2.34	1.15	0.48
201927	2	Tau 8S-4	0.19	0.11	0.75	0.62	2.10	1.17	0.29
202085		Area 5	0.01	0.28	1.16	0.50	0.88	1.81	0.17

\* C<sub>30</sub> Diahopane/C<sub>30</sub> Hopane

\*\* Extended Hopanes (C<sub>31</sub> to C<sub>35</sub> R+S)/ Pentacyclic Triterpanes (C<sub>27</sub>, C<sub>29</sub>, C<sub>30</sub>)

\*\*\* DST samples

## e. Saturate Biomarker Analyses, Continued

**Table 5. Representative sterane ratios for the Oils**

Sample	Zone	Well	%20S	% $\alpha\beta\beta$	Dia/Reg*	%C27	%C28	%C29	%C30	S27/S29	S28/S29
201917	4	Elli 6-1	53%	55%	1.73	24%	30%	35%	11%	0.68	0.87
201921	2	Ell 6-2	53%	60%	1.58	22%	26%	41%	12%	0.53	0.63
201914	4	Elli 5S-1**	54%	61%	1.69	26%	23%	41%	10%	0.63	0.58
202086	4	ElliS-3**	55%	62%	1.66	25%	26%	38%	11%	0.65	0.68
201911	2	Tau 8A-1	53%	64%	2.11	25%	22%	41%	11%	0.61	0.54
201926	2	Tau 8A-2	55%	58%	2.00	26%	26%	37%	11%	0.68	0.71
201915	3	Tau 8B-1	56%	64%	2.12	25%	22%	43%	10%	0.58	0.52
201916	2	Tau 8B-2	54%	58%	1.83	25%	24%	39%	12%	0.65	0.63
201922	4	Tau 8B-3	54%	59%	1.87	25%	24%	39%	11%	0.65	0.61
201924	3	Tau 8B-4	54%	58%	1.48	27%	27%	36%	10%	0.75	0.76
201923	3	Tau 8S-1	53%	57%	1.93	24%	30%	34%	12%	0.72	0.88
201920	3	Tau 8S-3**	53%	58%	2.04	25%	27%	37%	11%	0.68	0.75
201927	2	Tau 8S-4	54%	56%	1.97	27%	25%	37%	11%	0.73	0.66
202085		Area 5	54%	56%	0.78	28%	30%	32%	11%	0.88	0.95

\*Diasterane/Regular steranes

\*\* DST samples

## Diesel Contamination and Bubble Point Suppression, *continued*

**Table 6. Estimates of diesel contamination in the samples**

Sample	% Diesel using nC <sub>14</sub> /nC <sub>11</sub>	% Diesel using nC <sub>14</sub> /nC <sub>25</sub>	Best Estimate*
6-1	25	13	19
6-2	40	43	41
5S	-	-	-
ES-3	3	0	2
8A-1	28	22	25
8A-2	14	3	8
8B-1	10	21	15
8B-2	63	65	64
8B-3	40	36	38
8B-4	13	2	7
8S-1	15	0	7
8S-3	3	0	1
8S-4	3	0	1

\*Average of nC<sub>14</sub>/nC<sub>11</sub> and nC<sub>14</sub>/nC<sub>25</sub> estimates.

An example of these mixtures is shown in Figure 20 for mixing 10%, 20%, 40%, and 60% diesel with the Tau 8S-3 oil. These n-alkane distributions are similar to those for the whole-oil gas chromatograms shown in Figure 4 and those in the Appendix.

Although the n-alkane distributions are similar, it should be noted that these values are **estimates**, based only on the n-alkanes. Consequently, mixing of the end members did not account for other components in the oils and diesel (branched, cyclic, aromatics, etc.).

*Continued on next page*

## Reservoir Segmentation, Continued

The similarity in gasolines and gases for each of the main sub-fields (Elli and Tau) in Jotun, suggest that there is pressure communication between reservoir compartments. However, it is not to say that barriers on a production time scale don't exist. On a geochemical basis, compositions of fluids suggest a general homogeneity of fluids without major barriers.

