General information

Lithostrat. unit	EIRIKSSON FM
NPDID lithostrat. unit	32
Level	FORMATION
Lithostrat. unit, parent	STATFJORD GP

Level below

Lithostrat. unit

Description

Eiriksson Formation

Name

Named after Leiv Eiriksson, the discoverer of North America in the year 1000, according to the Norse Sagas. He was the son of Eirik Raude.

Well type section

Norwegian well 33/12-2 (Mobil) (Fig 1.17-18). from 2719 m to 2790 m below KB.

Well reference section

UK well 211/24-1 (Conoco/Gulf/NCB) (Fig .17-18).

Thickness

71 m in the type well. In the reference well the formation is 157 m thick. The thickness is relatively constant over the area of the Statfjord Field but the formation thickens towards the south and west (Fig .17-18). where sandstone characteristic of this formation occur at lower levels in the section.

Lithology

In the type well the formation is characterised by massive sandstone beds, generally correlatable between the wells, interbedded with hard grey shales. The sandstones are white to light grey, medium to very coarse grained with thin horizons of granules, pebbles, and lignite fragments, often concentrated in channels and along cross-bedding foresets. They contain slightly less kaolinite matrix, mica and rock fragments than the sandstones of the Raude Formation. The shales are slightly and commonly micaceous and carbonaceous. In the area of the Statfjord Field the sandstone beds average about 5 m in thickness and the shale beds average about 2.5 m. The sediments of this formation appear more mature than those of the Raude Formation, and marine fossils and glauconite are present near the top of the formation in the type well.

Boundaries

The originally Eiriksson Member of the Statfjord Formation was elevated to formation level by Lervik, 2006. There is usually a sharp upward transition from the Raude Formation reflecting a change to a more humid climate as well as a tectonic uplift of the hinterland. Sandstones are more abundant and thicker. The modified climate resulted in a change in the colour of the siltstones and mudstones from red to green and grey, and carbonate nodules and soils that formed in the previous evaporitic environment were replaced by coal- and carbonaceous-rich beds. The lower boundary is formed by the base of the lowest massive sandstone which can be well correlated. The upper boundary

is marked by the base of the distinctive sandstones of the Nansen Formation which are frequently calcareous. The Eiriksson Formation has a characteristic blocky gamma ray and sonic log response but the boundaries may not always be marked by prominent log breaks.

Distribution

The formation is present over much of the northern North Sea, but not in the southern part of the East Shetland Basin.

Age

In the type well it is Hettangian, possibly extending into the early Sinemurian. However, to the west and south the base of the formation appears to be progressively older.

Depositional environment

Nystuen and Fält (1995) reported vertically stacked channel-sandstones forming multi-storey sandstone units up to 30-40 m thick. Cross-bedded sandstones with basal channel-lag conglomerates of coarse- to very coarse-grained sandstones with pebbles of quartz and gneiss (Nystuen and Fält, 1995) associated with coal facies are interpreted as having a fluvial origin (Røe and Steel, 1985). Røe and Steel (1985) discussed the sheet-like extent of the sand bodies, interpreting them as having formed in a relatively high-gradient, braided-alluvial setting. The Eiriksson Formation is interpreted as the more proximal braided-stream deposit of a fan-delta system associated with coastal to shallow marine elements. Deegan and Scull (1977) reported marine fossils and glauconite near the top of the fromation in well 33/12-2, suggesting a marginal marine environment varying from coastal backswamp and river mouth situations to coastal barriers.

Compiled from

- Deegan, C. E. and Scull, B. J. (compilers) 1977: A standard lithostratigraphic nomenclature for the Central and Northern North Sea. UK Institute of Geological Sciences, Report 77/25. The Norwegian Petroleum Directorate, NPD-Bulletin No. 1, 36 pp.
- Goldsmith, P. J., Hudson, G. and Van Veen, P. Triassic. 105 – 127 in: Evans, D., Graham, C., Armour, A. and Bathurst, P. (editors and coordinators) 2003: The Millennium Atlas: petroleum geology of the central and northern North Sea. The Geological Society of London, 389 pp.
- Lervik, K.-S. 2006: Triassic lithostratigraphy of the Northern North Sea Basin. Norwegian Journal of Geology, Vol. 86, pp. 93-116.

