



Energy & Environmental Research Center (EERC)

CARBON CAPTURE, UTILIZATION, AND STORAGE (CCUS): FACT OR FICTION?

Midwest Energy Summit

Fargo, ND

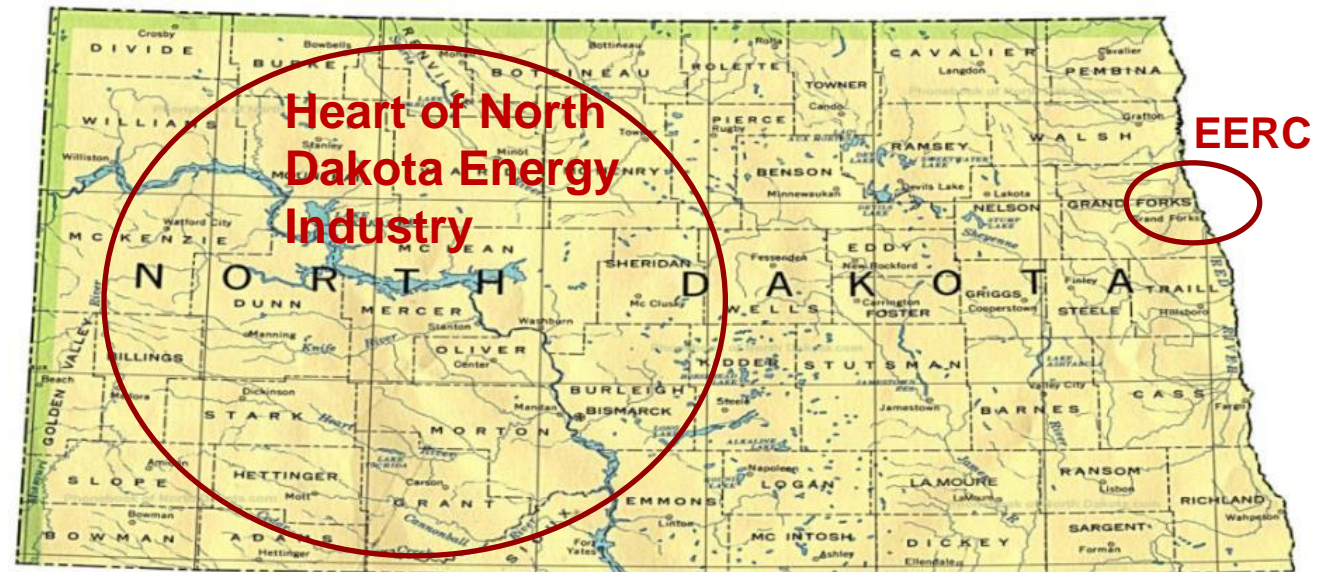
November 7, 2024

Josh Stanislawski

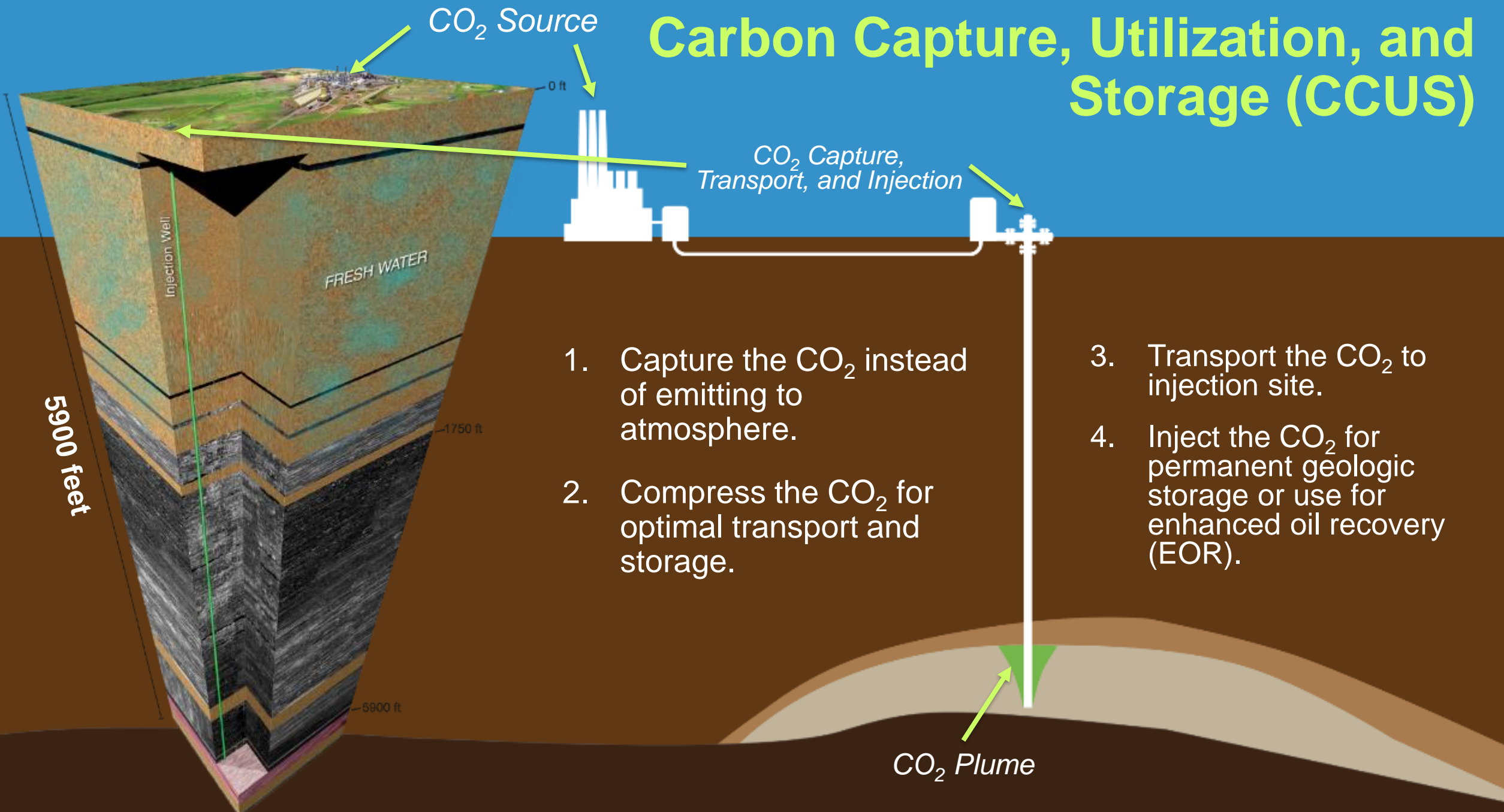
Director of Energy Systems Development

ENERGY & ENVIRONMENTAL RESEARCH CENTER (EERC)

- Nonprofit branch of the University of North Dakota.
- Over 270 employees focused on energy and environmental solutions.
- More than 254,000 square feet of state-of-the-art laboratory, demonstration, and office space.



Carbon Capture, Utilization, and Storage (CCUS)



