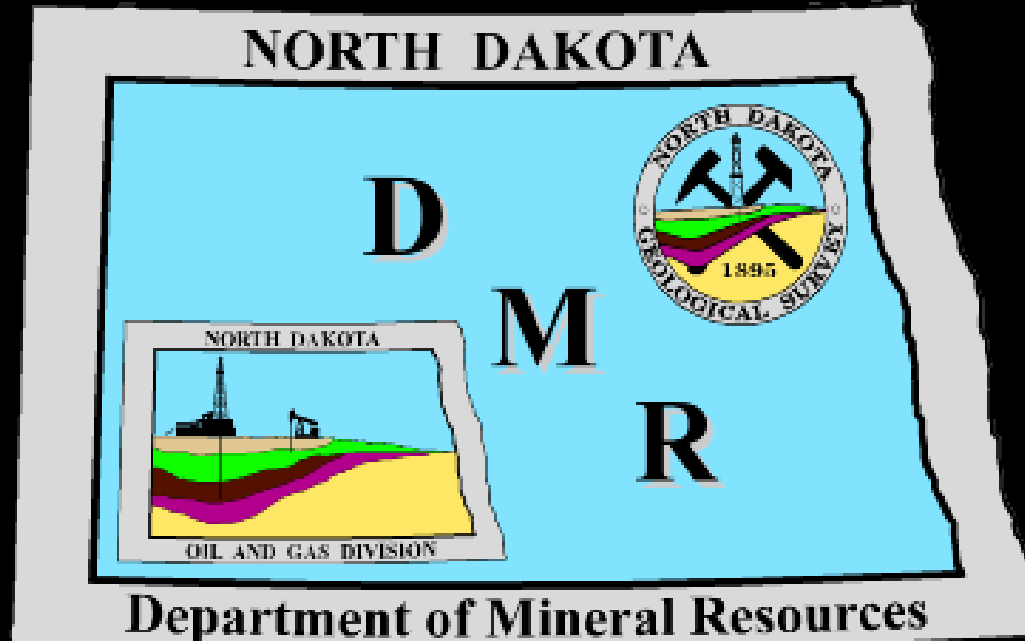


North Dakota Department of Mineral Resources



<http://www.oilgas.nd.gov>

<http://www.state.nd.us/ndgs>

600 East Boulevard Ave. - Dept 405

Bismarck, ND 58505-0840

(701) 328-8020 (701) 328-8000



North Dakota Update

- Spotlight on the Bakken: Media Coverage
 - National Geographic
 - New York Times
 - The Globe and Mail (Canada)
 - BBC
 - Al-Jazeera America
 - Daily: California, Florida, New York, Washington, D.C., Colorado, Alaska.
 - Inquiries from Australia, France, Germany, Japan, United Kingdom, Poland, Austria.

OIL & GAS UPDATE

The background of the slide is a photograph of an oil field. In the foreground, there is a pumpjack (oil pump) with a long arm and a counterweight. In the background, there are several large oil storage tanks and some industrial buildings. The landscape is a dry, open field with some sparse vegetation. The sky is blue with some light clouds.

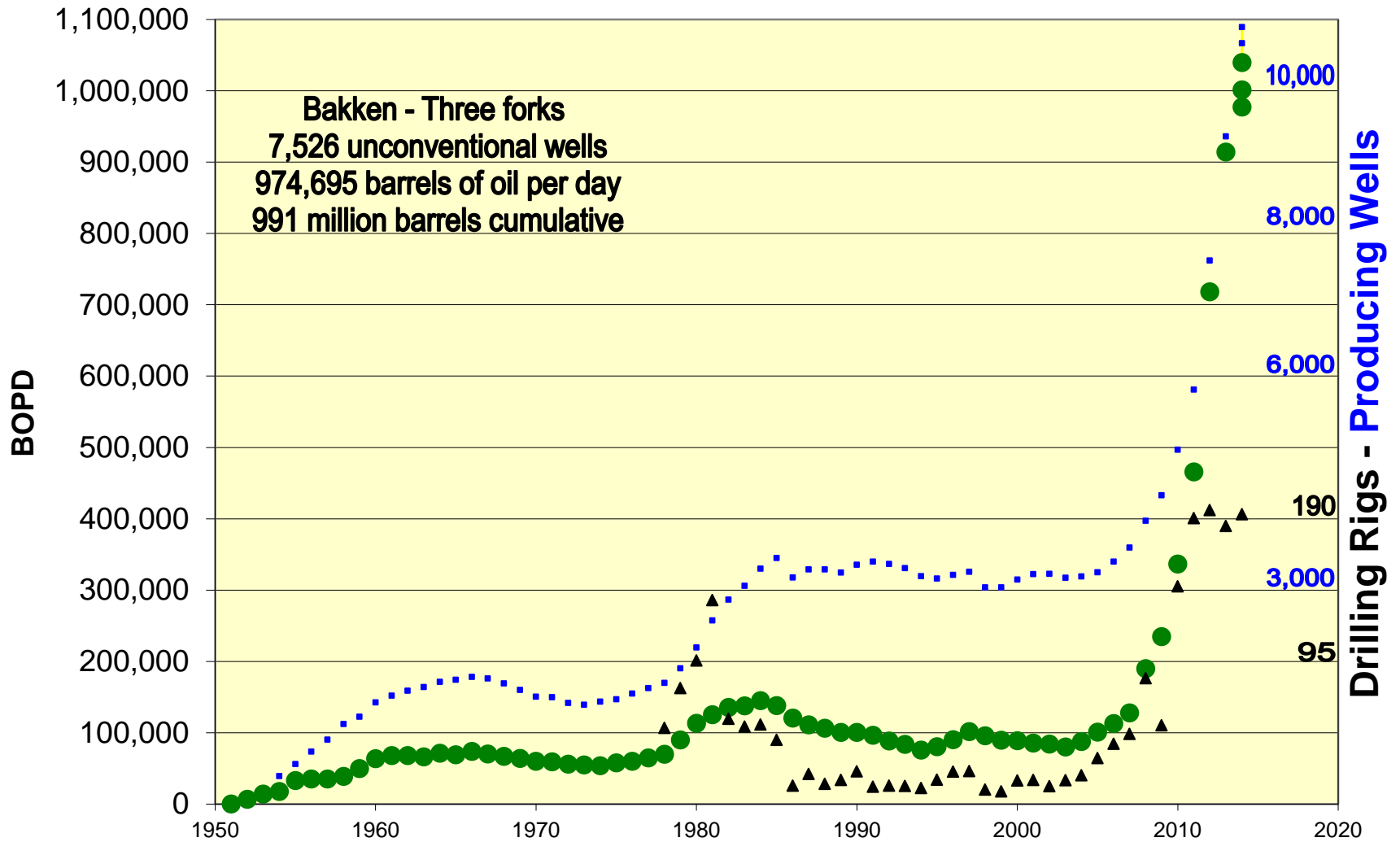
First barrel of oil produced in April 1951

1 Billionth barrel of oil produced in October 1989

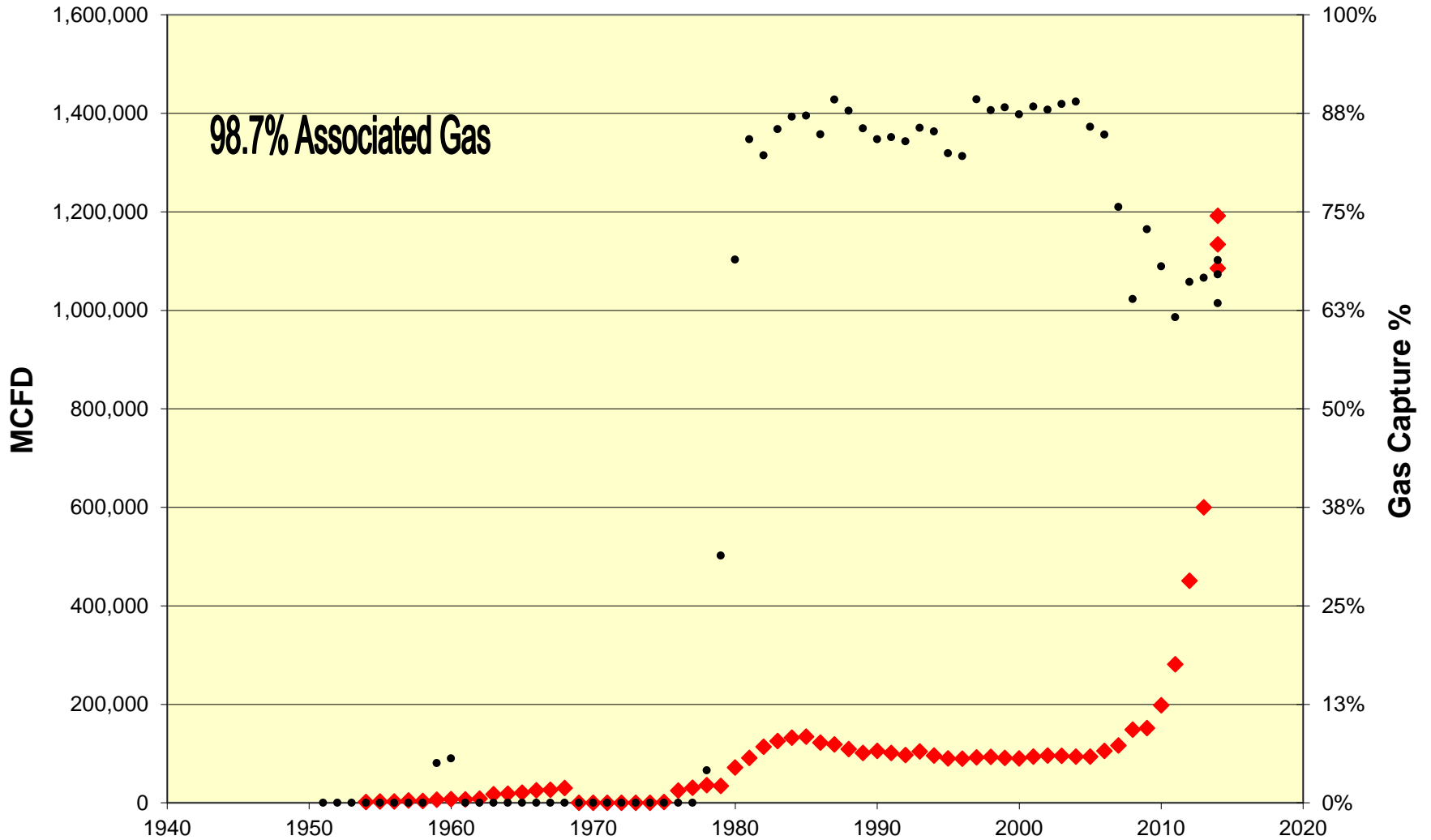
2 Billionth barrel of oil produced in November 2011

