



Energy & Environmental Research Center

# Bakken Production Optimization Program Phase II – Interim Report

Oil & Gas Research Program  
Department of Mineral Resources  
August 10, 2017

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Vice President for Strategic Partnerships

# Agenda

- Overview of work this past year
- Highlight some key areas for upcoming year
- Seek your thoughts and input

# Highlights

- Excellent advancement on balance of program
- Significant progress on EOR
- 2MM DOE funding secured
- Kickoff meeting with prospective members in May

# BPOP Members

- Enrolled



- In Consideration



# Program Elements

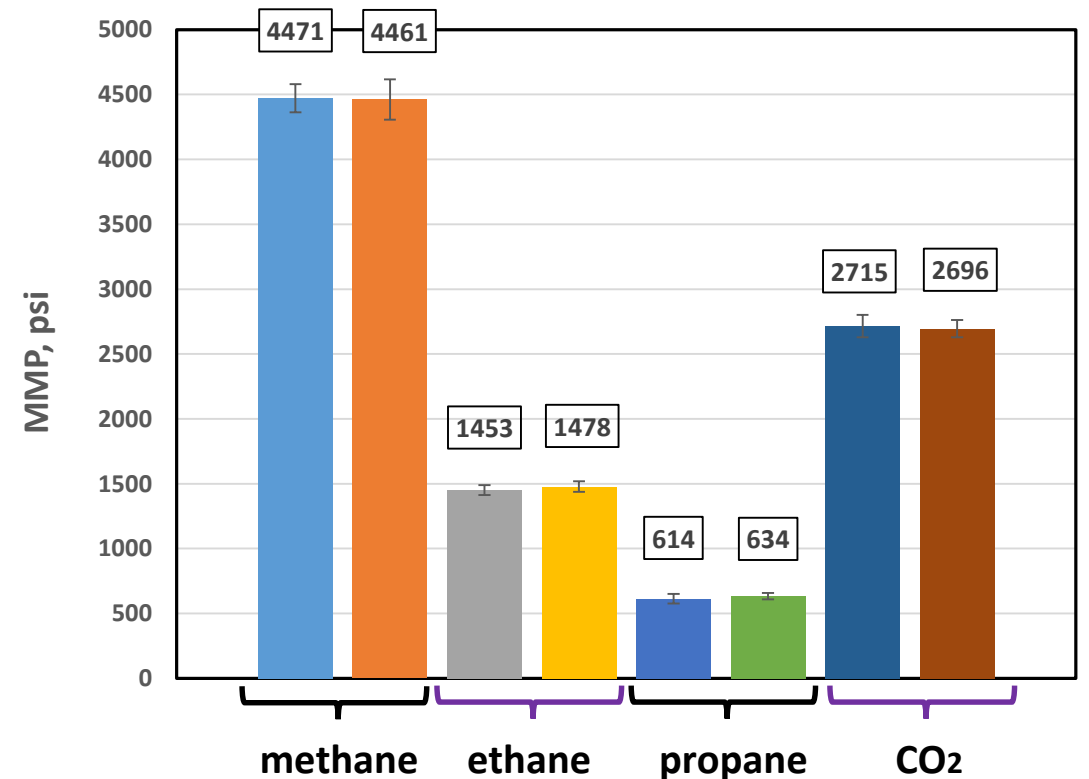
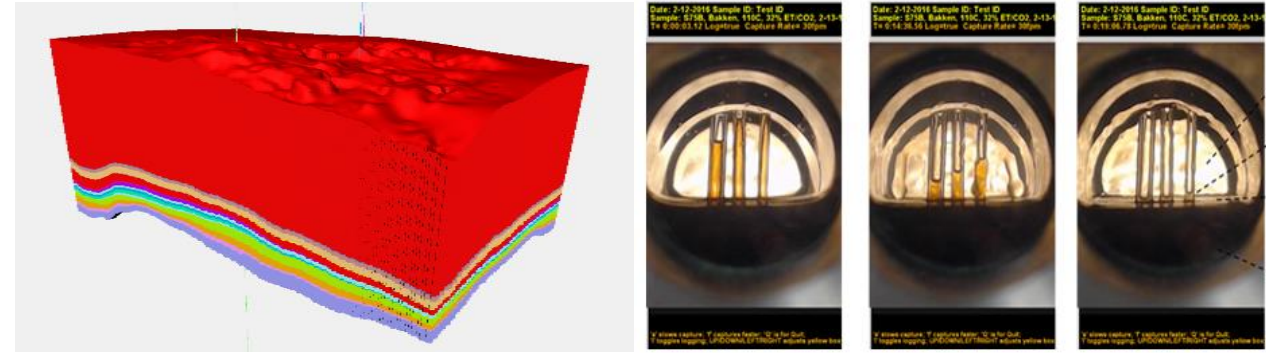
- Produced Fluids Characterization
  - Expanding Database
- Facilities Modeling/Crude Oil Vapor Pressure
  - Conditioning Optimization
- Water Management
  - Inyan Kara Simulation Model; McKenzie County
- Environmental Support
  - Unrefined Hydrocarbon working group
  - IOGCC Resolution (conflicting federal rules)
- ***Liberty Collaboration & EOR Work***
- ***Evaluation of the Bakken Refrac Potential***
- Aromatic & Aliphatic Method Development



