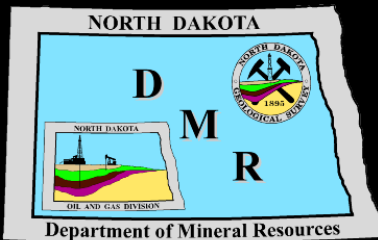


OIL AND GAS UPDATE

***Government Finance
Committee***



***Bismarck, ND
August 2, 2017***

Oil and Gas Update

- Bakken Development
- Bakken Performance
- Bakken Takeaways

Bruce E. Hicks
Assistant Director
NDIC-DMR-OGD
Bismarck, ND

←

→

NDIC DMR

https://www.dmr.nd.gov/oilgas/

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NDIC DMR

dmr.nd.gov

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North Dakota

N

North Dakota vs Vermont ...

N

North Dakota vs Vermont ...

📁

County Info ▾

nd.gov

64th Legislative Assembly ...

🔗

An error has occurred

📰

Bismarck News, Weather, ...

»

North Dakota

nd.gov

Official Portal for
North Dakota State Government

Services

Rules & Regulations

Policies & Guidance

Forms

Hearing Dockets

Active Drilling Rigs

Daily Activity Reports

Information Center

Confidential Well List

General Statistics

Seismic

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Report a Spill/Incident

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Email Addresses

NORTH DAKOTA

OIL AND GAS DIVISION

Welcome to the North Dakota Industrial Commission, Department of Energy and Natural Resources, and Oil and Gas Division, home page.

Please check out the new [Information Center](#) and [Publications](#).

Proposed Rule Changes and Adoption of New Rules

[Rule Changes Full Notice](#)

[General Guidelines for Temporary Abandonment of Wells](#)

[Bakken and Three Forks Information!](#)

Available on the ND Petroleum Council web site are the [Surface Owner Information Center](#), the [Royalty Owner Information Center](#), and the [Oil and Gas Division](#).

The Oil and Gas Division regulates the drilling and production of oil and gas in North Dakota. Our mission is to encourage and promote the development, production, and utilization of oil and gas in the state in such a manner as will prevent waste, maximize economic recovery, and fully protect the correlative rights of all owners to the end that the landowners, the royalty owners, the producers, and the general public realize the greatest possible good from these vital natural resources.

Phone: (701) 328-8020
Fax: (701) 328-8022
Mail:
NDIC Oil and Gas Division
600 East Boulevard Ave
Bismarck, ND 58505-0840
General Shipping:
NDIC Oil and Gas Division

Windows

Activity

https://www...

NDIC DMR

Department ...

Inbox - bhick...

35 Reminders

Activity Upd...

Oil and Gas Update

- **Bakken Development**

- **Uniform Spacing—orderly development**
- **Energy Corridors**

- **Bakken Performance**

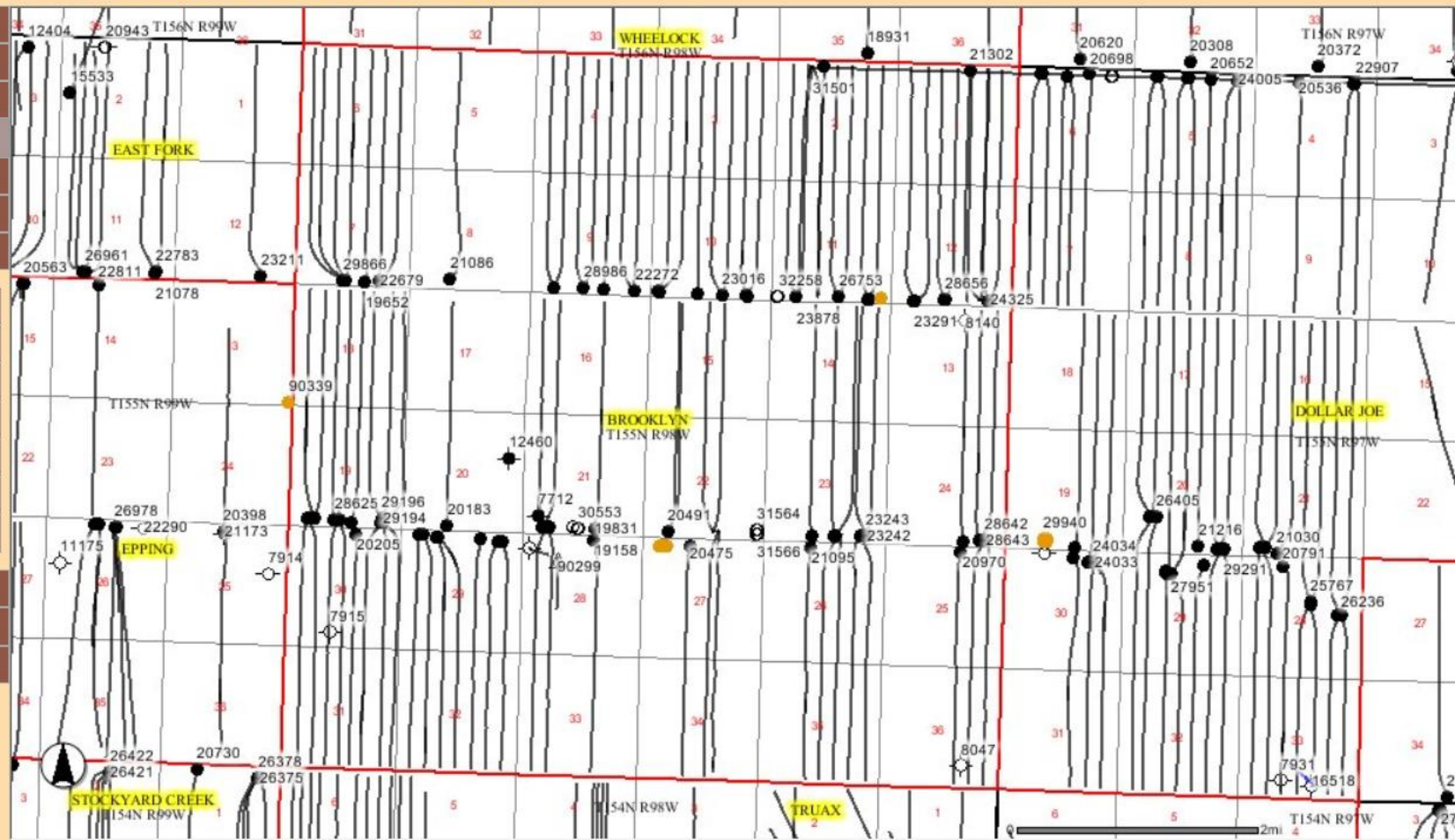
- **Oil Production**
- **Well Count**
- **Gas-Oil Ratio**
- **Gas Capture**
- **Water-Oil Ratio**
- **Stimulations**

- **Pipelines**

- **Bakken Takeaways**

Oil and Gas Subscription: ArcIMS Viewer

- Legend / Layers
- Overview Map
- View Entire State
- Previous View
- Clear Selection
- Search
- Create PDF
- Zoom In
- Zoom Out
- Pan
- Rect Identify
- Select Object
- Buffer
- Distance
- Find Well
- Find Field / Unit
- Find Section



Zoom In

Oil and Gas Subscription: ArcIMS Viewer

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Overview Map

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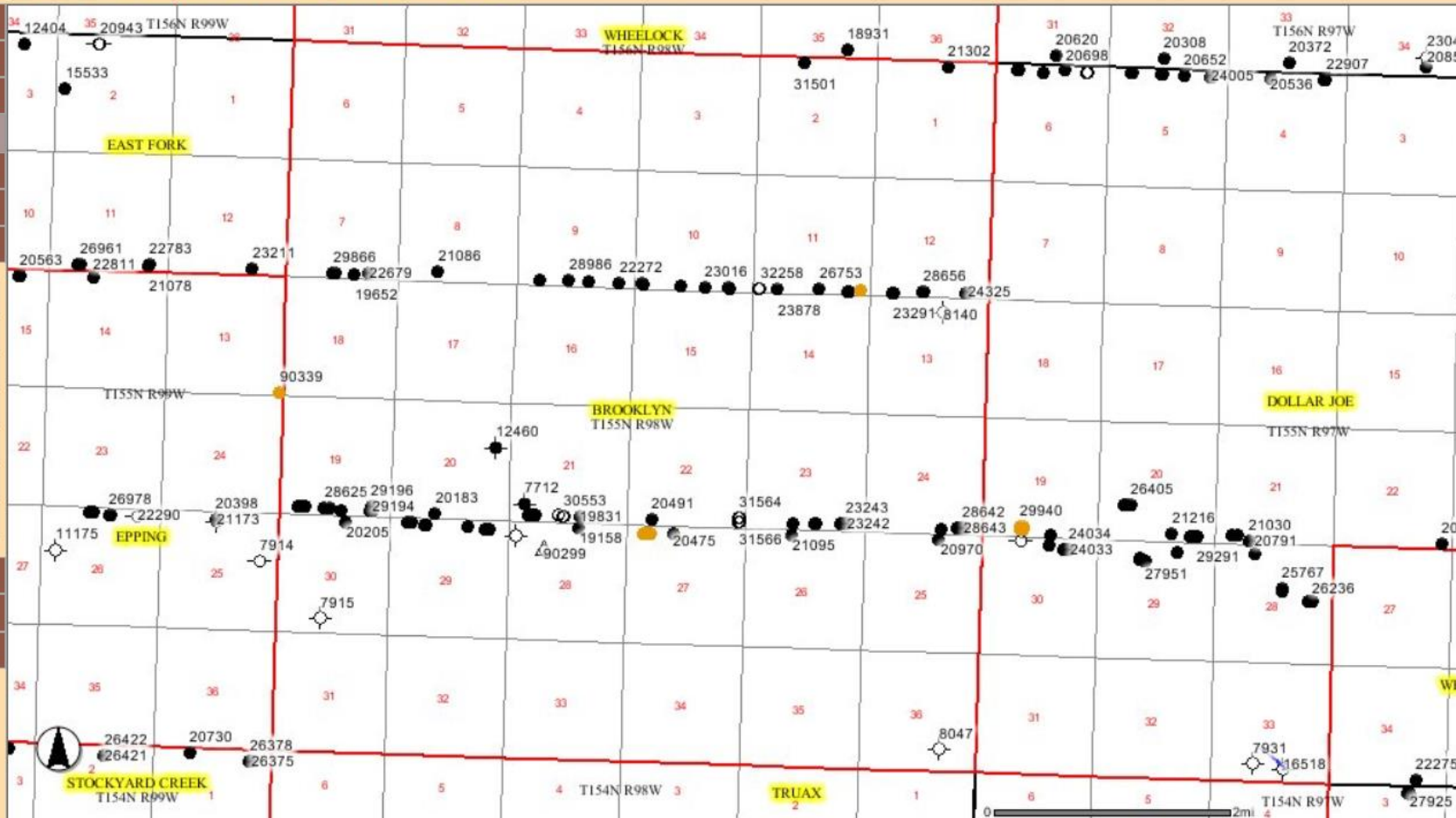
Buffer

Distance

Find Well

Find Field / Unit

Find Section



Zoom In



Performance...



