

A general summing-up of the isopachs of Cenomanian sediments in each of the three sub-basins is illustrated in Enclosure 14. The time intervals within the Durroon and Bark Sub-Basins are measured from the seismic data; those within the Boobyalla are estimated.

3.6 THE OTWAY DRIFT PHASE (PART 3)

Partly in response to lithospheric cooling, and partly in answer to the weight of sediments, the sub-basins sagged or continued to subside along their listric bounding faults. Sediments were deposited from distal areas of Tasmania, the Flinders Island group, exposed outcrops of Jurassic lavas, and the areas of Otway Group sediments left uncovered by the period of Cenomanian deposition (Enclosure 16). Sedimentation began in the Upper Cenomanian and eustatic sea levels were the highest ever recorded, 250 m above present sea level. Three brief periods of relative sea level lowstands interrupted this highstand. The last lowstand of 140 m below the highstand level, was marked by a major seismic unconformity. This seismic sequence boundary is recorded in each of the sub-basins and is mapped within the permit as the Turonian unconformity. It is the event that concluded this phase of drifting.

3.6.1 Cenomanian - Turonian Deposition Within the Durroon Sub-Basin

Dark grey carbonaceous mudstones of Turonian age have been drilled at Durroon-1. The mudstones are represented on seismic data by a suite of high amplitude reflections (BMR Line 88-306). Downdip from Durroon-1, the thickening wedge of reflections shows a change of character to three distinct seismic data packets: in effect, the high amplitudes associated with the mudstones are underlain and overlain by zones of reflections that are more chaotic and of lesser amplitudes.

These changes may be related to the changes in relative sea level. The curve of relative change in sea level in Turonian times shows a gradual rise from a lowstand to a highstand; a period of highstand, briefly interrupted by lowstands; and the concluding lowstand. If the Durroon mudstones represent the deposits of the highstand, then the seismic data packets that anticipate and succeed mudstone deposition must reflect the sedimentary facies of rising sea levels and rapidly falling ones, respectively. Siliclastics would form part of the facies deposited during the rising and falling of sea levels.

Suites of continuous, high amplitude reflections are recognised in each of the three sub-basins within T/15P. Their distribution can be mapped, as can the limits of the preceding and succeeding depositional episodes. Durroon mudstones are deposited everywhere within the Durroon Sub-Basin. Indeed, the mudstones are the first regionally distributed facies in this part of the Bass Basin as it was during this period that the topography of the tilted blocks was, for the most part, finally buried (Enclosures 15 and 16).

3.6.2 Cenomanian-Turonian Deposition Within the Bark Sub-Basin

Cenomanian-Turonian sediments onlap the culmination of the tilting edge of underlying block of Otway Group sediments to the north of Durroon-1. The exposed areas of the Otway Group will make a local contribution to the facies of the Turonian. Tasmania remains the major source for the sediments of the Bark Sub-Basin, and high amplitude, continuous, seismic reflections are recorded that are interpreted as evidence for the presence of Durroon mudstones.