# Geological Characterization of $CO_2$ Storage Sites: An example from the IEA Weyburn $CO_2$ Monitoring and Storage Project, Williston Basin

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**ABSTRACT**
Characterization of the geological framework around the Weyburn Field in southeastern Saskatchewan for storage of greenhouse gases is a major focus of the IEA Weyburn CO2 Monitoring and Storage project. Approximately 5,000 tonnes CO2 are injected daily into Mississippian limestones and dolostones (Midale Beds) as part of a CO2 miscible flood-EOR program operated by EnCana Corp. Determining the nature and distribution of primary and secondary seals and the identification of potential pathways of preferential fluid migration are primary considerations in assessing the integrity of the geological system.

These components were investigated within a regional, or basinal, scale for an area extending 200 x 200 km around the Weyburn Field, from basement to surface, covering much of the northeastern portion of the Williston Basin including portions of Saskatchewan, North Dakota and Montana. Results indicate the importance of understanding basin-scale hydrogeological flow and tectonic element distribution in assessing geological CO2 storage sites. Increased detail was focused within an area extending 10 km beyond the limits of the CO2 flood (approximately 30 x 30 km) that forms the foundation for a system model used in performance and risk assessment. Data obtained in this study was used to develop a three dimensional geological model for risk and performance assessment for the long-term fate of injected CO2.