

# North Dakota Oil & Gas Research Program



**Justin J Kringstad**

*Geological Engineer*

*Director*

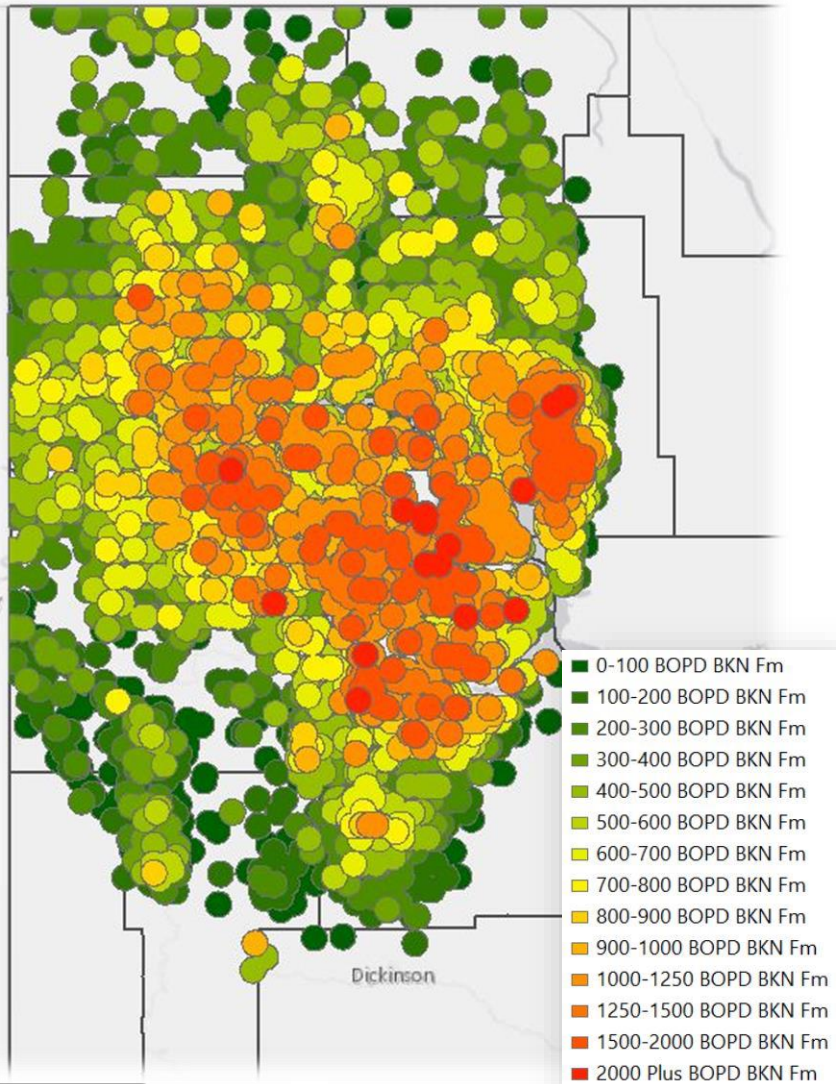
*North Dakota Pipeline Authority*

August 4, 2020

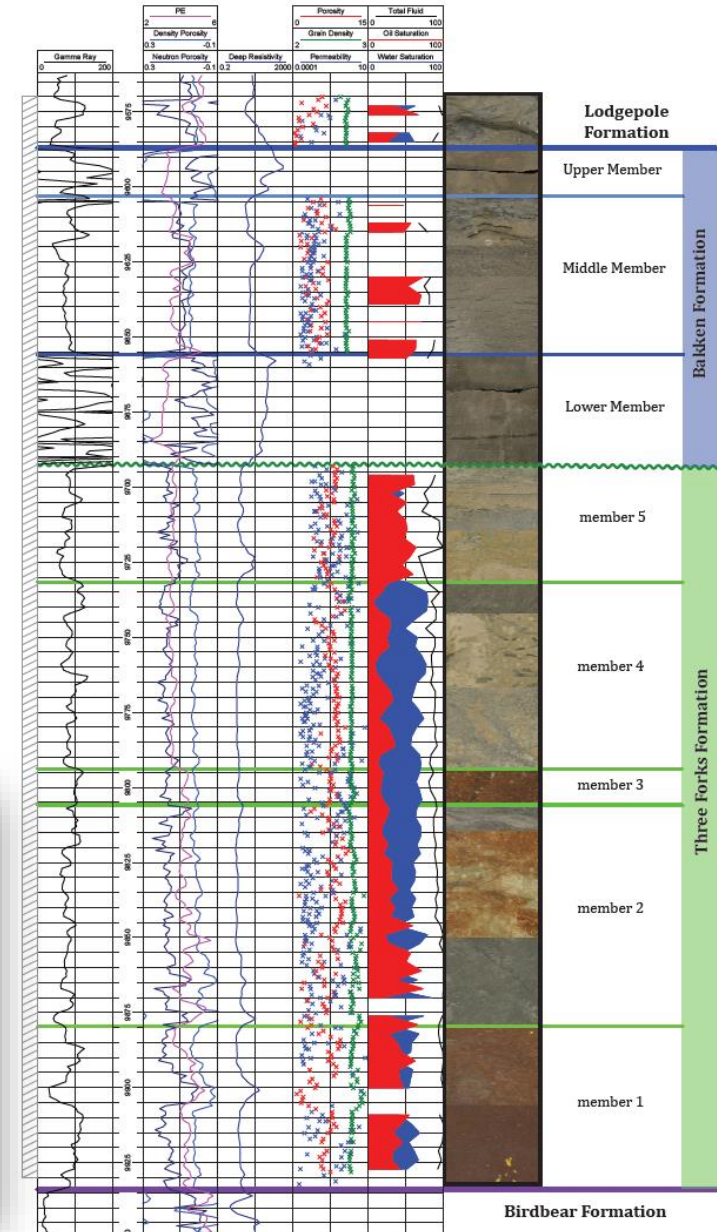
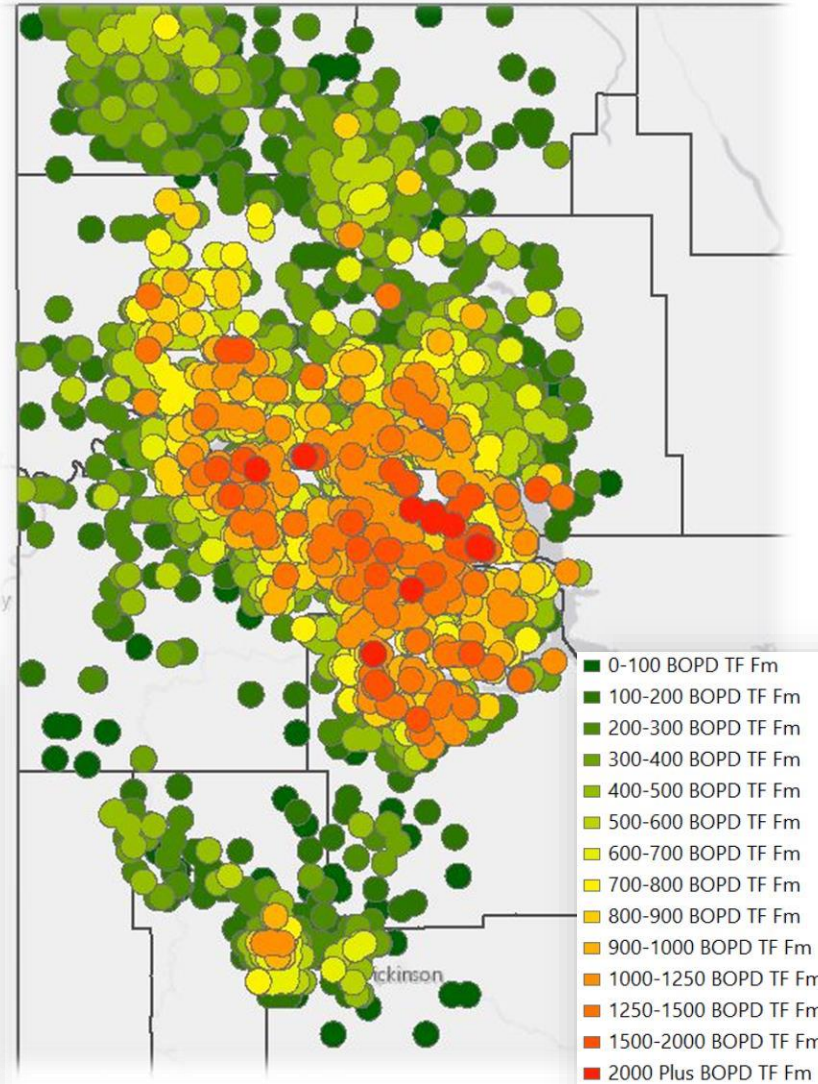


# Bakken & Three Forks Formations

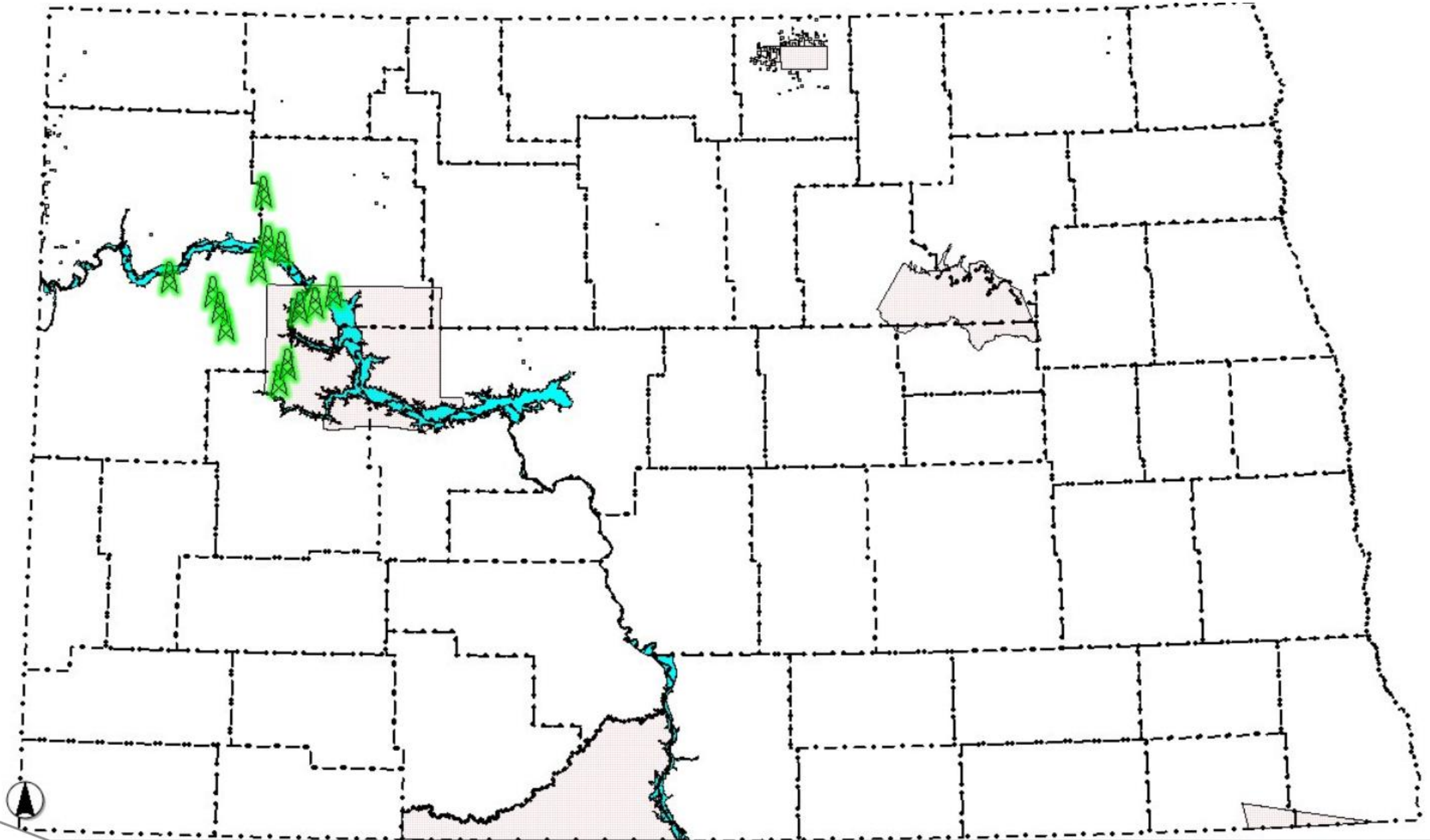
Bakken Formation



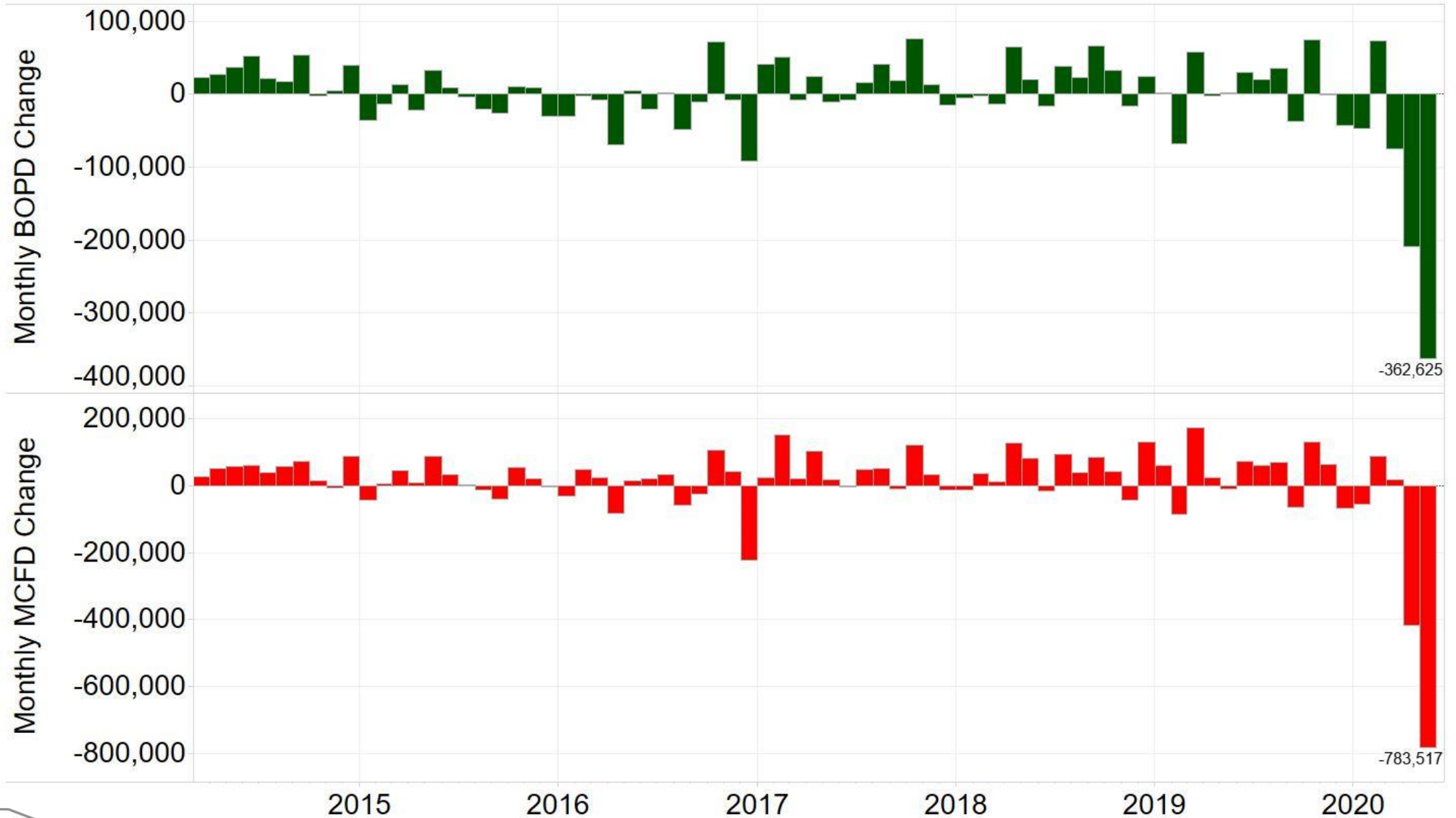
Three Forks Formation



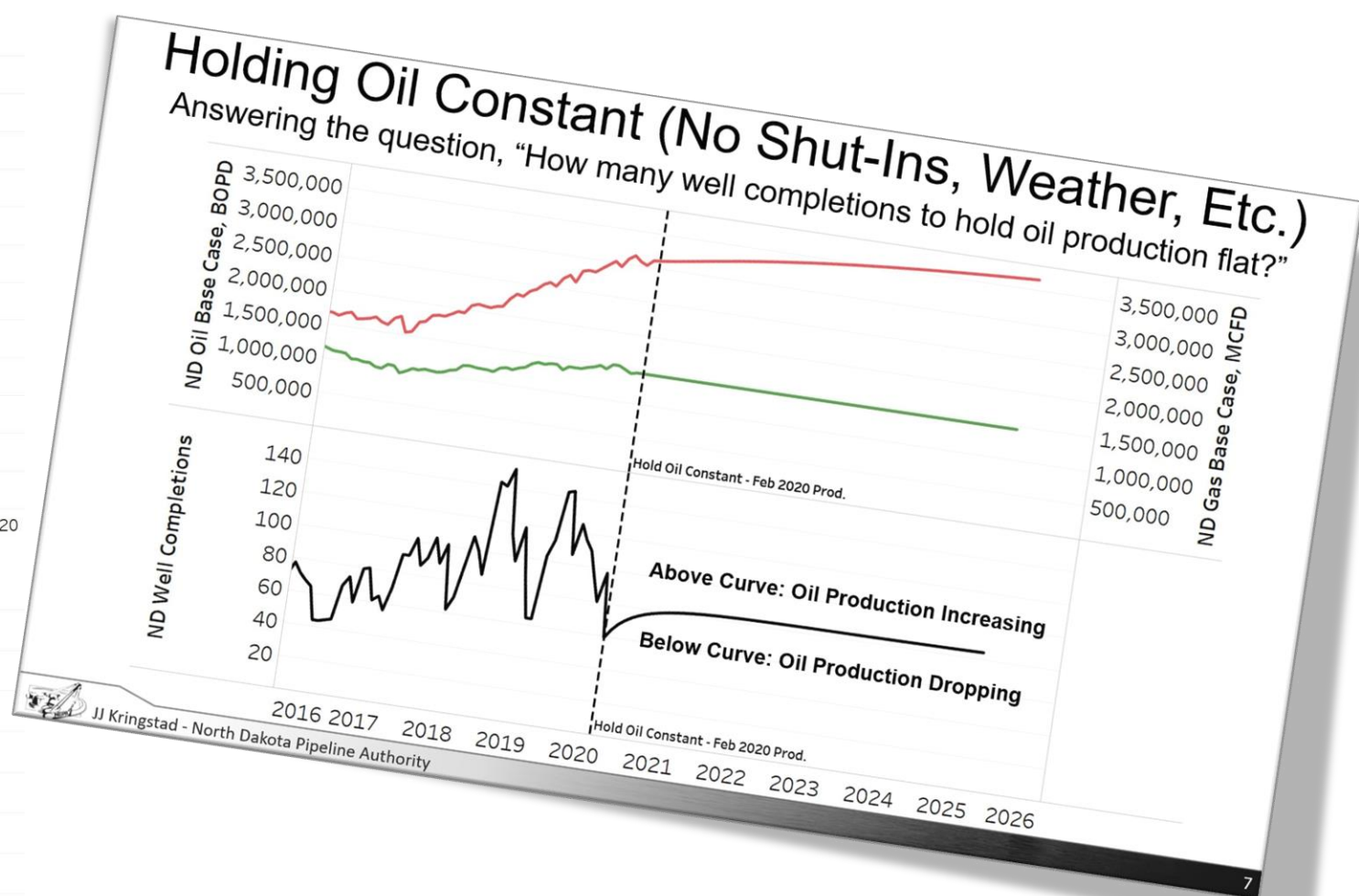
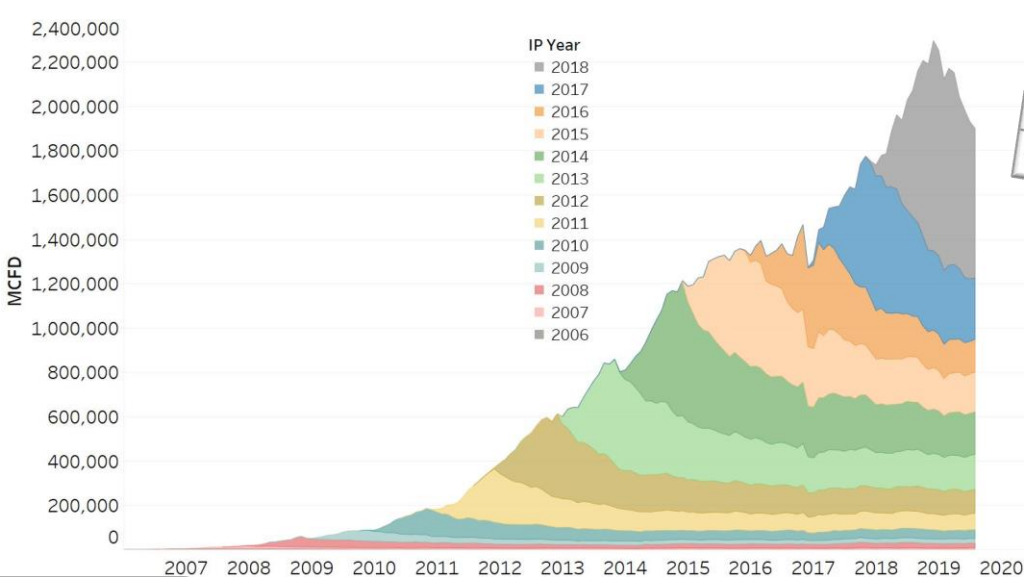
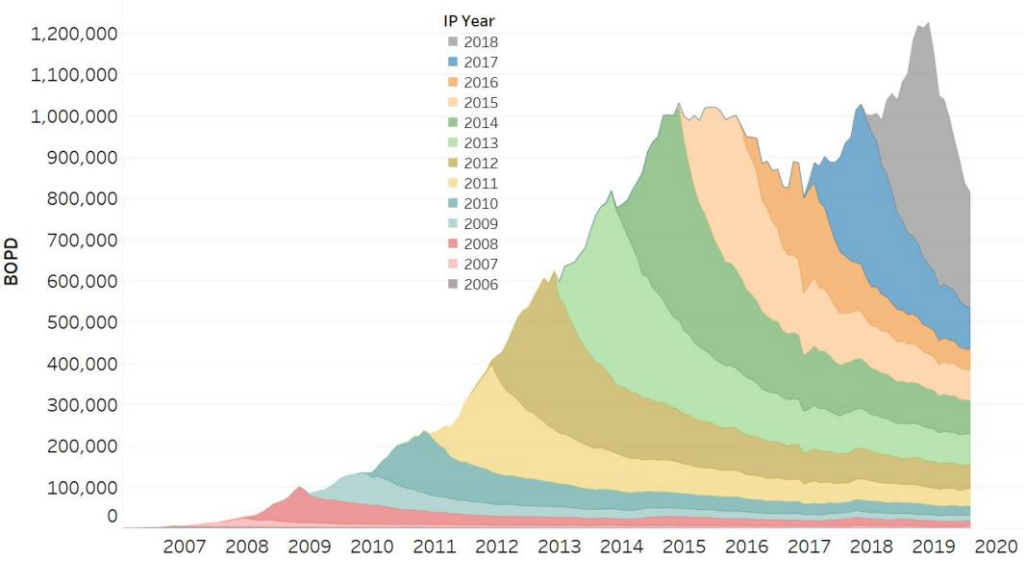
# Current Drilling Rig Fleet – 12 (August 3, 2020)



