

Minutes of the
EMPOWER NORTH DAKOTA COMMISSION
February 4, 2020
ND Department of Commerce 1600 E Century Avenue, Suite 2
Bismarck, ND 58503

Members present:

Michelle Kommer, Vawnita Best, Jason Bohrer, Ron Day, Mark Nisbet, Mike Rud, Jay Skabo, David Straley, Danette Welsh

Ex Officio Members present:

Lt. Governor, Wade Boeshans, Julie Voeck, Gerald Bachmeier

Guests present:

Appendix A

CALL TO ORDER/WELCOME

Chairwoman Kommer, called the meeting to order at 1:00 p.m.

APPROVAL OF MINUTES

Motion made by Day and seconded by Skabo to approve the November 21, 2019 minutes. Motion carried.

Pipeline Authority

Justin Kringstad

Appendix B

Justin presented on pipeline construction, crude oil and natural gas future development.

iPIPE

Jay Almie

Appendix C

Jay presented on intelligent pipeline integrity program (iPIPE); a newly formed program, conceived to focus on technology development for pipeline operators.

WDC Updates

Michelle Kommer

In 2017, the Workforce Development Council (WDC) worked hard to understand North Dakota's workforce challenges, by commissioning regional economic impact and labor availability studies, and partnering with the Greater North Dakota Chamber of Commerce to build the first-ever employer survey. In 2018, the summary report addressed five themes and thirty-two recommendations for the Governor's review. Out of those five themes, developed five subcommittees; Technical Skills Gap, Recruit & Retain, Populations with Barriers, Occupational

Licensing Reform, and the yet to be formed; Engagement & Communication subcommittee.

Michelle asks the EmPower ND Commission for their guidance or recommendations they see fit for the subcommittees discussed.

Review Draft Survey and EmPower ND Commission Dates & Topics

Michelle Kommer

Appendix D

Michelle presented a tentative 2020 roadmap for commission meeting dates and topics. The commission had discussed the need for more learning opportunities from the industries of the EmPower members. Secondly, a drafted survey was discussed for a response from the voting and ex - officio members. The survey, which is considered an open record; will encompass a better understanding to the commission's structure, membership, and consensus approach. Two weeks before March 25th, is the planned date for discussion to the survey.

Other

In response to a question, regarding the federally passed production tax credit (PTC), David Straley commented that he would offer to draft a letter to the congressional delegation with input and direction from the renewable constituents. This will be a discussion for the March EmPower ND Commission meeting.

Public Comment

No comments

ADJOURNMENT

Motion made by Rud and seconded by Day to adjourn the meeting. Motion carried and adjourned at 3:15 p.m.

Michelle Kommer

Chairwoman Kommer

5/28/2020

Date

Sherri Frieze

Sherri Frieze, Recording Secretary

05.28.20

Date



**REGISTRATION OF MEETING
ATTENDANCE**
SFN 10974 (3/01)

NAME OF MEETING

EmPower ND Commission Meeting

PLACE

WSI Board Room

DATE

Feb 4

YOUR NAME	AGENCY	E-MAIL ADDRESS
Ron Day	Marathon Petroleum	rwday@marathonpetroleum.com
Vawnita Best		vbest@nd.gov
Reice Haase	Caernot Office	rhaase@nd.gov
Danette Weese	anon	
Rudie Martenson	Primacy Strategy Group	
M. Rud	WDAPMA / WDPCA	
Gerald Bachmeyer	Red Trail Energy (Ethanol)	gerald@redtrailenergy.com
John Weeda	ND Transmission Authority	JohnWeeda@lighte.com
John Olson	Olson Ebertz	John@olson-ebertz.com
Justin Dever	MDU Resources Group	justin.dever@mdureources.com
Brady Pelton	ND Petroleum Council	bpelton@ndoil.org
DAVE BIAK	Network Solutions Services	db/nd.5394@gsn.c.com
John Jannone	OGE-360	info@OGE-360.com

EmPower ND Commission

Justin J. Kringstad

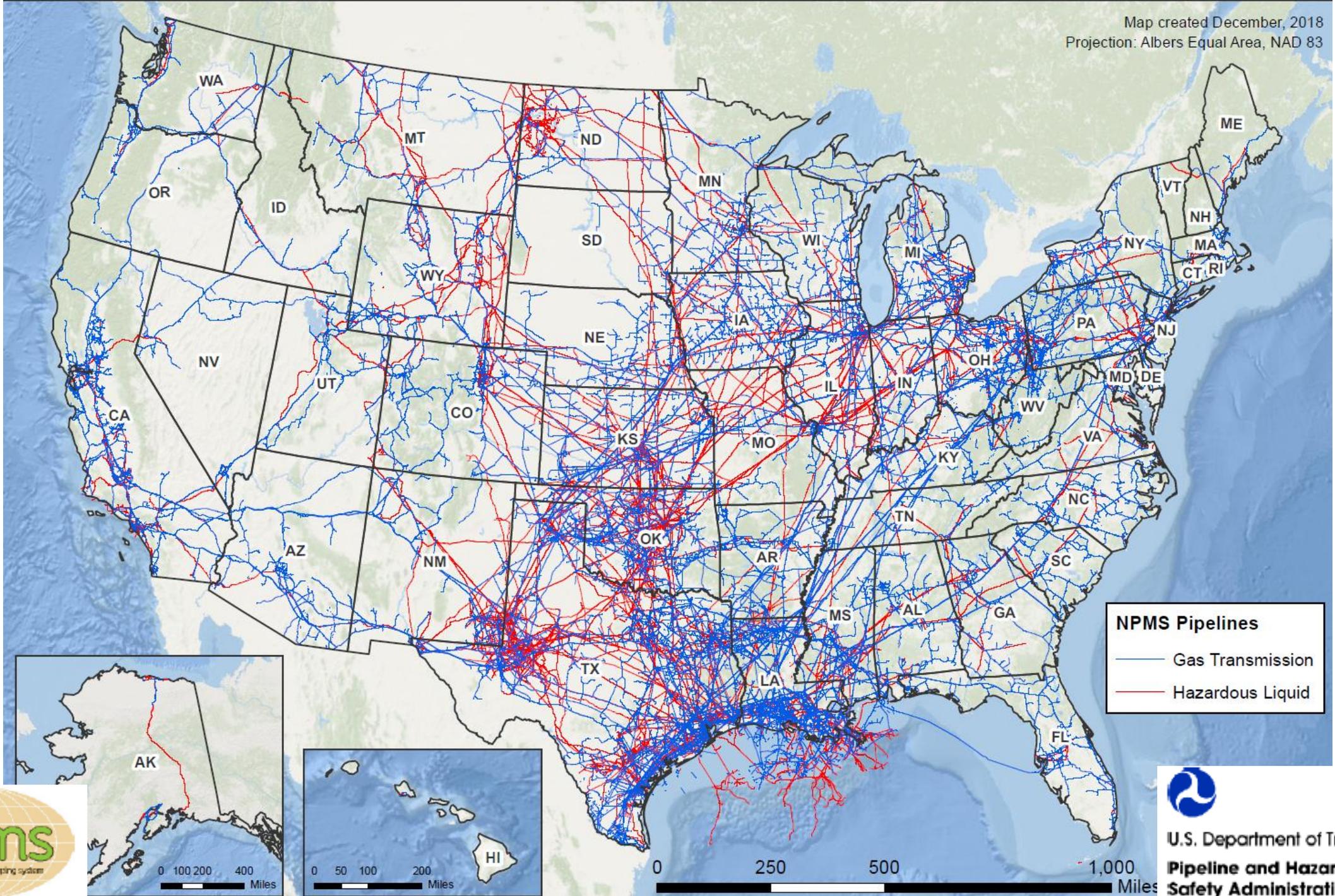
Geological Engineer

Director

North Dakota Pipeline Authority

February 4, 2020



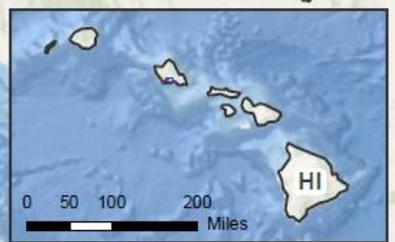
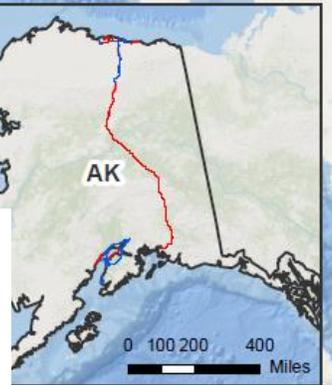
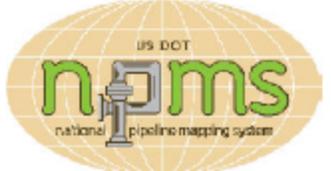


NPMS Pipelines

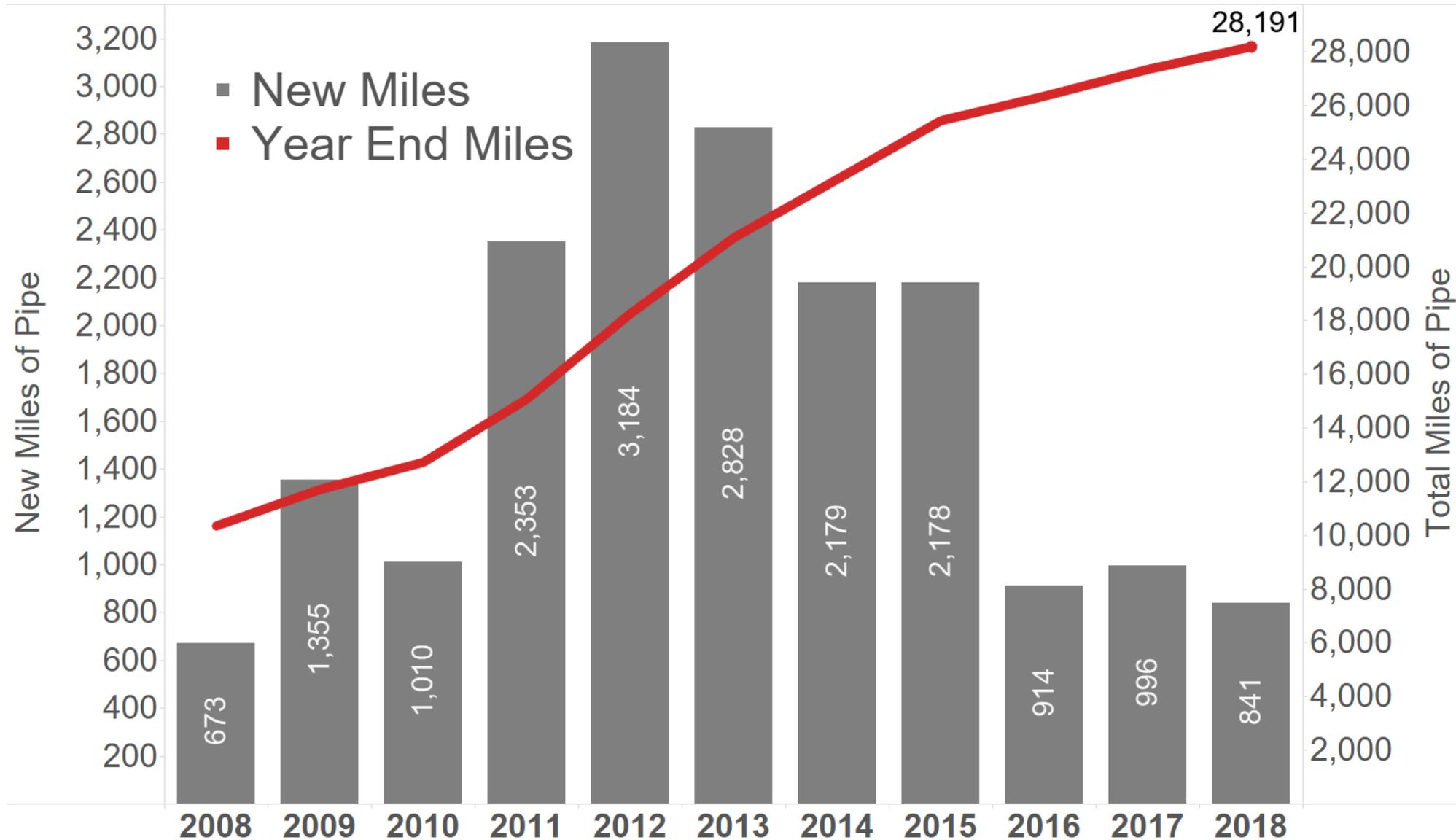
- Gas Transmission
- Hazardous Liquid



U.S. Department of Transportation
**Pipeline and Hazardous Materials
Safety Administration**



North Dakota Pipeline Construction

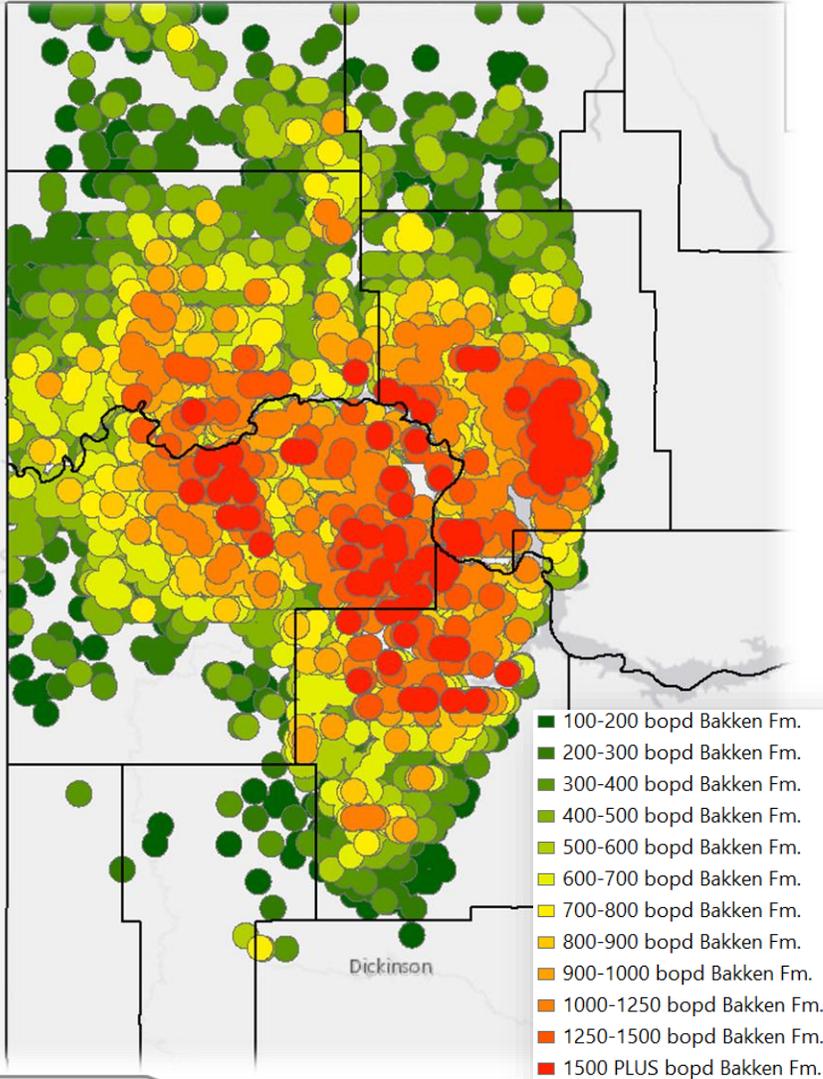


Sources: NDIC & PHMSA

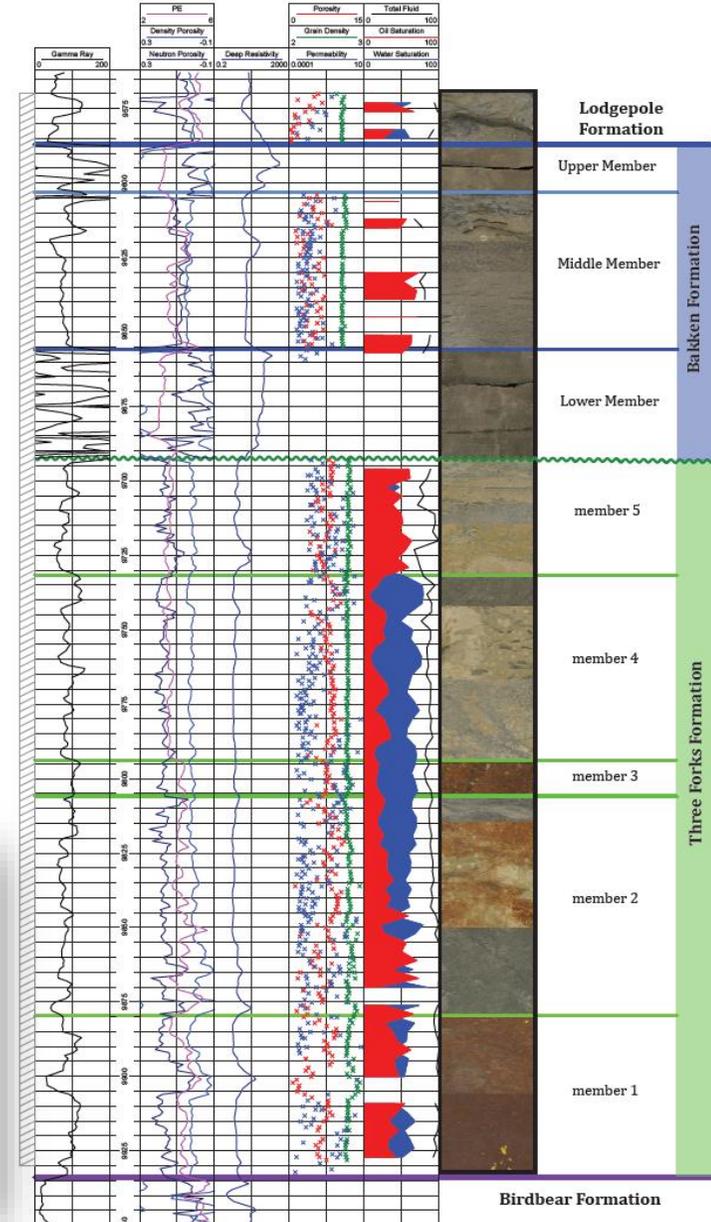
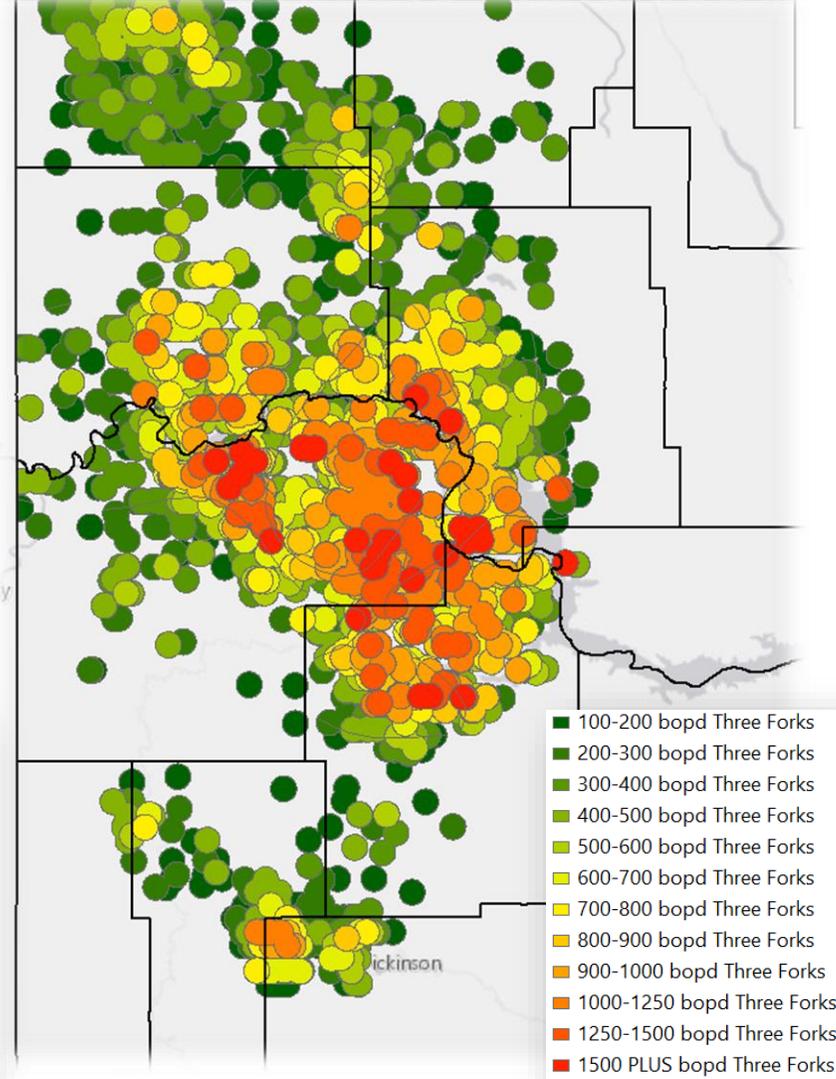


Bakken & Three Forks Formations

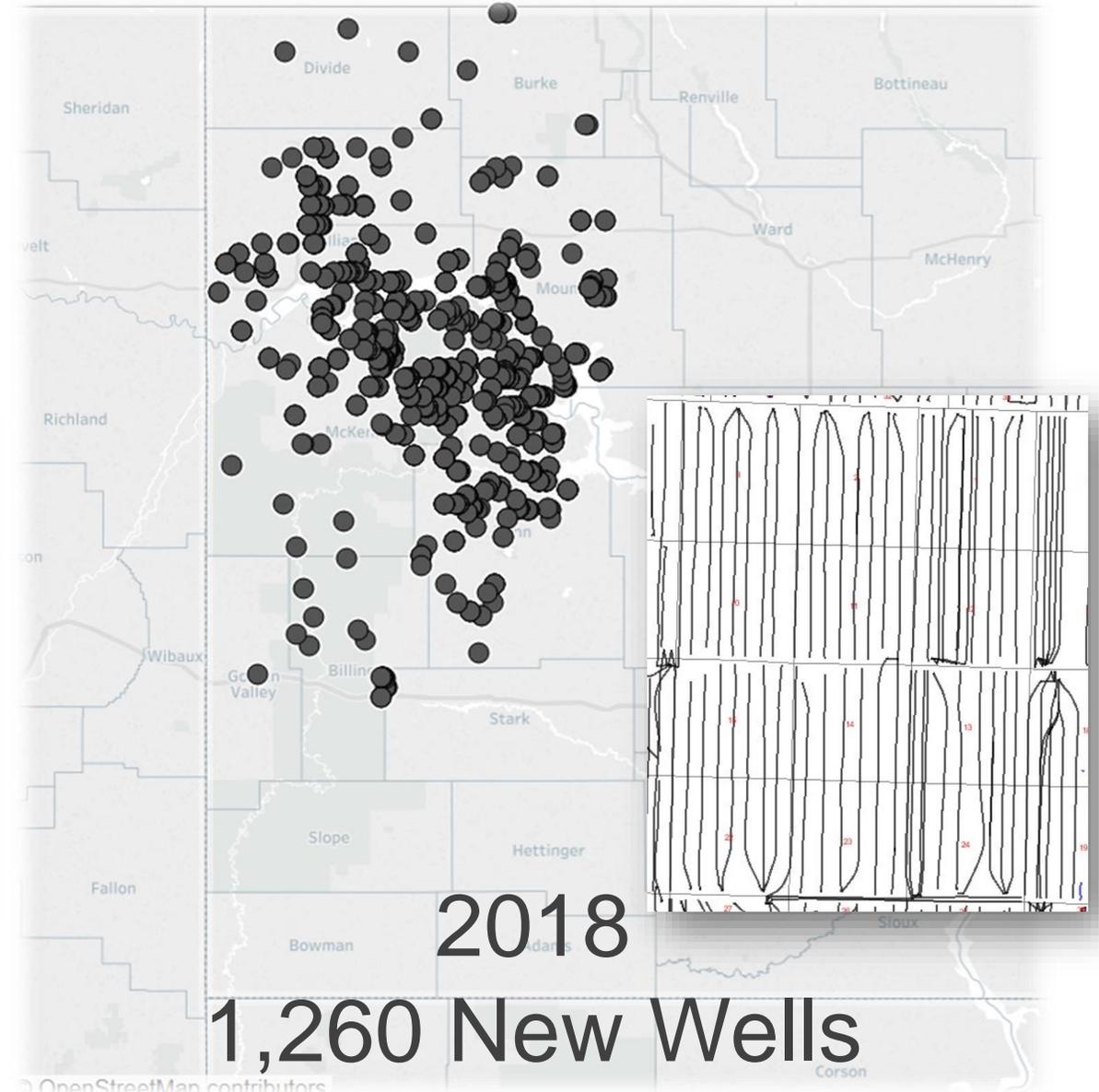
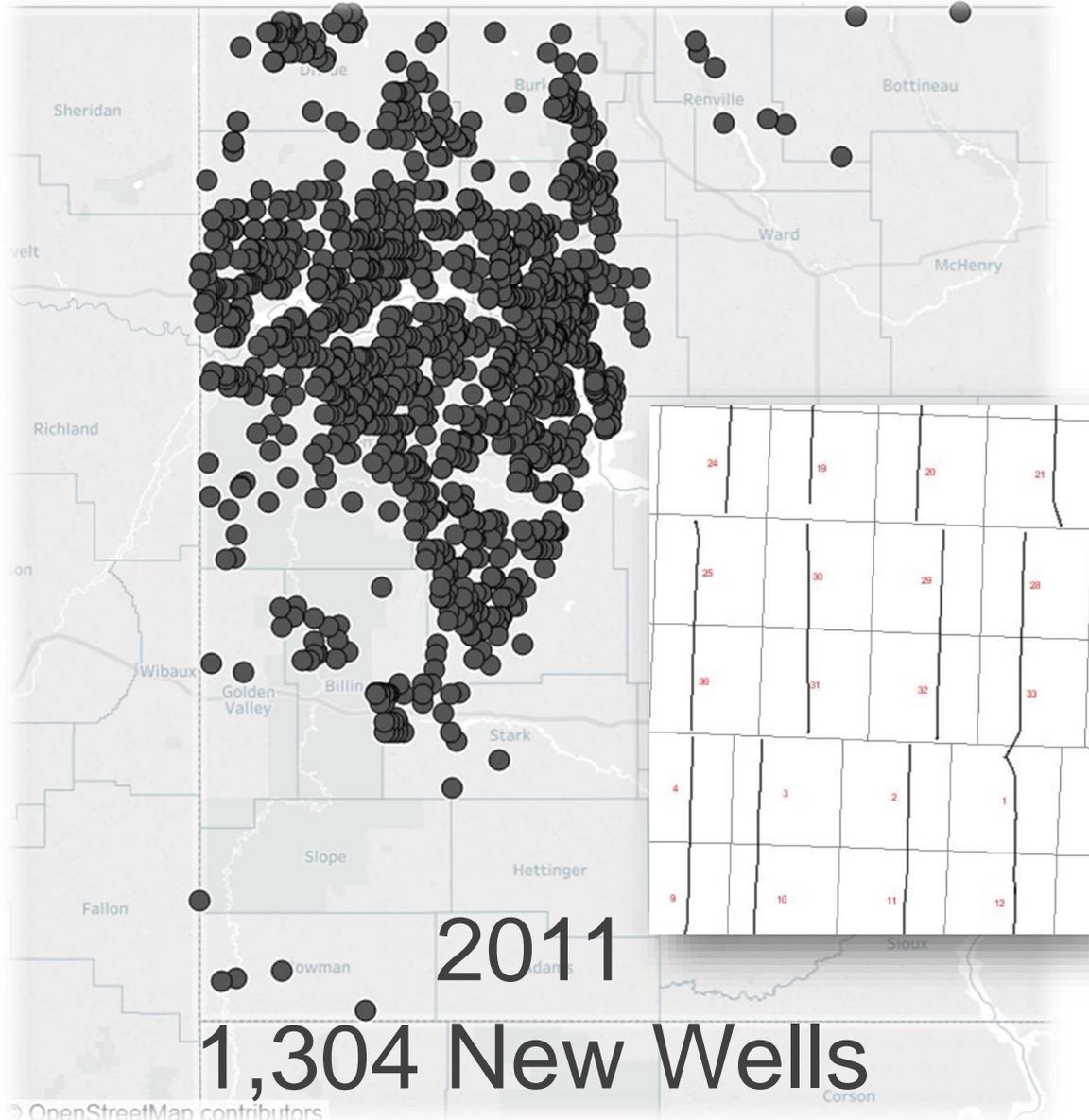
Bakken Formation



