

# PROJECT facts

U.S. DEPARTMENT OF ENERGY  
OFFICE OF FOSSIL ENERGY  
NATIONAL ENERGY TECHNOLOGY LABORATORY



## WEYBURN CARBON DIOXIDE SEQUESTRATION PROJECT

### Background

The Weyburn carbon dioxide (CO<sub>2</sub>) sequestration project is intended to expand the knowledge base on formation capacity, transport, fate, and storage integrity of CO<sub>2</sub> injected into geologic formations. Use of new reservoir mapping and predictive tools (surface seismic and tracer injection) to develop a better understanding of the behavior of CO<sub>2</sub> in a geologic formation in conjunction with the Weyburn unit is being addressed by EnCana and Dakota Gasification Company. Weyburn Field, in southwestern Saskatchewan, Canada, was discovered in 1954. Starting in 2001, several tons per day of CO<sub>2</sub> have been pumped into this reservoir to produce incremental oil in a procedure known as enhanced oil recovery (EOR). The CO<sub>2</sub> is being transported by pipeline 330 km from the Great Plains Synfuels Plant in Beulah, North Dakota. It is expected that approximately 50% of the CO<sub>2</sub> will remain locked up with the oil that remains in the ground. The 50% that comes to the surface with the produced oil will come out of solution as the pressure drops and be recycled back to the injection wells. This work will examine the way CO<sub>2</sub> moves through the reservoir rocks, the precise quantity that can be stored in a reservoir, and how long the CO<sub>2</sub> could be expected to remain trapped in the underground formation.

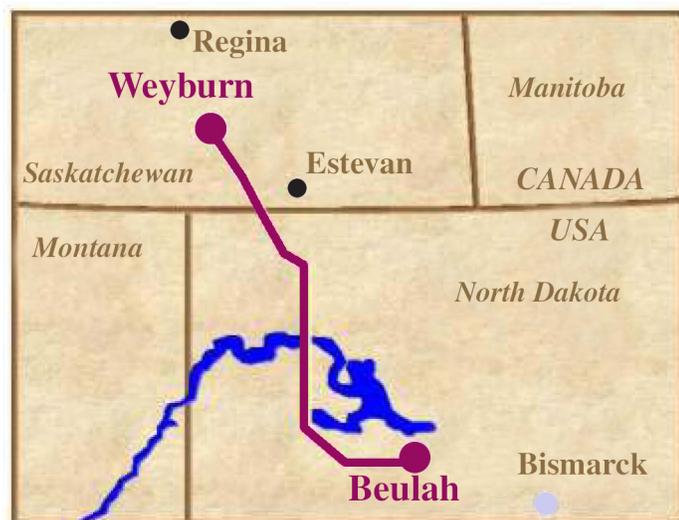
### CONTACT POINTS

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Pipeline Route from North Dakota Gasification Plant to Weyburn Oil Field

## CUSTOMER SERVICE

1-800-553-7681

## WEBSITE

www.netl.doe.gov

## PARTNERS

Provinces of Saskatchewan and Alberta

European Community (EC)

Petroleum Technology Research Council (PTRC)

Research Institute for Environmental Technology (RIET)

Lawrence Berkley National Laboratory

EnCana, Saskatchewan Power, Nexent, BP, Transalta

Dakota Gasification Company

University of Alberta

Colorado School of Mines

University of Regina

University of Saskatchewan

## COST

**Total Cost:**  
\$26,588,000

**DOE/Non-DOE Share:**  
\$4,000,000/\$22,588,000

## Primary Project Goal

The goal of the Weyburn CO<sub>2</sub> Sequestration Project is to enhance the knowledge base and understanding of the underground sequestration of CO<sub>2</sub> associated with EOR. The Weyburn site provides a unique and cost effective opportunity to obtain data to model and predict the long-term storage of CO<sub>2</sub> in a geologic formation.

## Objectives

- To show that sequestration into geologic formations can provide long-term storage of CO<sub>2</sub>.
- To determine how much CO<sub>2</sub> is actually stored during EOR operations.
- To monitor and verify the amount of CO<sub>2</sub> that is sequestered.
- To study the dependence of CO<sub>2</sub> storage on geology.
- To find ways to increase CO<sub>2</sub> sequestration without compromising EOR operations.



*Installation of CO<sub>2</sub> Pipeline*

## Accomplishments

- The project is on target to be completed by July, 2004.
- Approximately 71% of the CO<sub>2</sub> expected at the start of the project has been injected into the Weyburn site. Cumulative CO<sub>2</sub> injection as of June 30, 2003, was 69.6 billion standard cubic feet.
- Regional geological mapping is nearly complete.
- Regional hydrogeological mapping has identified 15 aquifers.
- The mineralogy of 100 reservoir core samples has been determined.
- An initial version of the CO<sub>2</sub> storage economic model, which includes the economics of CO<sub>2</sub> supply, transportation and storage, either stand alone or as an EOR operation has been completed.
- Risk assessment is continuing.

## Benefits

This project will provide significant opportunities for the U.S. to enhance existing monitoring technologies for CO<sub>2</sub> sequestration in geologic formations. This expertise will benefit future large scale sequestration of CO<sub>2</sub> in the U.S. Global warming is an international issue, and the development of new technologies will help create new capabilities in the U.S., thus benefiting the U.S. In addition, this project will use U.S. generated CO<sub>2</sub> that would otherwise be discharged to the atmosphere. Knowledge obtained from this project will enable DOE to inform public policy makers, the energy industry, and the general public by providing reliable information and analysis of geological sequestration of CO<sub>2</sub> in association with EOR.