Energy & Environmental Research Center (EERC)

Injection Testing with Propane or Natural Gas Liquid to Inform Future Bakken CO_2 EOR Pilot

Presented to the Oil & Gas Research Council

January 24, 2025

James Sorensen

Director for Subsurface R&D

THERE'S A LOT OF BAKKEN OIL TO CHASE! *

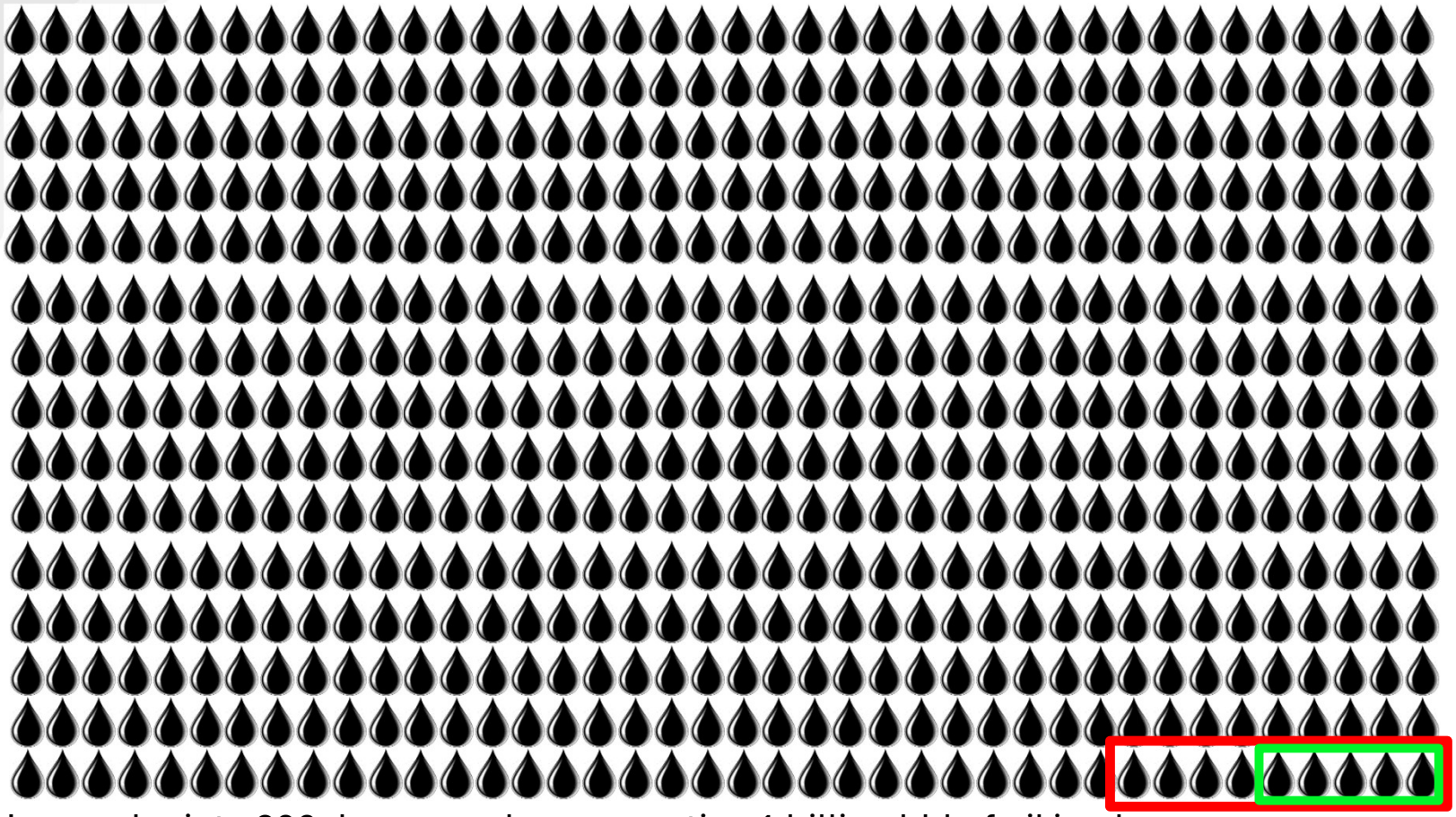


Image depicts 600 drops, each representing 1 billion bbl of oil in place.