**Table 7: Stratigraphic zone and oil characteristics which may account for segmentation.**

Zone	Well	Gases	Gasolines	"Wax"***	% Diesel*	PVT anomaly explained?
4	Elli 6-1	Family 1	Family 1	1	19	Yes
2	Ell 6-2	Family 1	Family 1	2	41	Yes
4	Elli 5S-1**	Family 1	Family 1	1	0	Yes
4	ElliS-3**	Family 1	Family 1	2	2	
2	Tau 8A-1	Family 2	Family 2a	1	25	Not Evaluated
2	Tau 8A-2	Family 2	Family 2	2	8	Not Evaluated
3	Tau 8B-1	Family 2	Family 2	1	15	Not Evaluated
2	Tau 8B-2	Family 2	Family 2	2	64	Not Evaluated
4	Tau 8B-3	Family 2	Family 2a	2	38	Not Evaluated
3	Tau 8B-4	Family 2	Family 2	3	7	Not Evaluated
3	Tau 8S-1	Family 2	Family 2	2	7	Not Evaluated
3	Tau 8S-3**	Family 2	Family 2	3	1	Not Evaluated
2	Tau 8S-4	Family 2	Family 2	3	1	Not Evaluated

\*Estimated

\*\* DST sample

\*\*\* relative scale based on Figure 6; higher number = higher amount of paraffins