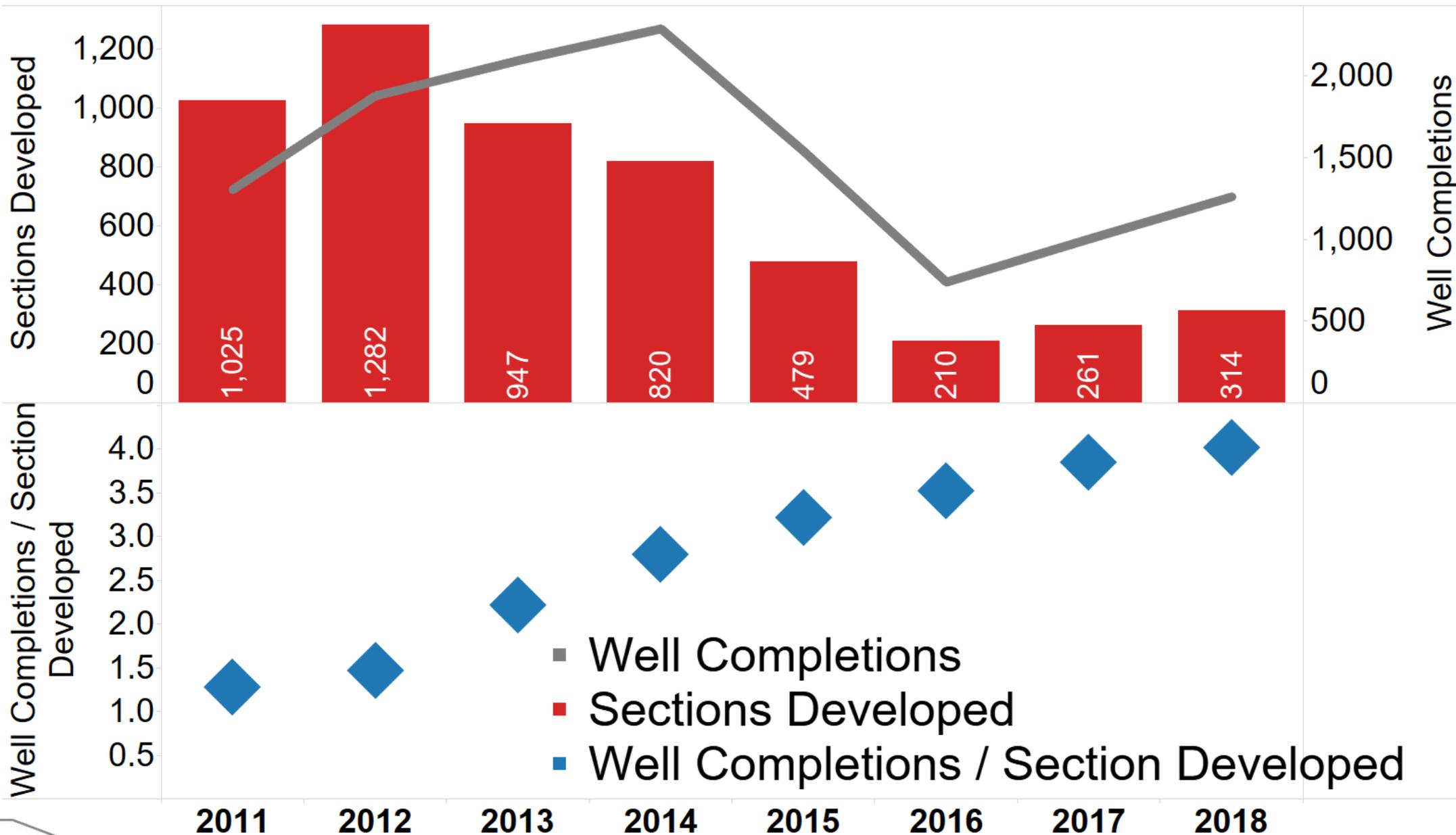
Three Forks Formation



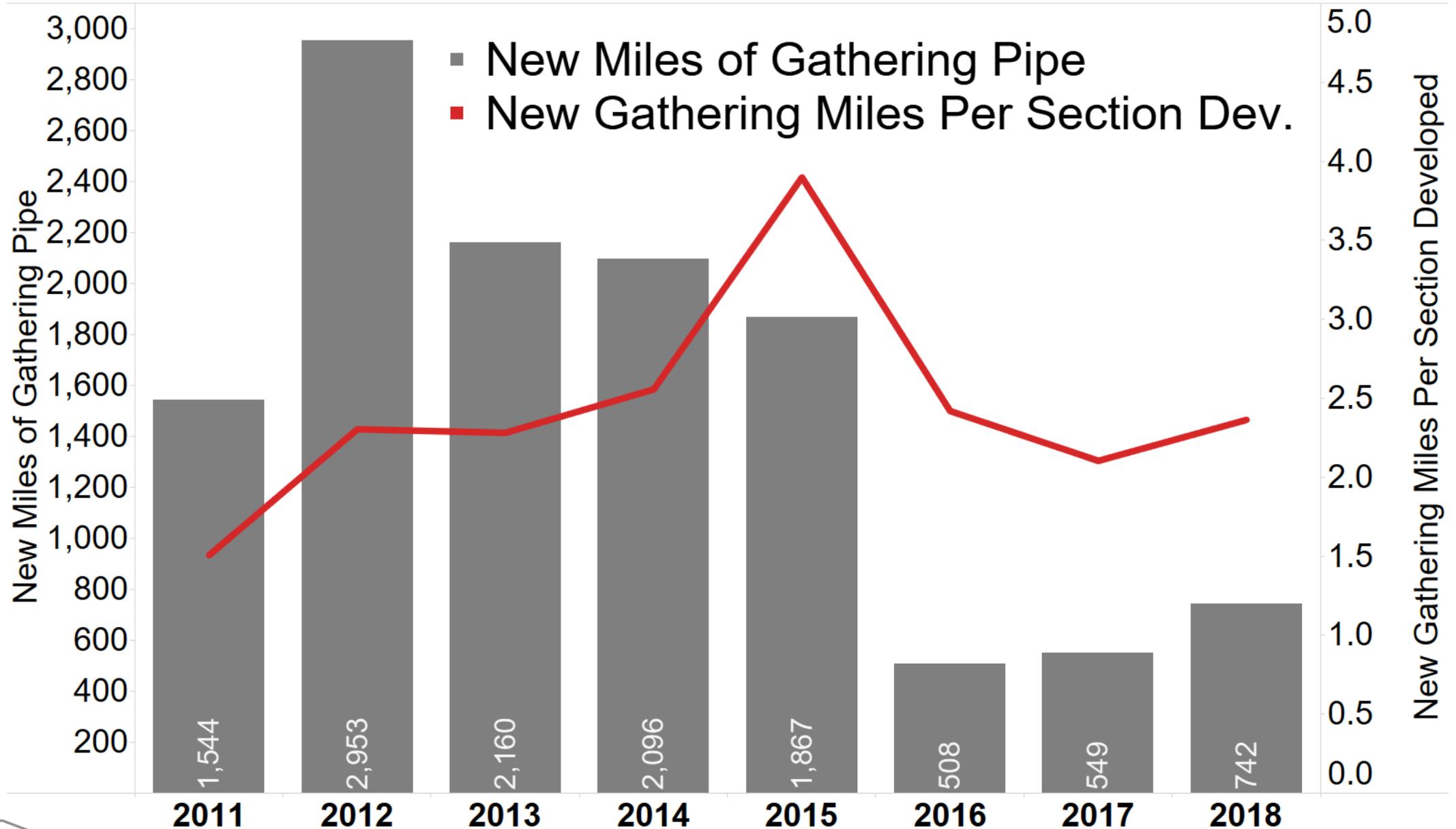
North Dakota Well Completions and Spatial Development



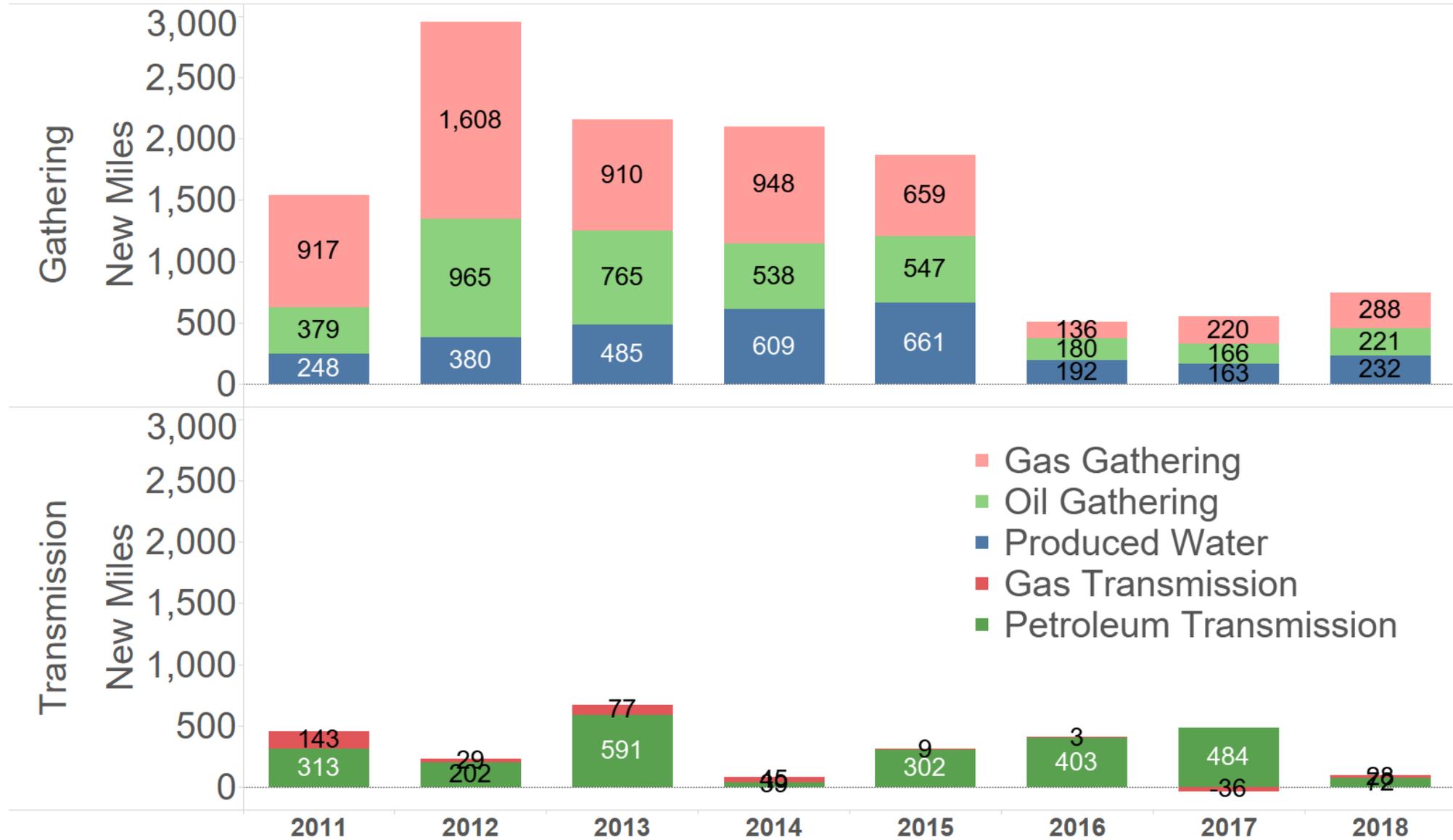
North Dakota Well Completions and Developed Sections



North Dakota Gathering Pipeline Development



North Dakota Pipeline Construction

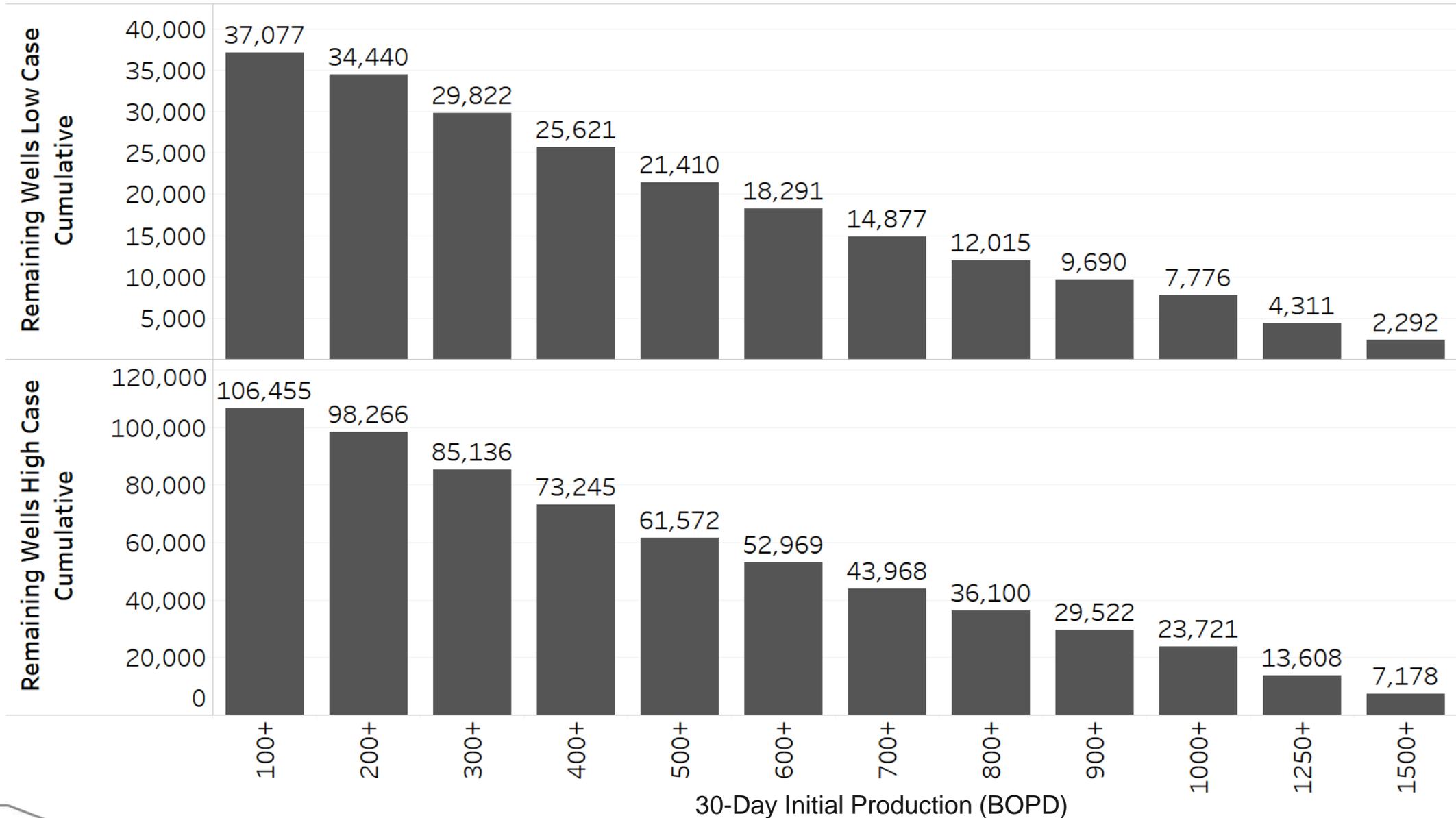


Sources: NDIC & PHMSA



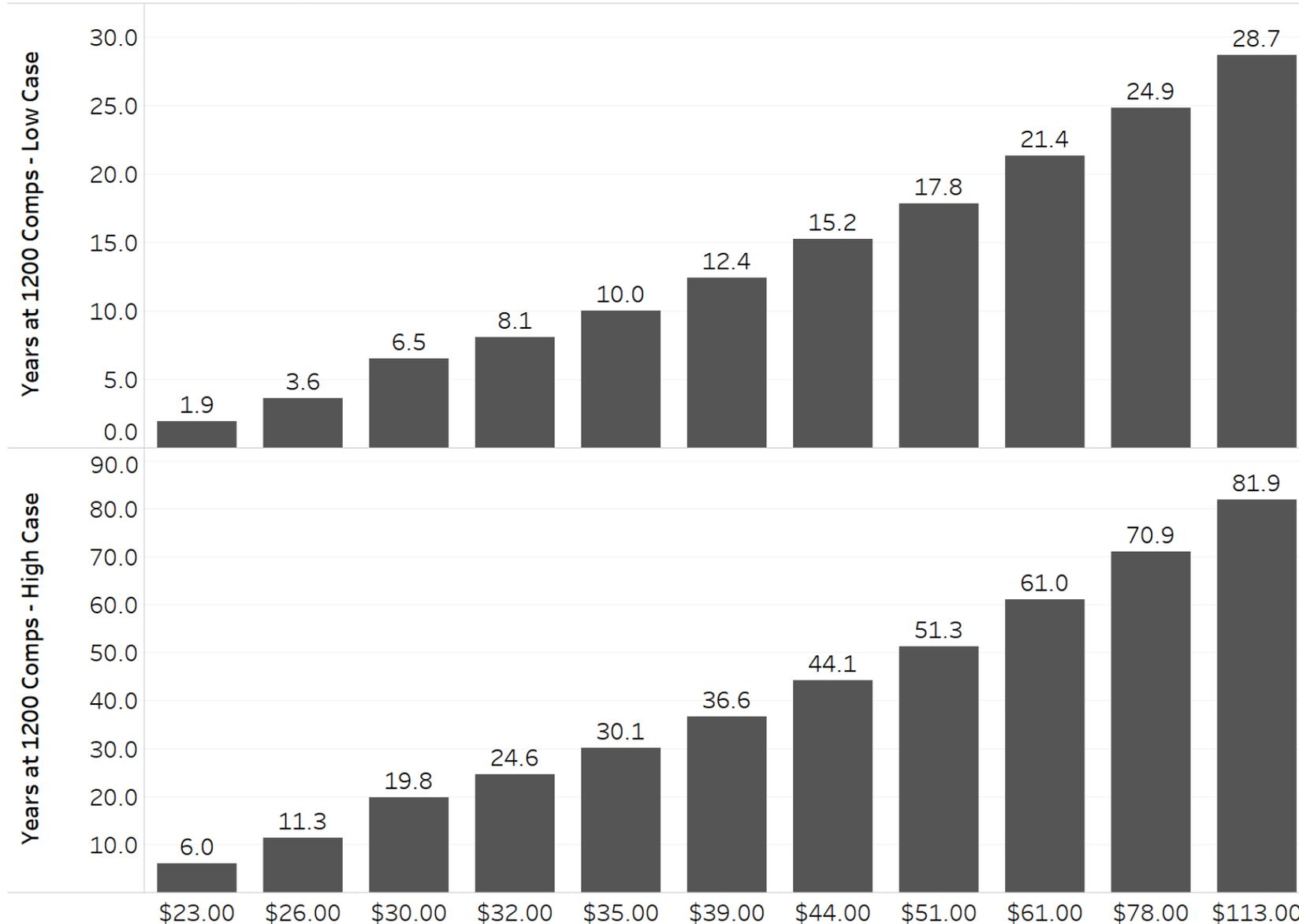
Cumulative Remaining Wells – Peak Month Minimum BOPD

Production Zone

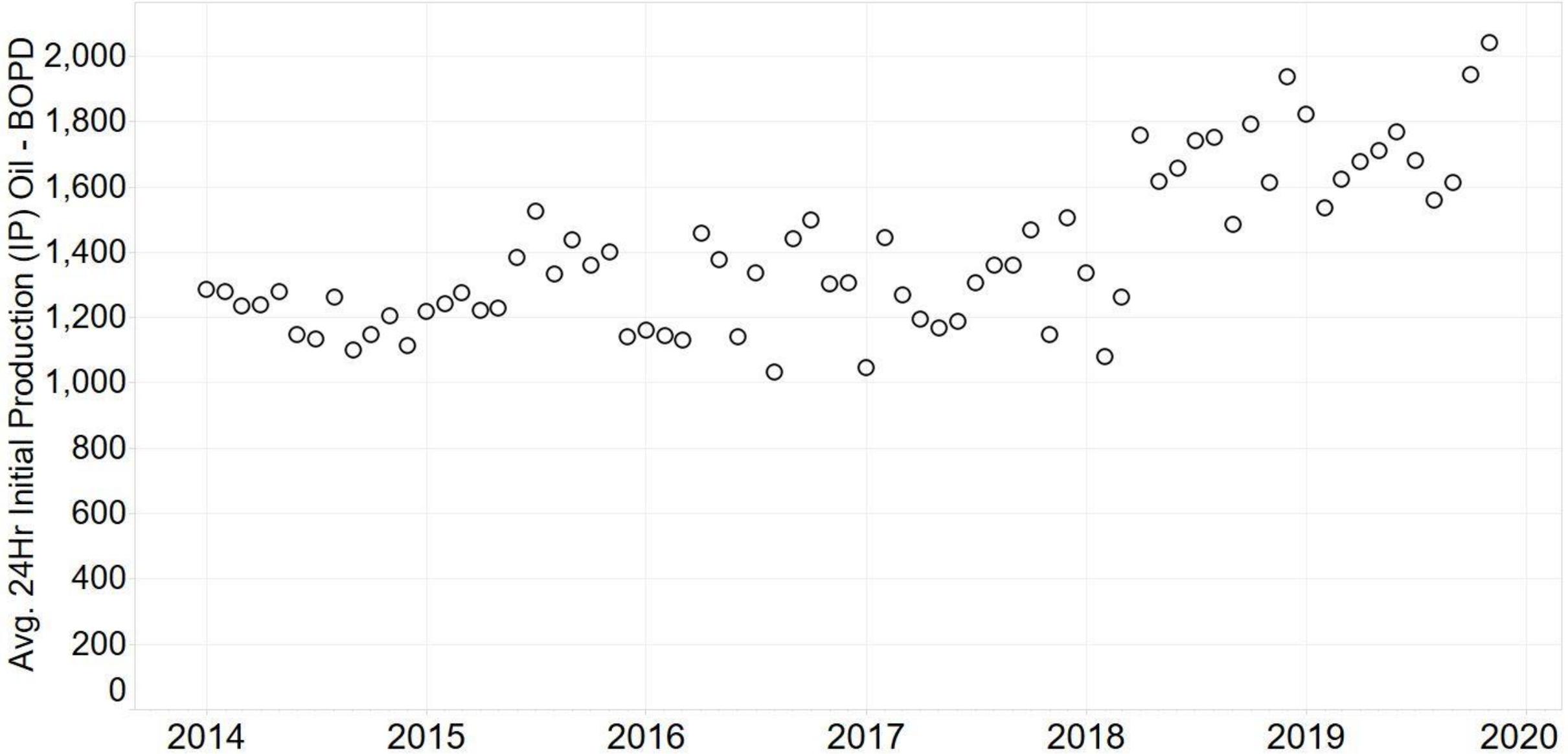


Years Remaining* / Minimum Wellhead Oil Price

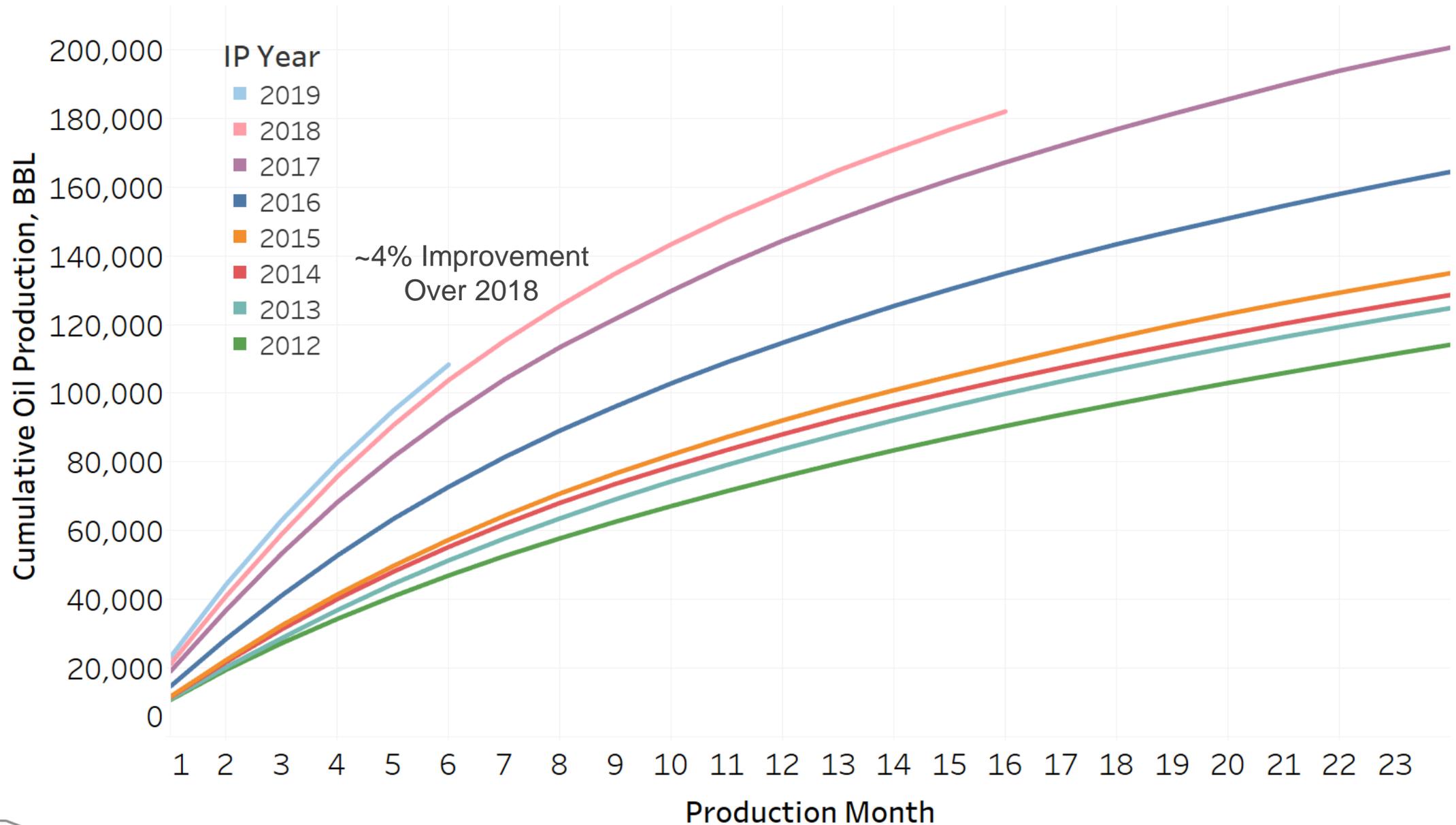
*Assumes 1,200 Completions Per Year and \$7MM Well Costs (20% After Tax IRR)



Statewide Initial Oil Production Rates – 24hr



Statewide oil Performance

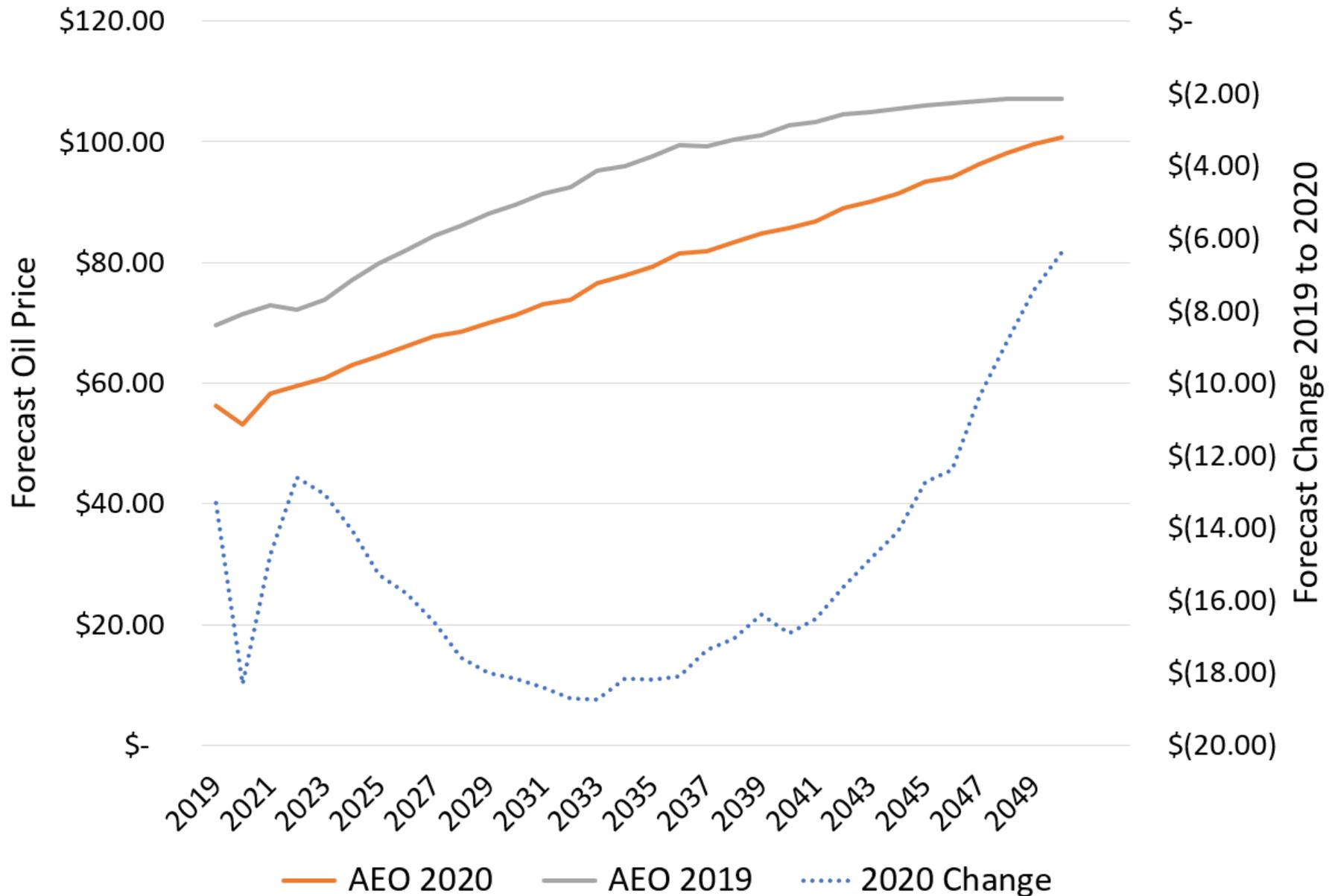


Presentation Forecast Note:

Many forecasts are in “draft” status as the EIA has recently released their 2020 Annual Energy Outlook with a revised oil price forecast. Final forecast updates/revisions will be available in mid-February.