Oil produced as of 2024.

Business as usual based on USGS 2021 technically recoverable reserve estimates.

*Image depicts 600 drops, each representing 1 billion bbl of oil in place, based on the median of OOIP estimates reported in literature.

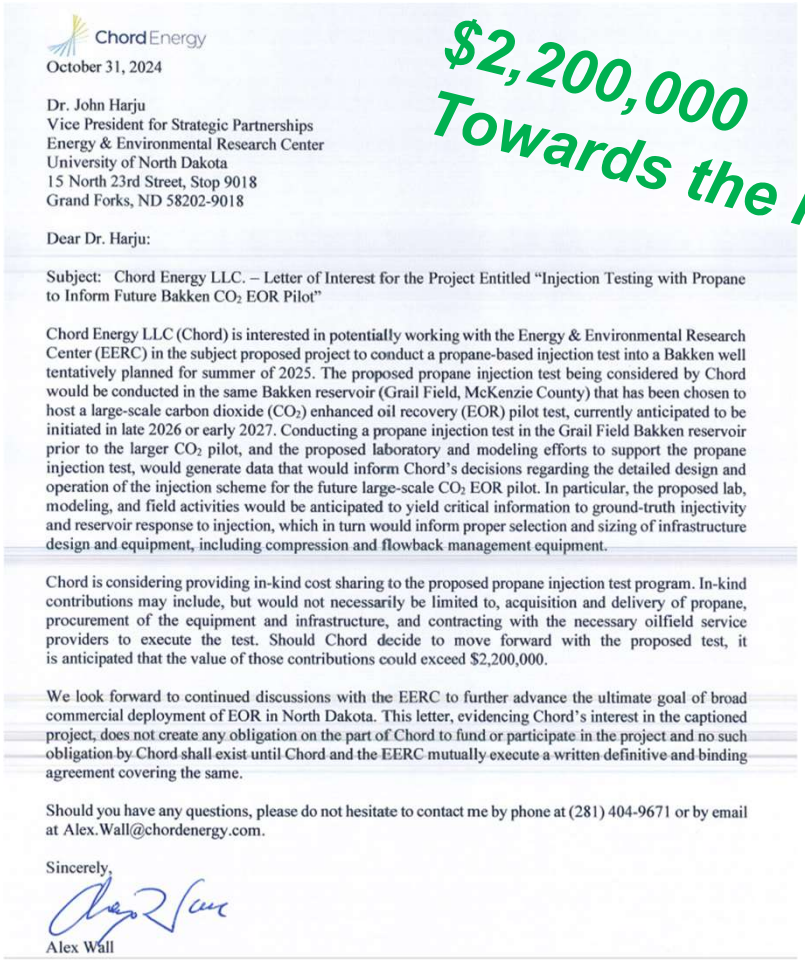
INJECTION TESTING WITH PROPANE/NGL TO INFORM FUTURE BAKKEN CO_2 EOR PILOT

The Energy & Environmental Research Center (EERC), in partnership with Chord Energy, seeks funding to support an injection test using propane or other natural gas liquid (NGL) as a proxy for CO_2 at a well location that is anticipated to serve as the location for a future large-scale CO_2-based enhanced oil recovery (EOR) pilot project.

- Short duration, small-scale injection testing using readily available propane or NGL will generate invaluable injectivity and reservoir response data to support the cost-efficient design and execution of the larger CO_2 pilot anticipated for 2026.