Figure A-1

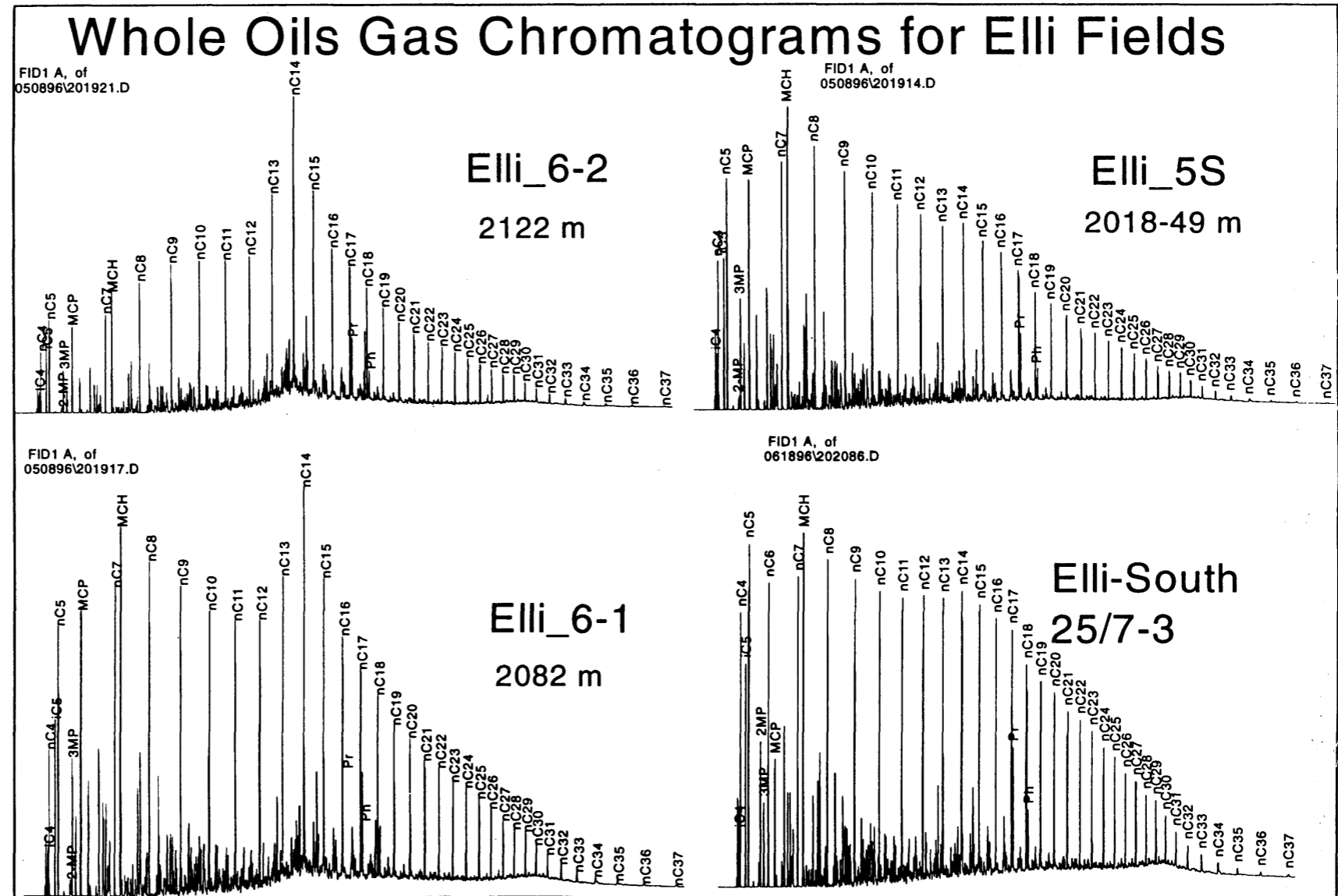


Figure A-2