FACT: THE PCOR PARTNERSHIP HAS BEEN DEVELOPING CCUS TECHNOLOGIES FOR OVER 20 YEARS

2003–2005 – PCOR Partnership: Characterization

2005–2008 – PCOR Partnership: Field Validation

2007–2019 – PCOR Partnership: Commercial Demonstration

2019–2025 – PCOR Partnership Initiative: Commercial Deployment



U.S. DEPARTMENT OF
ENERGY



NATIONAL
ENERGY
TECHNOLOGY
LABORATORY



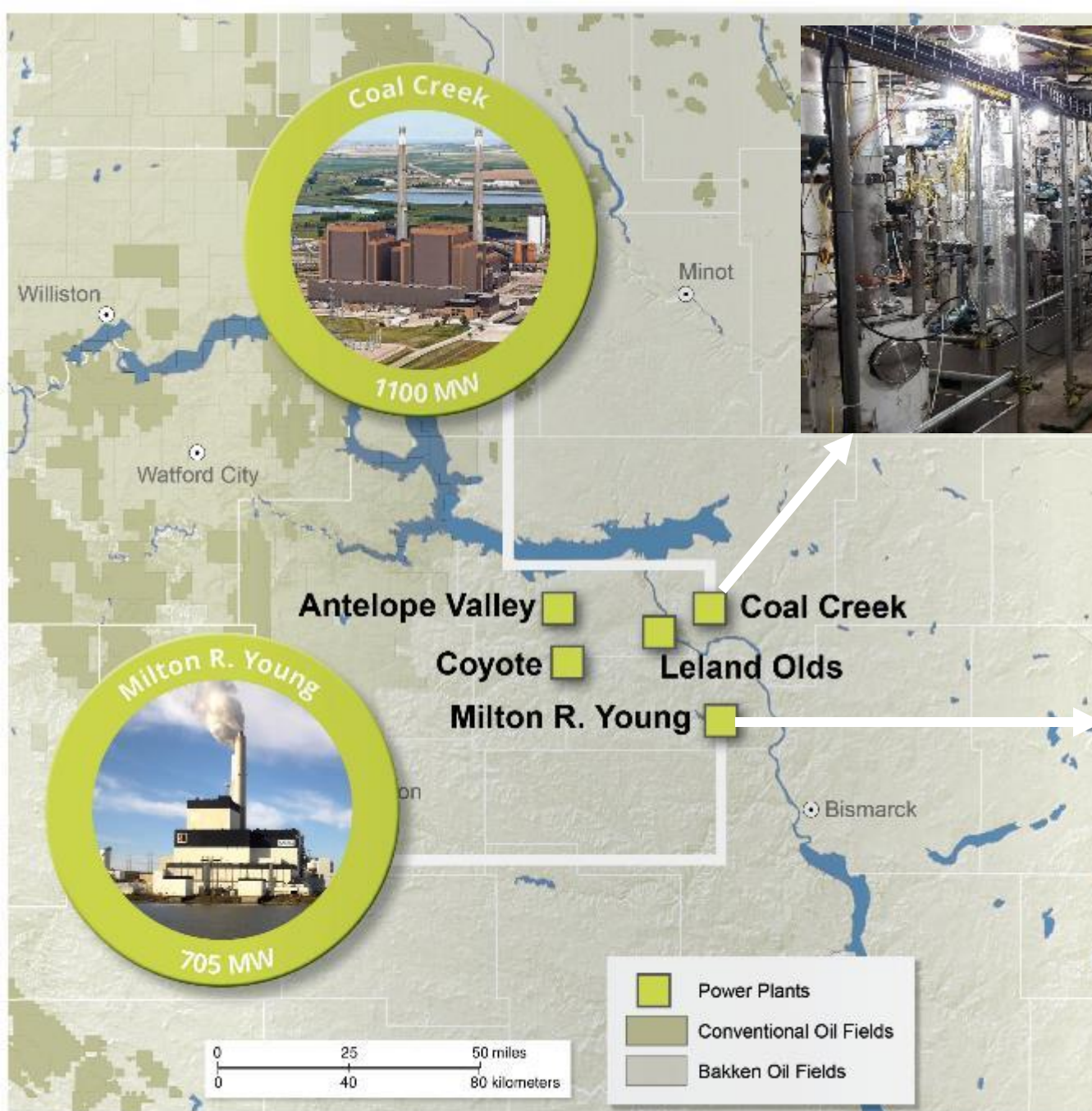
Institute of Northern Engineering
University of Alaska Fairbanks



SCHOOL OF
ENERGY RESOURCES







Carbon Capture Installed at CCS

FACT: THE EERC HAS PERFORMED PILOT-SCALE TESTING FOR NEARLY EVERY COMMERCIALY AVAILABLE CARBON CAPTURE TECHNOLOGY.



Wet ESP Installed at MRY

FACT: EXXONMOBIL'S SHUTE CREEK FACILITY HAS CAPTURED CO₂ FROM PRODUCED GAS SINCE 1986.

- The facility has captured more CO₂ than any other facility in the world, which is used for EOR in Wyoming, Montana, and North Dakota oil fields.