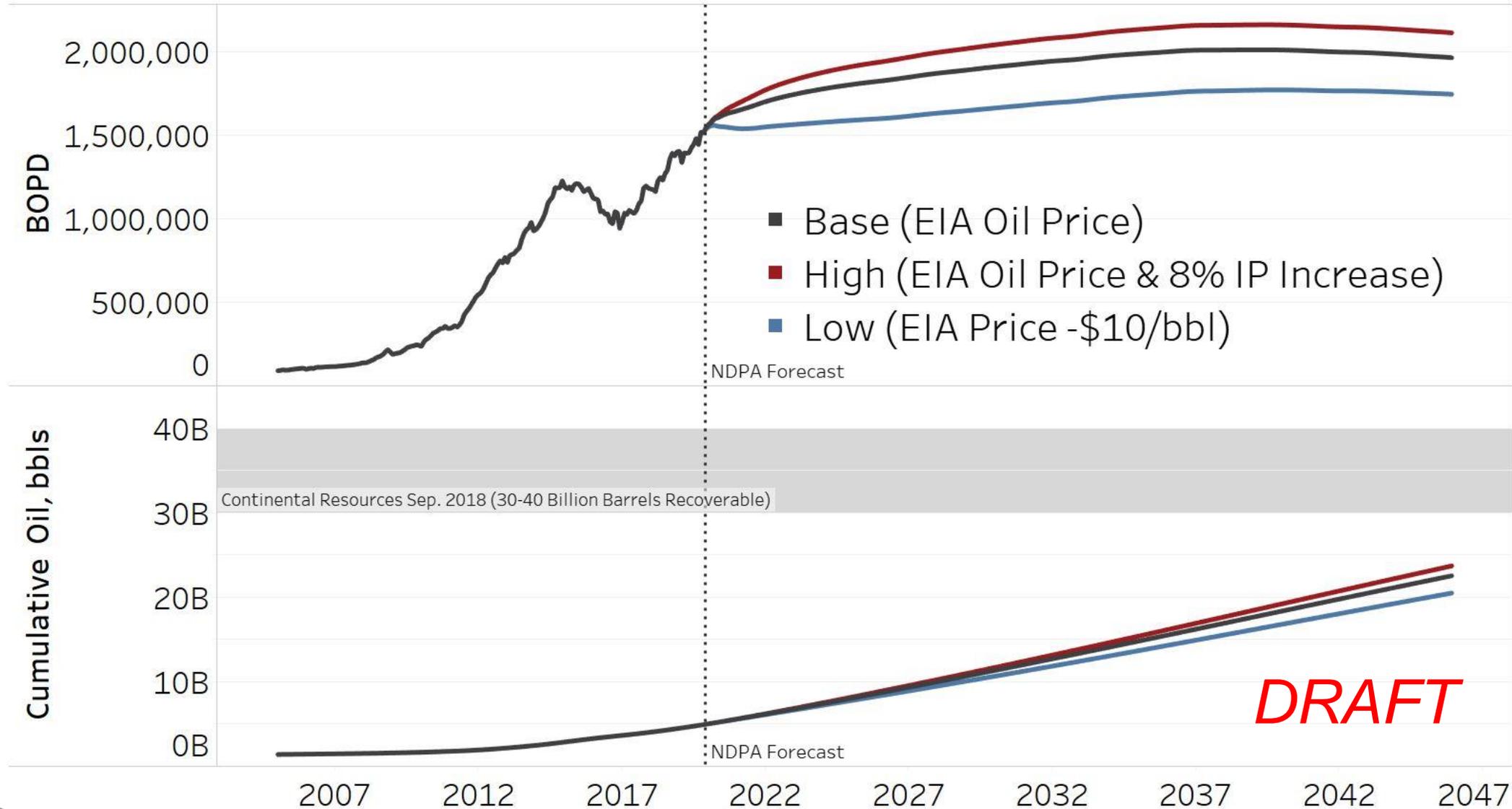


EIA Oil Price Forecasts - Reference Case

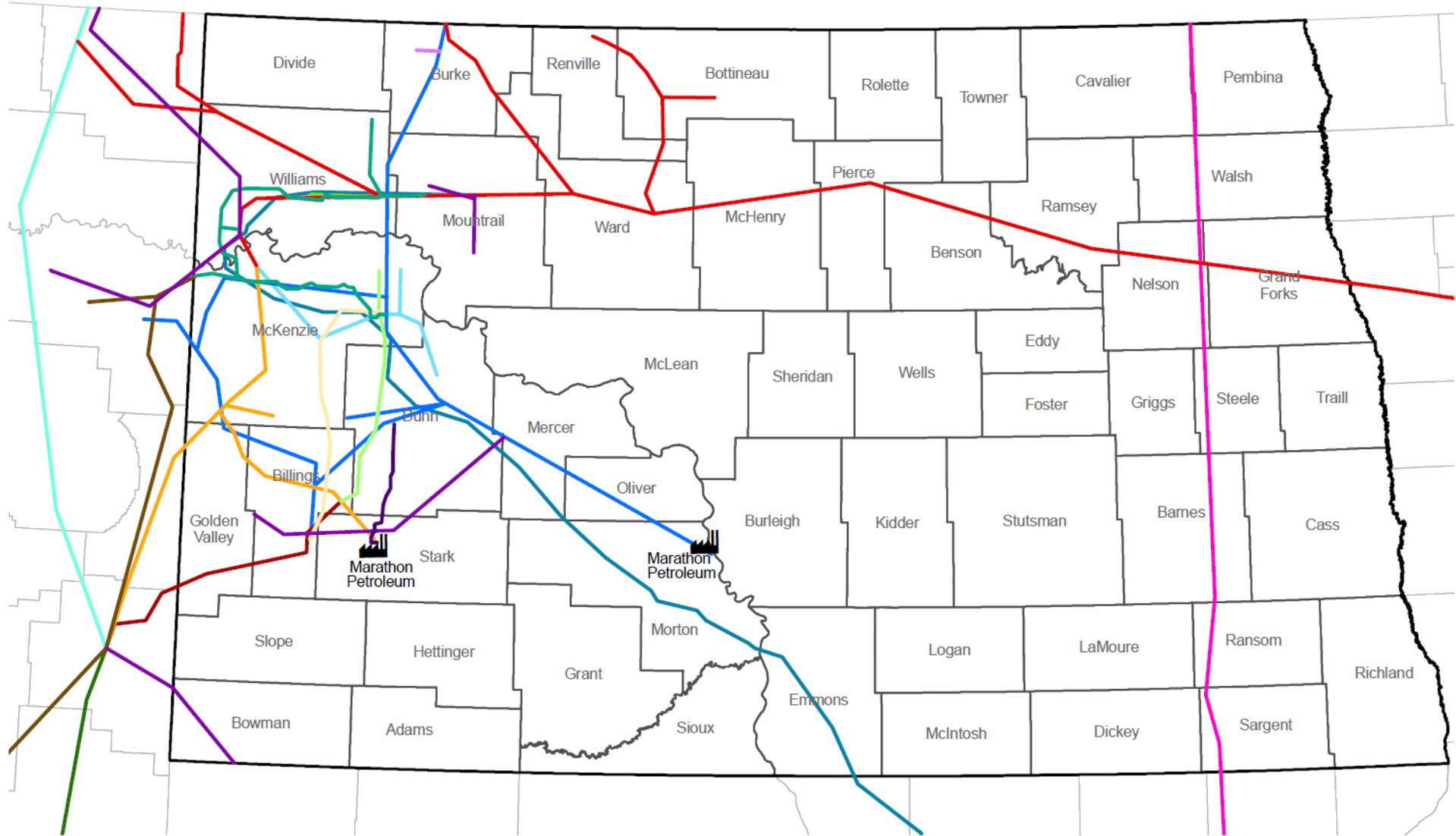


North Dakota Oil Production Forecast

Assumes Current Technology – Enhanced Oil Recovery Not Included

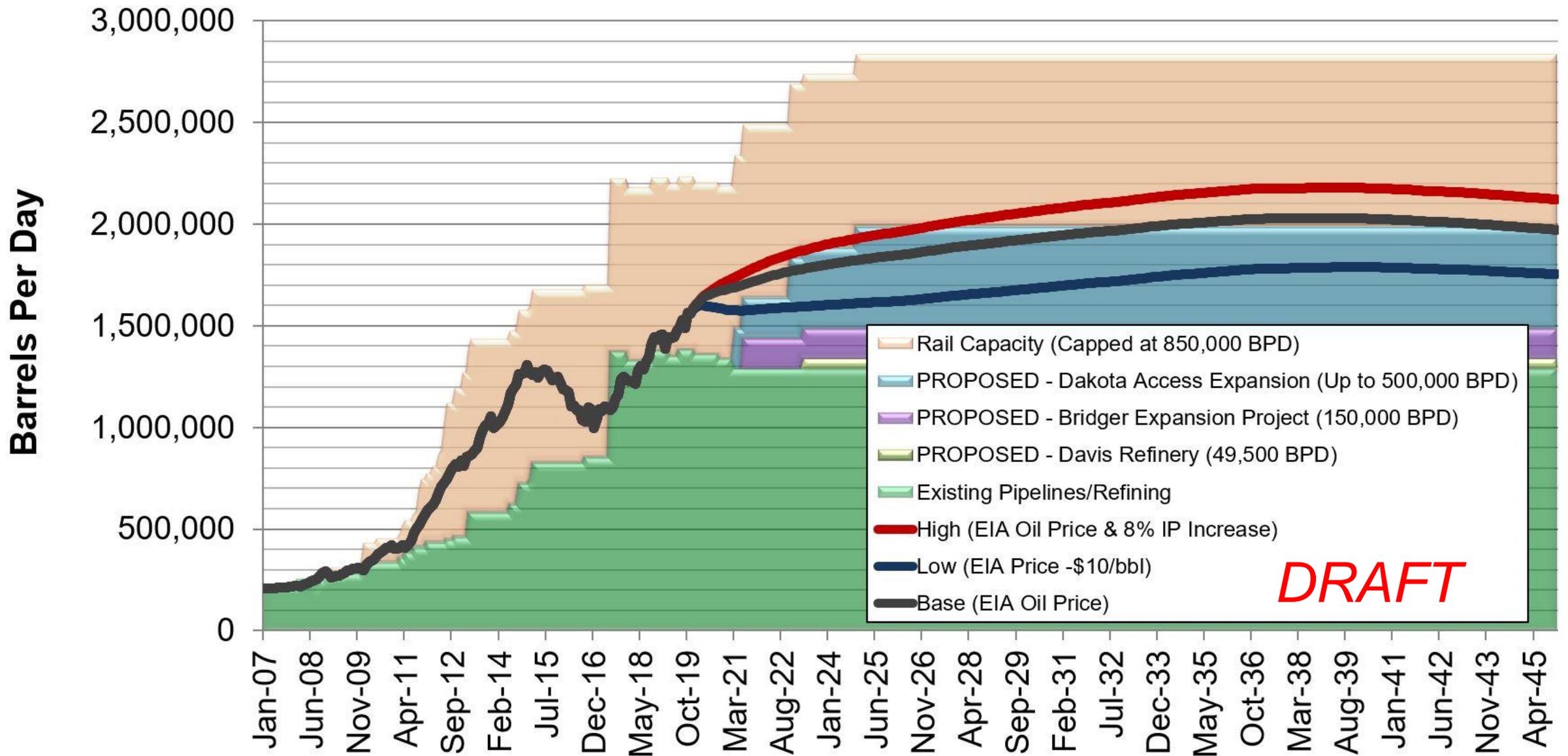


North Dakota Crude Oil Pipelines



- | | | | | | |
|--|---|---|--|---|--|
|  Refinery |  Basin Transload |  Butte |  Double H |  Hiland |  Bridger |
|  Bakken Oil Express |  Belle Fourche |  Crestwood |  Enbridge |  Keystone Pipeline |  Targa |
|  BakkenLink |  Bridger |  Dakota Access |  Four Bears |  Little Missouri |  Marathon |

Williston Basin Oil Production & Export Capacity, BOPD

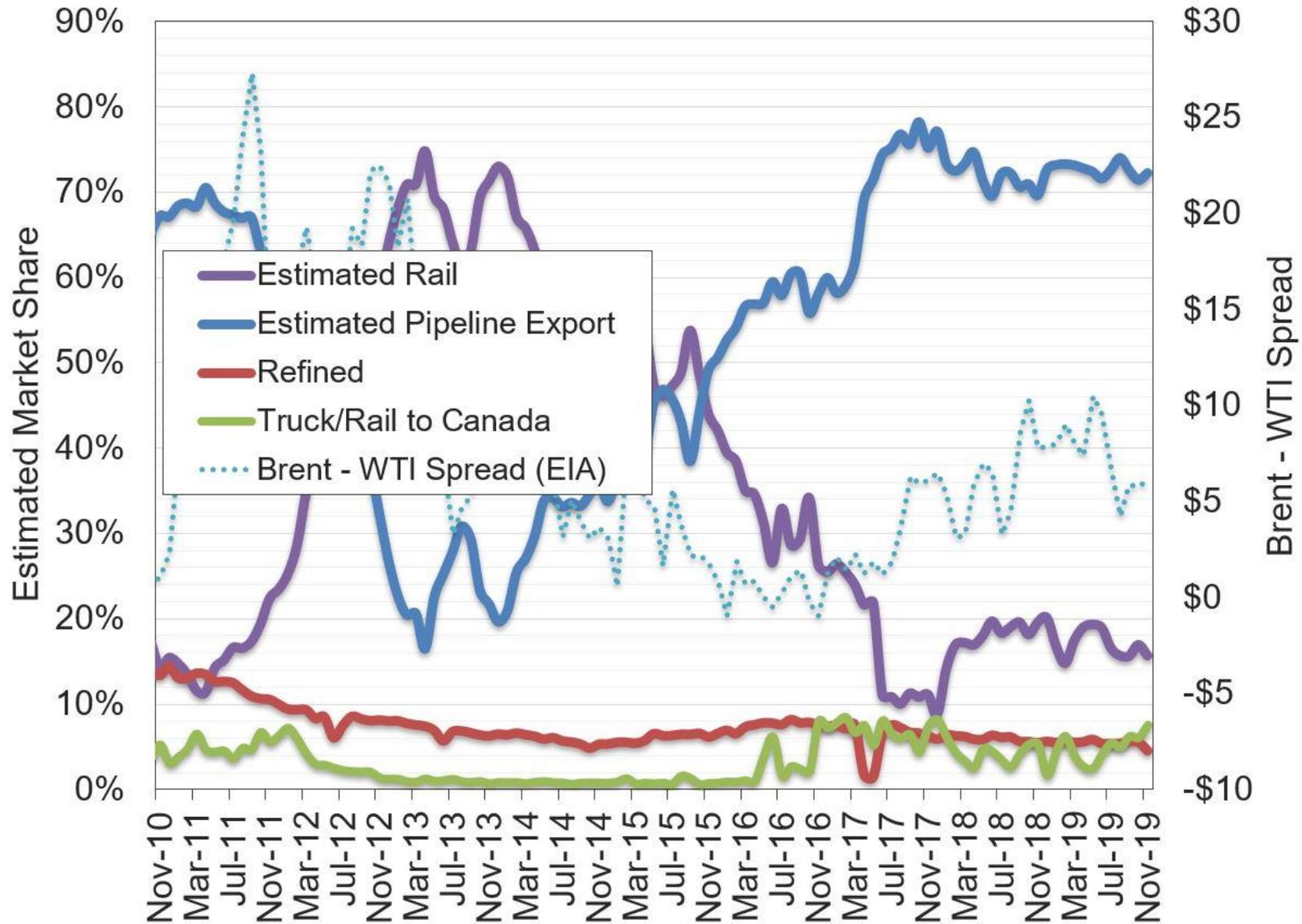


Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.

DRAFT



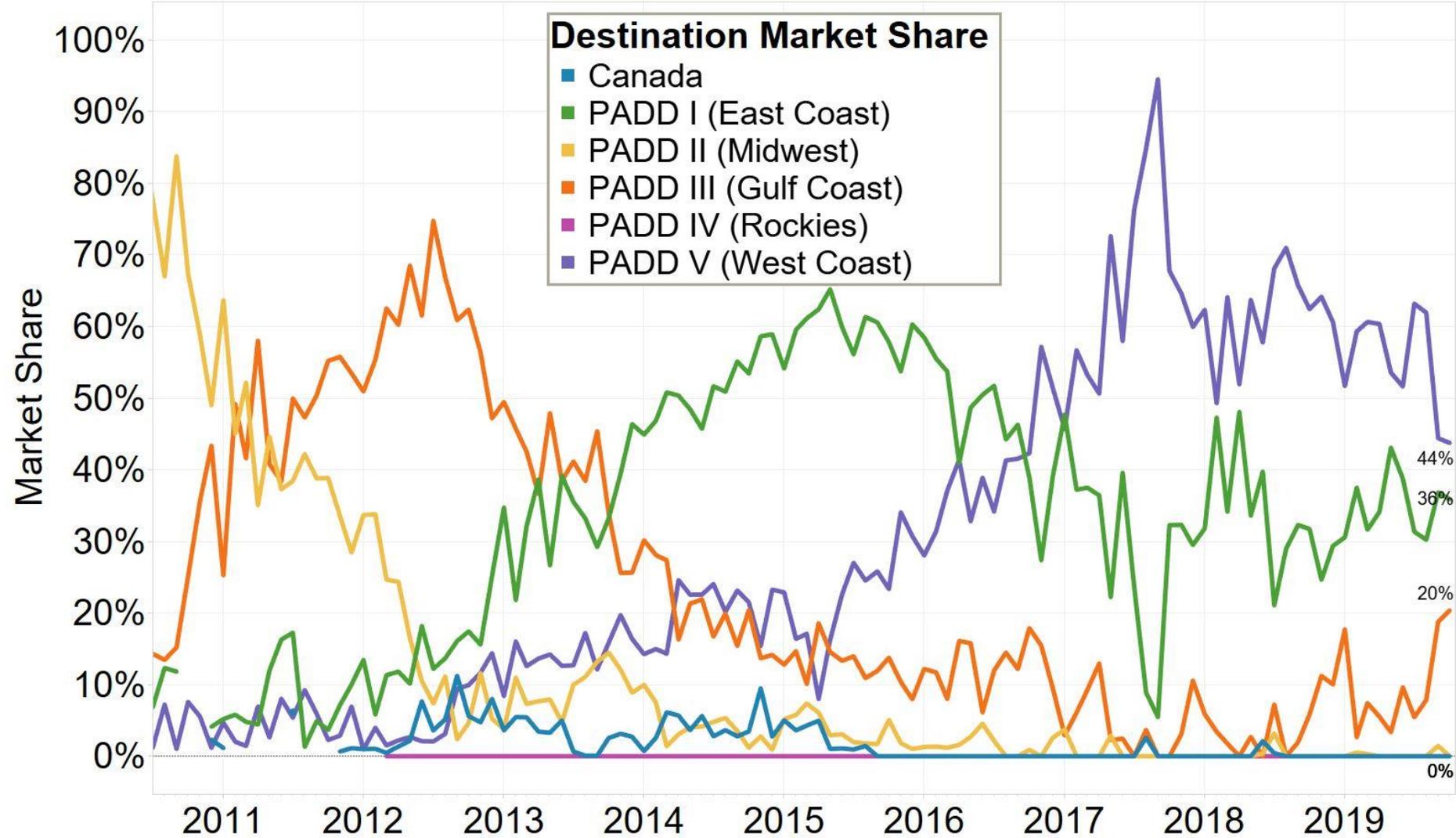
Estimated Williston Basin Oil Transportation



Estimated ND Rail Export Volumes



Rail Destinations Market Share (Oct 2019)



Data for Rail Destination Market Share Provided by the US Energy Information Administration



