

Oligocene Sand; 1071.0m to 1132.0m; thickness 61m

The top of the Oligocene Sand was picked at the top of the first major sand. During drilling the rate of penetration curve shows a positive drilling break of about 150%. The rate of penetration remained high on average until 1128.0m.

The wireline logs show a gamma ray reading of around 30 API units at the top of the sand increasing to 40 to 45 API units after the top 15.0m suggesting that the top part of the section is cleaner or coarser. The SP curve essentially follows the character of the gamma ray curve indicating an increase in permeability which is borne out by the separation of the three resistivity curves.

Throughout the basin the top of the Eocene has been picked on the basis of micropalaeontology using foraminifera found in fine marine clastics. In coarse clastic sediments, such as are seen at this level in Chat No. 1, dating has to be done on the basis of spore pollen interpretation. Thus the boundary between the Oligocene and Eocene, based on foraminifera, falls within the N. asperus zone and therefore somewhere within the so called Oligocene Sand in the Chat No. 1 well. This sand is considered to be a basal sequence marking the transition from the essentially deltaic Eastern View Group to the marine Torquay Group and is considered to be diachronous from Eocene to Oligocene. However it is mainly regarded as Oligocene.

The lithology consists of clear, translucent, white and occasionally orange and pink, unconsolidated sands. The sands consist of fine to very coarse, predominantly medium-grained sub-angular to rounded, quartz grains which are moderately sorted. A sub-angular, medium fraction and a sub-rounded to rounded, coarse fraction is evident. Traces of pyrite, glauconite and rare mica occur throughout this section.

The top of the Oligocene Sand was prognosed at 1042.0m and was expected to be 147.0m thick. The actual top was at 1071.0m, 29.0m deep to prognosis and was only 61.0m thick.

Eocene Demons Bluff Formation; 1132.0m to 1181.3m; thickness 49.3m

A sharp decrease in the rate of penetration indicated the top of the Demons Bluff Formation while drilling and the lithology changed from mainly sandstone to claystones.

The gamma ray curve shows an increase in API units from 45 to 75 to 80 units over this interval which is essentially the shale baseline at this level. The SP and resistivity curves show poor permeability and the sonic delta T curve shows a decrease in the transit time.

The Demons Bluff as seen in Chat No. 1 is predominantly a light greyish brown, soft to firm, silty claystone with granules of glauconite, and is sandier than it is near the centre of the basin. In Chat it contains occasional light to dark brown, very hard, very fine to fine-grained, moderately sorted, micaceous sandstones with traces of pyrite.