

North Dakota Department of Mineral Resources



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

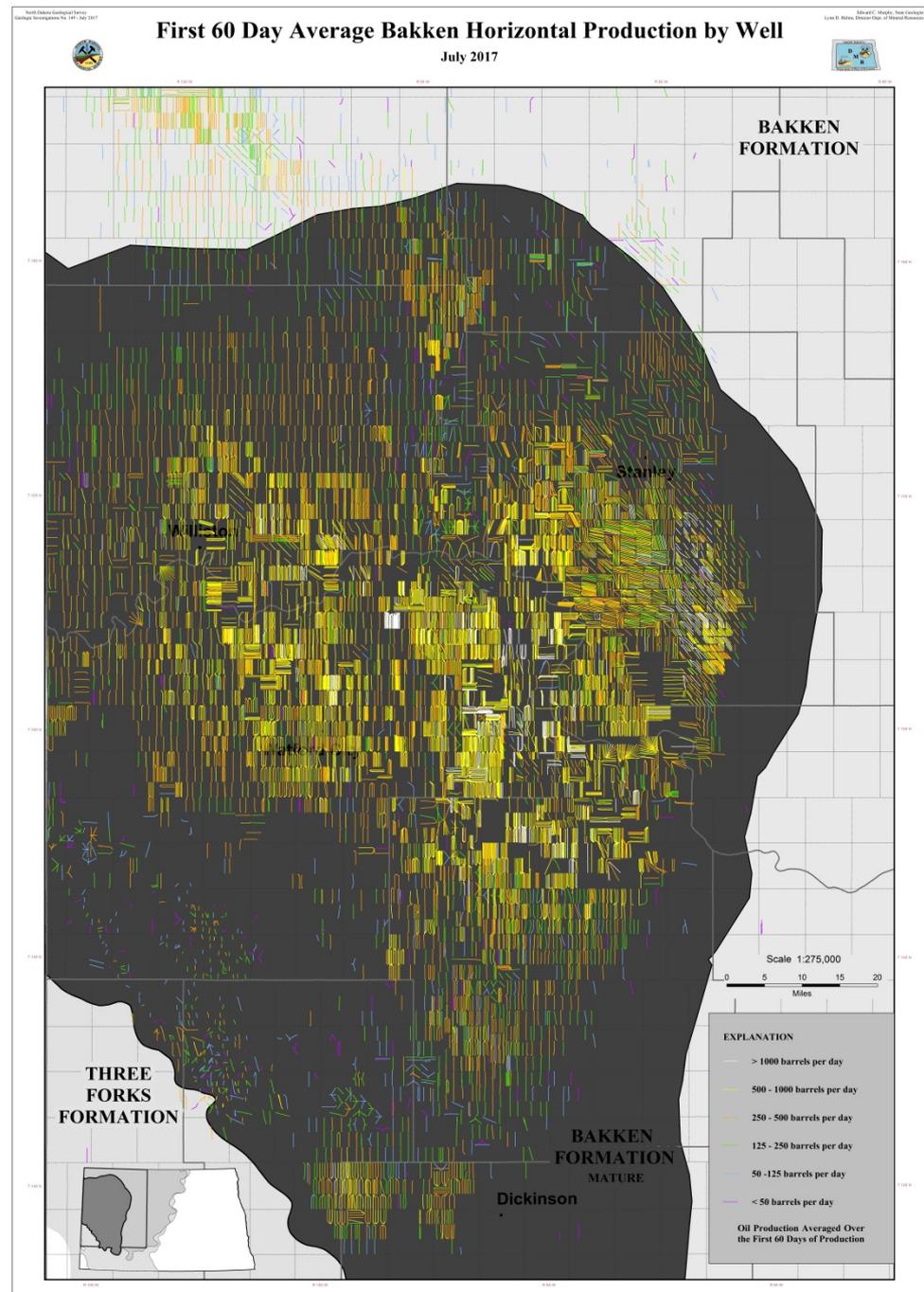
<http://www.state.nd.us/ndgs>

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Bismarck, ND 58505-0840

(701) 328-8020

(701) 328-8000

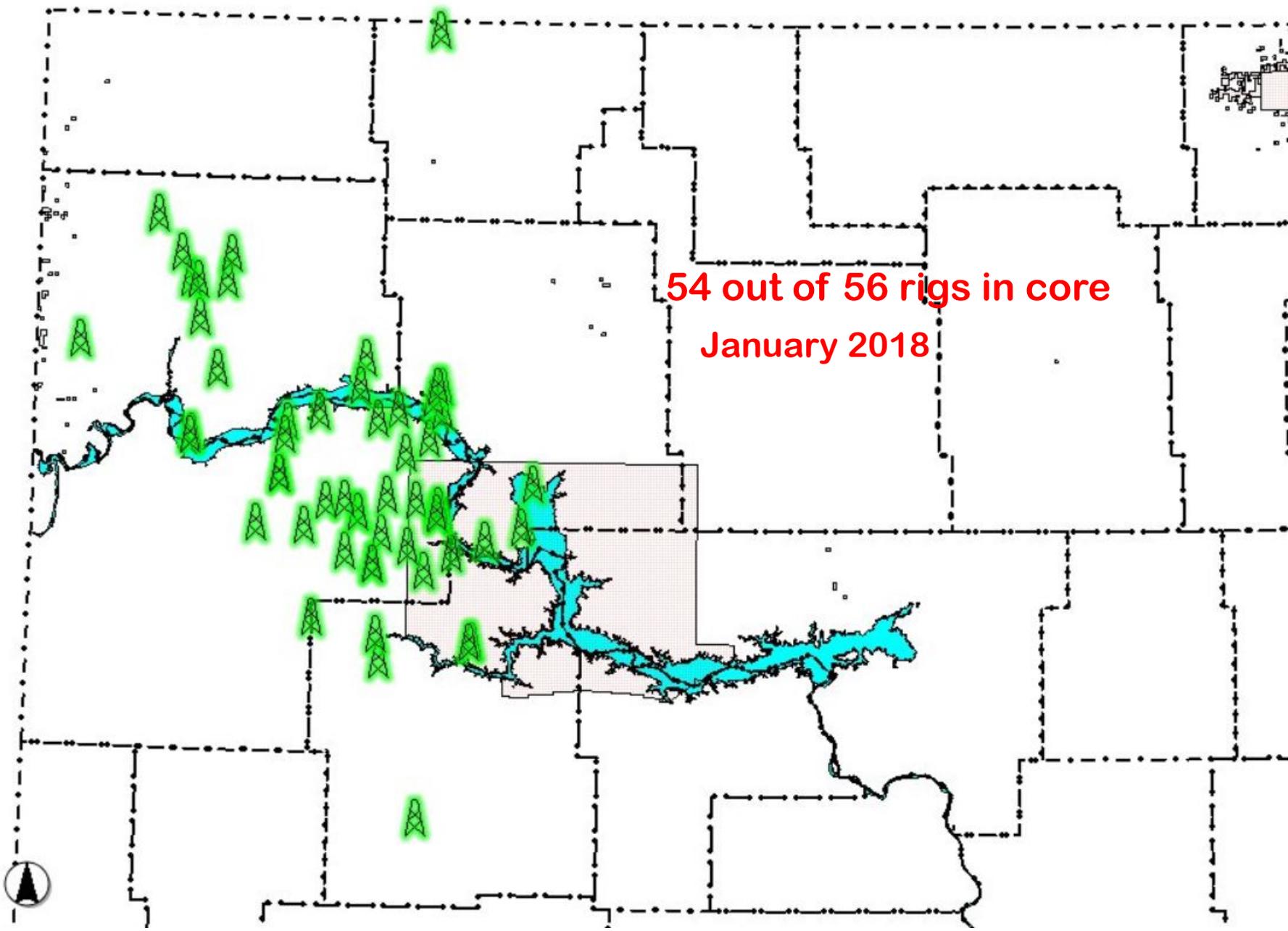


Wells

- 14,324 active
 - 2,055 conventional
 - 12,269 Bakken/Three Forks
- 1,492 inactive
 - +\$50 for 90 days
- 883 waiting on completion
 - +\$55 for 90 days
- 1,894 permitted
 - +\$60 for 90 days
 - NYMEX April 2018
- 13,314 increased density approved 01/15/18
- 31,907 total

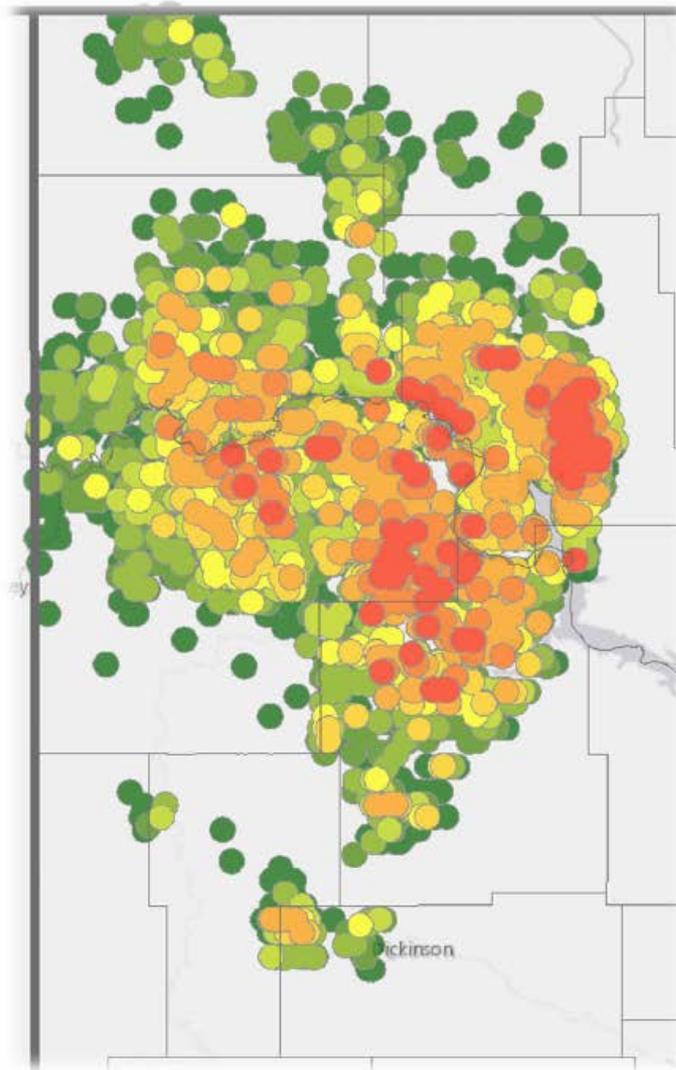
55,000-65,000 estimated final





54 out of 56 rigs in core
January 2018

Bakken Breakeven Price Range (20% ATIRR)



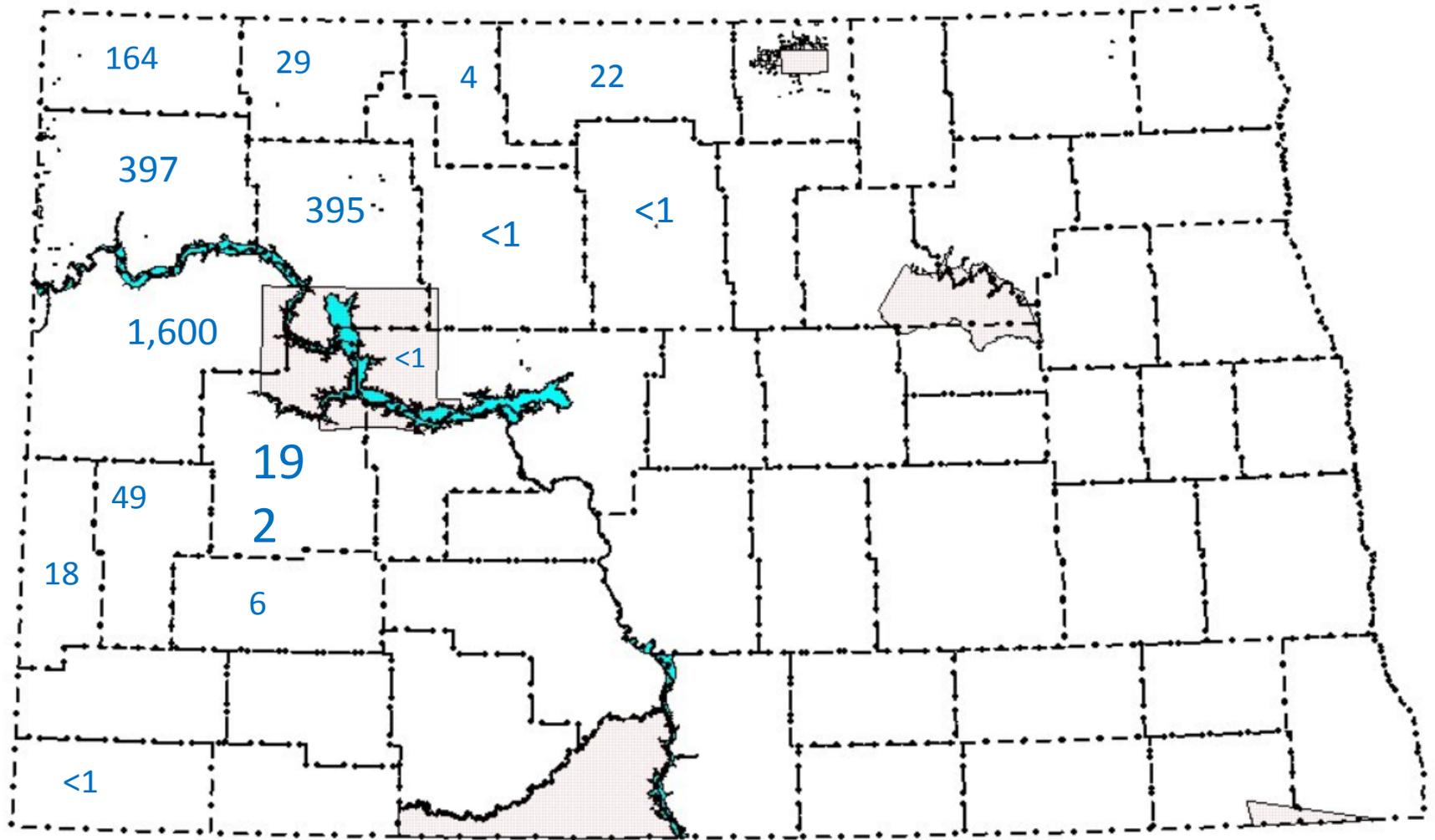
Bakken Breakeven Prices
\$6 - \$8 Million
Completed Wells Cost

- \$58-\$73
- \$49-\$61
- \$43-\$52
- \$39-\$48
- \$36-\$43
- \$34-\$40
- \$32-\$38
- \$28-\$33
- \$26-\$30

Background Map: Esri, HERE, DeLorme, MapmyIndia, ©
OpenStreetMap contributors, and the GIS user community



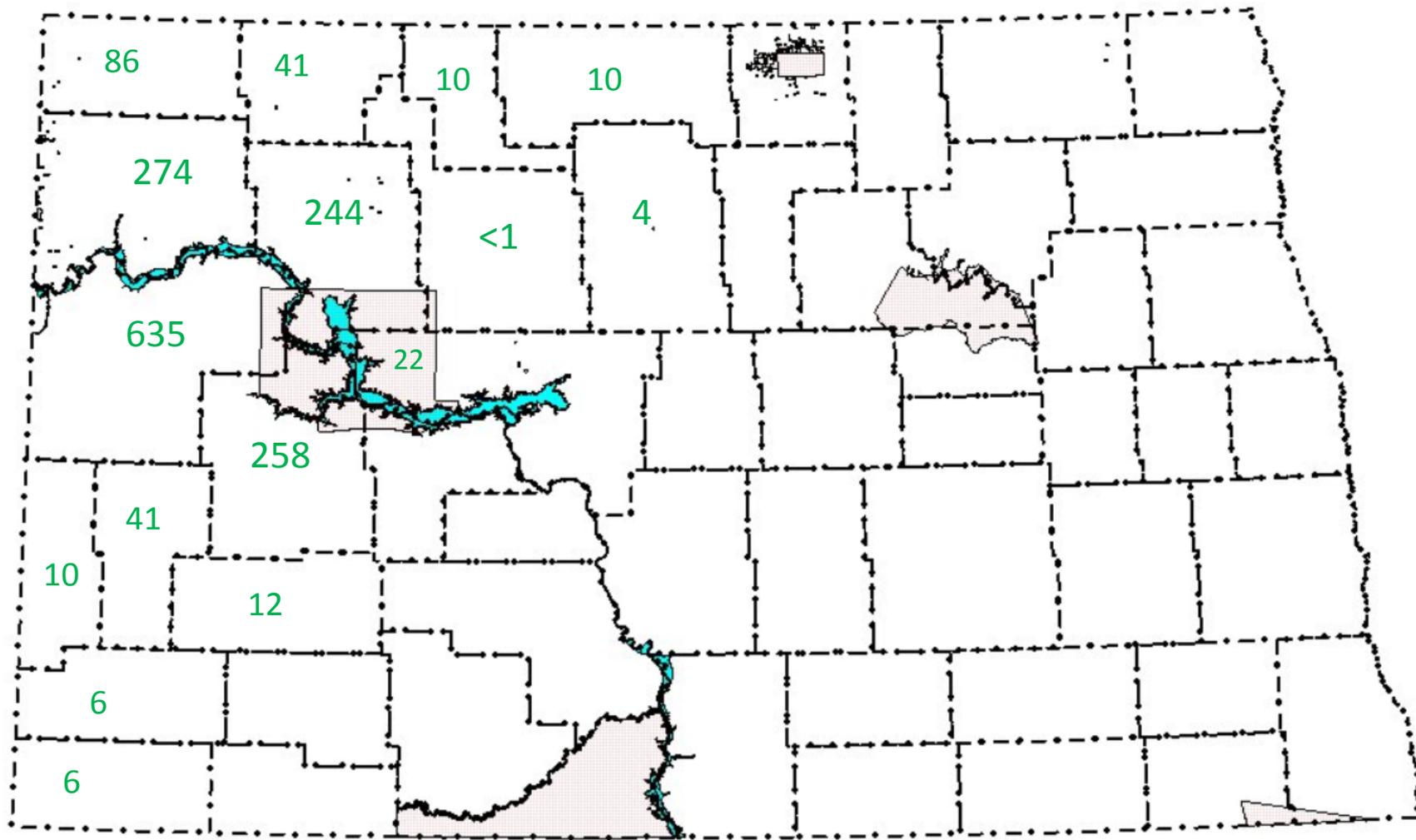
October 2017 Water Disposal Trucked Loads/Day



0 79mi



October 2017 Crude Oil Trucked Loads/Day



0 79mi



Impact

Wells drilled and completed - \$100 billion

Wells drilled not yet completed - \$11 billion

Natural Gas gathering and processing - \$13 billion

Rail and rail transportation facilities - \$1.25 billion

Crude Oil transmission pipelines - \$2 billion

Total estimate - \$127 billion

This does not include the investments in housing and infrastructure made by private firms and state-local-federal government.

