

The clay content increased below 730 m where the rock graded to very calcareous claystone. These very soft and dispersive light green-grey claystones continued to the base of the Torquay Group. Calcareous content decreased slowly with depth to approximately 15% at 880 m as both micrite, fossil and grain fragments diminished. Occasional mica flakes and trace amounts of clear, fine grained quartz sand appeared below 765 m. Trace amounts of dark green glauconite pellets and very fine black specks (heavy minerals?) occurred throughout the section. The claystones became slightly consolidated below 945 m.

Paleontologic analysis indicates that above 700 m the sediments resulted from high energy winnowing of biogenic sands in water depths of 30 m to 100 m. The section below 700 m was deposited in 90 m to 140 m of water where calcareous sediments were winnowed off a nearby bryozoan bank with associated clay influx.

#### **Angahook Formation (1053 m to 1668 m)**

The Angahook Formation was deposited from Earliest Oligocene to Early Miocene and can be divided into four lithologic units. The upper three units were deposited in the Early Miocene, whilst the lowermost unit, separated by a hiatus, was deposited in the Earliest Oligocene.

The uppermost unit from 1053 m to 1237 m consisted primarily of light coloured, slightly calcareous claystones which became firmer with depth and developed fissility below 1075 m. Sections occasionally became quite silty (up to 15%) with trace amounts of fine to medium grained quartz sand, especially below 1180 m. Minor amounts of mica and pyrite occurred throughout the section and finely disseminated carbonaceous material appeared below 1180 m.

The second unit, from 1237 m to 1305 m, consisted primarily of volcanoclastic material, sandstones and claystones with minor amounts of siltstone, especially at the base. The claystones continued from above and contained abundant embedded quartz silt and sand and small foraminifera. The volcanics were white to bluish grey and mottled with abundant alteration to clays and calcite and variable amounts of pyrite. They represent highly altered pyroclastics. Loose fine to coarse grained quartz was associated with the volcanoclastics but the first well developed sandstones in Yolla-1 only occurred below 1260 m. These were fine to very coarse grained, with rounded to angular quartz sands well cemented with clays, calcite and silica. They contained lithic grains, mafics, chert pebble fragments and pyrite nodules.

The third unit, from 1305 m to 1440 m, consisted primarily of sandstone with minor interbedded claystone. The sandstones were dominantly very fine to fine grained with abundant clay and calcite cement. They were generally very silty and commonly graded to siltstones. They contained abundant pyrite, glauconite, carbonaceous material and occasional mica below 1385 m. Finely interbedded with the sandstones were brown and grey-brown, soft claystones which contained variable amounts of embedded quartz silt and sand. They were generally slightly pyritic and had moderate amounts of carbonaceous material.

The lowermost unit of the Angahook Formation, extending from 1440 m to 1668 m, consists of thin stringers of medium to dark reddish-brown sandy dolomites and dolomitic limestones below 1620 m interbedded with fine grained dolomitic quartz sandstones and medium brown, silty and sandy