Field Activity FAQs

EERC UNIVERSITY OF NORTH DAKOTA

INVESTIGATING SAFE, PERMANENT GEOLOGIC STORAGE OF CO_2 IN NORTH DAKOTA

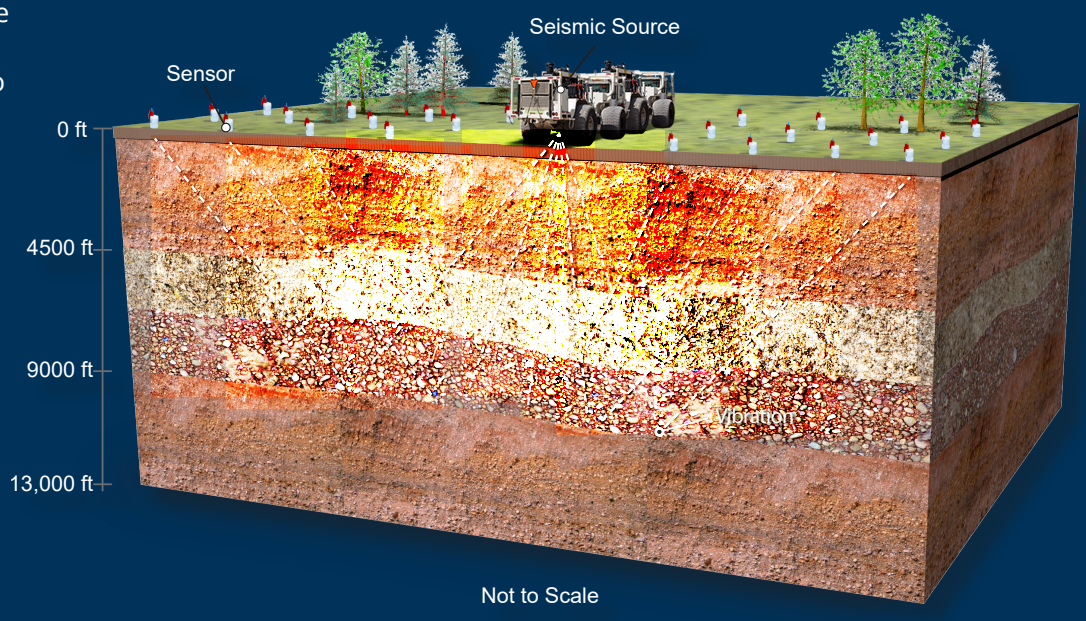
Geophysical Survey in Central North Dakota

In fall 2023 and winter 2024, field crews will conduct geophysical surveys to collect information about rock layers in the deep subsurface. This data gathering is an essential part of investigating the feasibility of developing safe, permanent, commercial-scale geologic storage for carbon dioxide, or CO_2. The geologic information collected will be assessed by geologists, engineers, and scientists to help determine the potential for CO_2 storage in the project area.

What Is a Geophysical Survey?

A truck-mounted seismic source generates vibrations using a metal plate that is pressed onto the ground and shakes. The vibrations travel deep into the earth and are reflected back to the surface. Sensors at the surface record the reflected vibrations. Geophysicists decipher these signals to learn about the subsurface rock layers.

Geophysical surveys are a common data collection tool and have been used in every county in western North Dakota.



What Is the Benefit of the Survey?

The data from the geophysical survey help evaluate the rock layers more than a mile below the surface; help develop more accurate computer models to simulate where injected CO2 might travel, evaluate the suitability of the storage zone, and determine the best location for injection and monitoring wells; help the permitting authority decide whether the geologic storage project can move forward; and ultimately map the movement of CO_2 in future surveys should the effort result in a commercial carbon capture and storage project.

What Is the Community Impact?

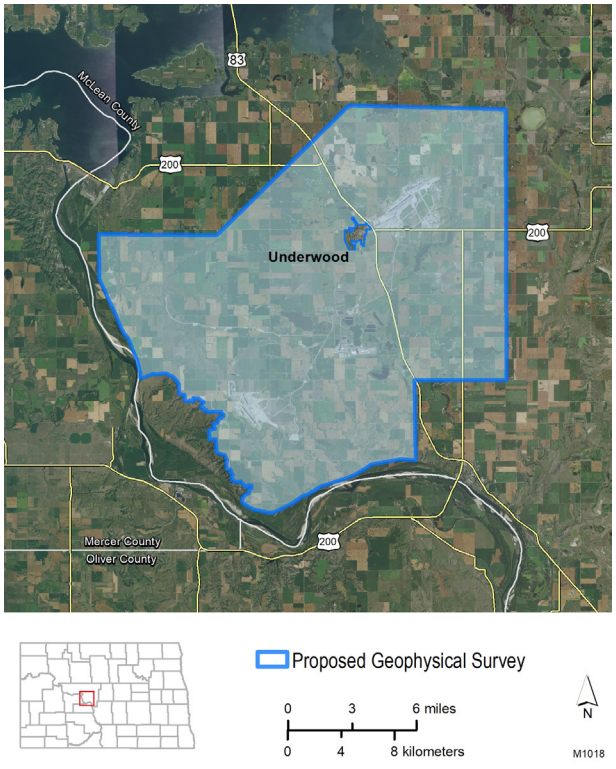
Safety and courtesy are top priorities during this survey. A low-level noise similar to that of a passing truck will be generated at each location from the vibrating truck-mounted plates. A person standing 100 feet from the source will not feel ground vibration. Care will be taken to avoid or minimize any environmental impacts and maintain normal traffic flow. The work will be carried out under a permit issued by the North Dakota Industrial Commission.

What Can Landowners on the Route Expect?

Project partners recognize the impact of survey work on the land and will contact landowners before the survey work to request permission to drive vehicles and place sensors on their land. The sensors will be pressed into the ground by hand by field crew walking and driving pickups or ATVs. Once installed, the sensors remain in place up to 2 weeks, as the source trucks (called vibroseis trucks) travel through the survey area along lines spaced about 880 feet apart, until each portion of the survey is finished. The survey will avoid buildings and other infrastructure such as drinking water wells and pipelines. Snowplows may be used to clear snow ahead of the vibroseis trucks. No trucks will operate within Underwood city limits to minimize traffic disruption. Project partners will work with landowners to mitigate inconveniences.

Where Will the Survey Be Conducted?

The proposed geophysical survey encompasses about 236 square miles of rural land in McLean County.



Vibroseis trucks drive across the landscape, stopping to generate vibrations every 110 feet along straight paths throughout the study area, avoiding buildings and infrastructure.

Example of a sensor in position at a similar geophysical survey.

How Will the Survey Be Carried Out?

The survey involves a network of vibrational sensors and pairs of vibroseis trucks working miles apart in the survey area. Sensors will be inserted into the ground every 110 feet along lines that are spaced 880 feet apart to record reflected vibrations generated during the survey. Next, the survey crew will drive the large vibroseis trucks along lines spaced 880 feet apart. At 110-foot intervals along lines, the trucks will stop and vibrate the ground for 1–2 minutes. The trucks will remain a safe distance from buildings and other infrastructure when vibrating the ground. This is anticipated to be approximately 300 feet.

For More Information:

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