Natural Gas Update



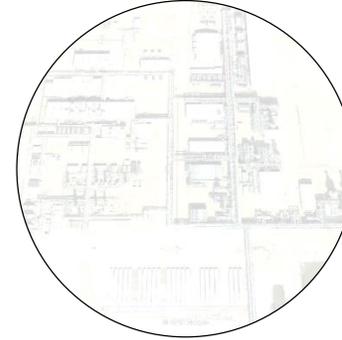
Production

- Technology
- Markets



Gathering

- Capacity
- Connections



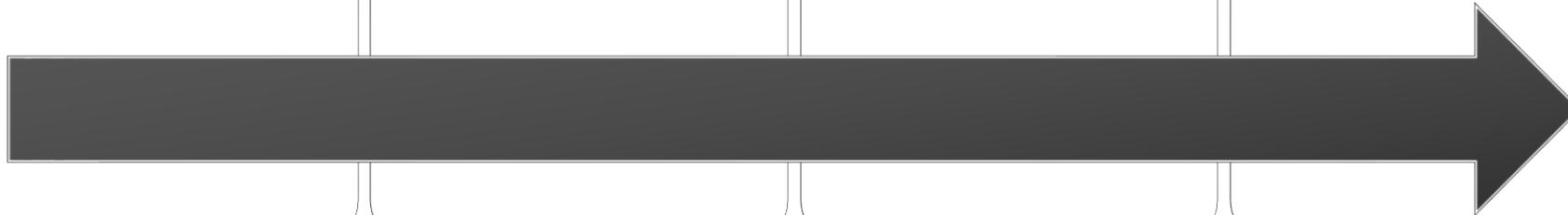
Processing

- Capacity
- Location

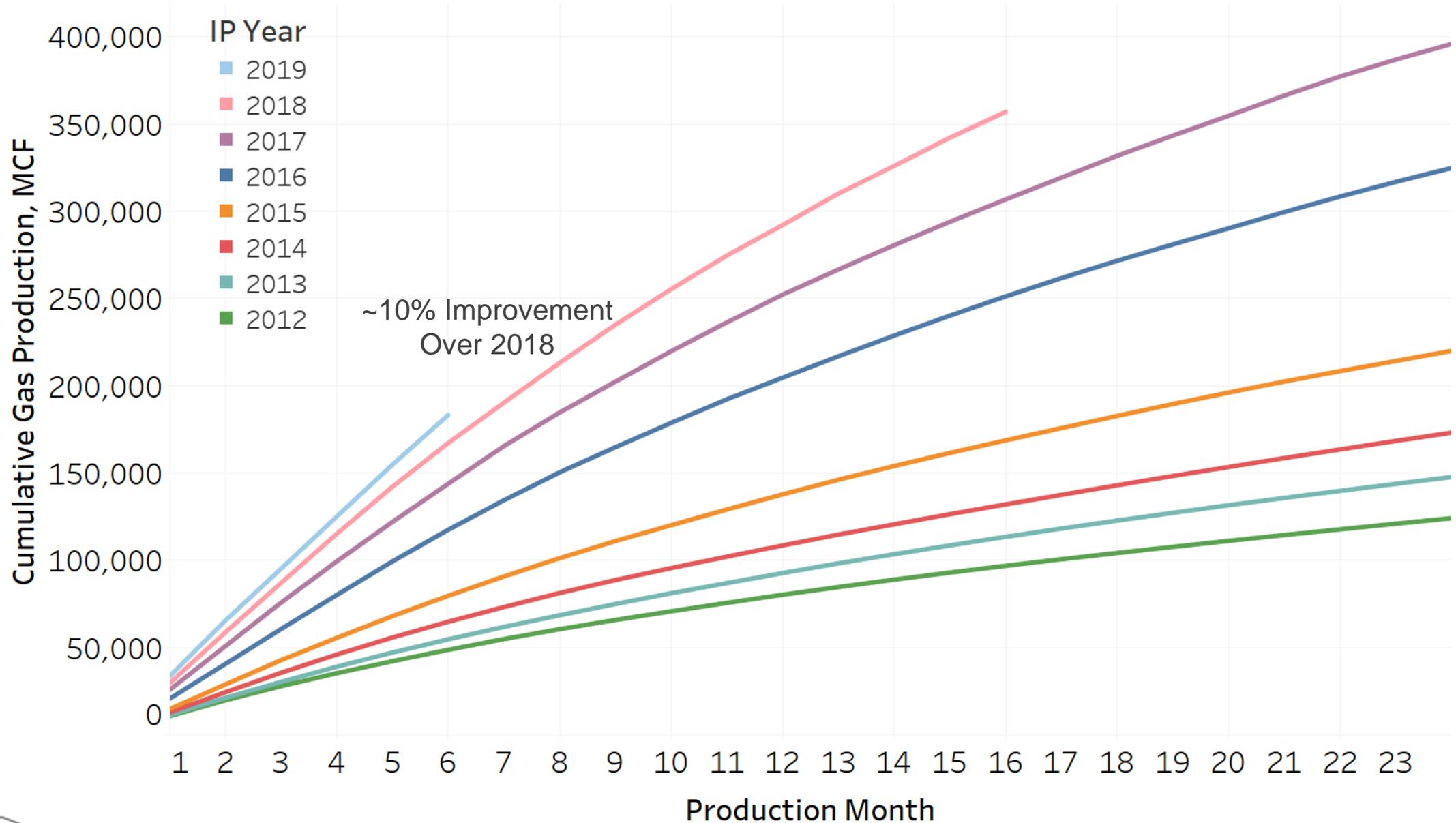


Transmission

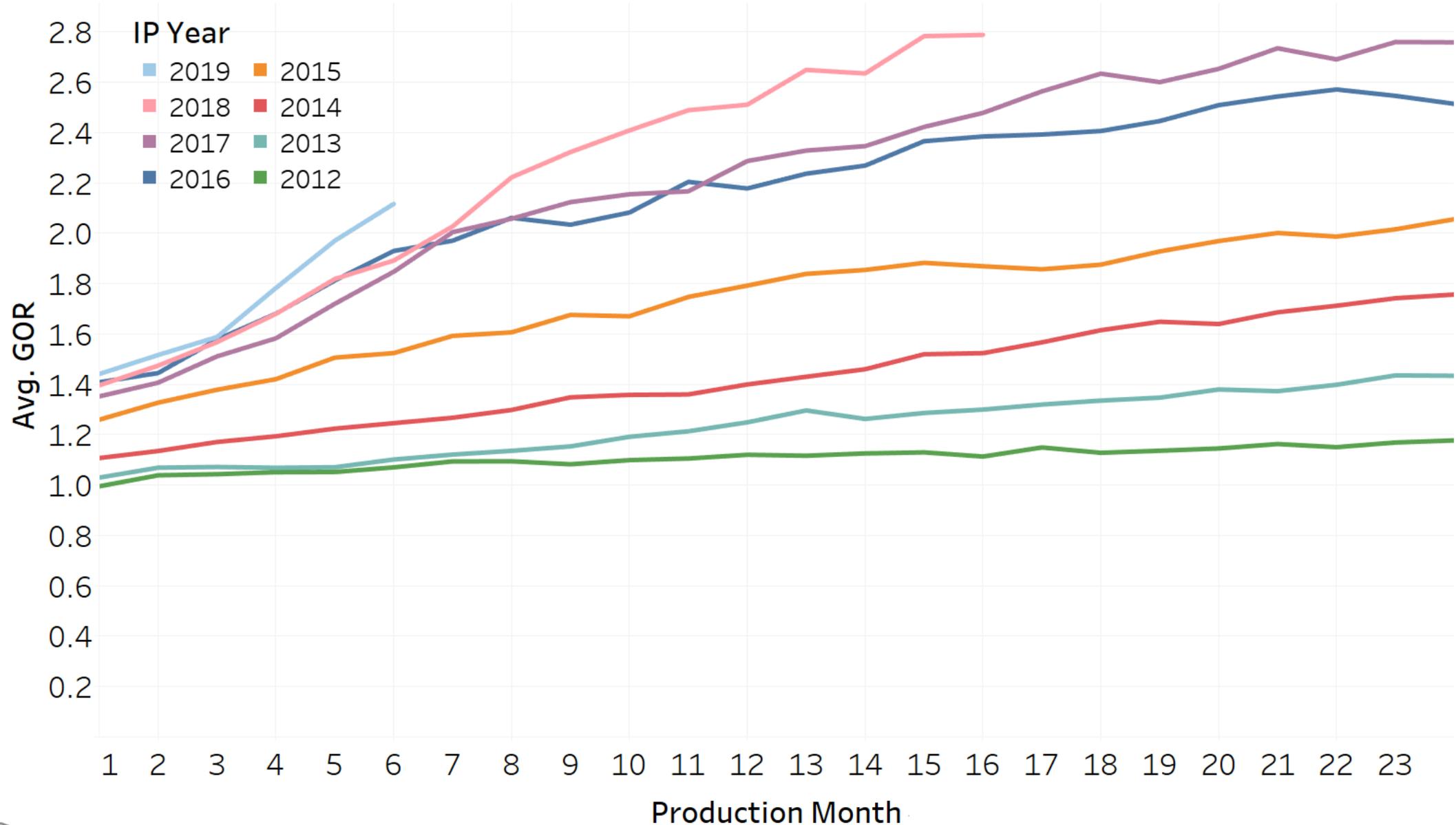
- Dry Gas
- Natural Gas Liquids



Statewide Gas Performance

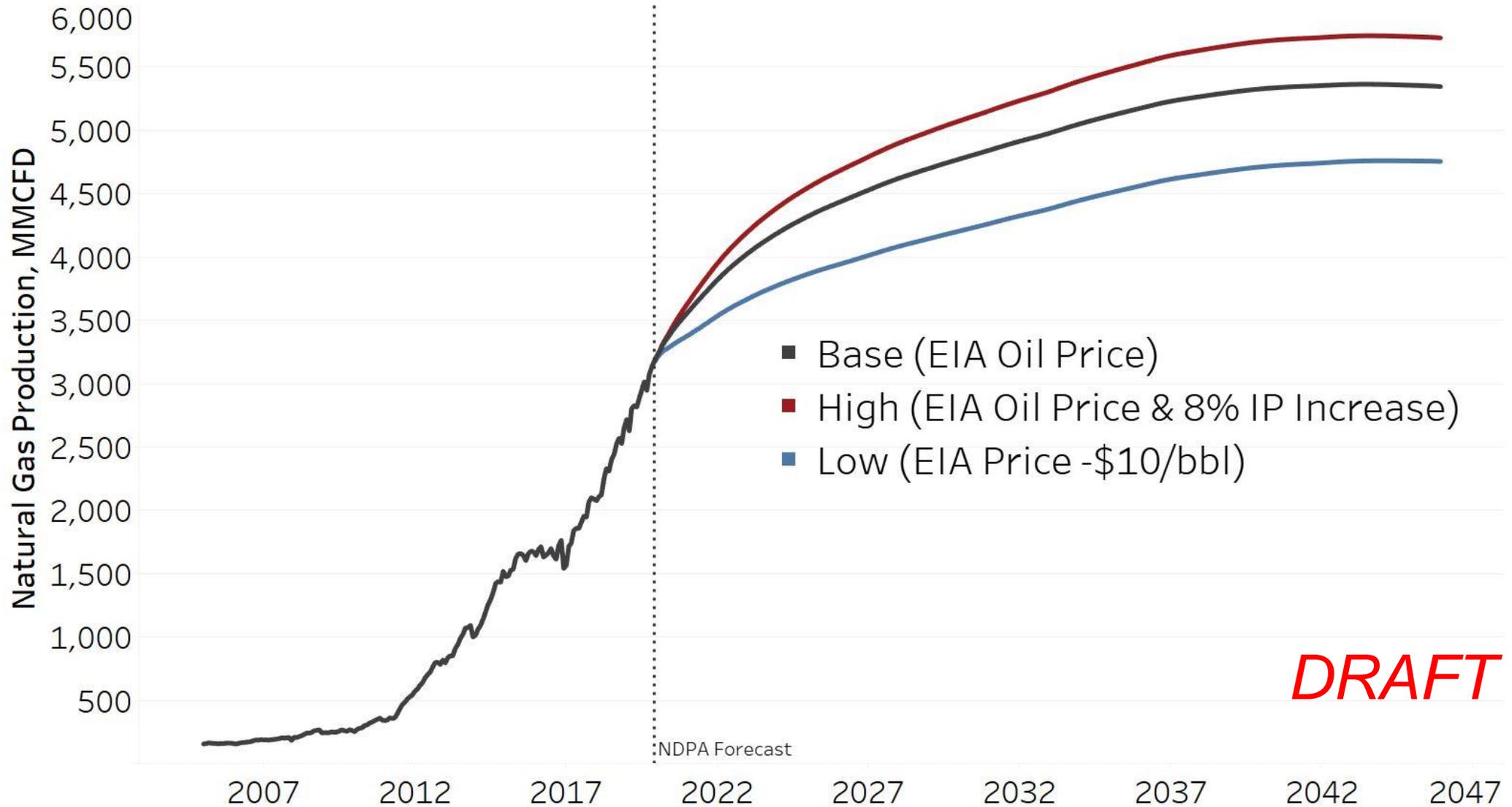


Statewide Gas-Oil Ratio



NDPA North Dakota Gas Production Forecast

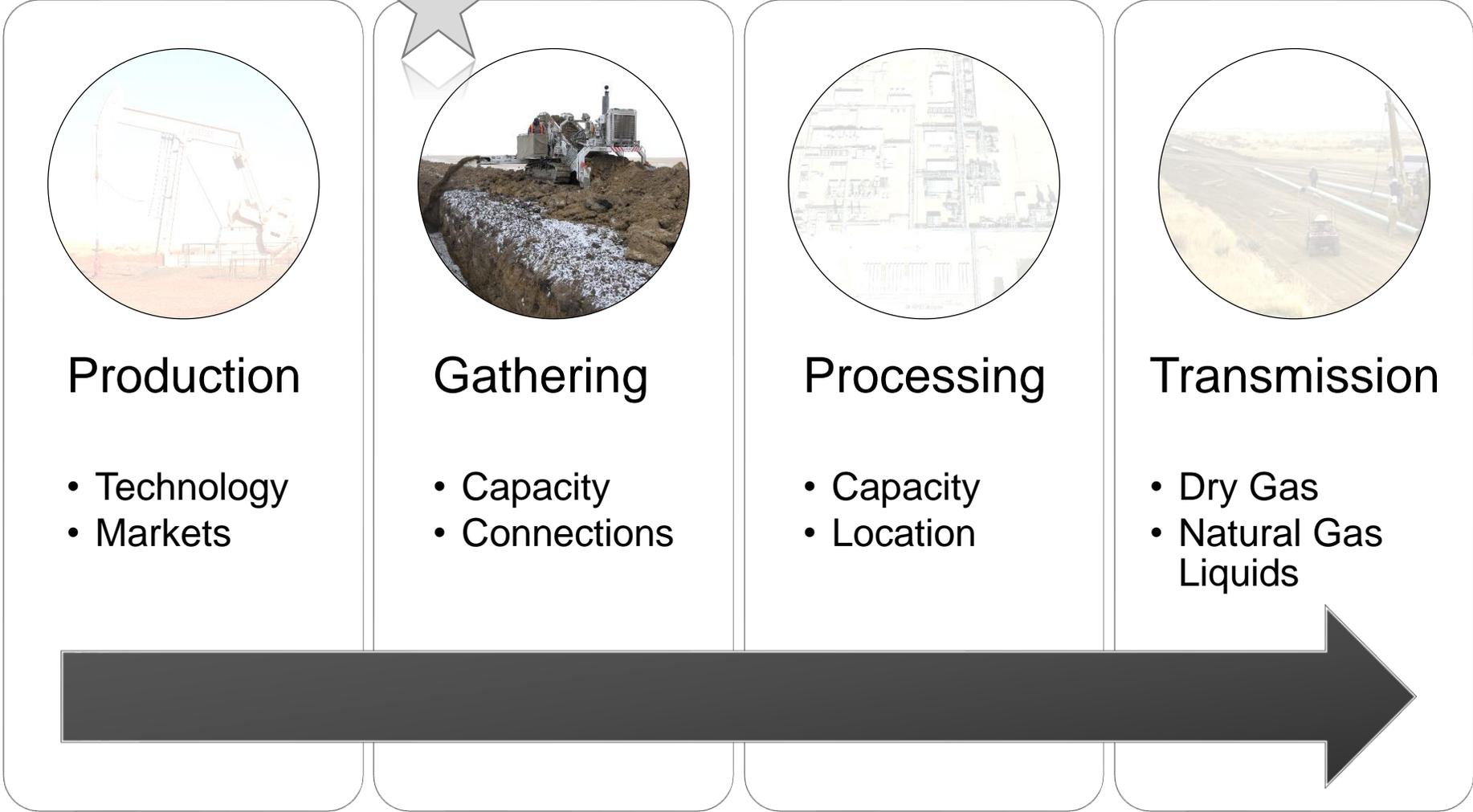
Assumes Current Technology – Enhanced Oil Recovery Not Included



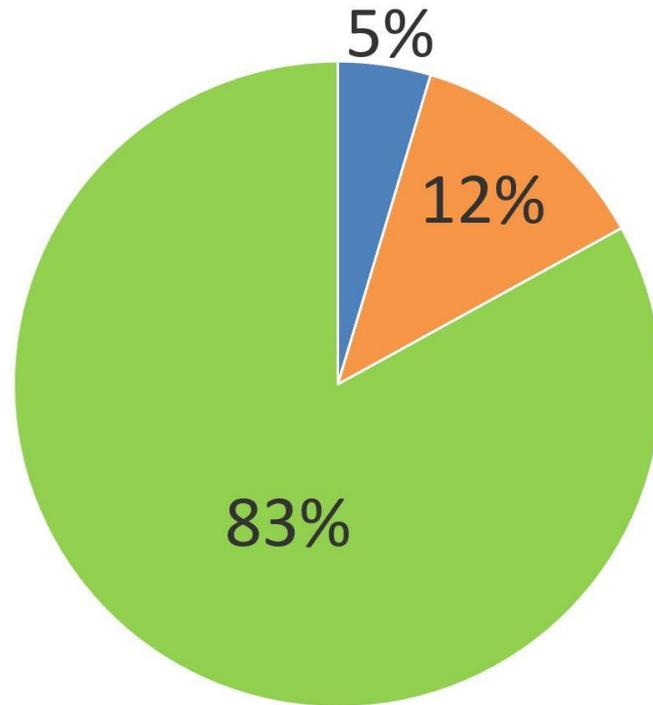
DRAFT



Natural Gas Update



Solving the Flaring Challenge



Statewide

GREEN – % of gas captured and sold
Blue – % flared from zero sales wells
Orange – % flared from wells with at least one mcf sold.

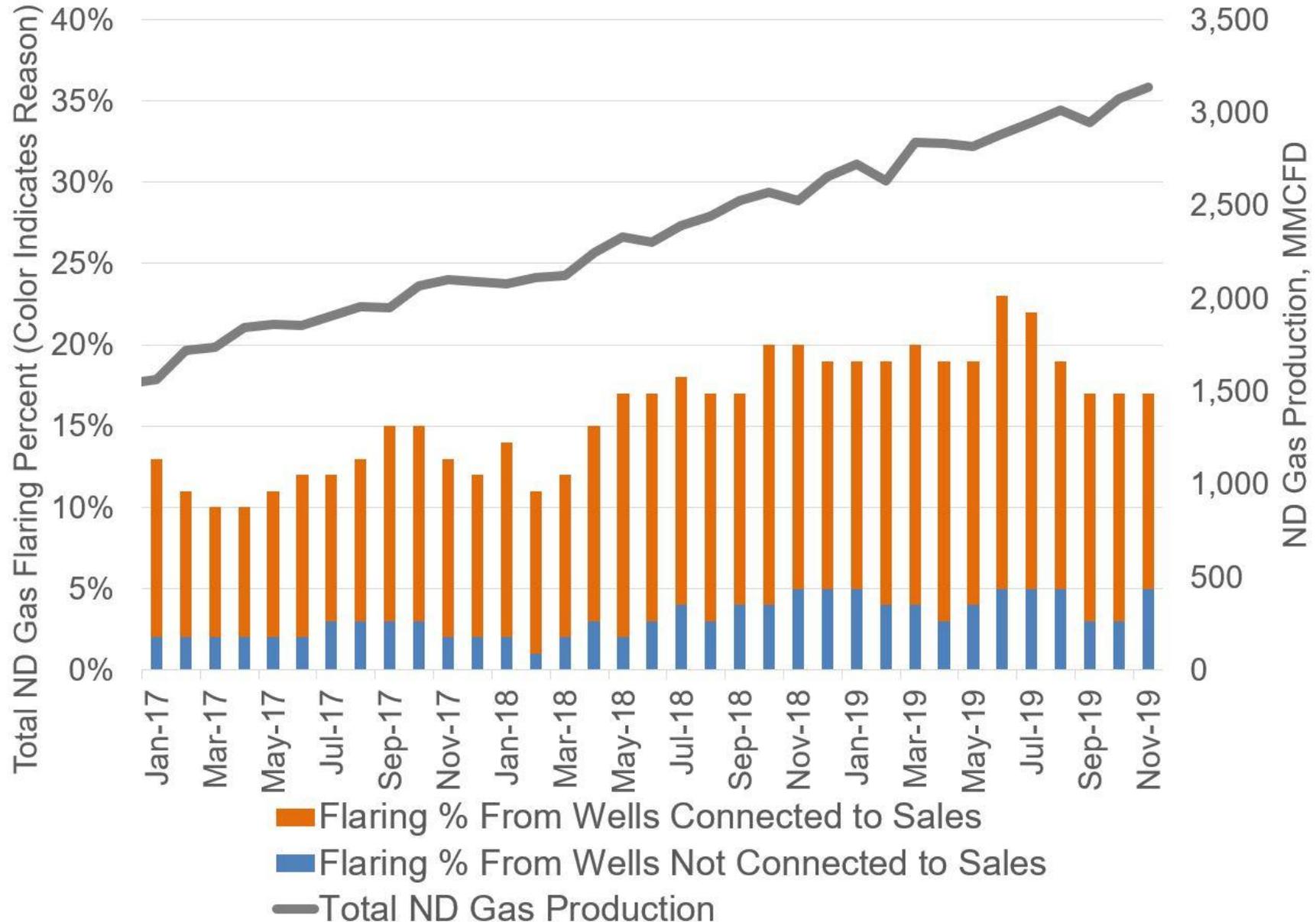
Simple Terms

Blue – Lack of pipelines
Orange – Challenges on existing infrastructure

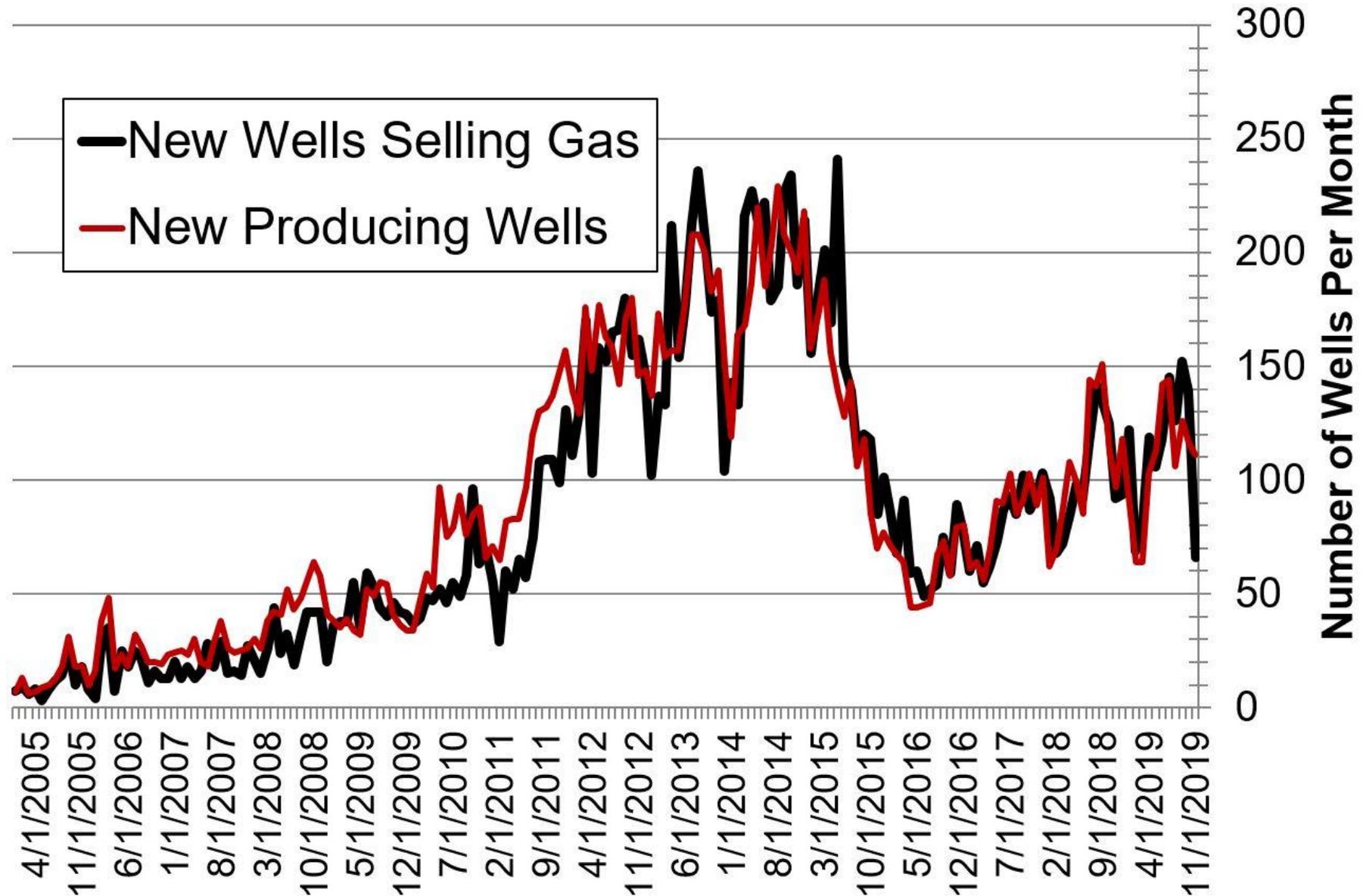
Nov. 2019 Data – Non-Confidential Wells



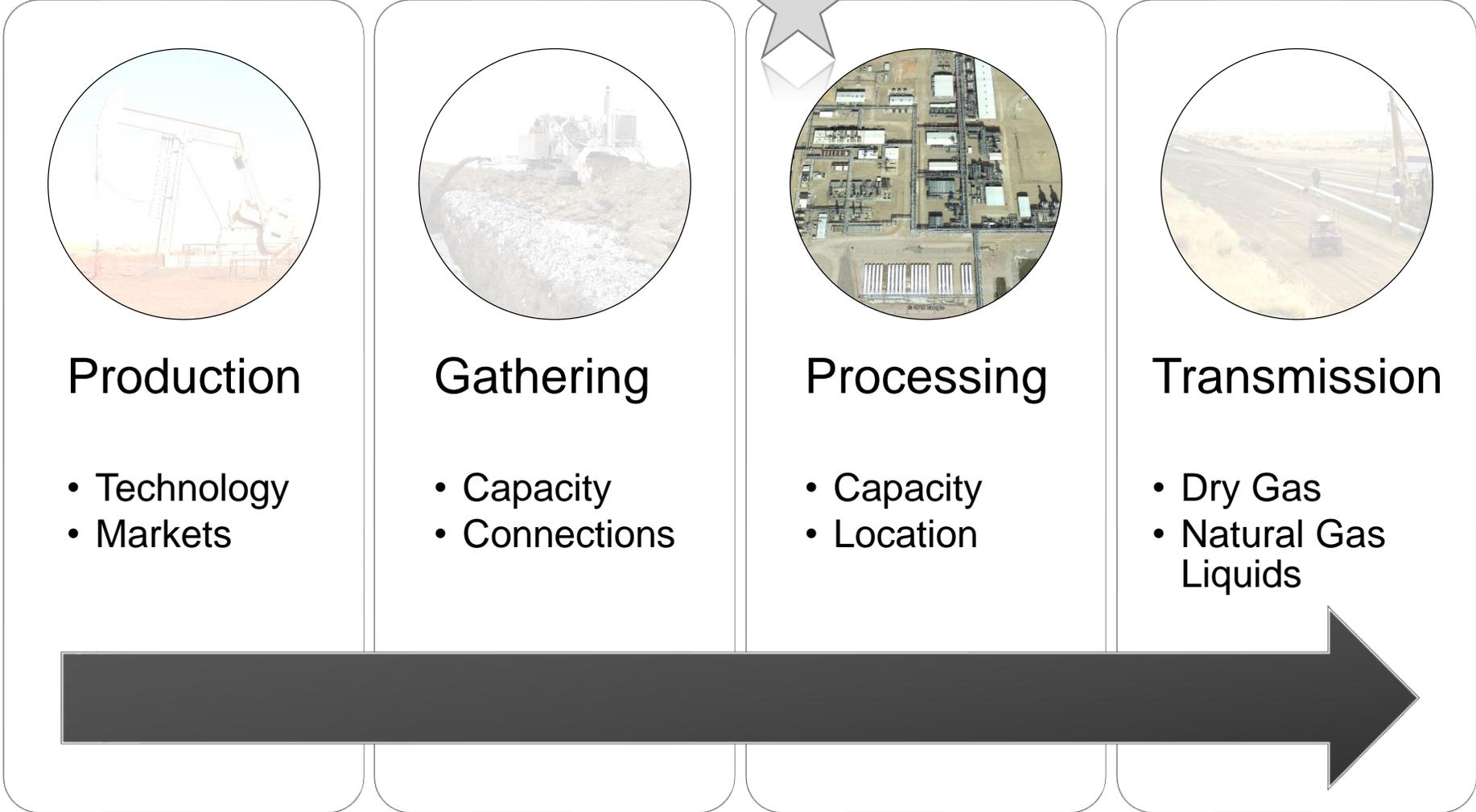
Solving the Flaring Challenge



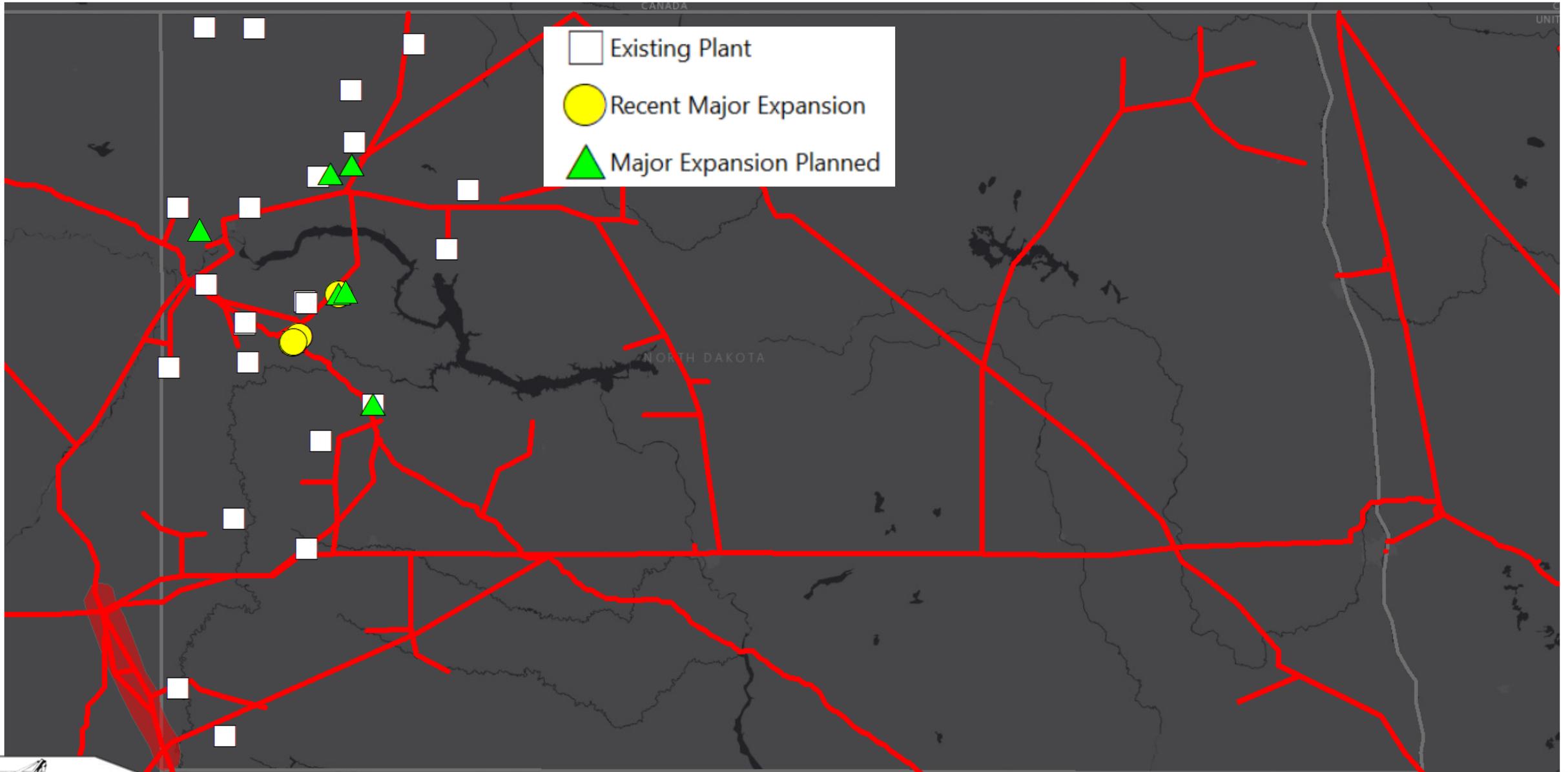
Solving the Flaring Challenge – Gas Connections



Natural Gas Update

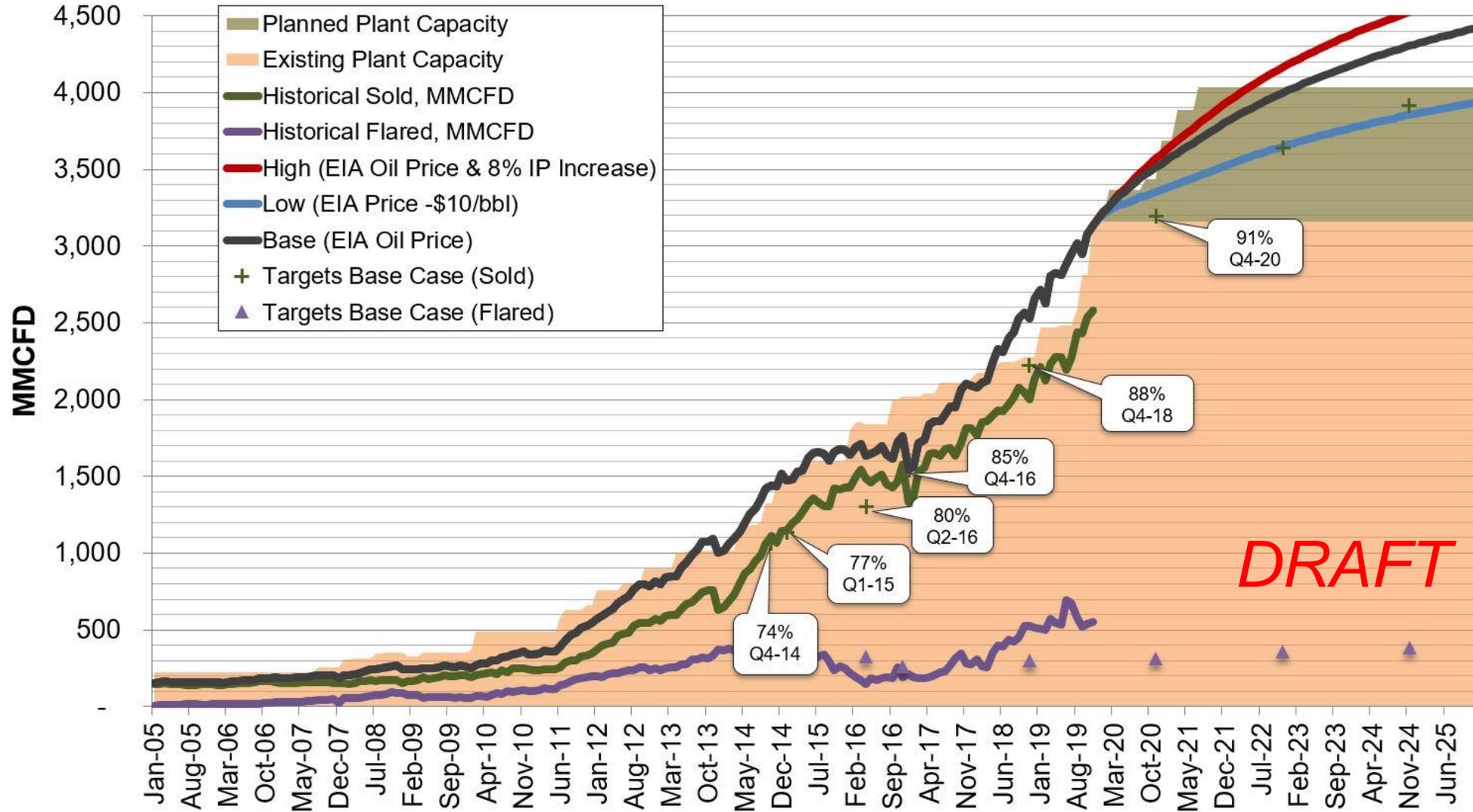


Gas Processing Expansions



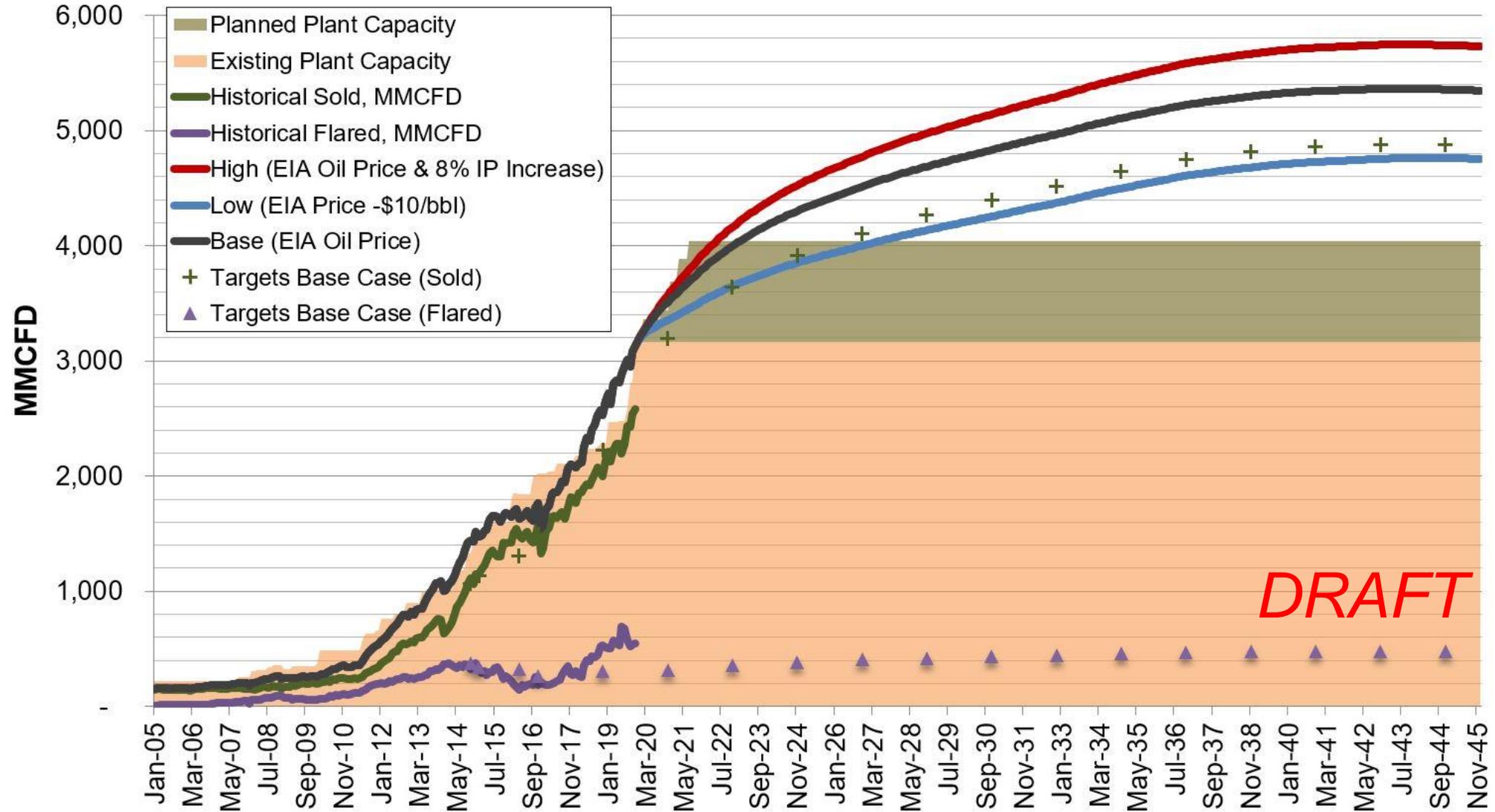
Solving the Flaring Challenge

Assumes Current Technology – Enhanced Oil Recovery Not Included



Solving the Flaring Challenge

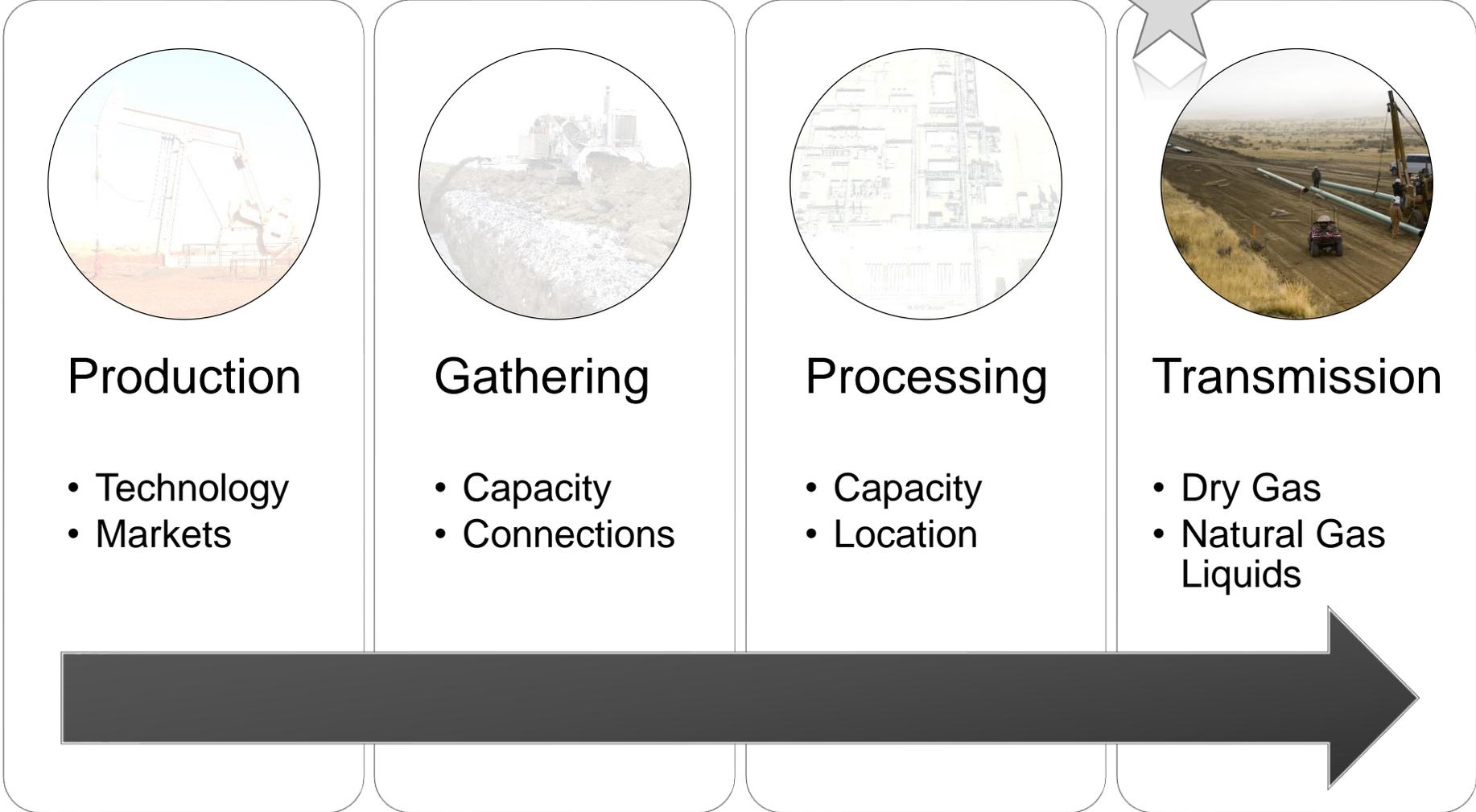
Assumes Current Technology – Enhanced Oil Recovery Not Included



