Well-log – based Correlation of Turonian – Lower Coniacian Depositional Systems in the Western Part of the Bohemian Cretaceous Basin: New Basis for Reconstructing the Basin History

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Well-log correlation has long been used in petroleum geology as an important stratigraphic tool; its usefulness and precision significantly increased with the onset of sequence stratigraphic methodology. In the Bohemian Cretaceous Basin, despite of an existing extensive well-log data base, this method has not been systematically used in stratigraphic practice or in research and/or industrial applications. The presented cross-sections represent a part of an ongoing, long-term research effort based on integrating geophysical and sedimentological data and focused on constructing a high-resolution, 3-D stratigraphic model of the infill of the Bohemian Cretaceous Basin.

The Turonian and Early Coniacian times represent the "mature" stage of evolution of the Bohemian Cretaceous Basin, characterized by siliciclastic wedges of deltaic systems that prograded from the fault-bounded basin margins and pinched out into distal, offshore through hemipelagic, facies. The next generation of cross-sections, to be finished in 2002, will include also data on the Cenomanian, as well as the Coniacian--Santonian stages of basin evolution.

In correlating the stratigraphically significant units and bounding surfaces we followed the basic sequence-stratigraphic techniques and principles, with the aim to define essentially chronostratigraphic units. However, because sequence boundaries of the "Exxon" type are difficult to precisely localize and correlate in the coarse-grained deltaic facies, we chose an allostratigraphic division of the stratigraphic record, similar to the Galloway "genetic stratigraphy" – that is, our division is based on regionally correlatable flooding /maximum flooding surfaces rather than subaerial erosion surfaces and their correlative conformities.

The recently presented network of stratigraphic cross-sections has a number of applications. The most straightforward use is as a basis for detailed, physical stratigraphy of the basin, which in near future will be combined with existing biostratigraphy. Within this multistratigraphic framework, depositional geometries of sedimentary bodies are used, for example, to interpret the basinwide relative sea-level history, improve our understanding of behaviour of nearshore through hemipelagic depositional systems in time and space, or to reconstruct the detailed timing and magnitude of movement on individual, syndepositionally active fault blocks. An important area of recent application is a test data set used for constraining 2-D and 3-D numerical forward models of stratigraphic evolution.

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Kinematics and Succession of the Neoalpine Fault Structures of the Tisovec Karst and its Surroundings

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Overthrusting of the Muráň nappe is not sufficiently resolved, because the tectonic structure is complex and the latest research of the Muraň nappe points to problems of its internal duplex structure (Havrila 1997; Vojtko 1999; Vojtko 2000). Tectonic units building up the Tisovec Karst area are derived from the Meliata-Hallstatt ocean during the Late Jurassic collision and these units have been overthrust northwesternly at the present coordinates (Hók et al. 1995; Plašienka 1993).

The Late Cretaceous to Early Eocene tectonics is characterized by the north-south compression and under these conditions, synform and probably also antiform structures in the Muráň nappe have been formed. Evolution of these structures lasted from the Maastrichtian till Paleocene, as synform structures, Santonian to Campanian sediments are also incorporated but Priabonian sediments have colmated them (Marko 1993a). The brittle fault zone, named Muráň line, which cut off the syn-