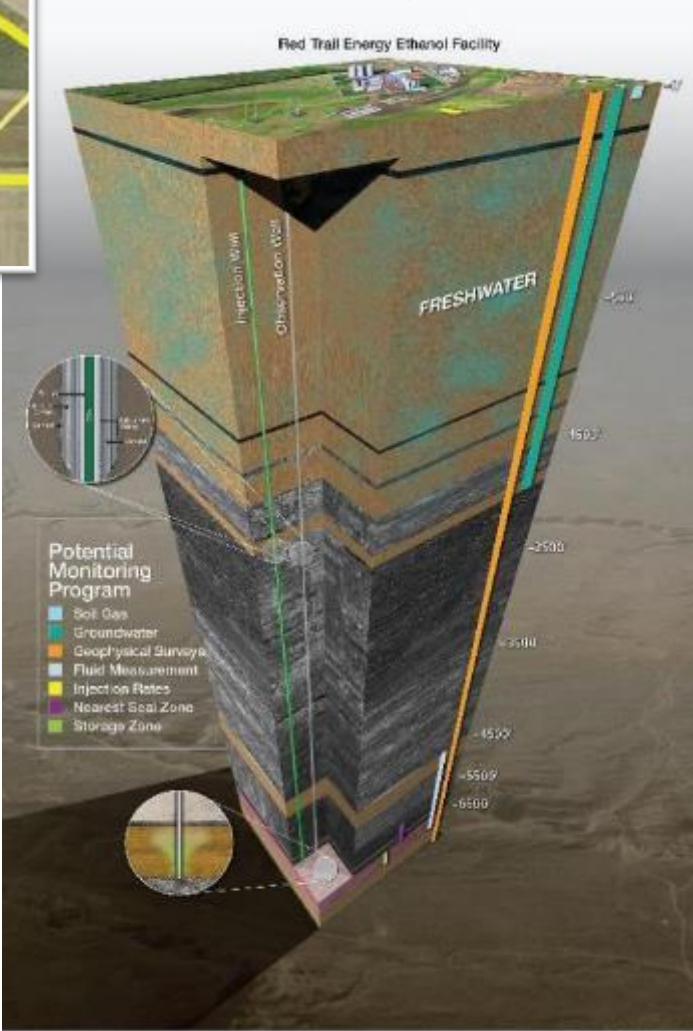
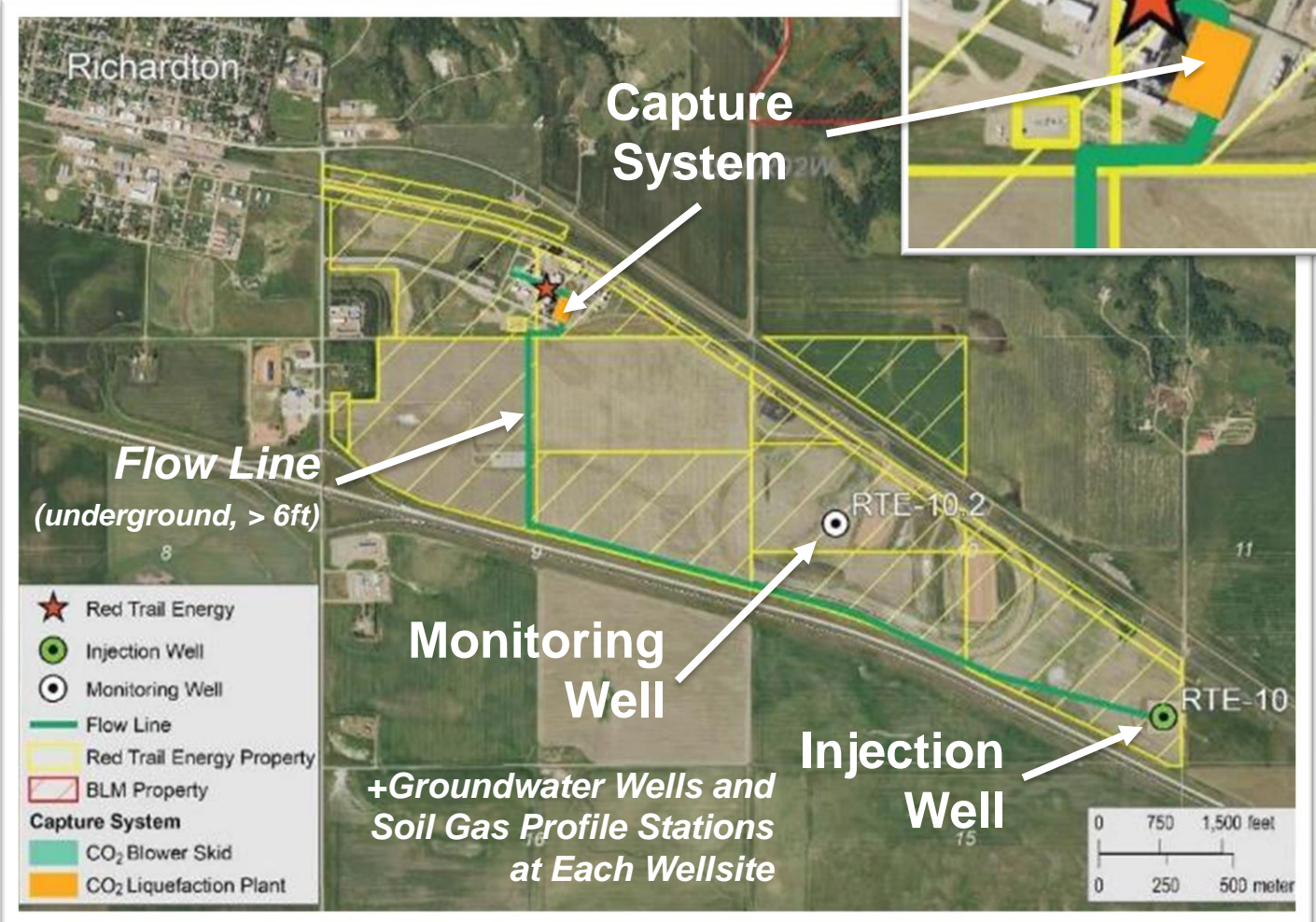
GREAT PLAINS SYNFUELS PLANT HAS BEEN SEQUESTERING CO₂ FOR NEARLY 25 YEARS.