DRAFT

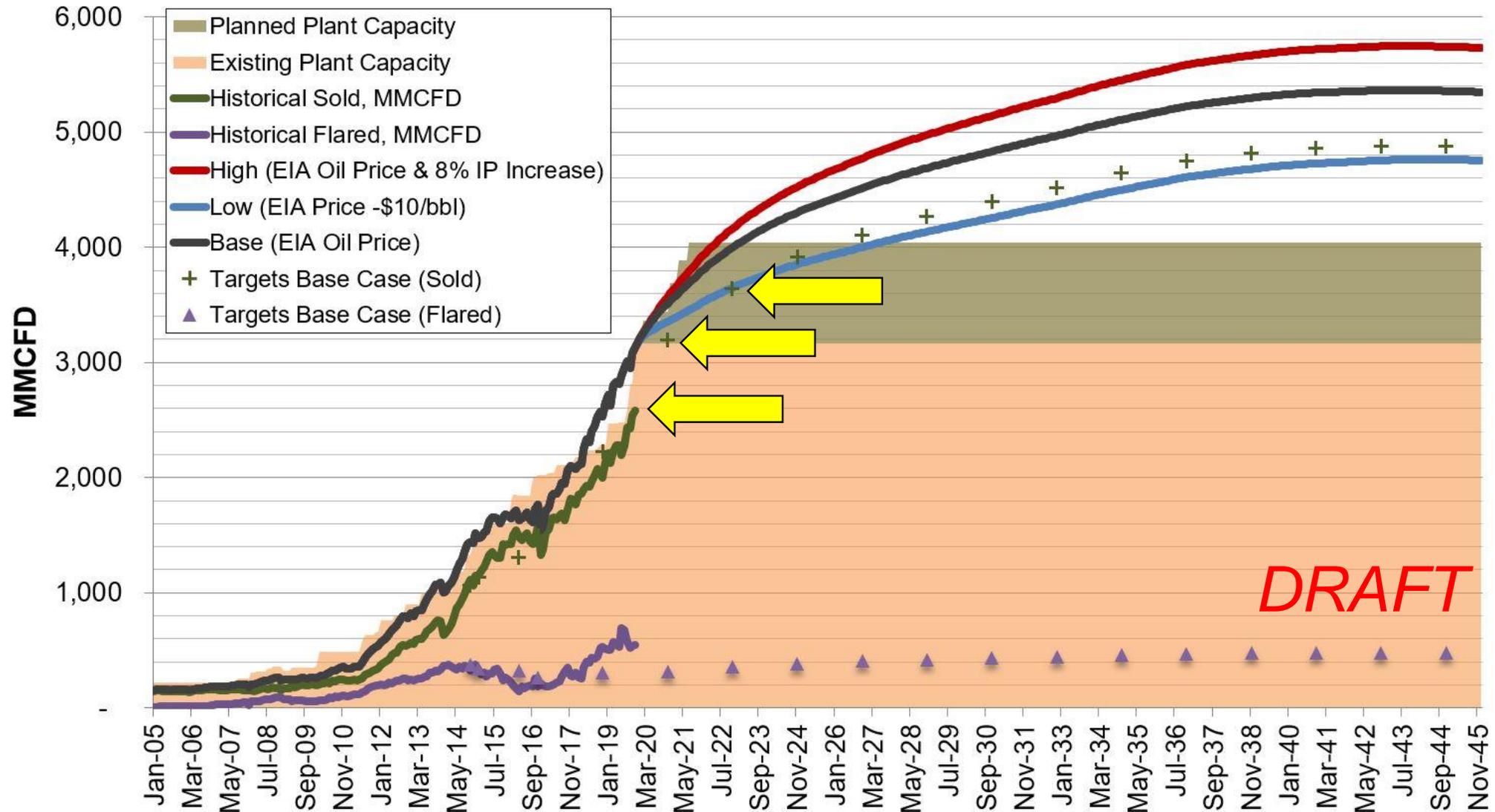


Natural Gas Update

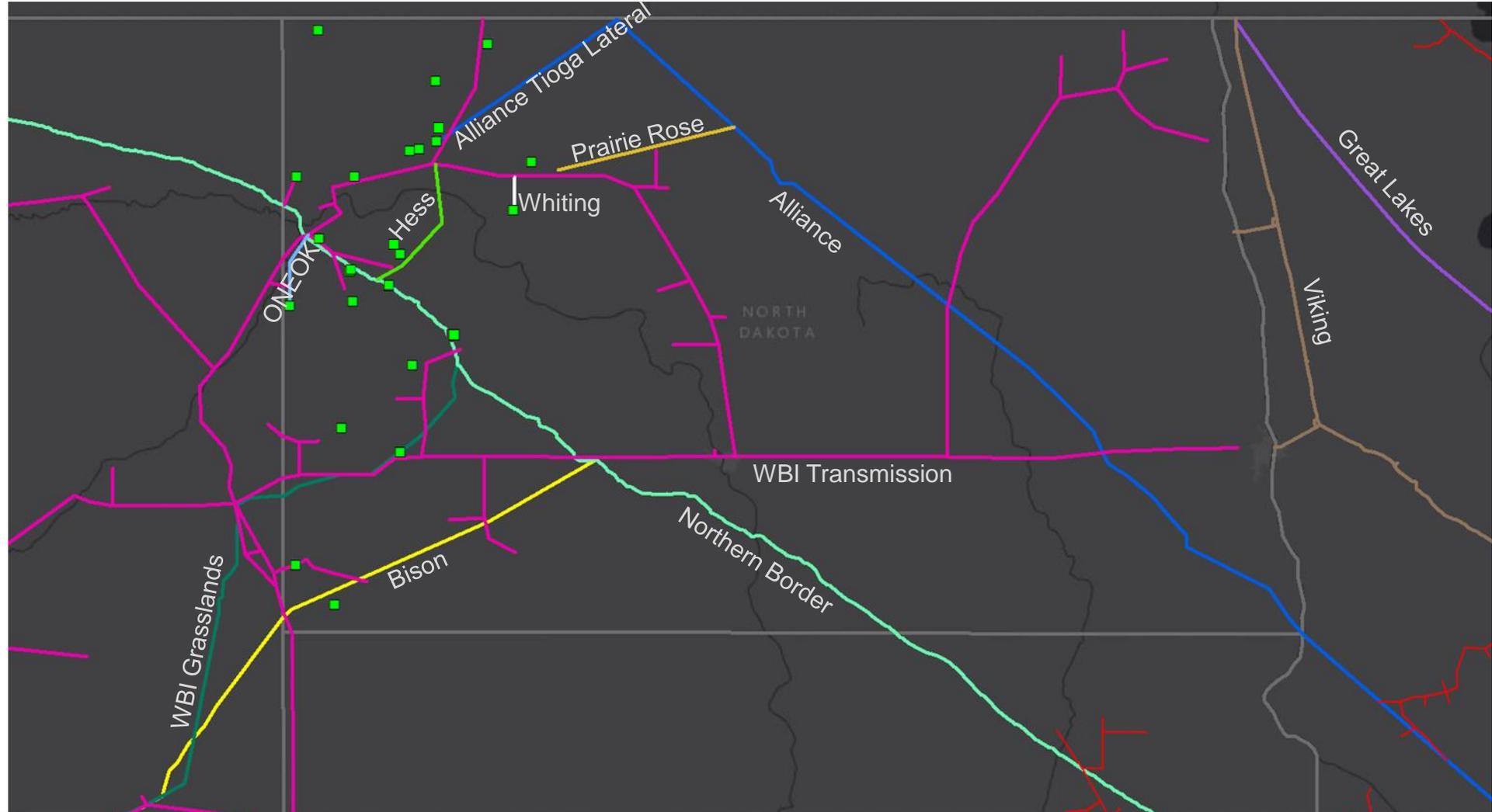


Solving the Flaring Challenge

Assumes Current Technology – Enhanced Oil Recovery Not Included



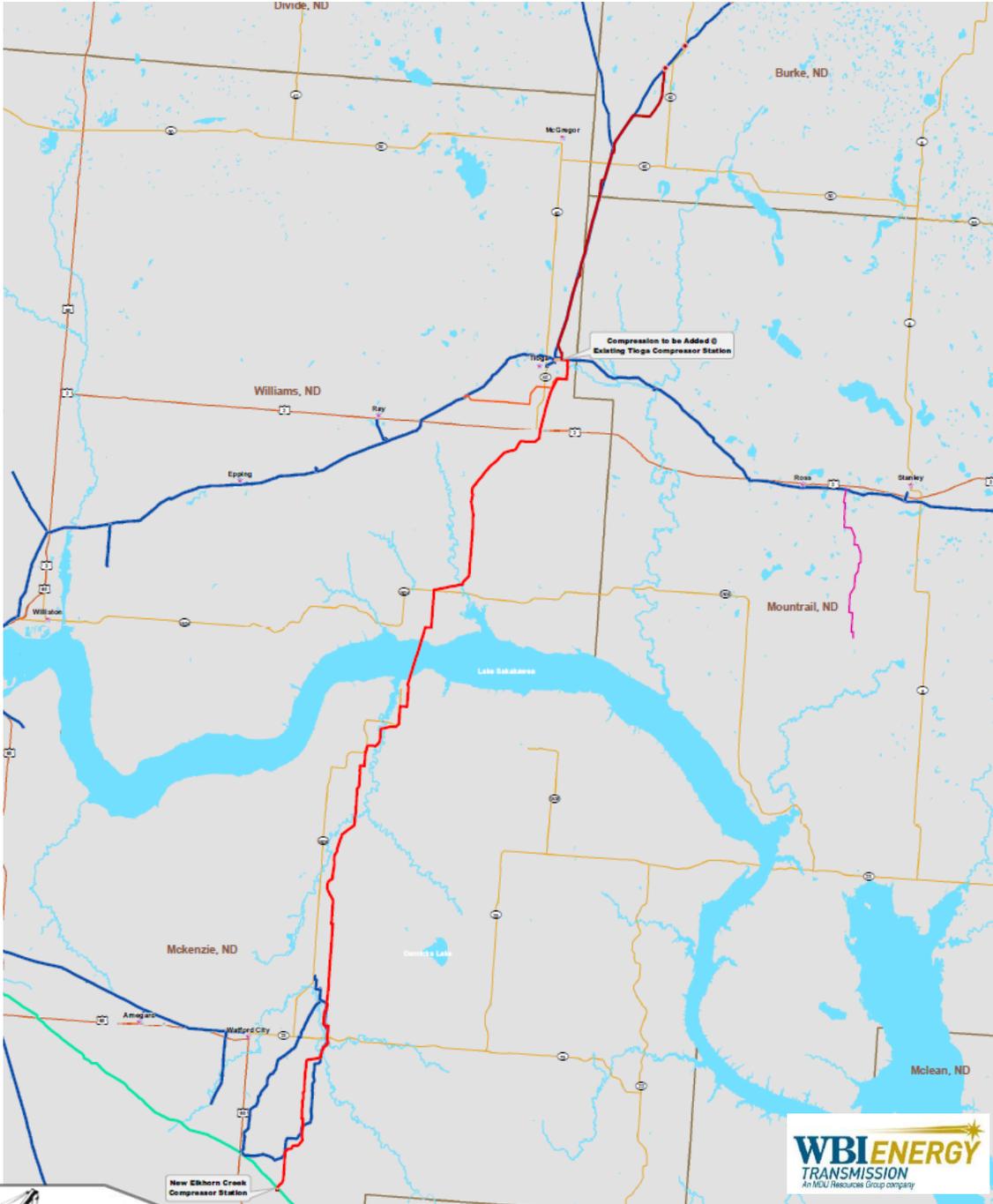
Major Gas Pipeline and Processing Infrastructure



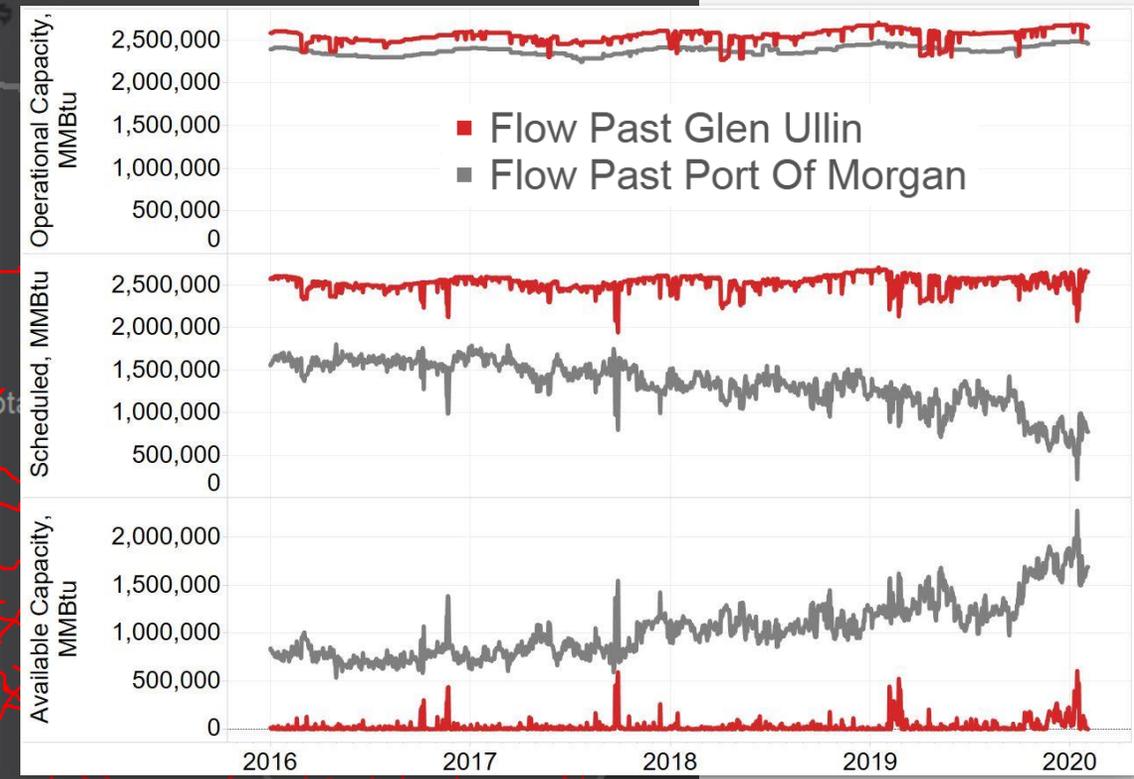
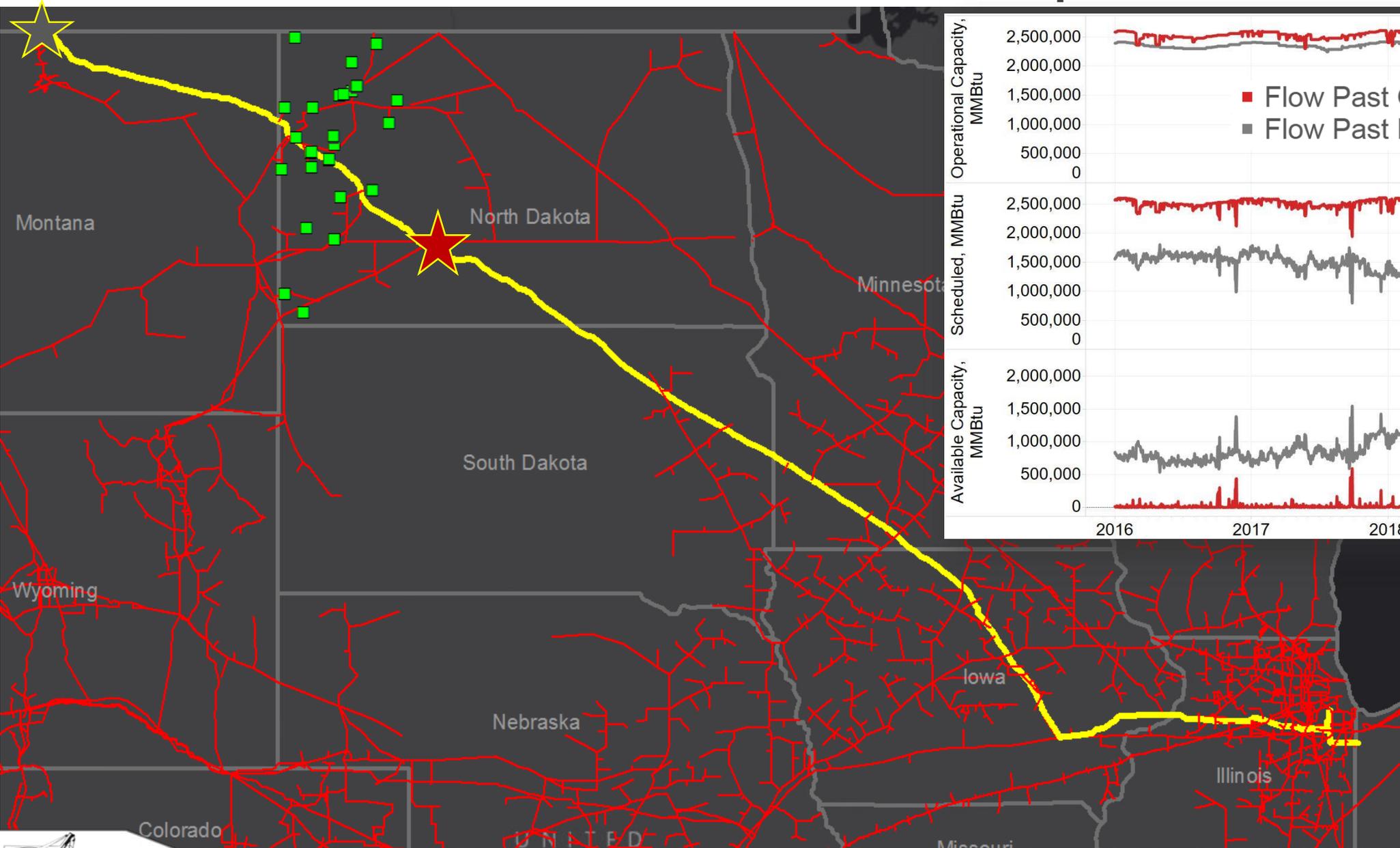
WBI Energy – North Bakken Expansion Project

Project Highlights

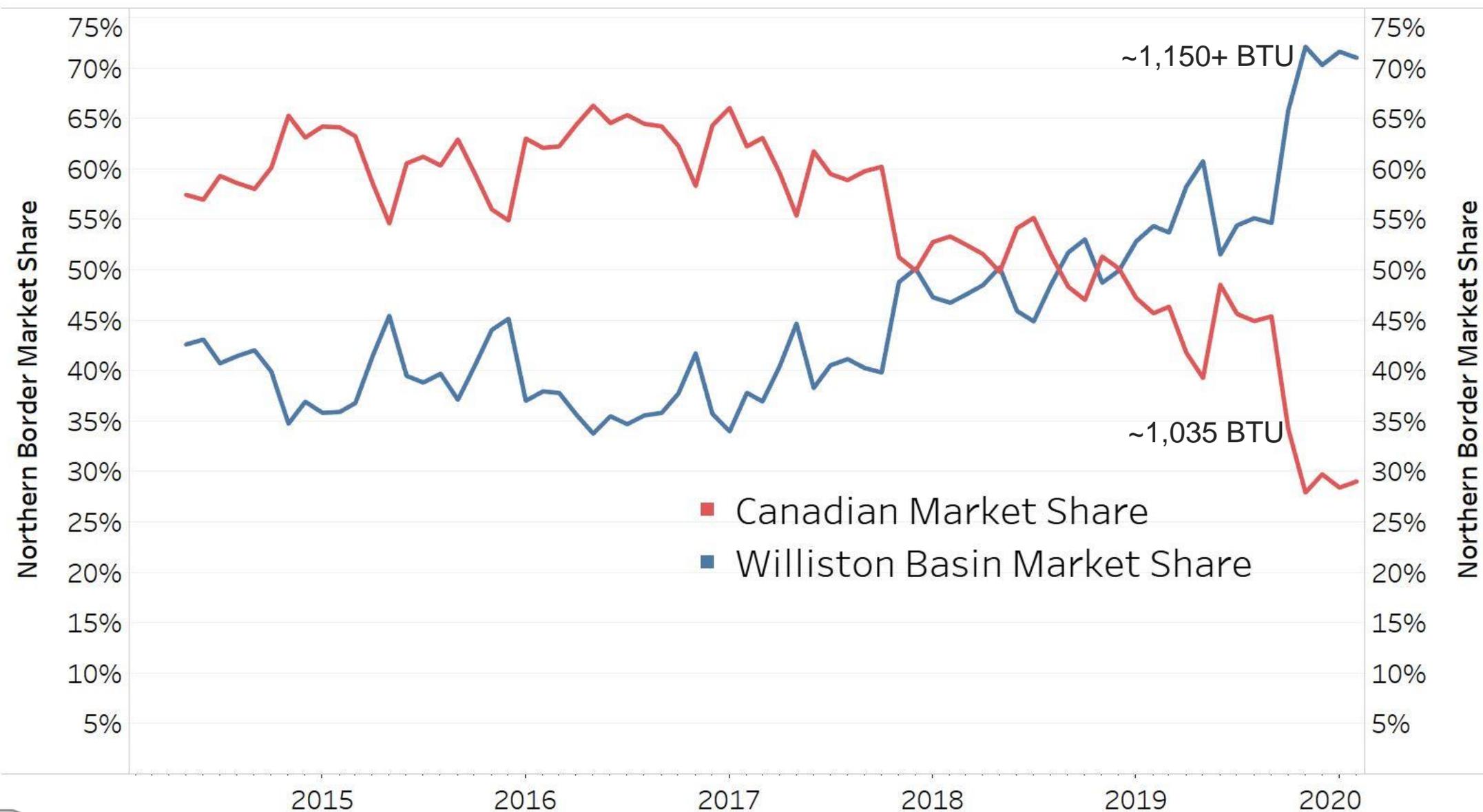
- 63 Miles - 24" Pipeline
- 20 Miles - 12" Pipeline
- \$220+ Million
- 350,000 MCFD Capacity (expandable)
- End of 2021 Proposed Completion
- Residue Gas Service From North of Lake Sakakawea to Northern Border Pipeline in McKenzie County