Coming Attractions

NDIC Rule Changes

EOR Field Tests

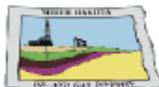
\$50 > \$60 > \$70/barrel

Coming Attractions

NDIC Rule Changes

EOR Field Tests

\$50 > \$60 > \$70/barrel



**NORTH DAKOTA INDUSTRIAL COMMISSION
DEPARTMENT OF MINERAL RESOURCES
OIL AND GAS DIVISION**

SUMMARY OF PROPOSED 2018 RULES

NDAC CITE	RULE	PROPOSED CHANGE
43-02-03 GENERAL RULES		
43-02-03-01	Definitions	"Treating Plant" does not include treating tank bottoms at well site or facility
43-02-03-05	Enforcement of Laws, Rules, and Regs	Requires contractors know regs before conducting operations
43-02-03-14.2	Oil and Gas Metering Systems	Requires serial numbers of oil and gas meters to be submitted
43-02-03-15	Bond and Transfer of Wells	Requires principal to submit drawing identifying location of pipelines off site
43-02-03-17	Sign on Well or Facility	Clarifies signs must be on both the well and facility
43-02-03-22	Defective Casing or Cementing	Requires MIT if suspect defective casing or cementing Requires subsequent MIT if casing integrity is questionable after remedial work
43-02-03-28	Safety Regulation	Clarifies ignition sources (not just boiler/generator) must be at a safe distance
43-02-03-30	Fires, Leaks, Spills, or Blowouts HB1151	Leak/spill involving CO, PW, NGL notification NR if < 10bbls, stays on site built >9-01-2000
43-02-03-30.1	Leak and Spill Cleanup	Requires Fm4 w/in 10 days of spill cleanup
43-02-03-33	Notice of Intention to Plug Well	Notice must include well bore diagram
43-02-03-34.1	Reclamation of Surface SB2333	Requires reclamation to original condition per 38-08-04.12 (SB2333) Authorizes Director to require an environmental assessment of the site
43-02-03-49	Oil Production Equip, Dikes, and Seals	Requires dikes around production equipment at new production facility Synthetic liner required on dikes and within diked area Requires all discharged wastes to be promptly removed, not just accidentally spilled
43-02-03-51.3	Treating Plant Construction and Operation	Requires Fm4 w/in 30 days of TP construction/modification Clarifies that prior approval needed before modify TP Authorizes Director to shut-in TP operations if noncompliant
43-02-03-51.4	Treating Plant Abandonment & Reclamation	Removes duplication in Adm Code--language appears under 43-02-03-34.1
43-02-03-53.3	SHF Construction & Operation Requirements	Requires Fm4 w/in 30 days of TP construction/modification Authorizes Director to shut-in TP operations if noncompliant
43-02-03-53.4	SHF Abandonment & Reclamation	Removes duplication in Adm Code--language appears under 43-02-03-34.1
43-02-03-55	Abandonment of Wells, TPs, & SHFs	Clarifies Comm can require shut-in inj wells plugged after notice & hearing
43-02-03-88.1	Special Procedures	Clarifies Comm must receive comments by 5pm last business day prior to hearing
43-02-05 UNDERGROUND INJECTION CONTROL		
43-02-05-06	Construction Requirements	Requires all SWD wells to have surface casing set below Fox Hills Fm Requires Director approval to perf after initial completion Clarifies surface facilities must be constructed pursuant to saltwater handling facilities rules
43-02-05-09	Pressure Limitations (formerly Operating Regs)	Moves existing language to 43-02-05-12
43-02-05-12	Reporting, Monitoring, and Operating Regs	Identifies forms needed to report monthly injection Requires initial and annual press test of all inj lines leaving the pumphouse site Added annular injection prohibition currently residing in 43-02-05-09
43-02-06 ROYALTY STATEMENTS		
43-02-06-01	Royalty Owner Information Statement	Requires point of sale for oil and gas Requires weighted average price and point of sale for natural gas liquids Modifies rule to conform to existing statute--must clearly identify deductions Requires gross and net mineral acres in spacing unit
43-02-11 CERTIFICATION OF HORIZONTAL, RE-ENTRY, AND TWO-YEAR INACTIVE WELLS		
43-02-11-01	Definitions HB1043	Removes reference to tax incentives repealed by HB1043
43-02-11-02	Appl to Certify Hor, Hor RE, Two-Yr Inactive HB1043	Removes qualifying well certification for tax incentives repealed by HB1043
43-02-11-04	Appl for Tax Exempt for Hor Well HB1043	Removes tax incentives repealed by HB1043
43-02-11-05	Appl for Tax Exempt for Hor RE Well HB1043	Removes tax incentives repealed by HB1043
43-02-11-06	Appl for Tax Exempt for Two-Yr Inactive Well HB1043	Removes tax incentives repealed by HB1043
43-02-11-07	Books & Records--Substantial Reports HB1043	Removes reference to tax incentives repealed by HB1043
43-02-11-08	Appl for Tax Exempt for Shallow Gas Well	Removes requirement to notify all working interest owners and gas purchasers
43-05-01 GEOLOGIC STORAGE OF CARBON DIOXIDE		
43-05-01-19	Facility Closure SB2333	Requires reclamation to original condition per 38-08-04.12 (SB2333)

TIMETABLE FOR ADOPTING OIL AND GAS RULES (tentative in RED FONT)

2017

- Jun 27:** Requested ideas f/rule changes at Annual Inspector Meeting
- Jul 28:** Received interoffice comments for proposed rules
- Aug 22:** IC meeting—received approval to proceed with proposed rulemaking
- Aug 23:** Sent legal ad to North Dakota Newspaper Association for rules notice
File full notice + rules w/Leg Council (LC) via hand-delivery
LC sends rules notice to interested parties w/in 15 business days after receiving them
- Aug 30:** Write reg analysis f/rules impacting industry > \$50,000
All papers (10 daily + 42 weekly) to publish proposed rules notice Aug 30 – Sep 5
- Oct 11:** Rules hearing (Case 26062) @ 9 am, Oil and Gas Division Field Office, 1000 E Calgary Ave, Bismarck
- Oct 11:** Rules hearing @ 1 pm, Oil and Gas Division Field Office, 926 E Industrial Drive, Dickinson
- Oct 12:** Rules hearing @ 8:30 am, Home Place Lodge and Suites, 1505 15th Ave West, Williston
- Oct 12:** Rules hearing @ 2 pm, Oil and Gas Division Field Office, 7 3rd St SE, Suite 107, Minot
Minimum ten-day comment period starts (to receive input on proposed rules)
- Oct 23:** Comment period ends—11 days from final hearing date
- Nov 27:** Finalize responses to all comments rec'd (oral-hearing + written comments)
Finalize appropriate amendments to rules
- Nov 28:** IC approve rules w/ICO # _____ (Case 26062): Prepared Aff of mailing to all parties
- Nov 28:** Write small entity reg analysis and small entity impact statement
Complete small entity regulatory analysis required to minimize adverse impact on small entities
Complete small entity impact statement required if has an adverse impact on small entities
Submit final rules to Attorney General (AG) for legal opinion including:
- Dec 20:** Receive opinion from AG's office
File rules+AG opinion w/LC
(Rules filed w/LC btn Nov 2-Feb 1 become effective Apr 1, 2018.)

2018

- Jan 17:** Notify all interested parties (+ post on web) of Adm Rules Comm hearing after LC posts agenda
- Mar 14:** Administrative Rules Committee Hearing (Notify all interested parties when LC posts agenda)
- Apr 1:** Adopt final rules

Coming Attractions

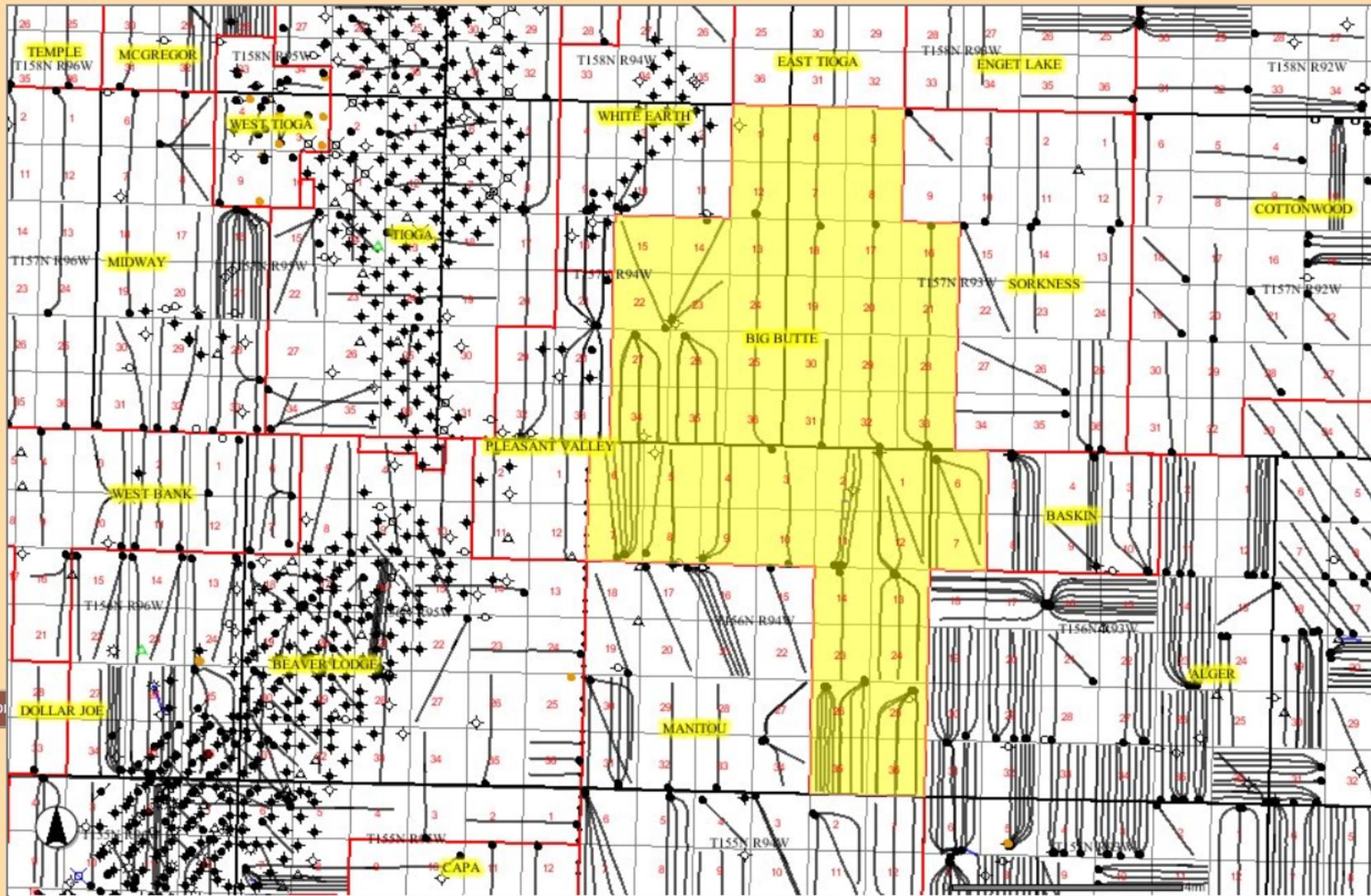
NDIC Rule Changes

EOR Field Tests

\$50/barrel & \$60/barrel

Oil and Gas Subscription: ArcIMS Viewer

- Legend / Layers
- Overview Map
- View Entire State
- Previous View
- Clear Selection
- Search
- Create PDF
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- Browser Settings Suggestion

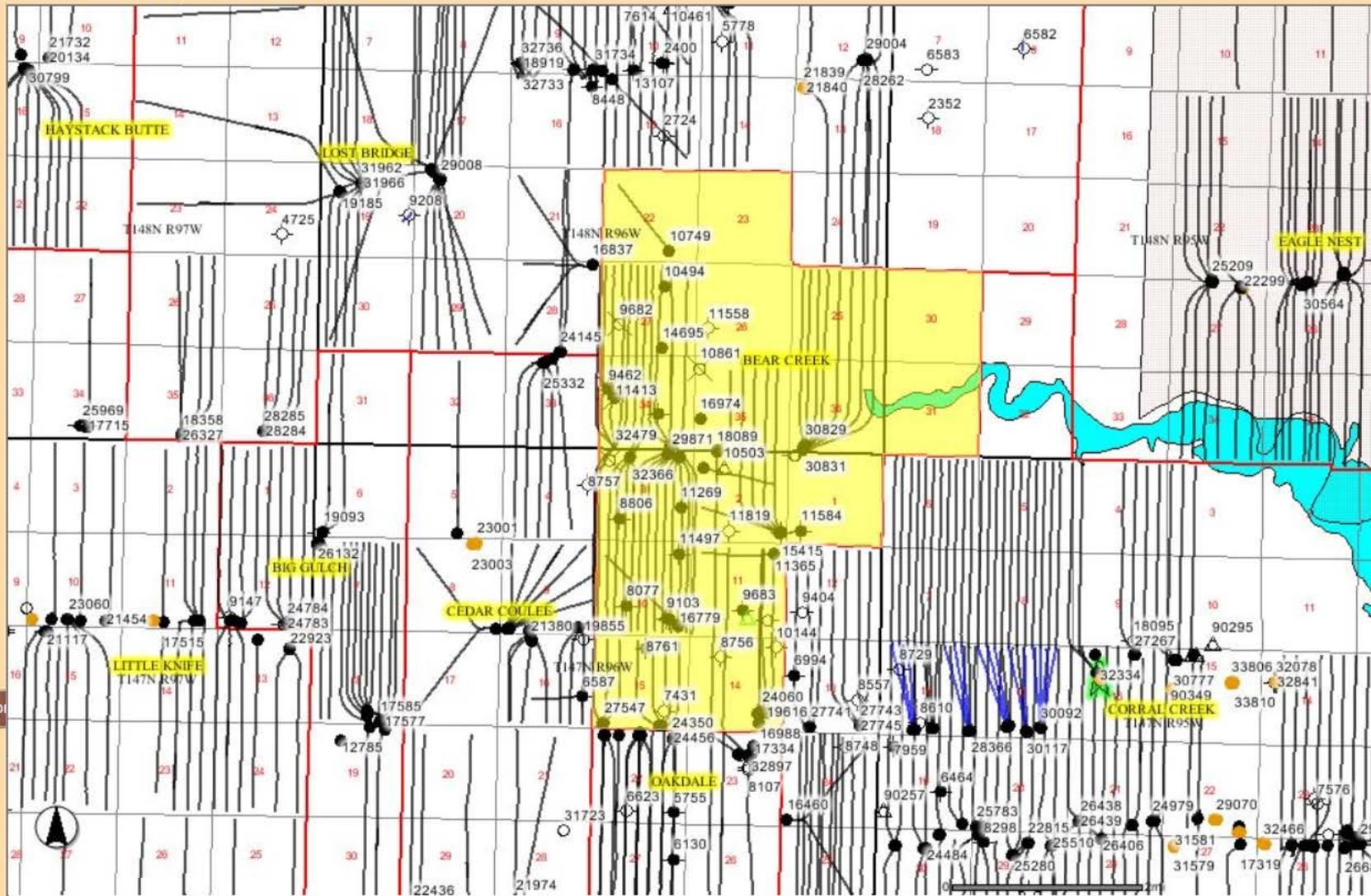


Oil Fields

Rec	Name	Type
1	BIG BUTTE	oilGas

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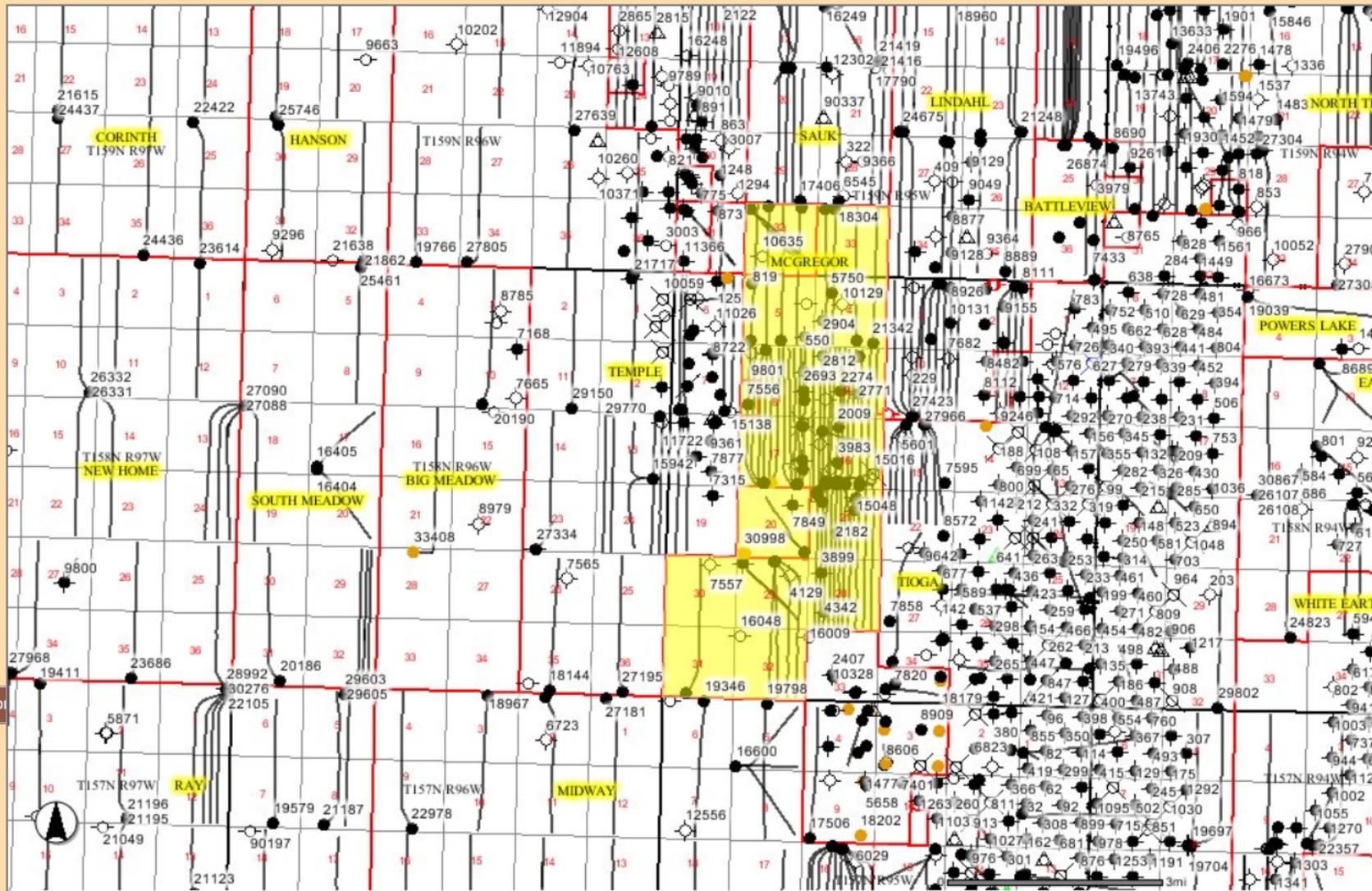


Oil Fields

Rec	Name	Type
1	BEAR CREEK	oilGas

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Oil Fields

Rec	Name	Type
1	MCGREGOR	oilGas

EOG on EOR

EOG is the first company to say it has significantly increased oil production from an unconventional play using gas injection.

Field tests since program started in 2013:

- The production increases on 15 wells indicated from 30 to 70% reserve gains.
- A 32-well test in 2016 added 300,000 bbl of oil at \$6/bbl finding cost.
- Work is ongoing on 100 wells in six areas in 2017.

Inputs and Outputs

- Additional capital costs average about \$1 million per well.
- The process uses associated gas from its wells.
- Production response is in 2–3 months.
- \$1 invested adds \$2 to net present value.

It Works if:

- The formation is able to contain high-pressure gas injection near the well.
- Wellbores contact the most productive rock.
- The completion maximizes the fractured area within a restricted zone around the wellbore.

Source: EOG.

Coming Attractions

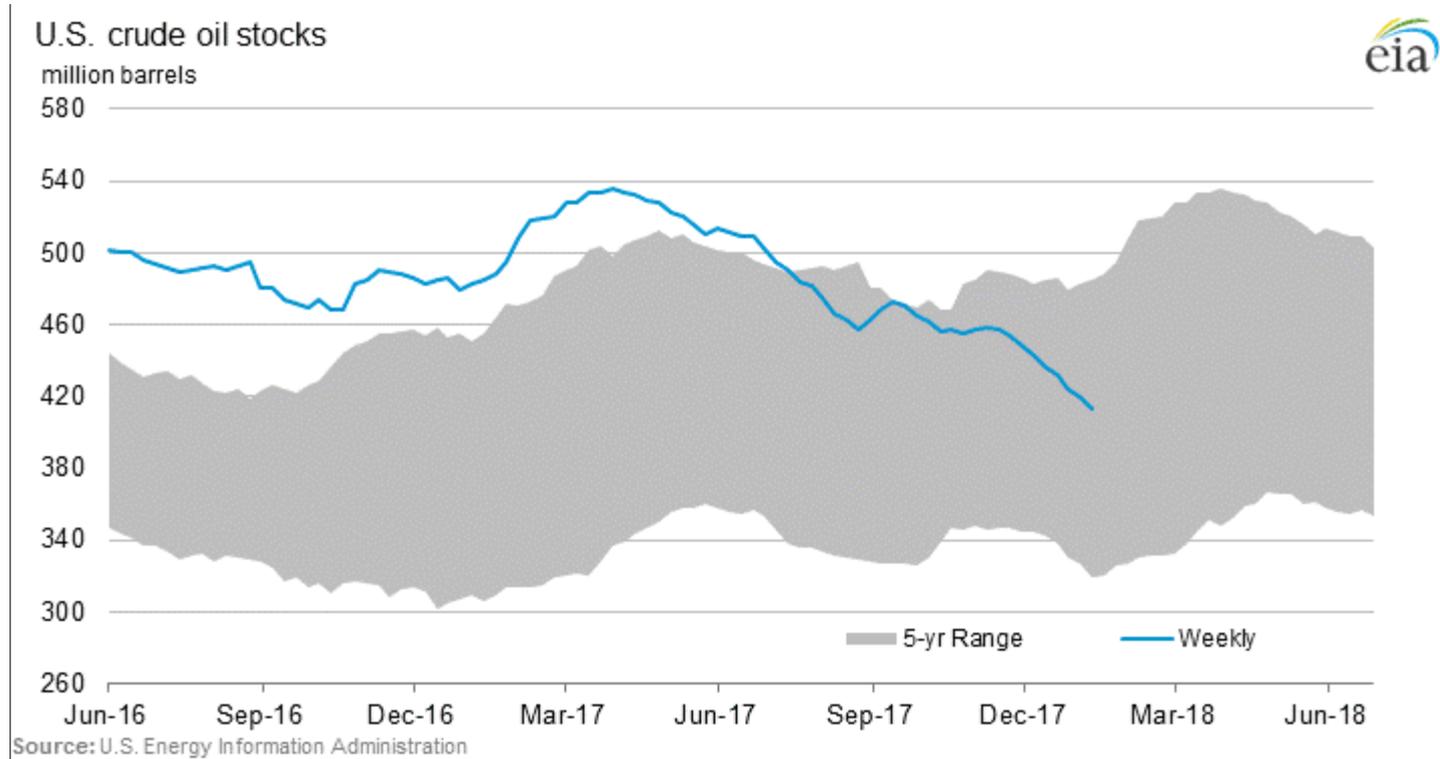
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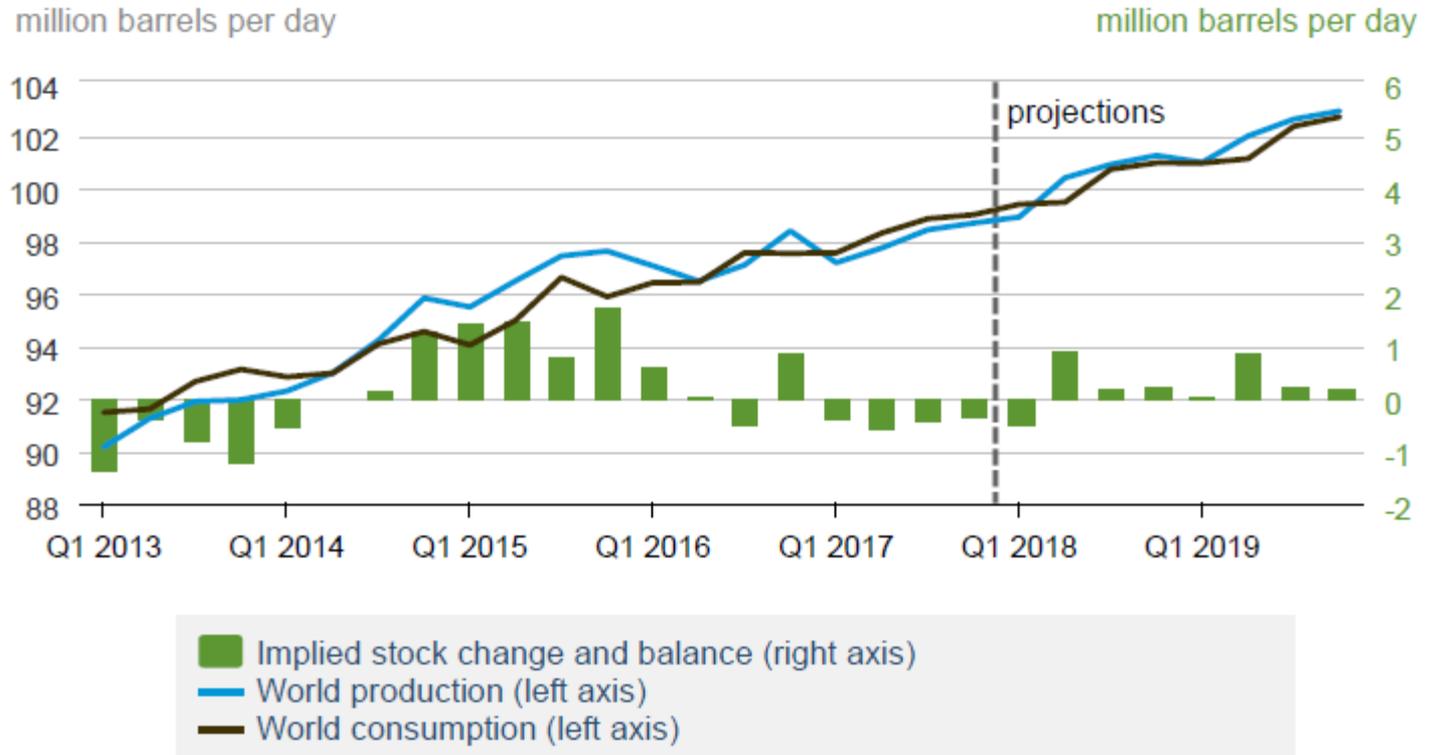
\$50 > \$60 > \$70/barrel

