Introduction

The Eocene Hecho Group turbidites outcrop in exposures in the south central Pyrenees. The Hecho Group forms a depositional fill of the Tremp-Pamplona Basin, a foreland basin trending parallel to the axial zone of the south central Pyrenees, opening towards the Atlantic and filled from the east (Fig. 20.1). The quality of outcrops and good field relationships between the fluvio-deltaic, shelf and deep-marine deposits of the Tremp-Pamplona Basin have stimulated numerous studies over the last two decades (see Mutti et al. 1989).

The Hecho Group turbidites form a huge sedimentary prism in the central and western sectors of the Tremp-Pamplona Basin. A regional chronostratigraphic framework for the Tremp-Pamplona Basin sediments has been set up by Mutti and co-workers, based on unconformity bounded stratigraphic units (Fig. 20.2). The Castisent, Santa Liestra and Lower Campodarbe systems form the volumetrically most significant part of the Hecho Group. Thick sandy depositional lobes wedge out upsteam fed by channels, now only represented by minor residual (generally coarse) channel deposits.

These systems are typified as the Type I system (Mutti and Normark 1987). The Upper Campodarbe Group contains well-developed channel-levee complexes, of which the Ainsa Channel is the best known. Volumetrically, these systems are less important to the basin infill, most of the sand deposition occurs within the channel complexes and sheet lobe deposits are not so well developed. These later turbidite systems are typified as Type II and Type III systems.

The Ainsa turbidite system contains two main sandy channel-fill complexes, the Ainsa I and the Ainsa II. The Ainsa I complex is an example of an erosional-depositional system, consisting of a lower erosional phase of deposition (residual channel lag facies), followed by a depositional phase of largely sandy turbidites (Mutti and Normark 1991). The sedimentary nature of the Ainsa II channel complex is discussed below.
Fig. 20.3. Bed correlation of the Ainsa II Channel complex showing the channel and intra-channel architecture. The section is drawn roughly north–south and at a vertical exaggeration of five times that of its horizontal scale. General palaeocurrent trend is NW–WNW (i.e. into the plane of the figure at an oblique angle). Major erosive down-cutting surfaces are shown by heavier lines, defining southward shifting channelized bodies numbered 1–5. Sand packets are shown by the shading of the correlation diagram in order to highlight the sandy facies channel architecture.

The detailed correlation has allowed the identification of architectural elements within the numbered channel bodies. Lateral accretion features can be seen in channel 1 and at the base of channel 2. Channel 3 shows a vertical stacking of sand-filled elements, interpreted asthalweg deposits. Channel margin onlap relationships can clearly be seen in the fill of channel 4, and the steep accretion margin of channel 5 has been interpreted as a rotational slide or slump scar element. See text for detailed descriptions of channel architecture and facies.