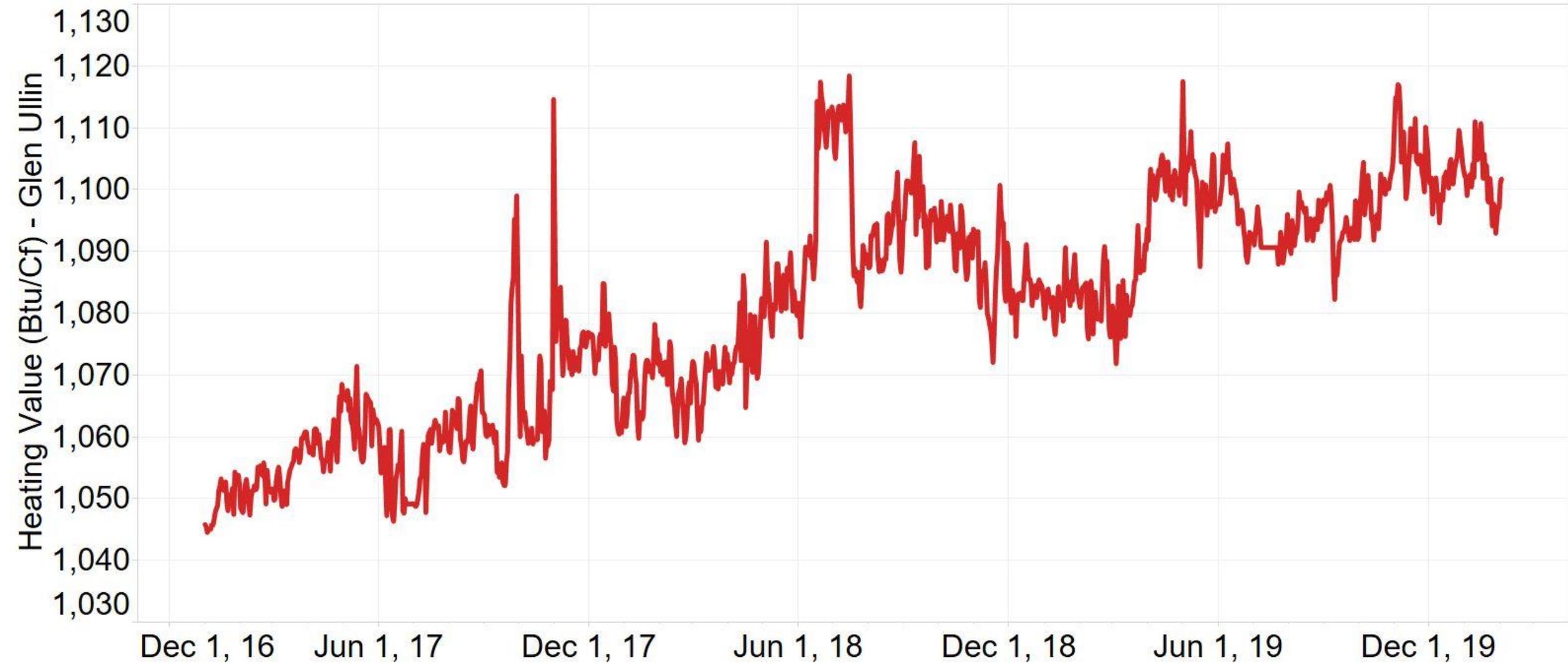
Northern Border Pipeline



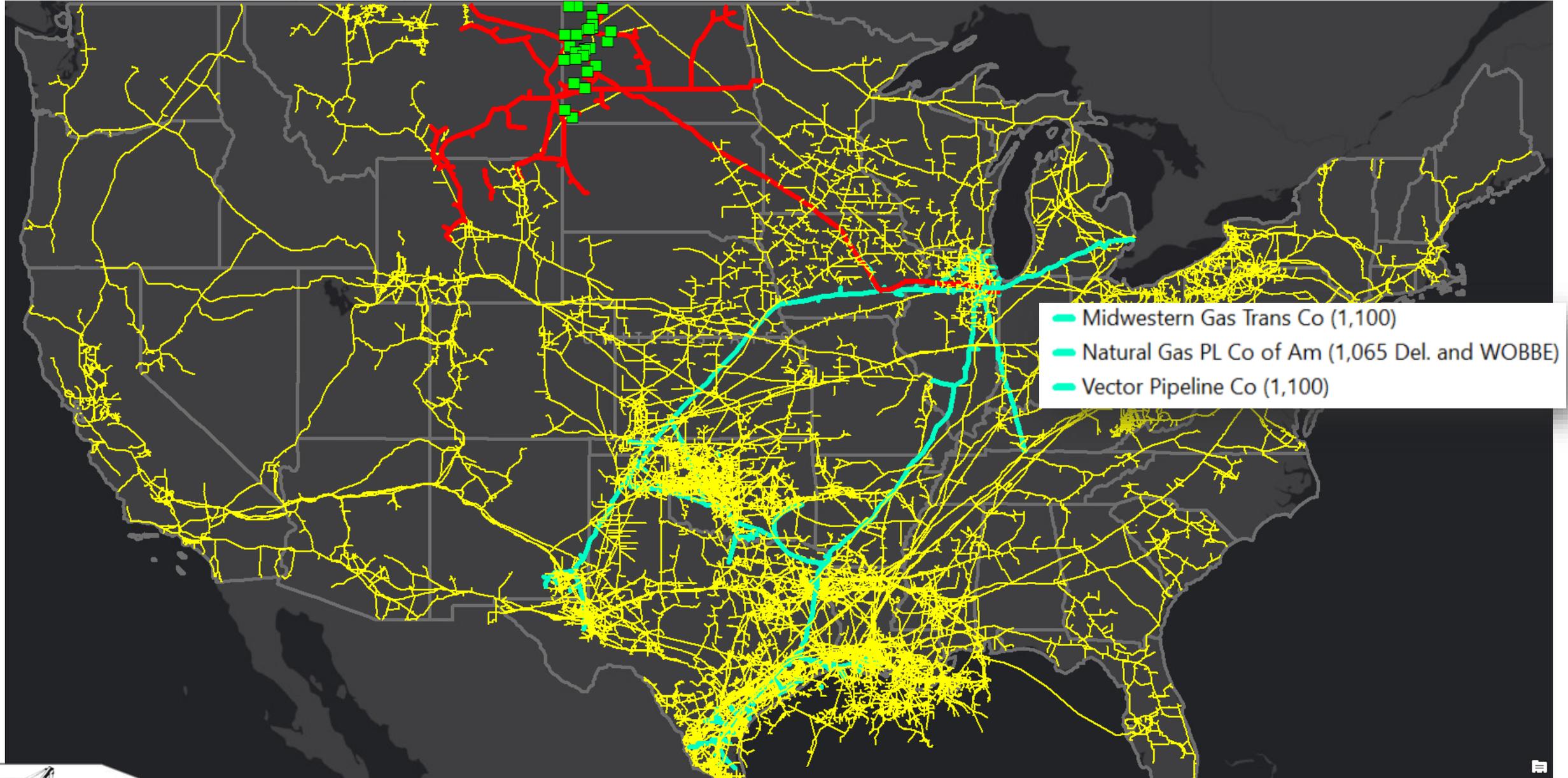
Northern Border Pipeline Market Share



Northern Border BTU at Glen Ullin, ND



NB Pipeline Interconnects With Known BTU Limits



Foothills System

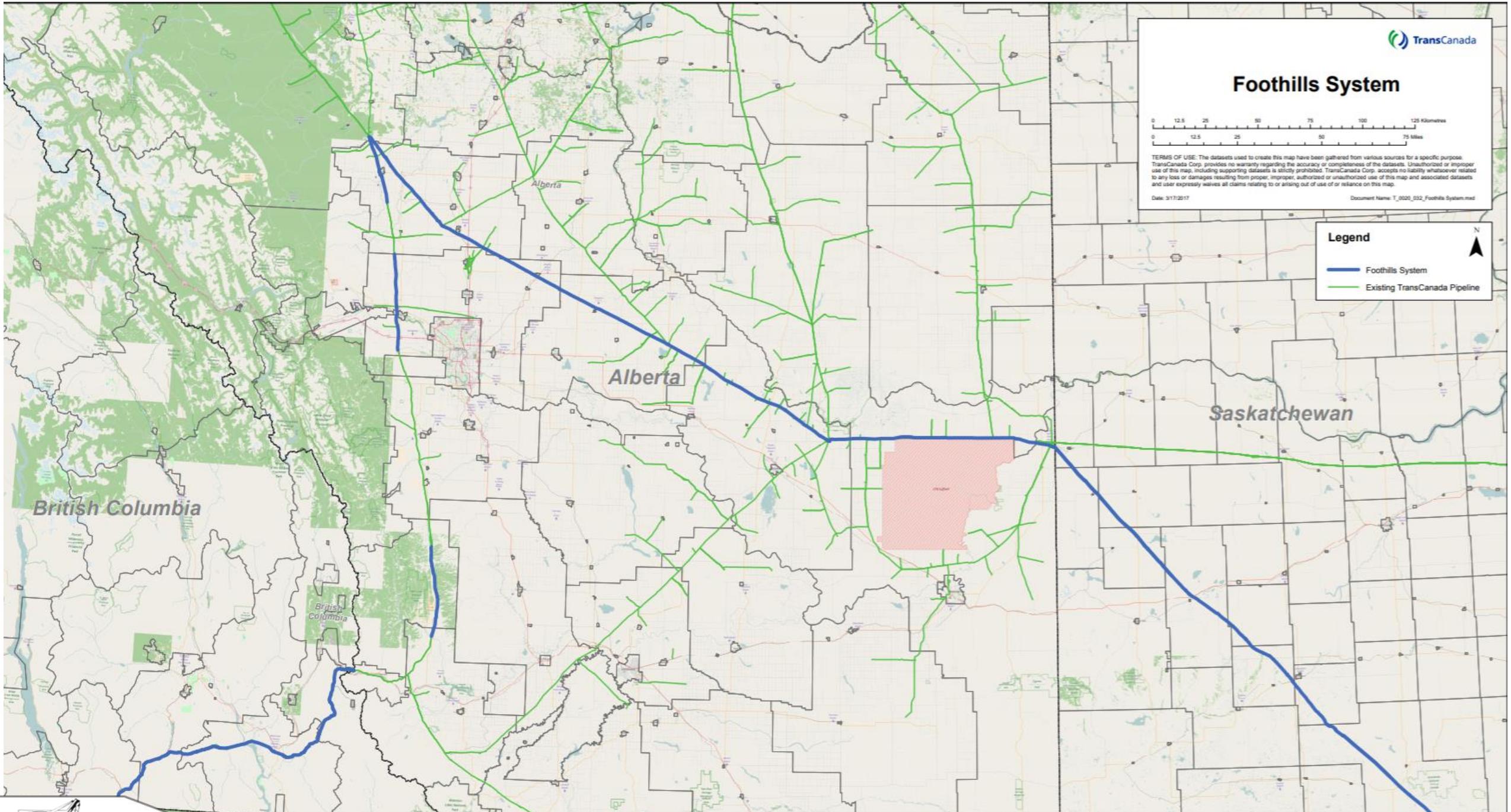


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Date: 3/17/2017 Document Name: T_0020_032_Foothills System.mxd

Legend

- Foothills System
- Existing TransCanada Pipeline

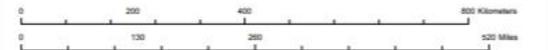




NATURAL GAS



Canadian Mainline



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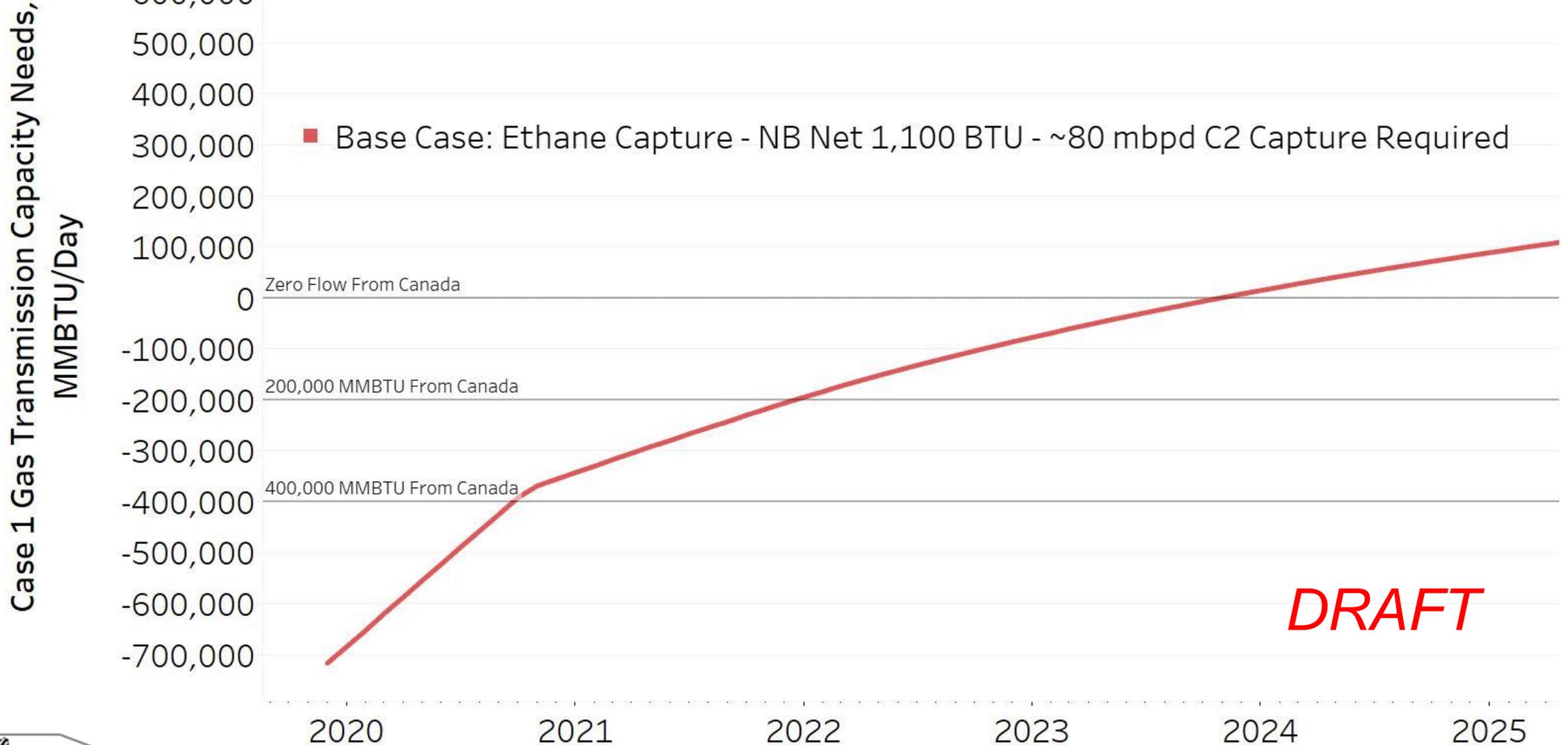
Date: 3/26/2017 Document Name: T_0020_050_D_CanadianMainline.mxd

Legend

- Canadian Mainline
- Existing TransCanada Pipeline

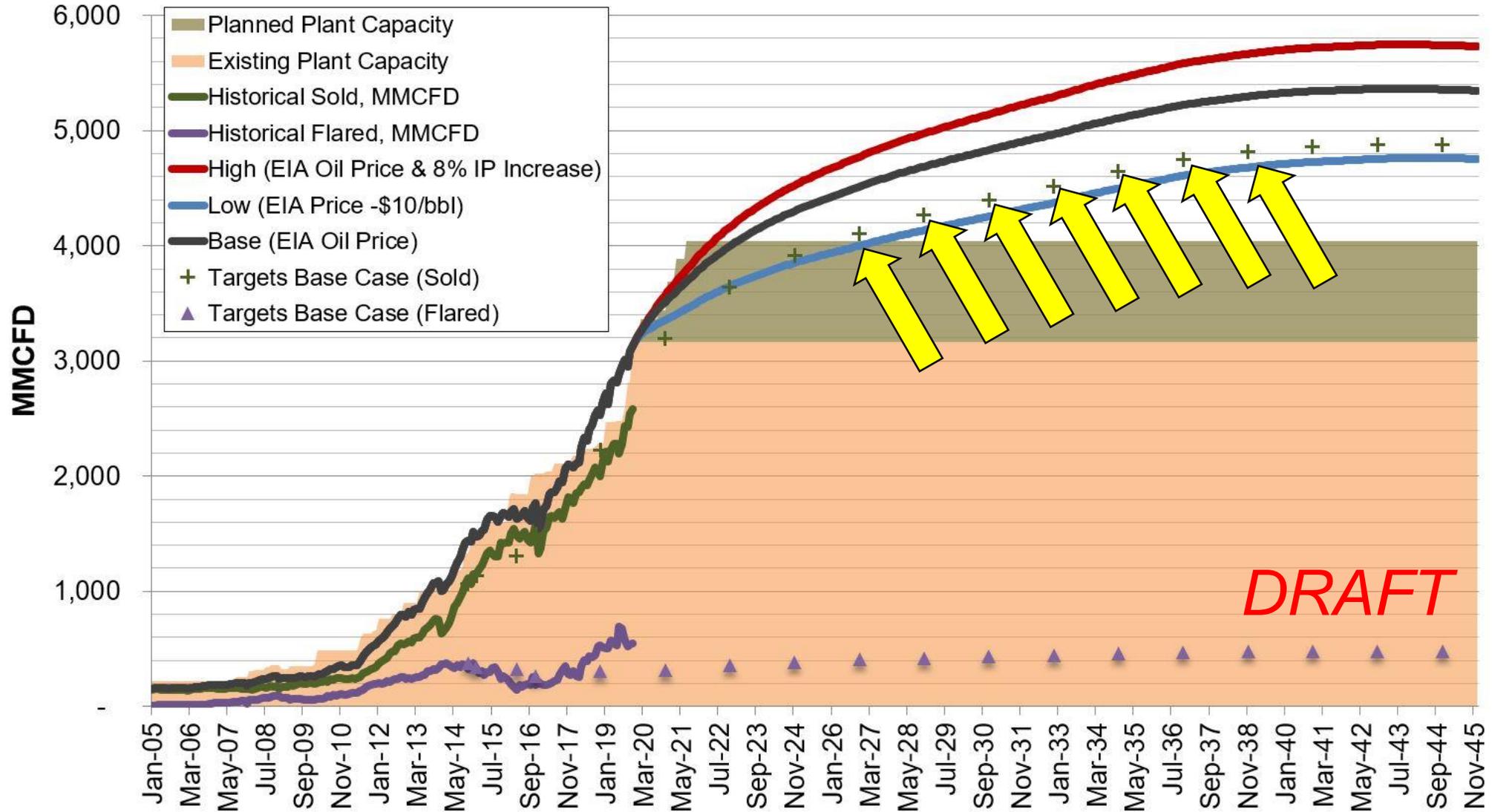


Northern Border – BTU Calculations*

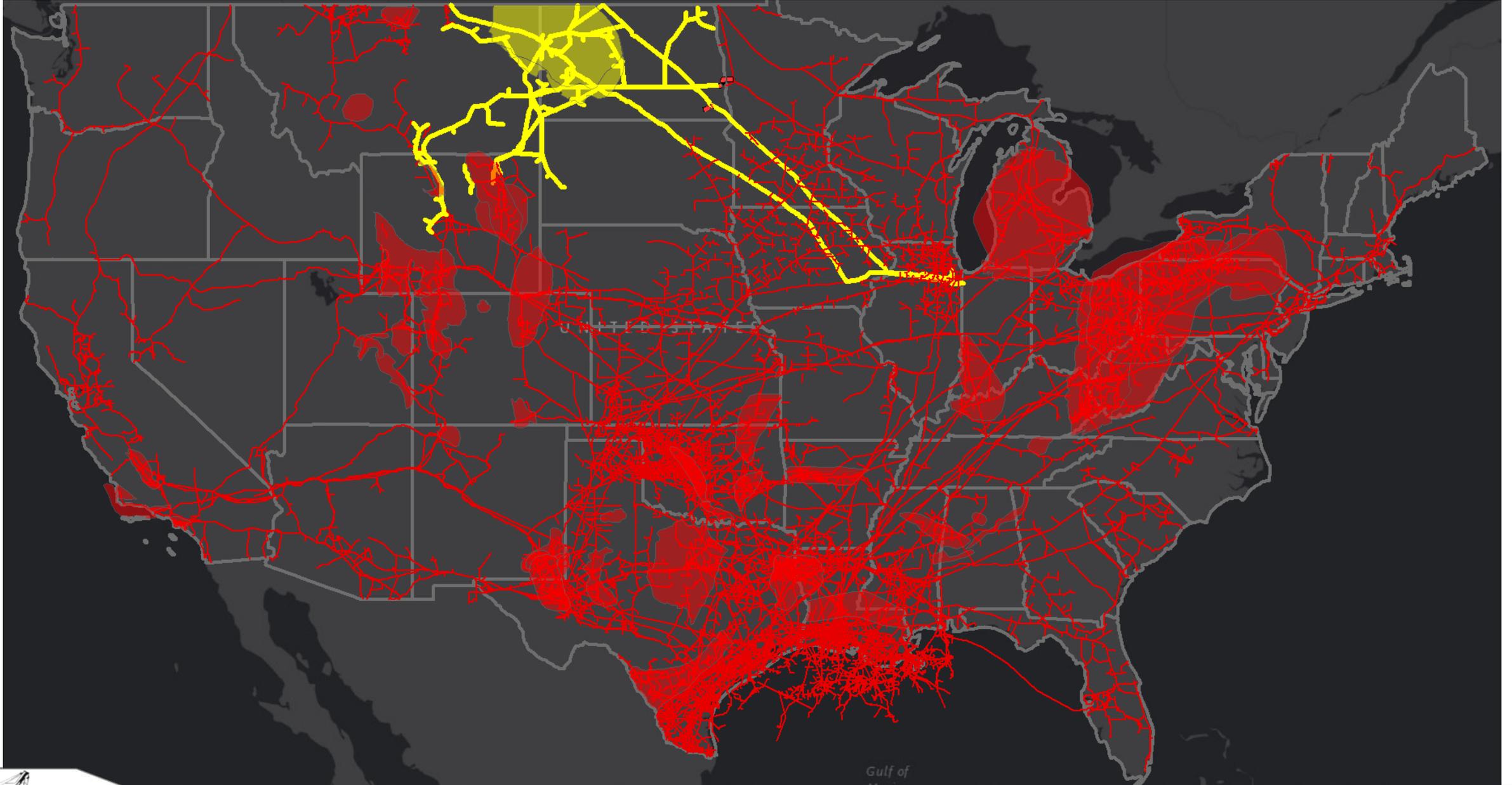


Solving the Flaring Challenge

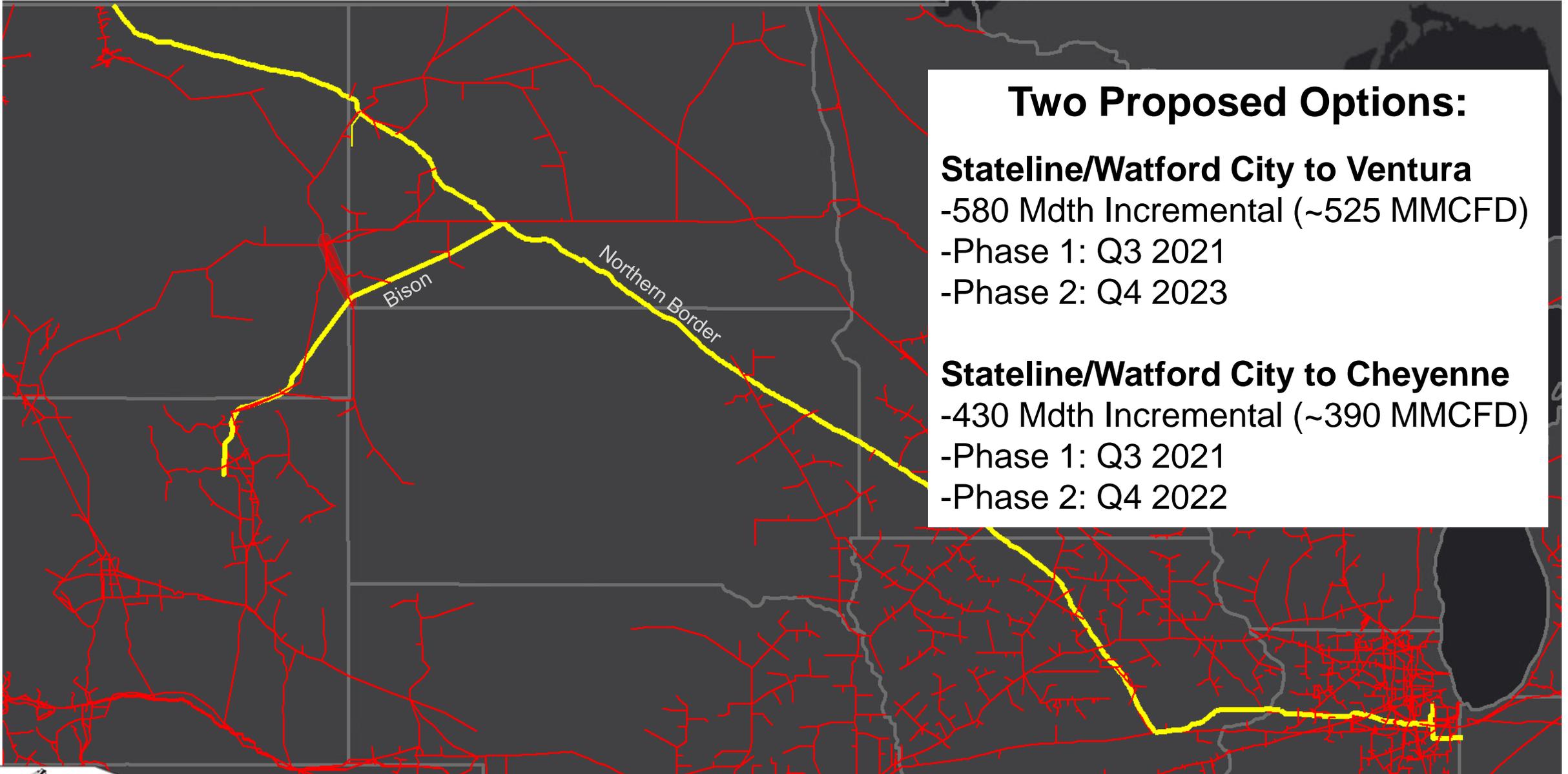
Assumes Current Technology – Enhanced Oil Recovery Not Included



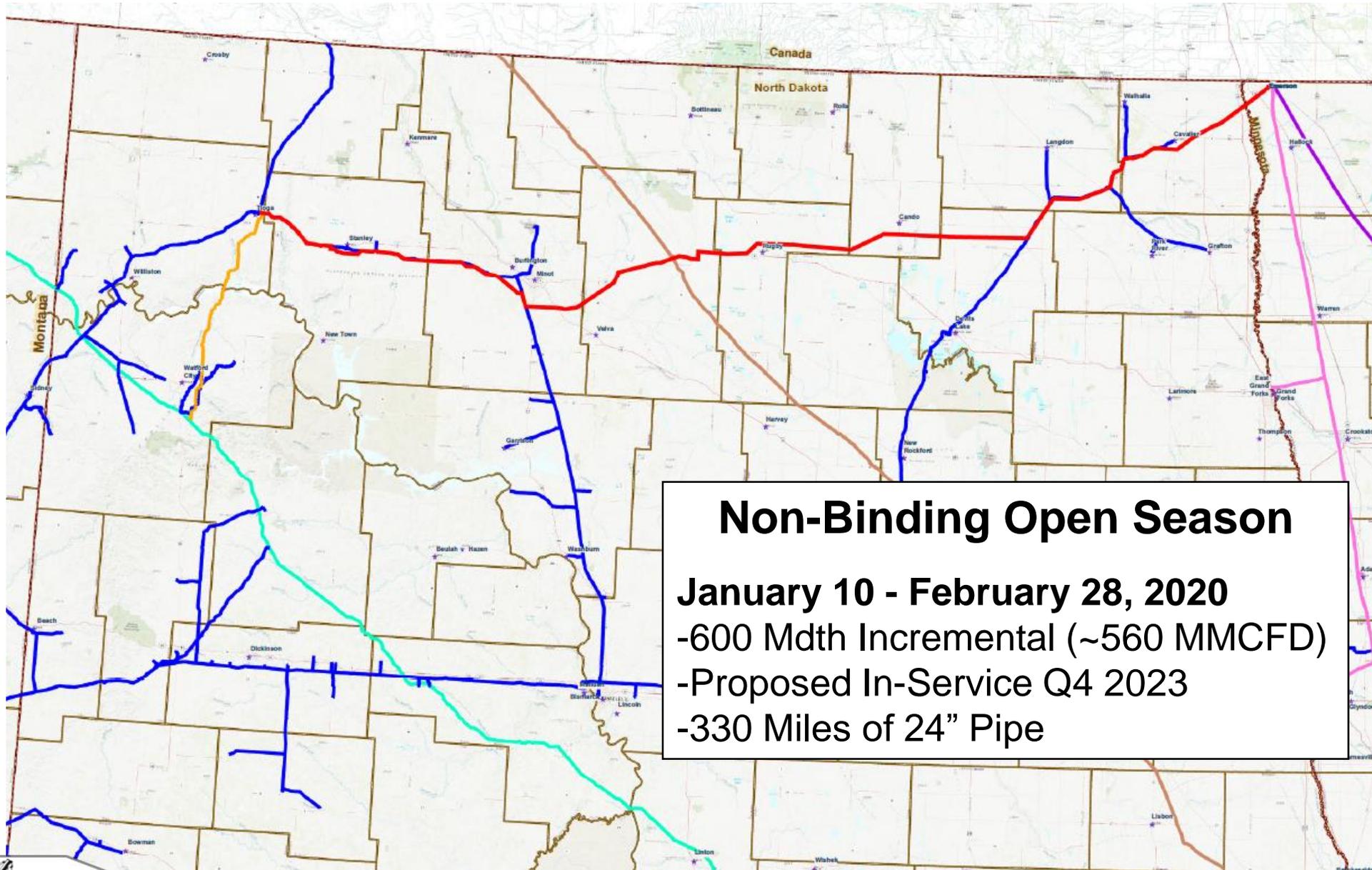
Bakken Natural Gas Infrastructure



Northern Border Proposed Expansion Options



WBI Energy Tioga to Emerson Proposal



Tioga - Emerson
Overview Exhibit

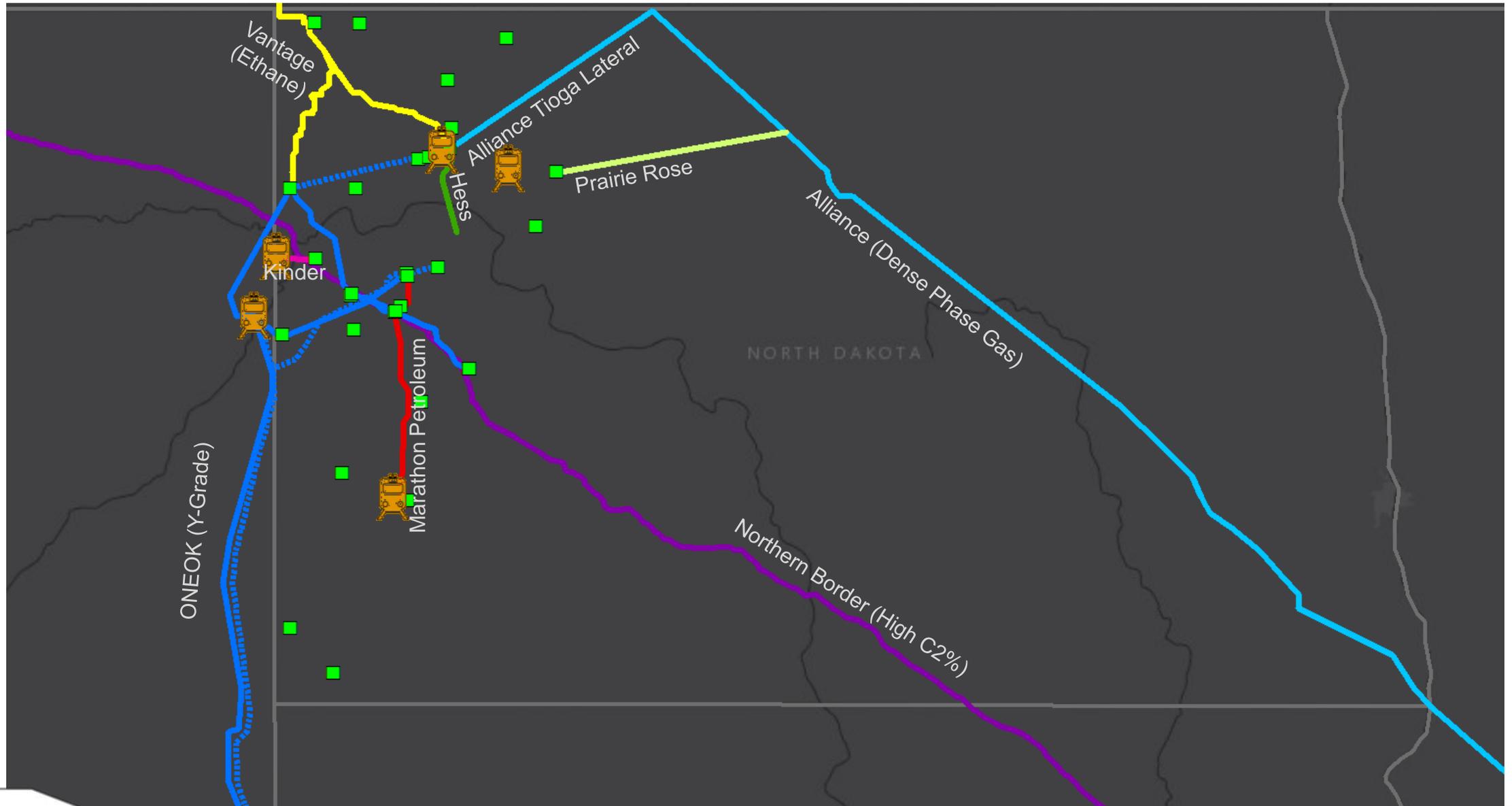
Non-Binding Open Season
January 10 - February 28, 2020
-600 Mdth Incremental (~560 MMCFD)
-Proposed In-Service Q4 2023
-330 Miles of 24" Pipe

- Legend
- ★ Cities
 - Red line Tioga-Emerson
 - Orange line North Bakken Expansion Project
 - Blue line Existing WBI System
 - Foreign Natural Gas Pipelines
 - Light blue line Alliance Pipeline
 - Light green line Northern Border Pipeline
 - Pink line Viking Gas Transmission
 - Purple line Great Lakes Gas Transmission
 - Red dashed line State Boundaries
 - Yellow dashed line County Boundaries