Storage East Coast 12 of 20=60%
 Permian 84 of 120=70%
 Rockies 22 of 40=55%
 Total US 413 of 735=56%

Cushing 42 of 70=60%
 Gulf Coast 203 of 395=51%
 West Coast 50 of 100=50%
 Normal 400 of 735=54%



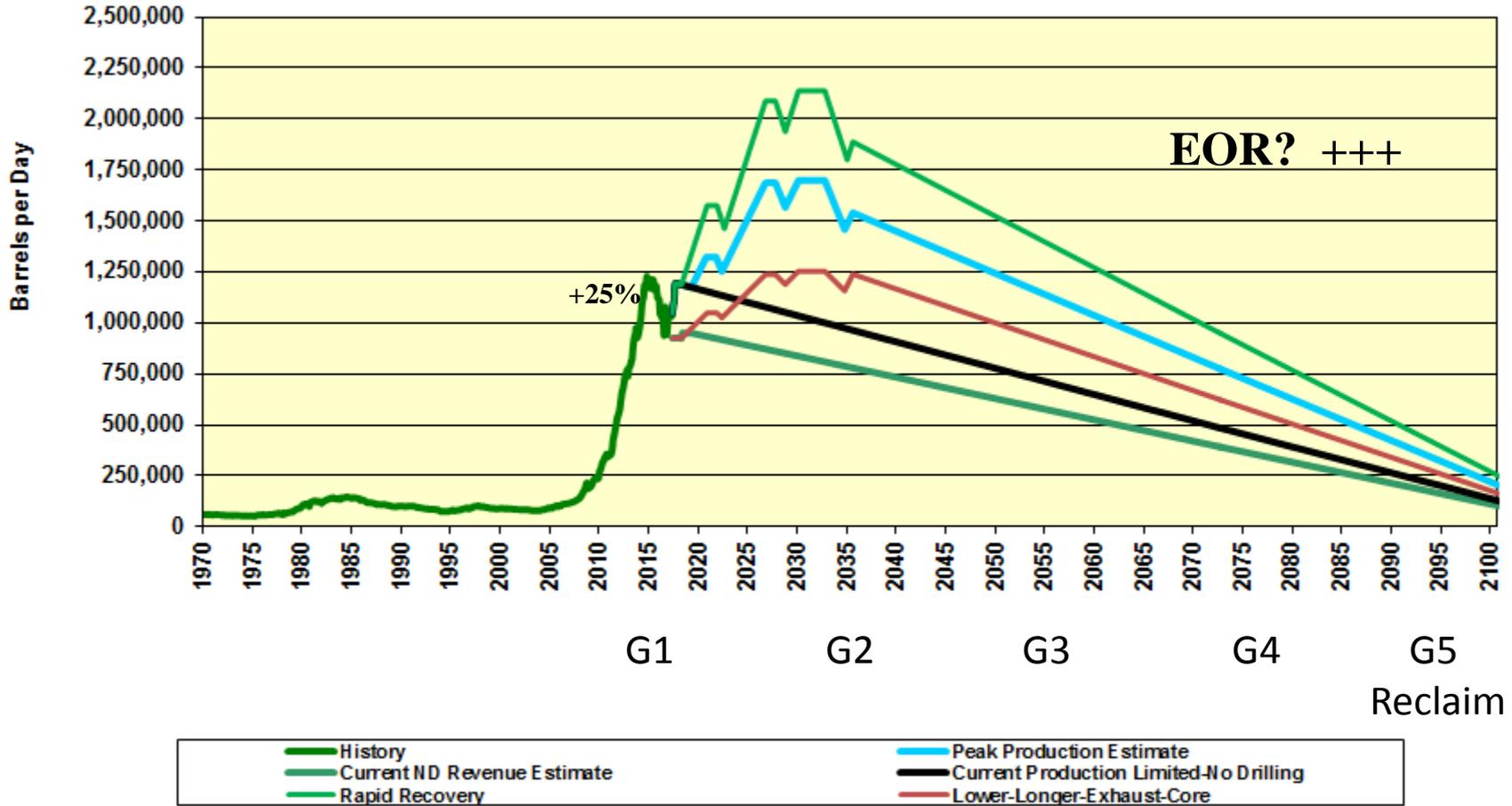
World liquid fuels production and consumption balance



Source: Short-Term Energy Outlook, January 2018

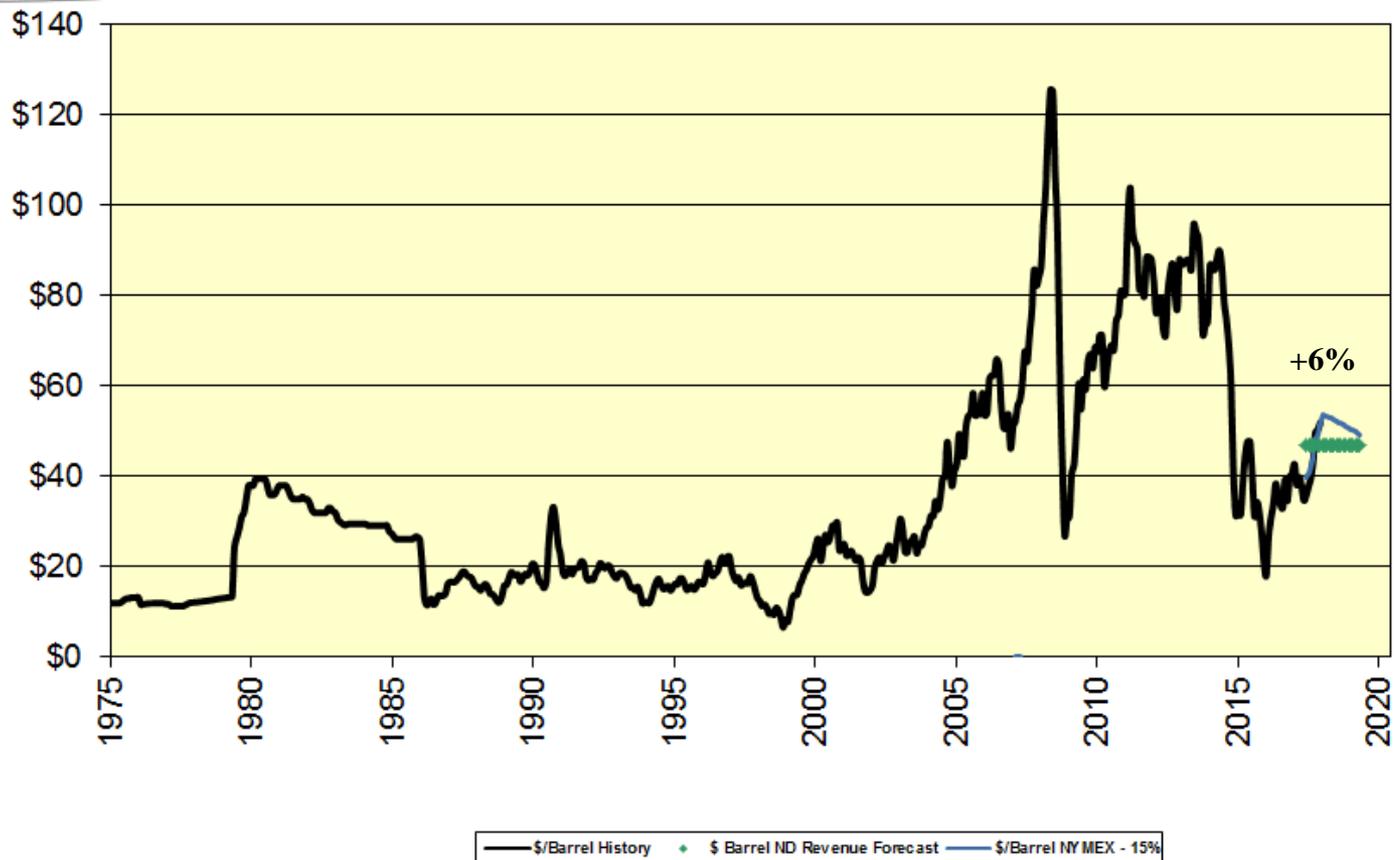


North Dakota Oil Production

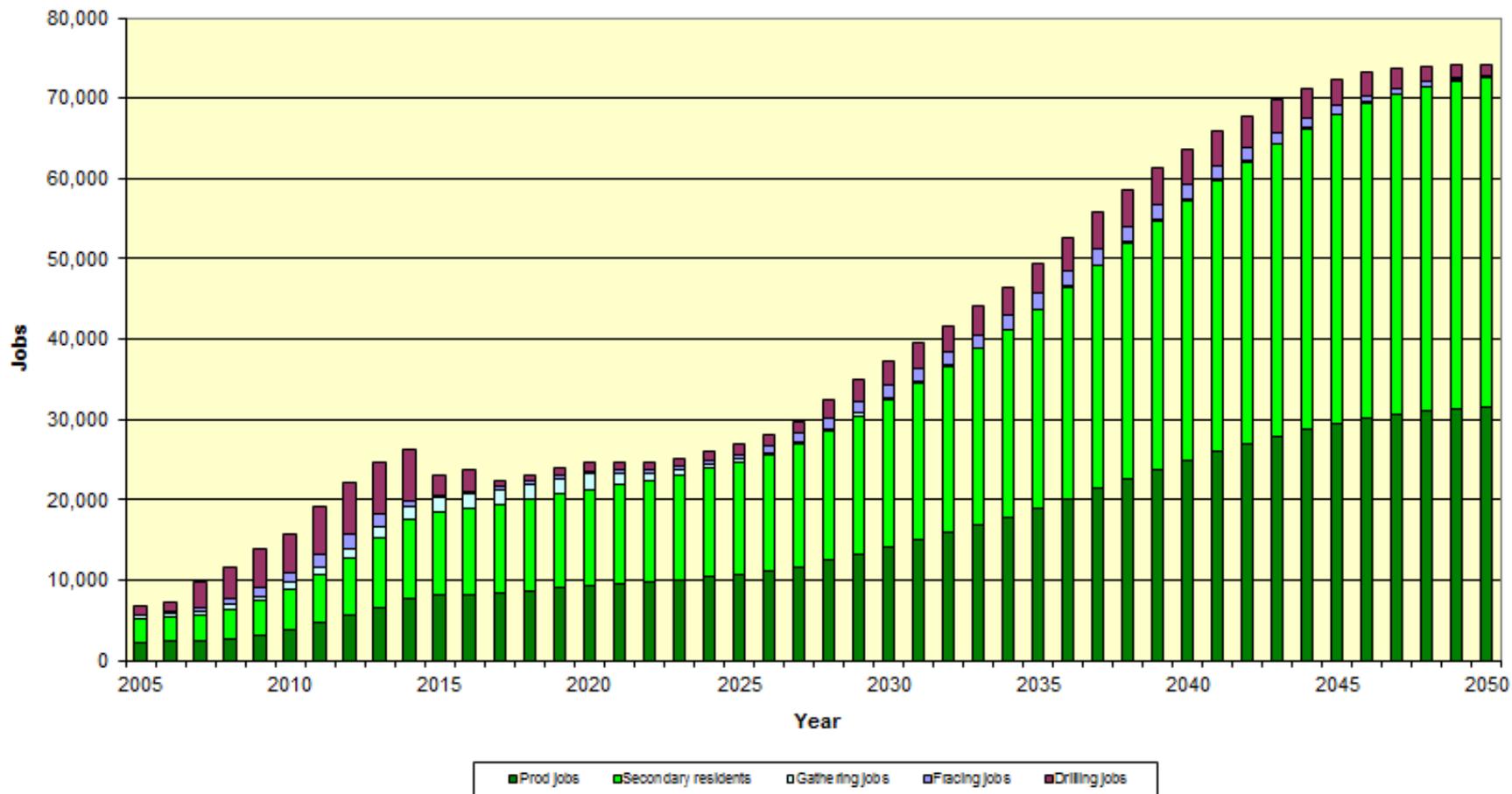




North Dakota Oil Production and Price

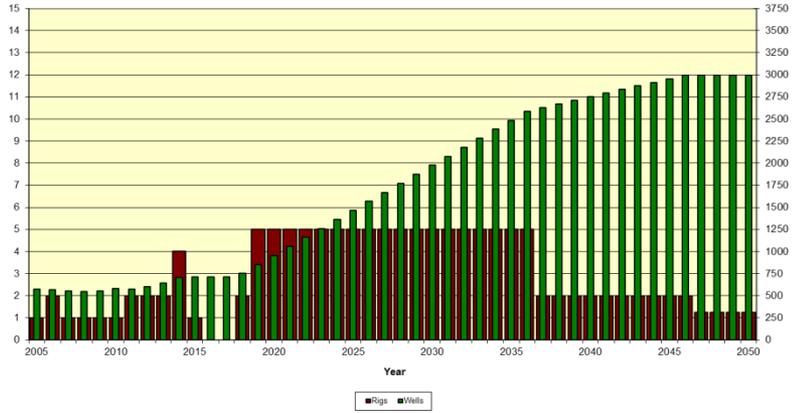


North Central North Dakota

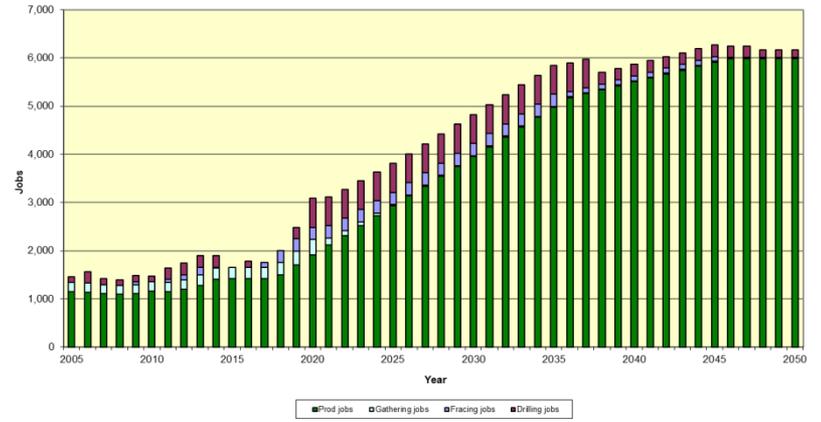


County by County Outlook

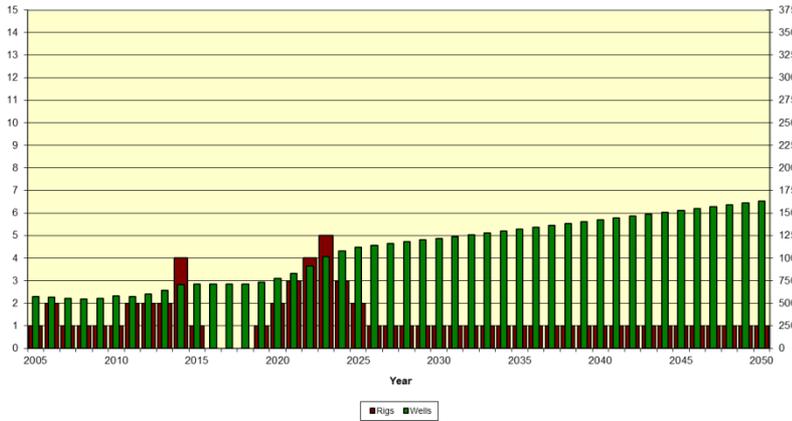
Bottineau Rigs and Wells



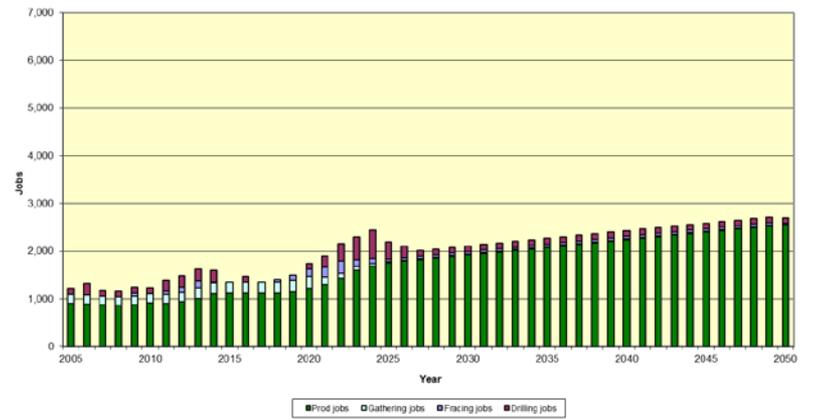
Bottineau Oil Industry Jobs



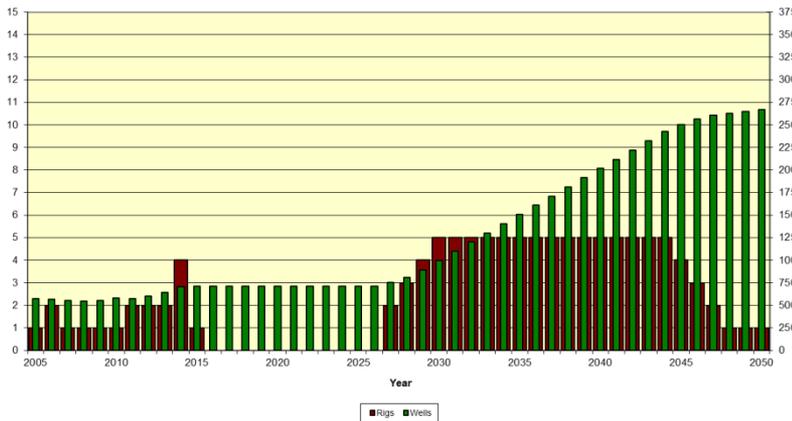
Bottineau Rigs and Wells



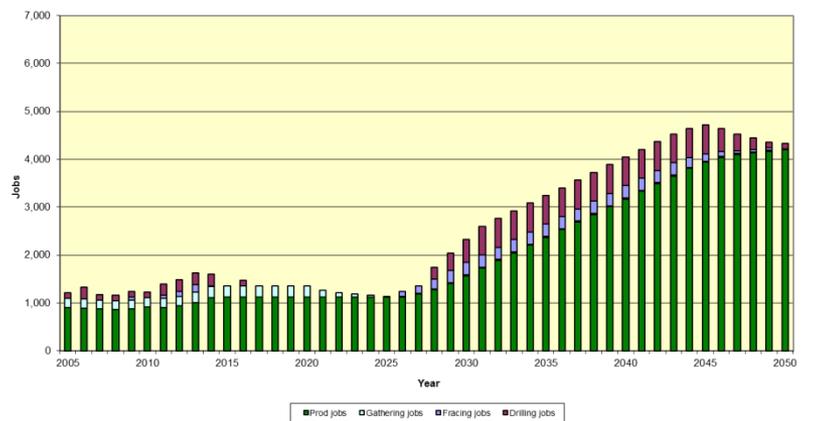
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Bottineau Rigs and Wells