Image from dakotagas.com

FACT: RED TRAIL ENERGY CCS IS NOW COMMERCIAL.

~180,000 metric tons per year since June 16, 2022





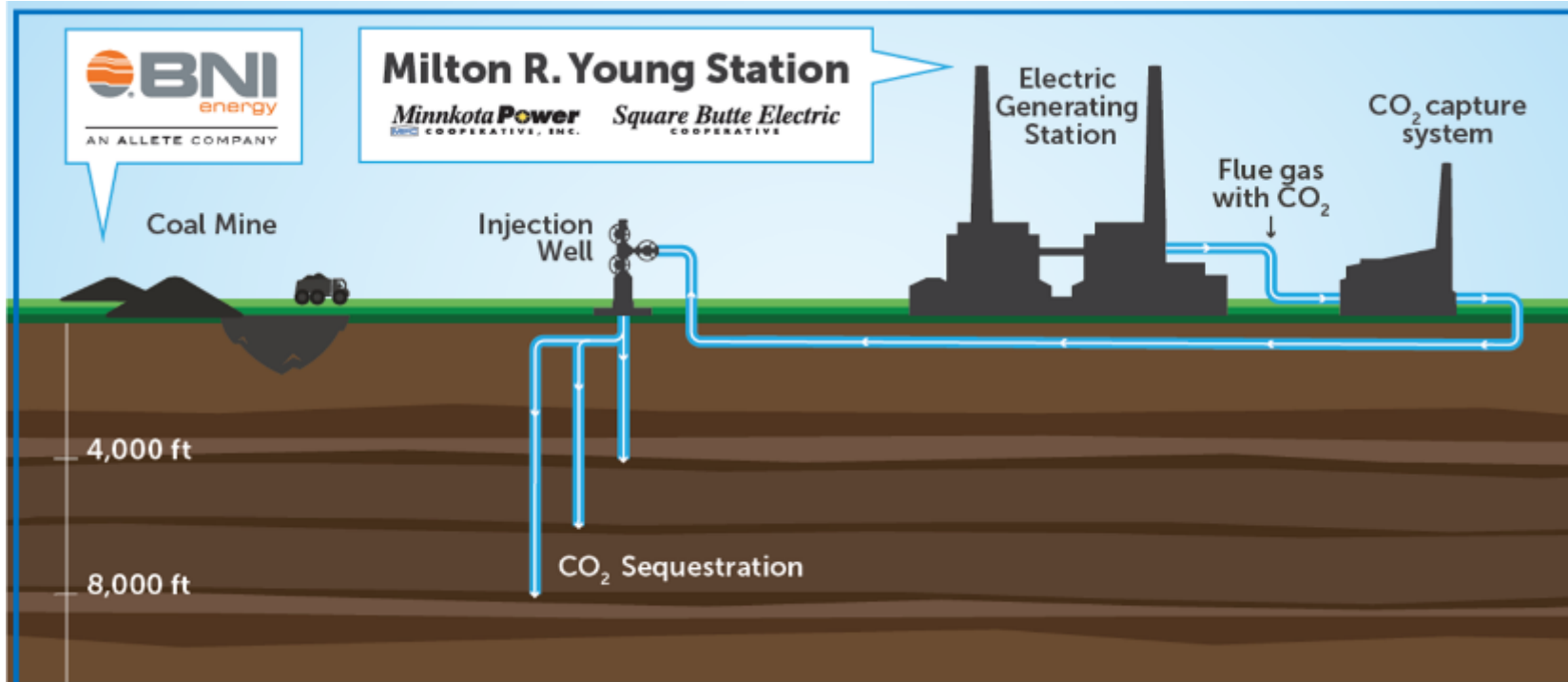
FACT: PROJECT TUNDRA IS NEARING A FINANCIAL INVESTMENT DECISION.