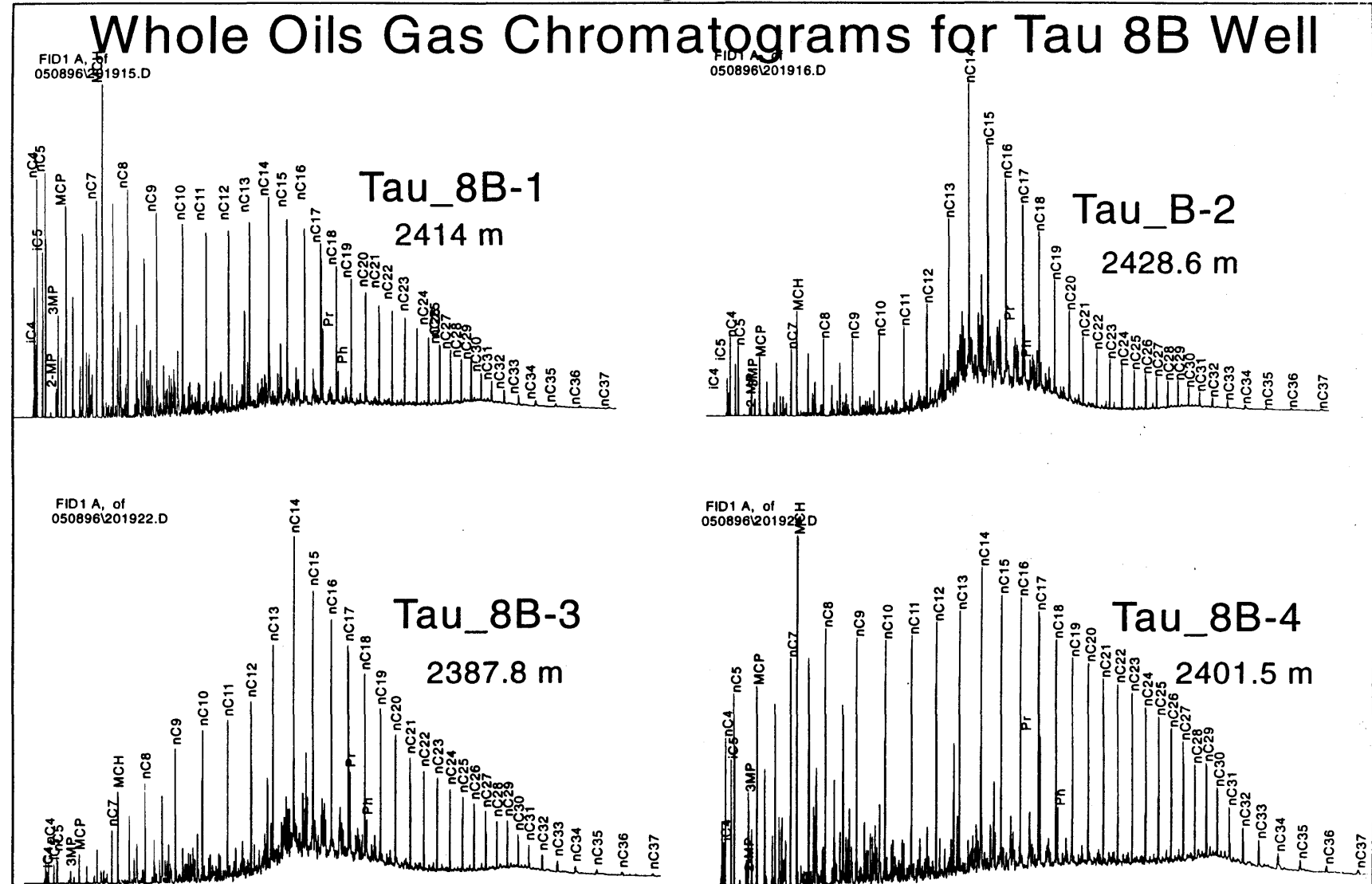


Figure A-3