Oil and Gas ...



Oil and Gas ...

NDIC
DMR

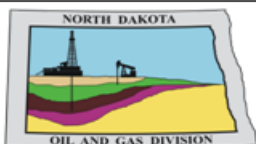
Activity Upd...



ZZ.Performa...

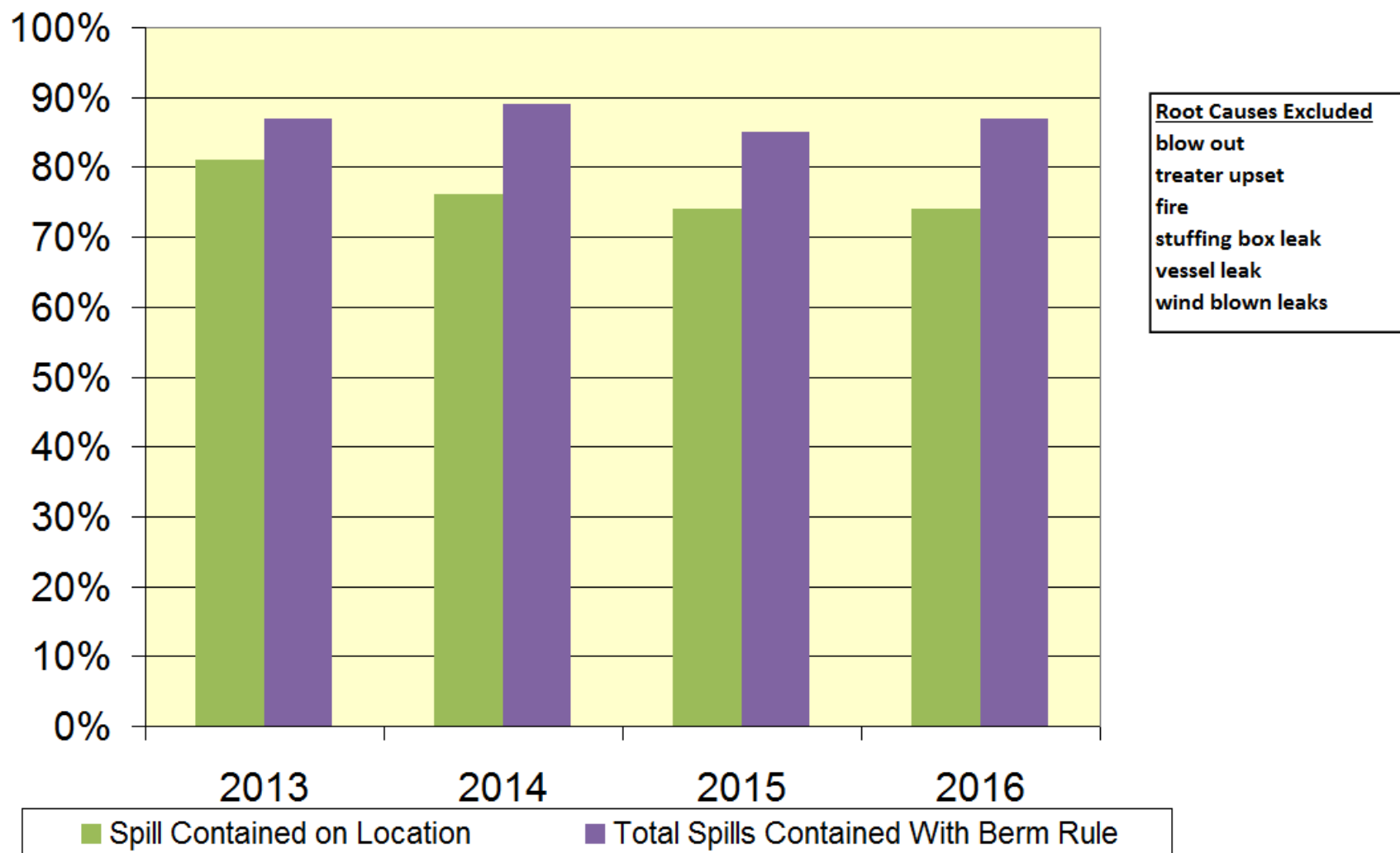


Vern Whitten Photography



Contained Spills / Berm Effectiveness

More spills will be contained onsite due to Oil and Gas Division rule changes effective April 1, 2016 requiring perimeter berms on high volume production sites.

