

General information

Lithostrat. unit	SOLA FM
NPIDID lithostrat. unit	152
Level	FORMATION
Lithostrat. unit, parent	CROMER KNOLL GP

Level below

Lithostrat. unit

Description

Sola Formation

Name

Informally named by Hesjedal & Hamar (1983) after a village in southwestern Norway.
Formally named by Jensen et.al. (1986).

Well type section

Danish well 1-1 from 2898 m to 2859 m, coordinates N 56°03'10", E 04°14'60" ([Fig. 5.14](#)). No cores.

Well reference sections

Norwegian well [2/11-1](#) from 2988 m to 2910 m, coordinates N 56°14'16.98", E 03°27'07.05" ([Fig 5.12](#)). No cores. Norwegian well [24/12-2](#) from 4043 m to 3985 m, coordinates N 59°12'00.75", E 01°52'53.34" ([Fig 5.18](#)). No cores.

Thickness

The thickness in the type well is 39 m, and in reference well [2/11-1](#) it is 78 m. It generally varies between 20 m and 200 m. The formation is thick in the Viking Graben and Åsta Graben, and thin in the East Shetland Basin and parts of the Fiskebank Sub-Basin.

Lithology

The Sola Formation consists of shales interbedded with stringers of marlstone and limestone. The carbonate content is lower than that in the underlying [Tuxen](#) and [Asgard](#) formations and the overlying [Rødby Formation](#). The colour is black or dark grey, but olive-grey, brown and red colours occur. The shales are finely laminated and often very pyritic.

Basal stratotype

The lower boundary is usually placed on the [Tuxen](#) or [Asgard](#) formations ([Fig 5.12 , 5.14 , 5.17 , 5.18](#)). Generally, the gamma-ray response increases and the velocity decreases from the calcareous and sandy sediments up into the shaly and organic rich Sola Formation. In some wells in the east, on the Horda Platform, the gamma-ray response does not increase when the boundary from the [Asgard Formation](#) up into the Sola Formation is crossed. In such wells, a lower, more stable velocity identifies the Sola Formation.

Characteristics of the upper boundary

The upper boundary is most often placed where the carbonate content starts to increase rapidly into the overlying [Rødby Formation](#) ([Fig 5.12 , 5.14 , 5.18 , 5.22](#)). In some areas

where, the Sola Formation is overlain by the [Ran sandstone units \(Fig 5.23\)](#), the boundary is defined by an upward decrease in gamma-ray response and an increase in velocity.

Distribution

The formation is widespread in the North Sea. It is absent or thin on structural highs, salt-induced structures and in parts of the Central Trough and Norwegian-Danish Basin.

Age

The Sola Formation is of Mid Aptian-Early Albian age. A possible Middle (Late) Barremian-Albian age is recorded from Danish wells (Heilmann-Clausen 1986).

Depositional environment

The Sola Formation was deposited in a marine environment with alternating anoxic and oxic bottom conditions. Hesjedal & Hamar (1983) suggested that the formation was deposited during a regressive period, while Rawson & Riley (1982) held the opposite view.

Source

- Isaksen, D. and Tonstad, K. (eds.) 1989: A revised Cretaceous and Tertiary lithostratigraphic nomenclature for the Norwegian North Sea. NPD-Bulletin No. 5, 59 pp.

Wellbores penetrating

Wellbore name	Wellbore completion date	Top depth [m]	Bottom depth [m]
1/3-1	11.11.1968	4482	4671
1/3-2	27.07.1969	4229	4297
1/3-5	11.02.1985	4604	4625
1/3-8	27.05.1997	4502	4556
1/3-9 S	31.07.1998	3933	3935
1/3-12 S	22.07.2010	5308	5346
1/5-5	16.09.2016	5459	5529
1/6-6	08.03.1993	4689	4694
1/6-7	12.07.1992	4336	4364
1/9-7	02.08.2003	3867	3948
2/1-4	03.08.1982	3775	3785
2/1-5	05.04.1983	3790	3797
2/1-9	06.07.1991	3838	3852
2/1-9 A	08.03.1992	3870	3881
2/1-10	14.01.1992	3889	3914
2/1-11	07.05.1997	4143	4155
2/1-12	10.02.1999	3144	3153
2/1-13 S	07.03.2009	4137	4149
2/1-14 S	28.02.2009	5760	5785
2/1-15	05.09.2013	3289	3310