# Monthly Oil & Gas Production Change



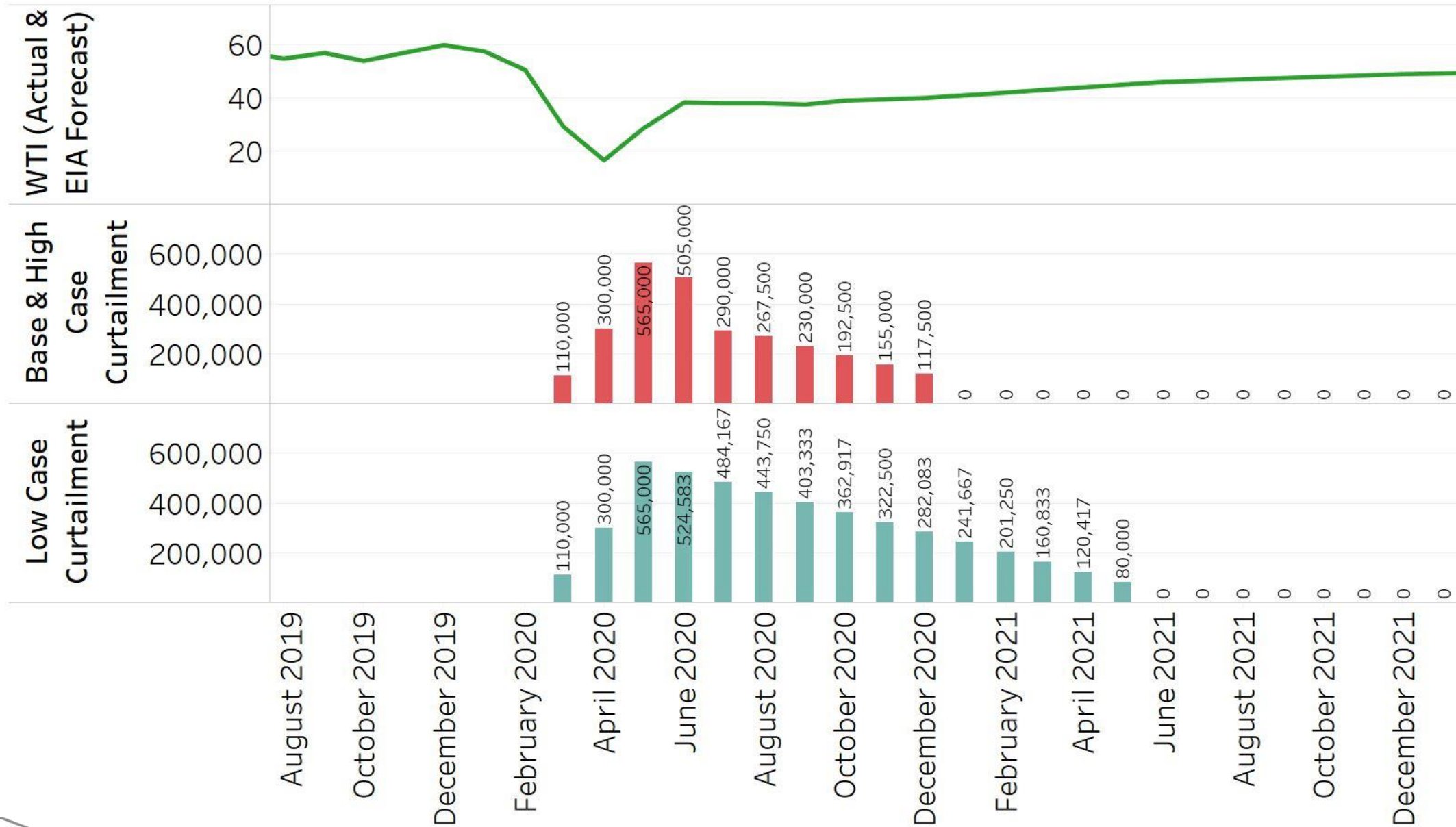
# Base Decline Challenges



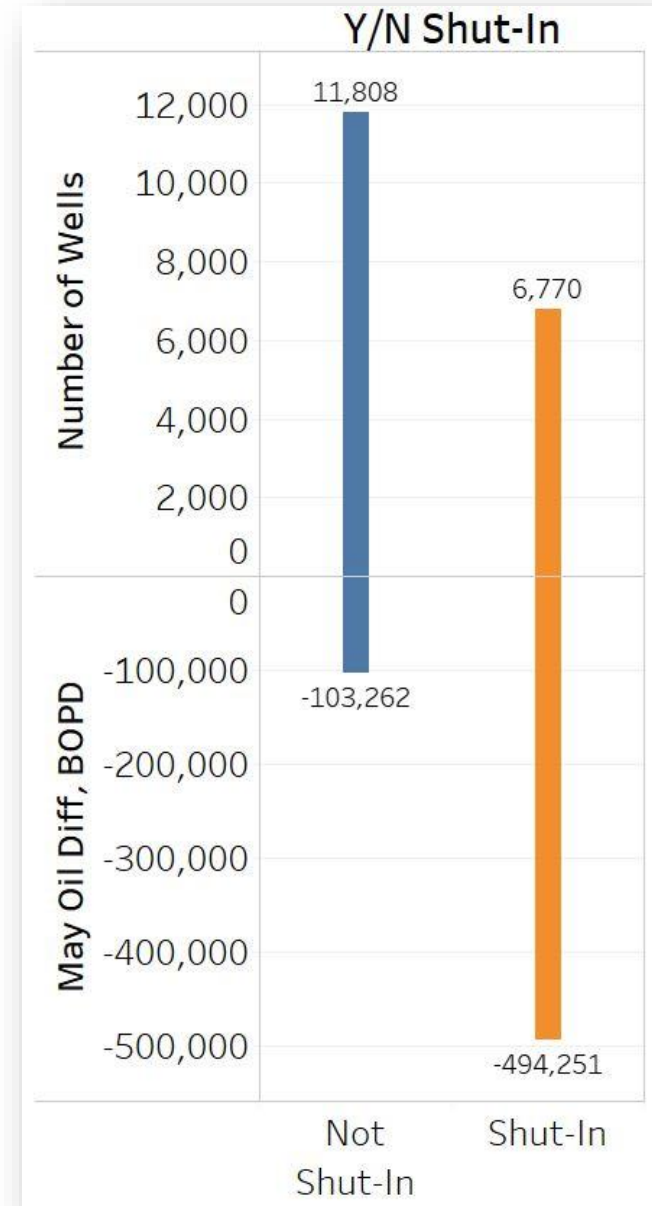
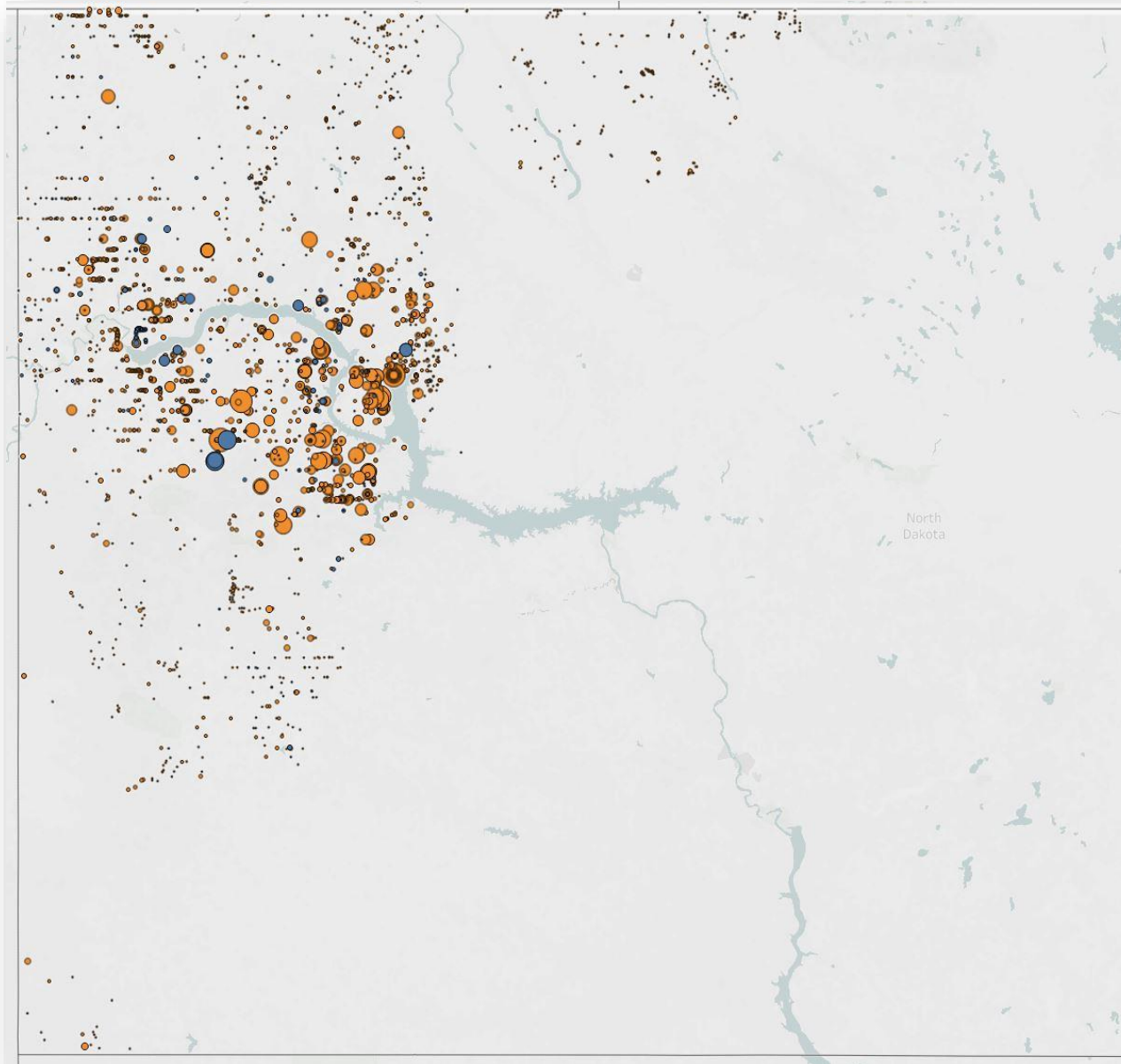
Slide Source:  
April 28, 2020 - NDIC Update