CHORD LETTER OF SUPPORT FOR COST SHARE

$2,200,000 Towards the injection test



Chord Energy

October 31, 2024

Dr. John Harju
Vice President for Strategic Partnerships
Energy & Environmental Research Center
University of North Dakota
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Dr. Harju:

Subject: Chord Energy LLC. – Letter of Interest for the Project Entitled "Injection Testing with Propane to Inform Future Bakken CO_2 EOR Pilot"

Chord Energy LLC (Chord) is interested in potentially working with the Energy & Environmental Research Center (EERC) in the subject proposed project to conduct a propane-based injection test into a Bakken well tentatively planned for summer of 2025. The proposed propane injection test being considered by Chord would be conducted in the same Bakken reservoir (Grail Field, McKenzie County) that has been chosen to host a large-scale carbon dioxide (CO_2) enhanced oil recovery (EOR) pilot test, currently anticipated to be initiated in late 2026 or early 2027. Conducting a propane injection test in the Grail Field Bakken reservoir prior to the larger CO_2 pilot, and the proposed laboratory and modeling efforts to support the propane injection test, would generate data that would inform Chord's decisions regarding the detailed design and operation of the injection scheme for the future large-scale CO_2 EOR pilot. In particular, the proposed lab, modeling, and field activities would be anticipated to yield critical information to ground-truth injectivity and reservoir response to injection, which in turn would inform proper selection and sizing of infrastructure design and equipment, including compression and flowback management equipment.

Chord is considering providing in-kind cost sharing to the proposed propane injection test program. In-kind contributions may include, but would not necessarily be limited to, acquisition and delivery of propane, procurement of the equipment and infrastructure, and contracting with the necessary oilfield service providers to execute the test. Should Chord decide to move forward with the proposed test, it is anticipated that the value of those contributions could exceed $2,200,000.

We look forward to continued discussions with the EERC to further advance the ultimate goal of broad commercial deployment of EOR in North Dakota. This letter, evidencing Chord's interest in the captioned project, does not create any obligation on the part of Chord to fund or participate in the project and no such obligation by Chord shall exist until Chord and the EERC mutually execute a written definitive and binding agreement covering the same.

Should you have any questions, please do not hesitate to contact me by phone at (281) 404-9671 or by email at Alex.Wall@chordenergy.com.

Sincerely,

Alex Wall

PROJECT OVERVIEW

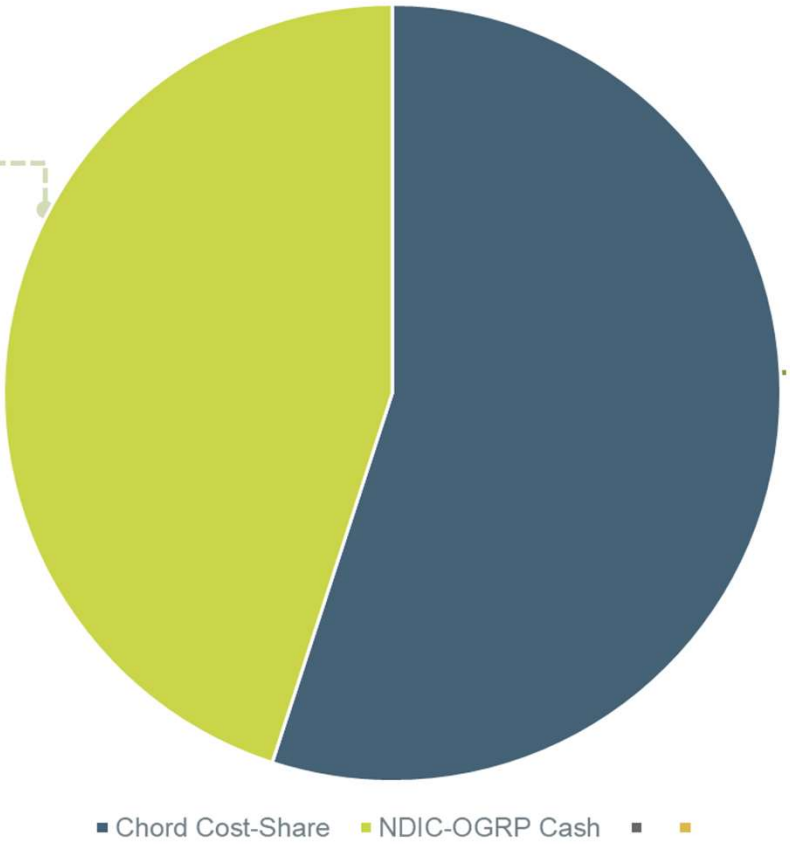
- **Period of Performance**: 3/1/2025 – 2/28/2026 (12 months)
- **Major Partners:**
  - North Dakota Industrial Commission (NDIC) funding through the Oil & Gas Research Program
  - Chord Energy
    - ♦ In-kind cost-share provider
    - ♦ Operator of the field-based injection and reservoir surveillance activities
  - EERC
    - ♦ Laboratory evaluations
    - ♦ Modeling
    - ♦ Injection test design and interpretation support
    - ♦ Project management

