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Sequence Stratigraphic analysis of Shoreline Sandstones Deposits of the Cardium Formation at NW Pembina, Alberta

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Summary

The Cardium Formation is a Cretaceous aged sandstone succession located along the western edge of the Western Canada Sedimentary Basin. The Cardium Formation is composed of offshore to shoreface fine grained to conglomerate sandstones, interbedded with mudstone beds. The oil and gas potential of the Cardium was first discovered in the 1950's and it became a prolific conventional reservoir through the 1980's. Over the course of the past couple decades the focus has shifted to the unconventional potential present in the Cardium, using modern multi-stage hydraulic fracturing and horizontal drilling technology.

Through reexamining cores, thin sections and well logs from wells we aim to identify sedimentary and stratigraphic similarities and differences of the sandstone between various wells in the Halo play area of NW Pembina. While many studies have been published on the stratigraphy of this area, these primarily focused on the conglomerates. In this study, we will focus on better understanding the depositional history of the sandstones in this area. We will interpret lateral facies changes in the sandstone between 5 wells to the west of wells with conventional narrow conglomerate production trends at Carrot Creek NW of the Pembina Field. The overall objective is to compare stratigraphic features of sandstone beds to determine whether they can be classified as shoreface sandstone or shelf sandstone deposits.

Our overall goal is to develop a deeper understanding of the depositional and stratigraphic history of the Cardium at Carrot Creek area to the NW of the Pembina Field.

Method

Cores from 5 wells of the Cardium Formation in the Carrot Creek area NW of the Pembina Field, AB were logged and a detailed description was carried out. The logs were then matched with the respective well logs from each well and a cross section of the interpreted sequence stratigraphic surfaces and sedimentary facies between the wells was created. Well logs were used in conjunction with core analysis to correlate features and ensure accurate interpretation of stratigraphic and sedimentary features. Thin sections of 3 of the 5 wells were analyzed to identify sedimentary composition and features of these wells to allow for an accurate regional analysis.

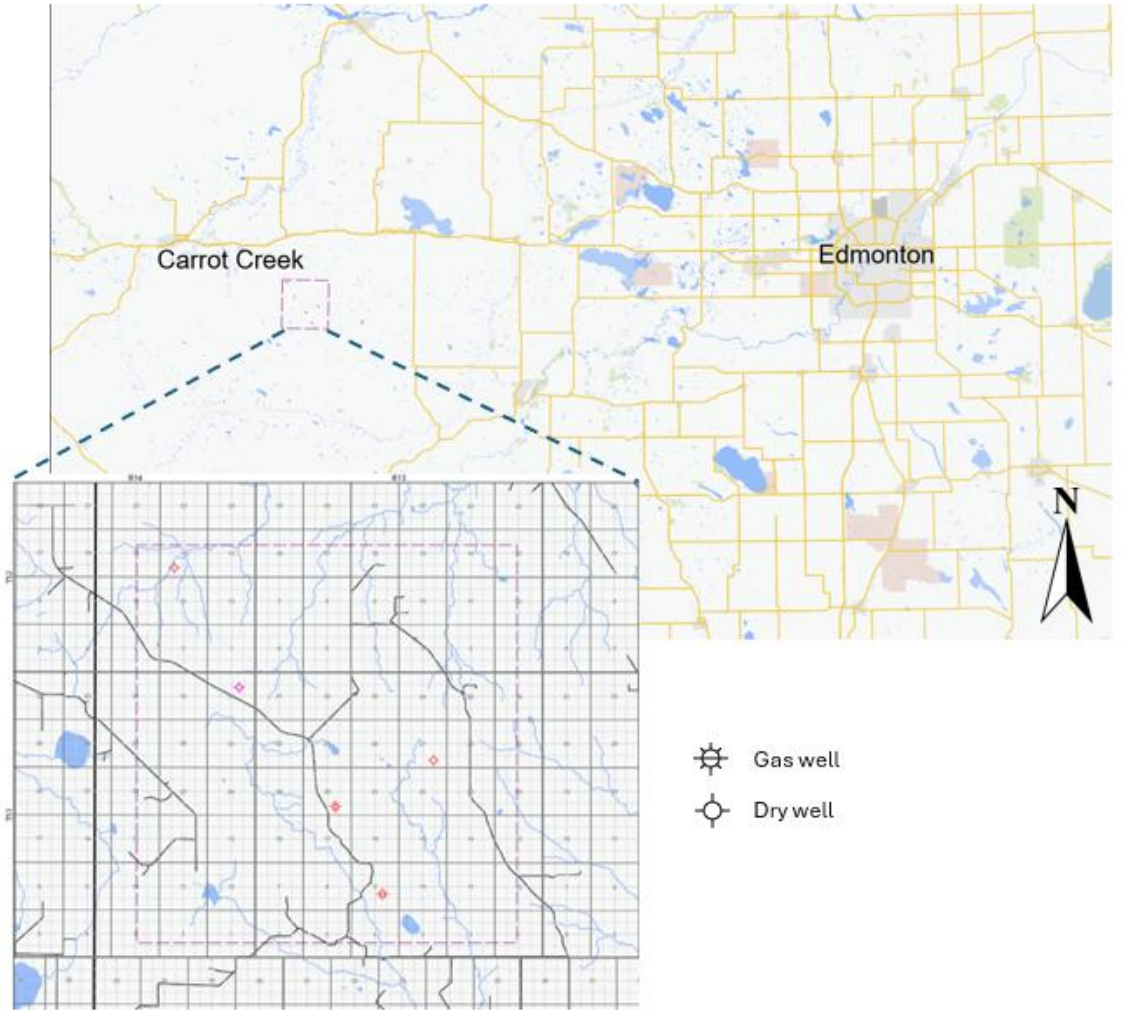


Figure1. Map showing the 5 selected wells in the general study area of Carrot Creek NW of the Pembina Field.

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