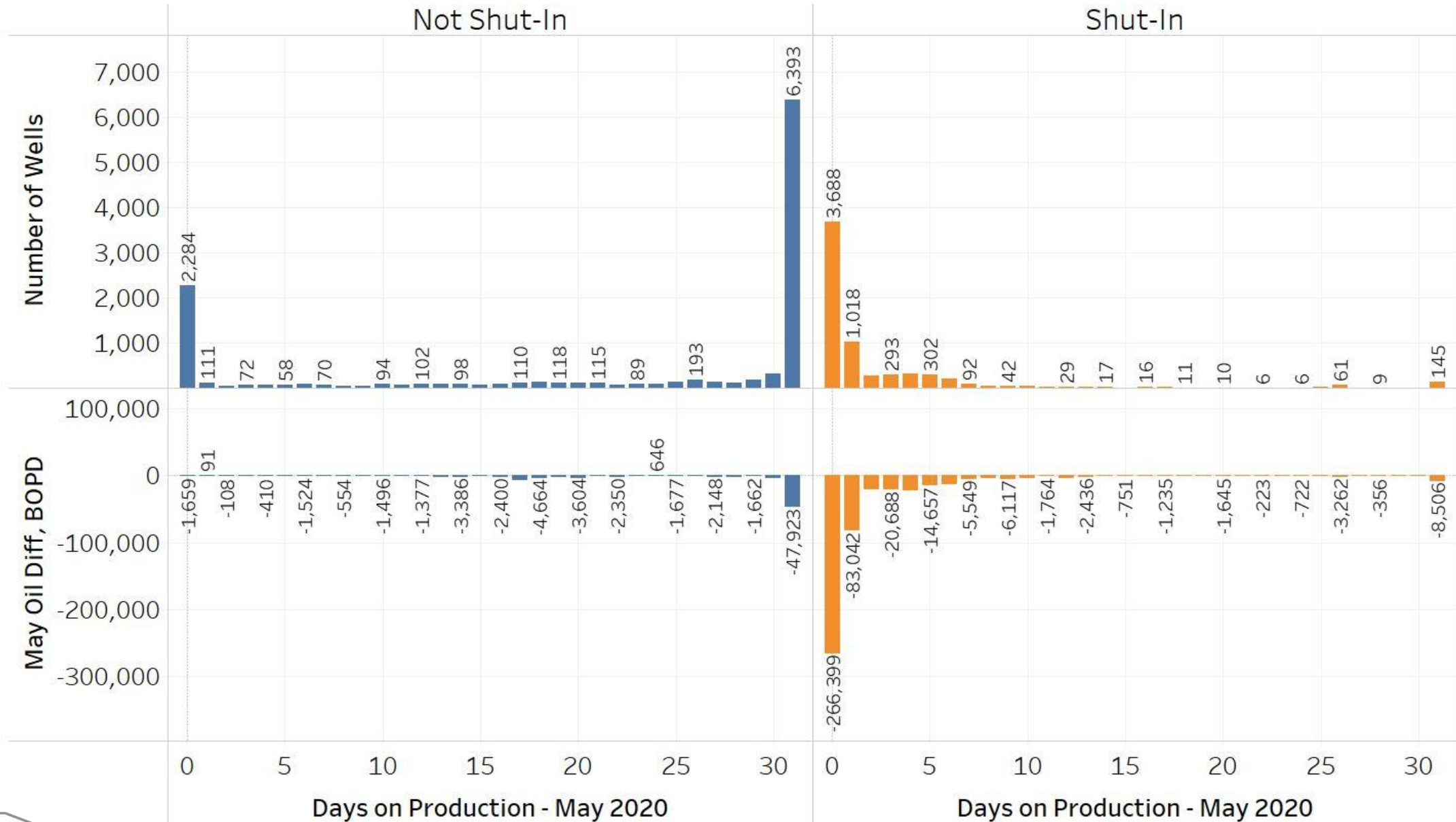
# Shut-In Assumptions: EIA Price Deck



# March to May 75+% M-O-M Oil Drop

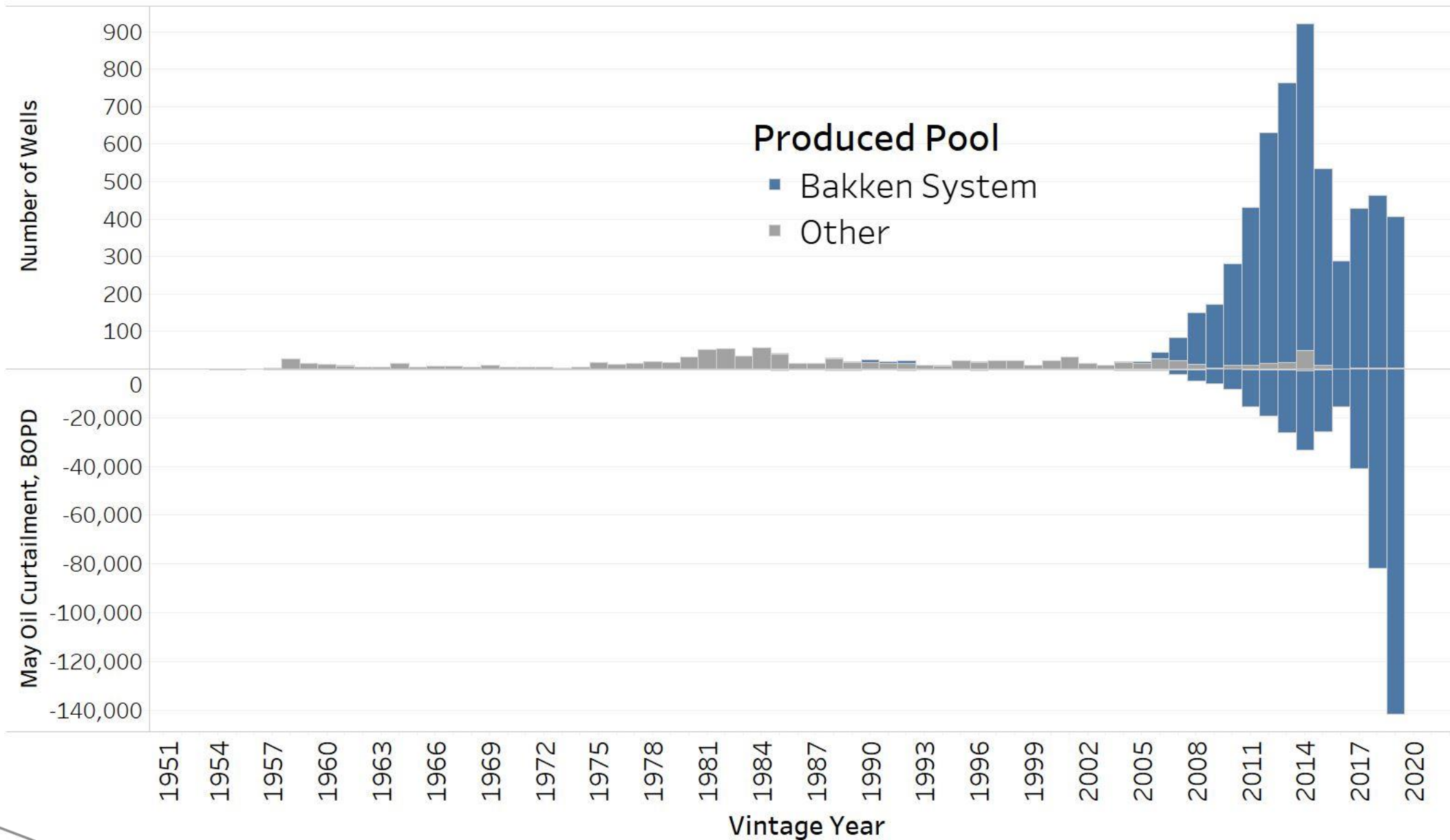


# March to May 75+% Oil Drop

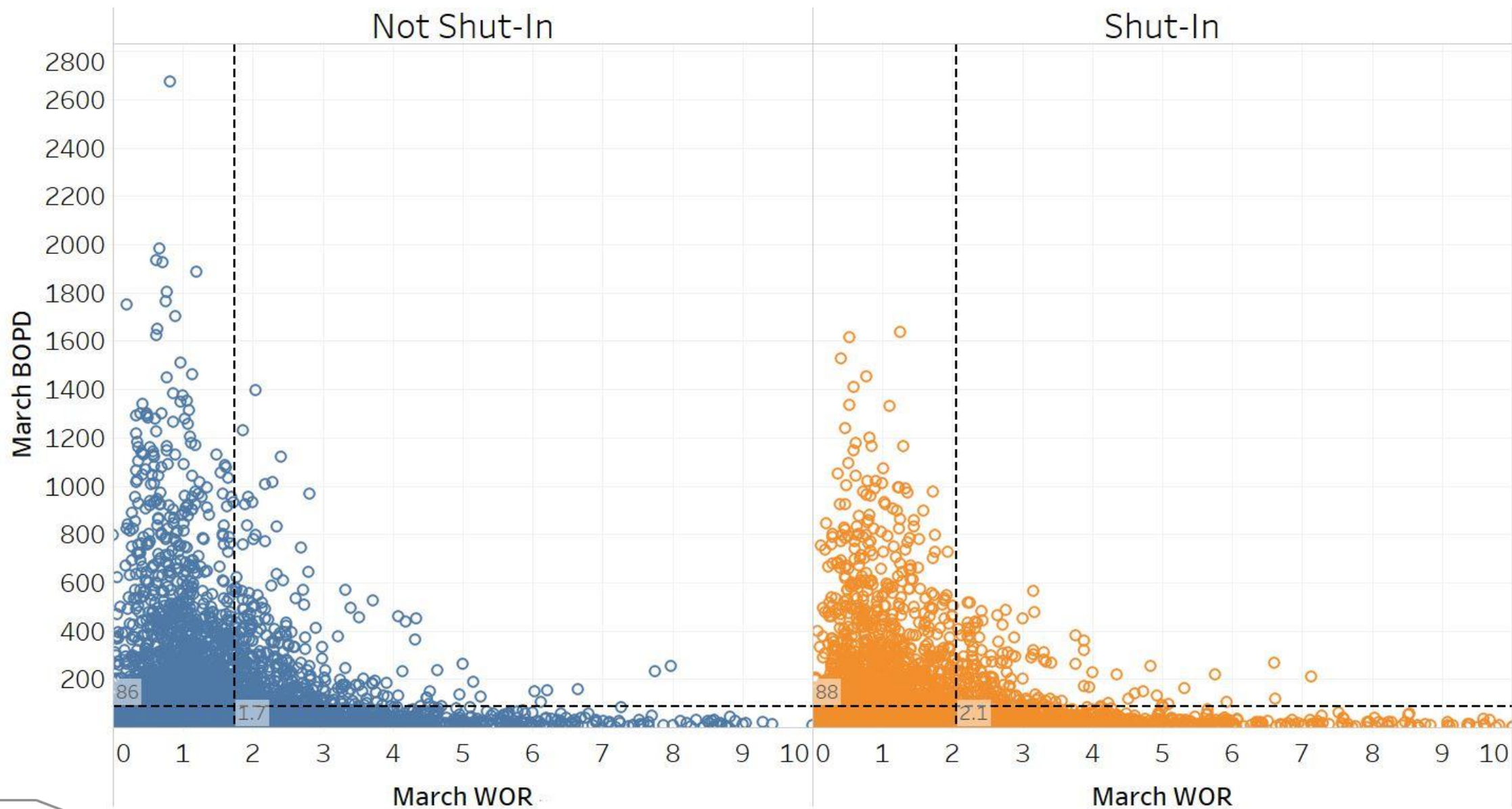




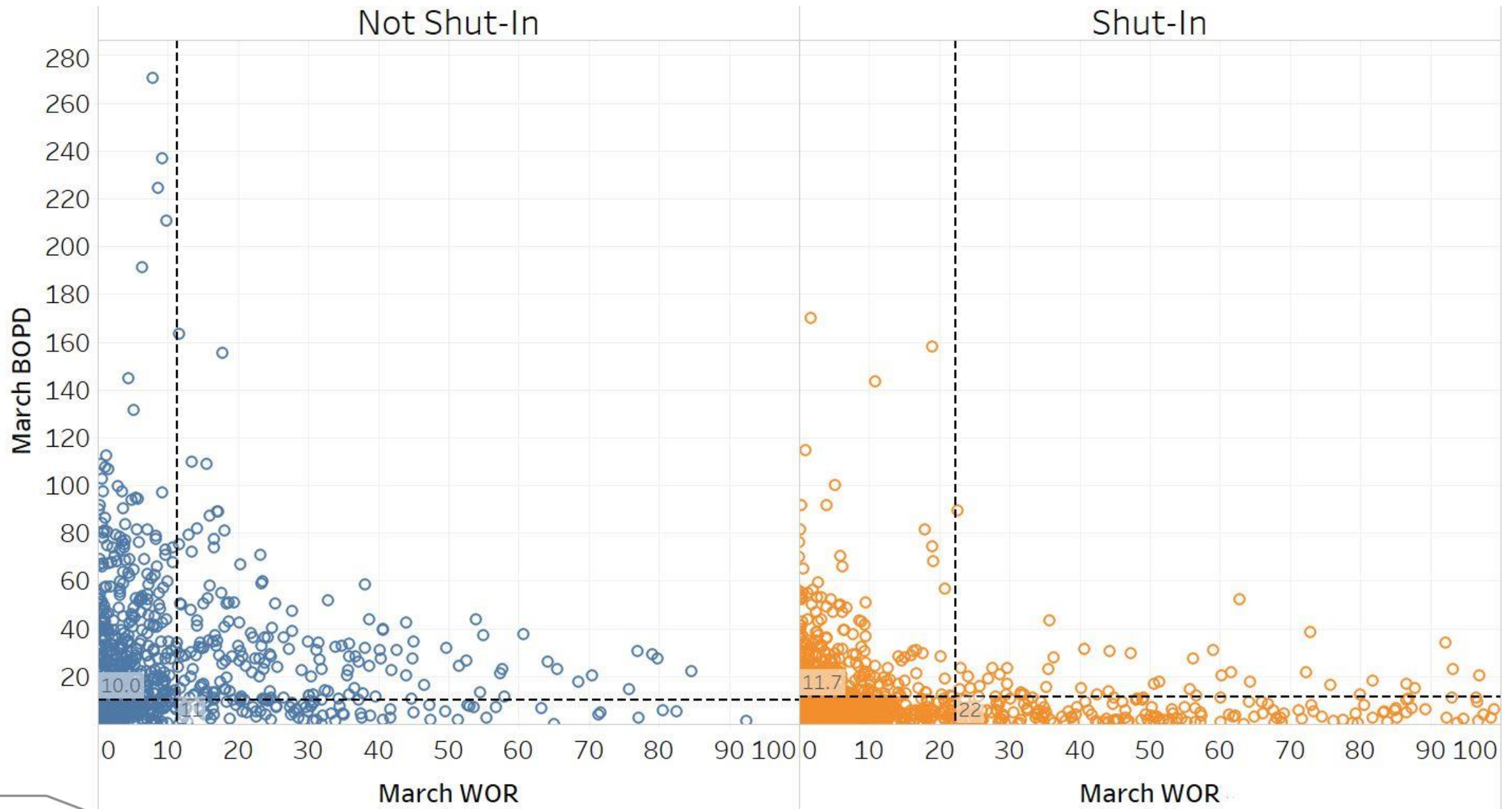
# Vintage Year of Shut-In Wells – May 2020



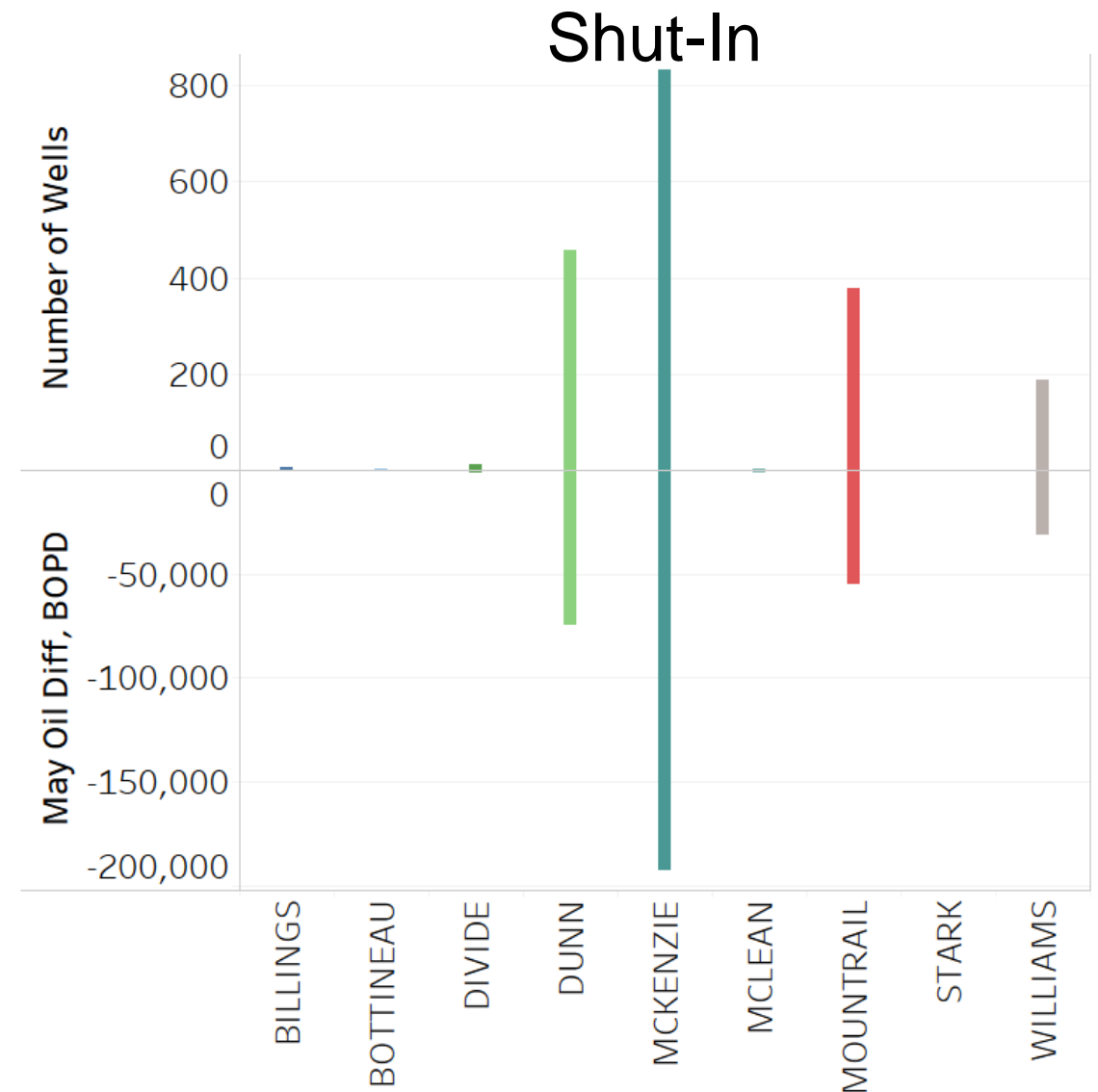
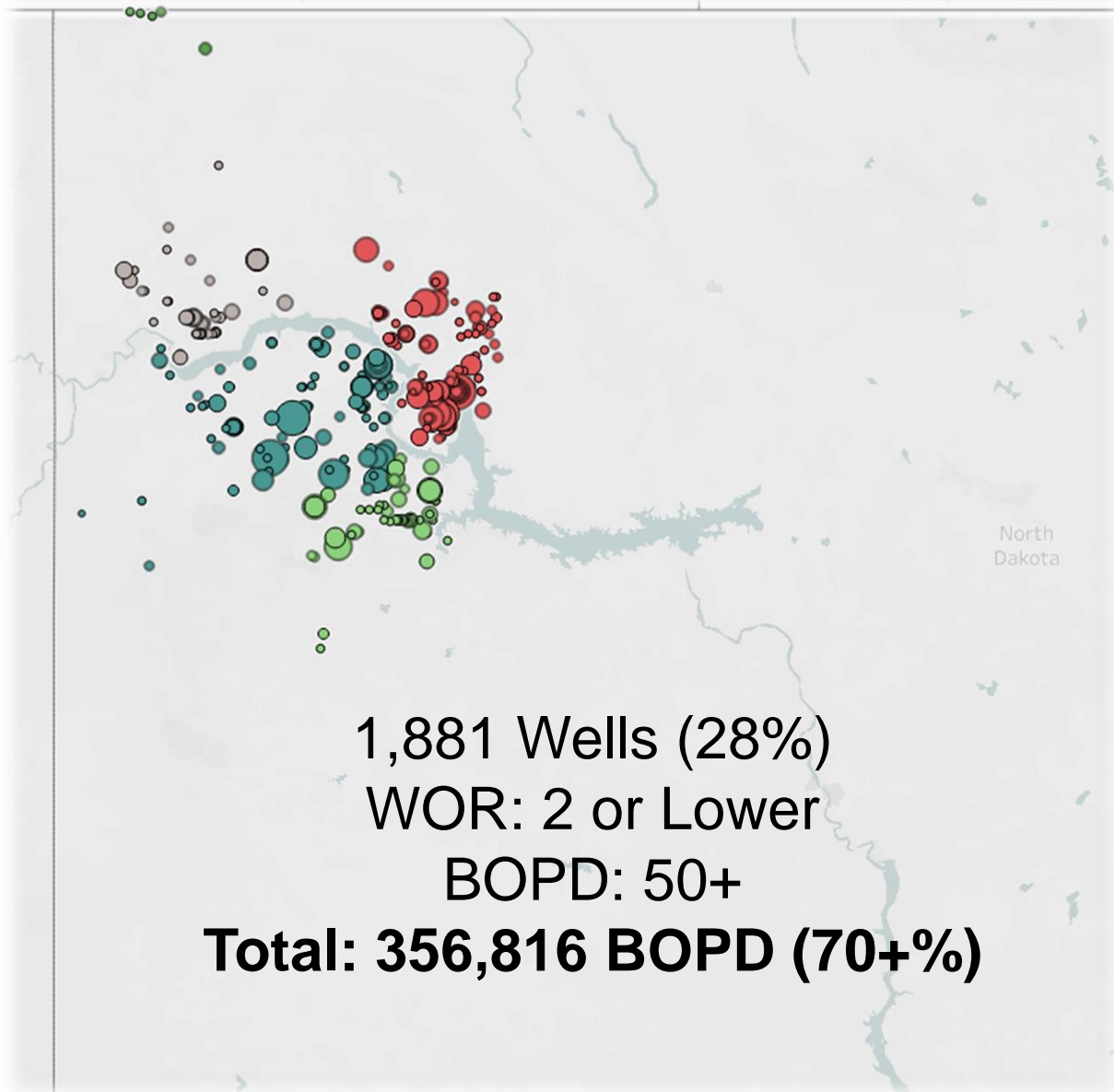
# Shut-In Well Selection: Bakken/Three Forks



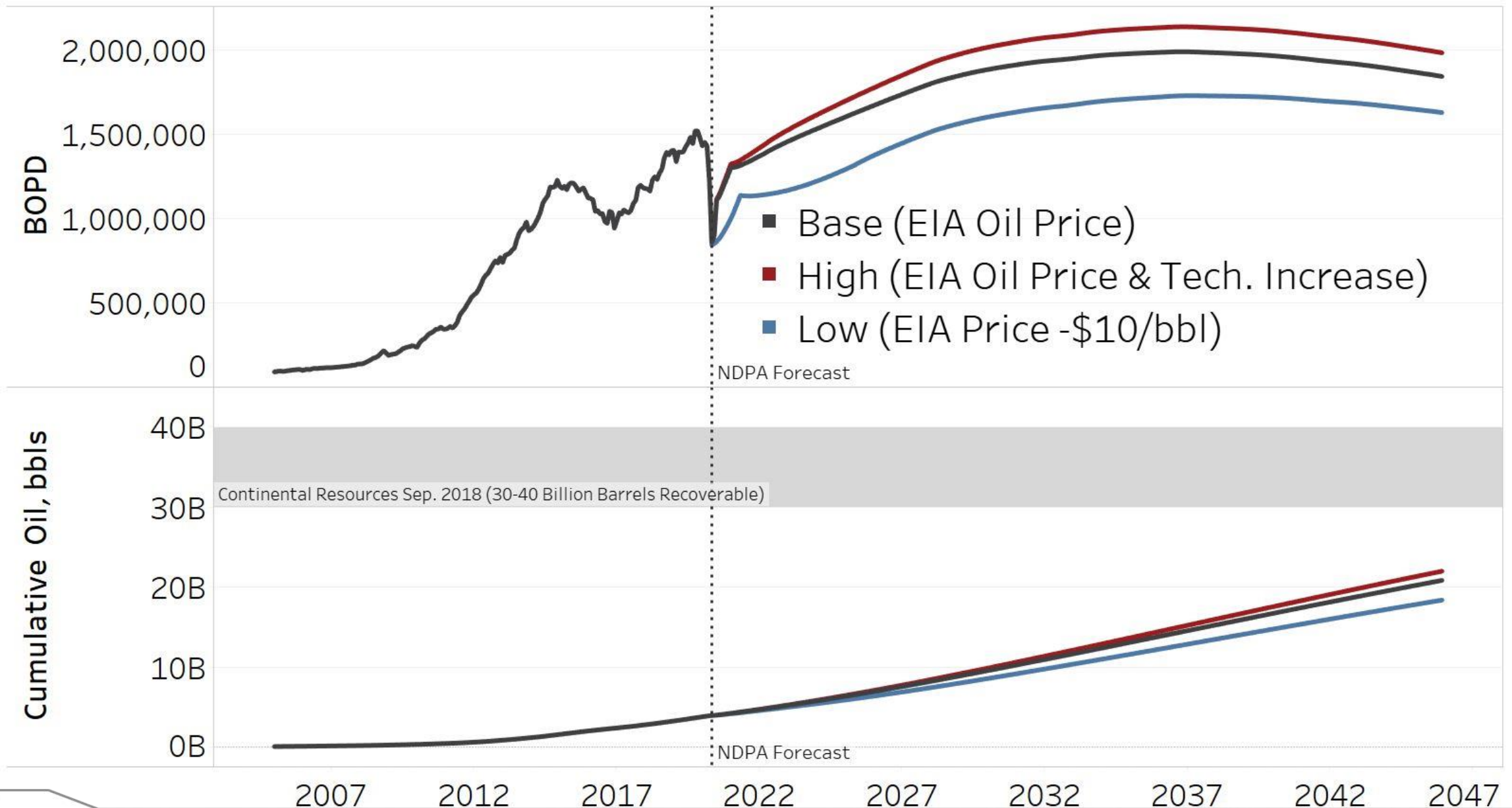
# Shut-In Well Selection: Non-Bakken/Three Forks