3 Billionth estimated in 2015

North Dakota Oil Production



North Dakota Natural Gas Production





463 BARRELS

Initial production from 2006
Parshall discovery well

BAKKEN

Basics

April 2006:
35 drilling rigs

May 2012:
All-time-high of
218 drilling rigs



1987- First Horizontal Bakken well drilled

15,000 sq mi. - the size of the mature area of the Bakken, or the size of the state of West Virginia

The 8,000 feet between the Bakken and drinking water, contains many layers of salt and shale

Mature

Drinking Water
Protected By

5 Layers

(3 Steel, 2 Cement)



TWO square miles = standard Bakken spacing unit

60,000+ Bakken wells expected to be drilled over the next **20** years



Bakken Formation named after
the **Bakken** family.

15,000+ well pads at full development

ENERGY
4 miles between
CORRIDORS

Hydraulic Fracturing has contaminated

ZERO

sources of drinking water

ND farmers from Tioga

4.5 Olympic-sized Swimming Pools can hold

3 Million Gallons of water to frac one well

223 truck beds can hold

2 Million Pounds of sand to frac one well

Small footprint: well pads use .5% surface area:

This piece of paper represents one spacing unit. This footprint is scaled to the size of a well pad.

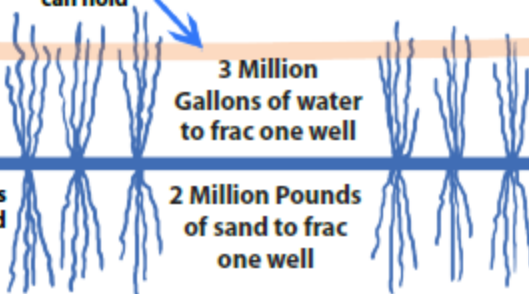


April 2006:
103,409

vs.

