

Stratigraphy and Sedimentology of the Muskiki and Marshybank Formations, Southern Alberta and Northern Montana

Meriem Grifi

The University of Western Ontario, Department of Earth Sciences, London, Ontario, Canada

mgrifi@uwo.ca

The early part of the Cretaceous Niobrara Cycle is represented in southern Alberta by the broadly transgressive mudstones of the Muskiki Formation (Middle Coniacian) and broadly regressive sandy siltstones of the Marshybank Formation (Upper Coniacian), spanning ~1.6 My. Due to low conventional petroleum prospects in these rocks, this part of the basin has received virtually no attention. Both the Muskiki and Marshybank Formations become increasingly muddy in southern Alberta and northern Montana, and a major part of the project is to develop a stratigraphic framework that will tie the southern portion of the basin to established stratigraphy in northern Alberta and B.C. High resolution sub-surface correlations will be integrated with outcrop and core data, as well as biostratigraphy, for better stratigraphic control.

The Muskiki and Marshybank Formations are in part, age equivalent shales to the Niobrara formation in southern Manitoba and the western interior of the United States. The Niobrara shale has recently been added to the list of hot shales, as the industry is more and more looking into developing new shale gas techniques. Understanding the key processes behind the sedimentation patterns of such mudstone units is needed in order to explain why some localities offer shale gas plays and others do not. Recent studies on mudstones also reveal that their depositional history is much more complicated than previously thought, and this project aims to provide a high resolution stratigraphic scheme that will better advance the understanding of mud deposition.