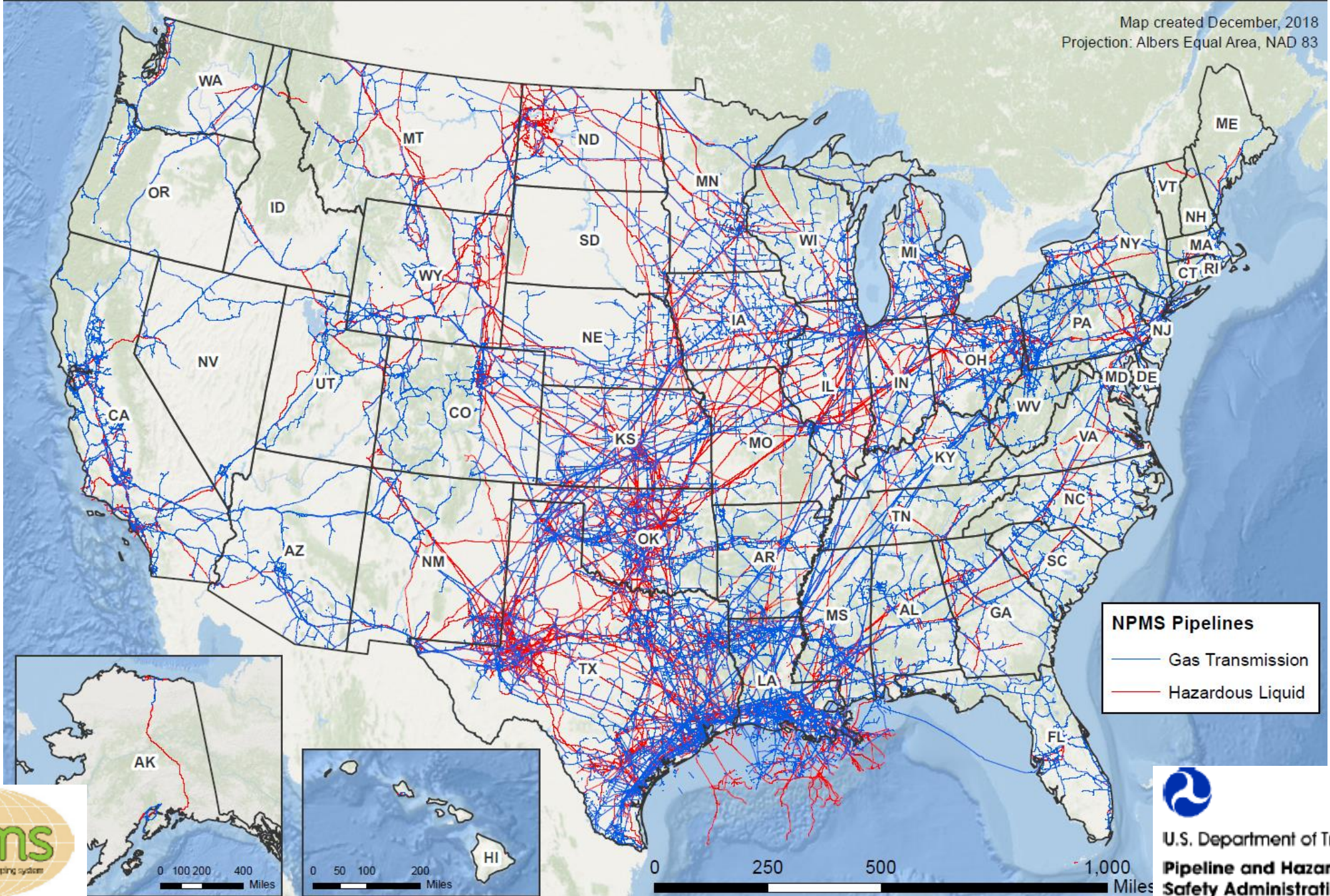


# Wells Most Likely to Return Quickly?



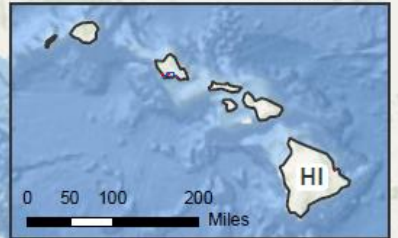
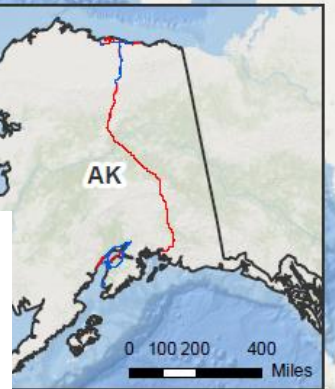
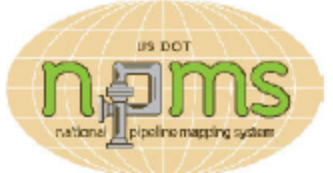
# ND Oil Production: EIA Price Deck





**NPMS Pipelines**

- Gas Transmission
- Hazardous Liquid





CANADA'S OIL & NATURAL GAS PRODUCERS



**PIPELINE TOLLS FOR LIGHT OIL (US\$ per barrel)**

Edmonton to

Burnaby (Trans Mountain)	2.40
Anacortes (TM/Puget)	2.70
Sarnia (Enbridge)	4.65
Montréal (Enbridge)	6.20
Chicago (Enbridge)	4.20
Cushing (Enbridge)	5.45*-6.80
Wood River (Enbridge/Mustang/Capwood)	5.75
USGC (Enbridge/Seaway)	6.45*-9.10\$

Hardisty to

Guernsey (Express/Platte)	3.40*
Wood River (Express/Platte)	5.20*
Wood River (Keystone)	4.55**-8.60
USGC (Keystone/TC Gulf Coast)	8.10\$-13.40
USEC to Montréal (Portland/Montréal)	0.90

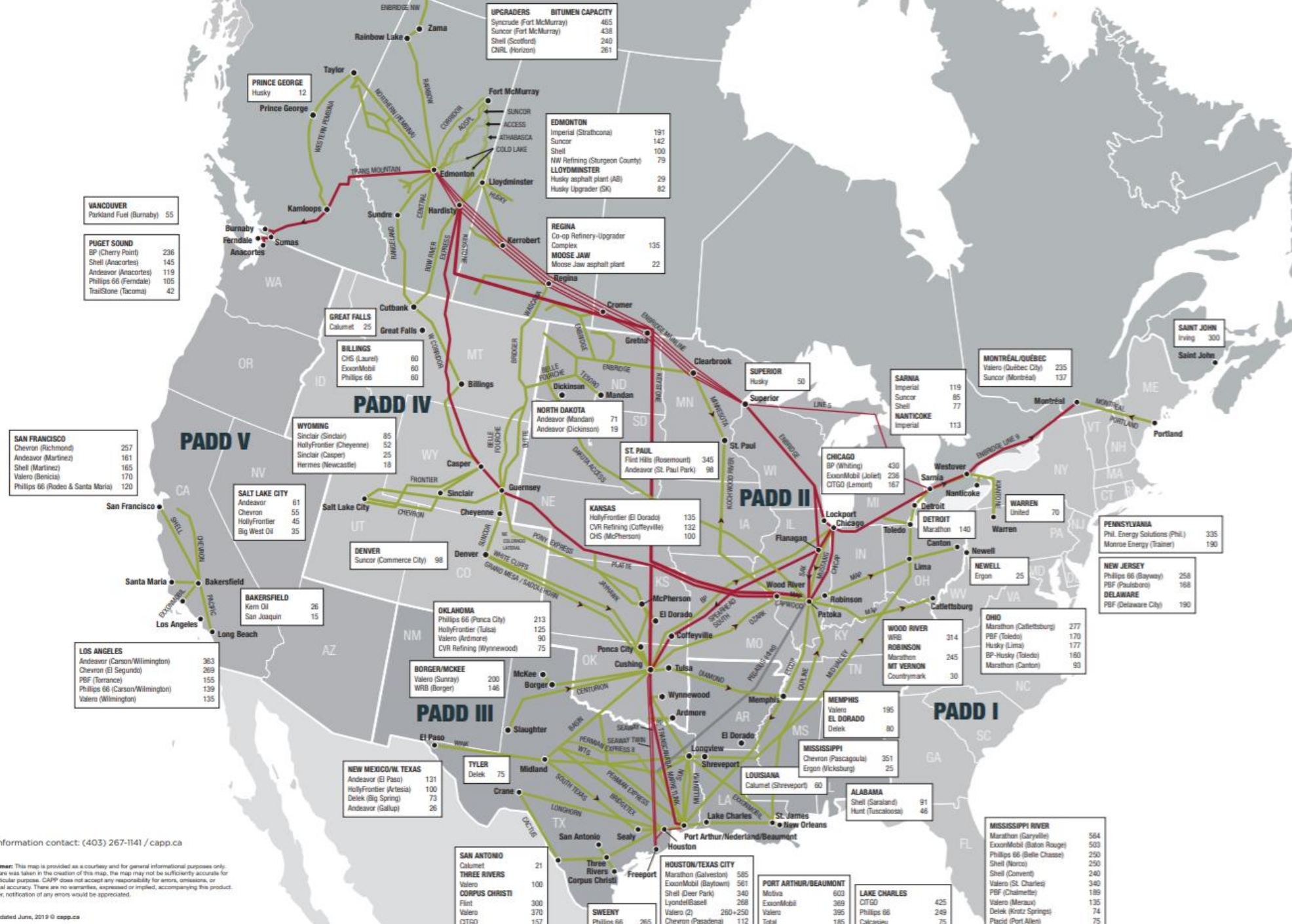
**PIPELINE TOLLS FOR HEAVY OIL (US\$ per barrel)**

Hardisty to:

Chicago (Enbridge)	4.40
Cushing (Enbridge)	5.65*-7.05
Cushing (Keystone)	6.30**-10.45
Wood River (Keystone)	6.45
Wood River (Enbridge/Mustang/Capwood)	6.45
BP-Husky (Toledo)	5.25**-9.45
Wood River (Express/Platte)	5.80*
USGC (Enbridge/Seaway)	9.60*-12.30\$
USGC (Keystone/TC Gulf Coast)	8.80\$-12.20

Notes: 1) Assumed exchange rate = 0.74 US\$ / 105 May 2019 average  
2) Tolls rounded to nearest 5 cents  
3) Tolls in effect July 1, 2019

\* 10-year committed toll  
\*\* 20-year committed toll  
† First Open Season 10-year, 50,000+ bbl committed volumes  
‡ International Joint Toll

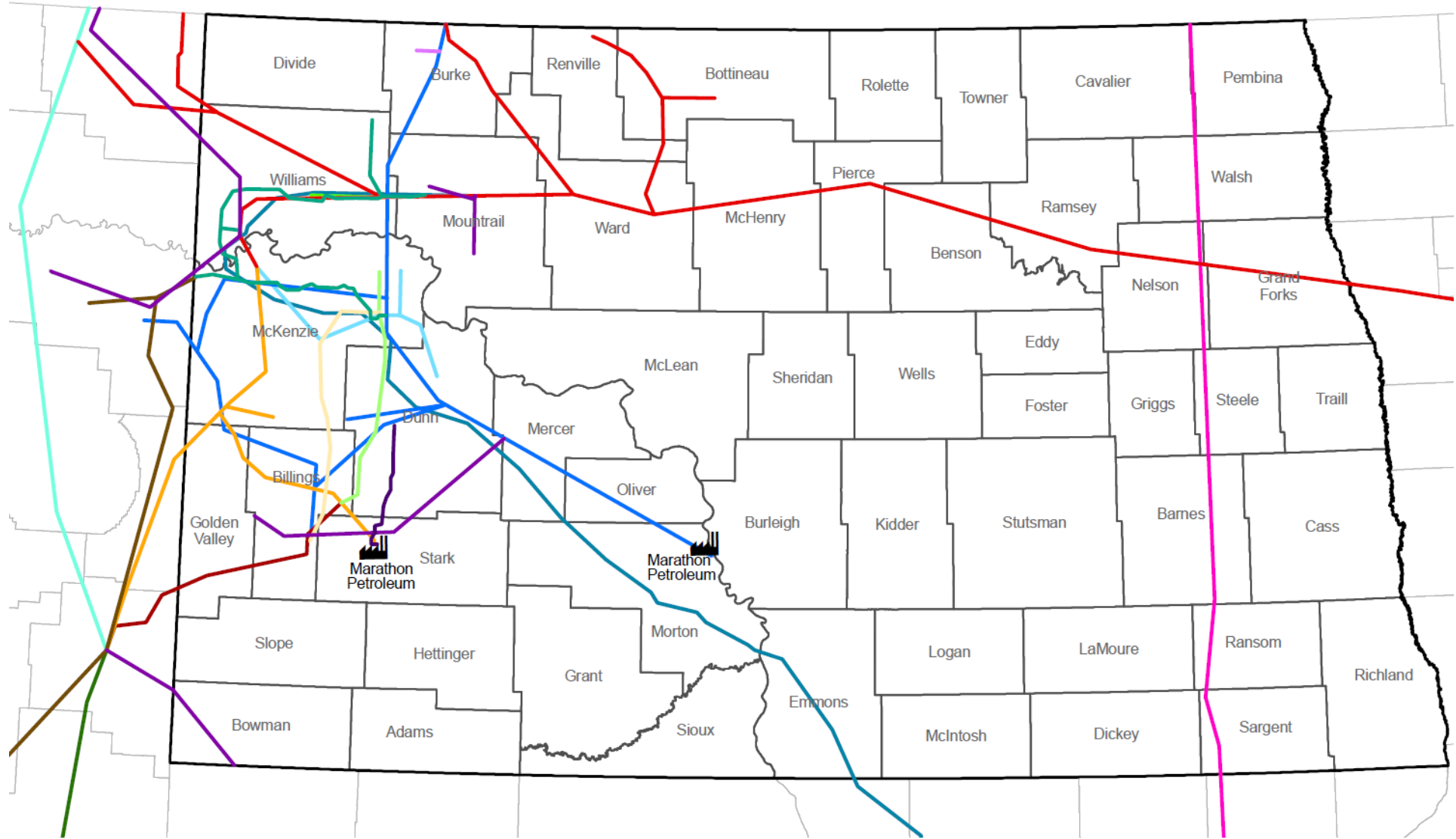




















For information contact: (403) 267-1141 / capp.ca

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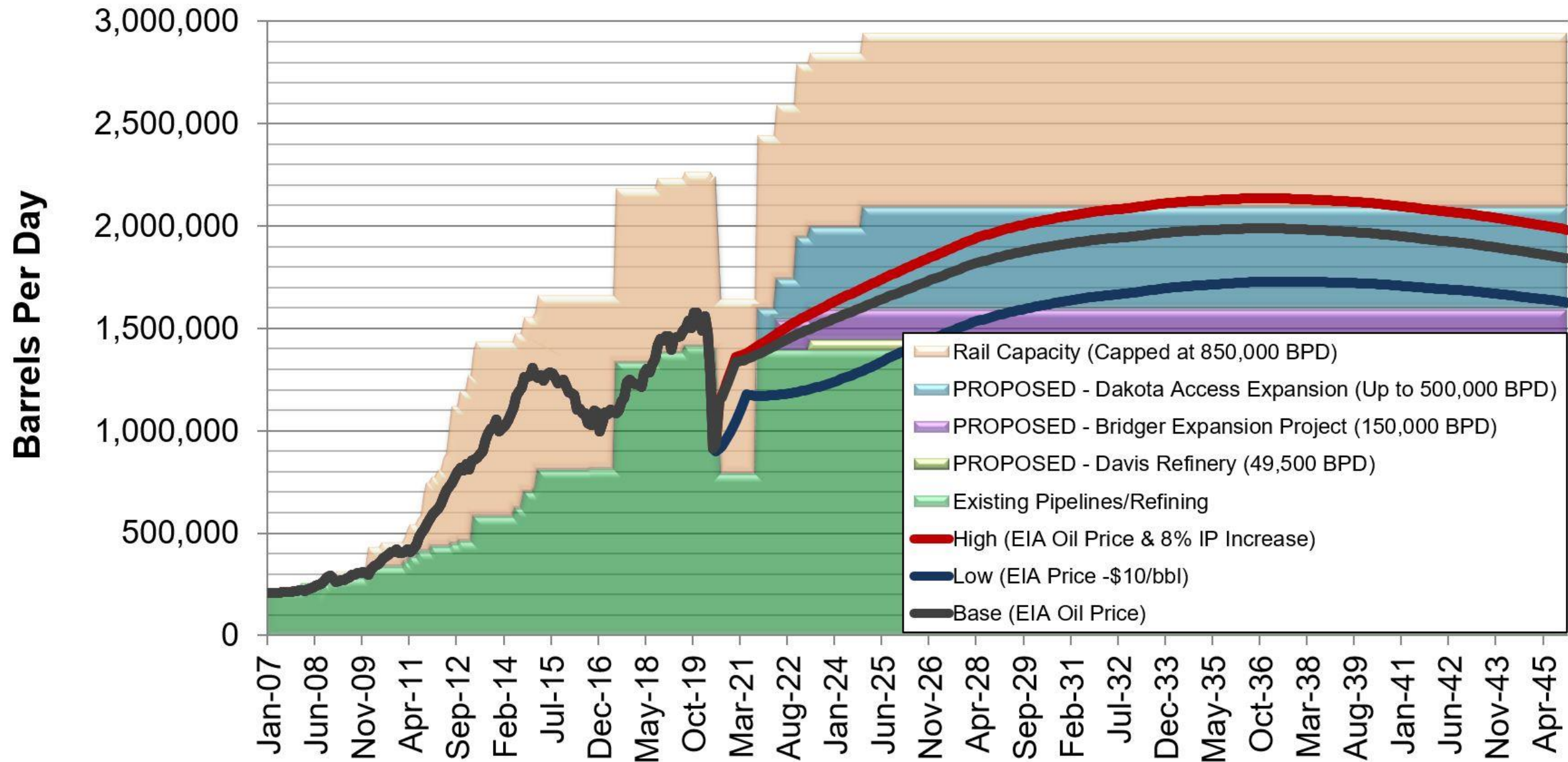
# North Dakota Crude Oil Pipelines



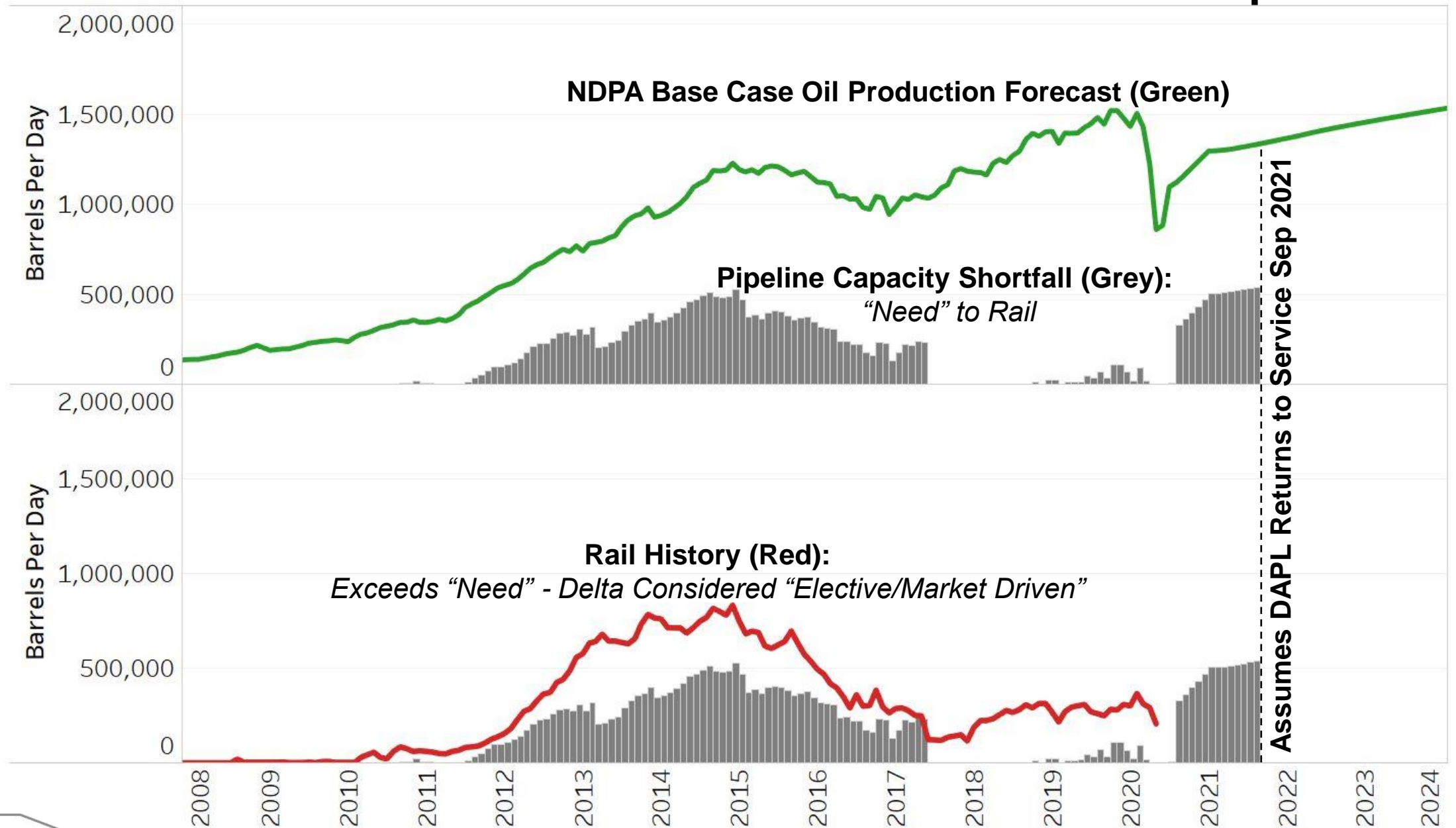
- |  |   |   |  |   |  |
|--|---|---|--|---|--|
|  Refinery           |  Basin Transload |  Butte         |  Double H   |  Hiland            |  Bridger  |
|  Bakken Oil Express |  Belle Fourche   |  Crestwood     |  Enbridge   |  Keystone Pipeline |  Targa    |
|  BakkenLink         |  Bridger      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



