CHAPTER 13 Cainozoic basins

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INTRODUCTION

Tertiary sediments are widespread in the interior of South Australia, occupying gently downwarped basins (Lake Eyre, Billa Kalina, Torrens and Hamilton Basins) and palaeochannels. Relatively thin, fluvial and lacustrine, carbonaceous and sandy sediments characterise the early Tertiary (Palaeogene), whereas thin clayey and carbonate sediments were laid down in lacustrine and fluvial settings during the late Tertiary (Neogene). Mainly fluvial and lacustrine sediments occur in small intramontane basins such as the Willochra and Walloway Basins.

In contrast, thicker sediments accumulated along the subsiding southern continental margin (Eucla, Pirie, St Vincent, Murray and Gambier Basins). Increasing marine influence as Australia drifted northwards from Antarctica resulted in a succession of Palaeogene non-marine clastic sediments passing upwards to marginal marine sediments and widespread temperate water limestones. A sea-level fall in the Pliocene resulted in the deposition of extensive coastal sand in the Murray Basin.

Outside of the basins, the landscape was generally subdued and tectonically stable. Deep weathering profiles developed in pre-Tertiary rocks, with concentration of iron oxide and silica forming duricrusts (ferricrete and silcrete) that characterise much of inland South Australia.

The Quaternary Period was a time of marked climatic and sea-level fluctuations. Along the coast, extensive deposits of carbonate dune sand accumulated during sea-level highstands. In the interior, widespread sand deserts of longitudinal dunes formed during arid phases that alternated with periods of moister climate when fluvial and lacustrine sedimentation was more extensive.

The Cainozoic basins of South Australia contain important resources of sedimentary uranium, heavy mineral sand, coal, construction materials (sand, clay, aggregate, building stone), dolomite and limestone, and gypsum. The distribution of the basins is shown in Fig. 13.1, and the stratigraphy of their sedimentary fill is summarised in Fig. 13.2. Further information on the basins is provided in Alley and Lindsay (1995) and Belperio (1995).

LAKE EYRE BASIN

Age

Late Paleocene to Holocene.

Prospective commodities

Uranium, heavy mineral sand, palygorskite, celestite.

DISTRIBUTION OF CAINOZOIC BASINS
SOUTH AUSTRALIA

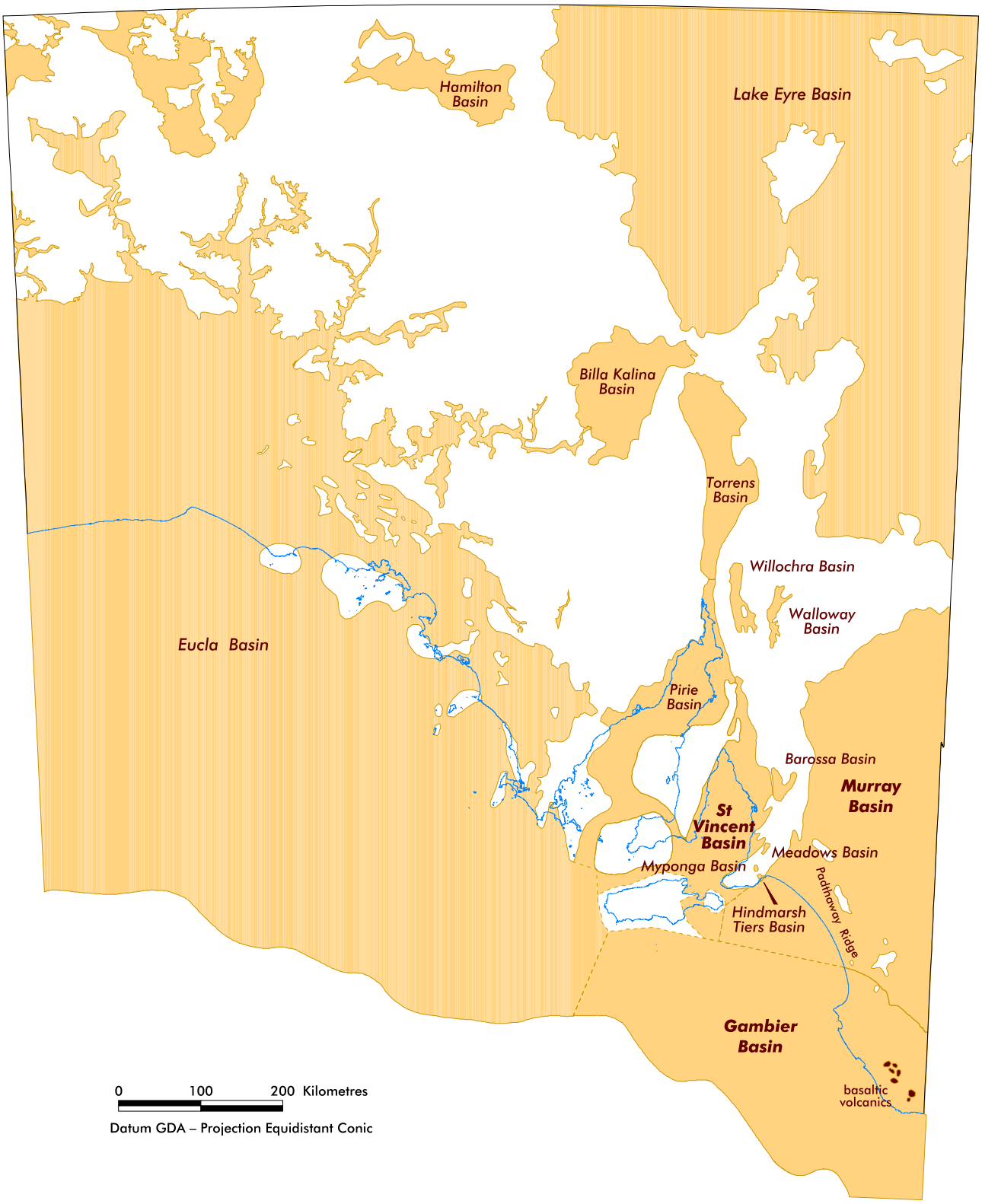

Figure 1

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