Project Tundra is in the advanced engineering and design phase. If the project moves ahead, construction could begin in 2025.

Precommercial:

>90% postcombustion CO₂ capture (~4 million tons per year).

All necessary Class VI permits have been secured for permanent geologic storage.



FACT: COAL CREEK STATION IS MAKING INVESTMENTS IN UNDERSTANDING CCUS.

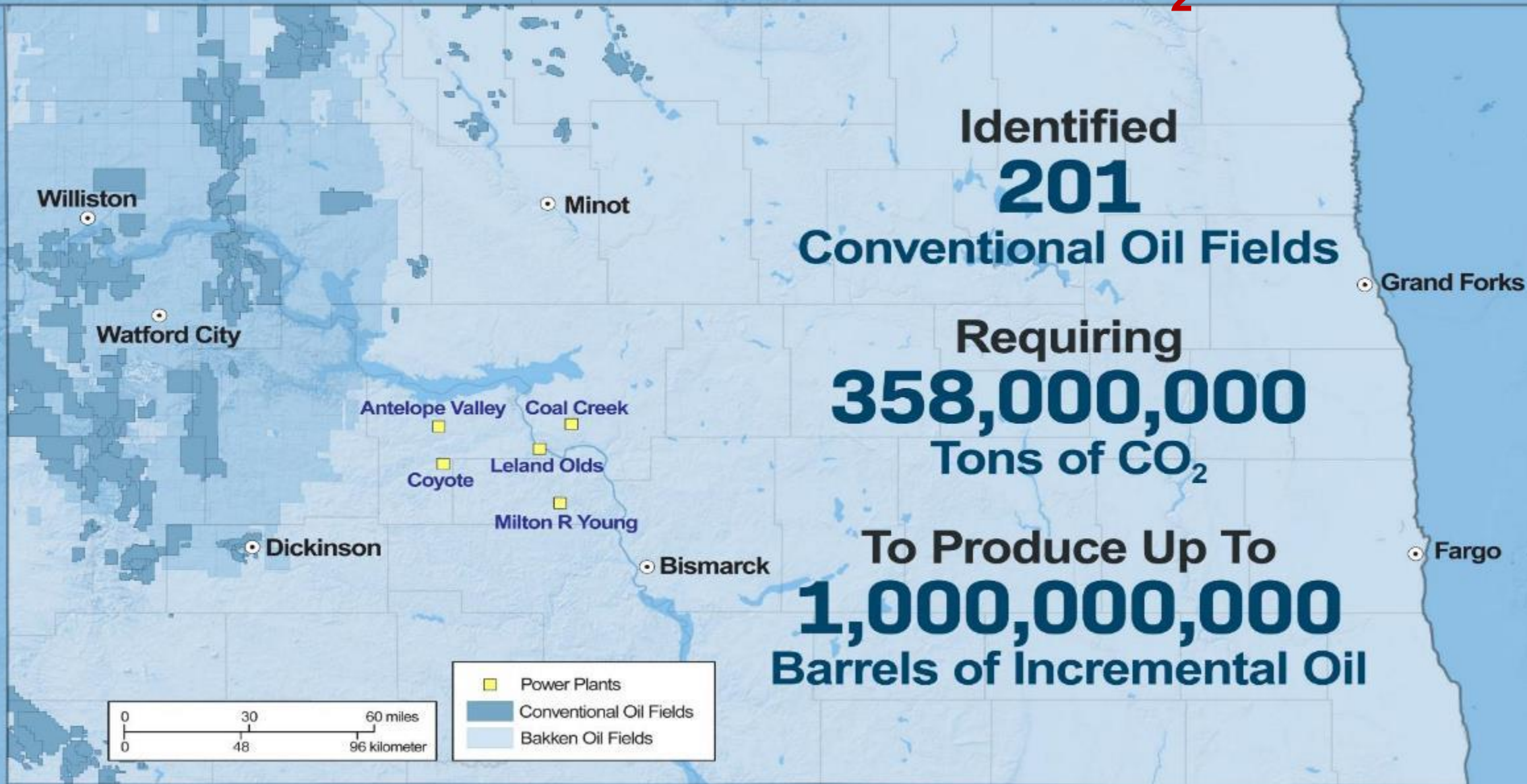
Coal Creek Carbon Capture FEED study will be completed in 2025.