# Williston Basin Oil Production & Export Capacity, BOPD



# NDPA Production Forecast and Rail Transportation



# Snapshot from DAPL Tariff

**DAKOTA ACCESS, LLC**  
**JOINT PIPELINE TARIFF**  
 In Connection With  
**Energy Transfer Crude Oil Company, LLC**

Applying On  
**CRUDE PETROLEUM**  
**FROM POINTS IN NORTH DAKOTA**  
**TO POINTS IN TEXAS AND TENNESSEE**

## TABLE OF RATES

ALL Rates in dollars per barrel of 42 US gallons

<b>UNCOMMITTED RATES FOR BAKKEN CRUDE PETROLEUM</b>		
<b>From</b>	<b>To Nederland, Jefferson County, Texas (SXL Nederland Terminal or P66 Nederland Terminal)</b>	<b>To Collierville, Tennessee (Valero Terminal)</b>
An Origin Point that is an Eligible Bakken Origin Point*	\$8.3492	\$8.3492

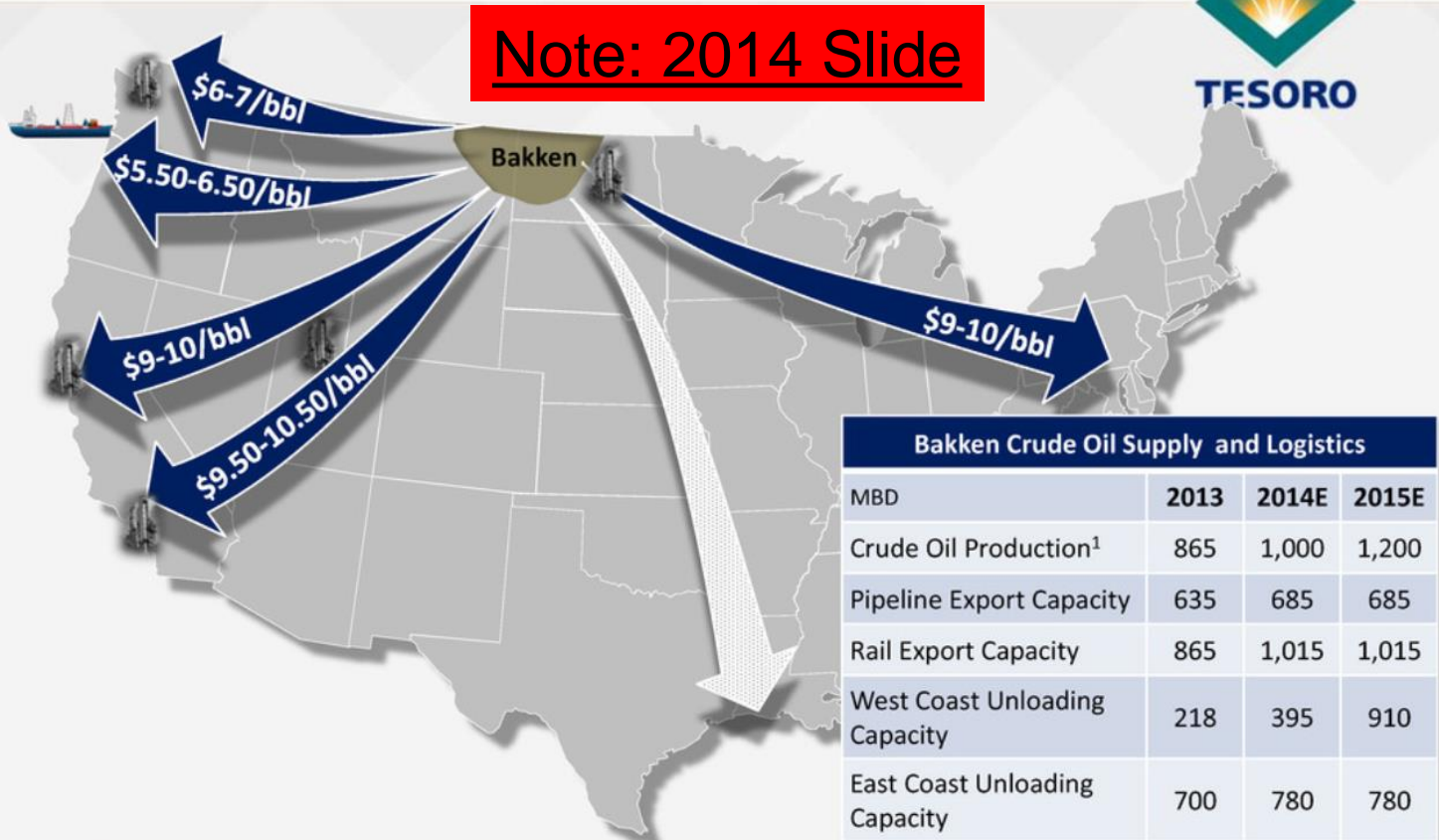
**Committed Rates for Bakken Crude Petroleum from a Committed Shipper's Selected Origin Point(s) that is an Eligible Bakken Origin Point\* to Destination Point of NEDERLAND, Texas – SXL Nederland Terminal**

<b>Volume Commitment (bpd)^</b>	<b>Term</b>	
	<b>7 Years</b>	<b>10 Years</b>
3,500 – 29,999	\$7.0358**	\$6.7652**
30,000 – 49,999	\$6.7652**	\$6.4946**
50,000 – 69,999	\$6.4946**	\$6.2240**
70,000 – 89,999	\$6.4946**	\$6.0616**
90,000+	\$6.0616**	\$5.9534**

# Look at Key Rail Rates

## Rail Costs to Clear Bakken

Note: 2014 Slide



Bakken Crude Oil Supply and Logistics			
MBD	2013	2014E	2015E
Crude Oil Production <sup>1</sup>	865	1,000	1,200
Pipeline Export Capacity	635	685	685
Rail Export Capacity	865	1,015	1,015
West Coast Unloading Capacity	218	395	910
East Coast Unloading Capacity	700	780	780

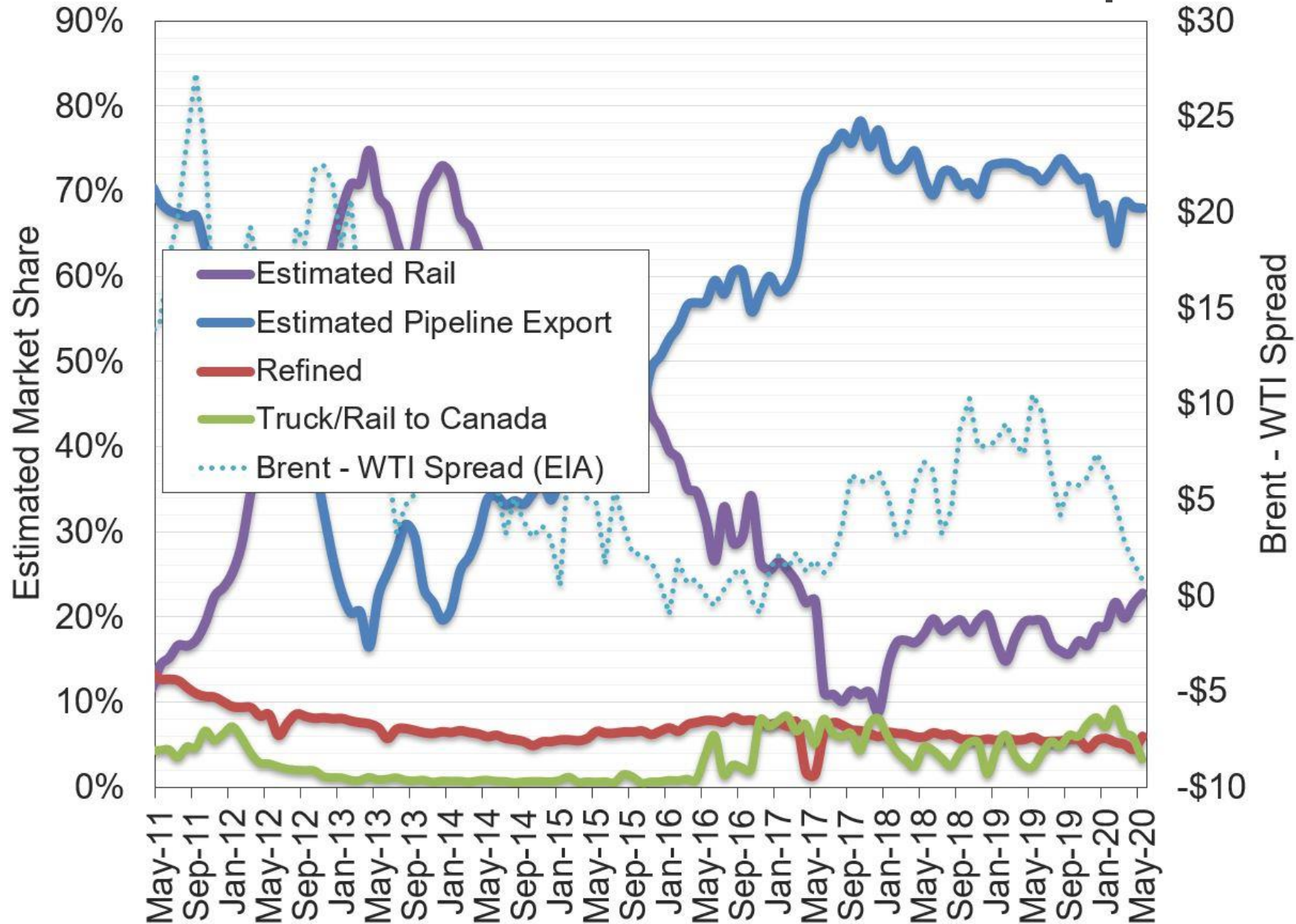
West and East Coasts clearing destinations for Bakken crude oil

Note: Rail cost estimates include only the railroad tariff.  
 1) Average annual crude oil production, export capacity and price discount estimates based on industry consultant and Tesoro market outlook.

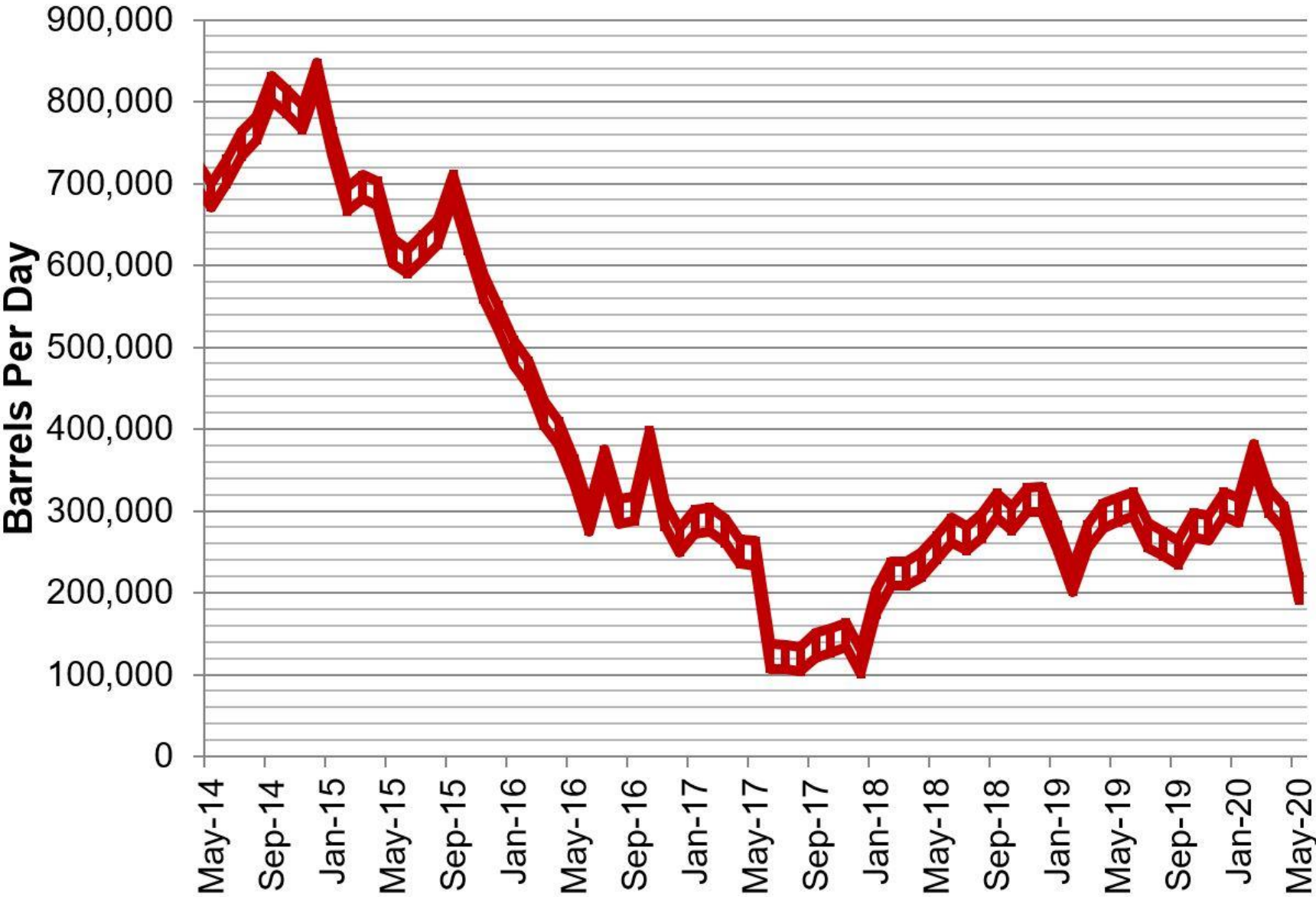
## Additional Rail Related Expense Considerations:

- Loading
- Unloading
- Car Leasing
- Unit vs Manifest
- Volume Commitments

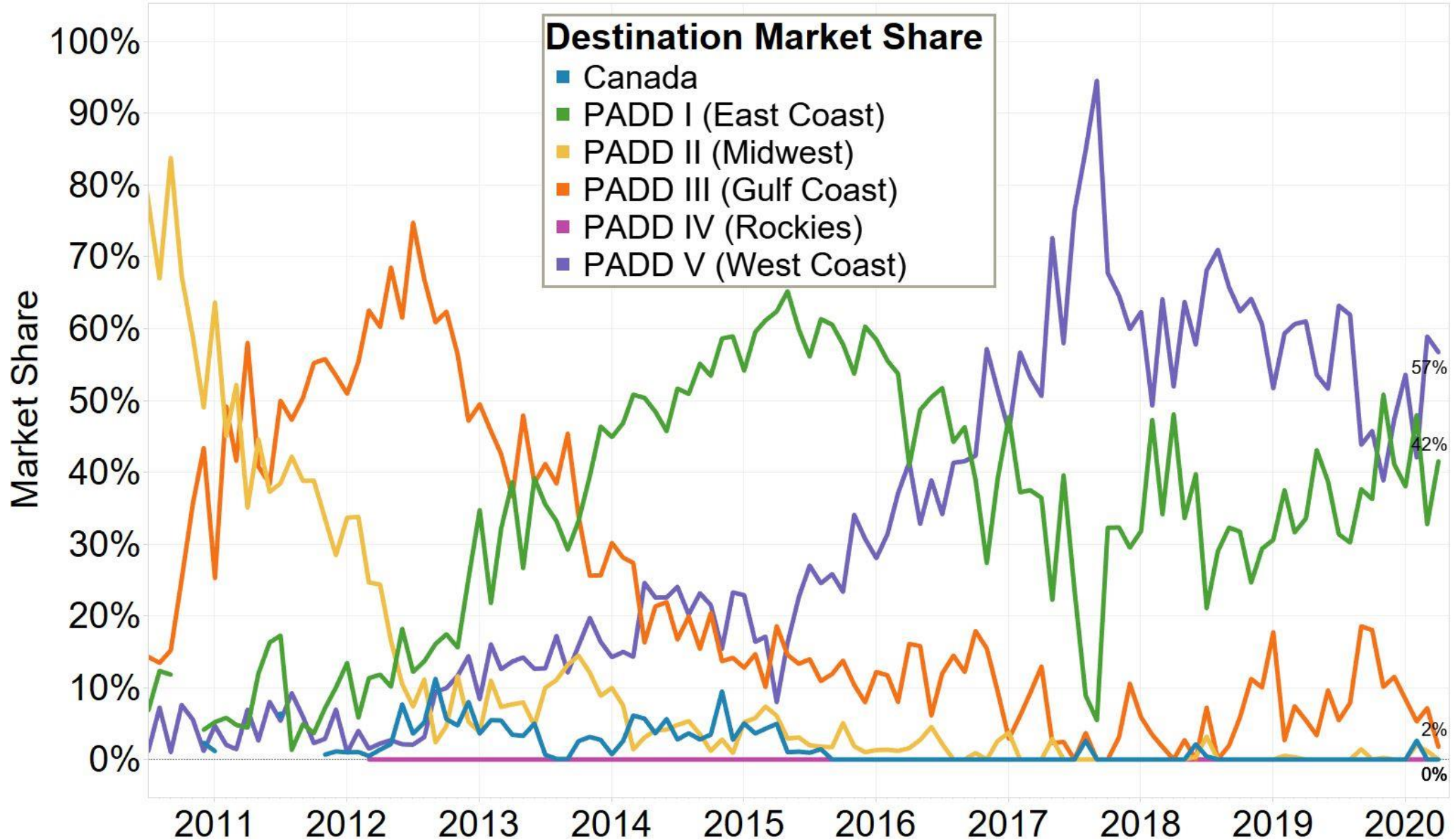
# Estimated Williston Basin Oil Transportation



# Estimated ND Rail Export Volumes



# Rail Destinations Market Share (April 2020)



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



COME BY CHANCE  
Silverpeak 115

Hibernia  
Hibernia  
Terra Nova

PIPELINE TOLLS FOR LIGHT OIL (US\$ per barrel)	
Edmonton to	
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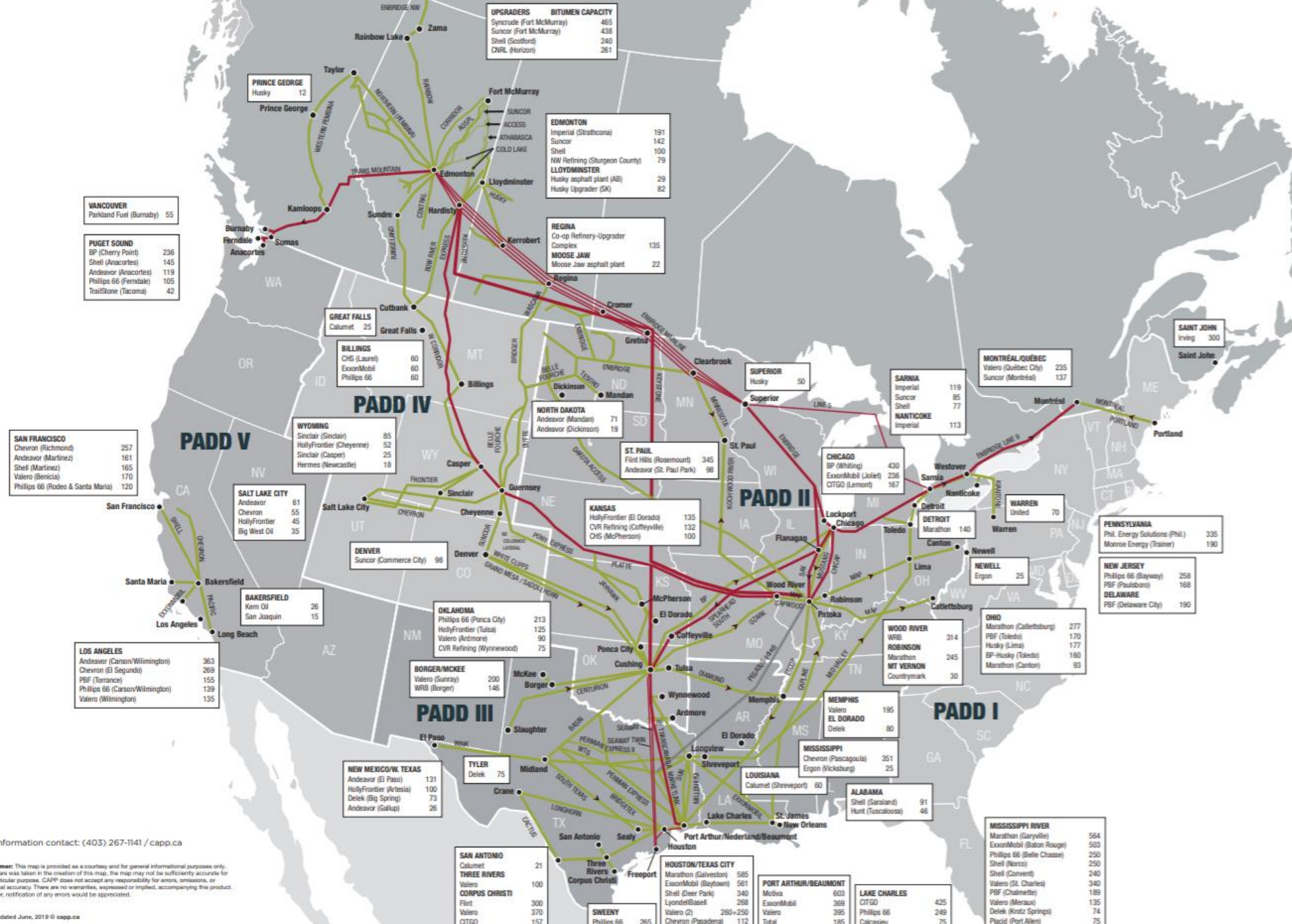
Notes: \* Assumed exchange rate = 0.74 US\$ / 10\$ May 2019 average  
 \*\* 25-year committed toll  
 \* 10-year committed toll  
 \*\* 25-year committed toll  
 † First Open Season 10-year, 50,000+ bbl committed volumes  
 ‡ International Joint Toll