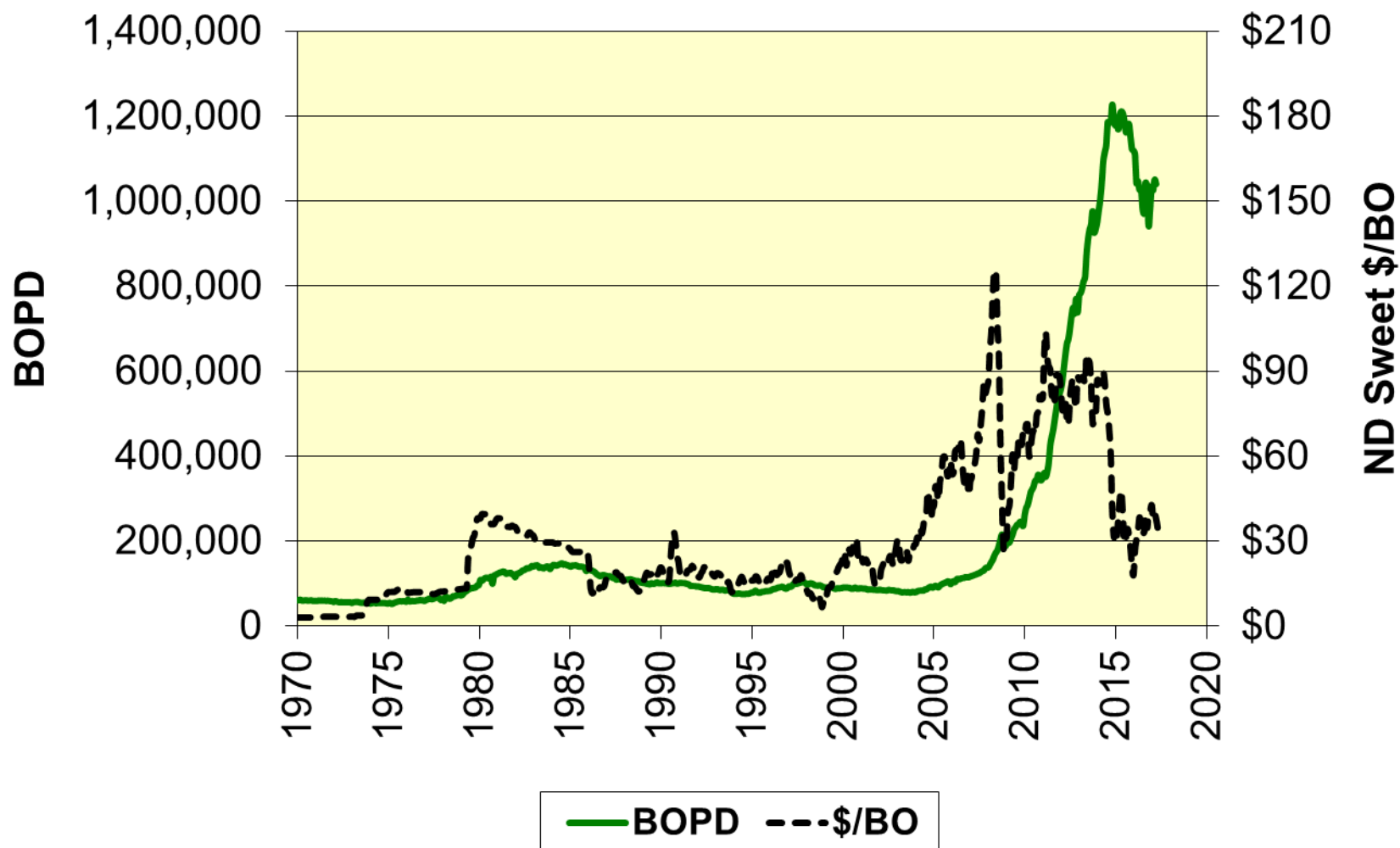


Oil and Gas Update

- Bakken Development
- **Bakken Performance**
 - **Oil Production**
 - Well Count
 - Gas-Oil Ratio
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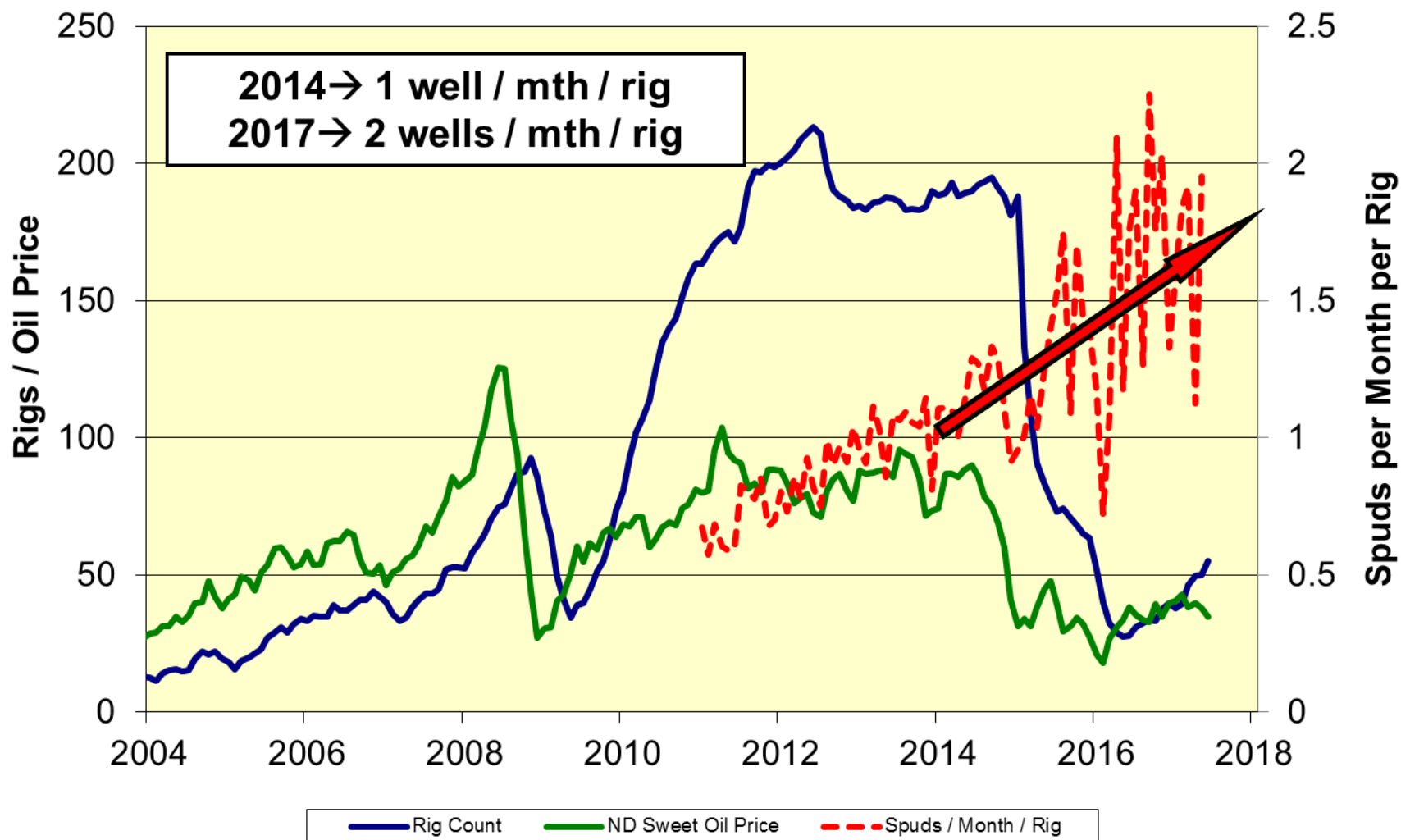


North Dakota Daily Oil Produced and Price

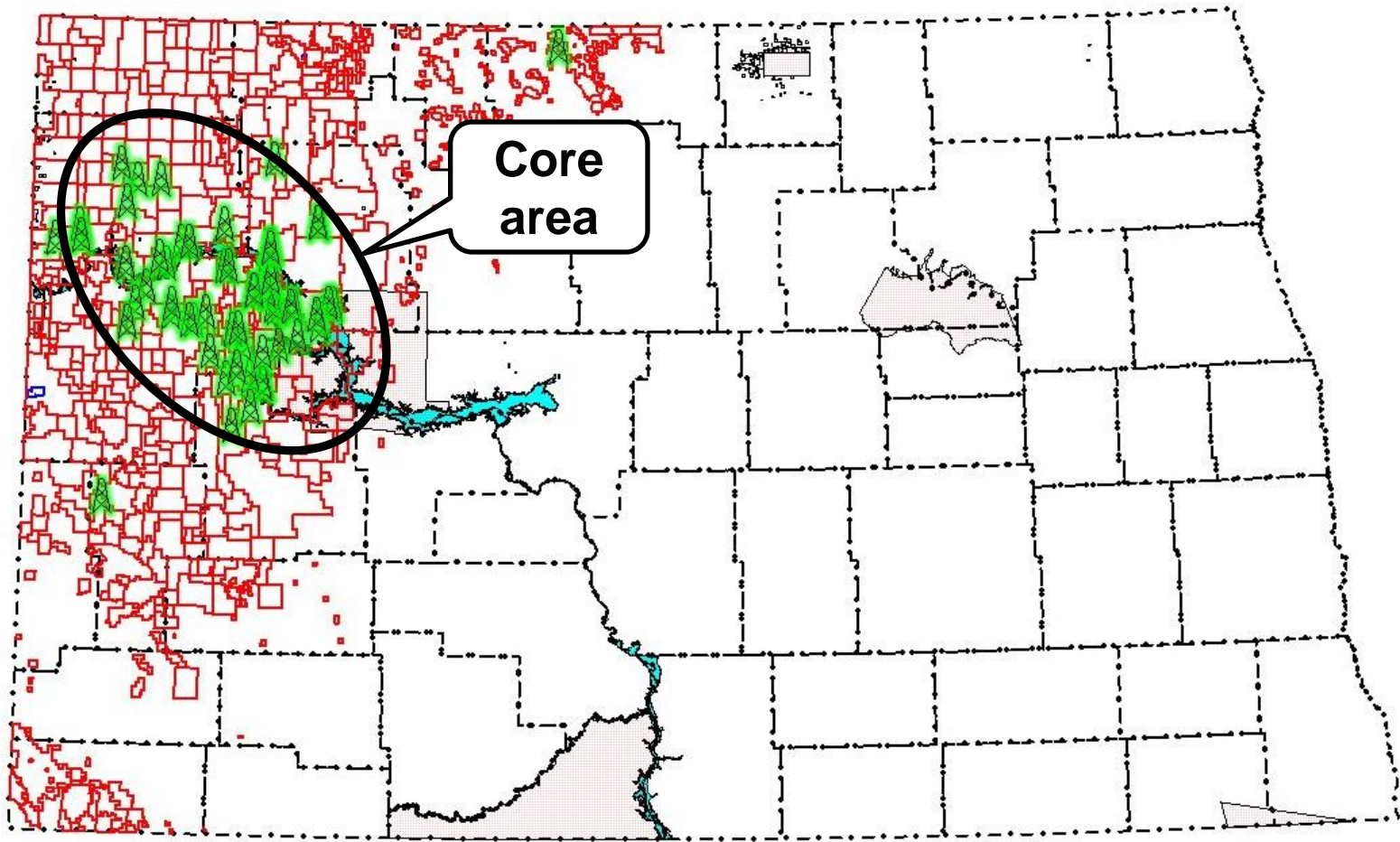




North Dakota Average Monthly Rig Count



NORTH DAKOTA – 60 DRILLING RIGS – August 2017

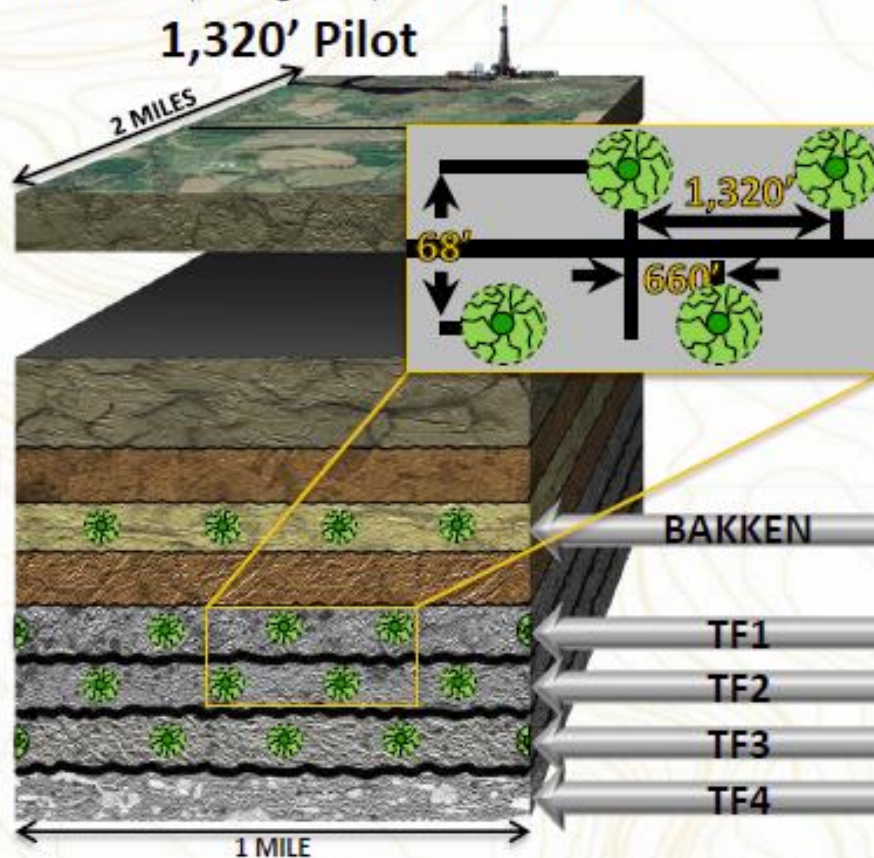


**Current drilling activity is focused
in Mountrail, Dunn, McKenzie, and Williams Counties**

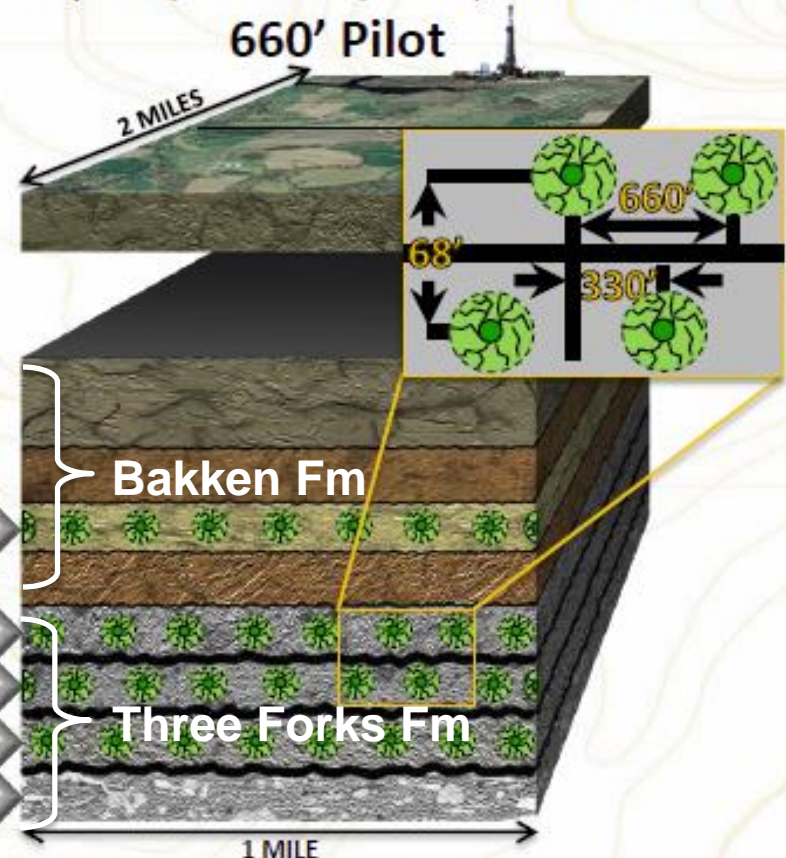
1,320' & 660' Pilot Density Projects: 2013-14