2014:
~1 million

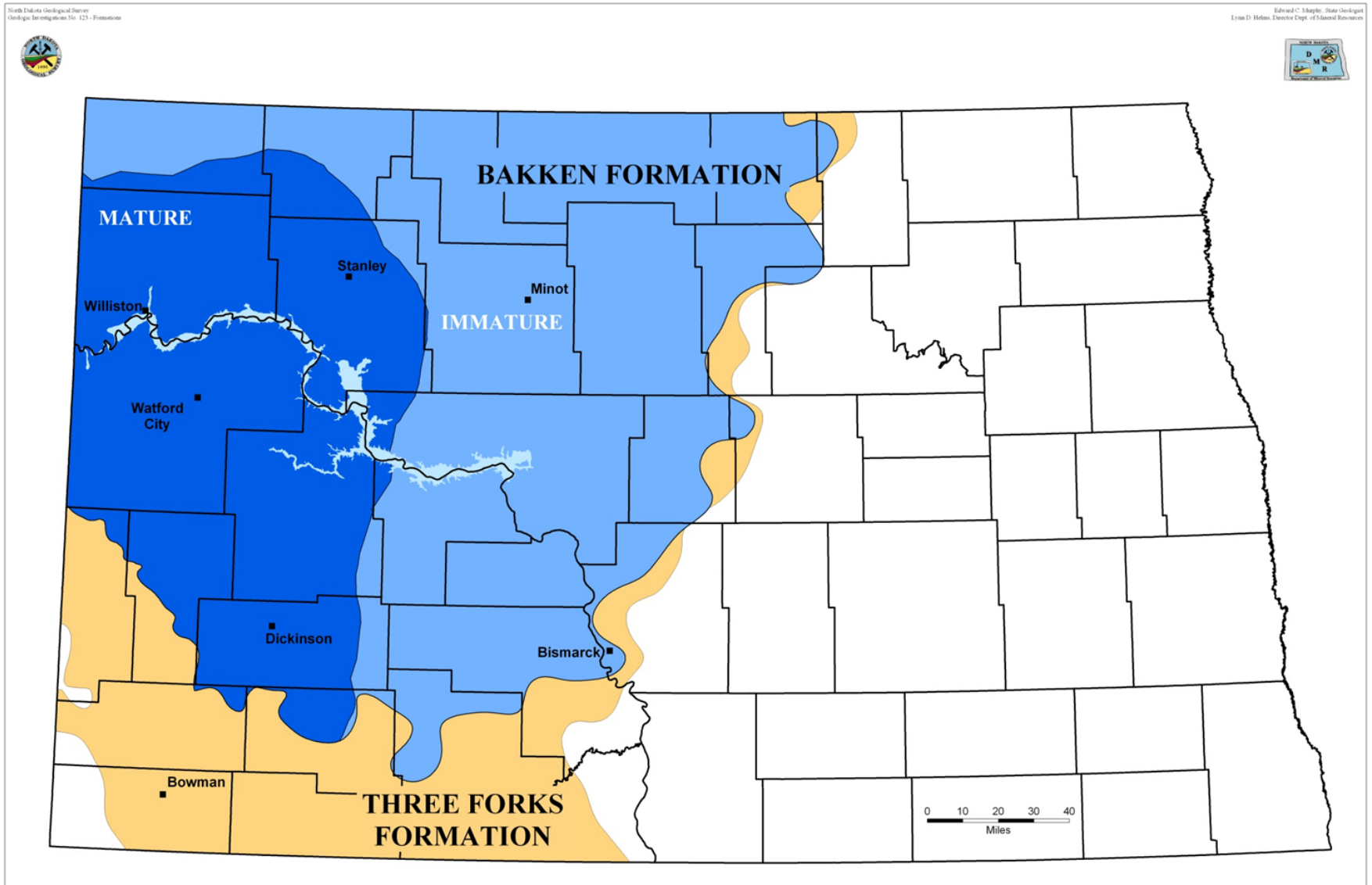
Barrels Of Oil Per Day



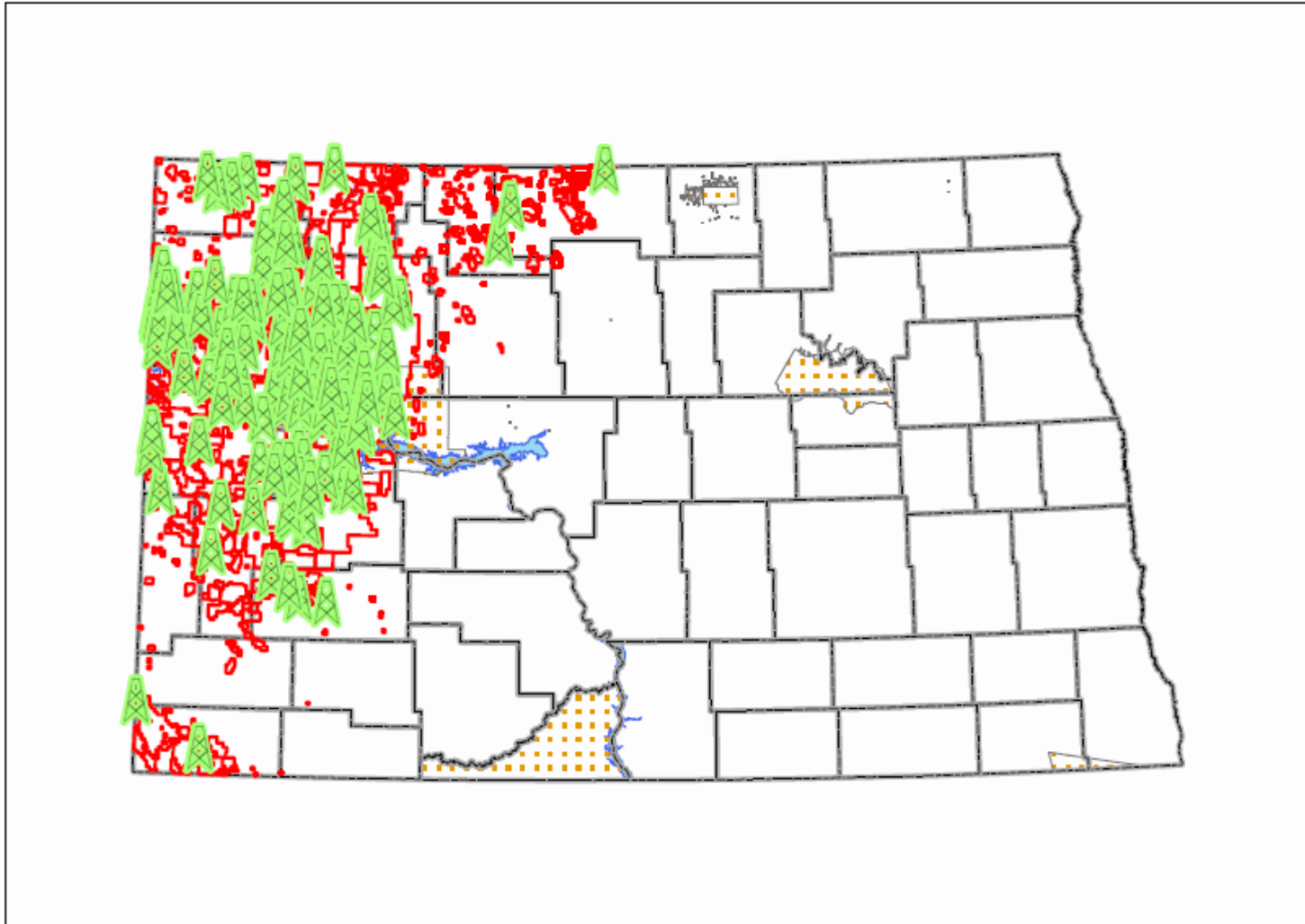
Phase 1

“Discovery”

Define the area



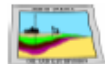
35 rigs in April 2006
200 rigs in January 2012
completed first phase of drilling



Disclaimer: Neither the State of North Dakota, nor any agency, officer, or employee of the State of North Dakota warrants the accuracy or reliability of this product and shall not be held responsible for any losses caused by reliance on this product. Portions of the information may be incorrect or out of date. Any person or entity that relies on any information obtained from this product does so at his or her own risk.