INJECTION TESTING WITH PROPANE/NGL TO INFORM FUTURE BAKKEN CO_2 EOR PILOT BUDGET

NDIC Cash – $1,800,000 Includes:

- $1,000,000 for EERC lab testing, modeling, test design & interpretation, project reporting & management.
- $800,000 for Chord site preparation and injection operation

PROJECT TOTAL: $4,000,000



Chord In-Kind Cost Share –

$2,200,000 Includes, but not necessarily limited to:
Acquisition, delivery, and injection of propane or other readily available NGL into selected Bakken well.

BUDGET OVERVIEW

- Total estimated cost for the proposed efforts is $4,000,000.
- Request from OGRP is $1,800,000.
- Chord anticipates field-based activities will cost approximately $3,000,000 to include, but not necessarily limited to:
  - Purchase of propane or NGL.
  - Transportation costs for propane or NGL.
  - Pumping costs.
  - Downhole and surface work to support execution of the test.
- Chord anticipating to pay ~$2,200,000 for field costs, to be shown as cost-share.
- Request to OGRP includes $800,000 to go towards expenses incurred by Chord over the course of site preparation & injection operations.
- Request to OGRP include $1,000,000 to go towards EERC expenses for lab testing, modeling, injection test design & interpretation support, and project management.

PROPANE/NGL INJECTION TEST PROJECT OBJECTIVE

- Determine the response of a Bakken reservoir to injecting propane (or other readily available NGL) to ***inform the cost-effective design and operation of a future large-scale CO_2-based EOR pilot project.***
- Generate data on effects of injection on reservoir rocks & fluids, injectivity, bottomhole pressure, pressure buildup and dissipation rates, evidence of communication with offset wells, and fluid flowback rates.

PROPANE/NGL INJECTION TEST EXPECTED RESULTS

- New data on key current reservoir conditions, reservoir response to injection, and conformance of injected fluids will ***enable the "right sizing" of surface infrastructure for the large-scale CO_2 EOR pilot in 2026.***
- Aspects of the CO_2 EOR pilot design that will be informed by the propane test include:
  - Compression
  - Fluid flowback management systems
  - Reservoir surveillance systems