Hawkinson, Tangsrud, and Rollefstad

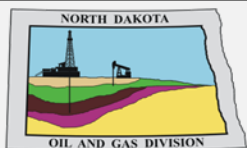
Wahpeton, Lawrence, Mack, and Hartman



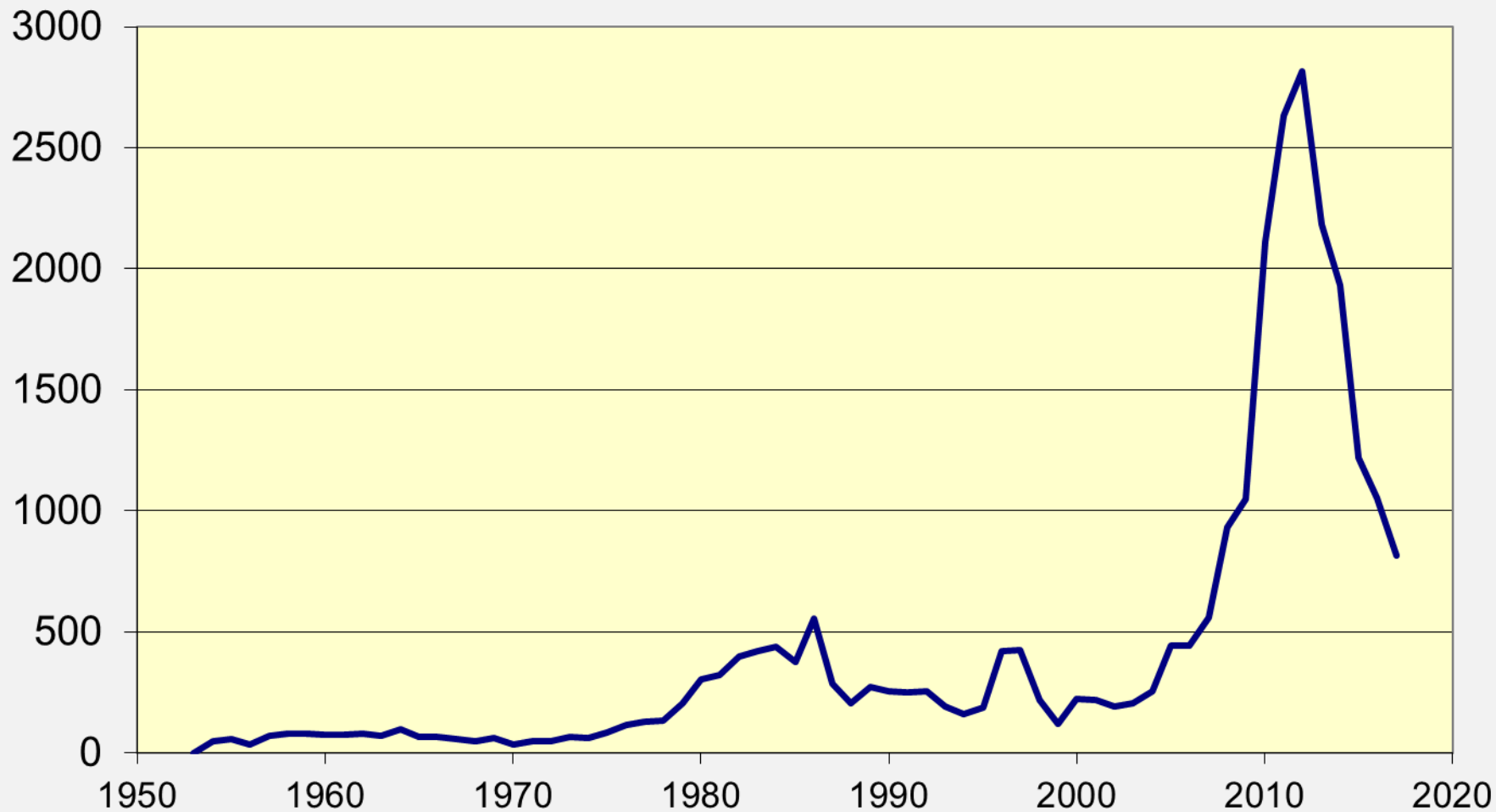
- 3 project areas
- 1,320 ft. same-zone spacing
- 34 new wells (gross)



- 4 project areas
- 660 ft. same-zone spacing
- 31 new wells (gross)