Crude Refining Capacities as at June 1, 2019 (thousand barrels per day)

**PADD** Petroleum Administration for Defense District

Major Existing Crude Oil Pipelines Carrying Canadian Crude Oil

Selected other Crude Oil Pipelines



**VANCOUVER**  
Parkland Fuel (Burnaby) 55

**PUGET SOUND**  
BP (Cherry Point) 236  
Shell (Anacortes) 145  
Andeavor (Anacortes) 119  
Valero (Benicia) 105  
TrailStone (Tacoma) 42

**SAN FRANCISCO**  
Chevron (Richmond) 257  
Andeavor (Martinez) 161  
Shell (Martinez) 165  
Valero (Benicia) 170  
Phillips 66 (Rodeo & Santa Maria) 120

**GREAT FALLS**  
Caburet 25

**BILLINGS**  
CHS (Laurel) 60  
ExxonMobil 60  
Phillips 66 60

**WYOMING**  
Sinclair (Sinclair) 85  
HollyFrontier (Cheyenne) 52  
Sinclair (Casper) 25  
Hermes (Newcastle) 18

**SALT LAKE CITY**  
Andeavor 61  
Chevron 55  
HollyFrontier 45  
Big West Oil 35

**DENVER**  
Suncor (Commerce City) 98

**BAKERSFIELD**  
Kern Oil 26  
San Joaquin 15

**LOS ANGELES**  
Andeavor (Carson/Wilmington) 383  
Chevron (El Segundo) 269  
PBF (Torrance) 155  
Phillips 66 (Carson/Wilmington) 139  
Valero (Wilmington) 135

**OKLAHOMA**  
Phillips 66 (Ponca City) 213  
HollyFrontier (Tulsa) 125  
Valero (Ardmore) 90  
CVR Refining (Wynnewood) 75

**BORGER/MCKEE**  
Valero (Sunray) 200  
WRB (Borger) 146

**NEW MEXICO/W. TEXAS**  
Andeavor (El Paso) 131  
HollyFrontier (Artesia) 100  
Delek (Big Spring) 73  
Andeavor (Salp) 26

**SAN ANTONIO**  
Calumet 21

**THREE RIVERS**  
Valero 100

**CORPUS CHRISTI**  
Fint 300  
Valero 370  
CTGO 157

**EDMONTON**  
Imperial (Strathcona) 191  
Suncor 142  
Shell 100  
NW Refining (Shurgeon County) 79

**LLOYDMINSTER**  
Husky asphalt plant (AB) 29  
Husky Upgrader (SK) 82

**REGINA**  
Co-op Refinery-Upgrader Complex 135

**MOOSE JAW**  
Moose Jaw asphalt plant 22

**NORTH DAKOTA**  
Andeavor (Mandan) 71  
Andeavor (Dickinson) 19

**ST. PAUL**  
Flint Hills (Rosemount) 345  
Andeavor (St. Paul Park) 98

**KANSAS**  
HollyFrontier (El Dorado) 135  
CVR Refining (Coffeyville) 132  
CHS (McPherson) 100

**MEMPHIS**  
Valero 195  
EL DORADO 80  
Delek 80

**MISSISSIPPI**  
Chevron (Pascagoula) 351  
Ergon (Wicksburg) 25

**LOUISIANA**  
Calumet (Shreveport) 60

**PORT ARTHUR/BEAUMONT**  
Motiva 603  
ExxonMobil 369  
Valero 395  
Total 185

**LAKE CHARLES**  
CTGO 425  
Phillips 66 249  
Calcasieu 75

**MISSISSIPPI RIVER**  
Marathon (Garyville) 564  
ExxonMobil (Baton Rouge) 503  
Phillips 66 (Belle Chasse) 250  
Shell (Norco) 250  
Shell (Convent) 240  
Valero (St. Charles) 340  
PBF (Chalmette) 189  
Valero (Morgan) 135  
Delek (Krotz Springs) 74  
Placid (Port Allen) 75

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### US Williston Basin Crude Oil Export Options - July 2020

Year End System Capacity, Barrels Per Day

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021*	2022*
Butte Pipeline	118,000	145,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000
Butte Expansion (Q3 2014)	-	-	-	-	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Marathon Petroleum Mandan Refinery	58,000	58,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000
Enbridge Mainline North Dakota	161,500	185,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Enbridge Bakken Expansion Program	-	25,000	25,000	145,000	145,000	145,000	145,000	145,000	145,000	145,000	145,000	145,000	145,000
Plains Bakken North (Up to 70,000 BOPD)	-	-	-	-	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Dakota Prairie Refinery (Q2 2015) (Proposed Conversion - No crude Q3-2020)	-	-	-	-	-	20,000	20,000	20,000	20,000	20,000	-	-	-
Davis Refinery (49,500 BOPD)*	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Transfer Partners Bakken Pipeline	-	-	-	-	-	-	-	520,000	570,000	600,000	600,000	600,000	600,000
ETP DAPL Expansion* (Exact Timeline Unavailable - Up to 500,000 bpd)	-	-	-	-	-	-	-	-	-	-	-	200,000	200,000
Bridger Expansion Project*	-	-	-	-	-	-	-	-	-	-	-	-	150,000
Kinder Morgan Double H Pipeline (Q1 2015)	-	-	-	-	-	84,000	88,000	88,000	88,000	88,000	88,000	88,000	88,000
<b>Pipeline/Refining Total</b>	<b>337,500</b>	<b>413,000</b>	<b>463,000</b>	<b>583,000</b>	<b>703,000</b>	<b>807,000</b>	<b>811,000</b>	<b>1,331,000</b>	<b>1,381,000</b>	<b>1,411,000</b>	<b>1,391,000</b>	<b>1,591,000</b>	<b>1,741,000</b>

RECEIPT CONNECTIONS	
Location	Capacity (BPD)
Alexander - Bridger	8,000
Beaver Lodge - Enbridge (NDPL)	14,800
Belfield - Belfield Gathering	25,000
Dodge - Bridger	10,000
Dry Creek - Arrow	20,000
Highway 22 - Bridger	9,800
Johnson's Corner - Arrow	60,000
Johnson's Corner - Oasis	30,000
Johnson's Corner - Plains	50,000
Johnson's Corner - Targa	50,000
Keene - Paradigm	24,000
Keene - Targa	20,000
Three Forks - Targa	40,000
Watford - American Midstream	15,000
Watford City - Enable	25,000

DELIVERY CONNECTIONS	
Location	Capacity (BPD)
Beaver Lodge - Enbridge (NDPL)	80,000 / Pipeline
Beulah - Basin Transload	20,000 / Rail
BOE - Bakken Oil Express	30,000 / Rail
Dry Fork - Crestwood	40,000 / Rail
Fryburg - Fryburg Rail Terminal	60,000 / Rail
Johnson's Corner - Arrow	10,000 / Pipeline
Johnson's Corner - BakkenLink	40,000 / Pipeline
Johnson's Corner - DAPL	40,000 / Pipeline
Johnson's Corner - Plains	17,000 / Pipeline
Mandan - Andeavor Refinery	70,000 / Refinery
Ramberg - DAPL	40,000 / Pipeline
Richey - Bridger	9,300 / Pipeline
Rupple Station - Bridger	14,000 / Pipeline
Skunkhill - Bridger	20,000 / Pipeline
Stampede - Global	18,600 / Rail

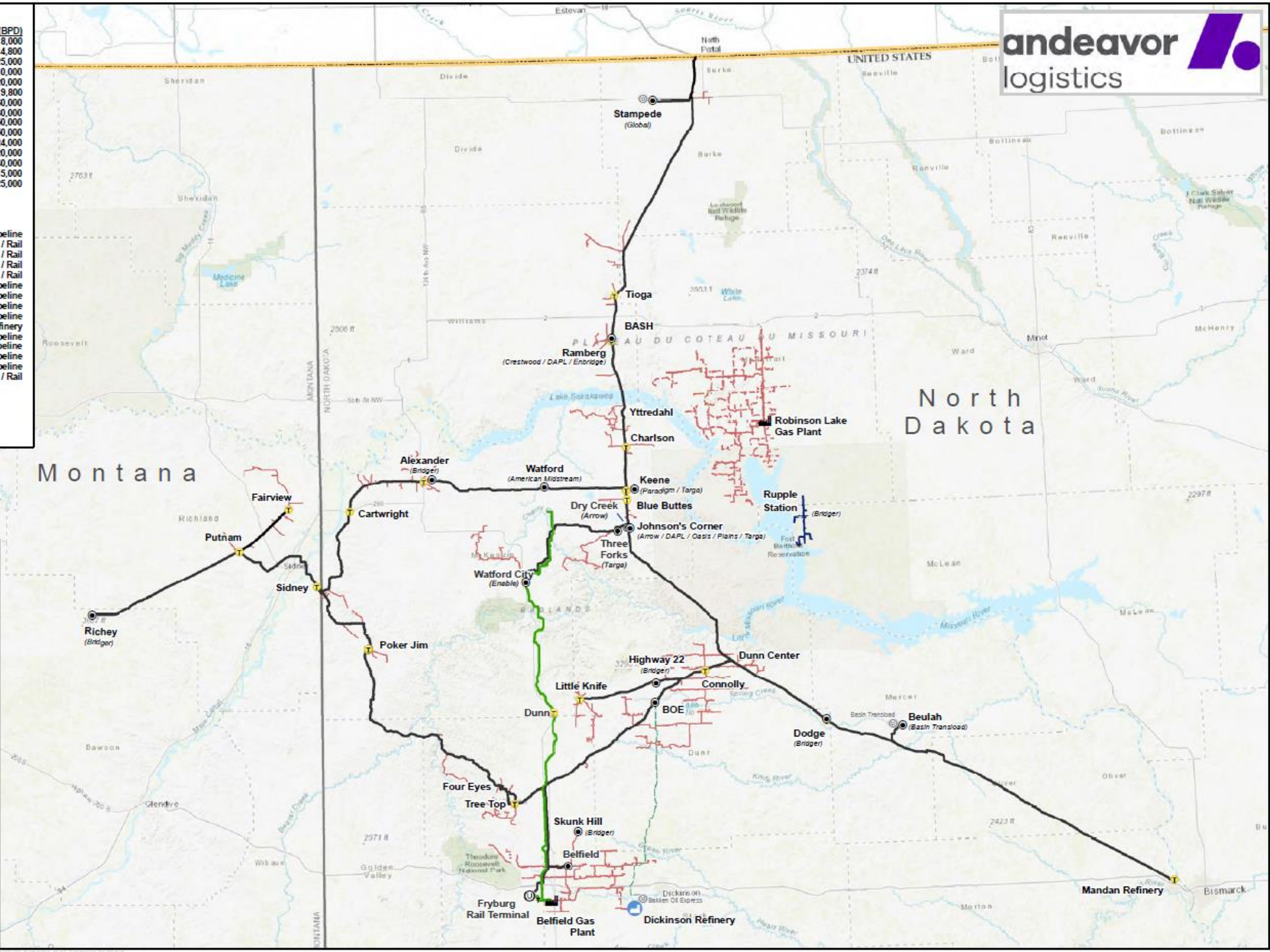
PROPRIETARY STORAGE FACILITY	
Location	Capacity (BPD)
Bakken Area Storage Hub (BASH)	
Fryburg Rail Terminal	

- Tesoro High Plains Pipeline
- Y Grade Pipeline
- Gathering
- NG Gathering
- QEPM Gathering I (Rupple)
- 3rd Party Pipelines - Joint Tariff
- 🏭 Gas Plant
- 🚛 Truck Offloading Station
- 🏠 Proprietary Storage Facility
- 🌐 3rd Party Connection
- 🏭 Andeavor Refinery
- 🚂 Unit Train
- 🚂 Fryburg Rail Terminal - Unit Train