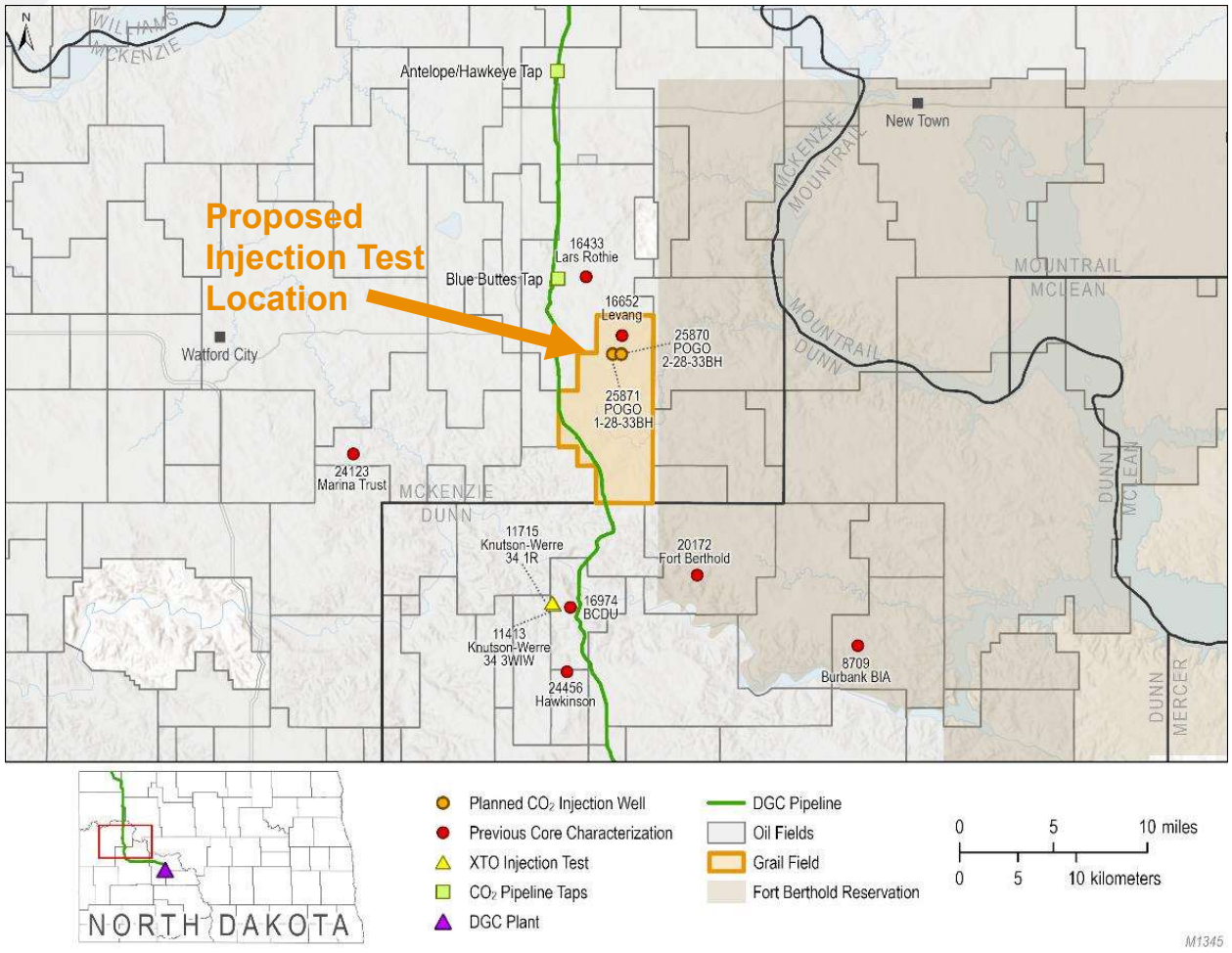
SPECIFIC PROJECT ACTIVITIES

Chord Energy

EERC
UND UNIVERSITY OF NORTH DAKOTA

- Lab Investigation of Propane/NGL Interactions with Rocks & Fluids from the Grail Field
- Reservoir Modeling, Simulation, and Calibration
- Field Injection Test and Reservoir Surveillance
- Project Management & Reporting