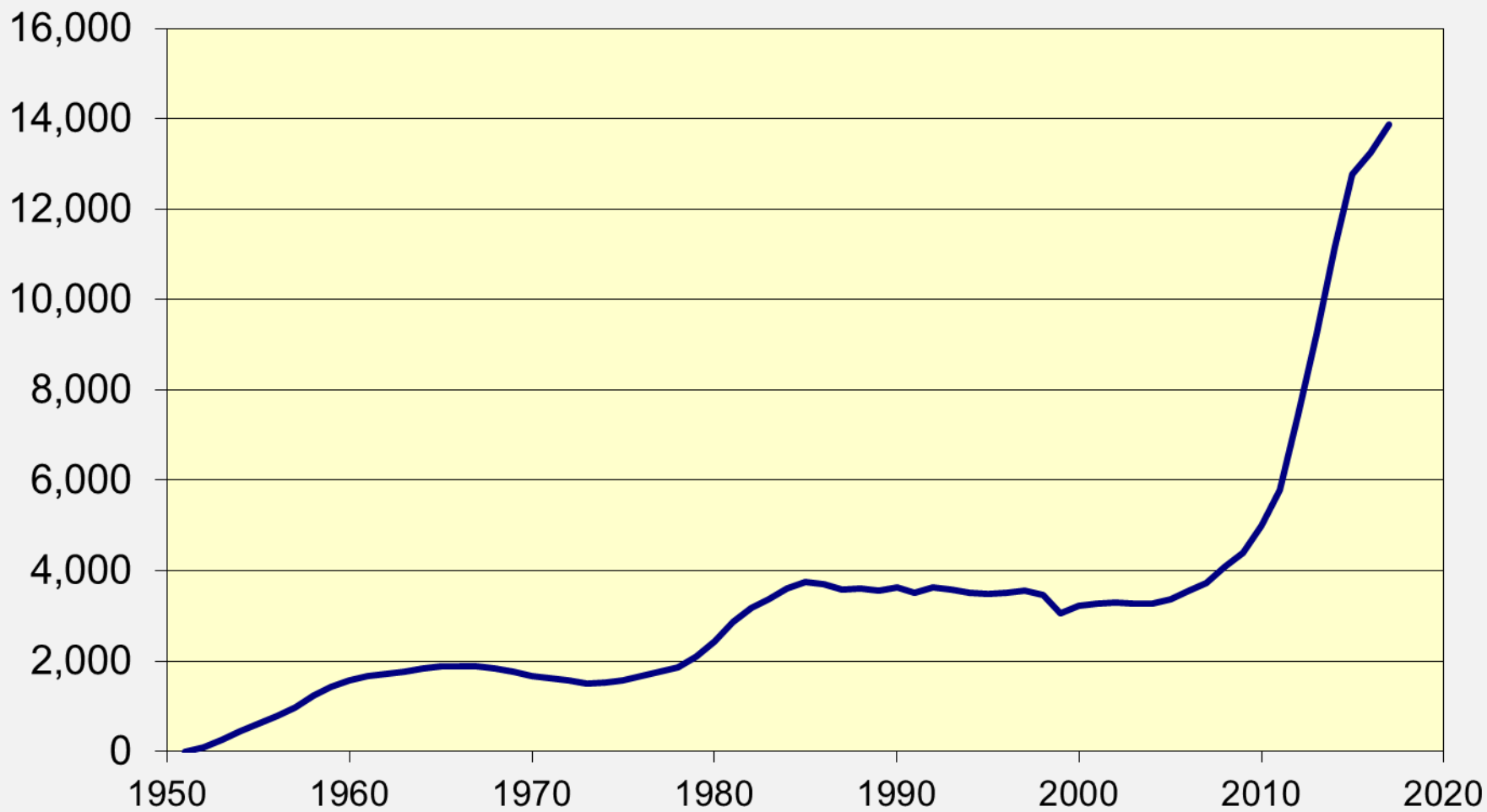


North Dakota Industrial Commission Cases Heard



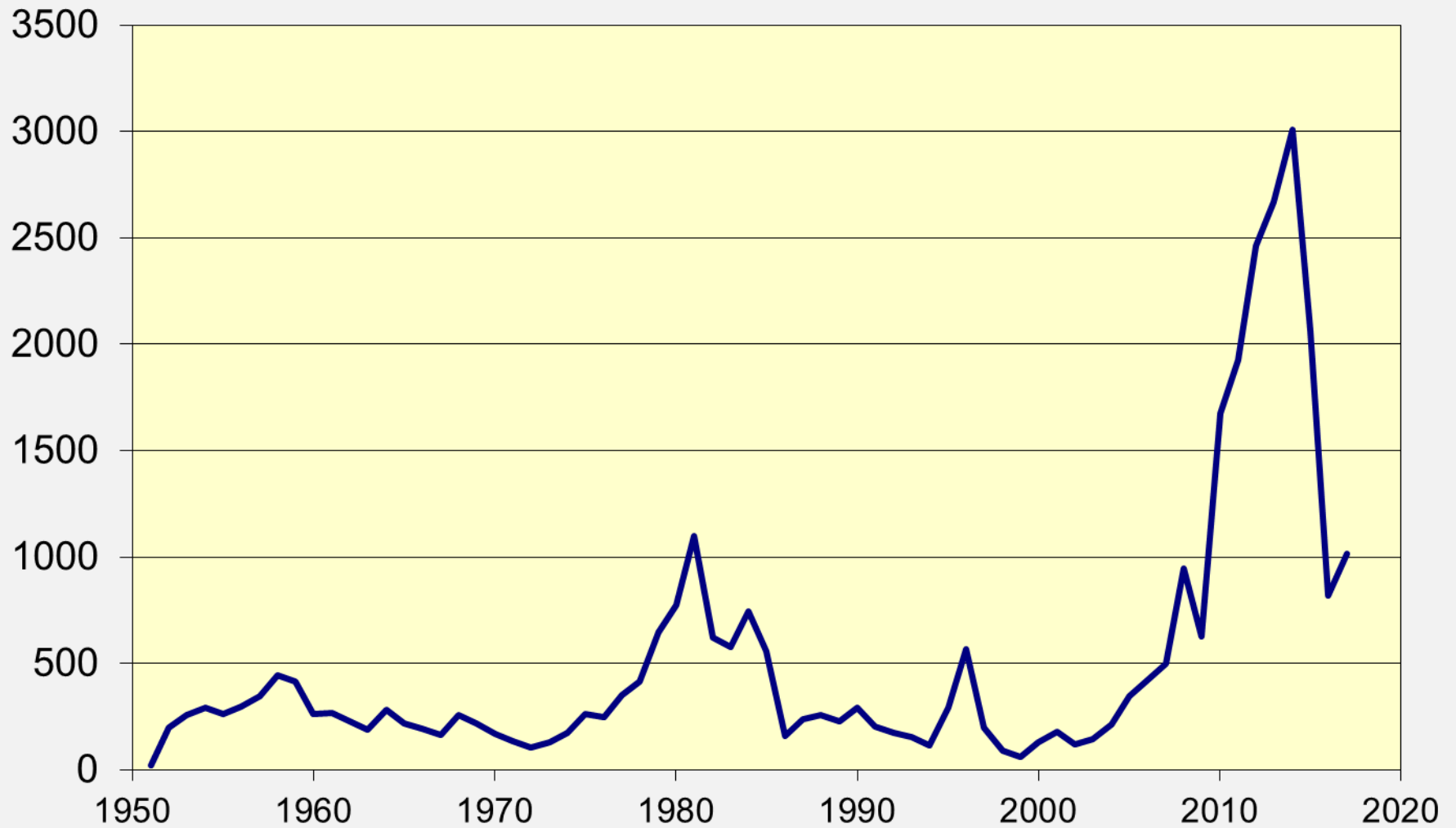


North Dakota Wells Producing



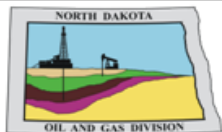


North Dakota New Well Permits Issued

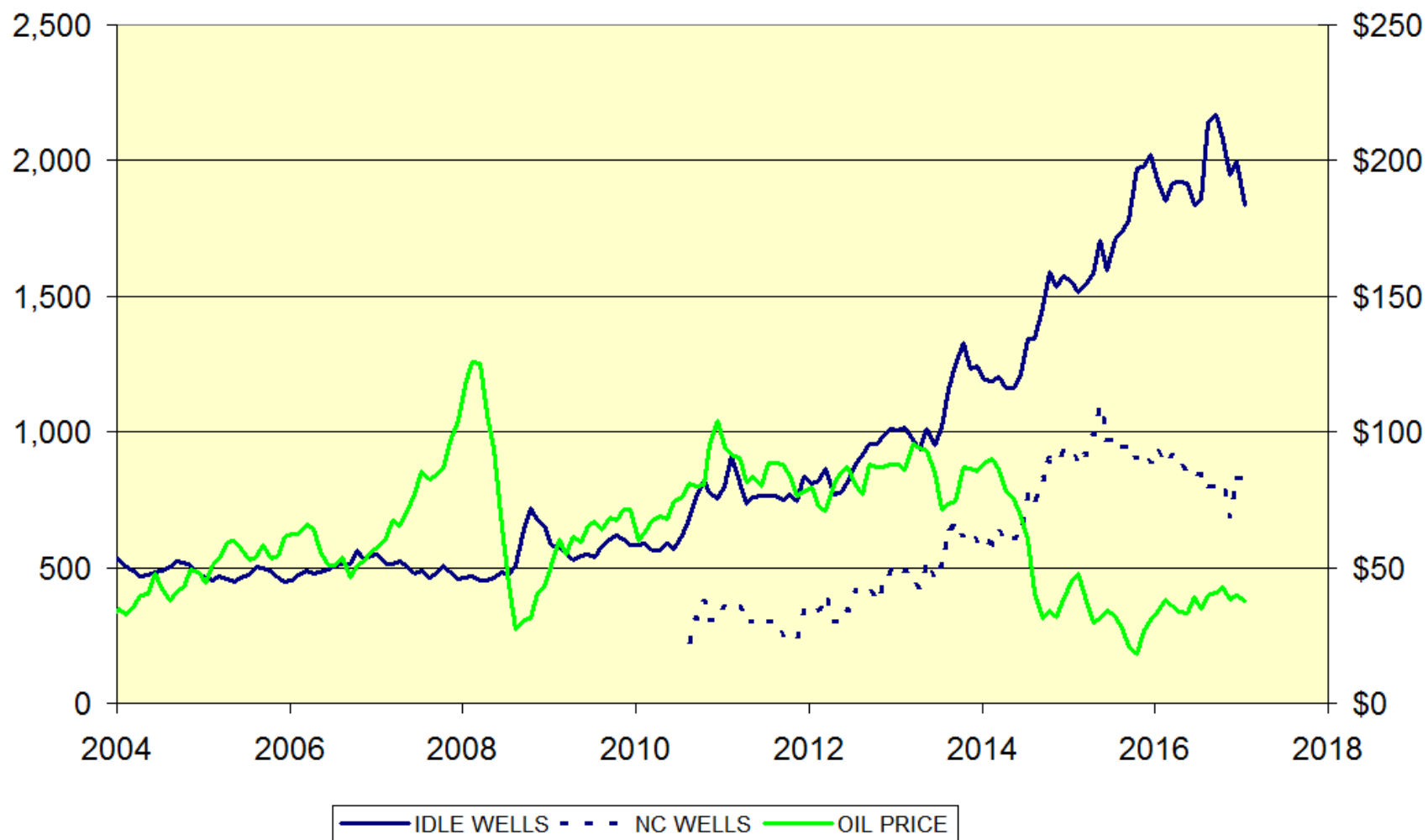


Oil and Gas Update

- Bakken Development
- **Bakken Performance**
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North Dakota Idle and Non-Completed Wells



Wells

13,876 active

2,057 conventional

11,819 Bakken/Three Forks

1,772 inactive

+\$40 for 90 days

830 waiting on completion

+\$50 for 90 days

1,919 permitted

+\$60 for 90 days

NYMEX 2024+

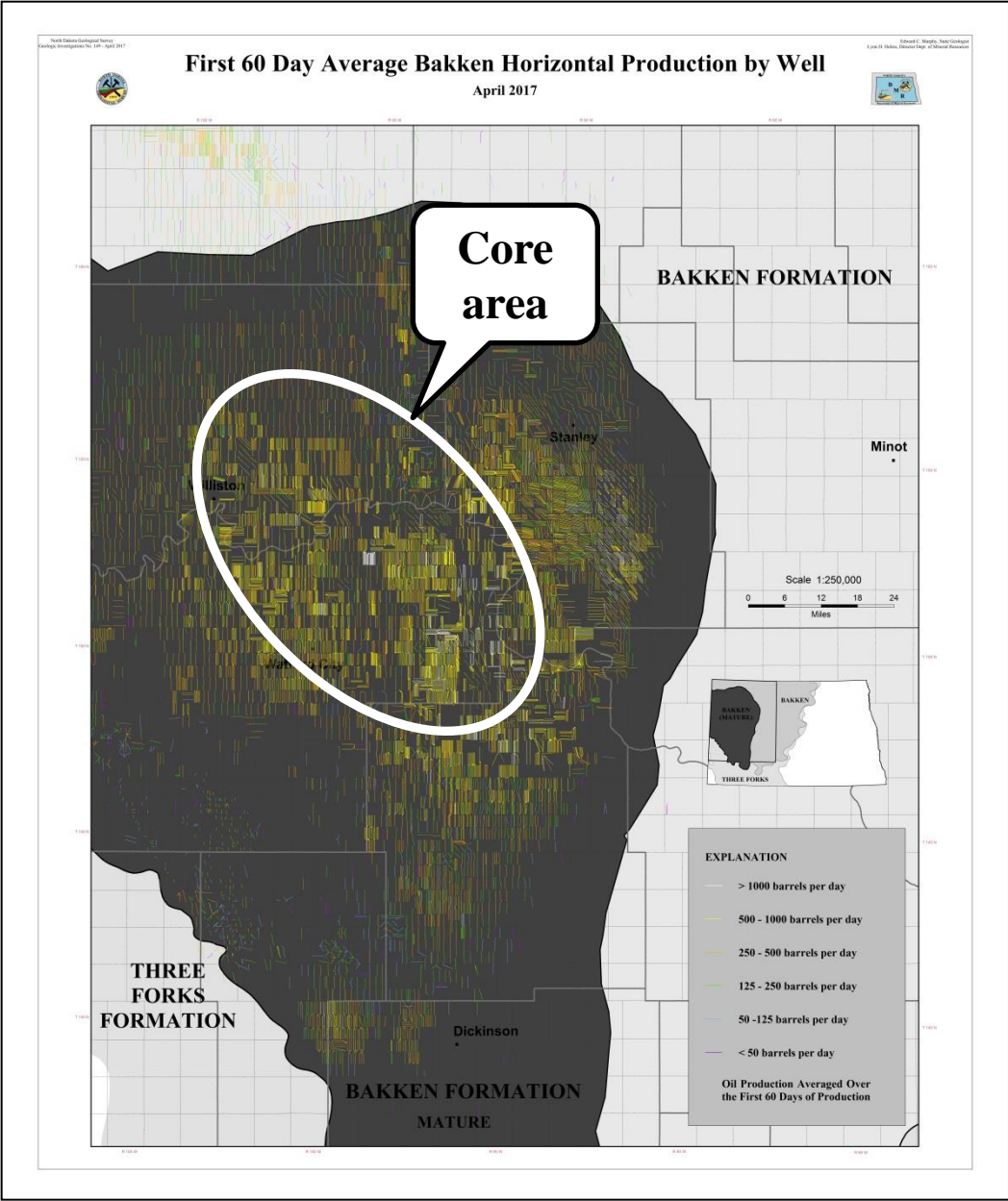
13,141 increased density approved 6/27/17