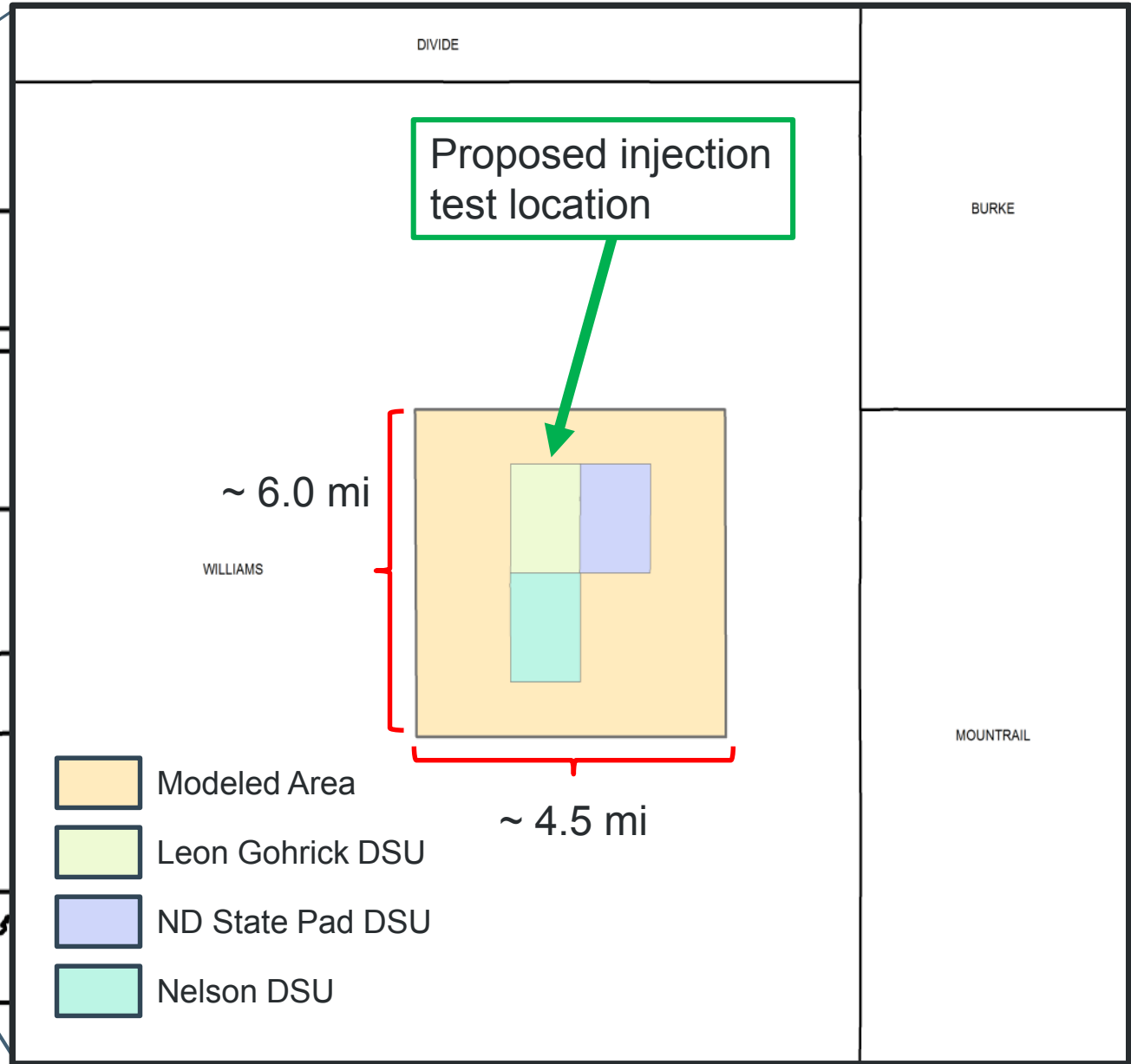