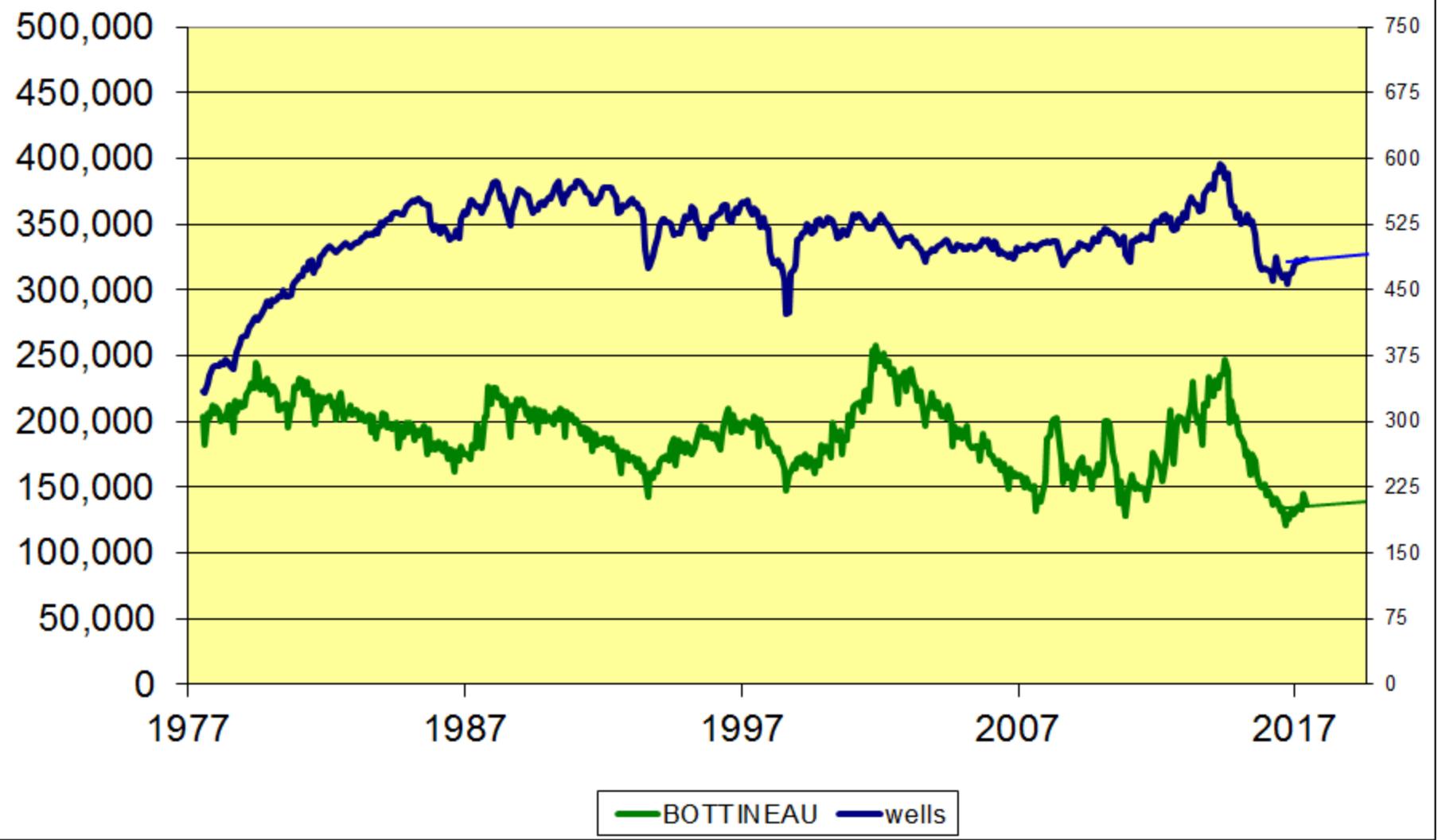


Bottineau Oil Industry Jobs

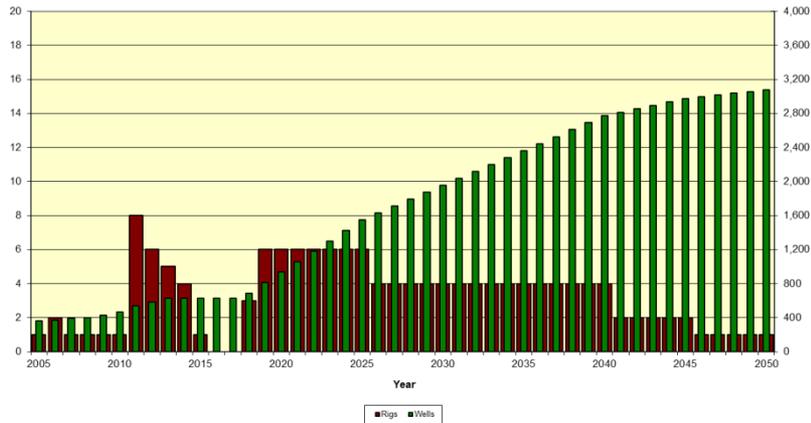




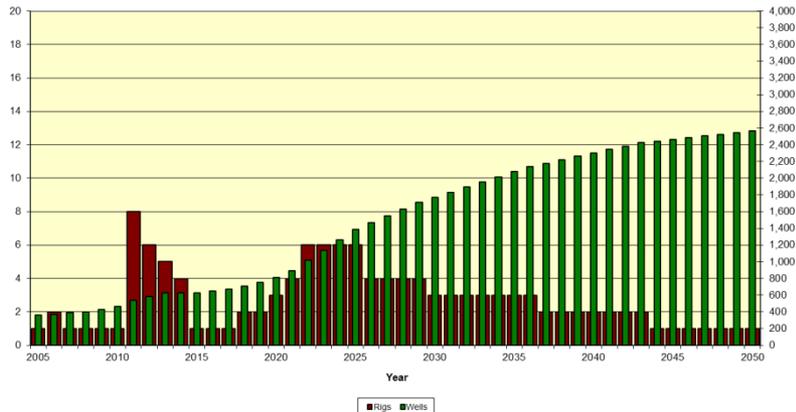
MONTHLY OIL PRODUCTION FOR LOCAL COUNTIES



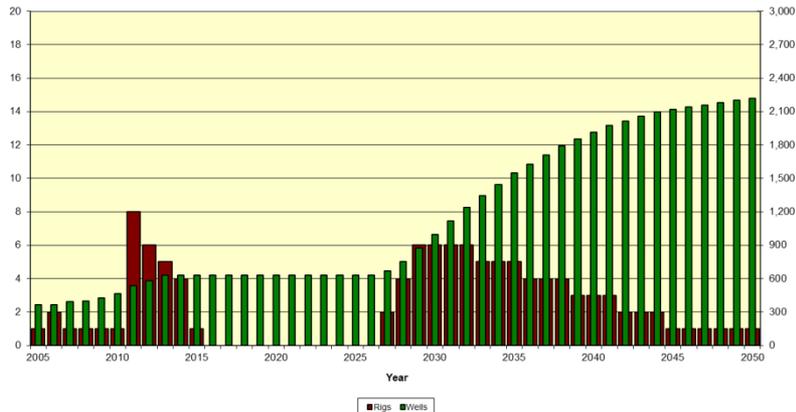
Burke Rigs and Wells



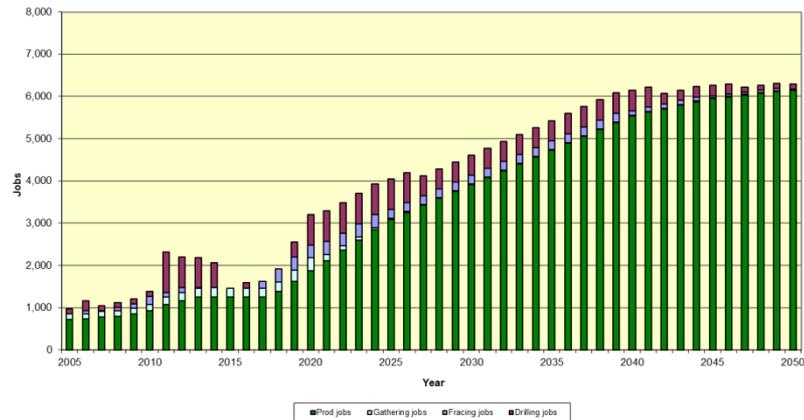
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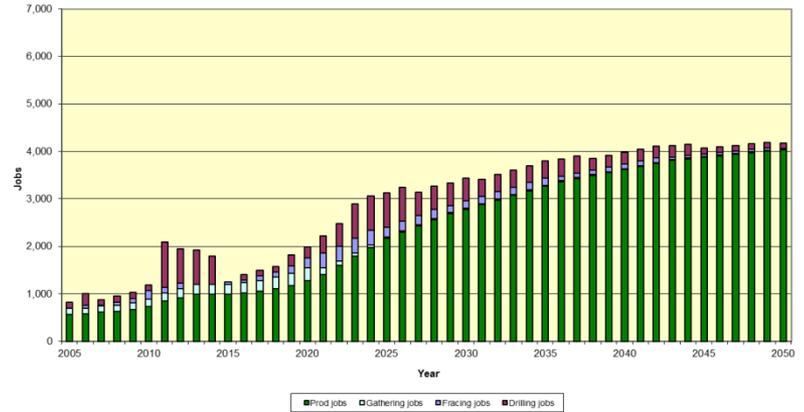
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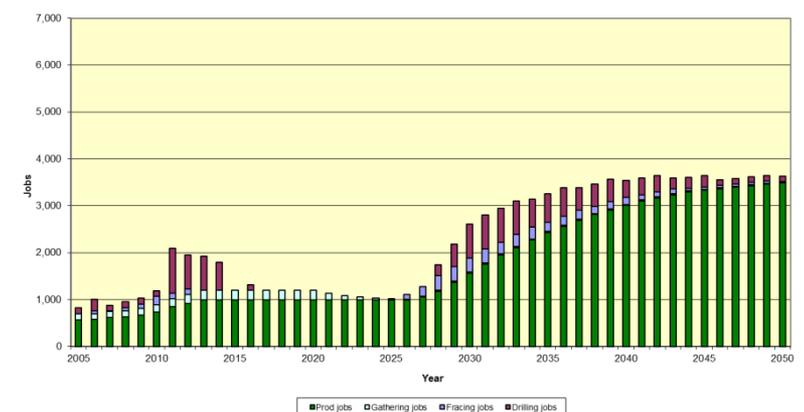
Burke Oil Industry Jobs



Burke Oil Industry Jobs

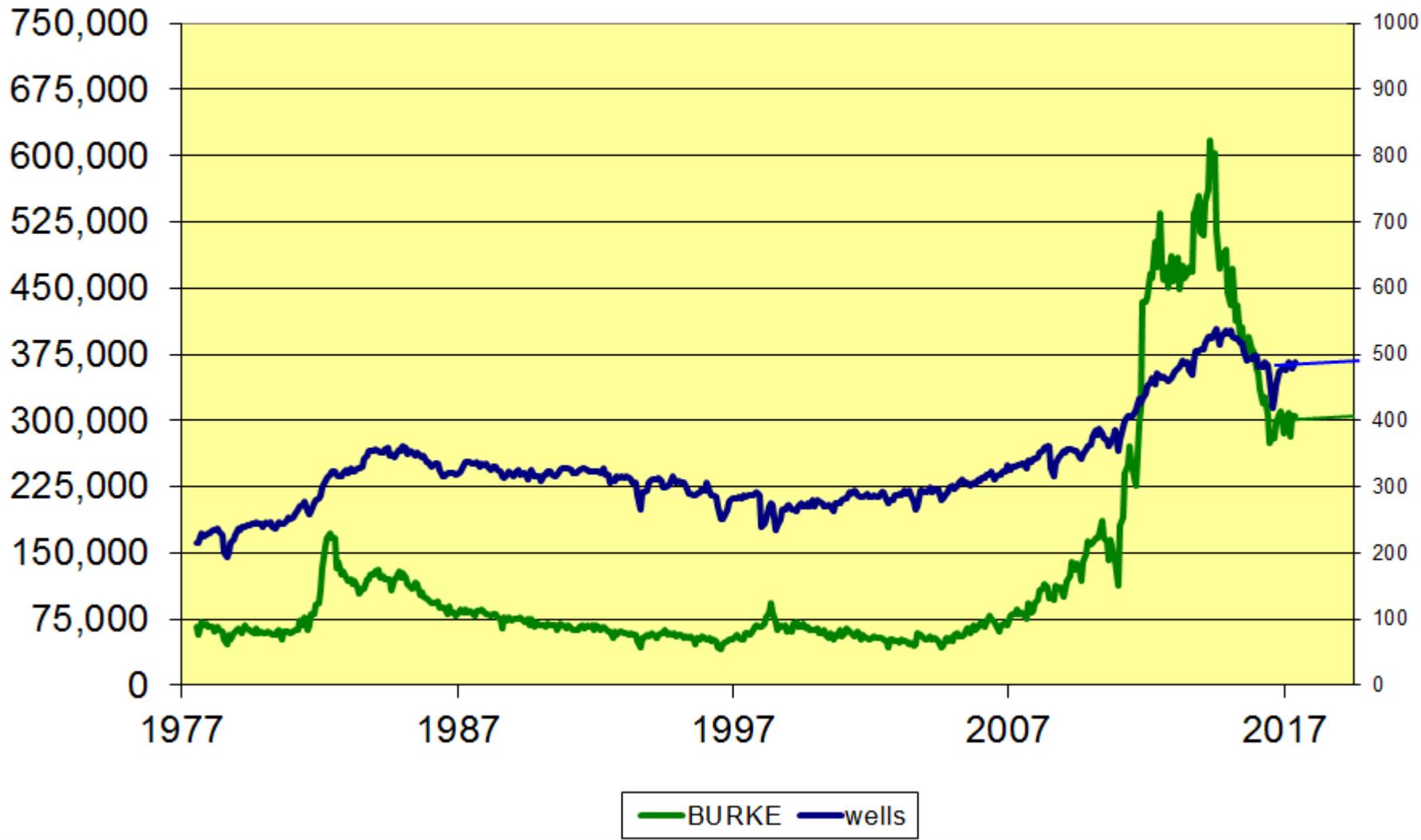


Burke Oil Industry Jobs

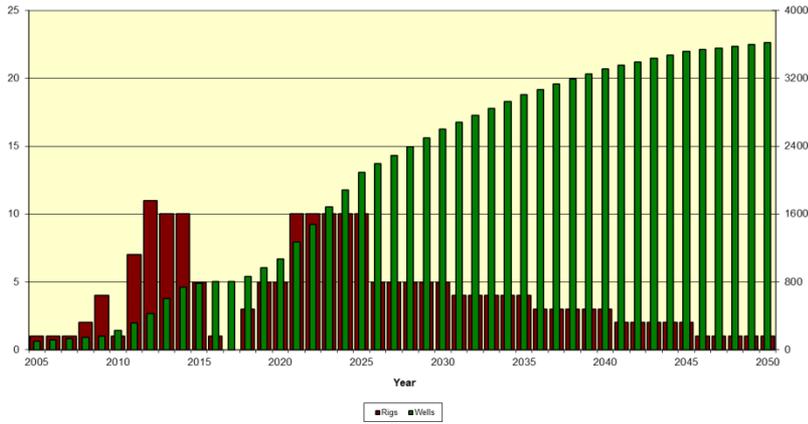




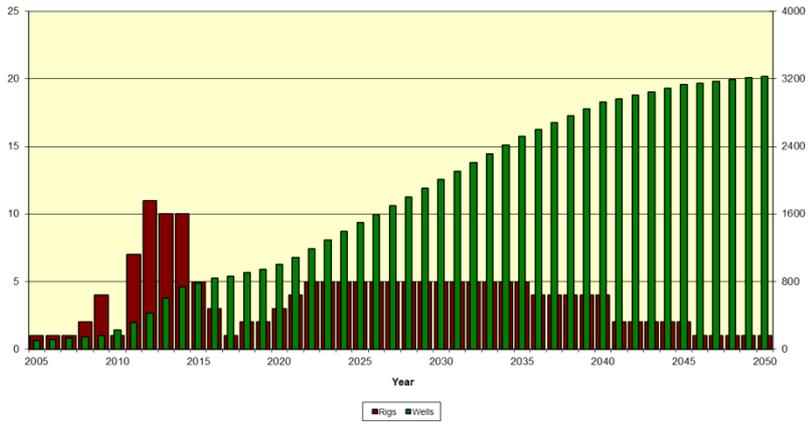
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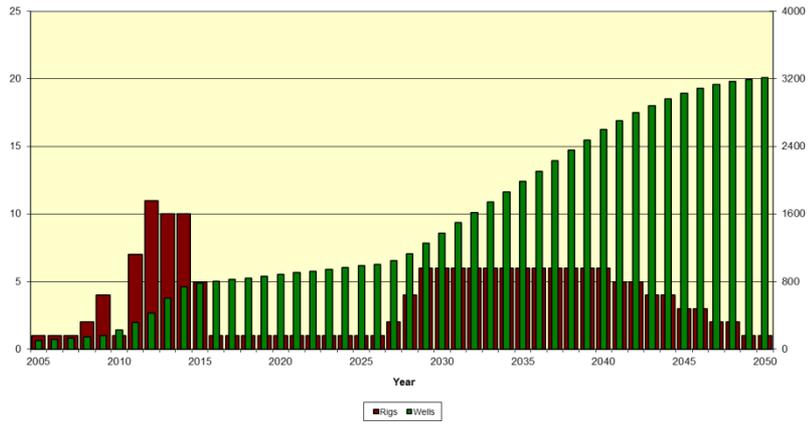
Divide Rigs and Wells



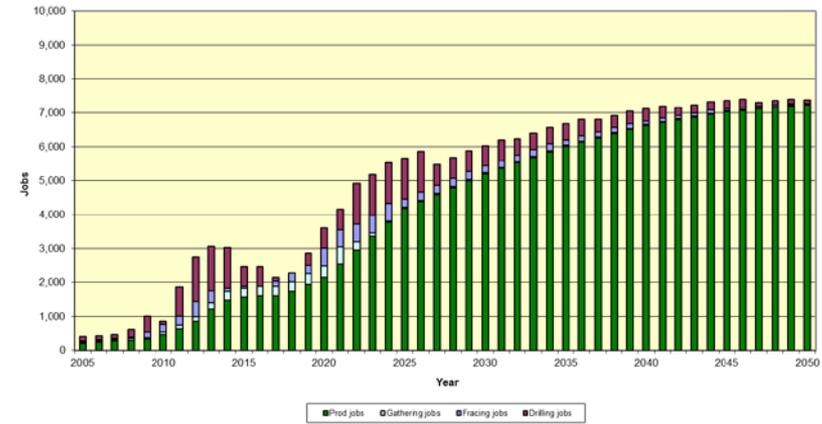
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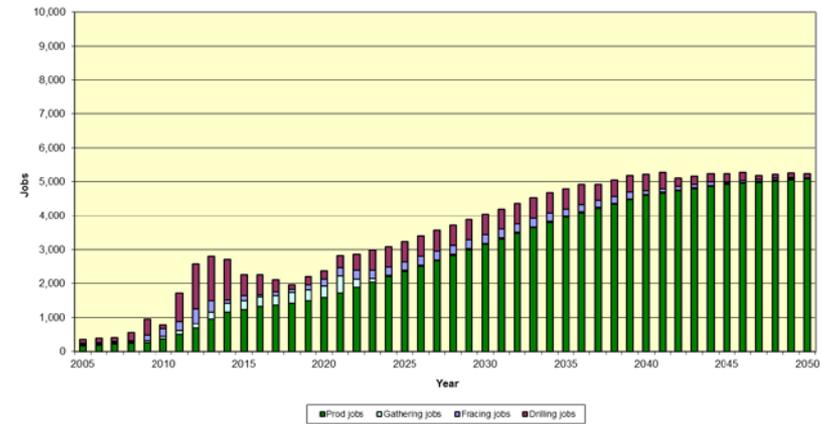
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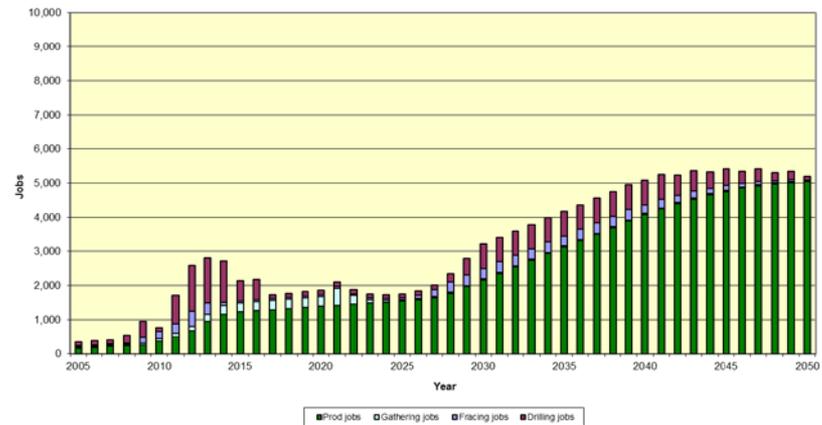
Divide Oil Industry Jobs