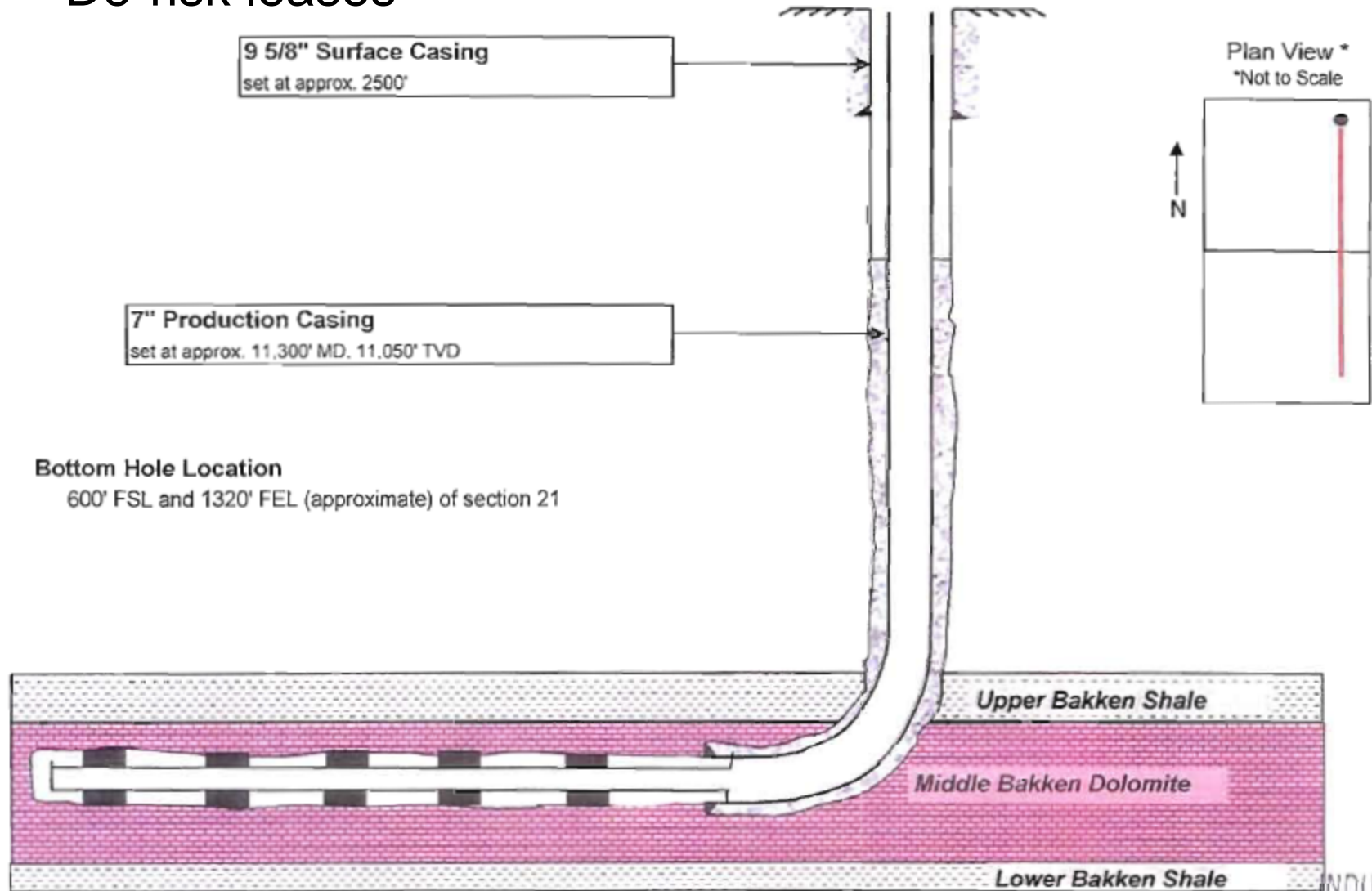
0 35 70 140 Miles

Prepared by N.D.I.C.
Oil and Gas Division
DATE : 10/8/2010
Time : 7:20:05 AM

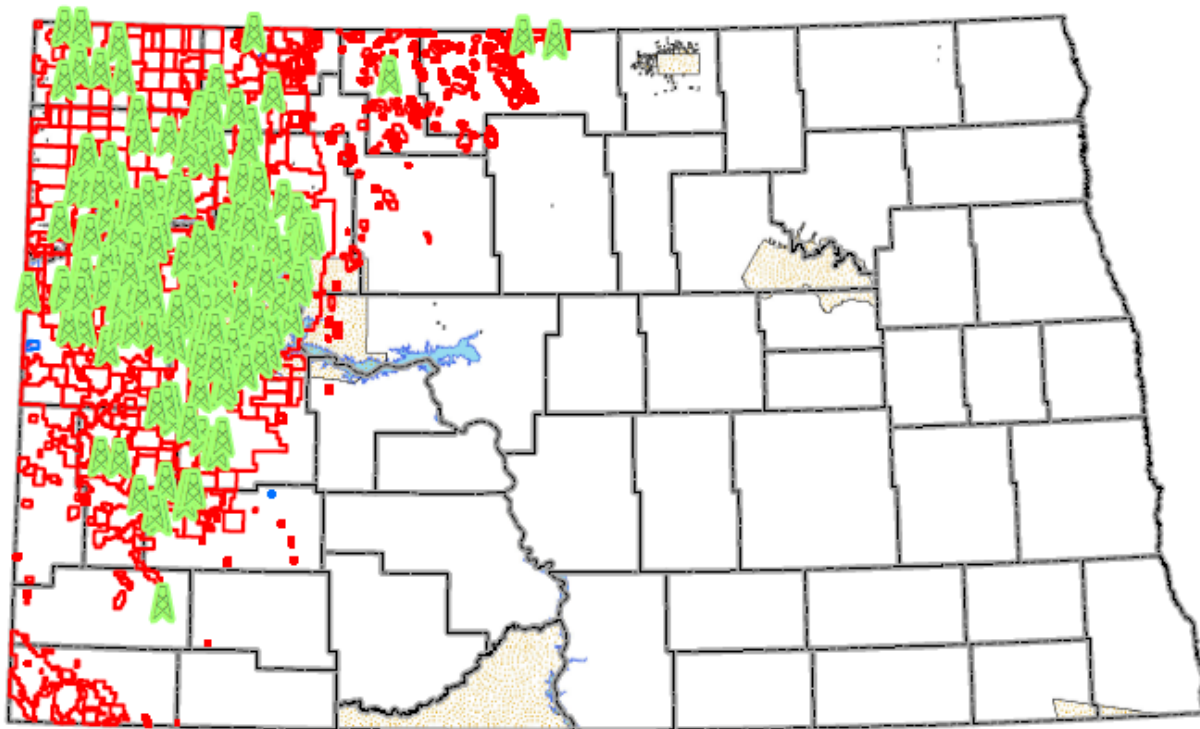


Phase 2 “Homesteading” De-risk leases

Sec's 16 & 21, T148N, R95W
Dunn County, ND



218 rigs in May 2012
190 rigs through January 2015
complete phase 2 of drilling

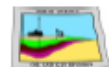


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0 30 60 120 Miles

Prepared by N.D.I.C.
Oil and Gas Division

1/17/2014
4:08:20 PM





Vern Whitten Photography

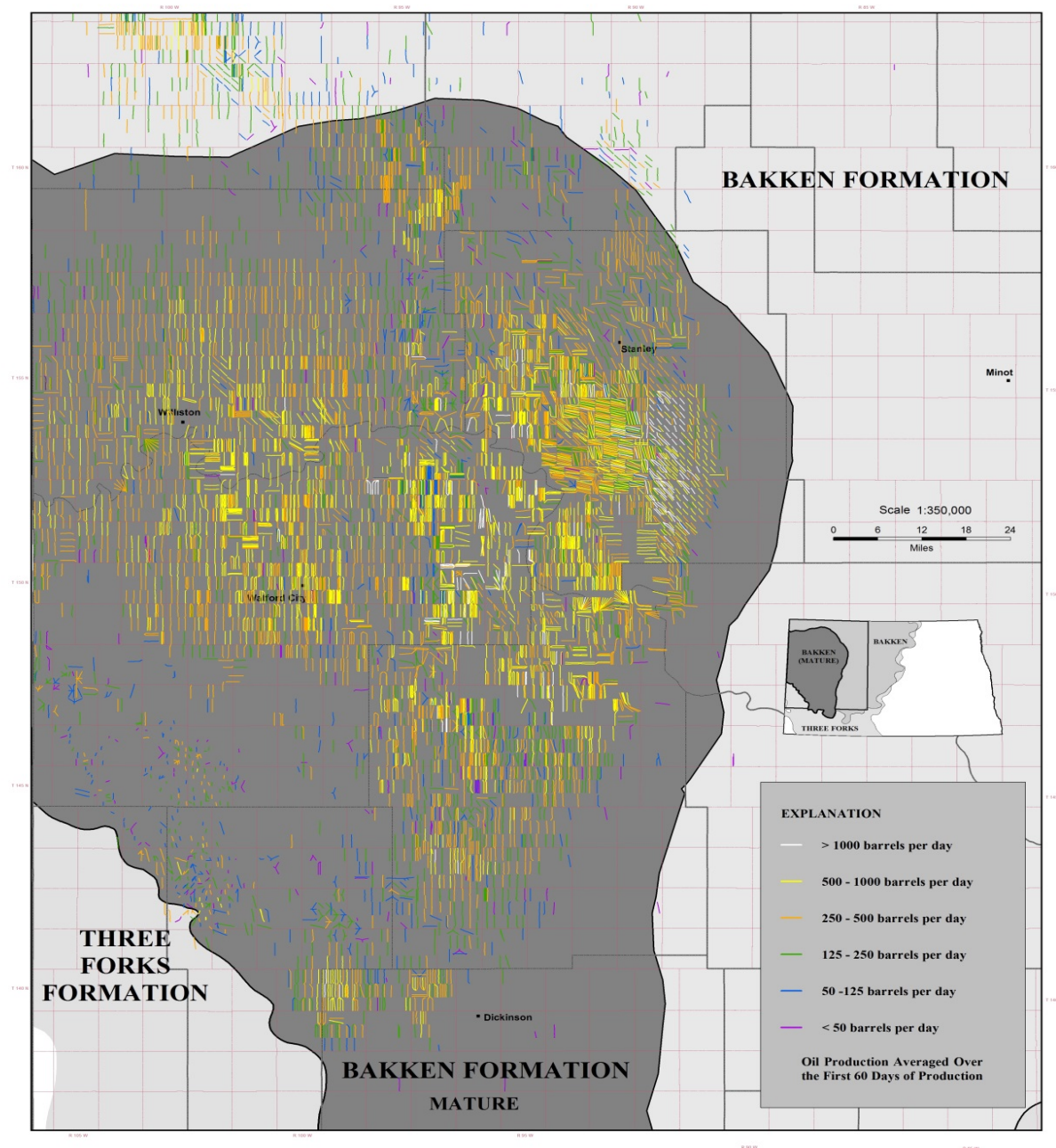
Phase 3 “Harvest” 6 – 28 or more wells per spacing unit

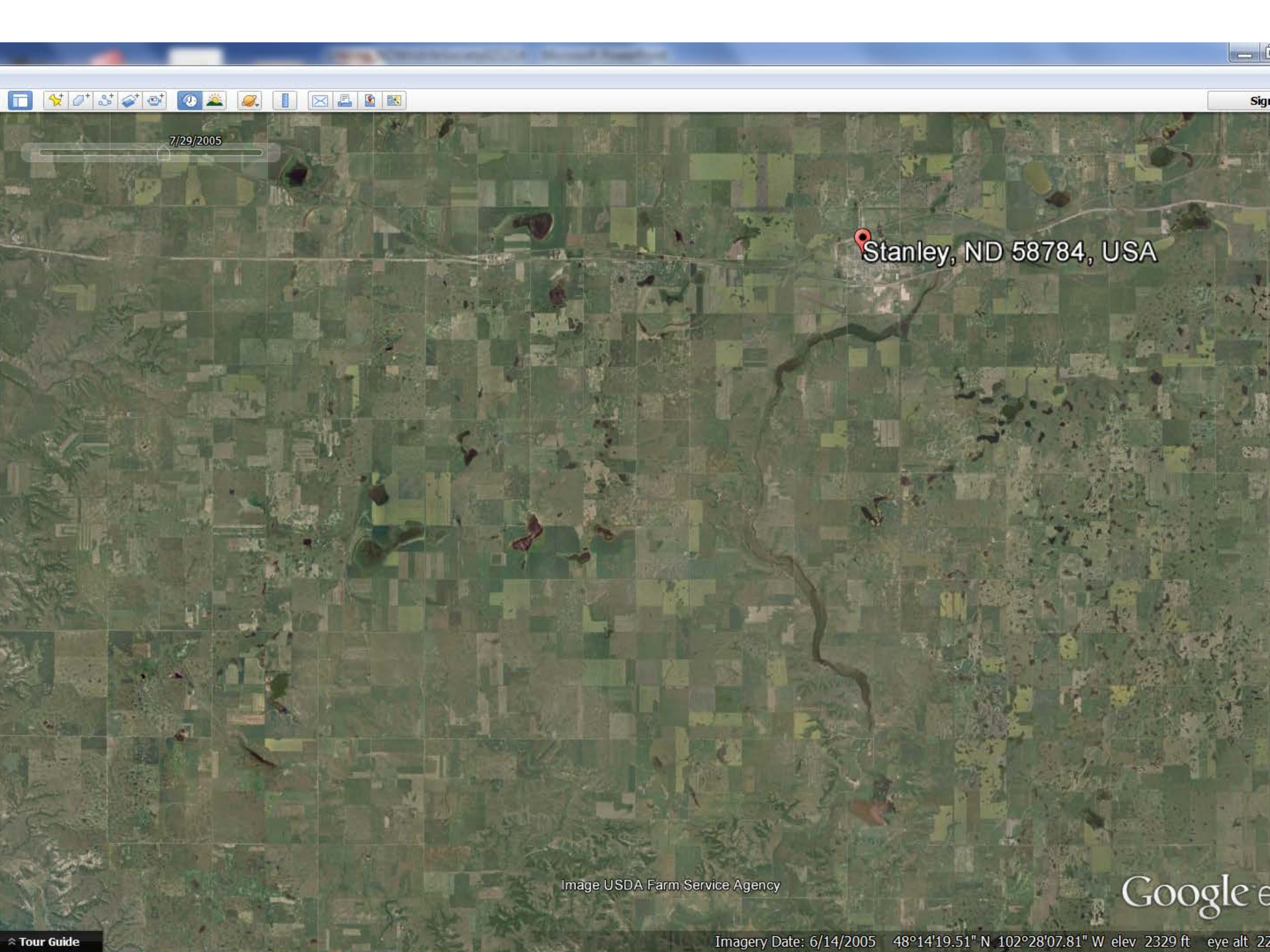


Vern Whitten Photography 6 wells producing - drilling 7-12 - and 11-18 coming soon

