

*Alternating sandstone-siltstone sequences:* Alternating beds of sandstone and siltstone occur caught up in the volcanogenic deposits at Te Huka Bay and north of Waikuku Beach; along the western part of Tom Bowling Bay and about a small bluff south of Wharekawa similar sediments are found *in situ*. The rocks are best seen at the last locality, but although exposures are poorer elsewhere the sediments are of similar type.

Graded bedding and an ill-defined bedding lamination, occasional mud-chip concentrations, an abrupt but sometimes uneven sole, and the infrequent occurrence of a ripple-drift-bedded interval between graded sandstones and overlying siltstones all typify the arenaceous components of these sequences. Carbonaceous material is abundant, and although no macrofossils were found Foraminifera are widespread. Most of the sandstones retain a fairly constant thickness throughout, but one particular bed at 491484 shows an increase in thickness from 8 to 60cm in a distance of 27m.

The monotonous lithologic sequence, the presence of graded and ripple-drift bedding, the abrupt contact below the coarse beds, and the lack of structures typical of shallow-water deposits are all characteristic of sediments that have resulted from turbidity-current deposition and intervening hemipelagic sedimentation (Kuenen, 1964).

*Fine-grained clastic sediments:* Interbedded fine sandstones and siltstones overlie the basal breccia at 476534. Most of the rocks are green in colour, and some of the thicker sandstones exhibit small-scale current bedding occasionally disturbed by minor slump-like structures. The relatively high degree of induration of these sediments and their fissile nature were noted by Bartrum and Turner (1928), who described some of the rocks as varve-like.

Shattered siltstones and mudstones and occasional massive claystones overly the basal breccia south-east of Hooper Point. These rocks are softer and normally finer than those discussed above and lack internal structures.

*Volcanogenic grits and breccias:* Coarse brown-weathering tuffaceous sediments are prominent at three localities in the formation. The thickest accumulation, in excess of 150m, is that immediately north of Waikuku Beach, between 500523 and 503524, a similar deposit about 40m thick is found in a small faulted block at Te Huka Bay, and the third, which may be a correlative of the Te Huka Bay rocks, outcrops along Tom Bowling Bay between 422513 and 425515 and is approximately 33m thick.

These deposits all show a gross overall grading, best seen at Te Huka Bay where the lowest exposed horizon is a heavy breccia which grades up into a coarse sandstone. Crude stratification is sometimes discernible, but mudstone partings are absent. Small boulders and numerous subangular cobbles of andesite that are often highly vesicular are present in the rocks at the first two localities; these rudaceous fragments are quite distinct from Whangakea debris, which occurs rarely. Angular sedimentary blocks are ubiquitously distributed throughout the tuffaceous material, and large rafts of sediment may float in its lower levels. At both Te Huka Bay and north of Waikuku Beach, the tuffaceous deposits are intimately associated with masses of slumped and disrupted strata of alternating sandstone-siltstone type.

The base of the grit at Tom Bowling Bay lies sharply but irregularly on the basal breccia, and it is in turn overlain by normal marine strata.

Thin sections show the tuffaceous material to be rich in volcanic glass and fresh andesite debris. The glass is often vesicular, with the vesicles showing a marked elongation in many instances. The direction of elongation varies between individual fragments, and there is no sign of welding. Very rare Foraminifera and glauconite pellets are found in the rocks. All the allogenic constituents are poorly rounded and the degree of sorting is low.