2/1-16 S	13.07.2013	3295	3296
2/1-17 S	08.11.2019	3880	3895
2/2-3	11.05.1983	3499	3523
2/3-3	20.11.1971	2710	2825
2/3-4	24.07.1984	2930	3005
2/4-23 S	05.09.2015	4850	4857
2/7-2	02.03.1971	3758	3791
2/7-13	21.04.1979	3305	3388
2/7-16	12.07.1980	4359	4533
2/7-19	02.02.1981	4328	4468
2/7-19 R	14.03.1990	4325	4465
2/7-22	15.10.1990	4225	4327
2/7-23 S	21.11.1990	4301	4322
2/7-24	13.04.1991	3017	3081
2/7-25 S	31.03.1991	4561	4584
2/7-27 S	17.06.1992	4287	4333
2/7-28	07.08.1992	3190	3263
2/7-29	06.01.1994	4228	4329
2/7-31	09.06.1999	4284	4372
2/8-3	03.09.1972	3209	3250
2/8-6	30.06.1975	2652	2669
2/8-12 S	27.04.1989	3271	3759
2/8-14	22.01.1991	2901	2936
2/8-17 A	21.02.1998	3111	3119
2/9-4	04.07.2008	4175	4259
2/11-1	03.10.1969	2910	2988
2/11-8	11.07.1991	3982	4070
2/11-9	23.12.1993	3795	3854
2/11-12 A	07.03.2019	3082	3090
2/12-2 S	14.09.1990	4232	4253
3/7-4	23.01.1990	3255	3261
3/7-5	07.02.1992	3048	3050
3/7-6	30.11.1996	3352	3360
3/7-7	27.10.2008	3386	3390
3/7-8 S	03.03.2013	3800	3801
3/7-9 S	28.04.2013	3480	3490
3/8-1	29.12.2010	3130	3162
6/3-1	01.02.1985	2922	2950
6/3-2	10.03.1986	2987	3000
7/1-2 S	08.05.2008	2828	2840
7/3-1	10.06.1969	2412	2419

7/4-1	21.08.1993	2847	2882
7/4-2	13.03.2008	3155	3163
7/4-3	03.06.2013	2710	2718
7/7-2	25.04.1992	3126	3140
7/7-3	04.07.1993	3274	3281
7/9-1	29.05.1971	2382	2406
7/11-11 S	10.06.2007	4176	4222
7/11-12 A	31.12.2011	5089	5112
7/11-12 S	16.07.2011	4873	4888
7/12-2	23.09.1976	3053	3100
7/12-10	29.08.1991	3332	3362
7/12-11	06.11.1991	3569	3586
7/12-12 S	17.03.1996	5625	5655
8/1-1	07.02.1972	1940	2015
8/3-2	04.12.1982	1604	1650
8/5-1	28.03.2013	2002	2013
8/9-1	10.02.1976	1953	1980
8/10-1	01.07.1969	2610	2679
8/10-2	17.03.1980	2540	2599
8/10-3	06.10.2010	2927	2950
8/10-4 A	18.12.2011	2883	2907
8/10-4 S	27.10.2011	2746	2757
8/10-5 A	24.05.2014	2162	2179
8/10-5 S	04.03.2014	2376	2438
8/10-6 S	16.07.2014	1851	1864
8/10-7 S	04.01.2019	2754	2774
8/11-1	29.06.1975	2574	2658
8/12-1	23.07.1971	2368	2423
9/1-1 S	21.11.2011	1229	1934
9/2-1	28.04.1987	1482	1601
9/2-2	21.09.1987	1445	1511
9/2-3	08.02.1990	1932	2027
9/2-4 S	11.04.1994	1581	1723
9/2-5	21.07.1995	1849	1945
9/2-6 S	15.10.1996	1681	1880
9/2-7 S	10.06.1997	2203	2362
9/2-8 S	02.02.1998	2290	2572
9/2-9 S	17.09.1999	1953	2019
9/2-11	29.03.2010	1159	1233
9/2-12	14.10.2019	1319	1425
9/3-1	04.09.1986	882	963