First 60 Day Average Bakken Horizontal Production by Well

July 2014



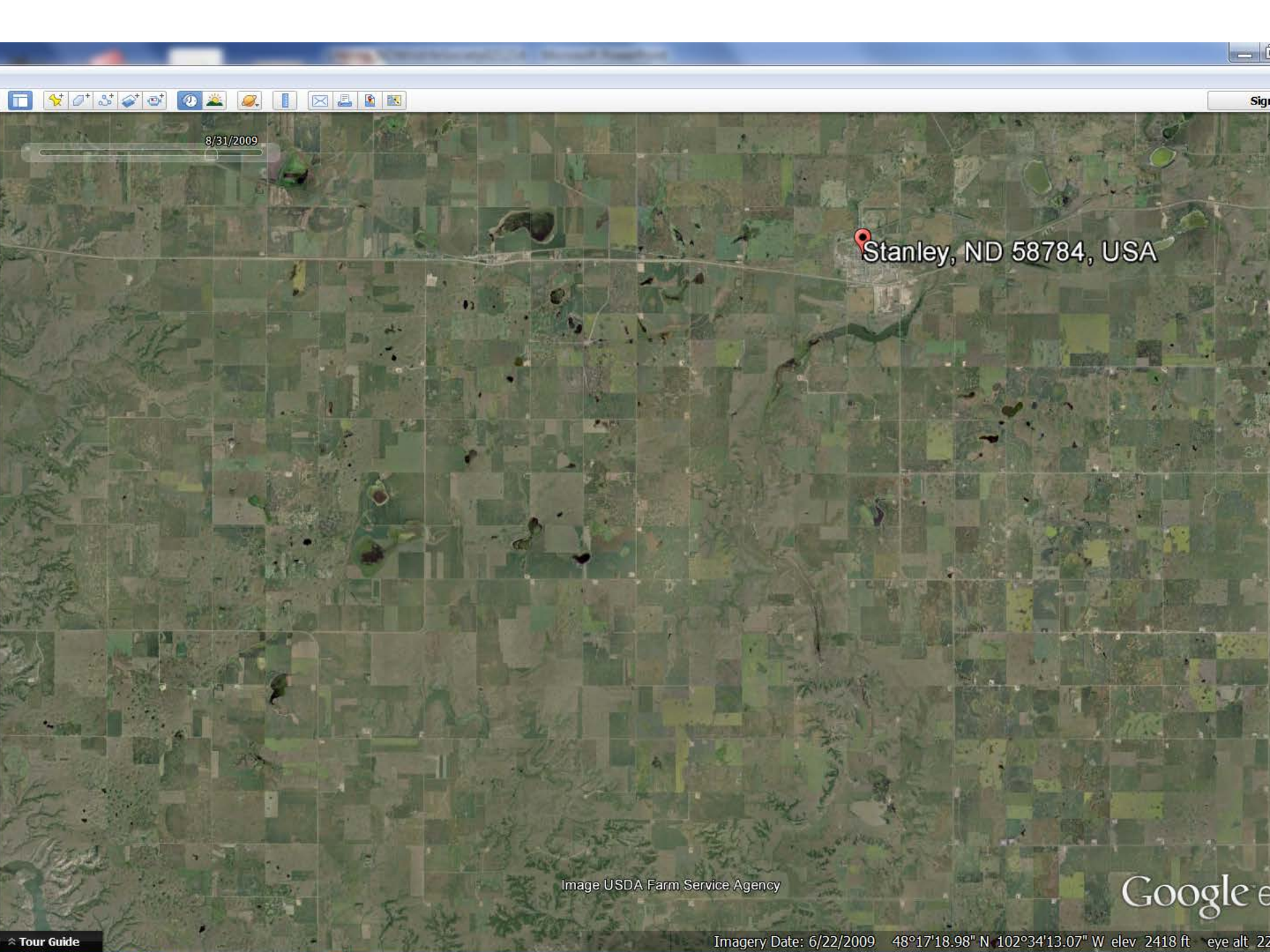


7/29/2005

Stanley, ND 58784, USA

Image USDA Farm Service Agency

Google e

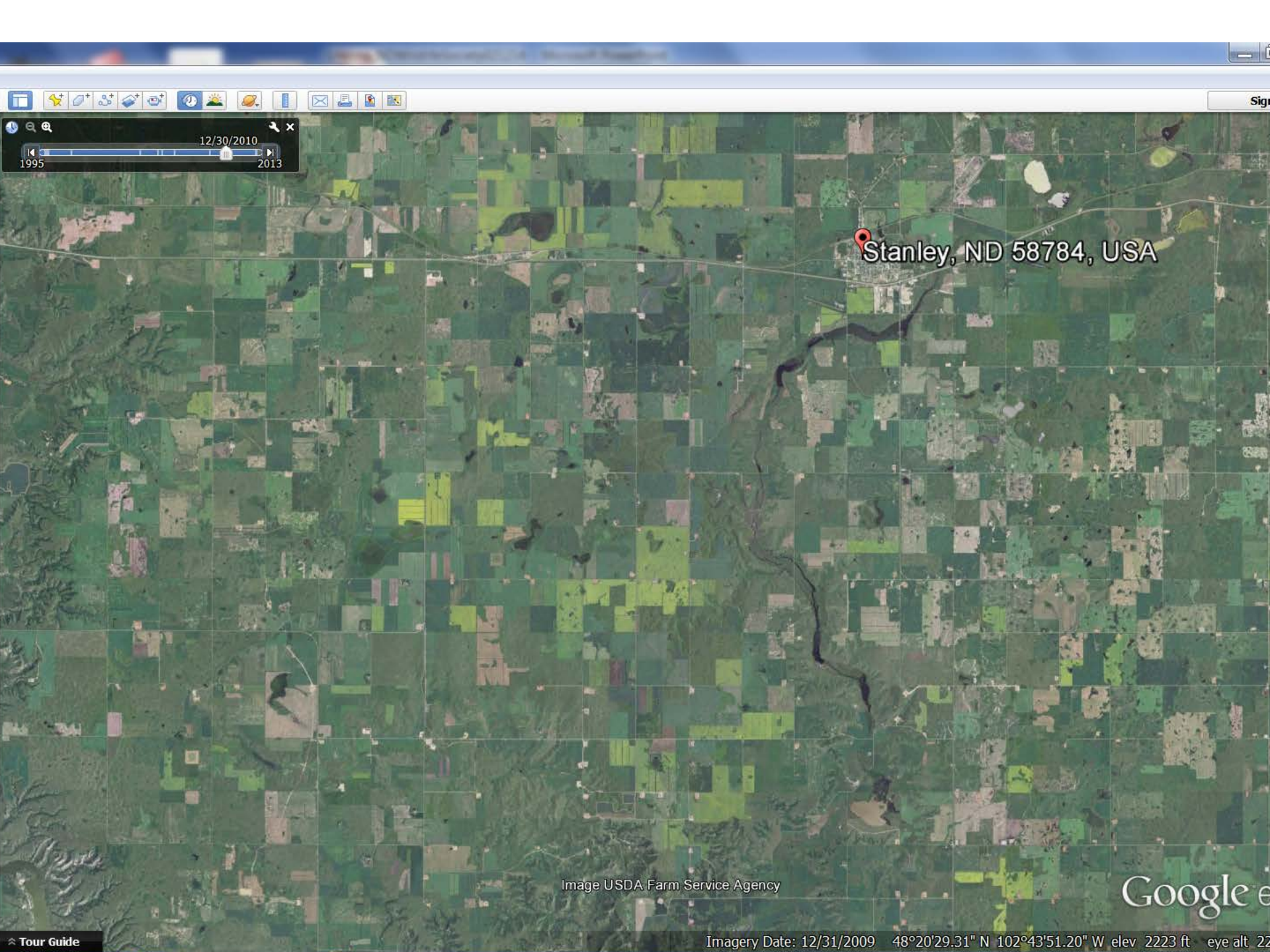


8/31/2009

Stanley, ND 58784, USA

Image USDA Farm Service Agency

Google e



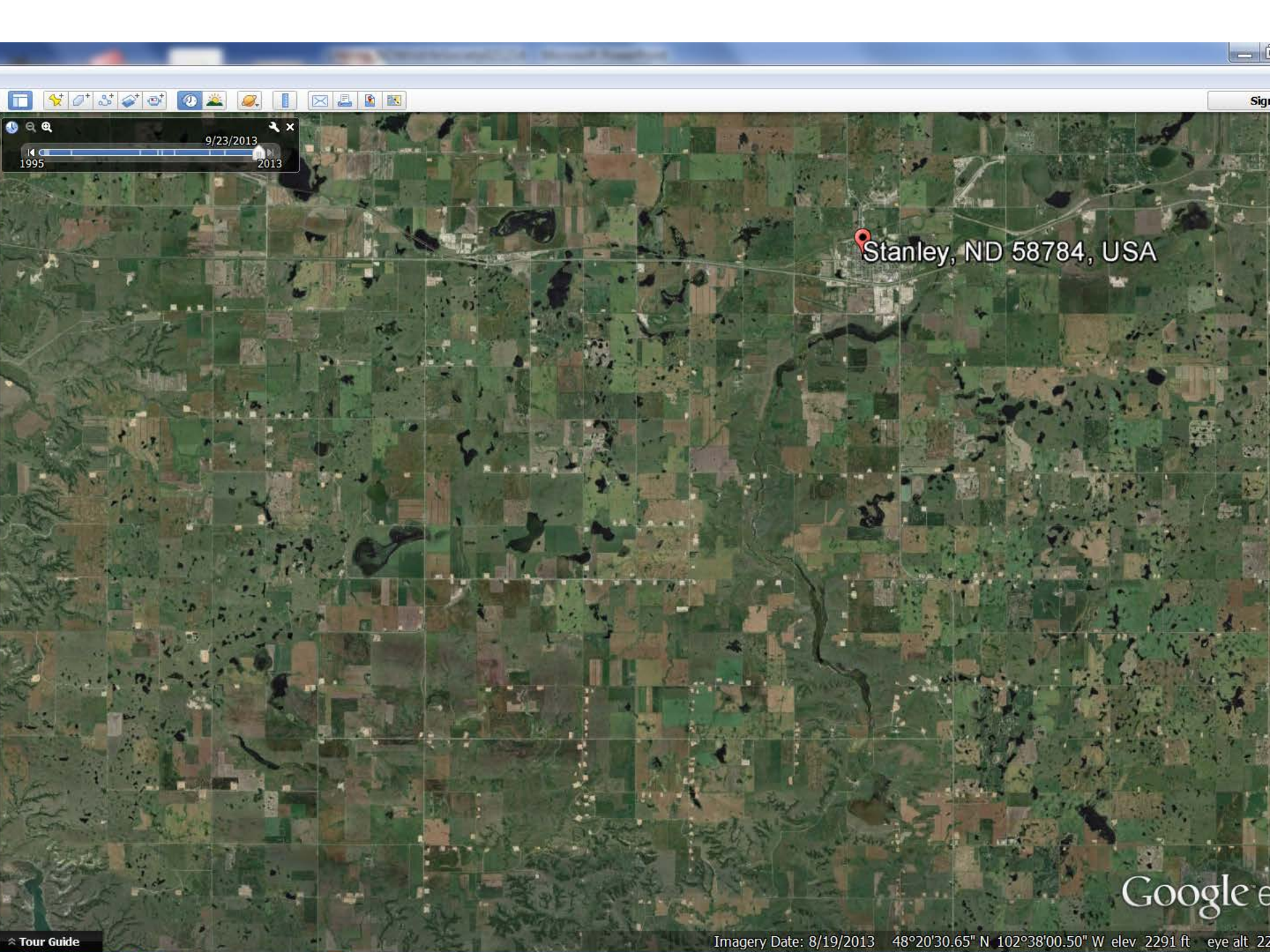
Stanley, ND 58784, USA