Divide Oil Industry Jobs

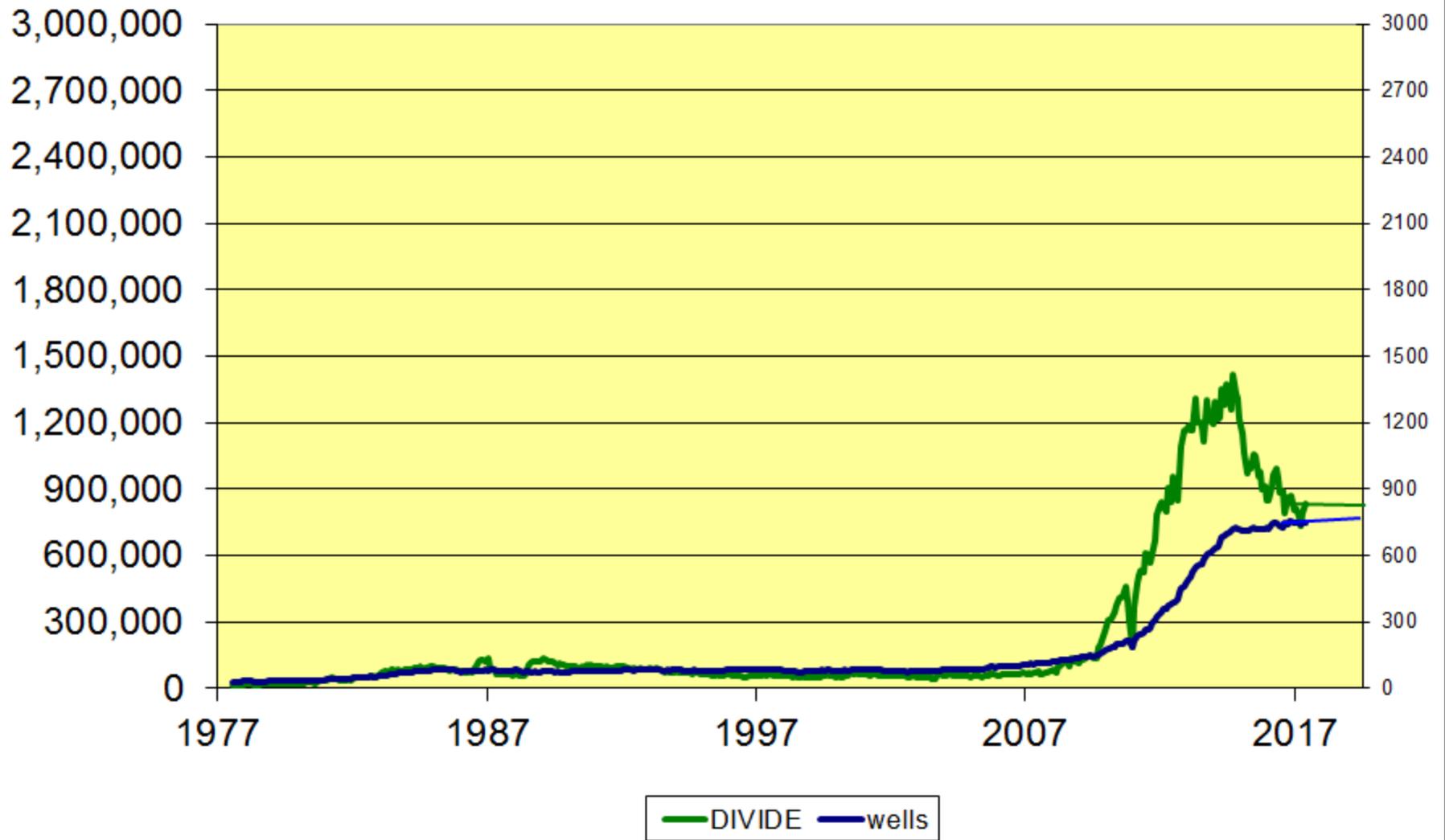


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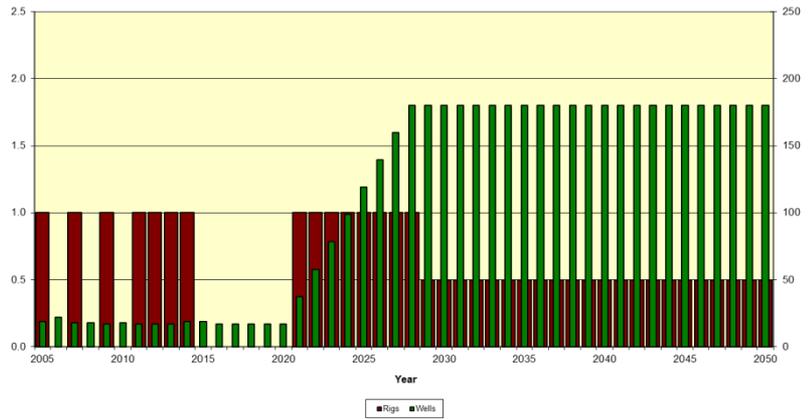




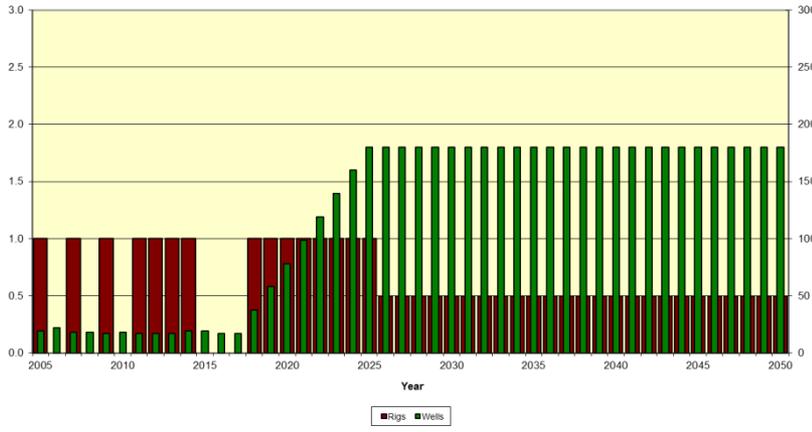
MONTHLY OIL PRODUCTION FOR LOCAL COUNTIES



McHenry Rigs and Wells



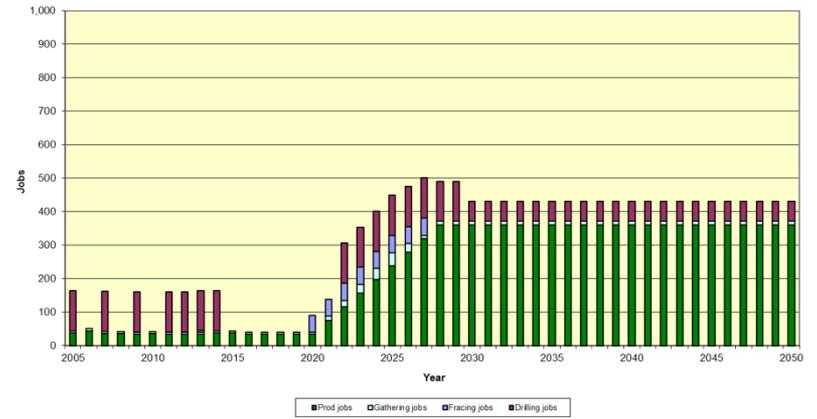
McHenry Rigs and Wells



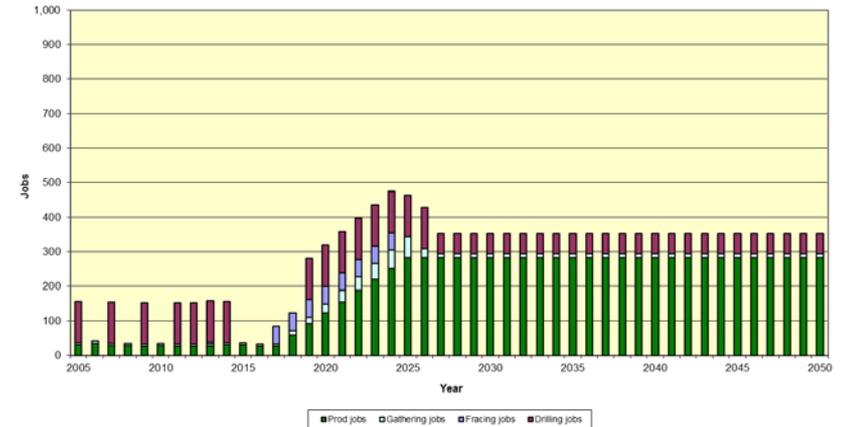
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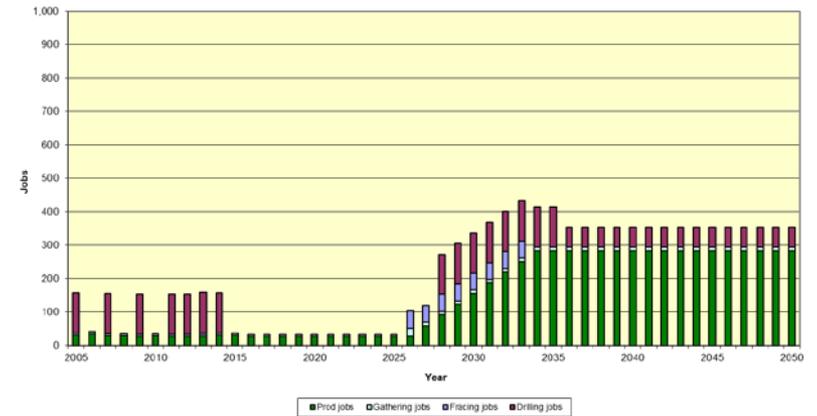
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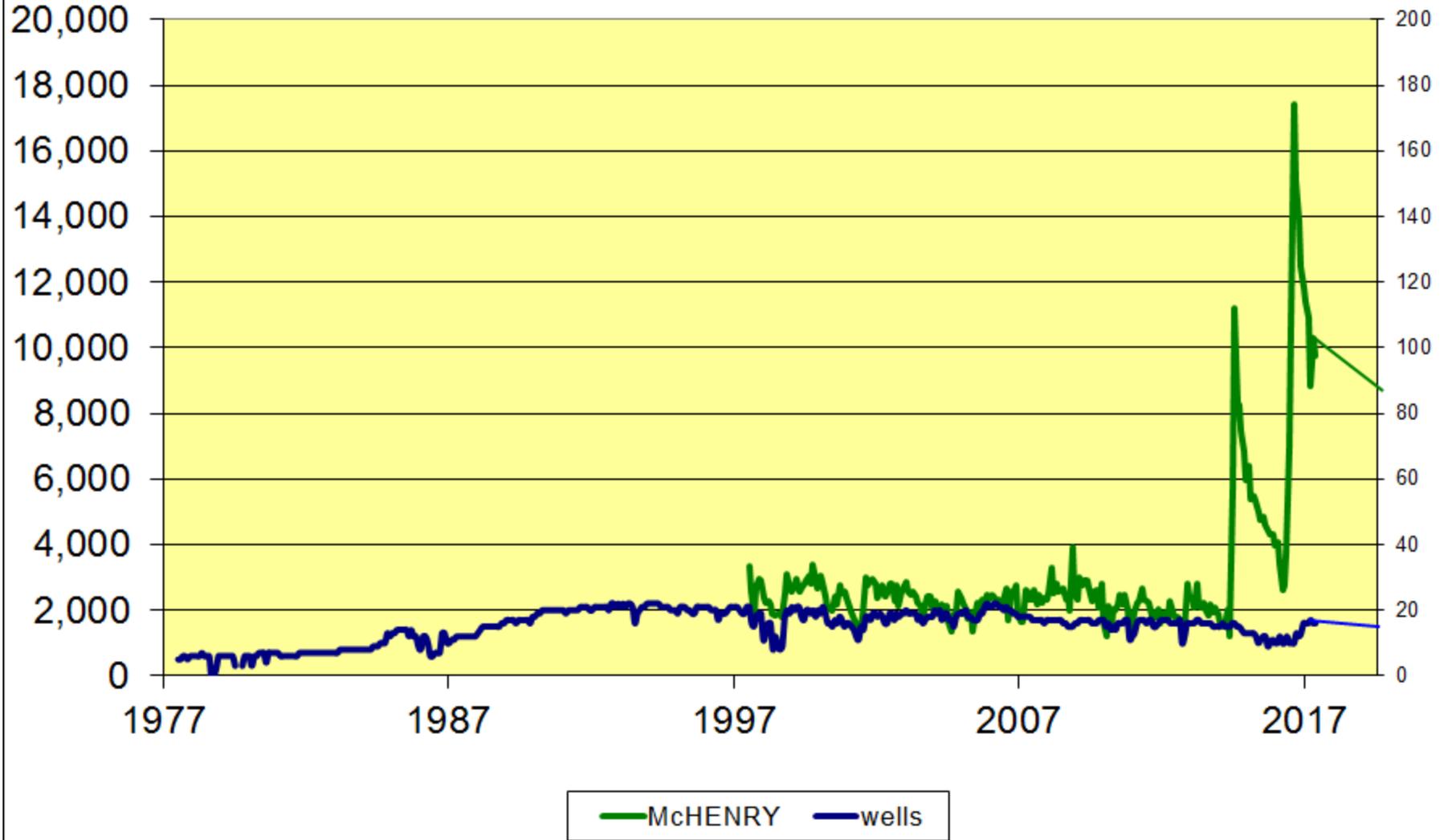


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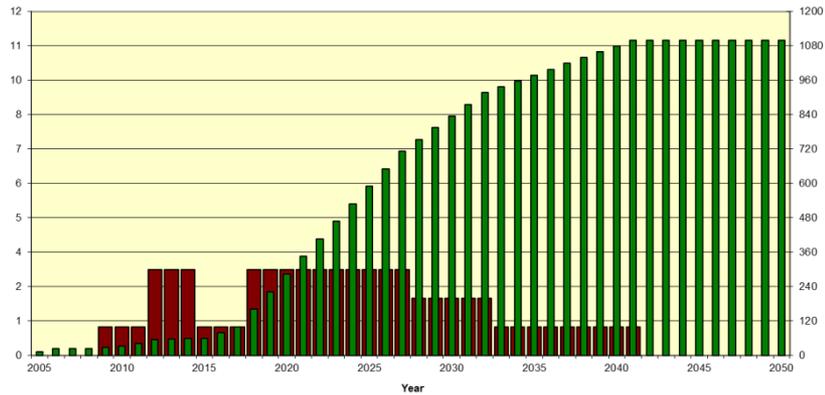




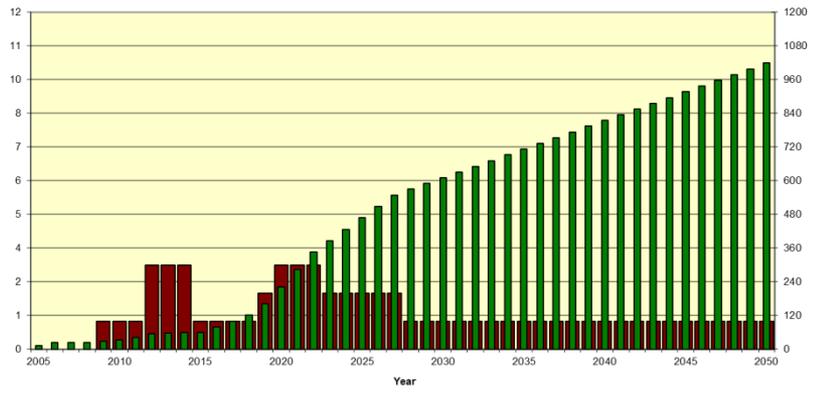
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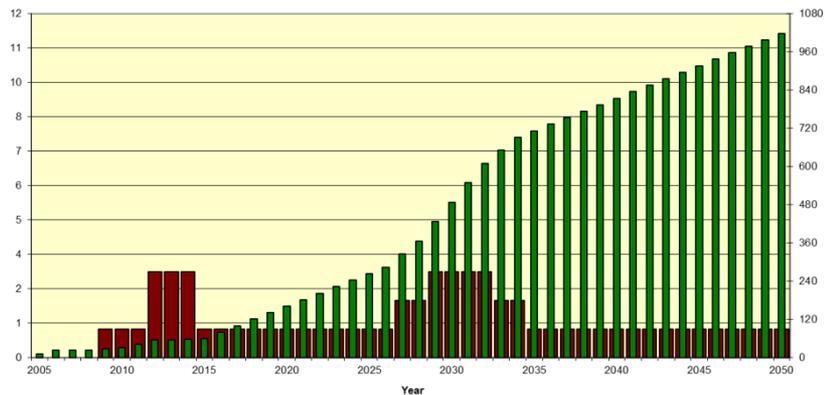
McLean Rigs and Wells



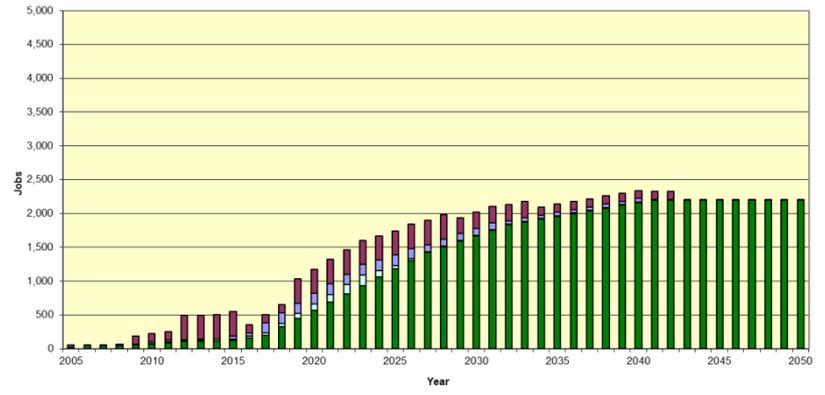
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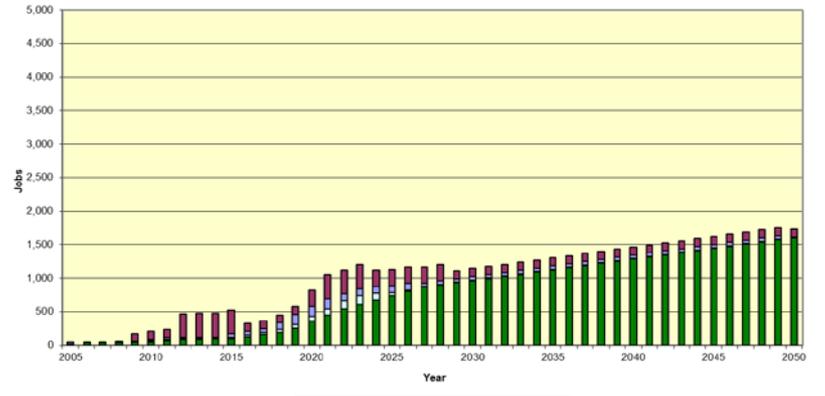
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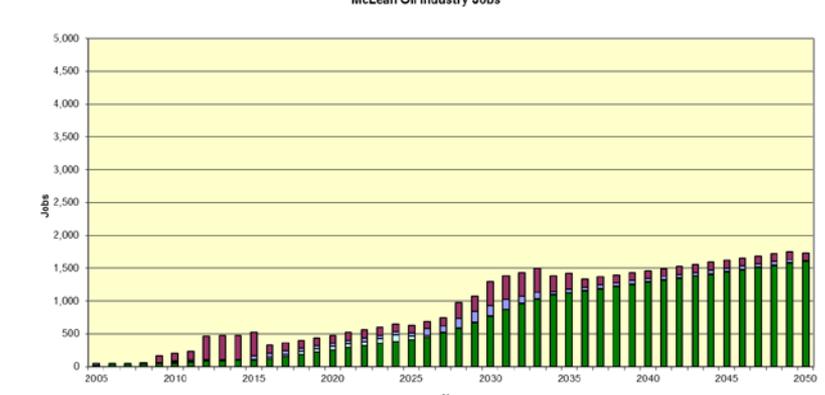
McLean Oil Industry Jobs