<u>9/3-2</u>	09.12.2005	1069	1162
<u>9/4-1</u>	19.05.1968	1822	1847
<u>9/4-2</u>	29.08.1970	1975	1998
<u>9/4-3</u>	19.08.1972	1983	2059
<u>9/4-4</u>	20.08.1977	1888	2016
<u>9/11-1</u>	19.08.1971	1790	1859
<u>10/4-1</u>	12.07.2015	1413	1429
<u>10/5-1</u>	26.06.1976	1093	1139
<u>10/8-1</u>	17.01.1971	1201	1326
<u>11/5-1</u>	12.09.2007	420	717
<u>15/2-1</u>	24.02.1982	3733	3805
<u>15/3-7</u>	01.09.2001	3867	3895
<u>15/3-8</u>	11.04.2006	3859	3875
<u>15/3-9</u>	13.08.2010	3812	3839
<u>15/3-11</u>	09.08.2018	3667	3697
<u>15/3-12 A</u>	03.03.2020	3577	4037
<u>15/3-12 S</u>	20.01.2020	3473	3512
<u>15/5-3</u>	07.12.1980	3579	3612
<u>15/5-7</u>	07.09.2008	3480	3666
<u>15/5-7 A</u>	13.10.2008	3493	3728
<u>15/6-11 A</u>	13.03.2011	3914	3935
<u>15/6-11 S</u>	19.12.2010	3595	3600
<u>15/6-12</u>	09.02.2011	3666	3669
<u>15/6-14 S</u>	26.12.2017	4474	4500
<u>15/6-16 S</u>	28.06.2019	3719	3733
<u>15/8-1</u>	07.01.1982	3445	3452
<u>15/8-2</u>	21.10.2011	3580	3643
<u>15/9-1</u>	30.05.1977	3327	3345
<u>15/9-2</u>	17.06.1978	3324	3345
<u>15/9-5</u>	11.04.1980	3331	3345
<u>15/9-7</u>	29.04.1981	3306	3323
<u>15/9-8</u>	25.05.1981	3227	3262
<u>15/9-9</u>	14.07.1981	2606	2613
<u>15/9-10</u>	07.11.1981	2982	2991
<u>15/9-11</u>	23.12.1981	2718	2725
<u>15/9-12</u>	27.02.1982	3348	3360
<u>15/9-13</u>	27.05.1982	2690	2698
<u>15/9-14</u>	27.06.1982	3131	3142
<u>15/9-18</u>	02.03.1984	3061	3076
<u>15/9-19 B</u>	02.02.1998	3740	3750
<u>15/9-19 SR2</u>	25.07.1997	4191	4204

<u>15/9-19 SR</u>	29.04.1993	4188	4201
<u>15/9-21 S</u>	23.05.1998	4320	4362
<u>15/9-23</u>	03.01.2010	2898	2917
<u>15/12-2</u>	27.02.1976	2650	2667
<u>15/12-3</u>	22.12.1980	2830	2865
<u>15/12-4</u>	31.10.1984	2735	2759
<u>15/12-5</u>	04.05.1986	2827	2841
<u>15/12-7 S</u>	07.01.1991	2942	2975
<u>15/12-8</u>	14.07.1991	2797	2829
<u>15/12-8 A</u>	29.07.1991	2797	2827
<u>15/12-12</u>	09.02.2001	2733	2774
<u>15/12-16 S</u>	31.03.2006	2715	2782
<u>15/12-17 A</u>	23.03.2007	3095	3127
<u>15/12-17 S</u>	04.02.2007	3092	3122
<u>15/12-18 S</u>	07.11.2007	3180	3201
<u>15/12-19</u>	20.05.2008	2911	2927
<u>15/12-21</u>	21.05.2009	2858	2873
<u>15/12-21 A</u>	21.06.2009	3011	3056
<u>15/12-22</u>	16.05.2010	2683	2704
<u>15/12-23</u>	29.05.2010	2921	2924
<u>15/12-23 A</u>	18.07.2010	4295	4312
<u>15/12-24 S</u>	20.05.2015	2826	2835
<u>15/12-26</u>	13.05.2021	2569	2576
<u>16/1-4</u>	13.04.1993	1860	1864
<u>16/1-12</u>	08.09.2009	1902	1909
<u>16/1-17</u>	20.03.2013	1860	1861
<u>16/1-18</u>	14.05.2014	1883	1885
<u>16/1-23 S</u>	25.08.2015	1943	1946
<u>16/1-25 S</u>	26.12.2015	1999	2000
<u>16/1-28 S</u>	23.08.2018	2283	2288
<u>16/1-31 S</u>	10.05.2019	1929	1931
<u>16/2-1</u>	09.08.1967	1858	1873
<u>16/2-3</u>	28.09.2007	1889	1894
<u>16/2-4</u>	15.12.2007	1877	1879
<u>16/2-6</u>	20.09.2010	1907	1912
<u>16/2-7</u>	01.09.2011	1894	1900
<u>16/2-7 A</u>	29.09.2011	1968	1975
<u>16/2-9 S</u>	24.09.2011	1906	1922
<u>16/2-10</u>	28.10.2011	1851	1885
<u>16/2-11</u>	29.03.2012	1868	1876
<u>16/2-11 A</u>	04.05.2012	2150	2162