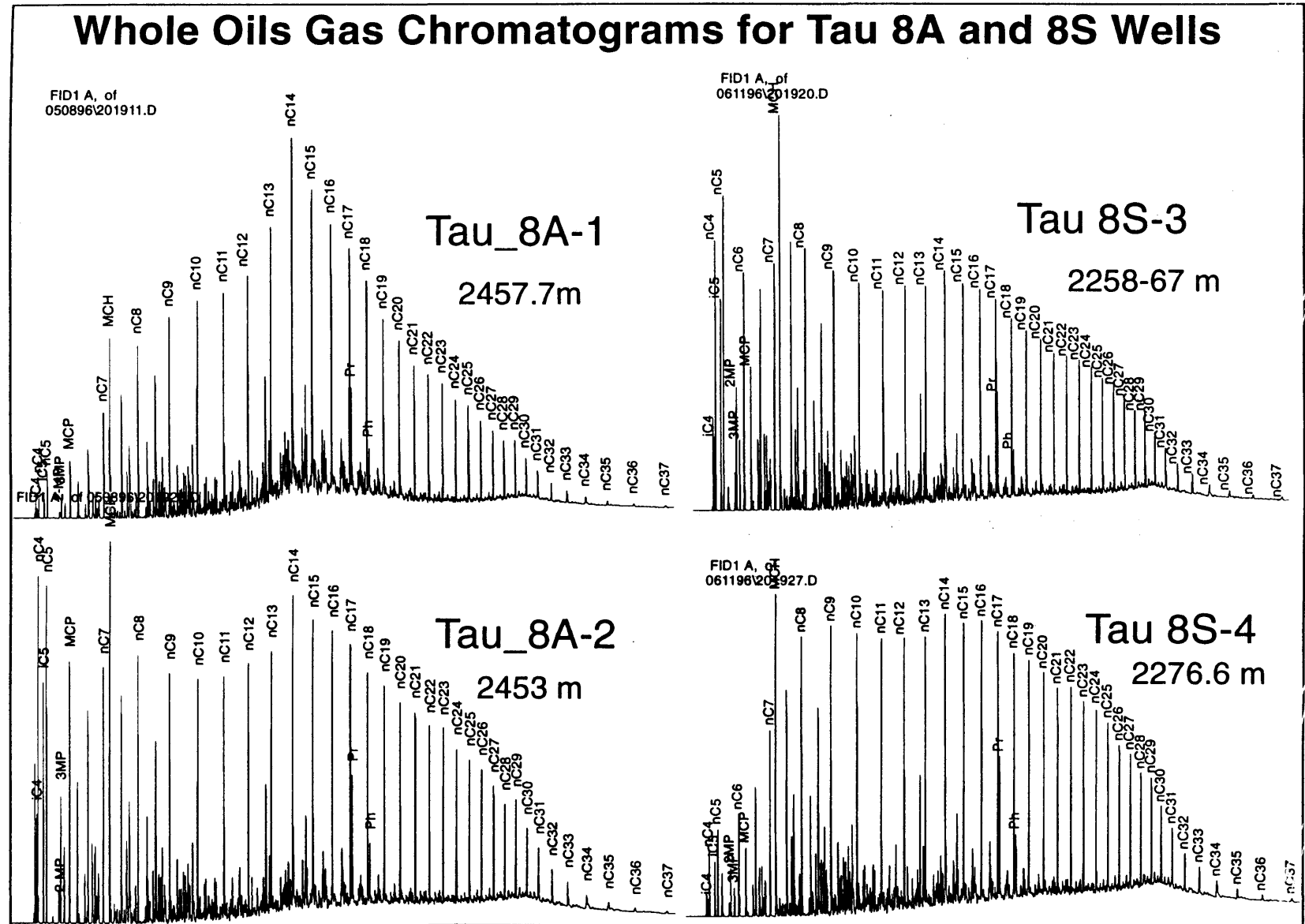
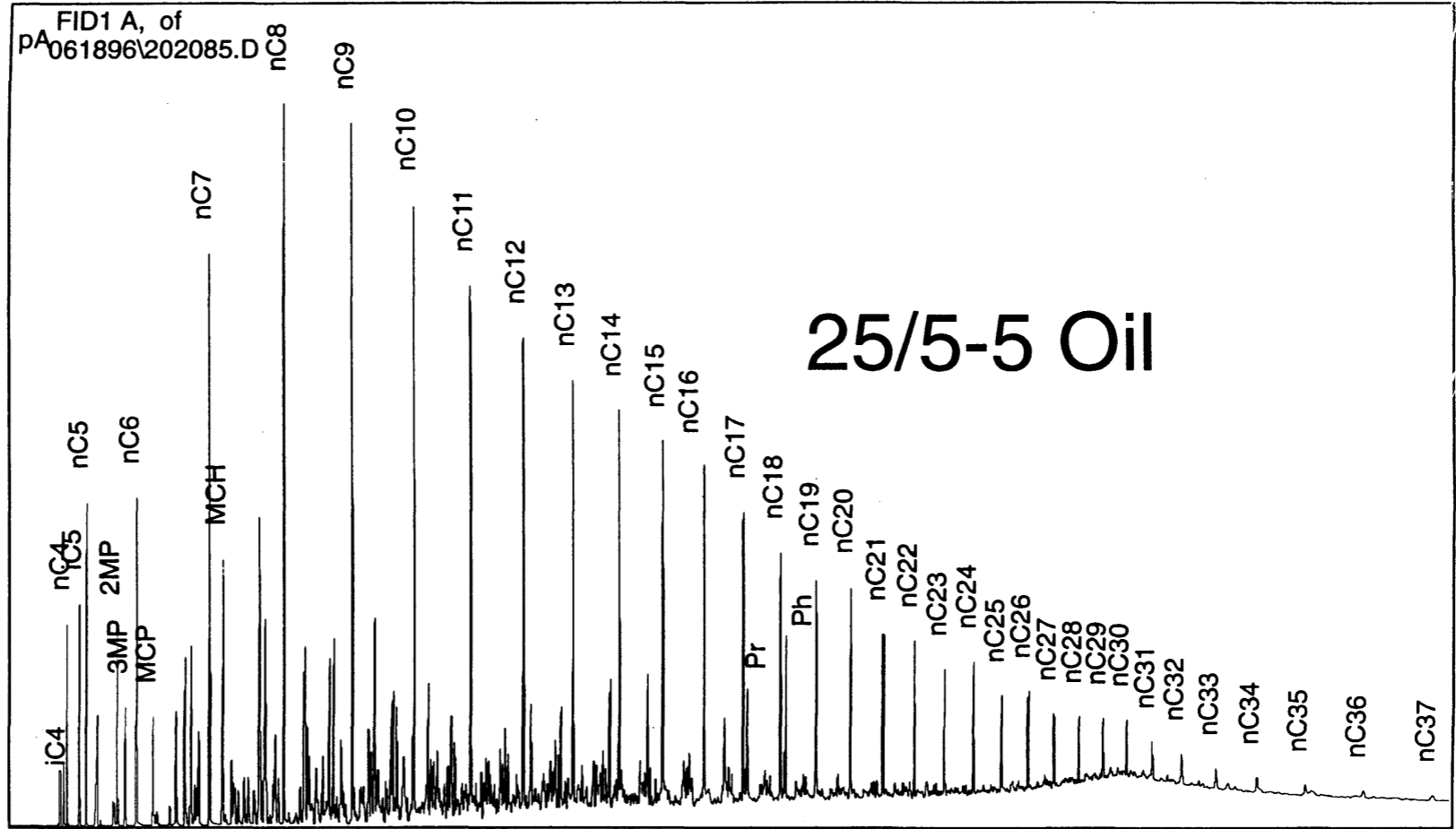