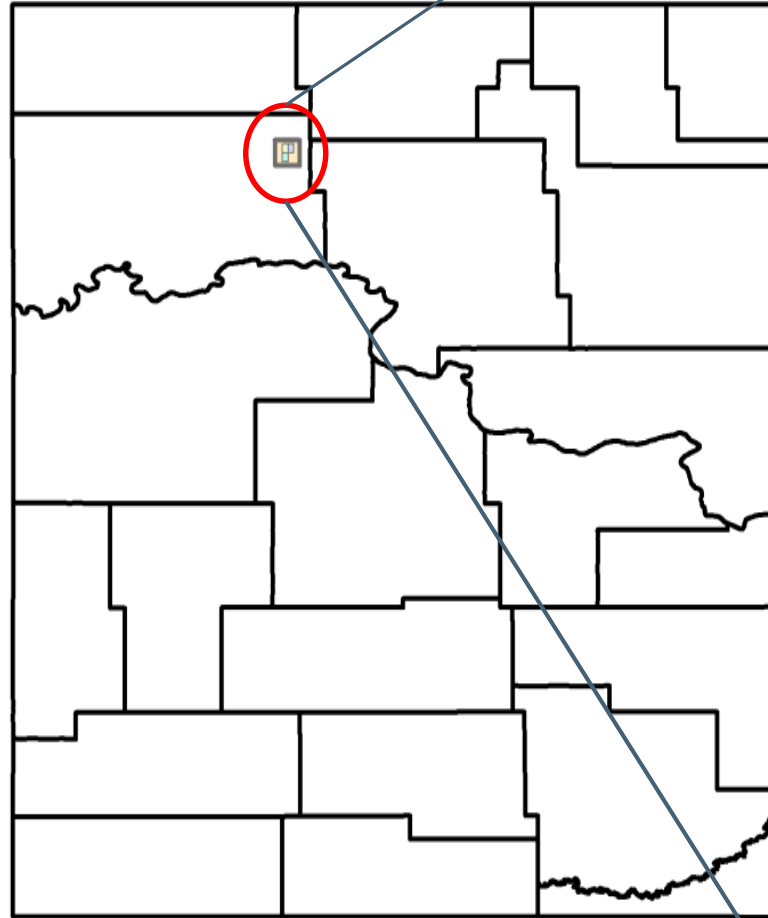
# Liberty Collaboration