Image USDA Farm Service Agency

Google e

Tour Guide

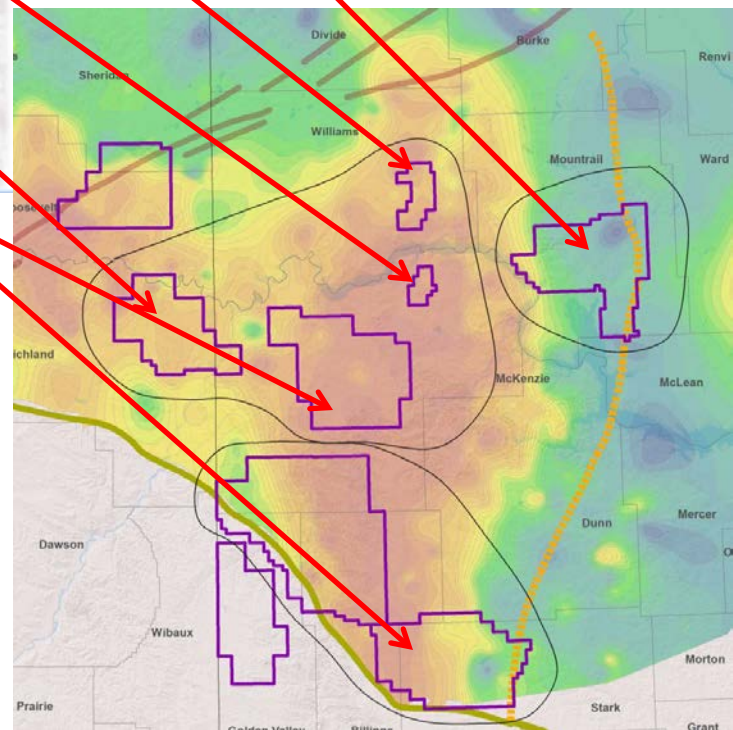
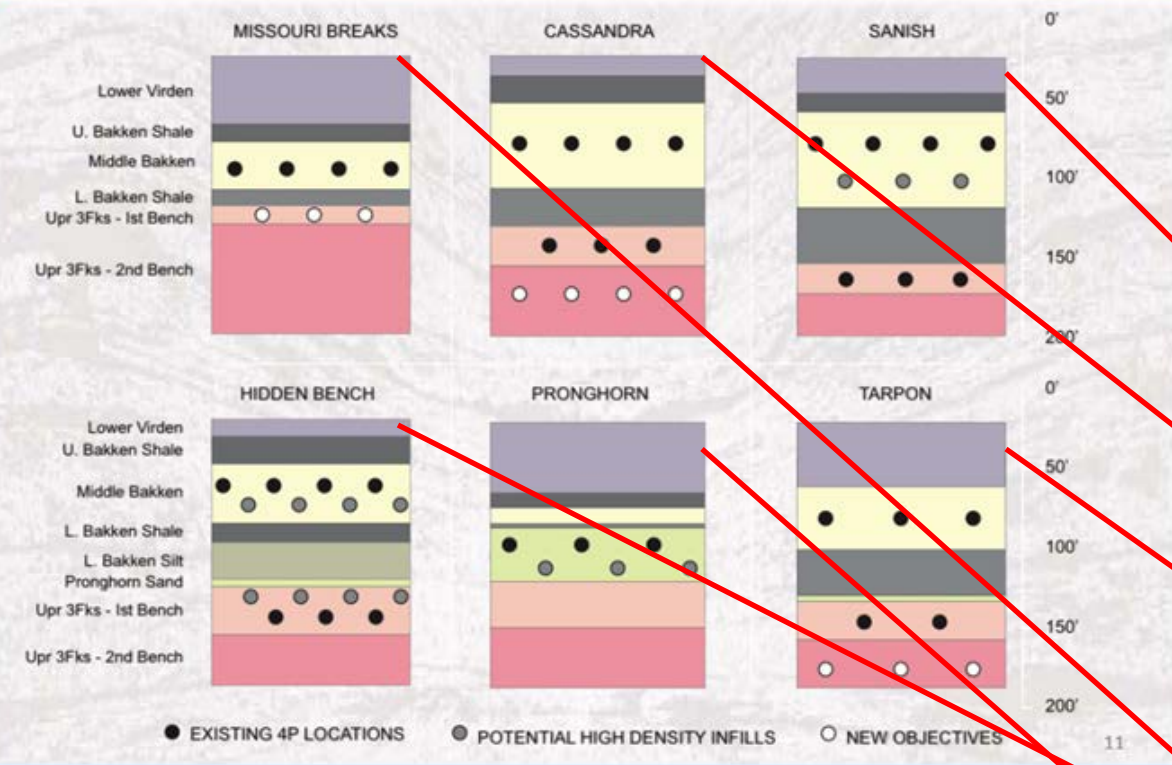
Imagery Date: 12/31/2009 48°20'29.31" N 102°43'51.20" W elev 2223 ft eye alt 22



Stanley, ND 58784, USA

Google e

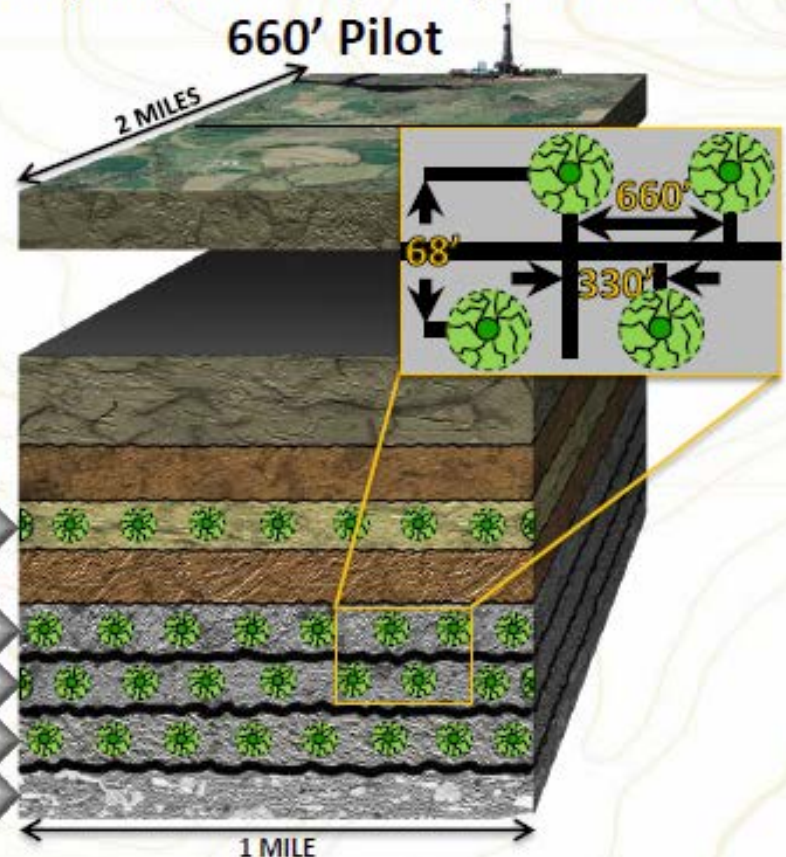
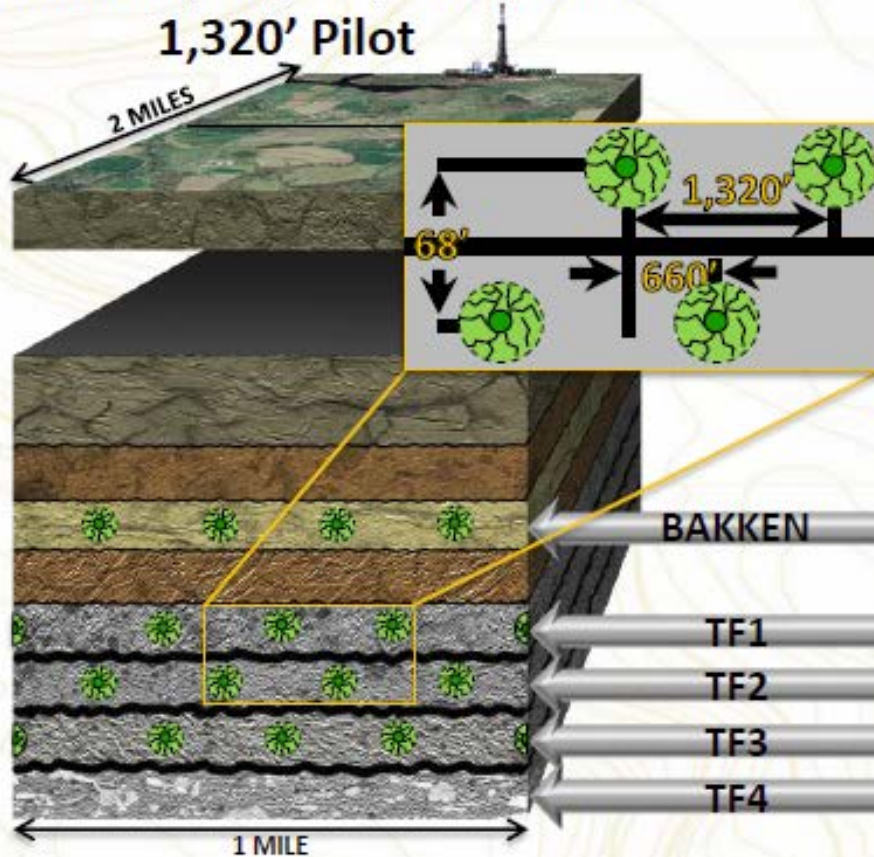
Williston Basin Primary and Prospective Drilling Plan by Area