31,538 total

55,000-65,000 estimated final

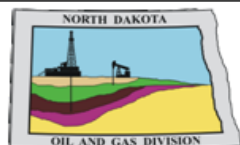
9,782 reclaimed and bond released

1,017 reclamation in progress

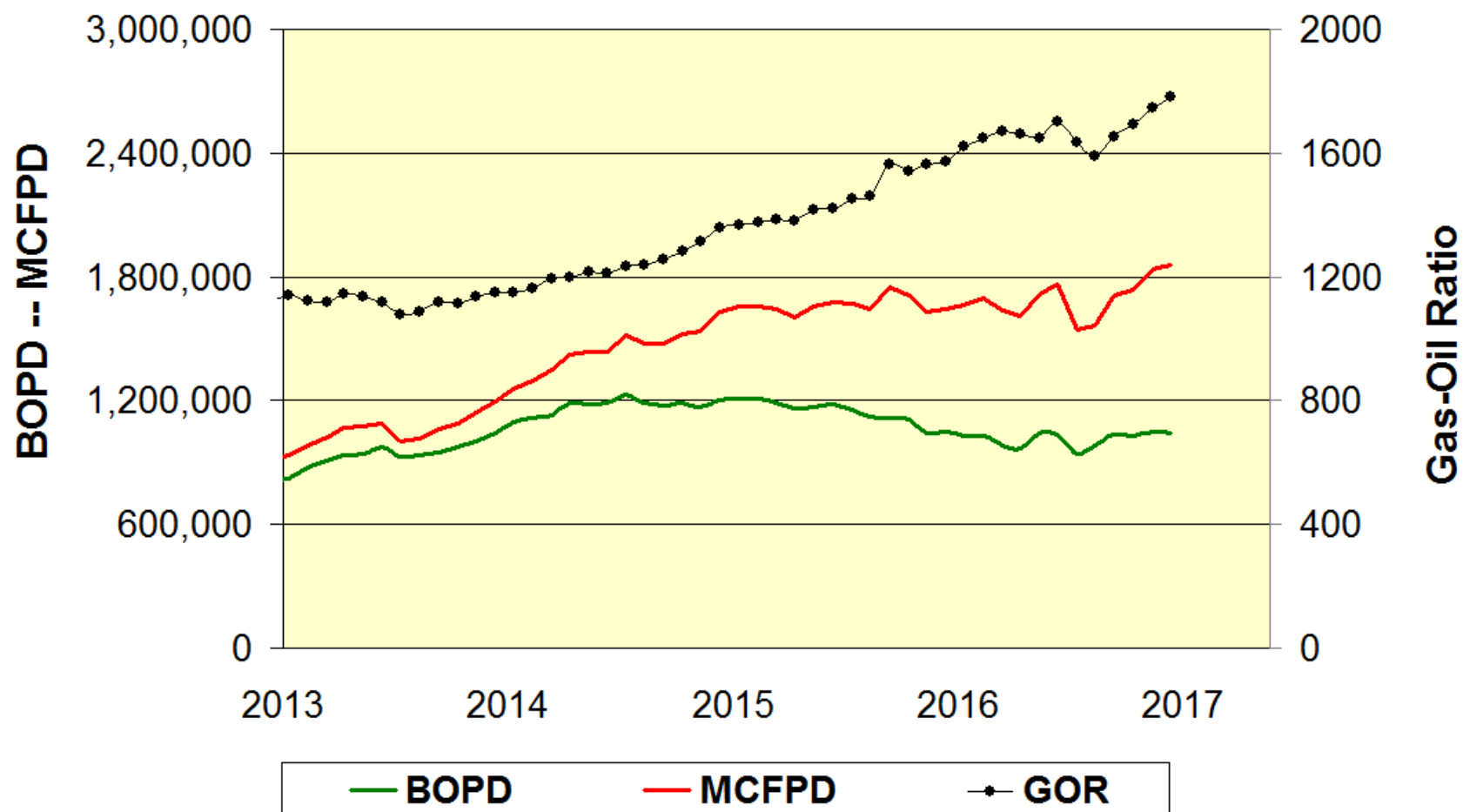


Oil and Gas Update

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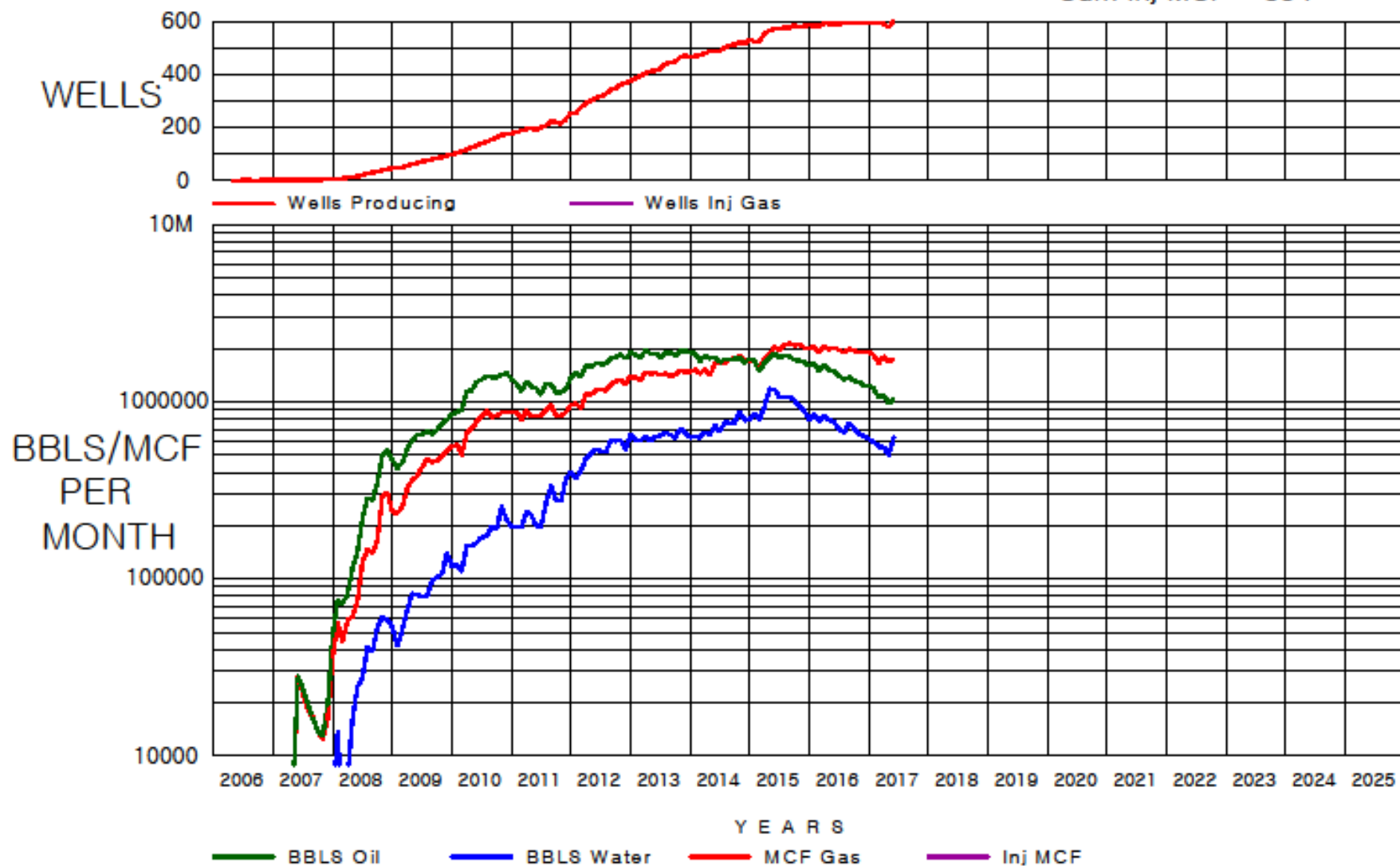


North Dakota Gas-Oil Ratio



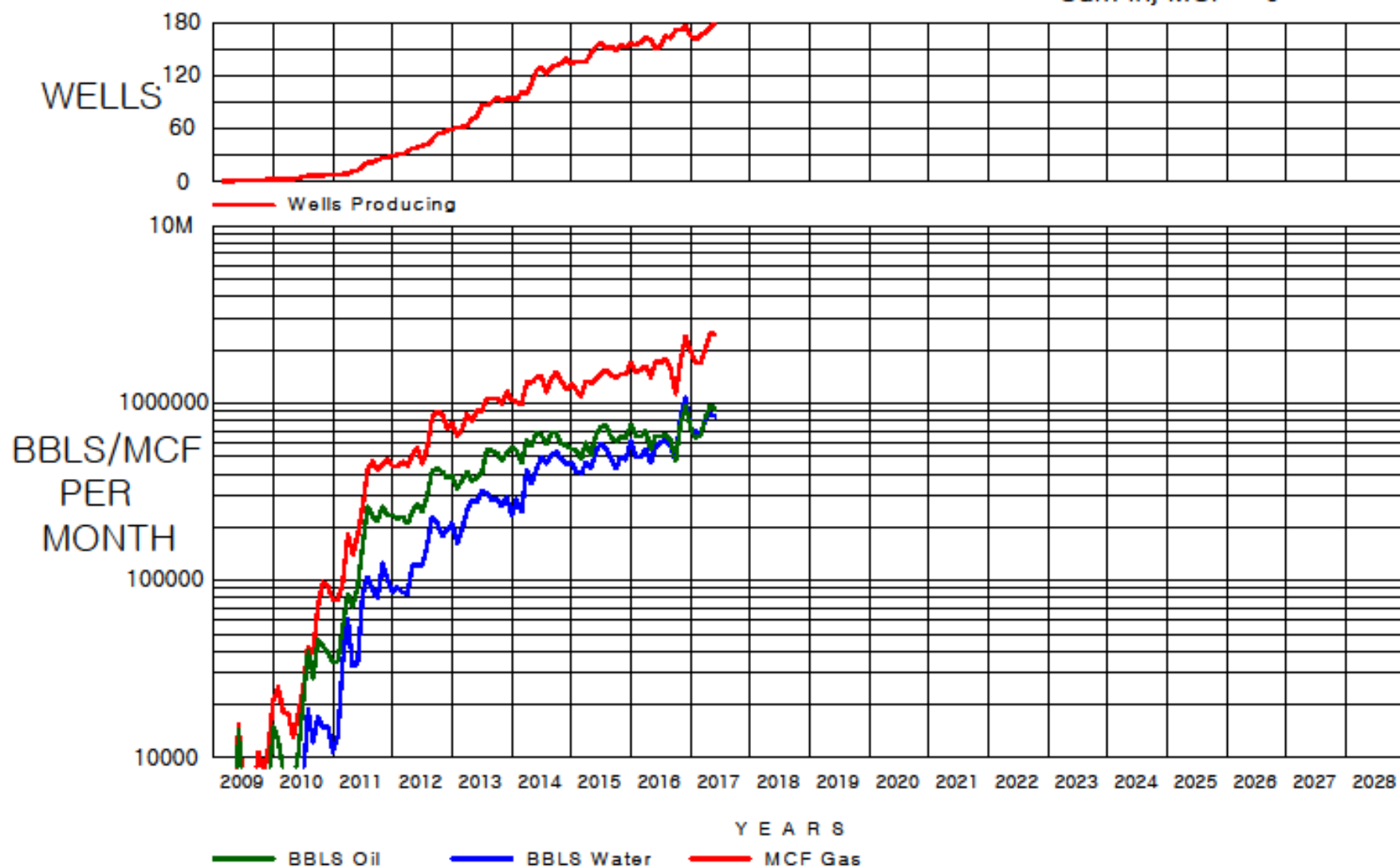
S A N I S H - B A K K E N

Cum Oil = 147307688
Cum Water = 53054111
Cum Gas = 133126306
Cum Inj BBLS = 0
Cum Inj MCF = 894