16/2-12	06.09.2012	1873	1883
16/2-13 A	29.09.2012	2527	2550
16/2-13 S	30.08.2012	1870	1886
16/2-16	12.12.2012	1924	1934
16/2-16 A	07.02.2013	2310	2314
16/2-18 S	08.08.2013	1853	1860
16/2-19	03.04.2014	1907	1920
16/2-19 A	03.05.2014	2247	2250
16/2-20 A	16.02.2014	2083	2087
16/2-20 S	21.11.2013	1978	1985
16/2-21	07.06.2013	1895	1906
16/2-22 S	28.01.2017	1919	1923
16/2-U-18	28.11.2016	1909	1935
16/2-U-19	12.12.2016	1891	1896
16/3-2	08.03.1976	1800	1908
16/3-4	28.06.2011	1861	1886
16/3-4 A	18.07.2011	2008	2034
16/3-5	07.03.2013	1855	1875
16/3-6	16.07.2013	1879	1890
16/3-7	08.11.2013	1867	1890
16/3-8 A	01.04.2014	1924	1934
16/3-8 S	16.03.2014	1921	1935
16/3-U-1	24.12.2016	1866	1896
16/3-U-1 A	10.01.2017	2259	2338
16/3-U-1 B	15.01.2017	2254	2335
16/4-1	18.11.1984	2315	2325
16/4-2	29.07.1990	2793	2838
16/4-7	21.08.2013	2413	2422
16/4-10	07.03.2016	2385	2405
16/4-12	08.10.2021	2112	2118
16/5-1	08.02.1971	1859	1923
16/5-2 S	28.01.2012	1923	1926
16/5-4	28.09.2013	1923	1925
16/5-5	29.12.2013	1930	1935
16/5-6	10.07.2016	2082	2121
16/5-7	12.07.2019	1906	1908
16/5-8 S	22.08.2019	2184	2189
16/6-1	19.01.1968	1894	1925
16/7-1	24.09.1967	2016	2040
16/7-5	03.08.1984	2575	2583
16/7-6	24.07.1997	2530	2550