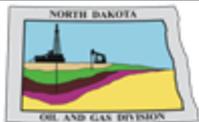


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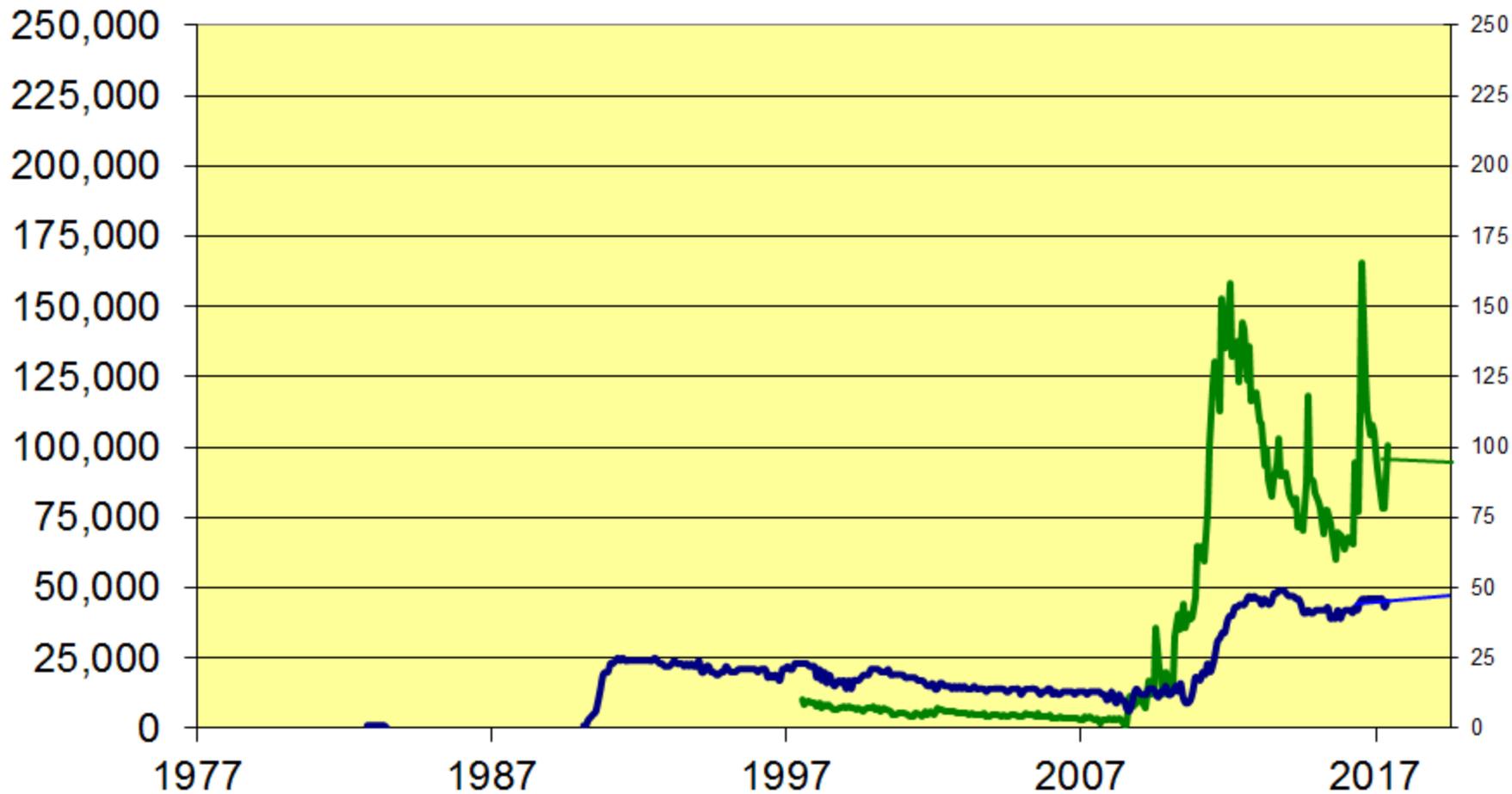


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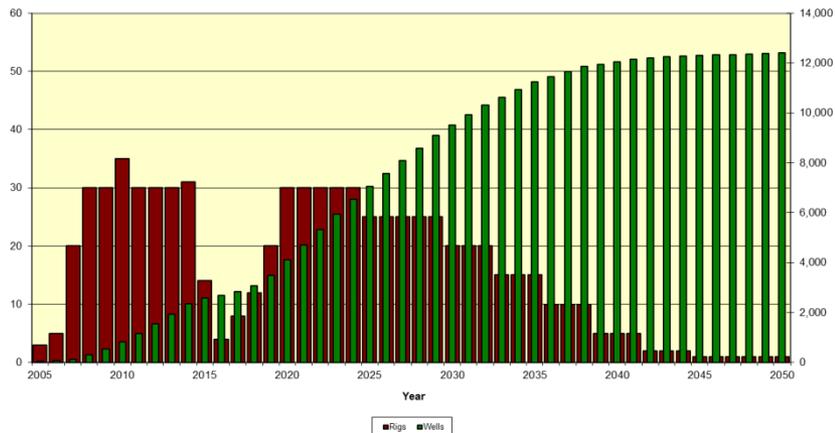


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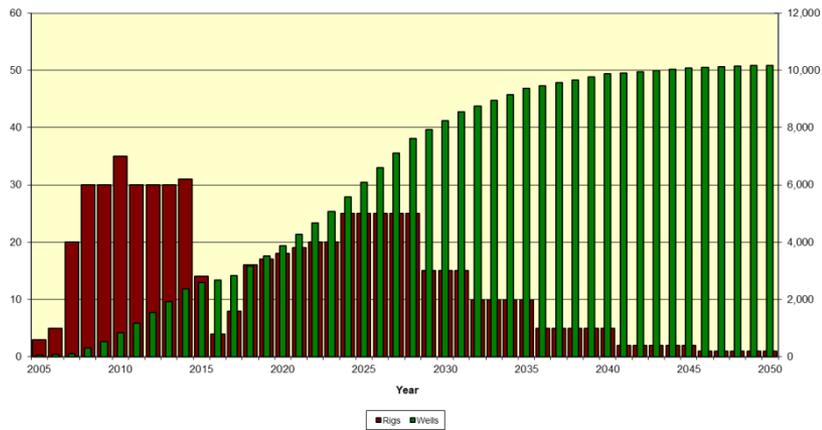


— McLEAN — wells

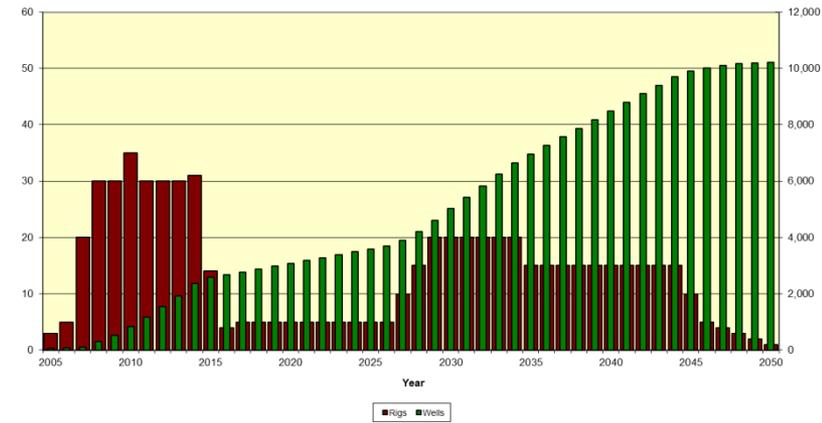
Mountrail Rigs and Wells



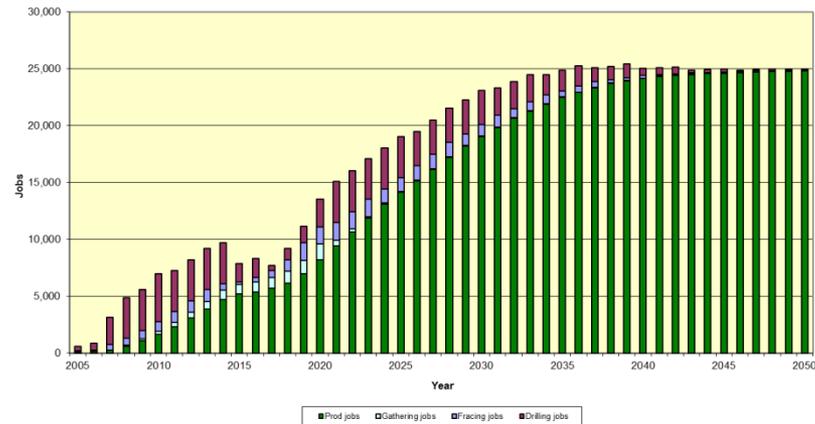
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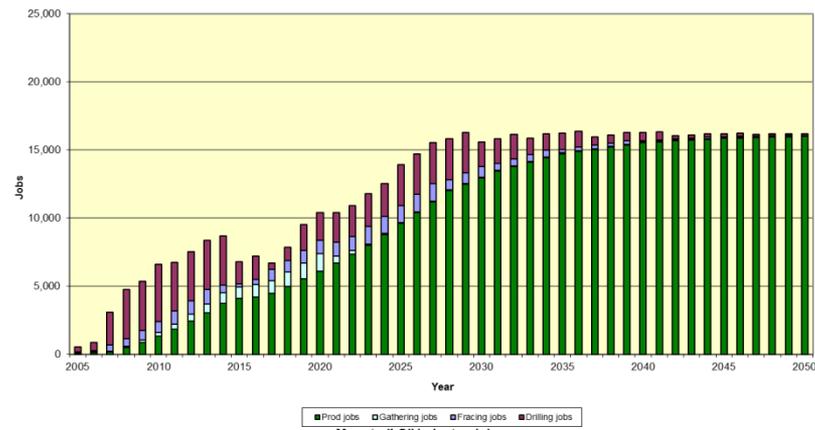
Mountrail Rigs and Wells