BANKS - BAKKEN

Cum Oil = 38422430
Cum Water = 28403534
Cum Gas = 85587932
Cum Inj BBLS = 0
Cum Inj MCF = 0

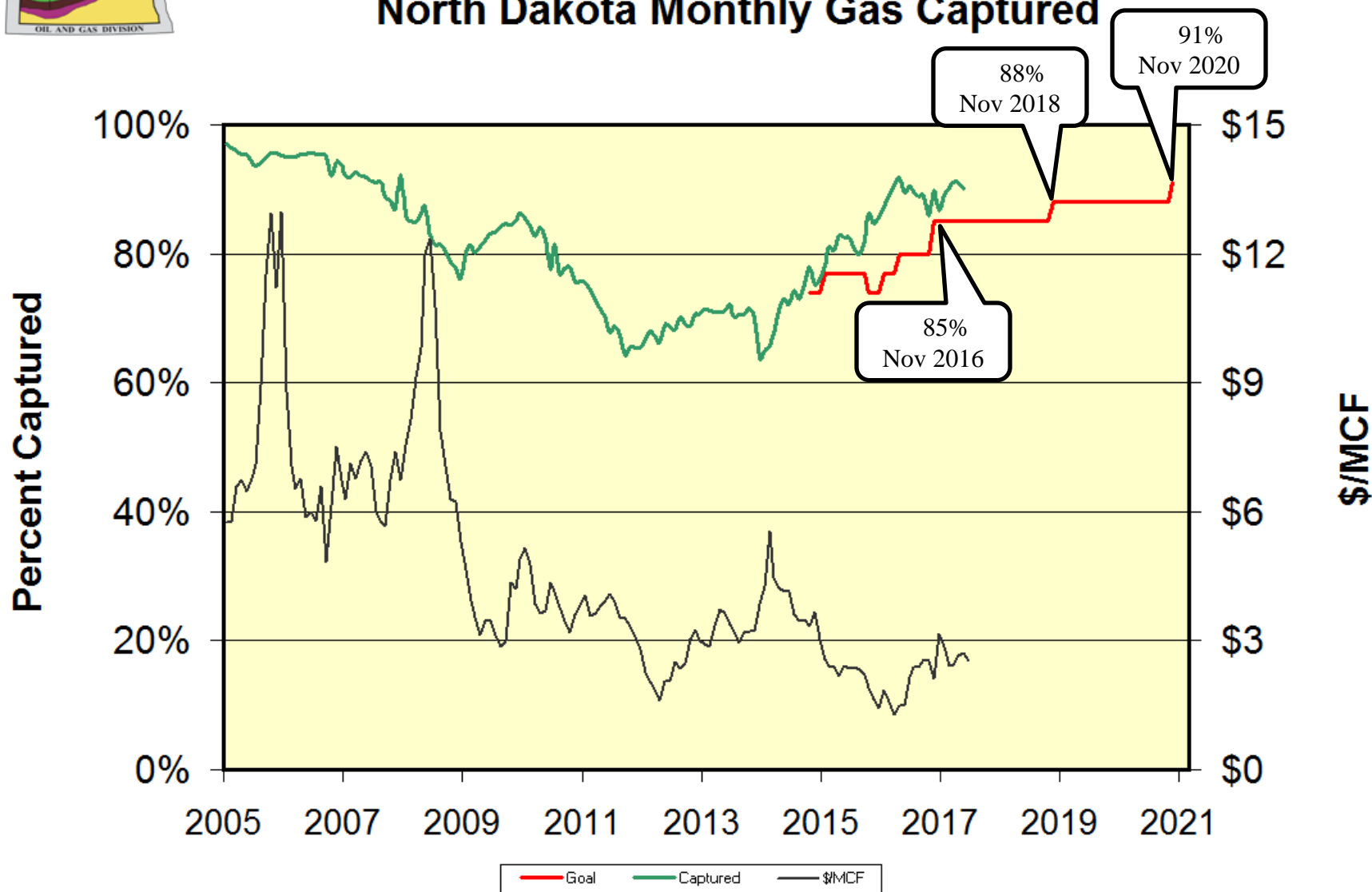


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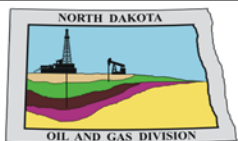