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

Hawkinson, Tangsrud, and Rollefstad

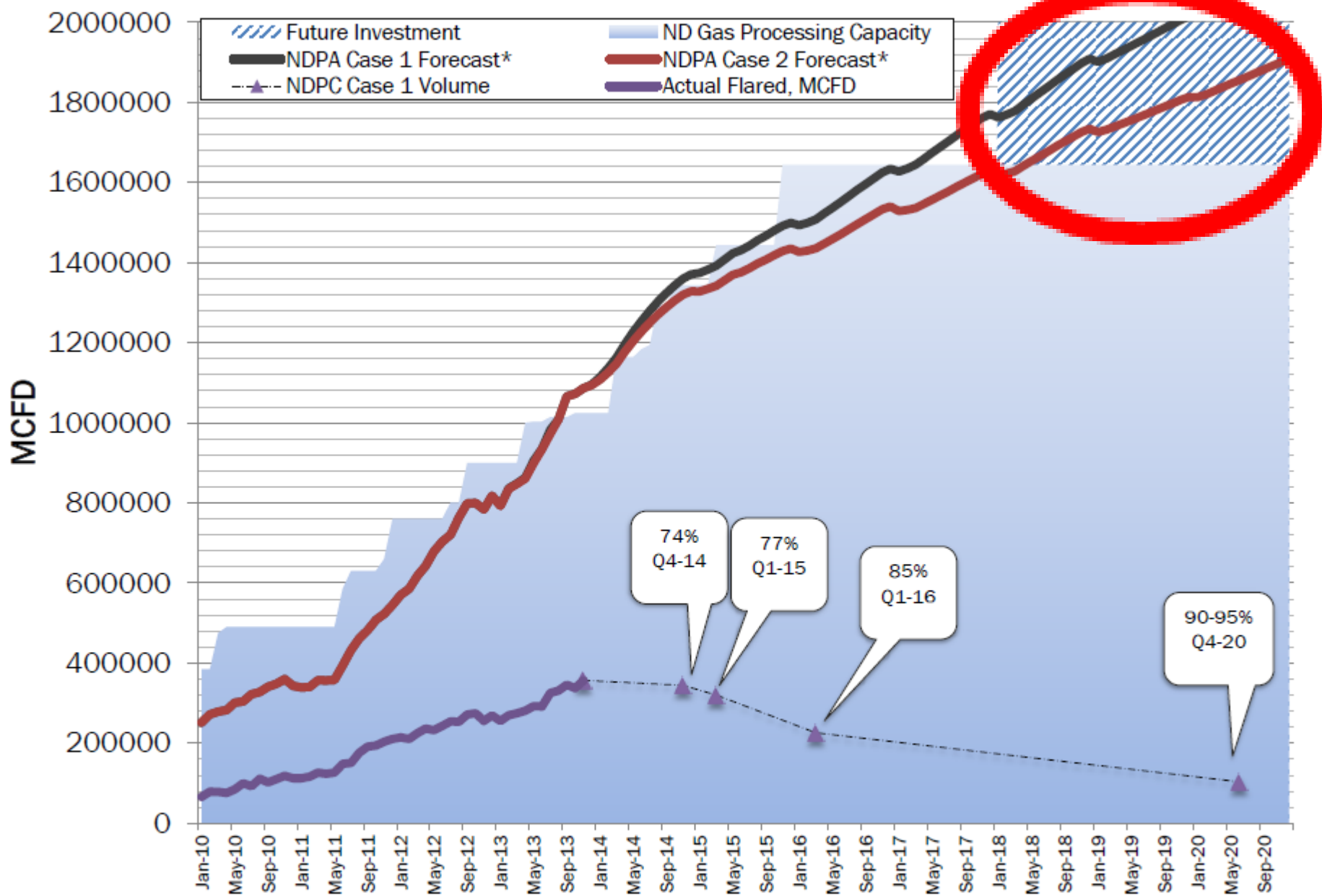
Wahpeton, Lawrence, Mack, and Hartman



- 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)

Source: Continental Resources

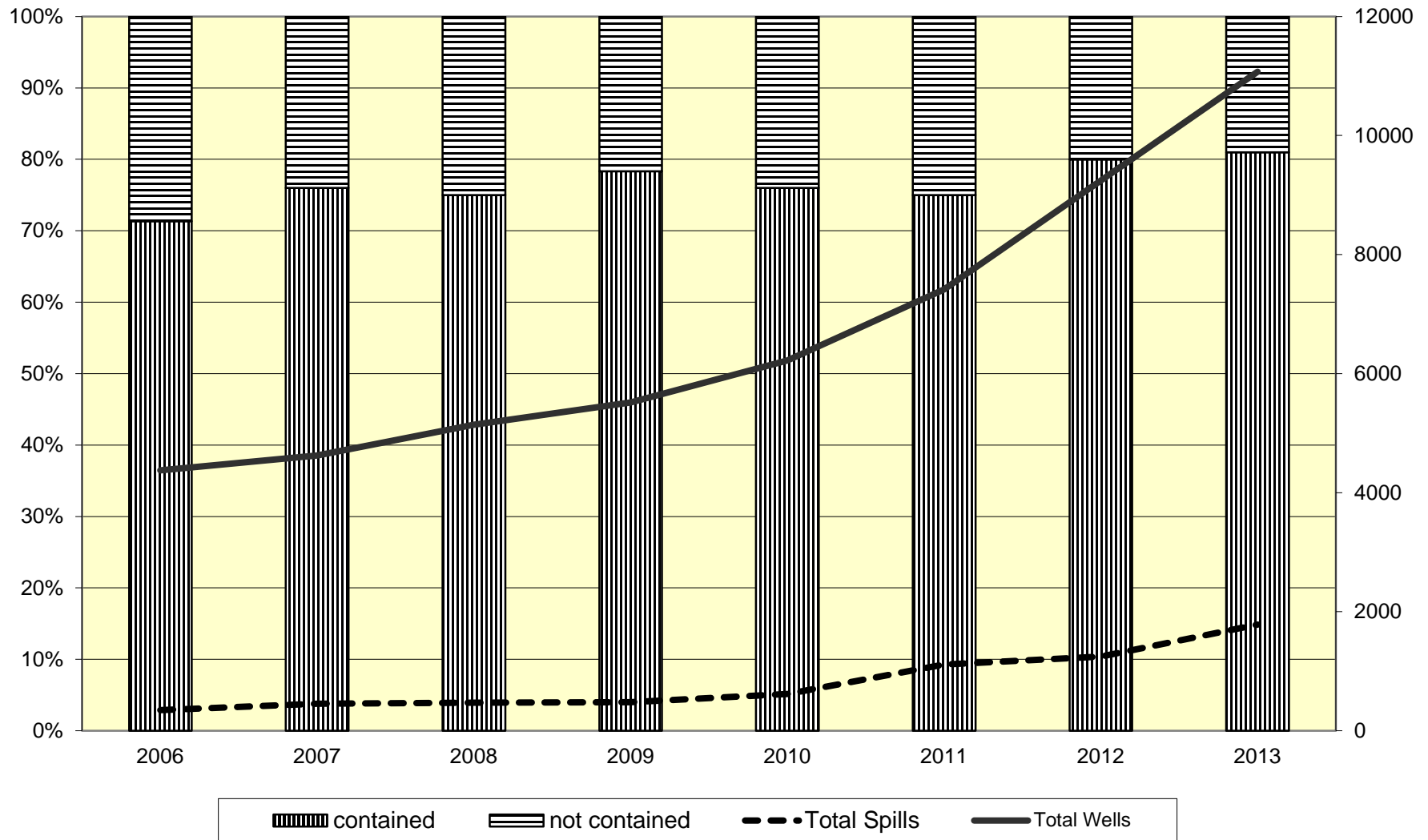


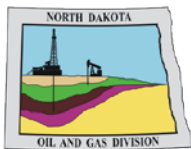
* NDPA Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning



Surface Spills

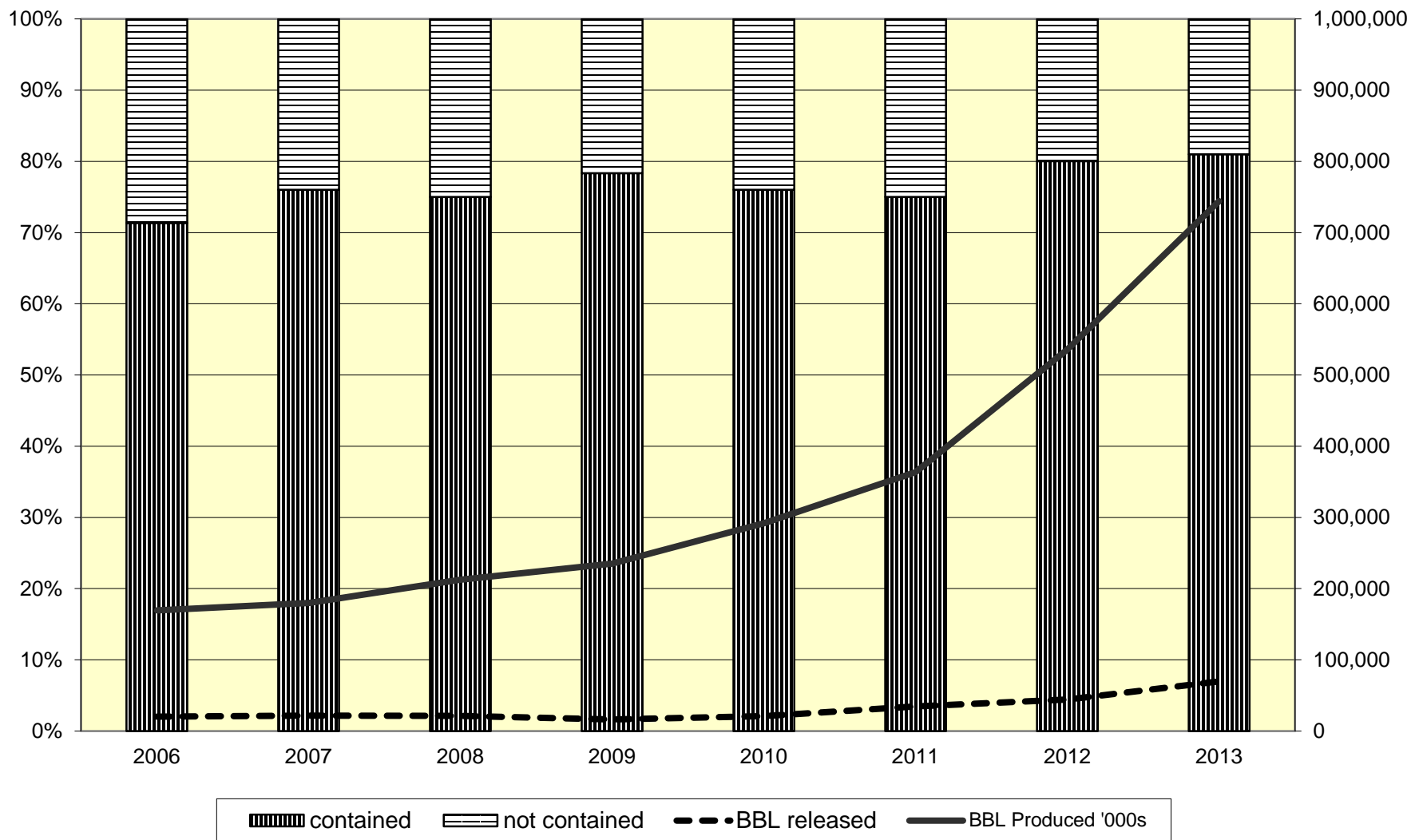
The Oil and Gas Division regulates spill containment through diking and site construction rules.





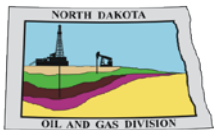
Surface Spills

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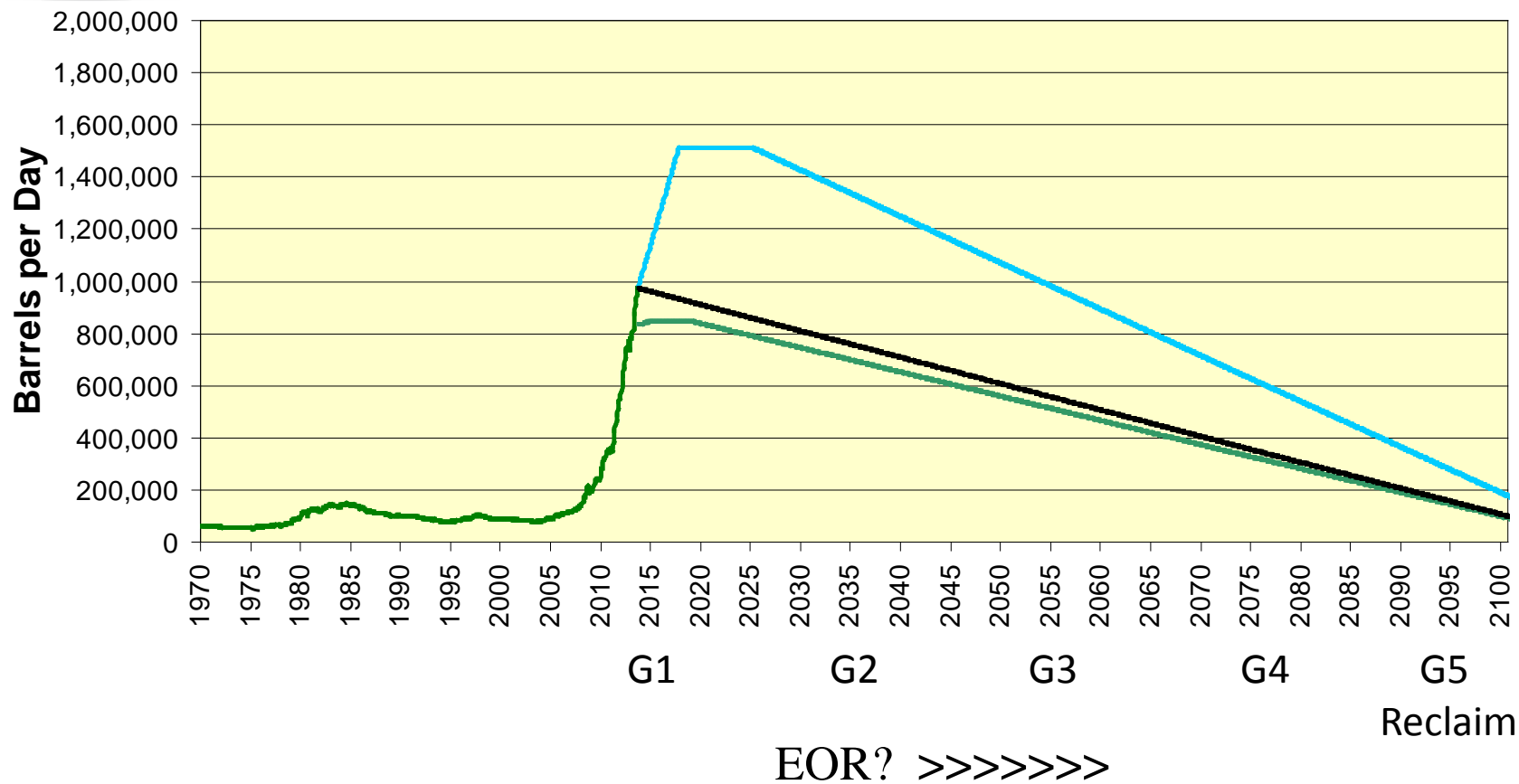


Issues

- Waste management and minimization
 - Drill cuttings
 - Filter socks
 - Illegal dumping
- Spill remediation
- Reclamation standards
- Flaring reduction
- Infrastructure
 - Housing
 - Roads
 - Pipeline Regulation (PSC/DMR/ROW)



North Dakota Oil Production



History Peak Production Estimate Current ND Revenue Estimate Current Production Limited-No Drilling

[illegible]

North Dakota Geological Survey



AGE MILLION YEARS BP	ERA	PERIOD	SEQUENCE	GROUP	FORMATION
251.0	PALEOZOIC	PERMIAN	ABSAROKA		NEAUMUS
					MINNEAPOTA
					OTECHE
299.0		PENNSYLVANIAN	MINNELUSA		BROWN CREEK
					ANDERSON
318.1		MISSISSIPPIAN	BIG SNIOW		TYLER
					OTTER
			MADISON		KIRBY
					CHARLES
					MISSOURI CANYON
					LODGEPOLE
359.2			KANSASIA		BAKKEN
					THREE FORKS
					RED RIVER
				JEFFERSON	OTTER
				MANTOBA	
					DAWSON RAY
		ELK POINT			PRABHU
					WINNEPEGOSIS
416.0		SILURIAN	TIPPECANOE		ASHEN
					INTERLAKE
443.7	ORDOVICIAN	BIG HORN			STONEWALL
				SEVEN MOUNTAIN	
				RED RIVER	
		WINNEPEG	RED RIVER		
			BLACK BLAND		
488.3	CAMBRIAN	SAUK		DEADWOOD	
542.0					

Paleozoic Era

Age: 542 to 251 million years before present.

The Paleozoic contains the record of geologic processes that fall between the first rapid and dramatic appearance of fossils produced by multi-celled animals and the largest mass extinction in Earth's history in which approximately 90% of all marine animal species became extinct.

[Mississippian Period](#) [Devonian Period](#)

Reclamation

- 26,346 wells permitted as of 9/1/13
 - 1,291 approved locations
 - 1,136 drilling and completing
 - 9,096 producing
-
- **8,432 reclaimed locations**



MORGAN DRAW

T144N R102W



8070

9078

8234

10935

MORGAN DRAW

9803

13228

T144N R102W

9515

13309

9766



MORGAN DRAW

T144N R102W