**High Plains Pipeline System**  
North Dakota / Montana

andeavor logistics  
19100 Ridgewood Parkway  
San Antonio, TX 78269

Update: Rev 12      Date: Oct 16, 2018



# Natural Gas Update



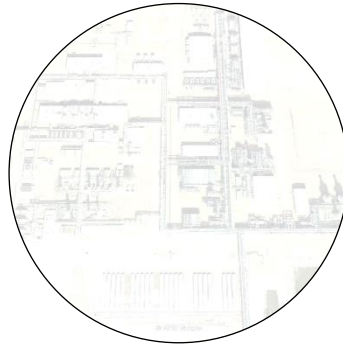
## Production

- Technology
- Markets



## Gathering

- Capacity
- Connections



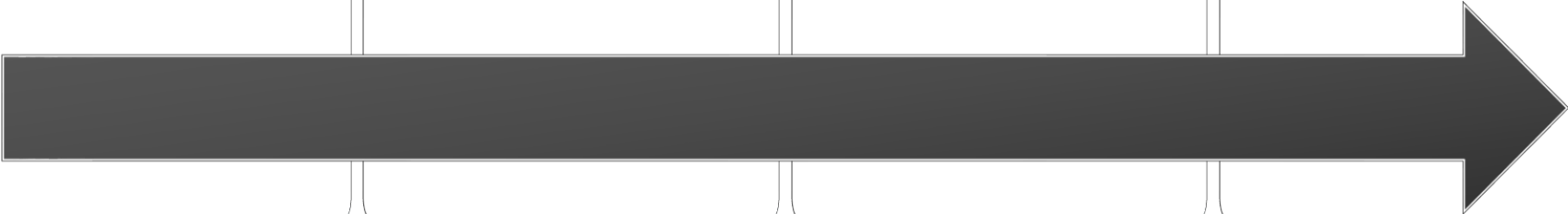
## Processing

- Capacity
- Location

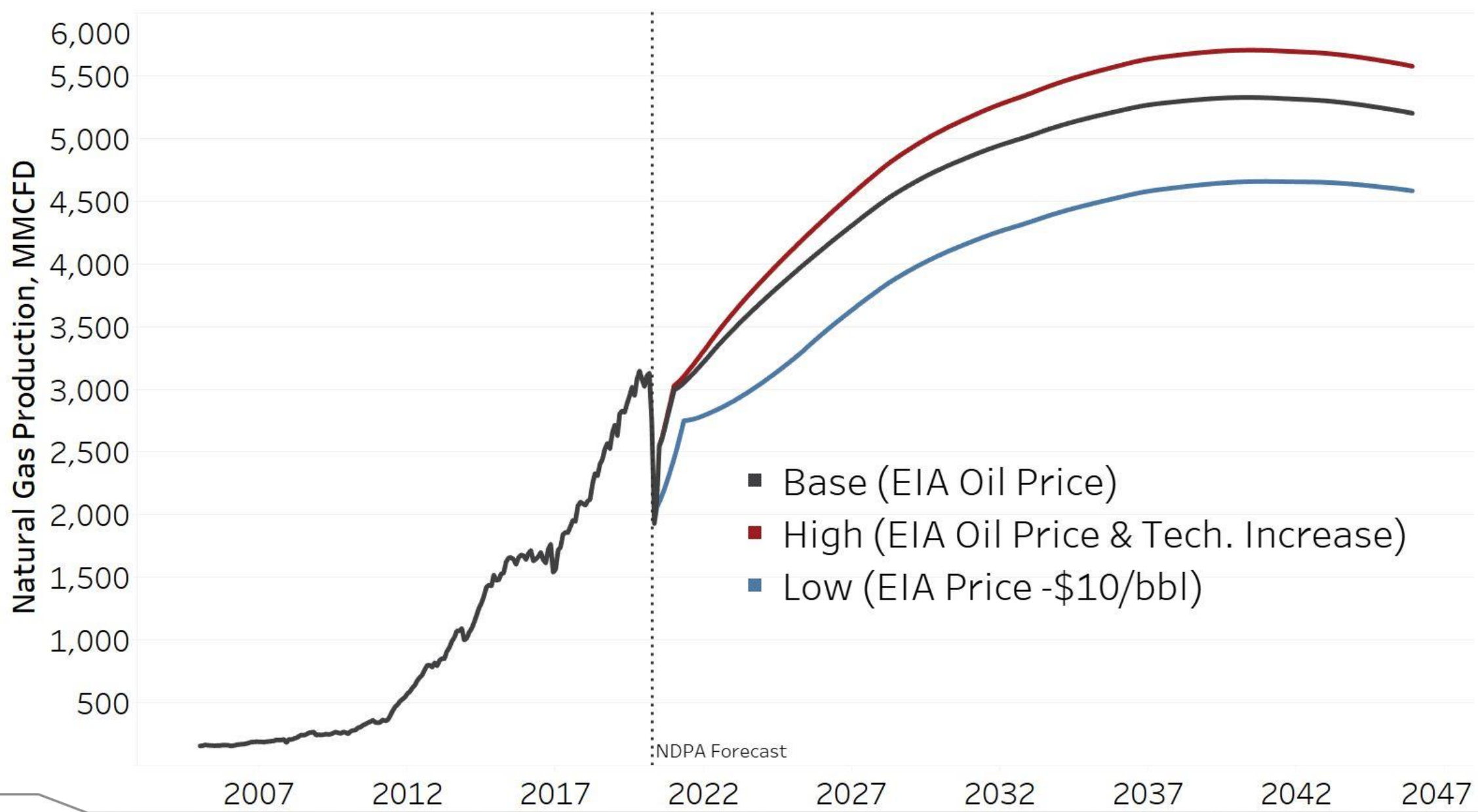


## Transmission

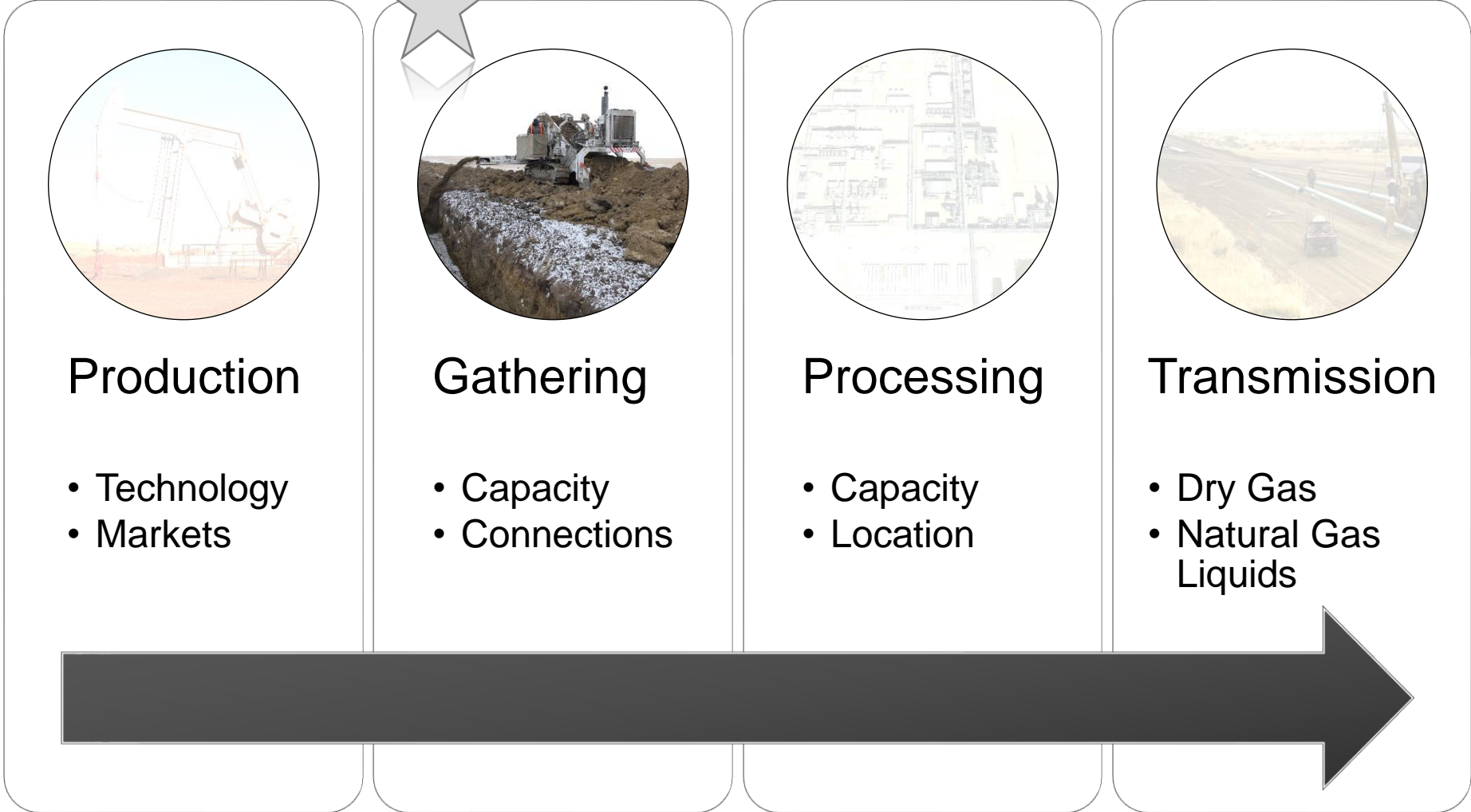
- Dry Gas
- Natural Gas Liquids



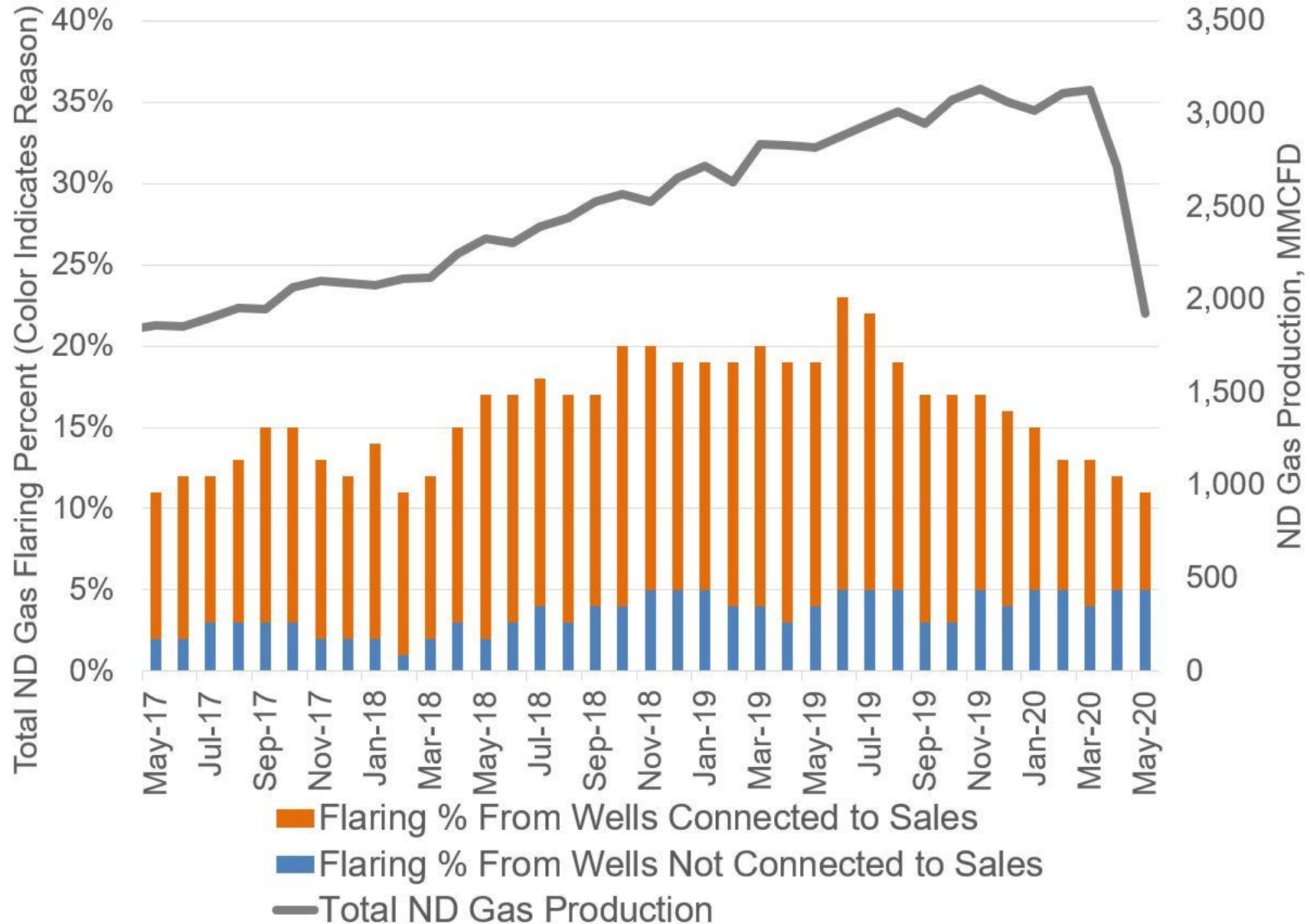
# ND Gas Production: EIA Price Deck



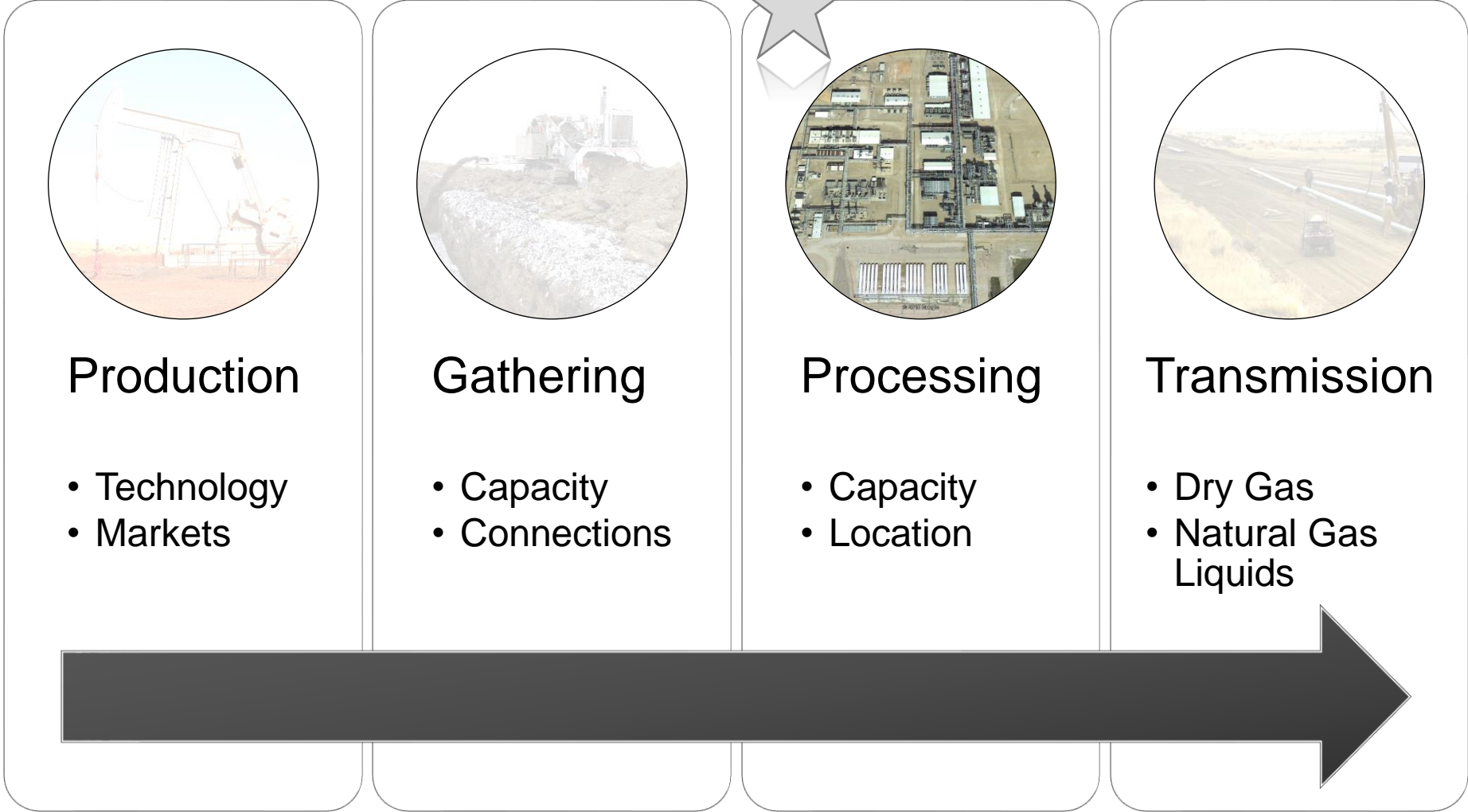
# Natural Gas Update



# Solving the Flaring Challenge

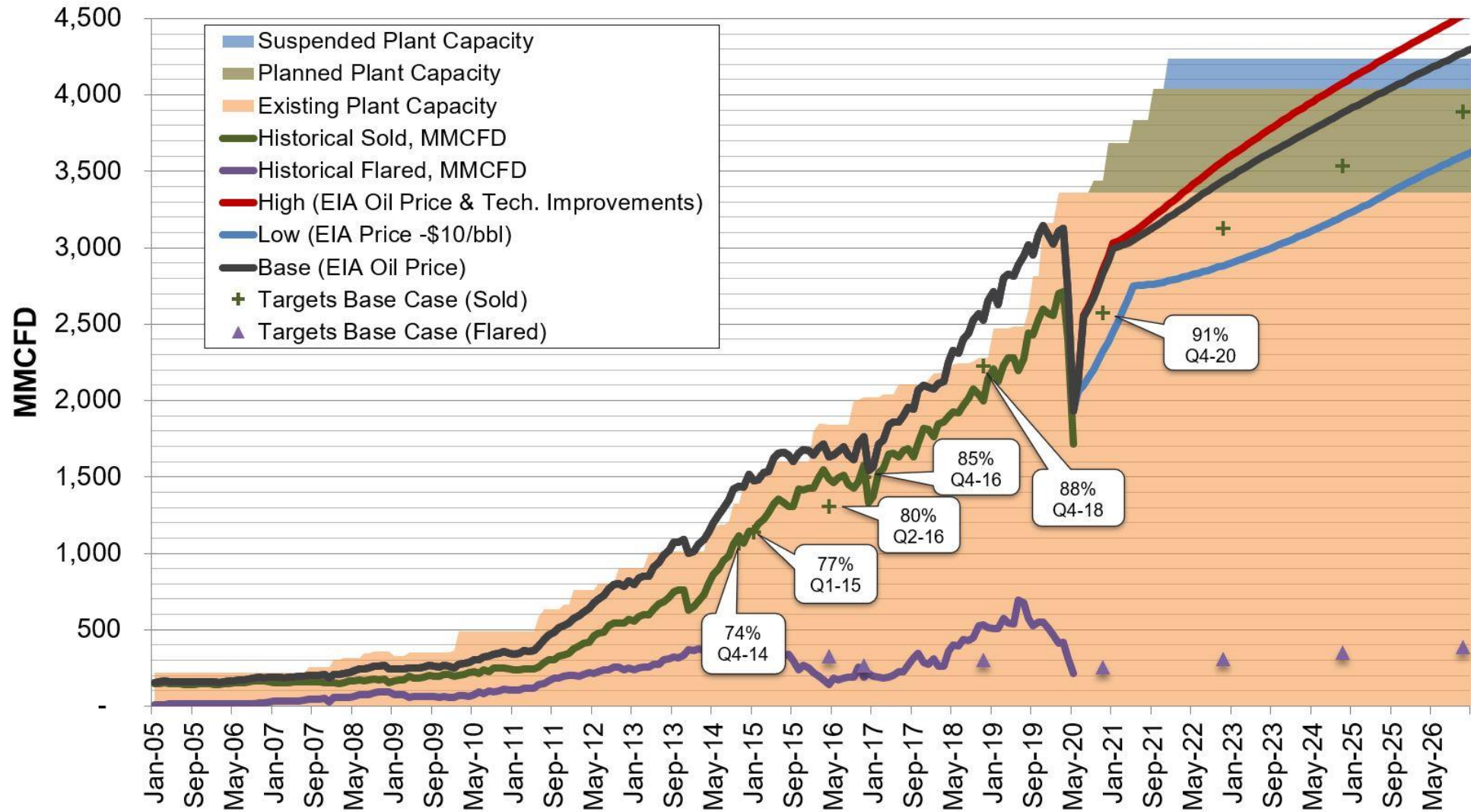


# Natural Gas Update



# Solving the Flaring Challenge

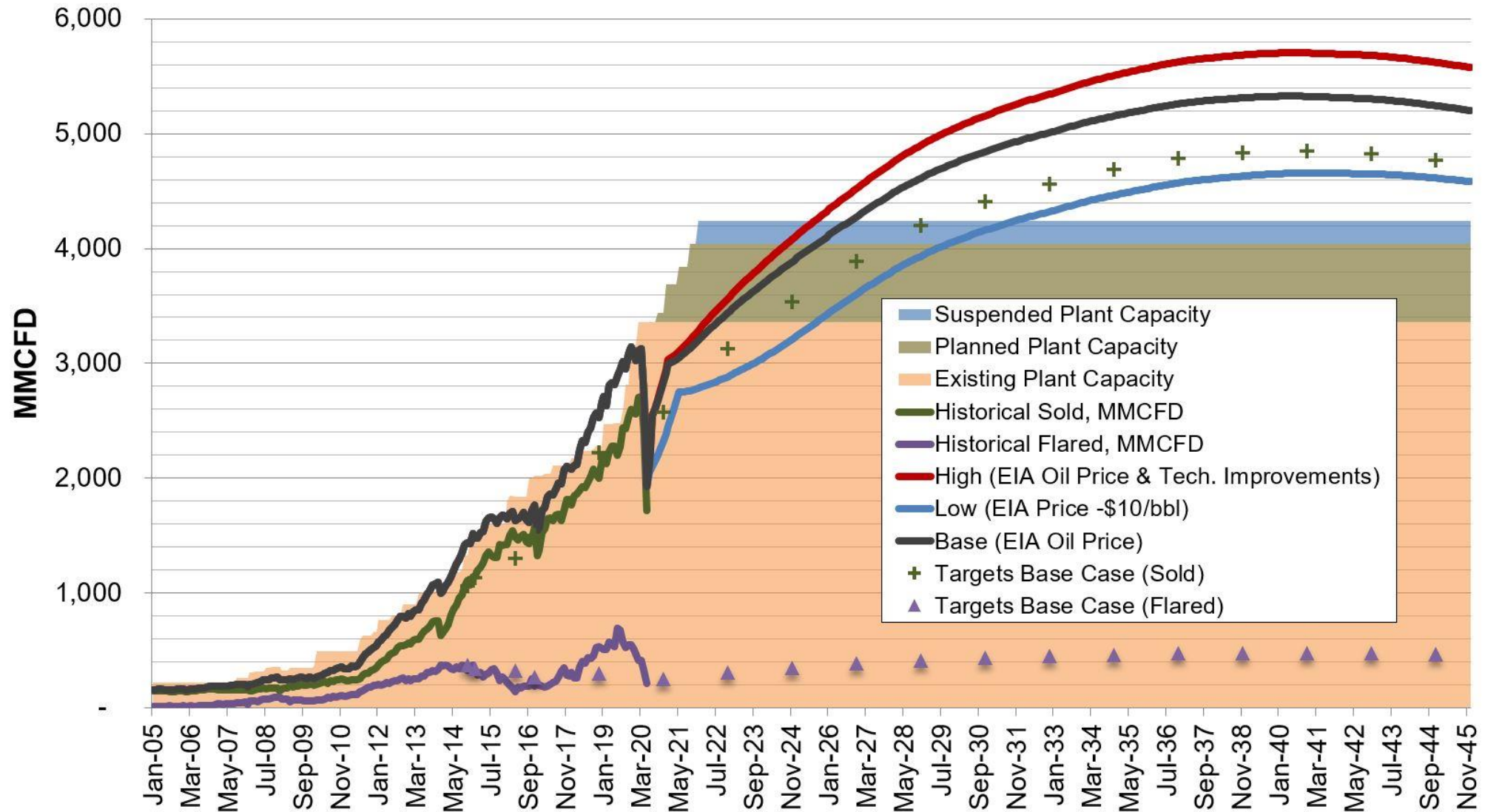
*Assumes Current Technology – Enhanced Oil Recovery Not Included*



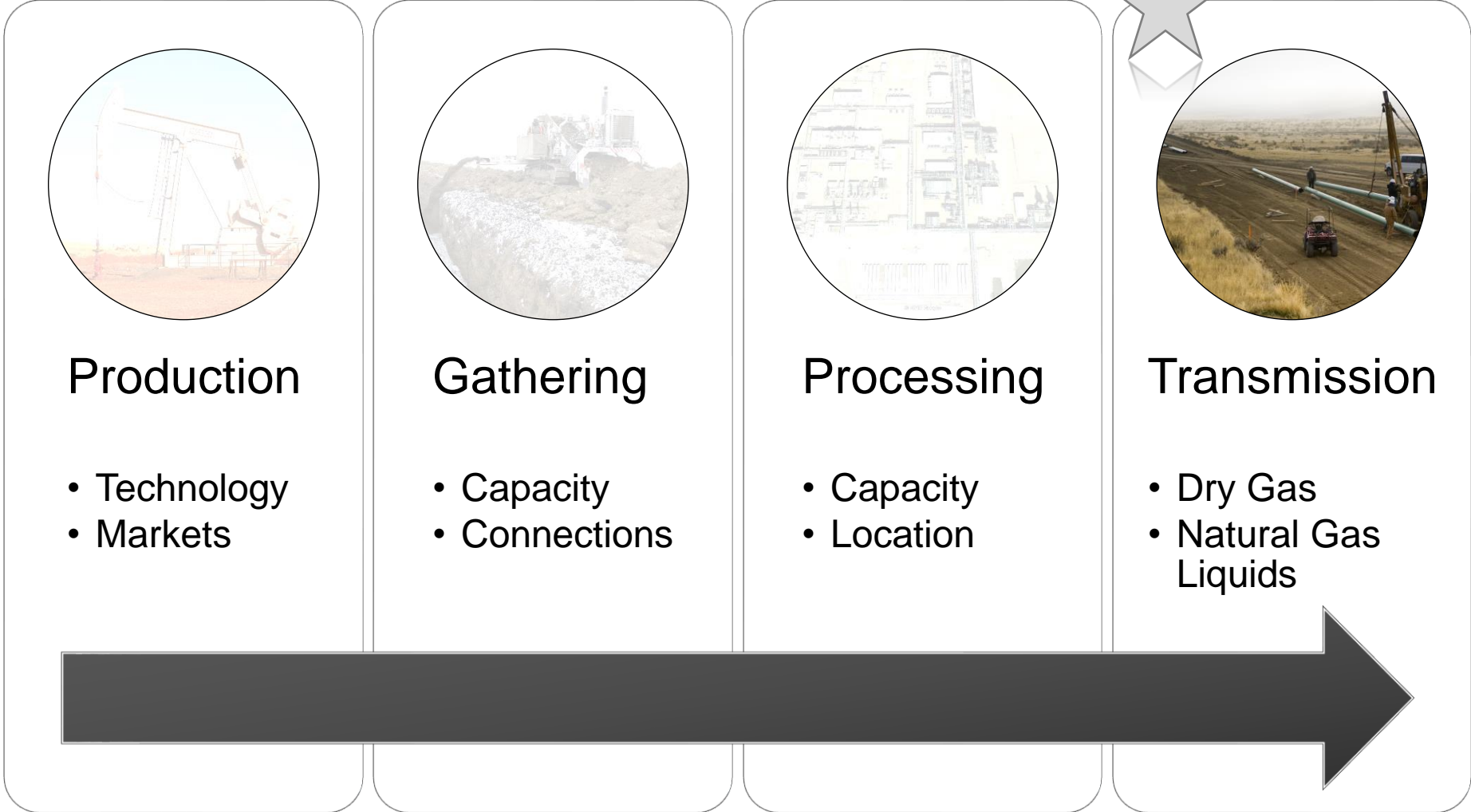


# Solving the Flaring Challenge

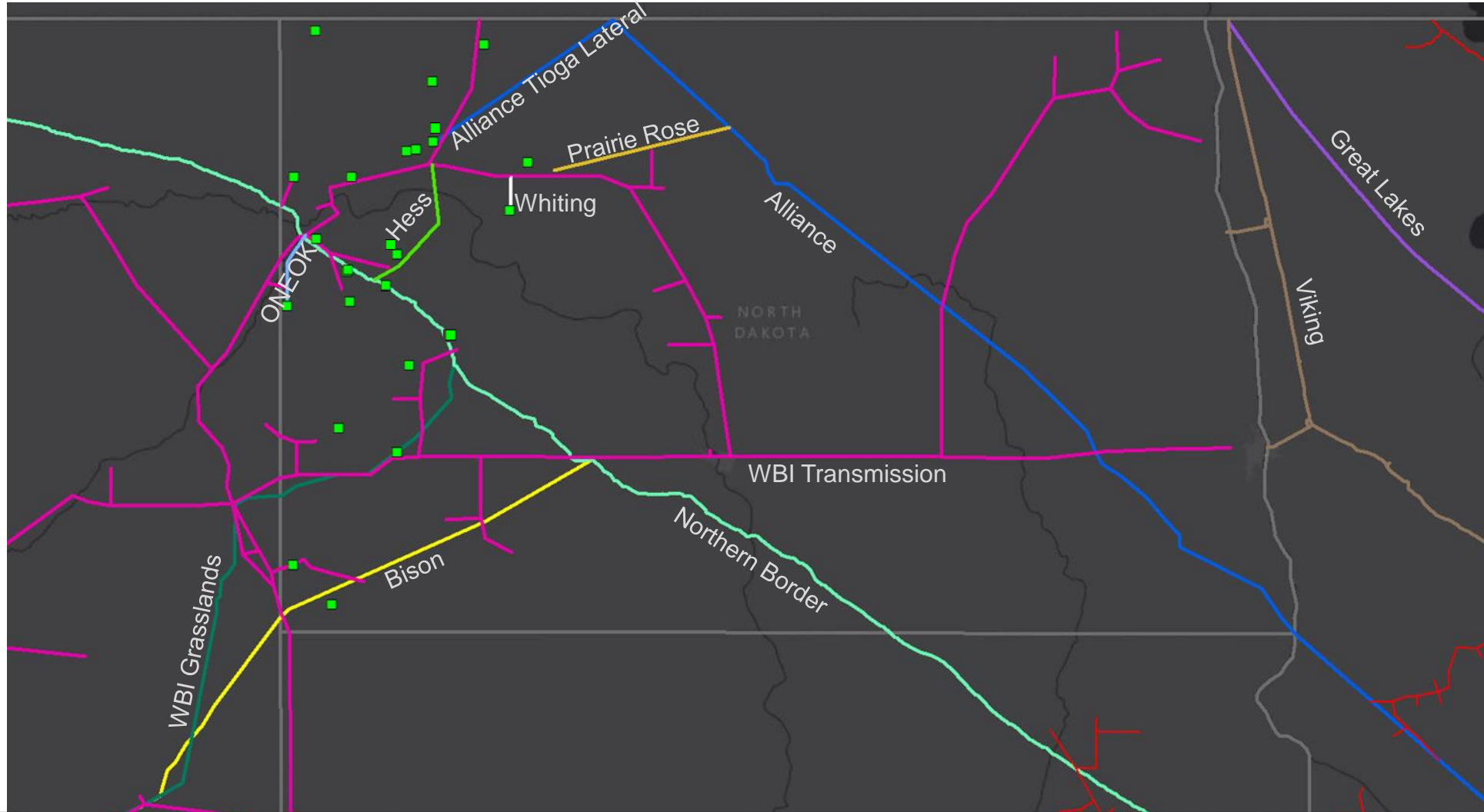
*Assumes Current Technology – Enhanced Oil Recovery Not Included*