Figure A-4





**Table A-1: Liquid column chromatography results of selected oils**

Field	Well	Depth(m)	EPR #	Sat. (%)	Arom (%)	NSO (%)	Asph (%)
Elli	6-1	2082	201917	68	27	4	1
Elli	6-2	2122	201921				
Elli	5S-1	2018-2049	201914	57	28	12	3
Elli South	ES-3		202086	67	28	4	1
Tau	8A-1	2457.7	201911				
Tau	8A-2	2453	201926	66	28	4	3
Tau	8B-1	2414	201915	58	28	12	2
Tau	8B-2	2428.6	201916				
Tau	8B-3	2387.8	201922				
Tau	8B-4	2401.5	201924	68	24	3	5
Tau	8S	2260	201923	61	28	4	7
Tau	8S-3	2258-2267	201920				
Tau	8S-4	2276.6	210927				
Area 5	25/5-5		202085	41	48	9	2

**Table A-2: Calculated ratios of nC14/nC11 and nC14/nC25 for mixtures of the n-alkanes from diesel and various oils from Elli-Tau fields.**

Percent Diesel Added	nC14/nC11			nC14/nC25		
	For Elli 5S	For Elli-South	For Tau 8S-3	For Elli 5S	For Elli-South	For Tau 8S-3
5%	1.0	1.2	1.3	4.4	2.2	2.1
10%	1.1	1.3	1.5	4.9	2.4	2.3
15%	1.3	1.5	1.7	5.4	2.7	2.6
20%	1.4	1.7	1.9	6.0	3.1	3.0
25%	1.5	1.9	2.1	6.7	3.5	3.4
30%	1.7	2.1	2.4	7.4	3.9	3.9
35%	1.9	2.3	2.7	8.3	4.4	4.4
40%	2.1	2.6	3.0	9.4	5.0	5.0
50%	2.6	3.3	3.8	12.0	6.6	6.6
60%	3.4	4.3	4.9	16.0	8.9	9.0
70%	4.5	5.7	6.5	22.7	12.8	13.1
80%	6.5	8.0	8.9	36.1	20.5	21.1

**Table A-3: Estimated percent diesel contamination of the oils from Elli-Tau based on nC14/nC11 ratios.**

Field	Well	Depth (meters)	EPR #	Measured nC14/nC11	% Diesel w/(E-5S)	%Diesel w/(ES-3)	%Diesel w/(T-8S-3)	Best Estimate*
Elli	6-1	2082	201917	1.67	29	20	15	25
Elli	6-2	2122	201921	2.36	45	35	30	40
Elli	5S	2018-2049	201914	0.95	0	0	0	0
Elli South	ES-3		202086	1.07	6	0	0	3
Tau	8A-1	2457.7	201911	2.13	40	30	25	28
Tau	8A-2	2453	201926	1.53	25	15	12	14
Tau	8B-1	2414	201915	1.40	20	12	7	10
Tau	8B-2	2428.6	201916	5.06	73	65	60	63
Tau	8B-3	2387.8	201922	2.71	52	45	35	40
Tau	8B-4	2401.5	201924	1.47	23	15	10	13
Tau	8S-1	2260	201923	1.57	26	17	12	15
Tau	8S-3	2258-2267	201920	1.16	10	5	0	3
Tau	8S-4	2276.6	210927	1.19	12	5	0	3

\* Elli samples estimated from average of Elli-5S mix and Elli-South (ES-3) mix. Tau estimates are an average of Elli-South (ES-3) and Tau (8S-3) mixes.

**Table A-4: Estimated percent diesel contamination of the oils from Elli-Tau based on nC14/nC25 ratios and best overall estimate of diesel contamination.**

Field	Well	Depth	EPR #	Measured nC14/nC25	% Diesel w/(E-5S)	%Diesel w/(ES-3)	%Diesel w/(T-8S-3)	Best Estimate**	Overall Best Estimate***
Elli	6-1	2082	201917	3.51	0	26	25	13	19
Elli	6-2	2122	201921	7.36	30	55	53	43	41
Elli	5S	2018-49	201914	4.00	0	-32	31	-	0
Elli South	ES-3		202086	1.91	0	0	0	0	2
Tau	8A-1	2457.7	201911	3.13	0	21	22	22	25
Tau	8A-2	2453	201926	1.99	0	2	4	3	8
Tau	8B-1	2414	201915	3.12	0	21	21	21	15
Tau	8B-2	2428.6	201916	11.04	47	65	65	65	64
Tau	8B-3	2387.8	201922	4.82	10	38	33	36	38
Tau	8B-4	2401.5	201924	1.87	0	0	3	2	7
Tau	8S-1	2260	201923	1.33	0	0	0	0	7
Tau	8S-3	2258-67	201920	1.80	0	0	0	0	1
Tau	8S-4	2276.6	210927	1.58	0	0	0	0	1

\*\* For nC14/nC25 ratios: Elli samples estimated from Elli-5S mix. Tau estimates are an average of Elli-South (ES-3) and Tau (8S-3) mixes. \*\*\* Overall best estimate is average of "best estimates" from the nC14/nC11 and nC14/nC25 ratios.