



Bakken Production Optimization Program



Program Introduction

The Energy & Environmental Research Center (EERC), in close coordination with Continental Resources, Inc., and several of the Williston Basin's premier operating companies, is engaged in a research program with the goal of simultaneously improving Bakken system oil recovery while reducing its environmental footprint. The results of the 3-year program will increase well productivity and the economic output of North Dakota's oil and gas resources, decrease environmental impacts of wellsite operations, and reduce demand for infrastructure construction and maintenance. Specific results will include:

- Greater understanding of Bakken–Three Forks reservoirs and attendant significant increases to estimates of recoverable hydrocarbons.
- Less truck traffic, resulting in decreased diesel emissions, road dust, and spills.
- Reduced road maintenance costs, wastewater production, disposal costs, and freshwater use.
- Reduced land use impacts.
- Increased revenue from added product streams, captured earlier in the well life cycle.



Costs Shared by Consortium of Producers and State of North Dakota

As a partner in this ongoing research program, the North Dakota Industrial Commission (NDIC) committed \$8.5 million in matching funds over 3 years to support a consortium of industry partners conducting research focused on improving the efficiency and reducing the environmental footprint of oil production in North Dakota. The EERC, along with founding partners Continental Resources, Marathon Oil Company, and Whiting Petroleum Corporation, is seeking additional organizations interested in participation in this consortium. Participation in the consortium can be achieved by committing cost-share funds to support consortium-developed activities, thereby leveraging the combined funding and expertise of all consortium members.



Opportunities to Share in Results

This is a producer-driven program with the goal of providing solutions to nonconfidential wellsite productivity issues affecting all Bakken producers. Employing a consortium approach for these issues minimizes corporate financial and staffing input, makes solutions quickly available to consortium companies, and partners with the State of North Dakota to ensure transparency and continued cooperation to assist producers in getting the most out of wellsite economics.

Several leading Bakken producers, including Continental Resources, Whiting Oil, and Marathon, enlisted as founding consortium members. Participation of additional membership is now being actively solicited:

- \$100,000/year for producers with 150 wells or more
- \$50,000/year for producers with fewer than 150 wells
- \$25,000/year for service company participation

Benefits of membership include:

- Ability to guide research efforts to issues highest on your company's priority list.
- Rapid information sharing among consortium members.
- Engagement with industry professionals focused on high-priority wellsite productivity issues.

Program Details

Activities focused on the optimization of wellsite operations will be developed and prioritized by consortium members and will include projects in the following topic areas.

Hydrocarbon Utilization

- Investigate the use of wellhead gas for drilling, completion, and production operations.
- Perform engineering analysis of small-scale gas-processing technologies, and assess viability of implementation.

Waste Management, Minimization, and Reuse

- Investigate alternative treatment and reuse strategies for drill cuttings.
- Evaluate waste management options for the variety of waste generated at wellsites, including trash, packaging, construction debris, sewage, etc.
- Assess approaches for addressing NORM (naturally occurring radioactive material), including operational considerations, disposal options, and best practices.

Water Management

- Evaluate the technical and economic viability of water recycling and/or treatment on multiwell locations.
- Inventory water supply options and assess quantity and quality.
- Inventory water disposal options and assess capacity.
- Develop a wastewater treatment demonstration facility to allow testing and demonstration of new technology.

Site Logistics

- Evaluate design, layout, and workflow to improve efficiency at multioperation wellsites.
- Investigate equipment and/or component standardization.

Process Optimization and Systems Failure Analysis

- Investigate opportunities for systems integration.
- Perform failure analysis.
- Quantify and characterize emissions.

Soil Remediation

- Investigate improved techniques of spill remediation (both hydrocarbon and brine).
- Develop best management practice guides.
- Perform site-specific demonstrations.

Land Reclamation

- Investigate strategies to accelerate the return of land to productive use after drilling activities have ceased, production ceases and wells are plugged and abandoned, and access road and pipeline rights of way are remediated.
- Perform site-specific demonstrations.
- Develop best management practice guides.

Public Outreach and Education

- Develop fact sheets for public dissemination.
- Engage in both industry-specific and public sector platforms.

Continental Resources Hawkinson Project

As a large part of this program, Continental Resources is also engaged in a multimillion-dollar effort to develop a data set that will help answer the question of whether the oil reserves of the second and third benches in the Devonian Three Forks Formation in North Dakota should be considered separate and unique reserves from those of the first bench. This portion of the program will help determine optimal well spacing for development in the Middle Bakken and first, second, and third benches of the Three Forks; further define fracture geometries between newly drilled and completed wells and proximal, partially depleted locations; and predict areas of future reservoir sweet spots. It is anticipated that these data will substantiate significant increases in estimates of recoverable oil from the Bakken–Three Forks system.



To discuss consortium membership, contact:

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