<u>16/7-7 S</u>	29.12.1997	2731	2738
<u>16/7-8 S</u>	19.01.2003	2809	2813
<u>16/7-9</u>	03.01.2011	2315	2345
<u>16/8-1</u>	29.10.1976	1879	1900
<u>16/8-2</u>	13.08.1980	1945	1972
<u>16/8-3 S</u>	01.05.2013	2123	2167
<u>16/10-1</u>	14.07.1986	2750	2763
<u>16/10-2</u>	01.08.1991	2778	2790
<u>16/10-3</u>	01.12.1996	2378	2411
<u>16/10-4</u>	10.08.1998	2398	2408
<u>16/10-5</u>	27.11.2012	2718	2720
<u>16/11-1 S</u>	31.10.1967	2025	2040
<u>16/11-2</u>	23.07.1973	1917	1963
<u>17/3-1</u>	20.08.1995	1425	1505
<u>17/8-1</u>	23.10.2021	1636	1790
<u>17/9-1</u>	23.10.1973	1354	1464
<u>17/9-1 R</u>	11.06.1974	1354	1464
<u>17/10-1</u>	24.03.1969	1945	1985
<u>17/11-1</u>	30.06.1968	1587	1665
<u>17/12-1 R</u>	21.06.1972	1339	1482
<u>17/12-3</u>	03.02.1980	1388	1555
<u>18/10-1</u>	01.01.1980	1468	1573
<u>18/11-1</u>	31.03.1974	1135	1325
<u>24/6-1</u>	25.08.1985	4177	4196
<u>24/9-1</u>	03.07.1976	4050	4170
<u>24/12-1</u>	09.04.1978	3945	3966
<u>24/12-1 R</u>	14.08.1978	3945	4004
<u>24/12-2</u>	21.01.1982	3985	4043
<u>24/12-6 S</u>	20.12.2010	4222	4281
<u>25/1-1</u>	22.07.1971	4065	4135
<u>25/2-18 B</u>	30.10.2016	3772	3791
<u>25/2-18 C</u>	17.11.2016	3612	3647
<u>25/4-5</u>	26.03.1981	3507	3574
<u>25/4-6 S</u>	24.08.1991	3545	3563
<u>25/4-6 SR</u>	14.09.2003	3554	3572
<u>25/5-2</u>	04.07.1989	2980	2990
<u>25/6-1</u>	03.02.1986	2192	2222
<u>25/6-2</u>	29.05.1992	2256	2261
<u>25/6-6 S</u>	22.04.2019	2508	2513
<u>25/7-2</u>	18.07.1990	3875	3948
<u>25/7-7</u>	09.11.2019	3885	4105

25/8-9	28.01.1997	2369	2376
25/9-4	27.02.2014	2281	2296
25/10-6 S	22.03.1996	4057	4074
25/10-11	10.08.2011	3897	3954
25/11-1	09.07.1967	1938	1980
25/11-15	25.12.1991	1942	1954
25/11-17	22.03.1993	1951	1966
25/11-24	29.03.2007	2003	2015
25/11-26	17.02.2013	2052	2084
26/4-1	17.07.1987	2623	2637
30/2-3	05.10.1992	3620	3642
30/3-1	07.09.1979	3637	3673
30/3-1 R	26.04.1982	3678	3702
30/3-7 A	29.01.1998	5962	5969
30/3-9	01.07.2000	3632	3637
30/3-10 S	29.04.2009	3621	3627
30/3-11 S	09.09.2022	3858	3870
30/4-1	14.05.1979	3960	4030
30/5-1	29.07.1972	3889	4094
30/5-3 A	30.05.2009	4606	4650
30/9-8 R	25.09.1989	2750	2758
30/9-12	09.05.1991	2543	2545
30/9-12 A	04.06.1991	2675	2676
30/9-12 AR	11.07.2002	2679	2680
30/9-13 S	11.10.1991	2926	2931
30/9-13 SR	17.07.2002	2930	2935
30/9-14	14.05.1993	2955	2965
30/9-16	08.08.1994	2640	2648
30/9-18	11.04.1995	2581	2586
30/9-22	10.03.2009	2749	2758
30/10-5	01.05.1975	4046	4121
30/10-6	09.11.1992	4026	4095
30/11-12 A	20.05.2016	3654	3669
30/11-12 S	04.05.2016	3117	3134
30/12-1	07.03.1994	2693	2712
31/1-2 A	29.01.2021	3042	3081
31/1-2 S	12.01.2021	2771	2801
31/2-19 S	13.07.1996	2534	2560
31/5-7	06.03.2020	1838	1861
31/6-3	26.12.1983	1058	1130
31/6-5	21.05.1984	1312	1347