Wellbores penetrating

Wellbore name	Wellbore completion date	Top depth [m]	Bottom depth [m]
16/1-34 S	31.07.2021	2261	2316
16/1-35 S	28.02.2023	3098	3177
16/2-16	12.12.2012	1966	1999
16/2-16 A	07.02.2013	2356	2385
16/2-20 S	21.11.2013	2027	2038
16/2-21	07.06.2013	1948	1965
25/6-6 S	22.04.2019	2972	3170
25/7-8 S	09.01.2020	2995	3067
25/8-19 A	19.03.2020	2286	2483

25/8-19 S	30.12.2019	2263	2434
25/10-12 S	18.01.2015	2249	2324
25/10-17 S	10.02.2023	3978	4052
30/2-3	05.10.1992	4294	4325
30/3-2 R	16.02.1981	3308	3394
30/6-1	22.09.1979	2786	2959
30/6-9	16.12.1982	3226	3334
30/6-9 R	12.05.1990	3224	3332
30/6-14	08.02.1984	2799	2855
30/6-15	05.09.1984	3272	3548
30/6-16	21.01.1985	2967	3224
30/6-19	21.06.1986	3275	3301
30/6-19 R	25.05.1994	3274	3300
30/6-23	01.07.1990	3179	3210
30/6-28 S	29.03.2012	2590	2754
30/6-29 S	03.03.2015	5735	5765
30/8-1 SR	01.03.1996	4729	5149
30/9-4 S	30.03.1985	4209	4303
30/9-9	06.11.1989	2775	2809
30/9-16	08.08.1994	3476	3550
30/9-28 S	26.02.2016	3717	4083
31/11-1 S	28.06.2021	3043	3120
33/2-1	26.12.2014	4388	4411
33/6-3 S	24.07.2012	4285	4332
33/12-2	23.08.1974	2719	2790
33/12-8 S	26.04.2002	3731	3750
34/2-2 R	08.05.1981	3865	3957
34/4-14 S	19.05.2015	4658	4723
34/4-18 S	06.03.2022	2855	2918
34/5-1 S	13.03.2010	3834	3900
34/6-2 S	05.11.2012	4095	4252
34/6-3 S	24.09.2014	4407	4462
34/7-6	30.05.1985	2527	2586
34/7-7	16.12.1985	2560	2629
34/7-10	29.10.1986	2562	2620
34/10-2	08.12.1978	3379	3497
34/10-3	07.06.1979	2561	2677
34/10-3 R	10.10.1987	2558	2674
34/10-4	15.10.1979	2435	2458
34/10-5	02.01.1980	2649	2732
34/10-11	05.03.1981	1935	2000

34/10-21	22.10.1984	3914	3930
34/10-32	13.07.1987	3386	3488
34/10-32 R	10.08.1987	3386	3488
34/10-43 S	11.04.2001	3946	4165
34/10-44 S	08.07.2001	3776	3982
34/10-54 A	18.04.2014	4512	4635

Wellbores with cores

Wellbore name	Wellbore completion date	Core length [m]
16/2-16	12.12.2012	20
16/2-16 A	07.02.2013	28
16/2-20 S	21.11.2013	10
16/2-21	07.06.2013	17
25/7-8 S	09.01.2020	72
25/8-19 A	19.03.2020	16
25/8-19 S	30.12.2019	15
30/6-15	05.09.1984	119
30/6-16	21.01.1985	8
30/9-4 S	30.03.1985	8
30/9-16	08.08.1994	10
33/12-2	23.08.1974	3
34/7-6	30.05.1985	52
34/7-7	16.12.1985	54
34/7-10	29.10.1986	42
34/10-2	08.12.1978	11
34/10-32	13.07.1987	61
34/10-54 A	18.04.2014	9