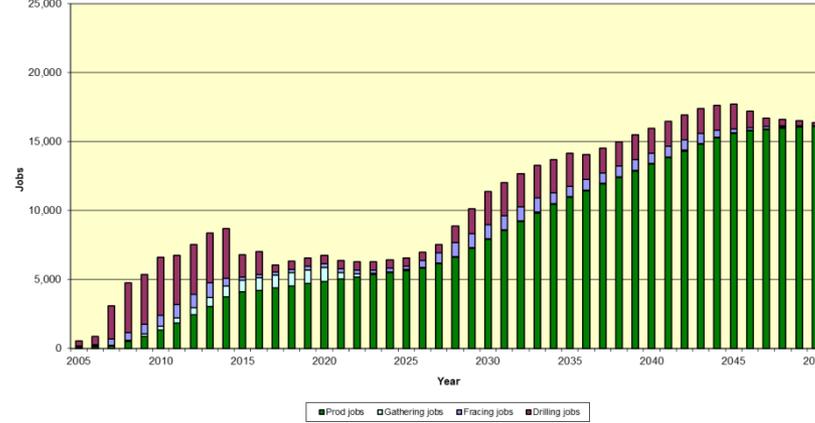
Mountrail Oil Industry Jobs

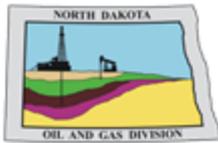


Mountrail Oil Industry Jobs

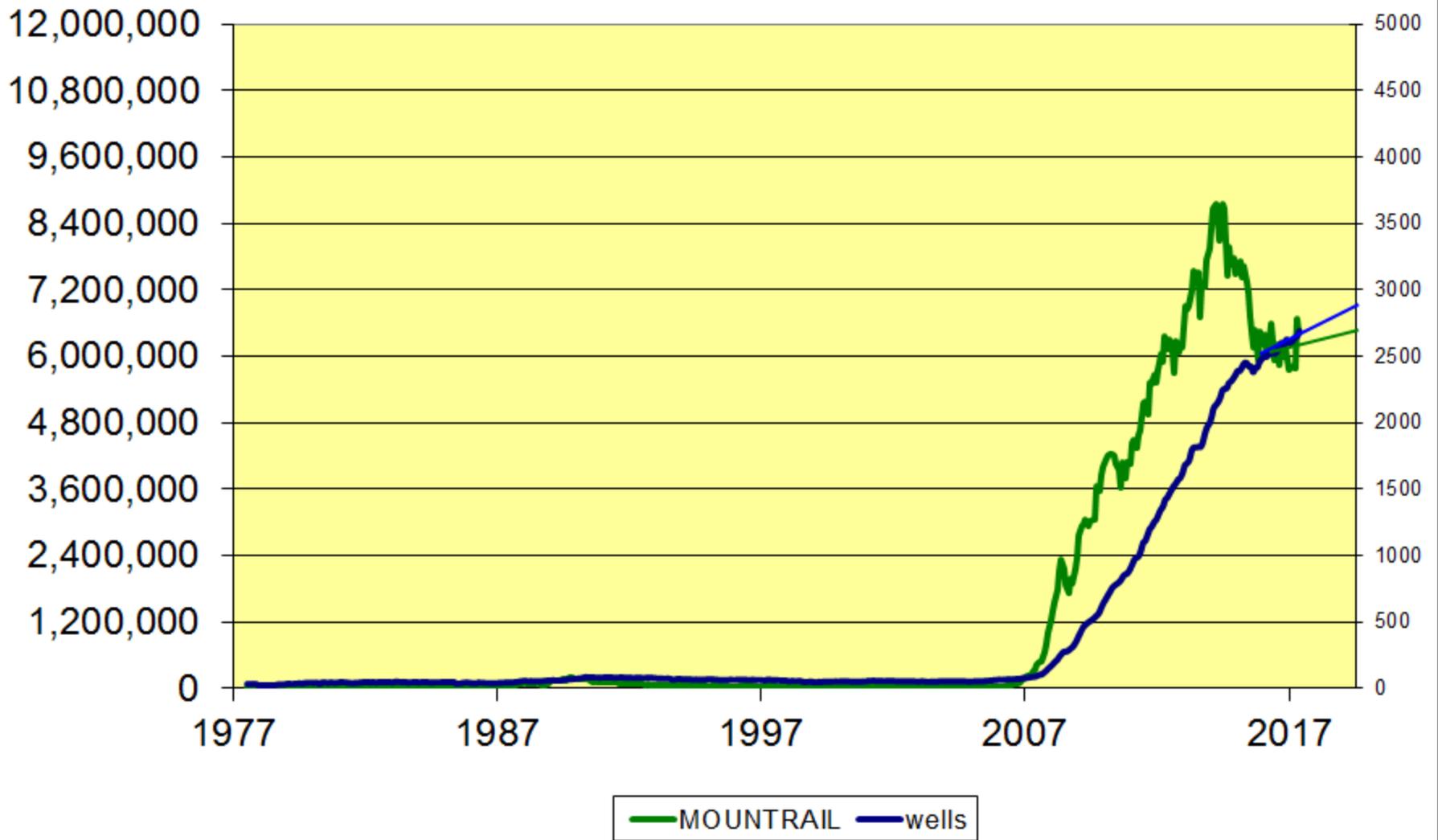


Mountrail Oil Industry Jobs

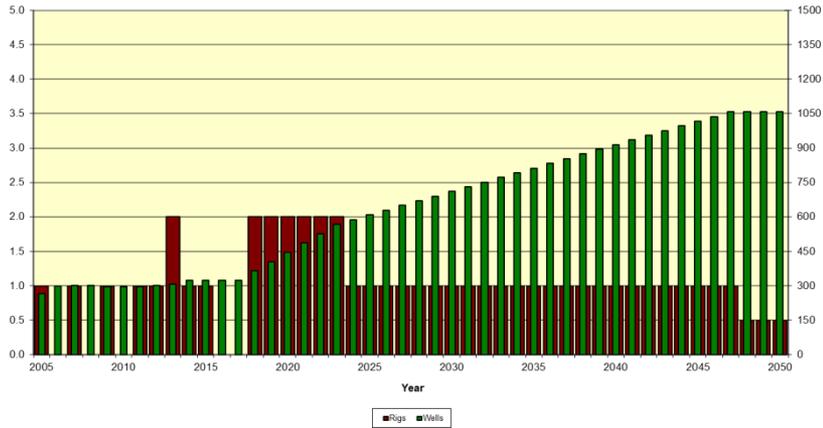




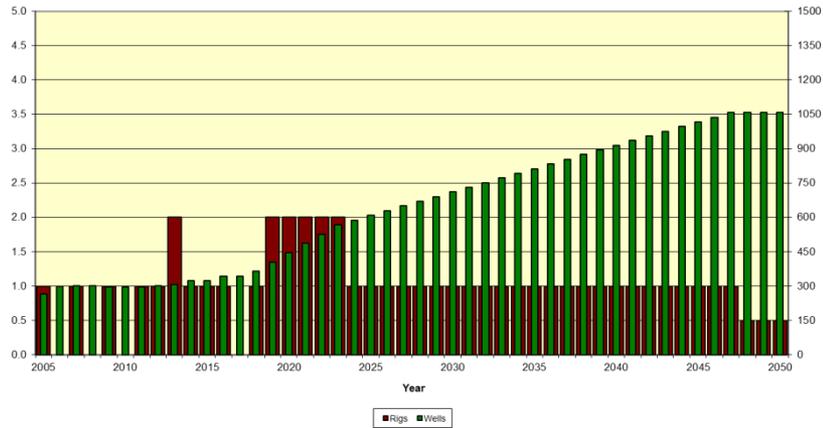
MONTHLY OIL PRODUCTION FOR LOCAL COUNTIES



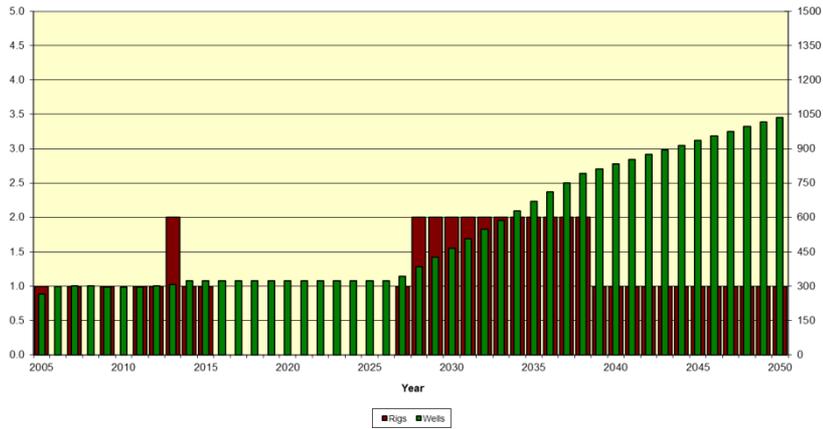
Renville Rigs and Wells



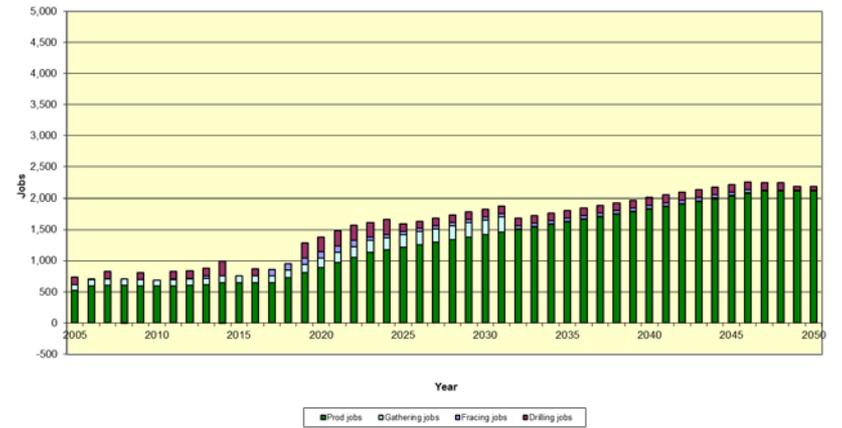
Renville Rigs and Wells



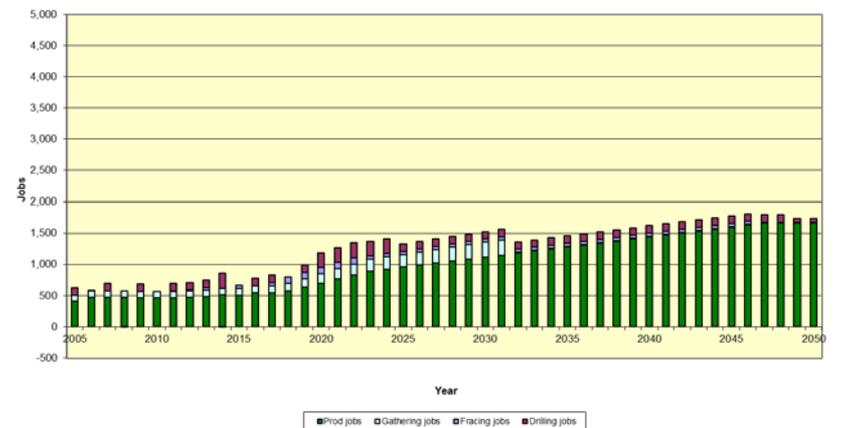
Renville Rigs and Wells



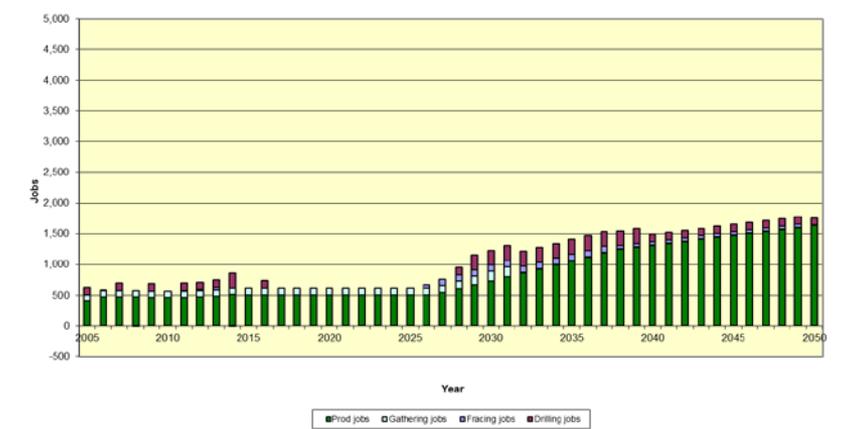
Renville Oil Industry Jobs

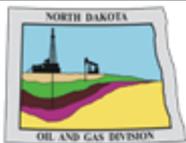


Renville Oil Industry Jobs

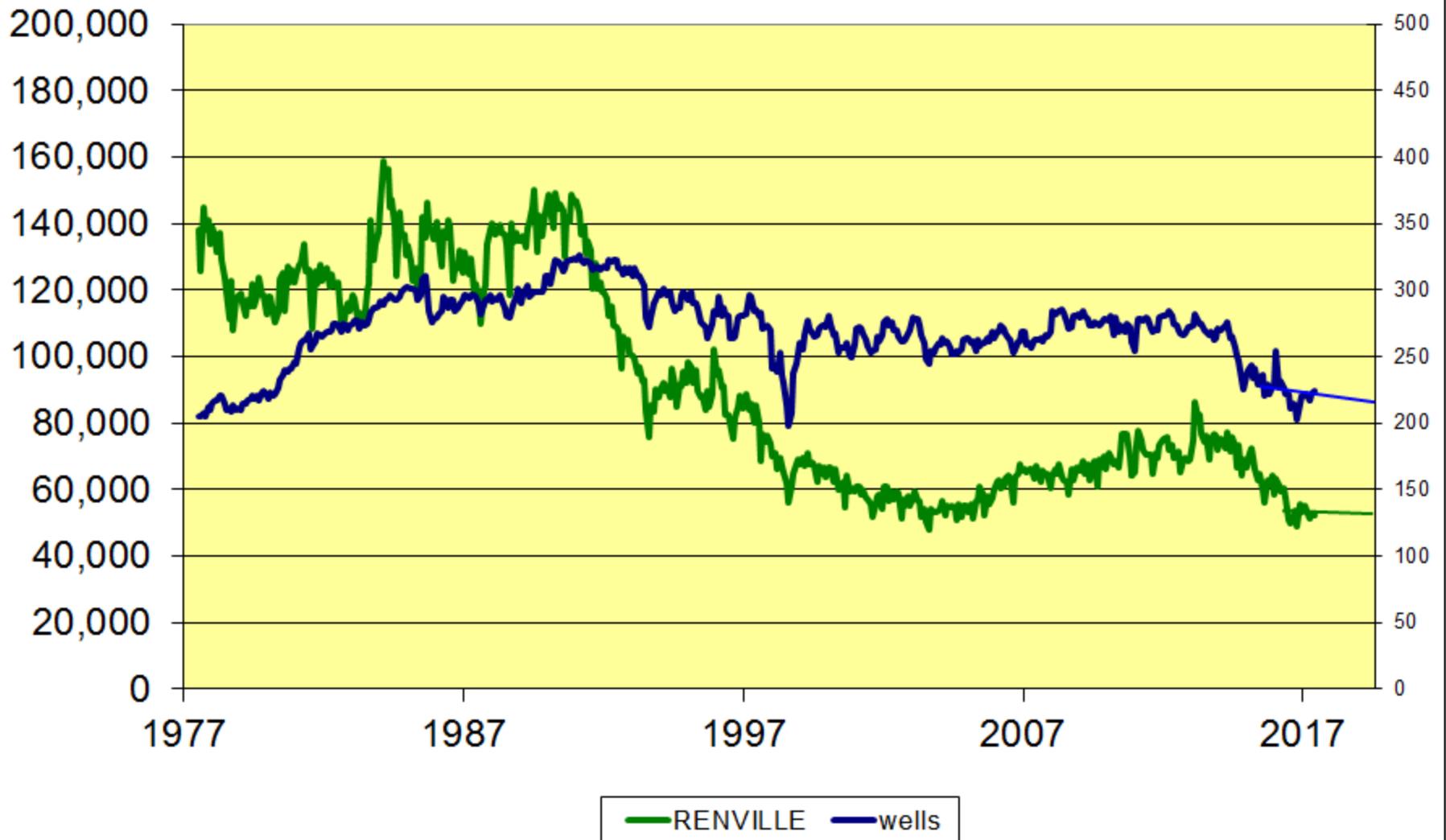


Renville Oil Industry Jobs

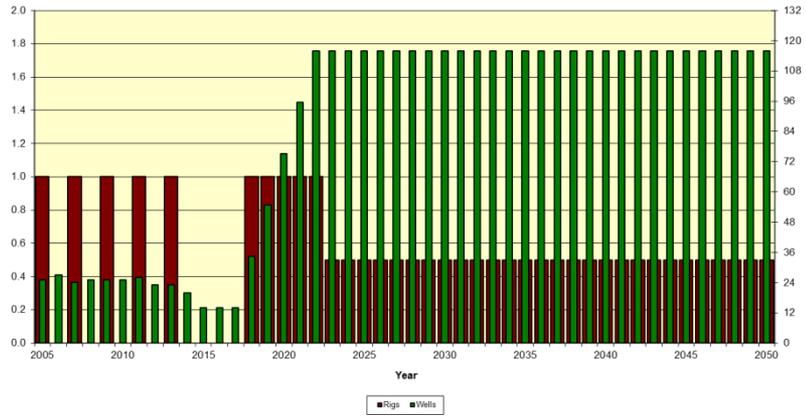




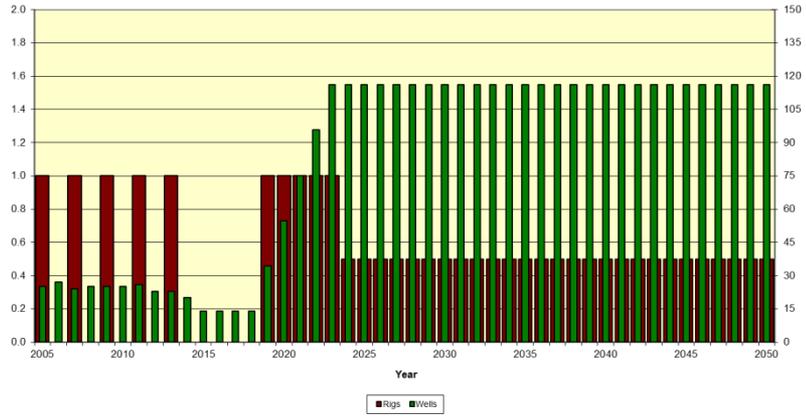
MONTHLY OIL PRODUCTION FOR LOCAL COUNTIES



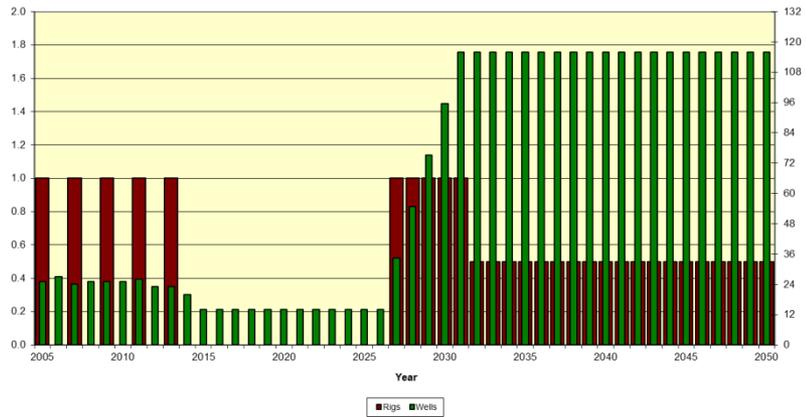
Ward Rigs and Jobs



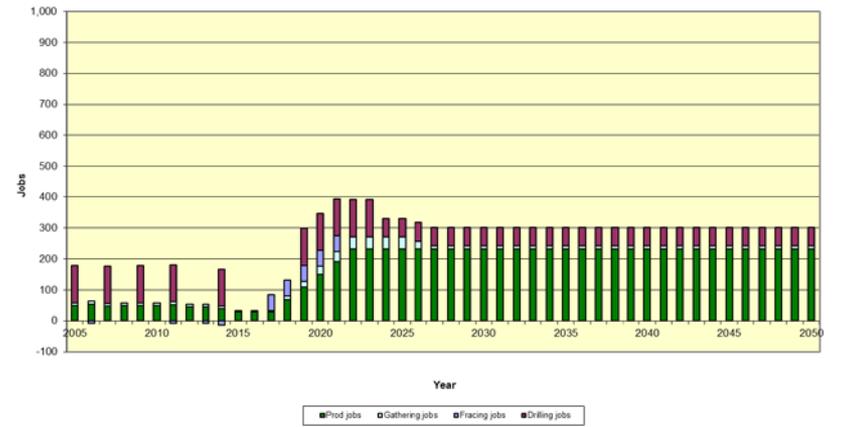
Ward Rigs and Jobs



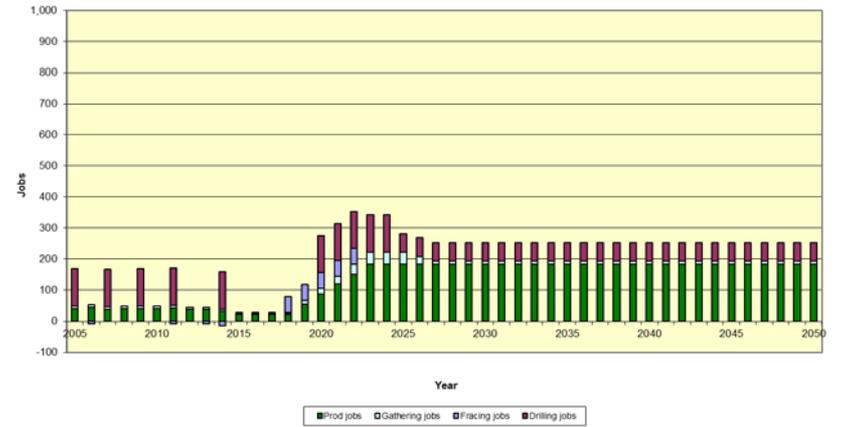
Ward Rigs and Jobs



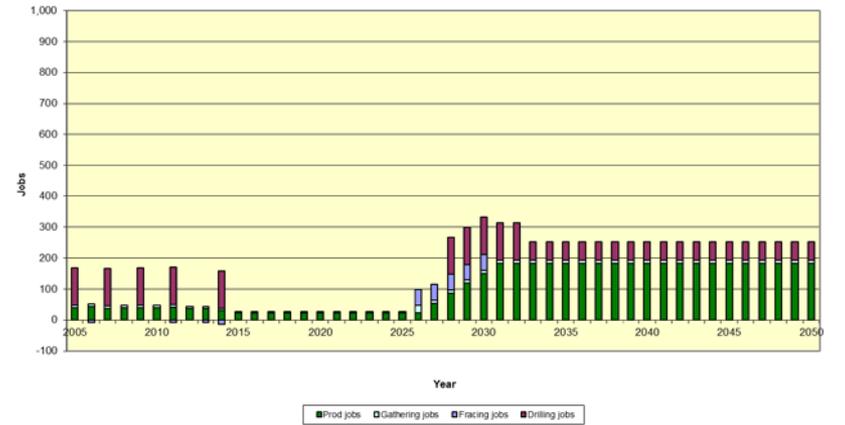
Ward Oil Industry Jobs

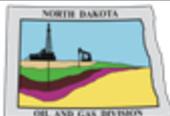


Ward Oil Industry Jobs

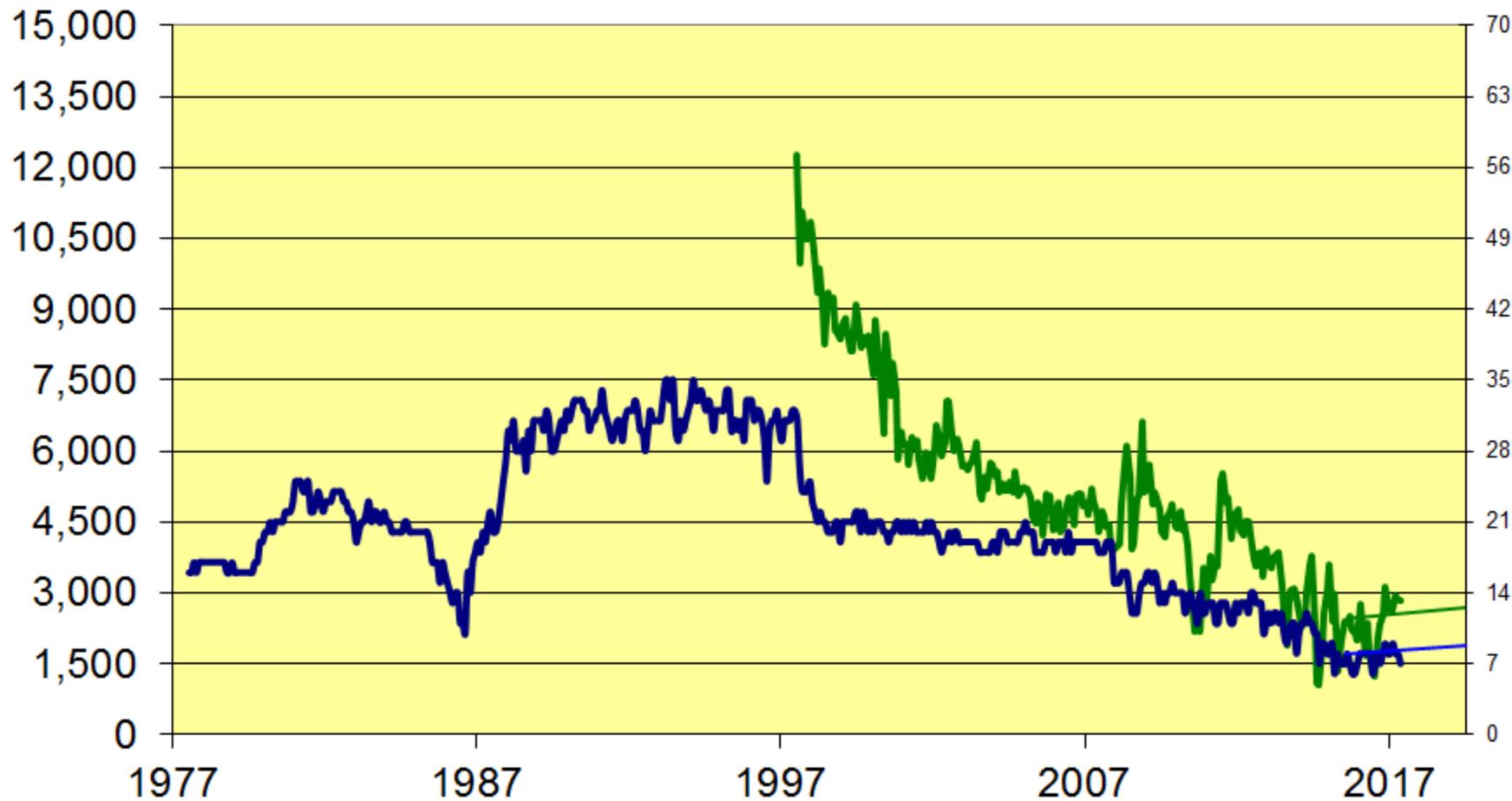


Ward Oil Industry Jobs



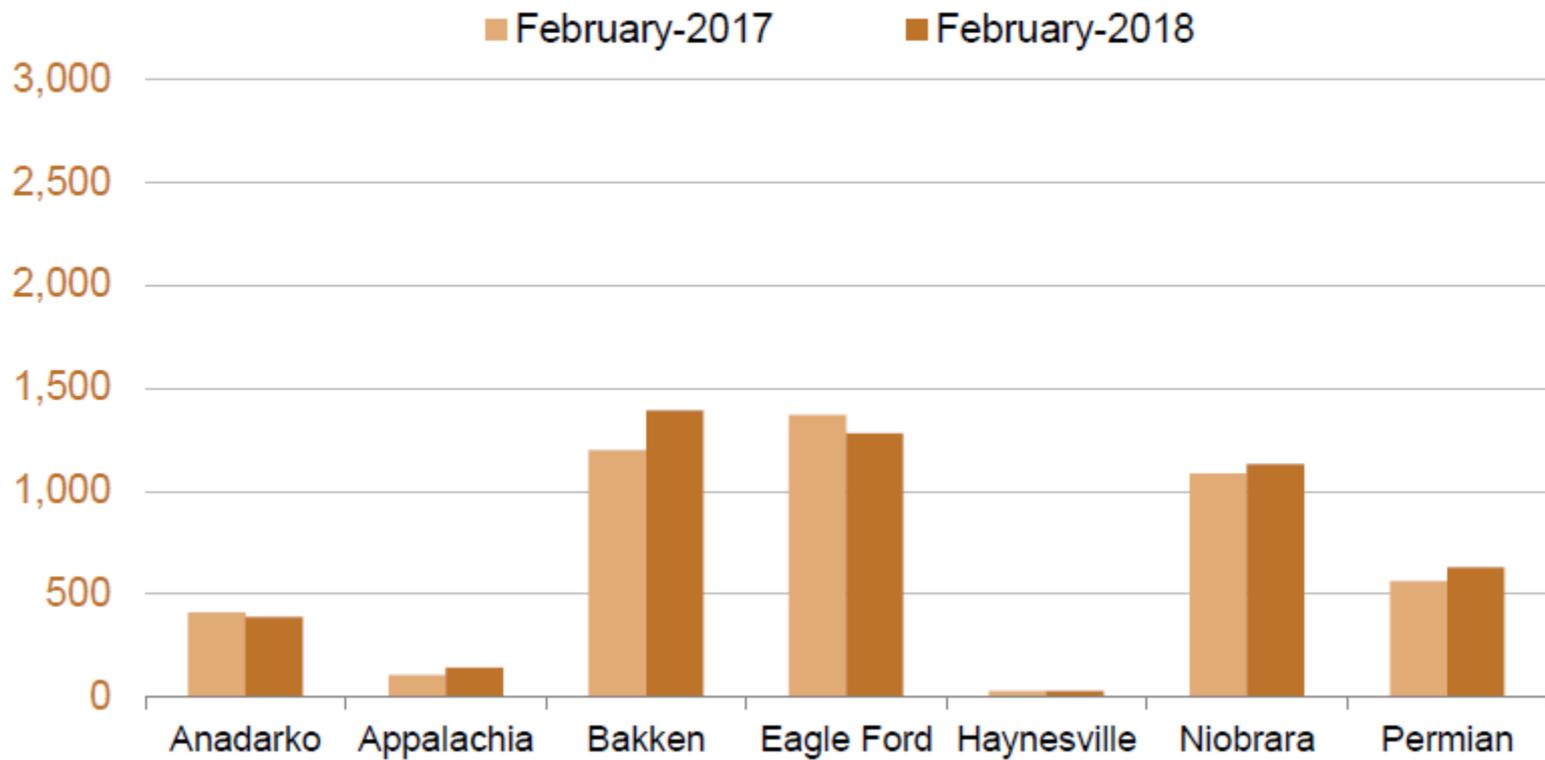


MONTHLY OIL PRODUCTION FOR LOCAL COUNTIES

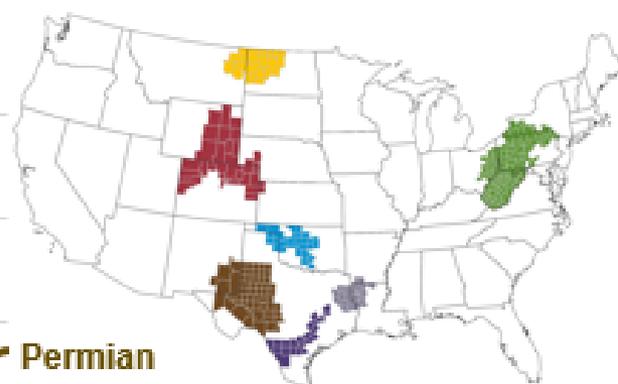
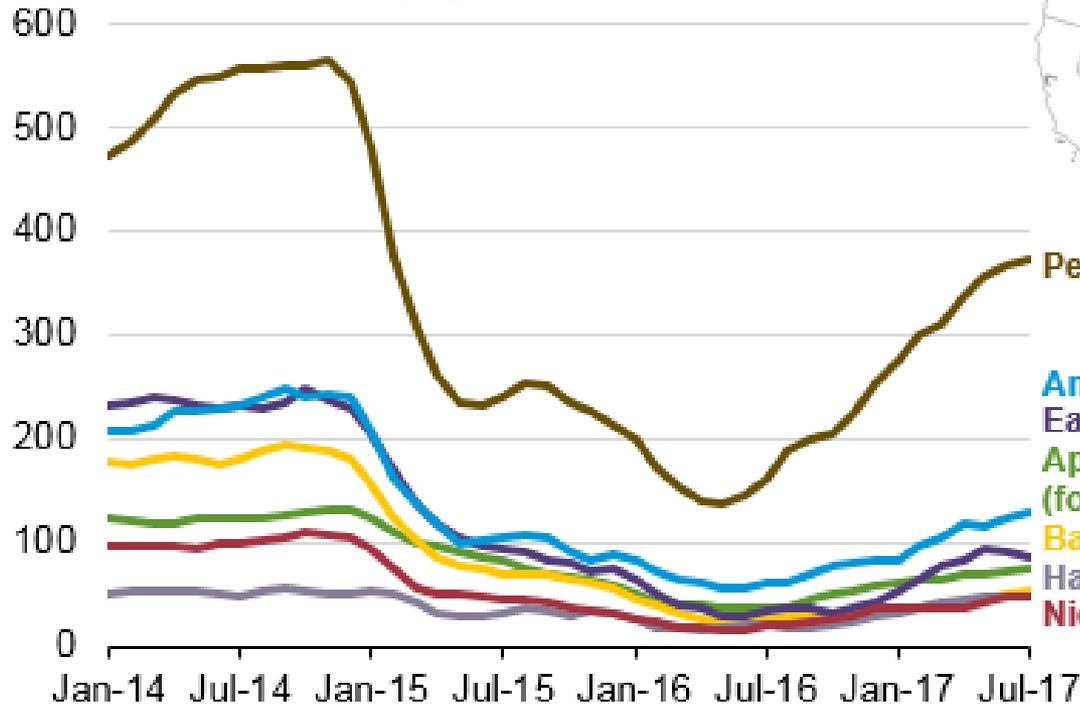