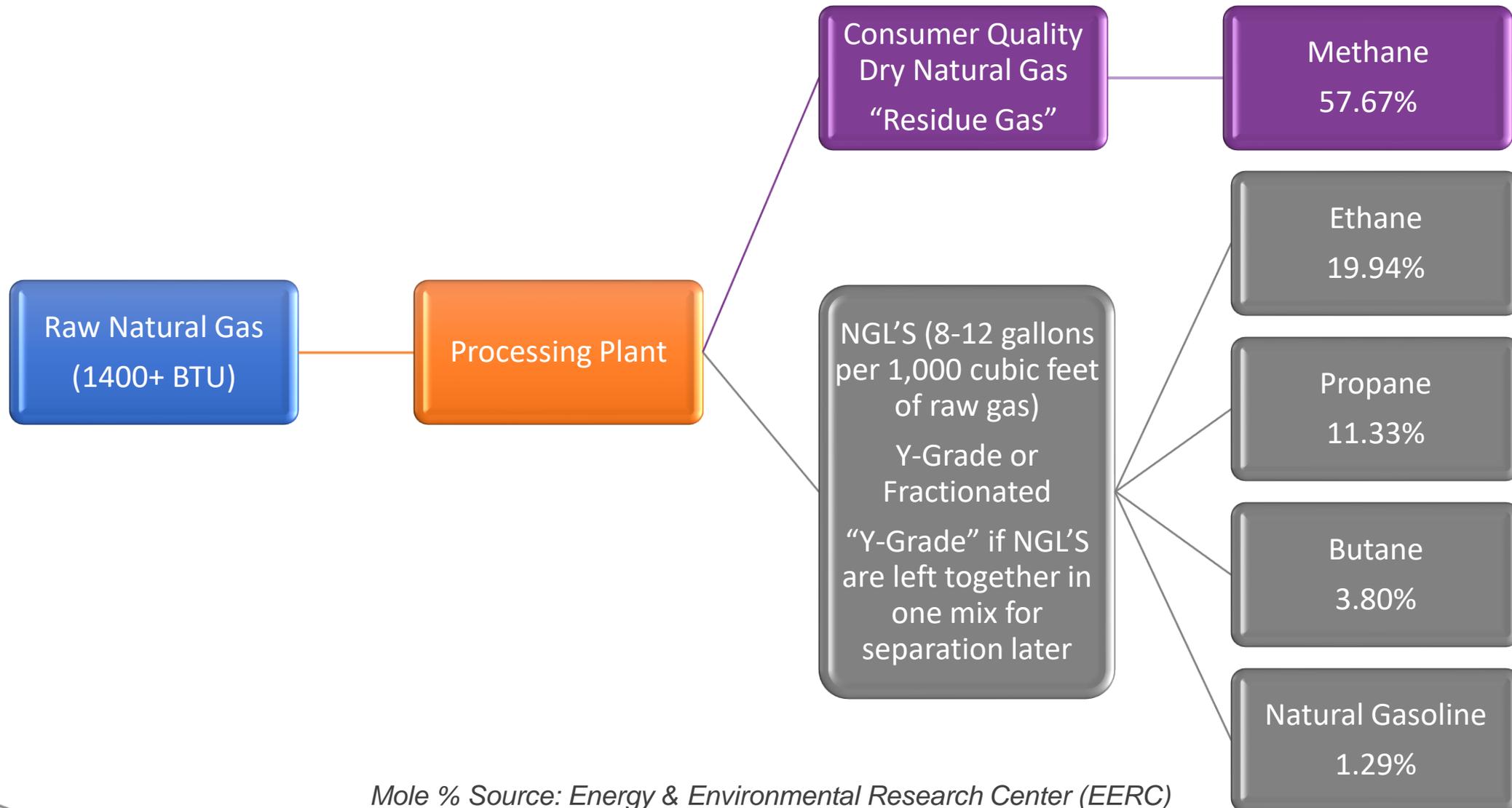
1 in = 62,500 ft



Regional NGL Infrastructure



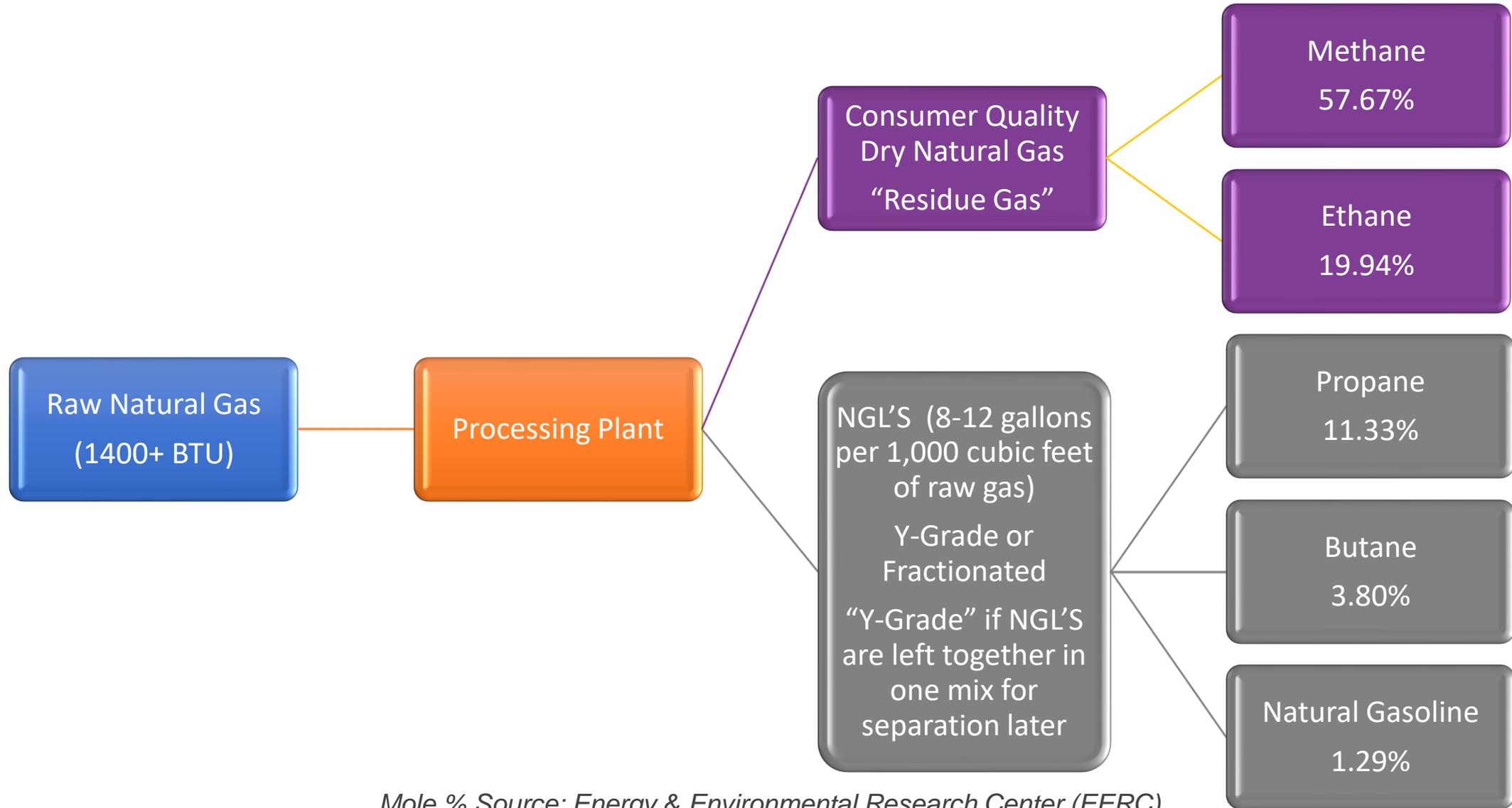
Natural Gas Processing – “Ethane Capture”



Mole % Source: Energy & Environmental Research Center (EERC)



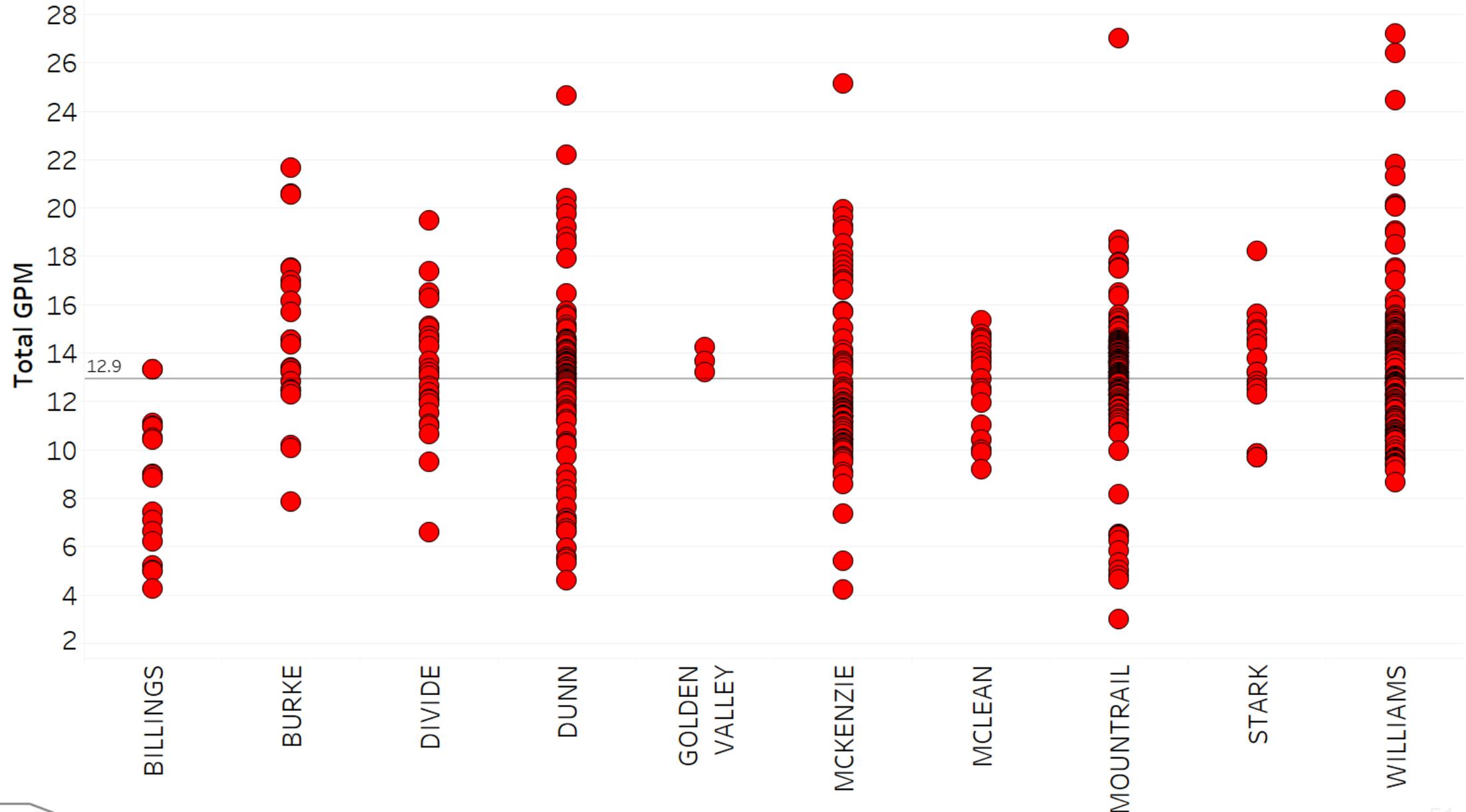
Natural Gas Processing – “Ethane Rejection”



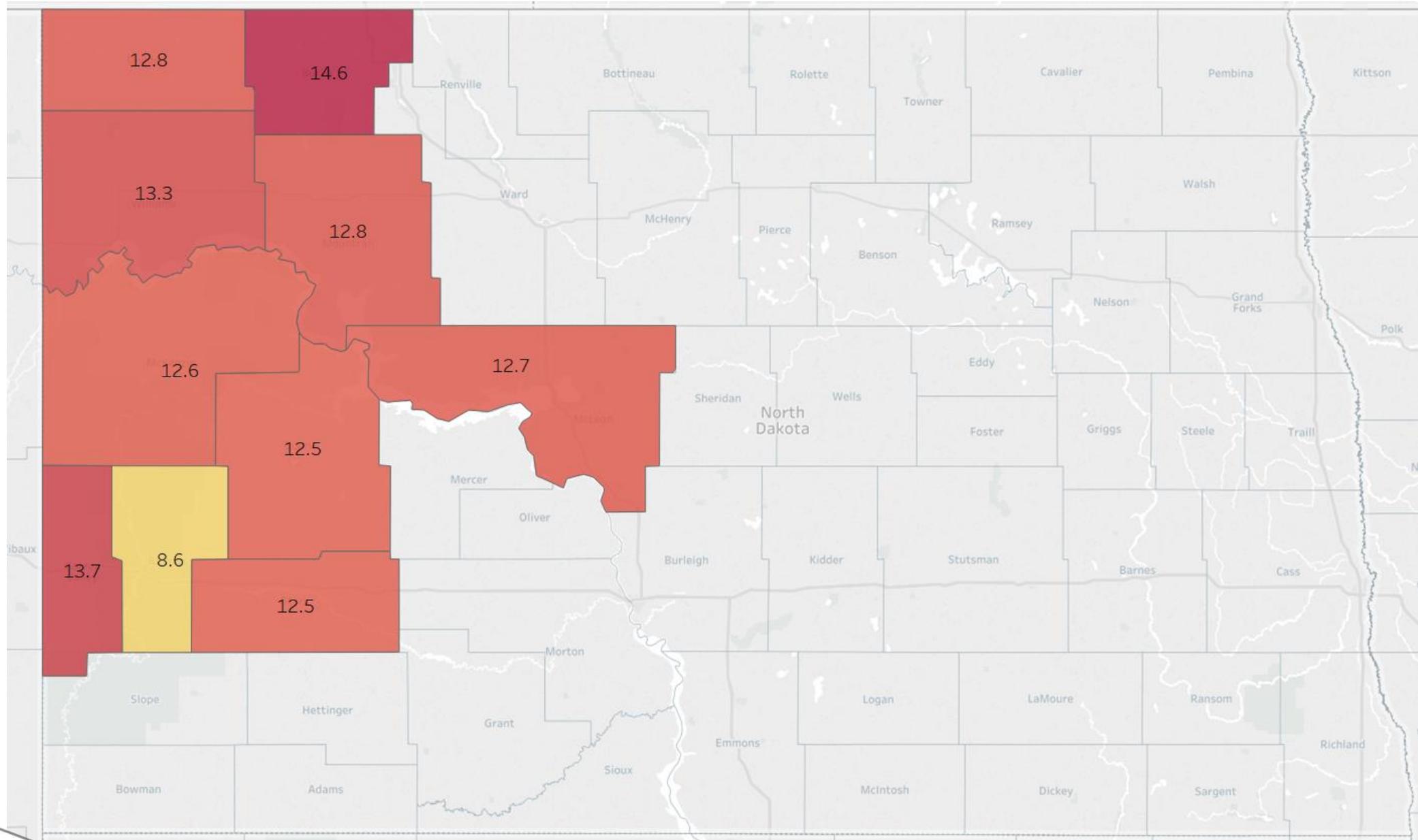
Mole % Source: Energy & Environmental Research Center (EERC)



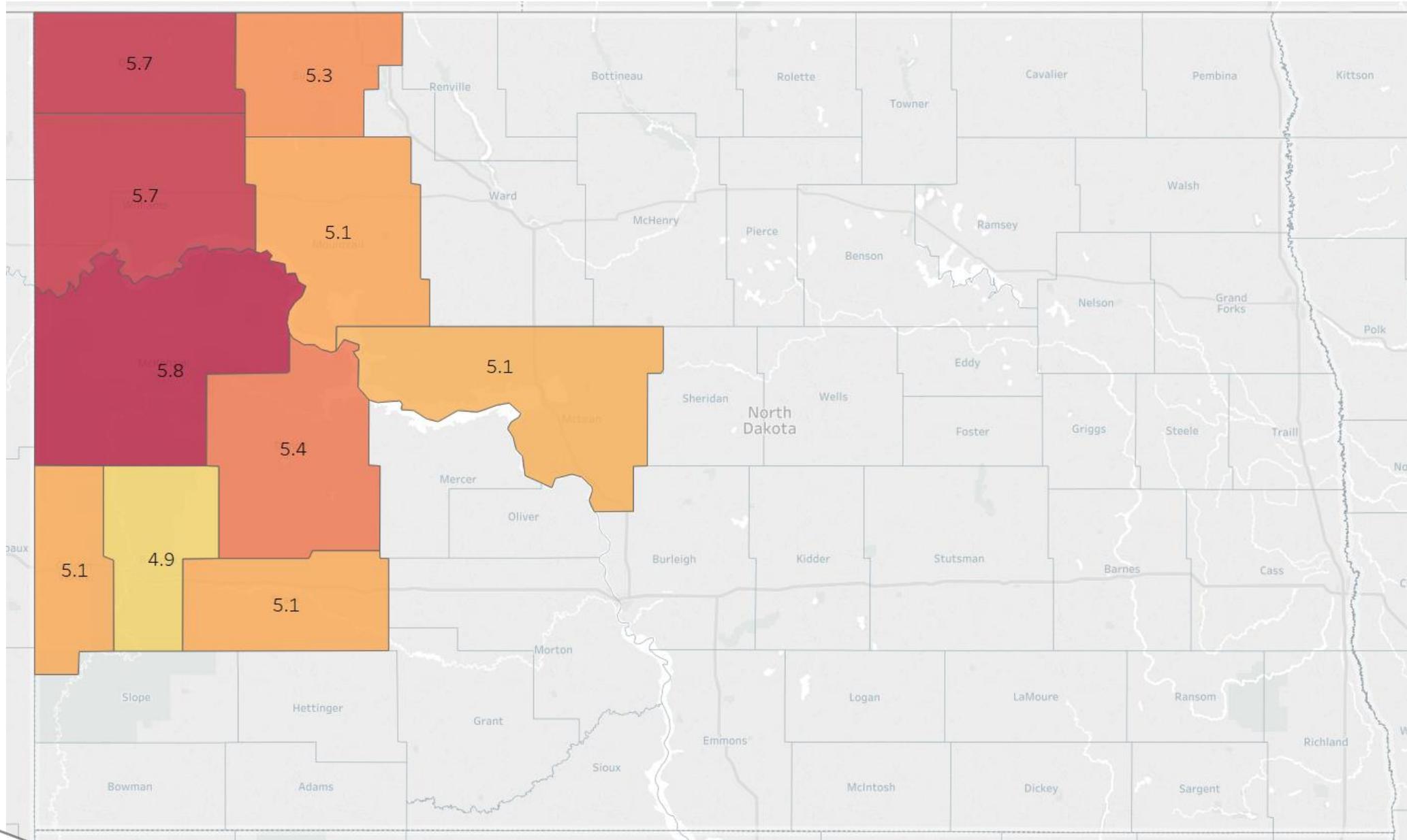
Bakken – Three Forks Average NGL Content (GPM)



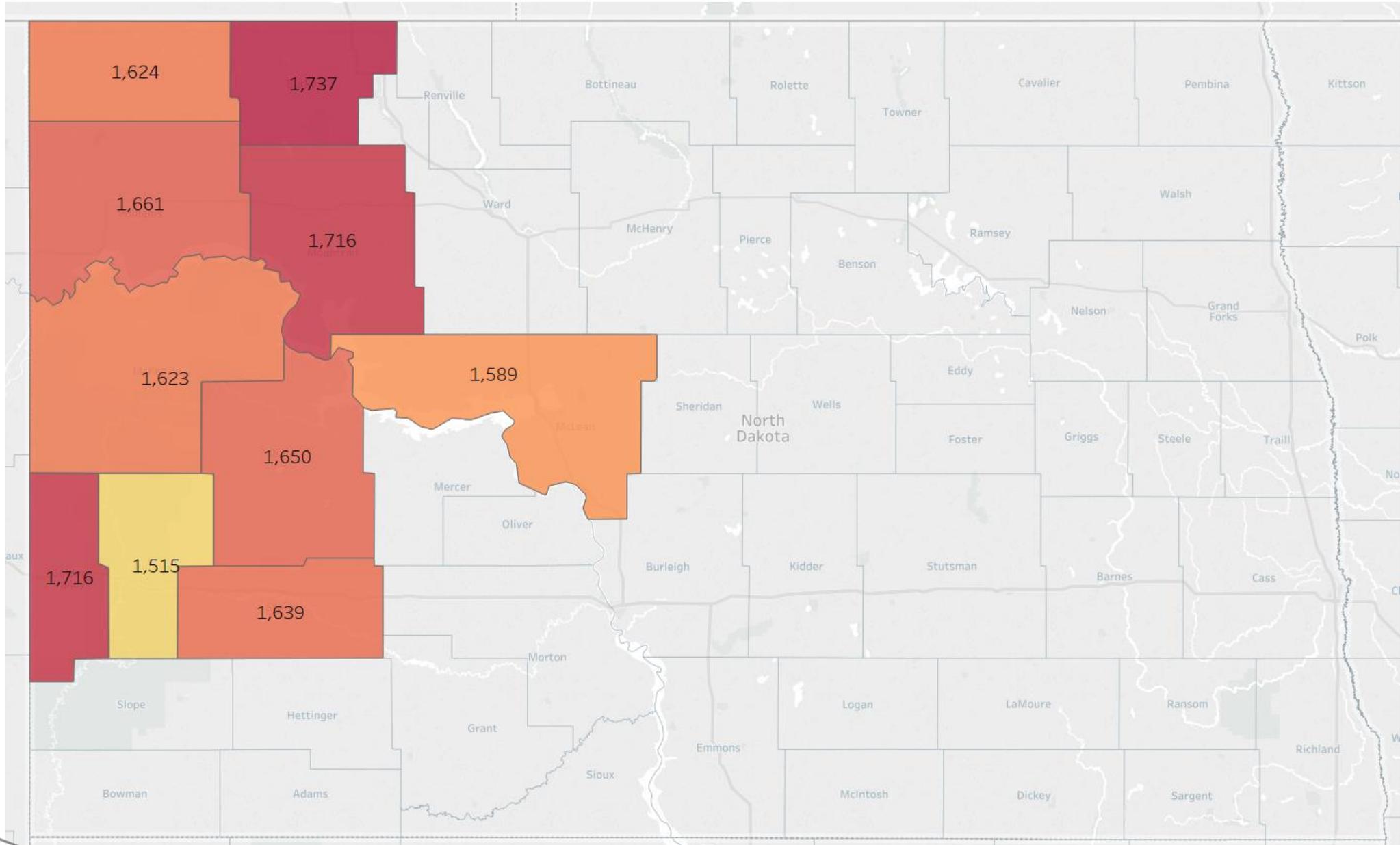
Bakken – Three Forks Average NGL Content (GPM)



Bakken – Three Forks Average Ethane Content (GPM)



Bakken – Three Forks Average Gas BTU



Assumed NGL Content for NDPA NGL Forecasts

Component	Mole %	GPM	% of Liquids
Nitrogen	5.21%	NA	NA
Carbon Dioxide	0.57%	NA	NA
Hydrogen Sulfide	0.01%	NA	NA
Methane	57.67%	NA	NA
Ethane	19.94%	5.32	52.5%
Propane	11.33%	3.11	30.7%
Isobutane	0.97%	0.32	3.1%
Normal Butane	2.83%	0.89	8.8%
Isopentane	0.38%	0.14	1.4%
Normal Pentane	0.55%	0.20	2.0%
Hexane+	0.36%	0.16	1.5%
Totals	99.82%	10.14	100.0%

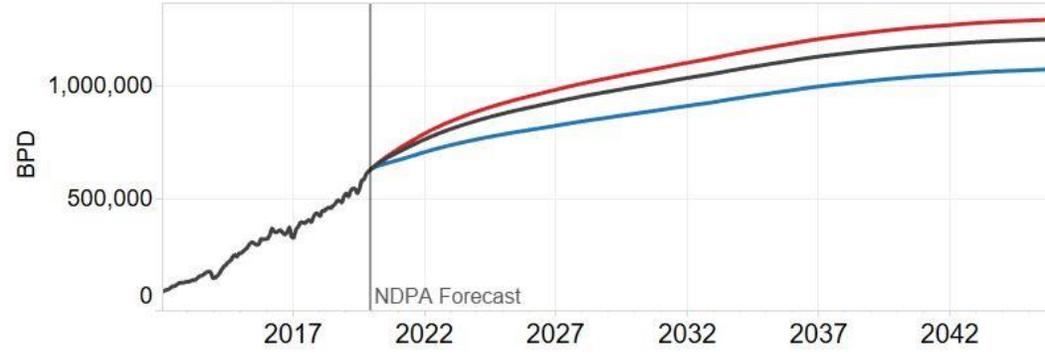
Gas Stream BTU Value	1,399
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Mole % Source: Energy & Environmental Research Center (EERC)

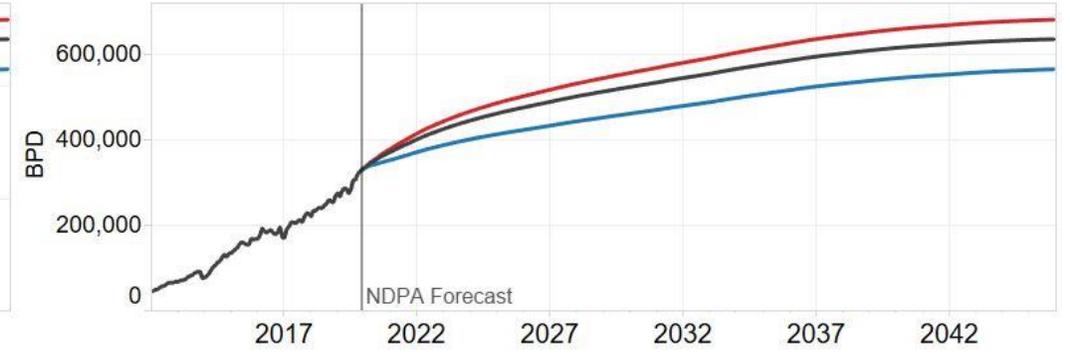


North Dakota Captured* NGL's

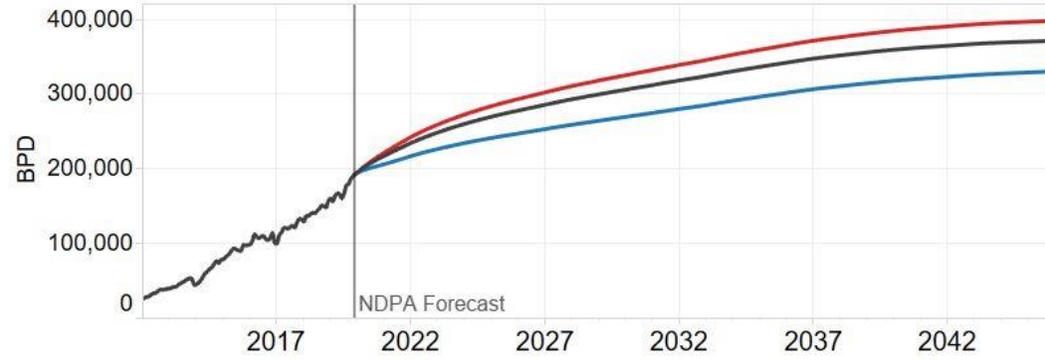
All Natural Gas Liquids



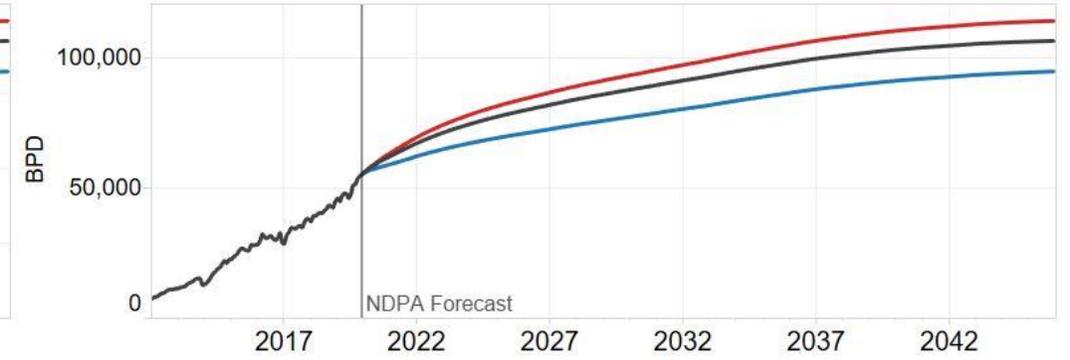
Ethane



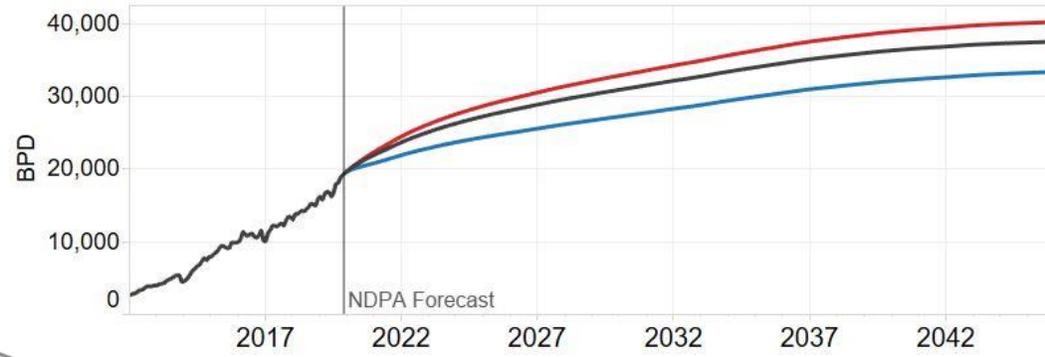
Propane



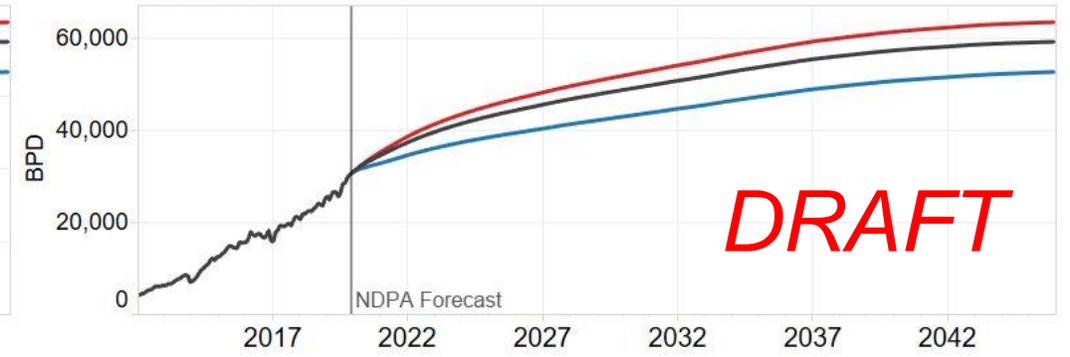
Butane



Isobutane



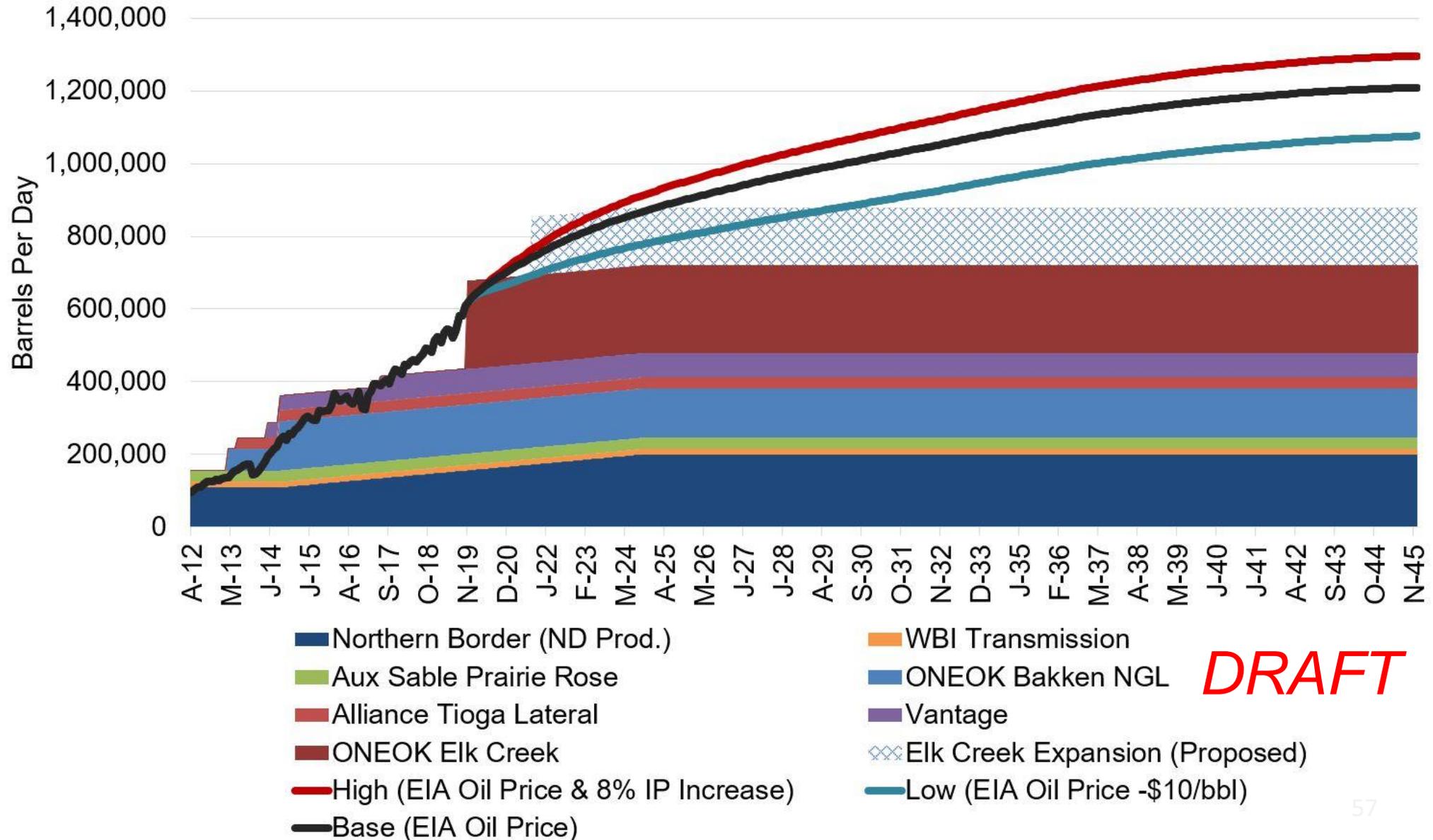
Natural Gasoline



DRAFT



NGL Pipeline Takeaway Options



DRAFT



Contact Information

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Websites:

www.pipeline.nd.gov
www.northdakotapipelines.com



**Know what's below.
Call before you dig.**





iPIPE Briefing for EmPower ND Commission
Tuesday, February 4, 2020

Bismarck, ND

Jay C. Almlie

Program Manager

(and Principal Engineer @ EERC)



Program Overview



- iPIPE mission
 - Foster development of emerging technologies to prevent pipeline releases.
 - ◆ Fund development work,
 - ◆ Provide live, operating pipelines upon which technology is developed,
 - ◆ Provide user feedback to hone products.
- Unique collaboration between eleven pipeline operators, the NDIC, the EERC, and technology providers.