## Year 1 – Accomplishments

- Secured \$2M of DOE funding
- Injection permit application submitted
- MMPs for methane, ethane, propane
- Rock extraction data for rich gas components
- Geocellular model of Stomping Horse area
- Simulations initiated:
  - ◆ Equation of State tuning
  - ◆ History matching for oil, water, gas, BHP
  - ◆ Injection-production scenarios



# Location



# Evaluation of Bakken Refrac Potential

- Refrac is a recent development for the Bakken and the Williston Basin, but is widely practiced in other tight oil and gas basins
  - Limited data available for the Bakken, but initial responses appear favorable
  - Intensively studied elsewhere, including DOE research
- Preliminary work plan – Initiate Fall 2017
  - Review existing research for lessons learned from other basins
  - Collect Bakken refrac data (Whiting's project, J Kringstad's recent work)
  - Evaluate production and EUR performance of recent refrac wells
  - Examine/determine candidate selection criteria of recent refracs
  - Determine/recommend candidate selection criteria for future refracs
  - Estimate large scale reservoir impacts of widespread refracturing





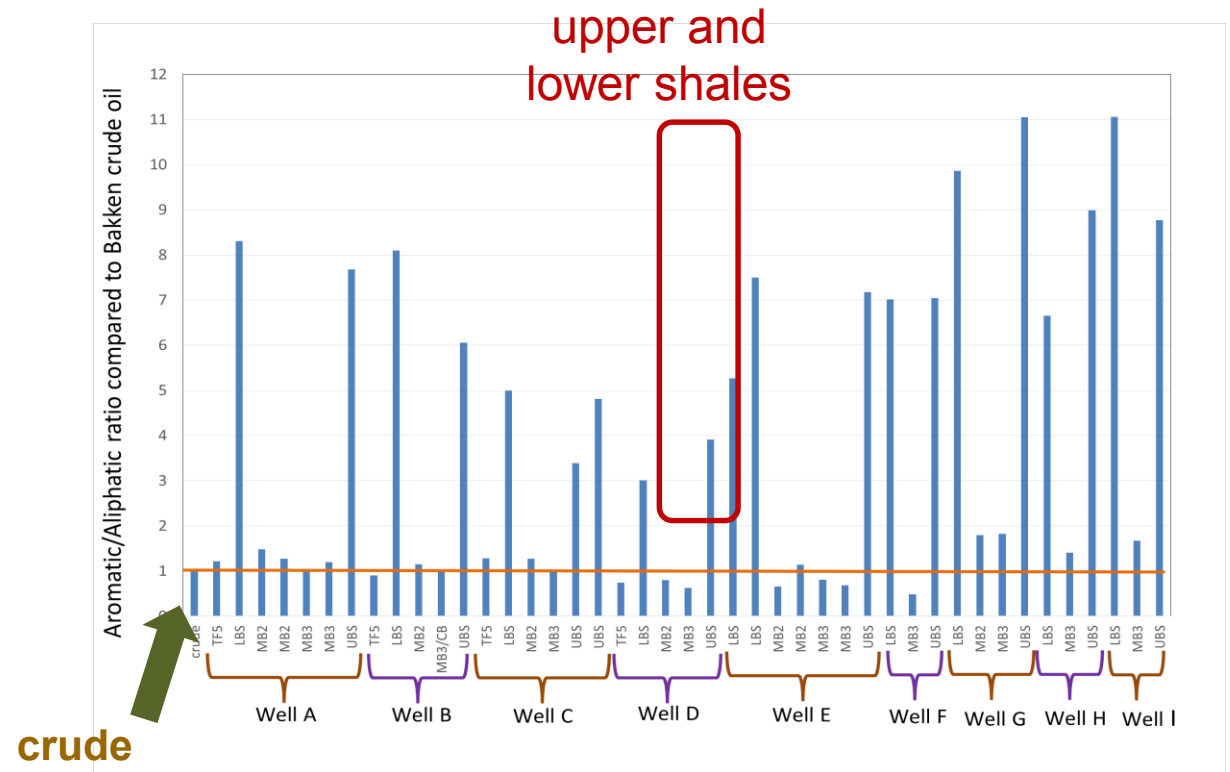
# Benefits of Bakken Refrac

- Improved production & EUR
- Efficient use of existing infrastructure
- Increased investment
- New source of revenue for service companies vs. new well drilling and development
- Sustained economic activity for local communities
- Improved understanding of Bakken and Three Forks reservoirs



# Aromatic/Aliphatic Method Development

- A quantitative analytical method of the aromatic/aliphatic tracer content was developed and validated.
  - >50 rock core samples analyzed
    - ◆ Recovery factor
    - ◆ Reserve attribution
    - ◆ Better informed completions



# CONTACT INFORMATION

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