— WARD — wells

New-well oil production per rig barrels/day



Rig count in EIA's Drilling Productivity Report regions
number of active drilling rigs



Taxes

- Permian – 3.75% to 7.5%
- Anadarko – 7%
- Eagle Ford – 7.5%
- Appalachia – 0.2%
- Bakken – 10%
- Haynesville – 5% to 7.5%
- Niobrara – 3% to 6%

Federal & Tribal Lands

- Permian – <2%
- Anadarko – <2%
- Eagle Ford – <2%
- Appalachia – <2%
- Bakken – 9% to 30%
- Haynesville – 2% to 9%
- Niobrara – 36% to 48%

17 Potential unconventional oil resource Source Rock formations

- | | |
|----------------|------------------|
| Spearfish 1 | Charles 2 |
| Tyler 1 | Mission Canyon 2 |
| Lodgepole 1 | Bakken 2 |
| Birdbear 1 | Duperow 1 |
| Winnipegosis 1 | Stony Mountain 1 |
| Red River 2 | Winnipeg 1 |
| Deadwood 1 | |

Steps to obtain a Fort Berthold Right of Way (non-sequential)

Obtain permission to survey from landowners and allottees

Survey and stake route

Conduct Onsite with BLM, BIA, Tribe, Landowners, Surveyors

If approved, submit appropriate NEPA information and obtain FONSI from BIA

If there are Tribal mineral interests in any portion, present to the MHA Natural Resources Committee

If approved, present to the MHA Tribal Business Council

If approved, present to MHA Chairman for signature

Concurrently obtain consents from owners possibly associated with each allotted tract

Typically 50 to 100 owners with small fractional interests

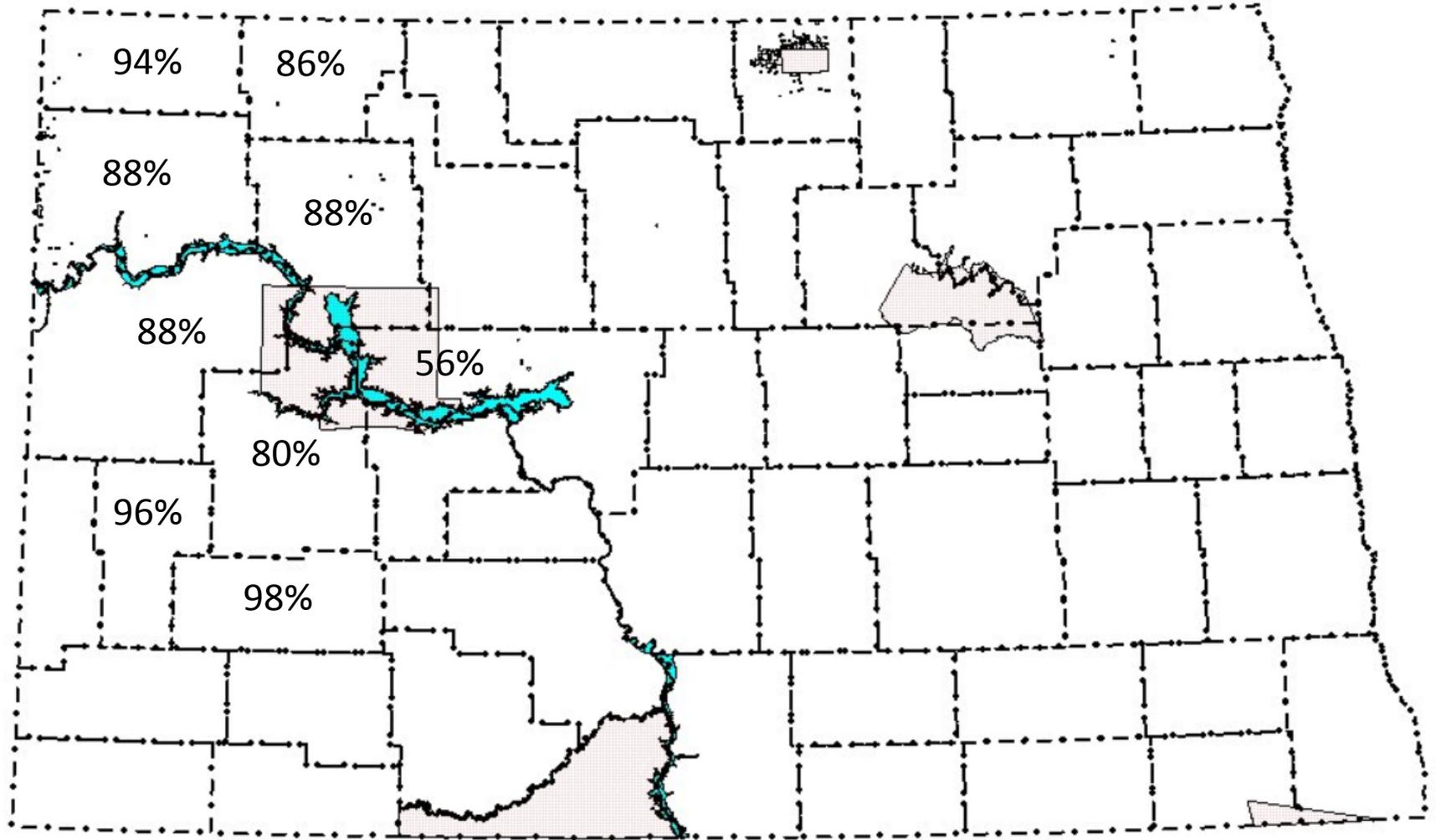
51% of ownership must approve to gain a right-of-way.

Submit all paperwork to BIA for approval

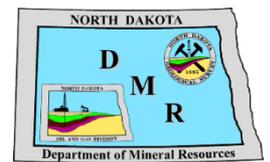
Approximate timeline - undetermined (due to unexpected problems)

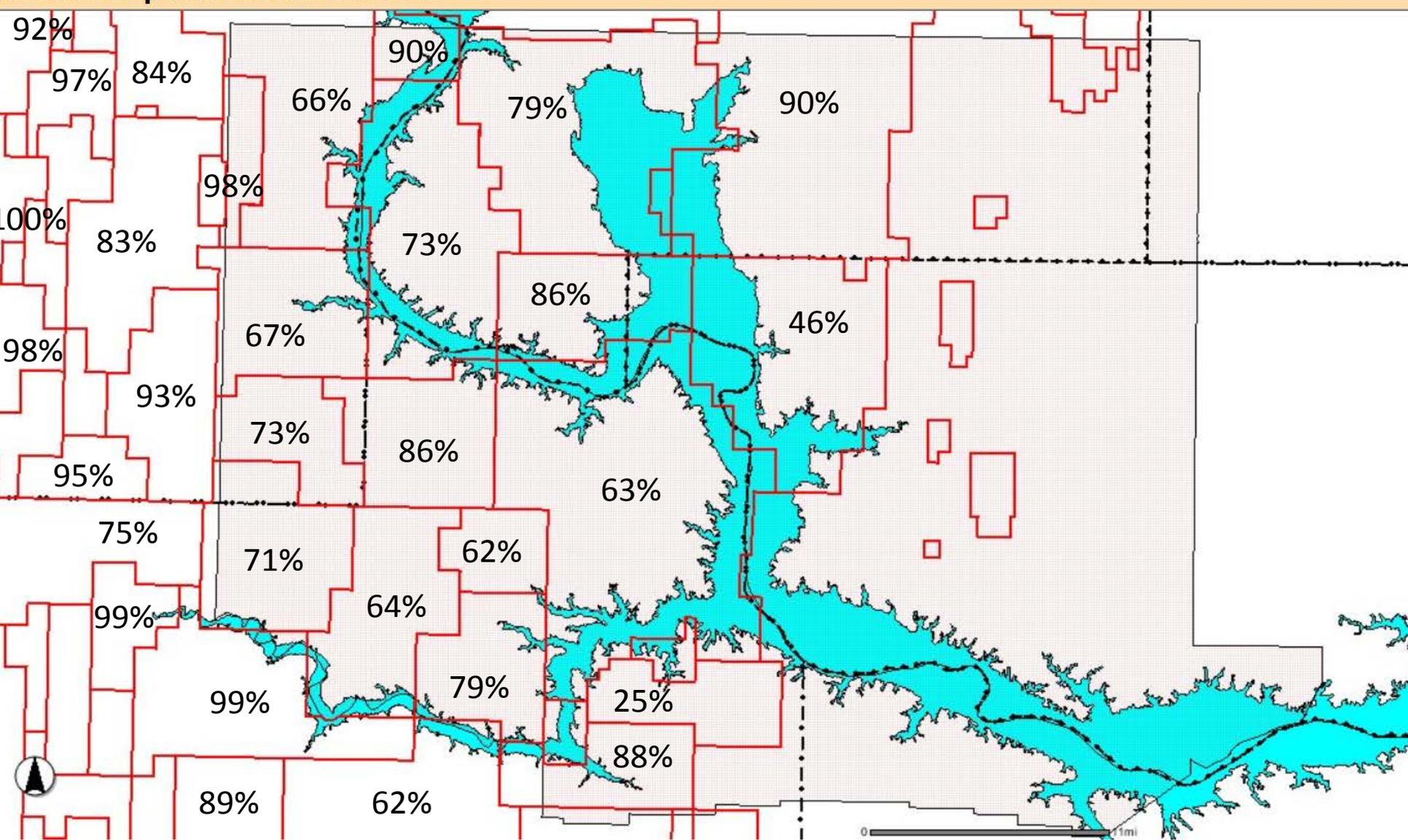
The Tribe recognizes the issues with attaining Right Of Ways from the allottees as a major hurdle

November 2017 Gas Capture %



0 79mi





Oil Fields is now the Active Layer

November 2017 Gas Capture %

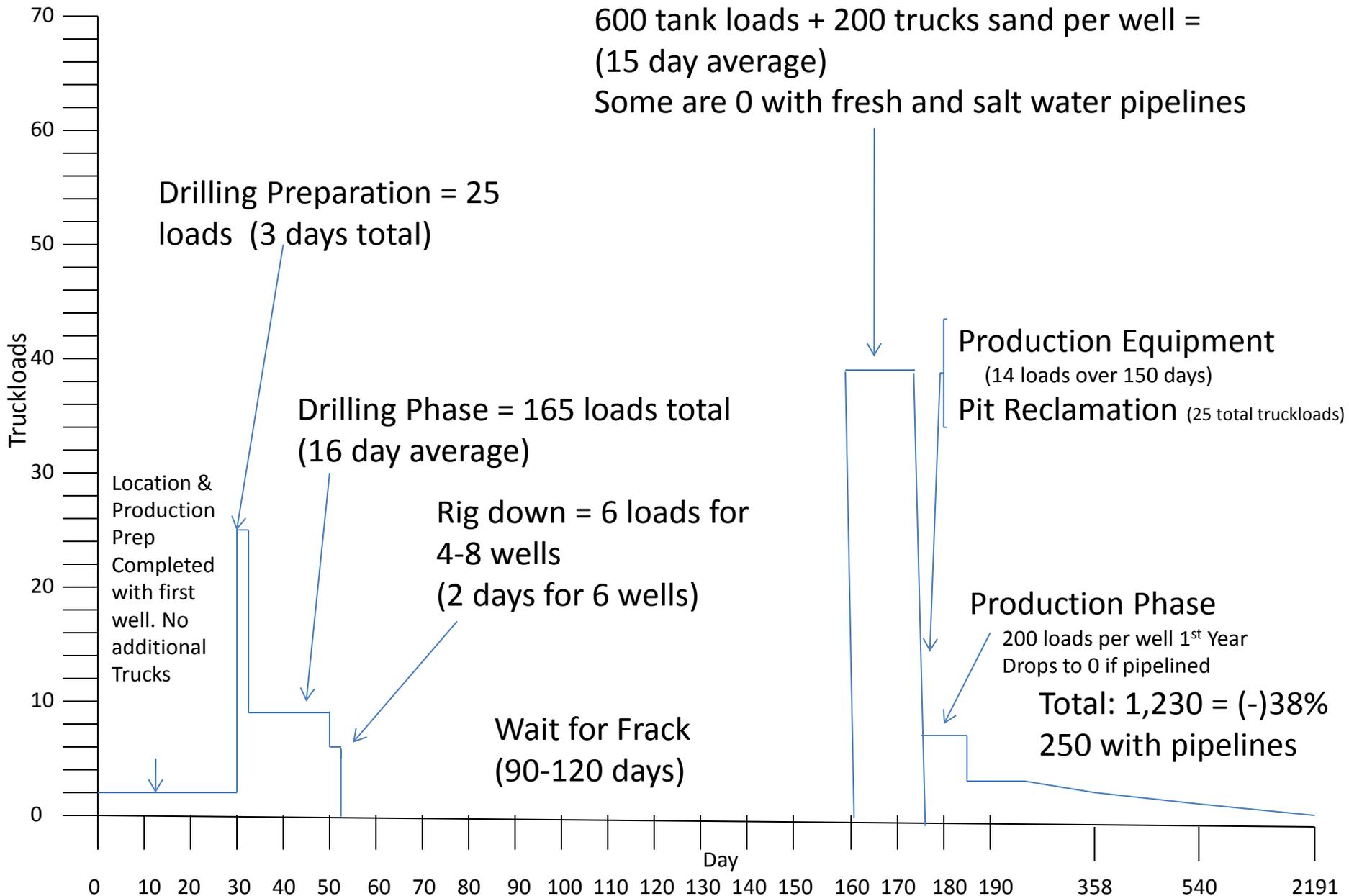


Bakken Wells – Truckload Timeline

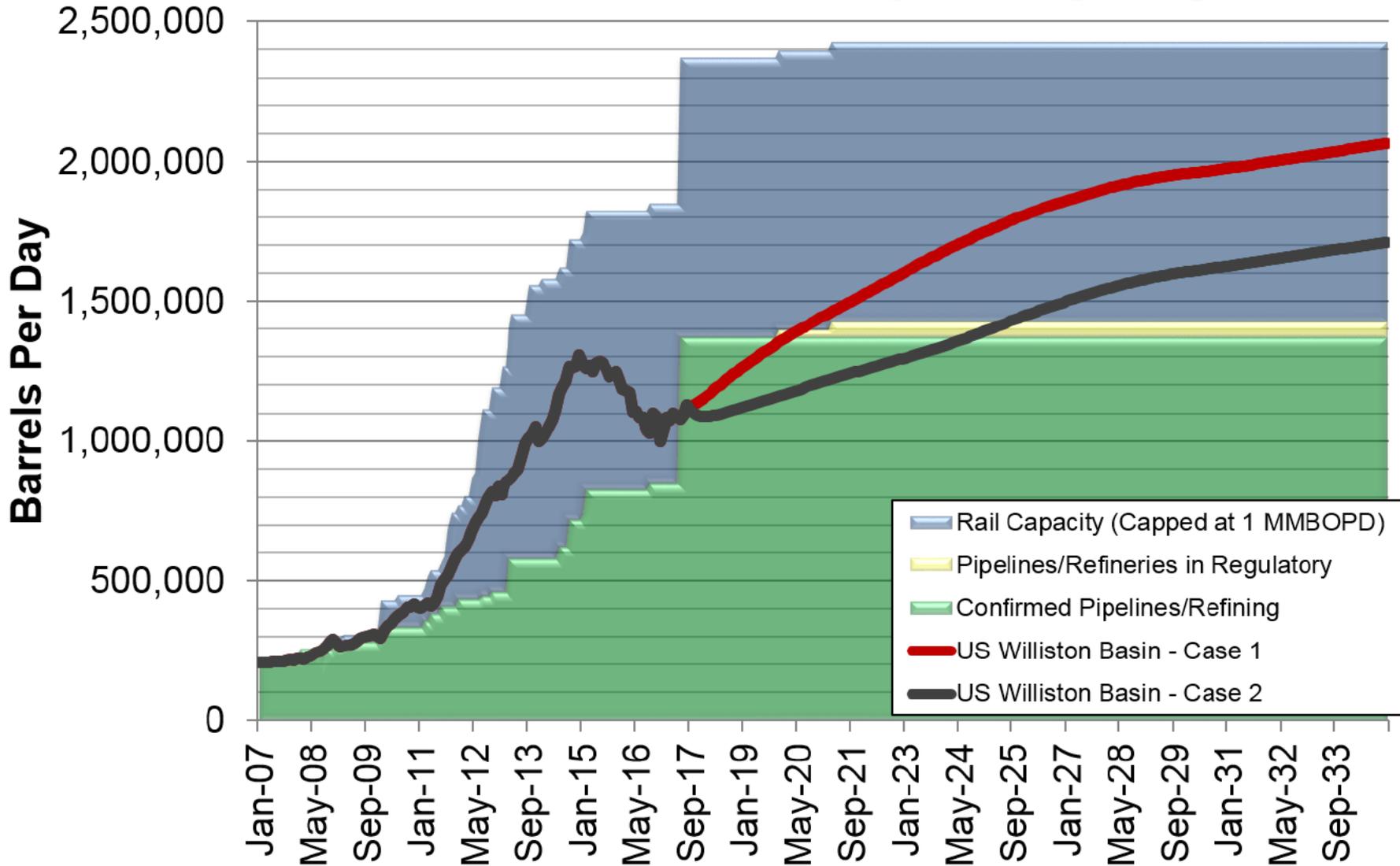
Fracturing Phase – (800 loads)

600 tank loads + 200 trucks sand per well =
(15 day average)

Some are 0 with fresh and salt water pipelines



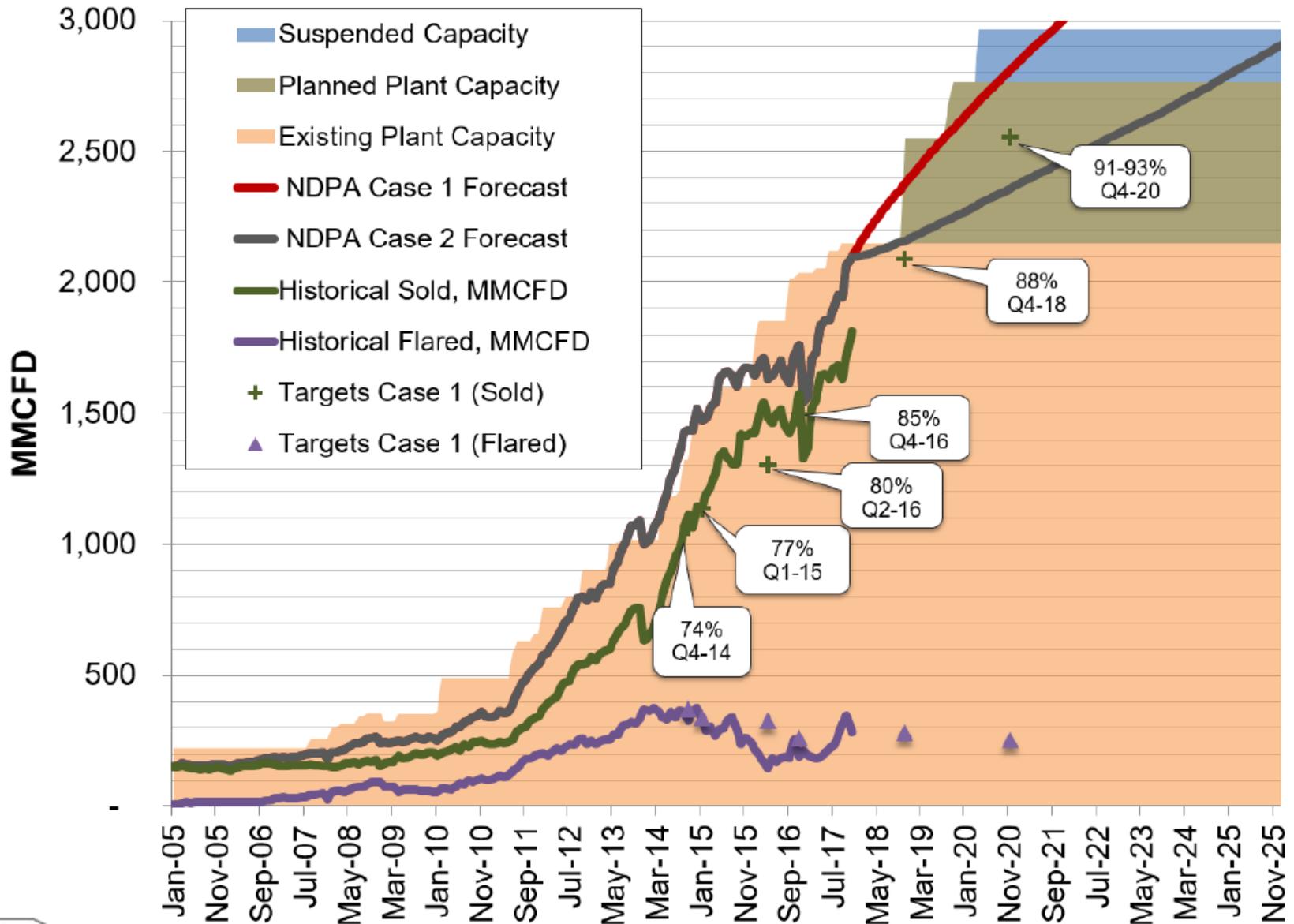
Williston Basin Oil Production & Export Capacity, BOPD



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



Solving the Flaring Challenge



NDPA ND Gas Production Forecast