Program Thrusts

ORIGINALLY: Technology Development

- Program was originally conceived to focus on technology development.



GROWTH: Solutions Forum

- Members realized that they have no other forum where challenges, solutions, successes, and failures can be shared openly in a trusting, non-competitive environment.
- As such, program is now hosting twice-yearly member forums to focus on shared challenges.

Technology Selection Process

Modeled after ABC Television's Popular "Shark Tank" Program

iPIPE



- Emerging technologies are scouted year-round.
- Technology providers present to Technology Selection Committee.
- Technology Selection Committee makes selections.
 - One representative from each iPIPE member company.
 - Meets annually to select technologies to co-develop.

iPIPE Annual Process



Three Technology Selection Rounds to Date



First Round – May 2018

- 9 invited
- 7 proposals
- 7 presented
- 2 selected

Second Round – Oct 2018

- 22 invited
- 10 proposals
- 9 presented
- 4 selected

Third Round – Oct 2019

- 65 invited
- 14 proposals
- 8 presented
- 2 selected



iPIPE Funding Formula



\$2.8M Industry Cash

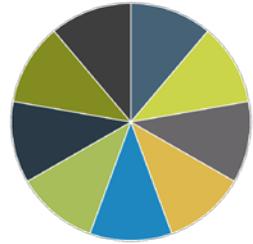
2018

\$44k ea. (x8)
\$25k (x1)
\$377k sum



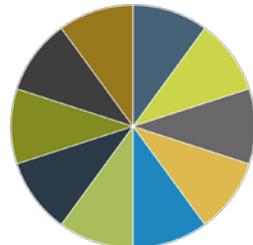
2019

\$75k ea. (x9)
\$50k (x2)
\$775k sum



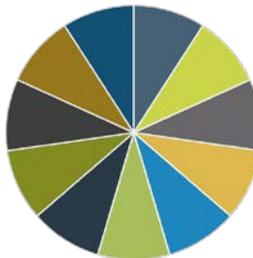
2020

\$75k ea. (x11)
\$825k sum



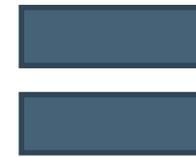
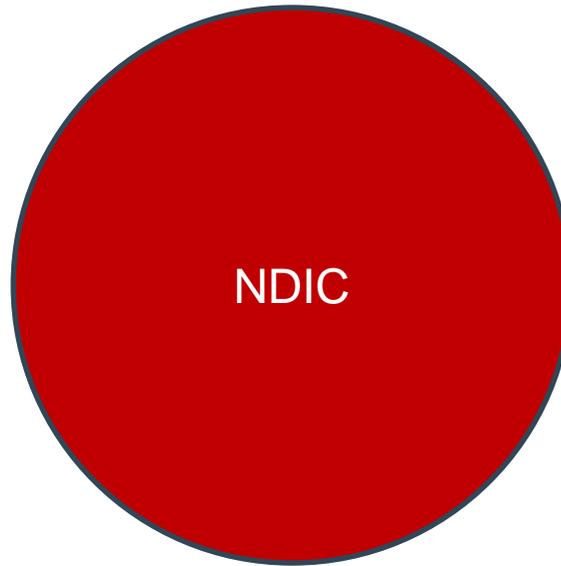
2021

\$75k ea. (x11)
\$825k sum



- Dakota Access
- DCP
- Enbridge
- Equinor
- Goodnight
- Hess
- MPLX
- Oasis
- ONEOK
- TC Energy
- Whiting

\$2.6M NDIC Cash



\$5.4M TOTAL Cash

+

\$1.6M In-Kind (to date)



TECHNOLOGY DEVELOPMENT

Satelytics – Opportunistic Data

Leveraging Big Data:

- Data Acquisition
- Spectra
- Bands
- Algorithms
- Analytics
- Alerts and Dashboards

Leveraging Technology



Satellites



Nanosatellites



Aircraft



Drone/UAV

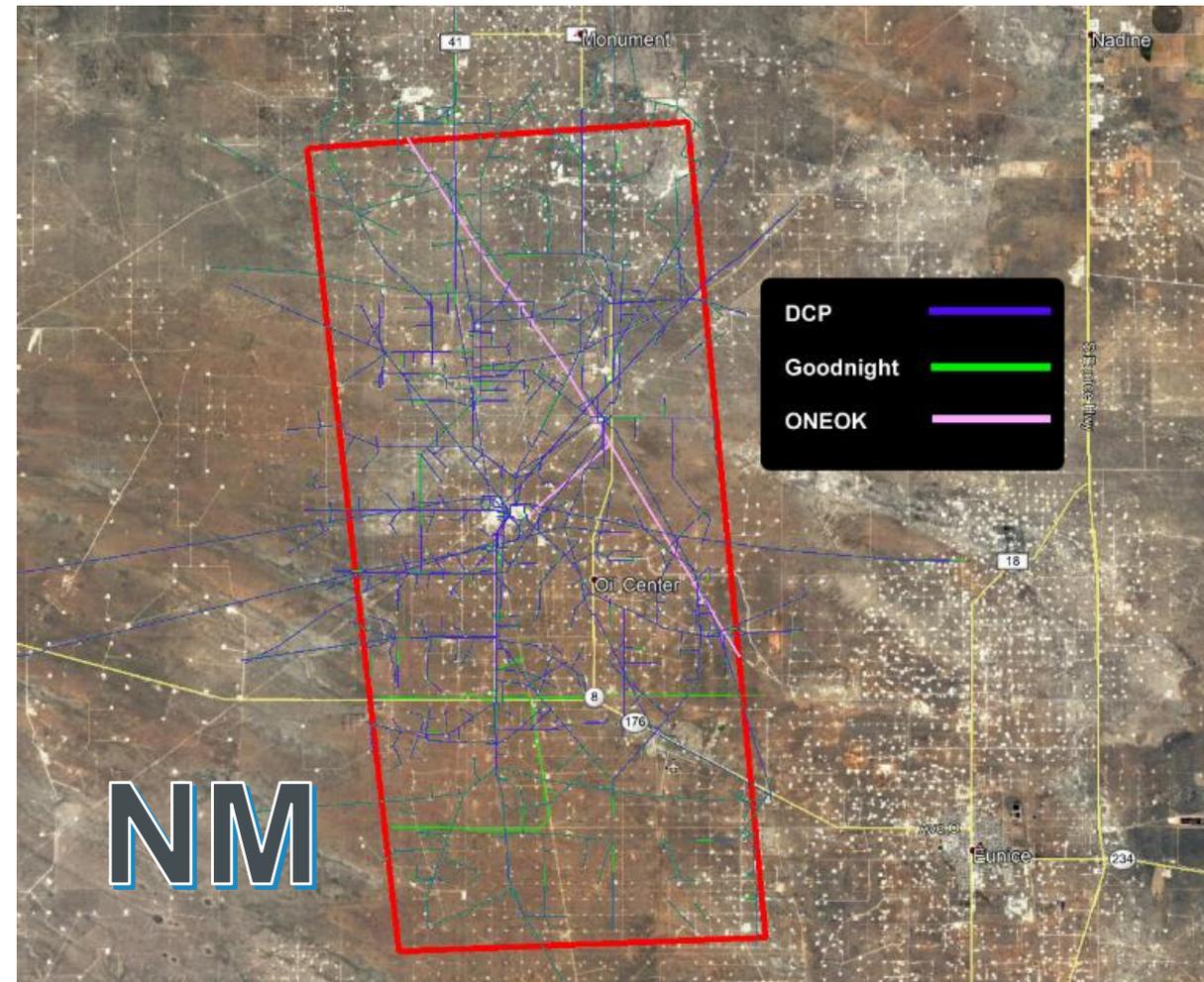
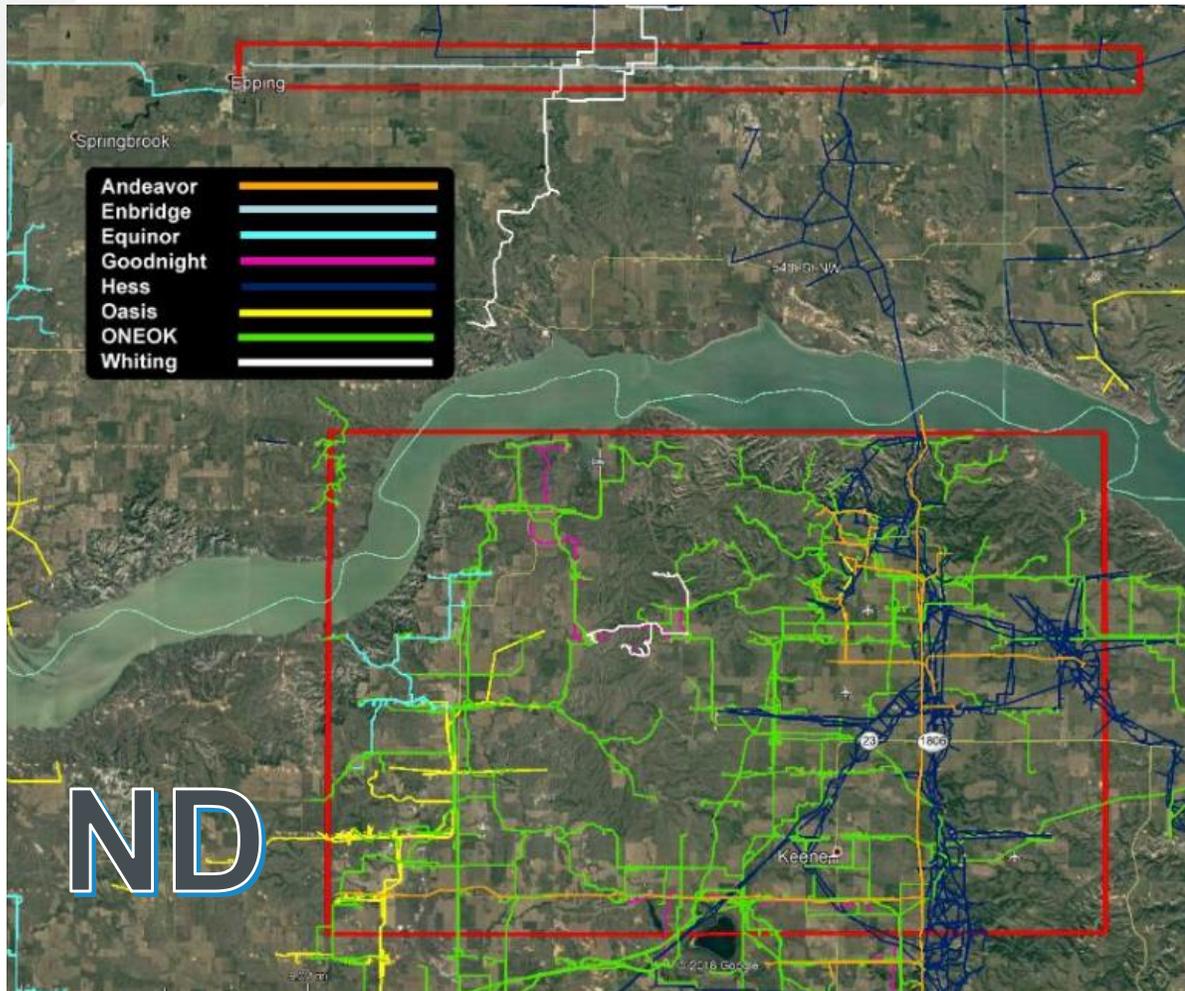


Fixed/Persistent Platform



Satelytics

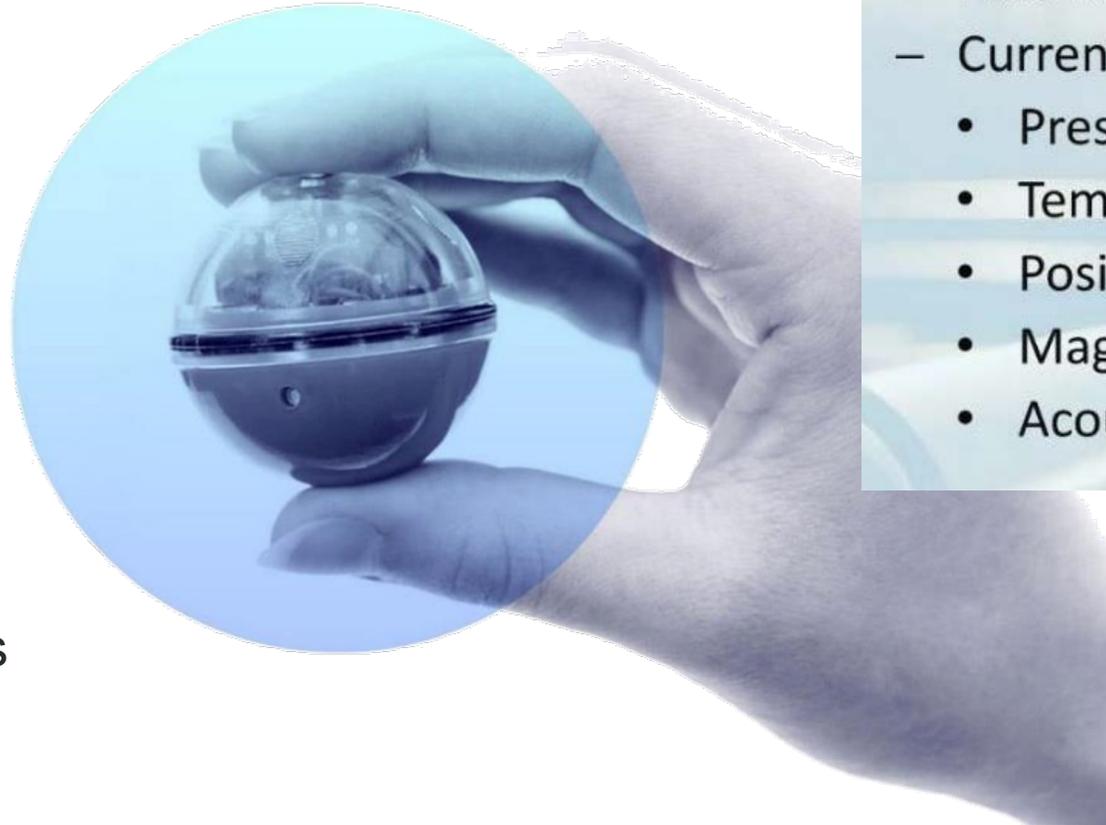
- Uses machine learning algorithms to produce leak alerts, digesting billions of pixels of satellite data.



“Golf Ball” Pipeline Sensor

Pipers™: Control in the palm of your hand

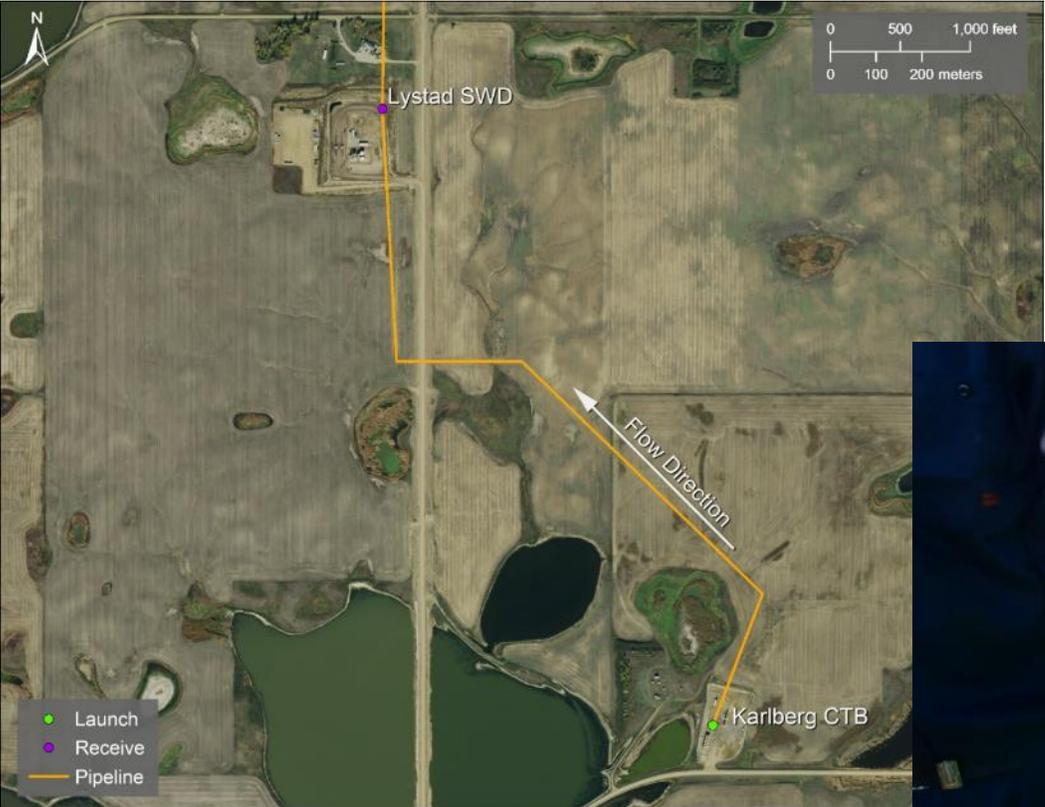
- Deploy when needed in all pipelines
- No downtime



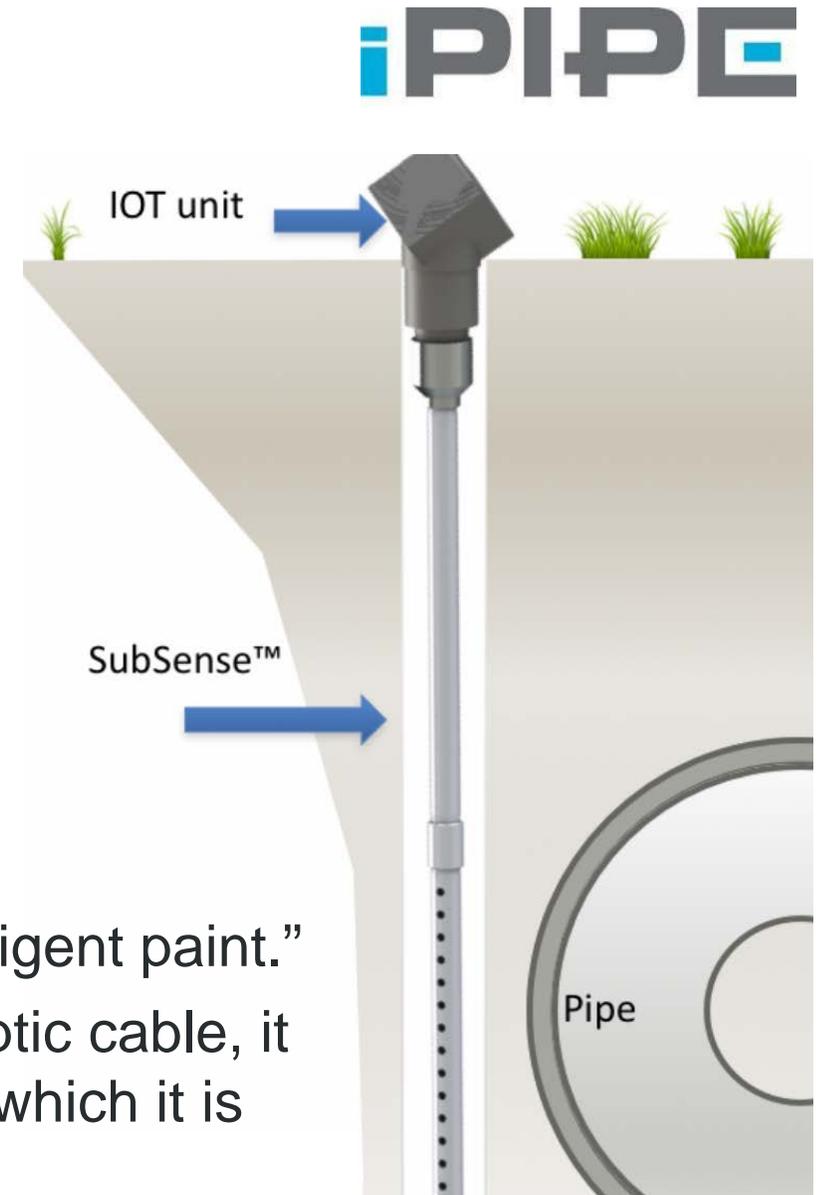
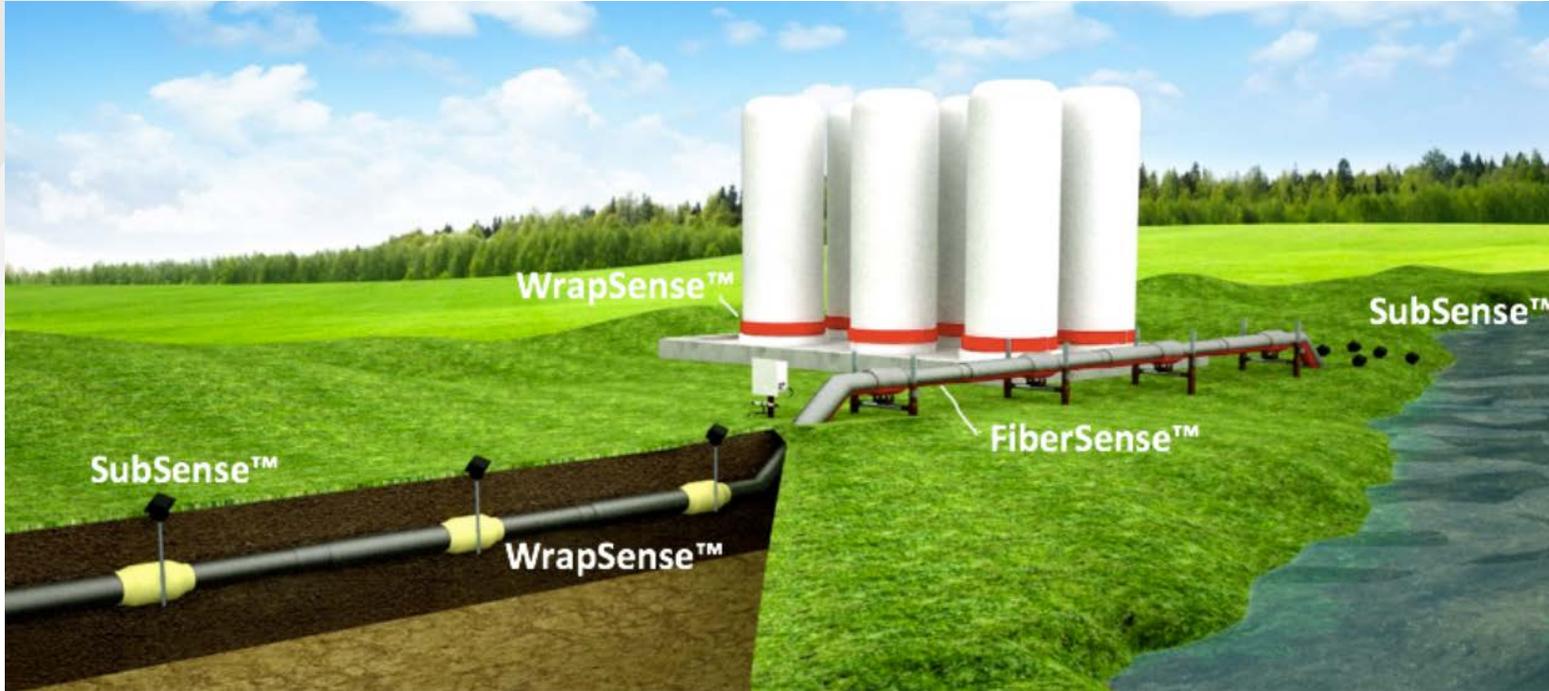
- Golf ball-sized (1.5 inch)
- Free-flowing; adjustable weight
- Current sensors
 - Pressure
 - Temperature
 - Position (acceleration/rotation)
 - Magnetic fields
 - Acoustics

- Detect leaks
- Locate deposits
- Identify pipe wall flaws
- Locate pipeline centerlines

Field Trial Overview



Direct-C



- Uses polymers mixed with nanoparticles to create an “intelligent paint.”
- When applied to a PCB board, flexible substrate, or fiber optic cable, it creates a sensor to indicate presence of different fluids for which it is tuned (hydrocarbons or brine).

Negotiations with 2020 Selections

- Executing contracts with two new awardees now:
 - Satelytics, Phase III
 - ◆ Assessment of winter operations performance
 - ◆ Methane sensing
 - ◆ Hyperspectral data fusion
 - Orbital Sidekick
 - ◆ Satellite launch with hyperspectral instrument
 - ◆ 5000 km² area of interest in ND
 - ◆ 5000 km² area of interest in TX
 - ◆ Development of analytics algorithms



iPIPE Is Already Producing Results!



- Early iPIPE efforts have already resulted in commercial contracts of developed technologies with individual iPIPE members.
- New technologies are being invented to meet needs of pipeline operators!
- iPIPE is moving the needle!



<http://www.ipipepartnership.com>

i PIPE

INTELLIGENT PIPELINE INTEGRITY PROGRAM



EMPOWER ND COMMISSION 2020 MEETING DATES/TOPICS

February 4	<ol style="list-style-type: none"> 1. Welcome to new members 2. Pipeline – Justin Kringstad, Pipeline Authority 3. EERC/iPipe– Jay Almlie 4. WDC Update – Michelle Kommer 5. Review survey draft/process
February 26	<i>CANCEL currently scheduled meeting to allow time to analyze survey results</i>
March 25	<ol style="list-style-type: none"> 1. Governor remarks (pending availability) 2. Discuss Survey Results 3. Education and Facilitation (by issue) as necessary 4. Next Steps
April 29	<ol style="list-style-type: none"> 1. House and Senate Majority Leader Remarks (pending availability) 2. Education and Facilitation (by issue) as necessary 3. Next Steps
May	NO MEETING
June 2	<i>[Meeting at EERC]</i> <ol style="list-style-type: none"> 1. Discuss/reach consensus <ol style="list-style-type: none"> a. Areas where there is agreement/support b. Areas that may be pursued outside of EmPower c. Discussion regarding suggested legislation/policy
June 24	<ol style="list-style-type: none"> 1. Finalize <ol style="list-style-type: none"> a. Areas where there is agreement/support b. Areas that may be pursued outside of EmPower c. Discussion regarding suggested legislation/policy 2. Discuss engagement plan (legislative, etc.) 3. Next Steps