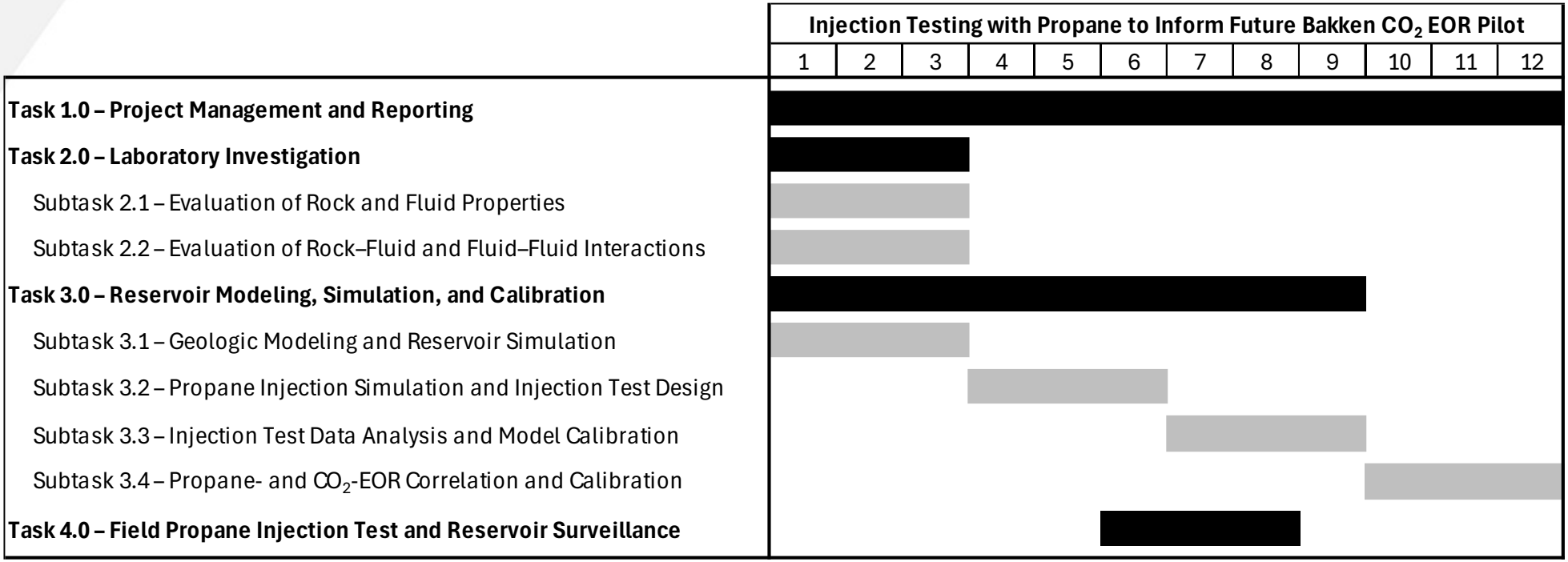
PROPANE/NGL INJECTION TEST LOCATION



A Chord operated well in a Bakken DSU in the Grail Field, McKenzie County, will serve as the EOR field test location.

This map also displays wells where data have been collected through prior EERC research, and project location proximity to DGC CO_2 pipeline.

INJECTION TESTING WITH PROPANE/NGL TO INFORM FUTURE BAKKEN CO_2 EOR PILOT - TIMELINE



VALUE TO NORTH DAKOTA

This project, combined with the larger CO_2 EOR pilot planned for 2026, could ultimately increase oil and gas operations in North Dakota by improving resource recovery, decreasing costs, reducing environmental impacts, yielding low-carbon-intensity incremental oil.

Successful completion of the proposed project will also demonstrate the technical viability and cost effectiveness of using propane and possibly other NGLs as a working fluid for EOR in its own right.

Ultimately, successful CO_2 EOR operations would **extend the lifetime of the Bakken play by multiple decades**, potentially yielding billions of barrels of incremental oil and natural gas, which would ***translate into billions of dollars in economic impact to North Dakota.***

Questions?

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