Photo credit: [greatriverenergy.com](https://www.greatriverenergy.com)

Critical Challenges. Practical Solutions.

FACT: NORTH DAKOTA OIL FIELDS NEED CO₂.



Identified
201
Conventional Oil Fields

Requiring
358,000,000
Tons of CO₂

To Produce Up To
1,000,000,000
Barrels of Incremental Oil

FACT: "WE ARE ON THE CUSP OF WIDE-SCALE COMMERCIAL DEPLOYMENT."

–EERC CEO Charles Gorecki
Addressing U.S. Secretary of Energy
Granholm, October 14, 2021

PROJECTS IN PCOR PARTNERSHIP REGION

Active and Developing CCUS Projects in the PCOR Partnership Region

- Active Capture
- ▲ Active Injection
- Developing Capture*
- ▼ Developing Injection**
- CO₂ Pipeline
- Active
- Planned

ACTL = Alberta Carbon Trunk Line
CCA = Cedar Creek Anticline (ND/MT border)
EWSH = Eastern Wyoming Sequestration Hub
*Not all Developing Capture are shown on a map
** May also be partially permitted

Proposed Alberta CCUS Hubs

- | | |
|----------------------------|--------------------------------|
| 1. Grande Prairie Net Zero | 14. Alberta Carbon Grid |
| 2. Greenview Region | 15. Atlas Carbon Sequestration |
| 3. Grande Prairie CCS | 16. Wolf Midstream |
| 4. Masikwa | 17. Battle River |
| 5. Athabasca Banks | 18. Central Alberta |
| 6. Opal Carbon | 19. Ram River |
| 7. Rocky Mountain | 20. Bow River |
| 8. Tourmaline Clearwater | 21. Rolling Hills |
| 9. Brazeau | 22. North Drumheller |
| 10. Oil Sands Pathways | 23. Pincher Creek |
| 11. Meadowbrook | 24. Clear Horizon |
| 12. Open Access Wabamun | 25. East Calgary Region |
| 13. Origins | Carbon Sequestration |



- 17 active projects
- 4 partially permitted
- 35 announced/developing



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A wide-angle photograph of a university campus at sunset. The sun is low on the horizon, creating a warm glow and long shadows. In the foreground, there are trees with some autumn-colored leaves. In the background, there are several large, multi-story brick buildings and a parking lot filled with cars.

THANK YOU

Critical Challenges. Practical Solutions.



EERC



UNIVERSITY OF
NORTH DAKOTA



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