31/8-1	24.07.2011	1673	1811
31/11-1 S	28.06.2021	1895	1942
32/2-1	01.07.2008	620	755
33/5-2	18.11.1981	3821	3858
33/6-3 S	24.07.2012	4070	4080
33/9-15	08.06.1992	2714	2717
33/9-17	04.05.1994	3017	3022
33/9-20 S	09.09.2006	5029	5102
33/9-21 A	30.04.2009	5518	5546
33/9-21 B	11.06.2009	5518	5546
33/9-21 S	19.03.2009	5587	5672
34/2-2 R	08.05.1981	3345	3370
34/2-4	11.06.1985	3535	3575
34/2-5 S	31.03.2018	3389	3396
34/4-14 S	19.05.2015	4227	4250
34/6-2 A	12.12.2012	3413	3478
34/6-2 S	05.11.2012	3449	3536
34/6-5 S	08.06.2021	3376	3396
34/7-3	02.01.1985	2353	2357
34/7-4	16.01.1985	2496	2504
34/7-5	16.03.1985	2485	2489
34/7-27	07.10.1998	2733	2735
34/7-28	02.03.1998	2654	2658
34/7-35 S	22.07.2012	3075	3091
34/7-36 S	17.09.2014	3376	3380
34/8-6	03.11.1991	3418	3440
34/8-7	16.07.1992	4298	4374
34/8-7 R	10.02.1993	4298	4374
34/8-8	24.08.1992	2877	2883
34/8-8 R	09.03.1993	2877	2883
34/9-1 S	19.06.2022	4405	4455
34/10-2	08.12.1978	2867	2870
34/10-16	11.04.1983	2984	2990
34/10-16 R	27.09.1983	2981	2987
34/10-21	22.10.1984	2904	2911
34/10-54 A	18.04.2014	3920	4030
34/10-54 S	11.02.2014	3756	3833
34/11-1	25.10.1994	3895	3905
34/11-6 S	26.01.2017	6260	6414
34/12-1	30.04.2008	4070	4100
35/3-5	31.03.1982	3510	3639

35/4-3	17.05.2022	4022	4055
35/7-1 S	15.08.2011	3814	3850
35/8-6 A	14.05.2016	3420	3425
35/8-6 S	22.04.2016	3535	3539
35/9-11 A	21.05.2014	3065	3082
35/9-11 S	15.04.2014	3065	3080
35/10-1	16.01.1992	3081	3085
35/10-2	22.08.1996	3795	3820
35/10-4 A	12.11.2018	3489	3493
35/10-4 S	10.10.2018	3174	3180
35/10-7 S	11.12.2021	2865	2868
35/11-2	04.12.1987	2710	2721
35/11-6	20.04.1992	2800	2816
35/11-12	14.05.2000	2786	2798
35/11-15 S	28.06.2007	2623	2643
35/11-16 S	18.03.2014	2968	2997
35/11-18	27.09.2015	2951	2962
35/11-18 A	16.12.2015	3005	3012
35/11-20 A	07.08.2016	3333	3340
35/11-20 S	19.06.2016	2928	2935
35/11-22 S	02.02.2019	2749	2756
35/11-24 A	28.08.2020	2919	2996
35/11-24 B	16.09.2020	2936	3001
35/11-24 S	09.08.2020	2710	2759
35/12-5 S	19.06.2015	2742	2758
35/12-6 A	30.06.2018	2760	2817
35/12-6 S	14.06.2018	2719	2762
36/1-3	25.03.2019	2766	2844
36/7-2	22.09.1997	678	774
36/7-4	26.09.2016	2554	2620
6204/11-2	28.12.1997	2690	2700
6205/3-1	11.02.1990	3780	3956
6205/3-1 R	30.11.1990	3780	3956

Wellbores with cores

Wellbore name	Wellbore completion date	Core length [m]
16/1-12	08.09.2009	7
16/1-17	20.03.2013	2
16/1-23 S	25.08.2015	0

<u>16/2-18 S</u>	08.08.2013	4
<u>16/5-2 S</u>	28.01.2012	3
<u>16/5-4</u>	28.09.2013	2
<u>16/7-7 S</u>	29.12.1997	3
<u>25/11-1</u>	09.07.1967	4
<u>33/9-15</u>	08.06.1992	4
<u>36/7-4</u>	26.09.2016	1