North Dakota Monthly Gas Captured

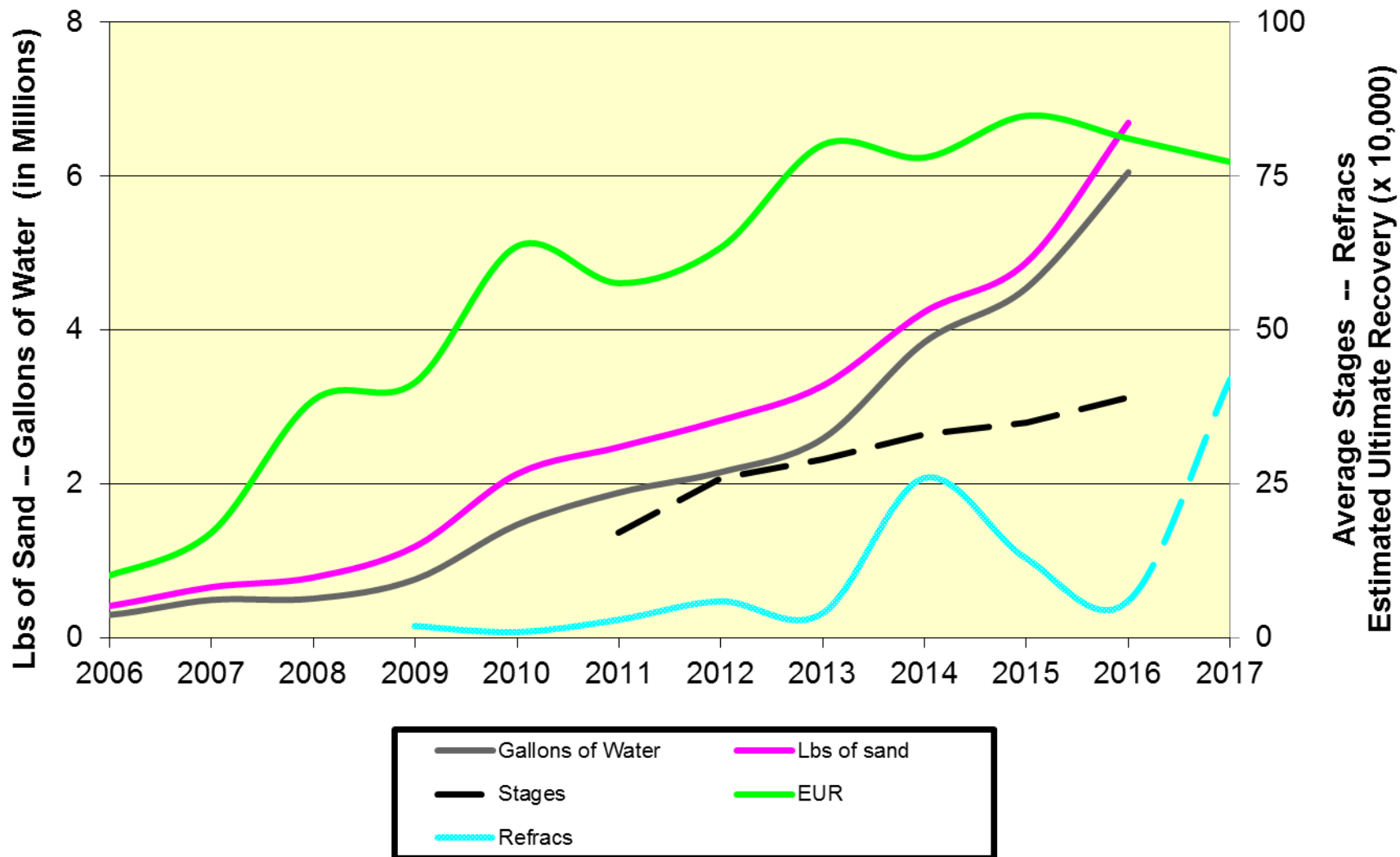


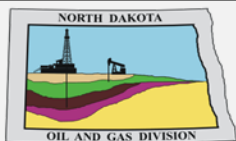
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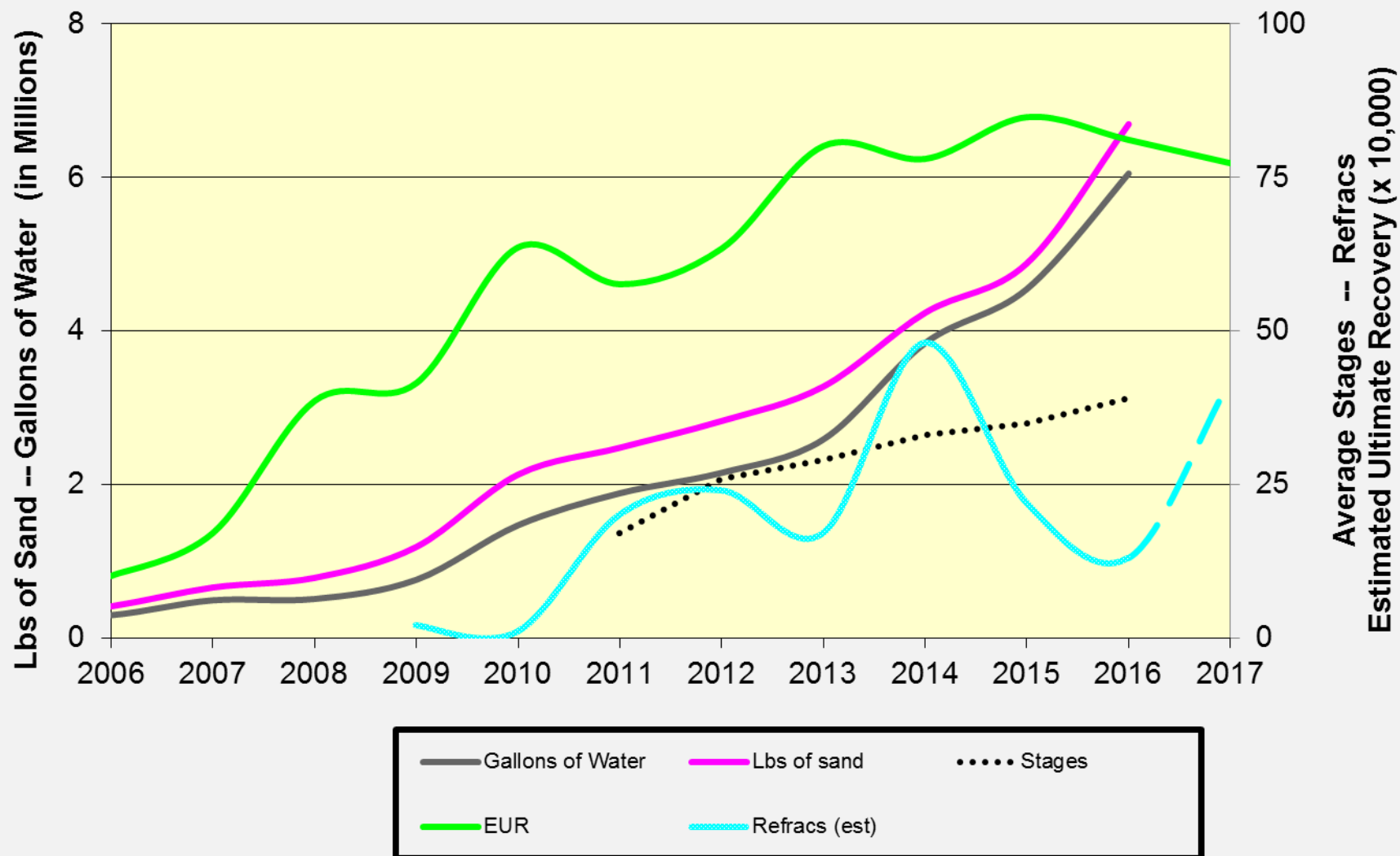


North Dakota Stimulations



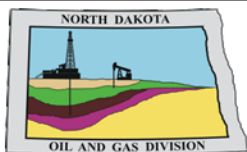


North Dakota Stimulations

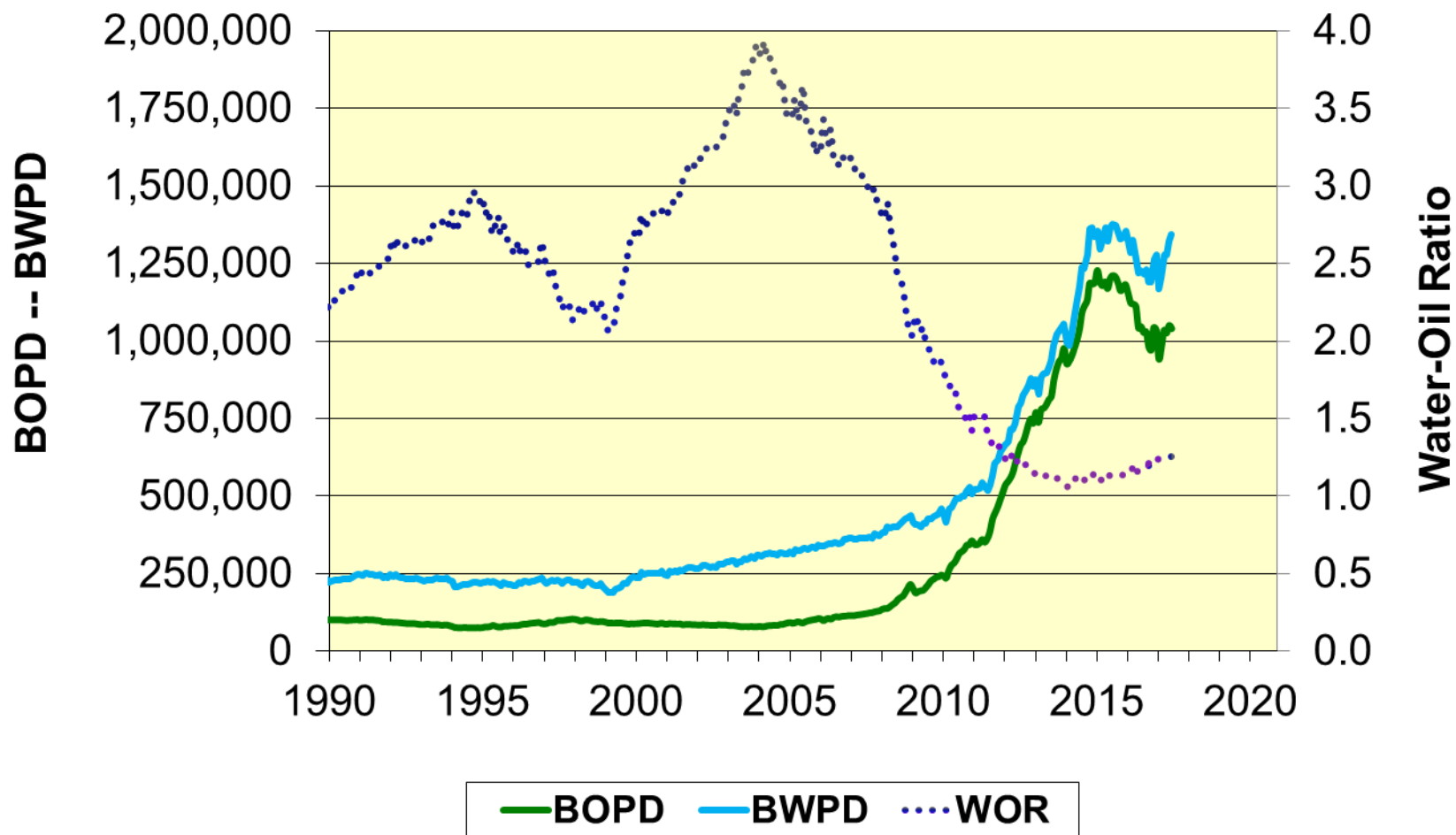


Oil and Gas Update

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North Dakota Daily Oil and Water Production



Oil and Gas Update

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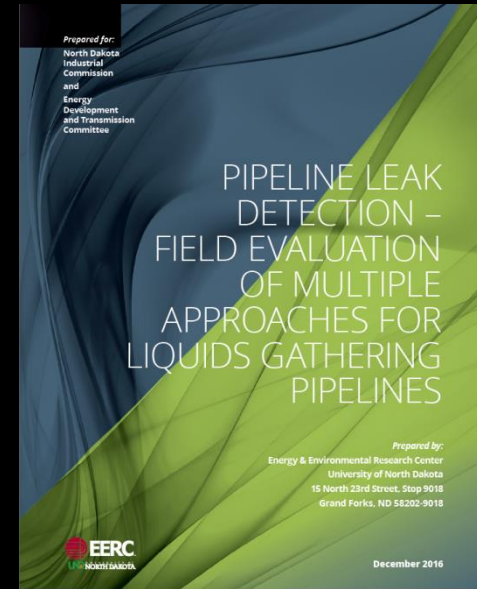
EERC—Phase I Study

- HB 1358—Effective April 20, 2015
- Recommendations to NDIC
- December 1, 2015—EERC report published
- NDIC promulgated rules—effective January 1, 2017



EERC—Phase II Study

- **HB 1358—Effective April 20, 2015**
- **Pipeline Leak Detection**
- **Field Evaluation of Liquid Gathering Pipelines**
- **December 30, 2016—EERC report published**



EERC—Phase III Study

- **HB 1347—Effective July 1, 2017**
- **Leak detection and monitoring technology analysis**
- **Risk assessment of new + existing pipeline systems**
- **September 30, 2018—EERC report due**

Western North Dakota Gathering Pipelines

Estimate 12,700 miles pre August 2011

+ 4,900 miles August 2011-December 2013

+ 2,650 miles per year 2014-mid 2017

= 26,875 miles thru mid 2017

= 36,000 miles projected to 2020



14,000+ miles within OGD database

Bakken/Three Forks EOR Potential

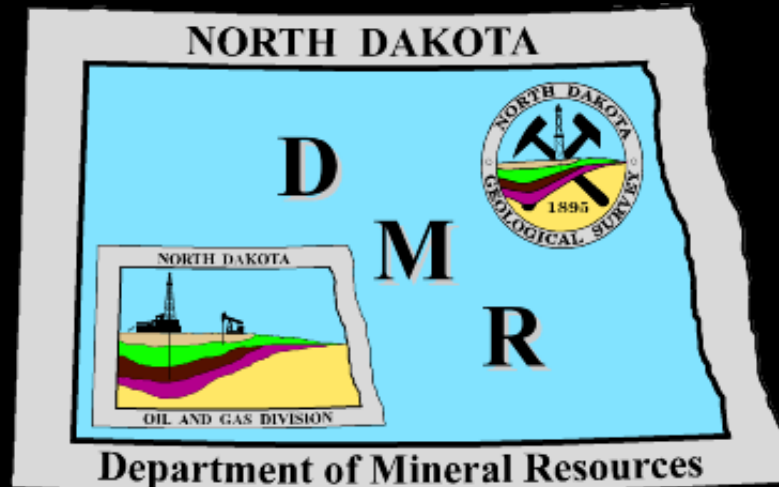
- **Pilot projects**
 - CO₂ injection
 - water injection
 - projects small-scale and usually inconclusive
 - ethane injection encouraging in lab
 - further testing must be conducted
- **> 300 billion barrels OOIP**
 - every 1% of EOR = 3 billion barrels

(note: cum oil prod from 1951-2016 = 3.8 bil bo)

Bakken Takeaways

- **Multi-well pads allow batch drilling**
- **Rig efficiency = more wells / rig**
- **SI + NC wells = near term prod increase**
- **GOR increasing = more gas issues**
- **Stimulation improvements = higher EUR**
- **WOR increase = disposal + pipeline needs**
- **Bakken EOR Potential**

North Dakota Department of Mineral Resources



Bruce E. Hicks
Assistant Director
NDIC-DMR-OGD
Bismarck, ND

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