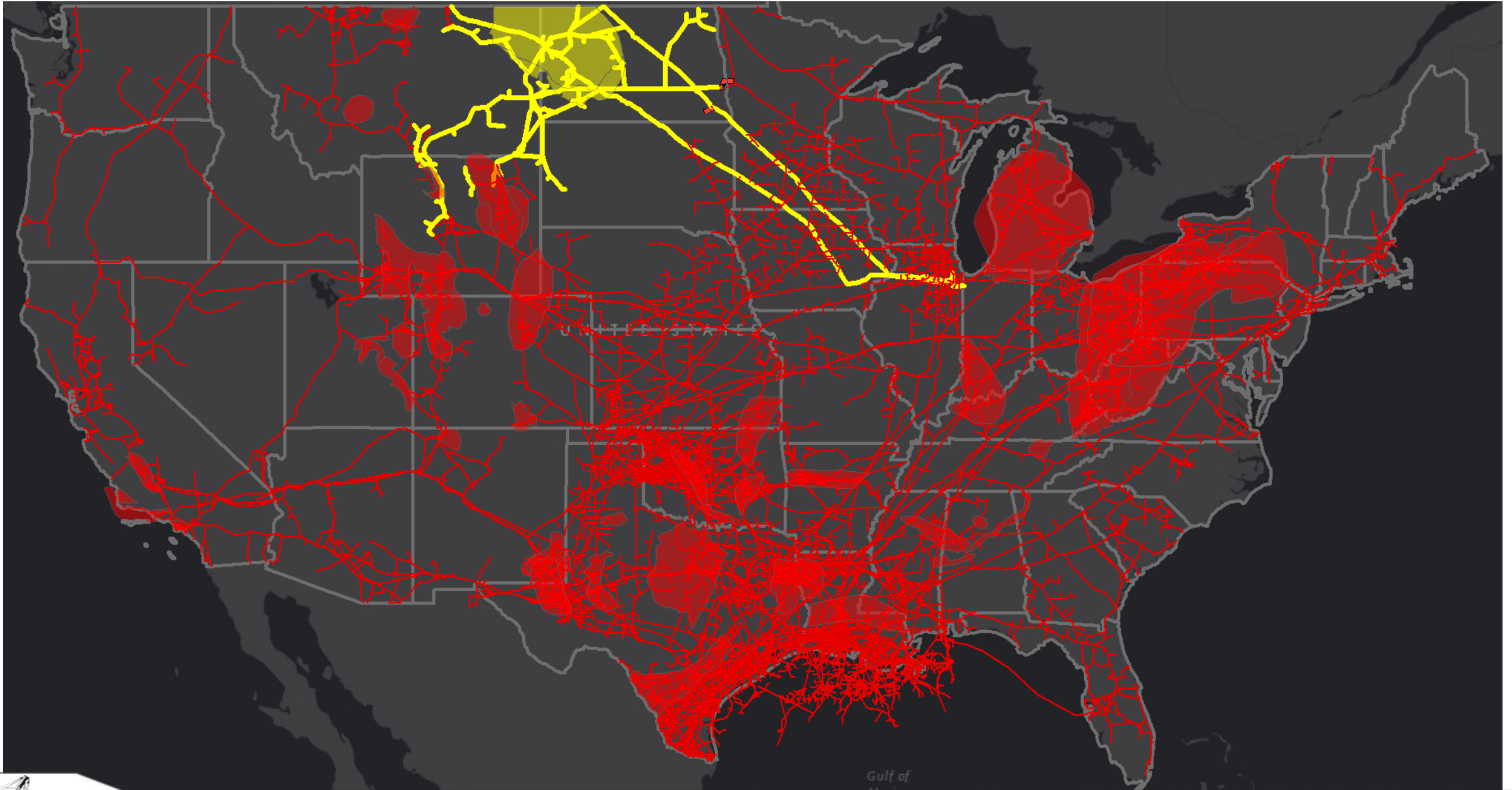
# Natural Gas Update



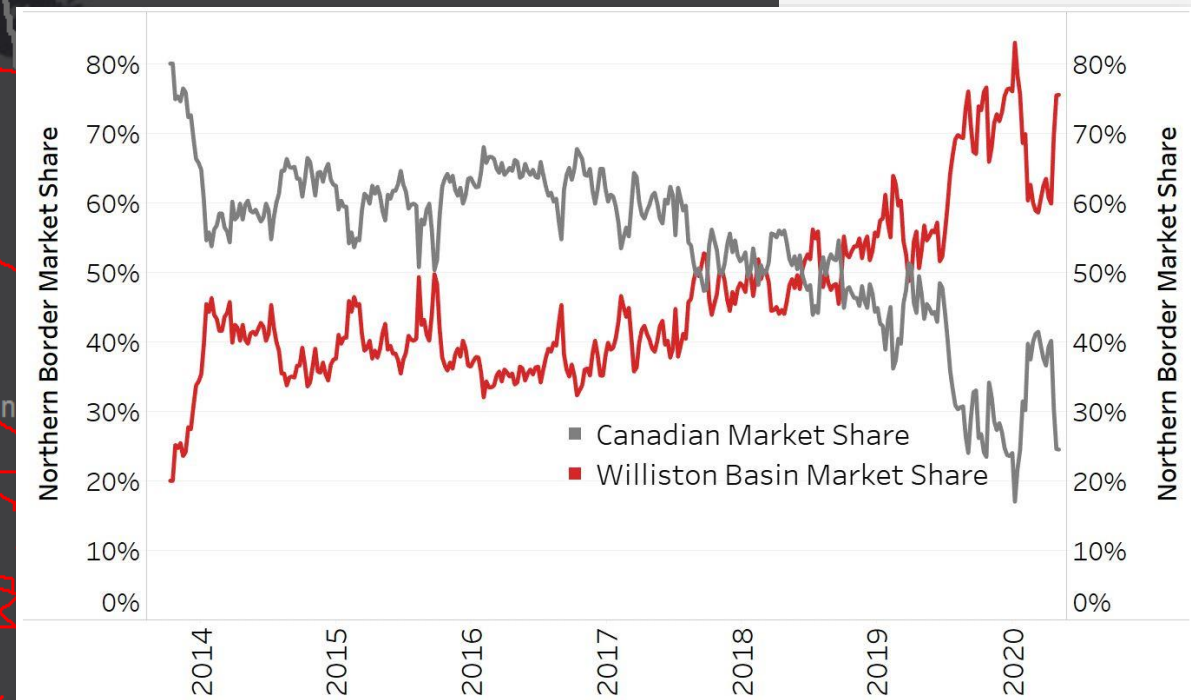
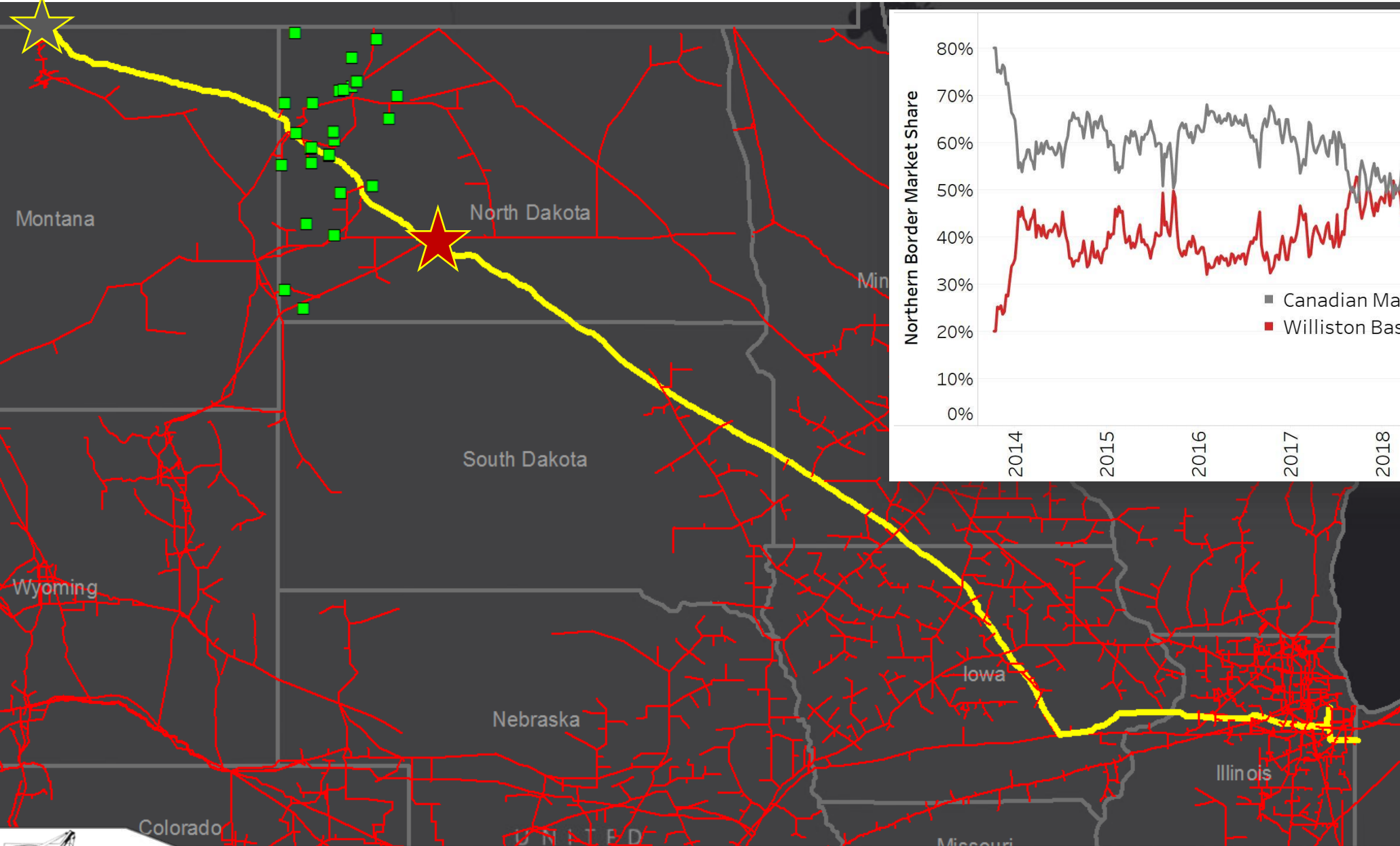
# Major Gas Pipeline and Processing Infrastructure



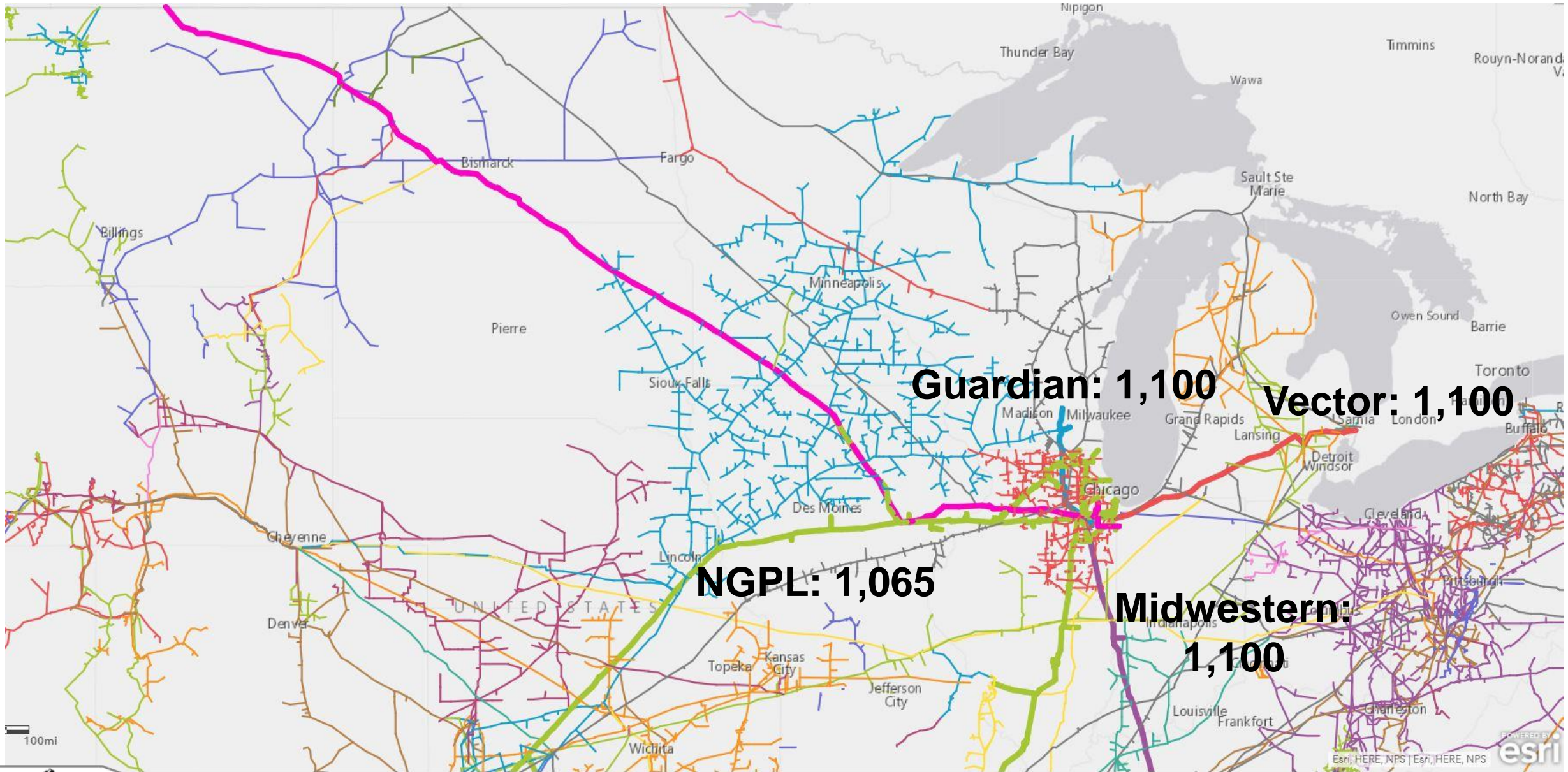
# Bakken Natural Gas Infrastructure



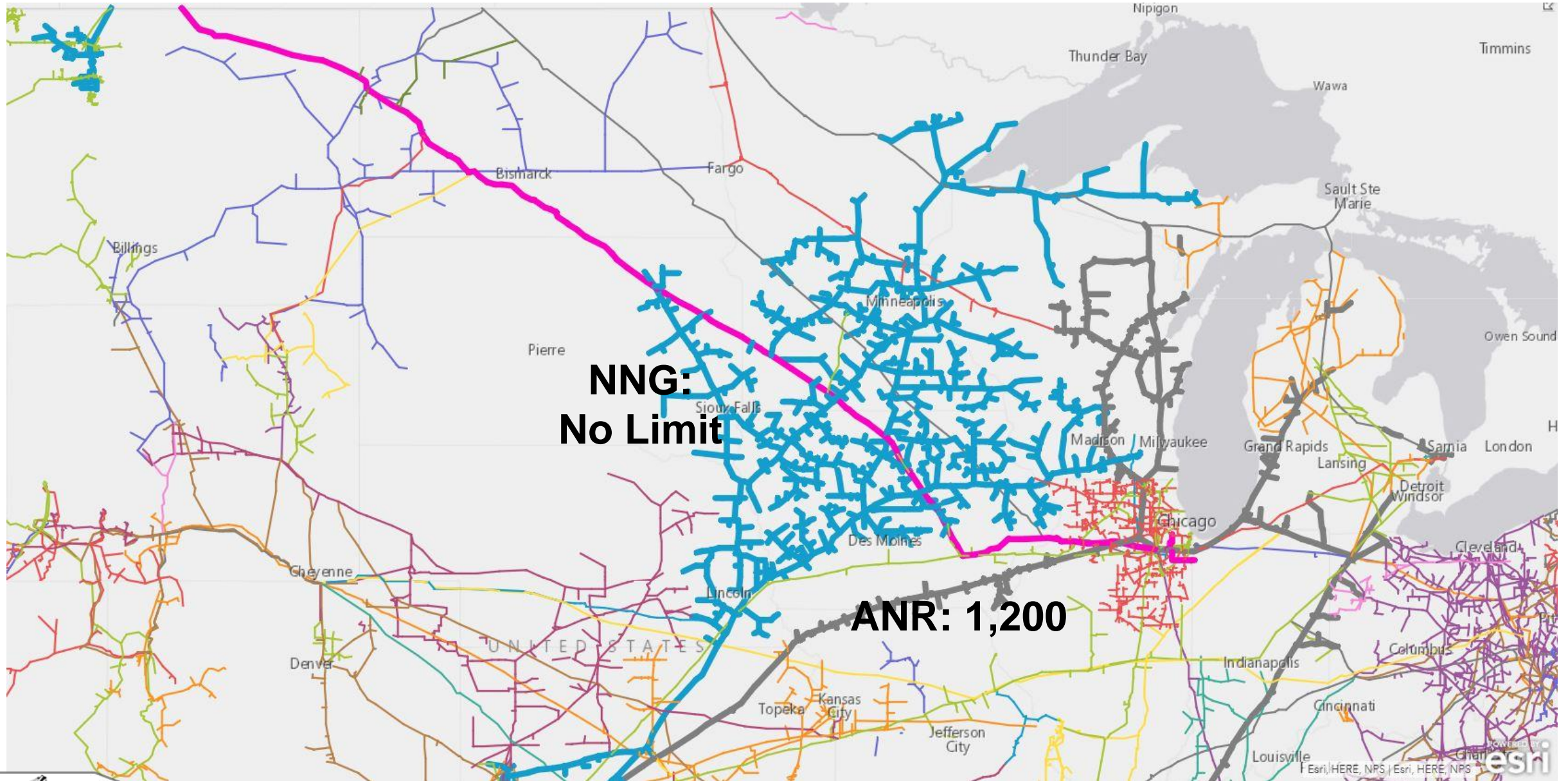
# Northern Border Pipeline



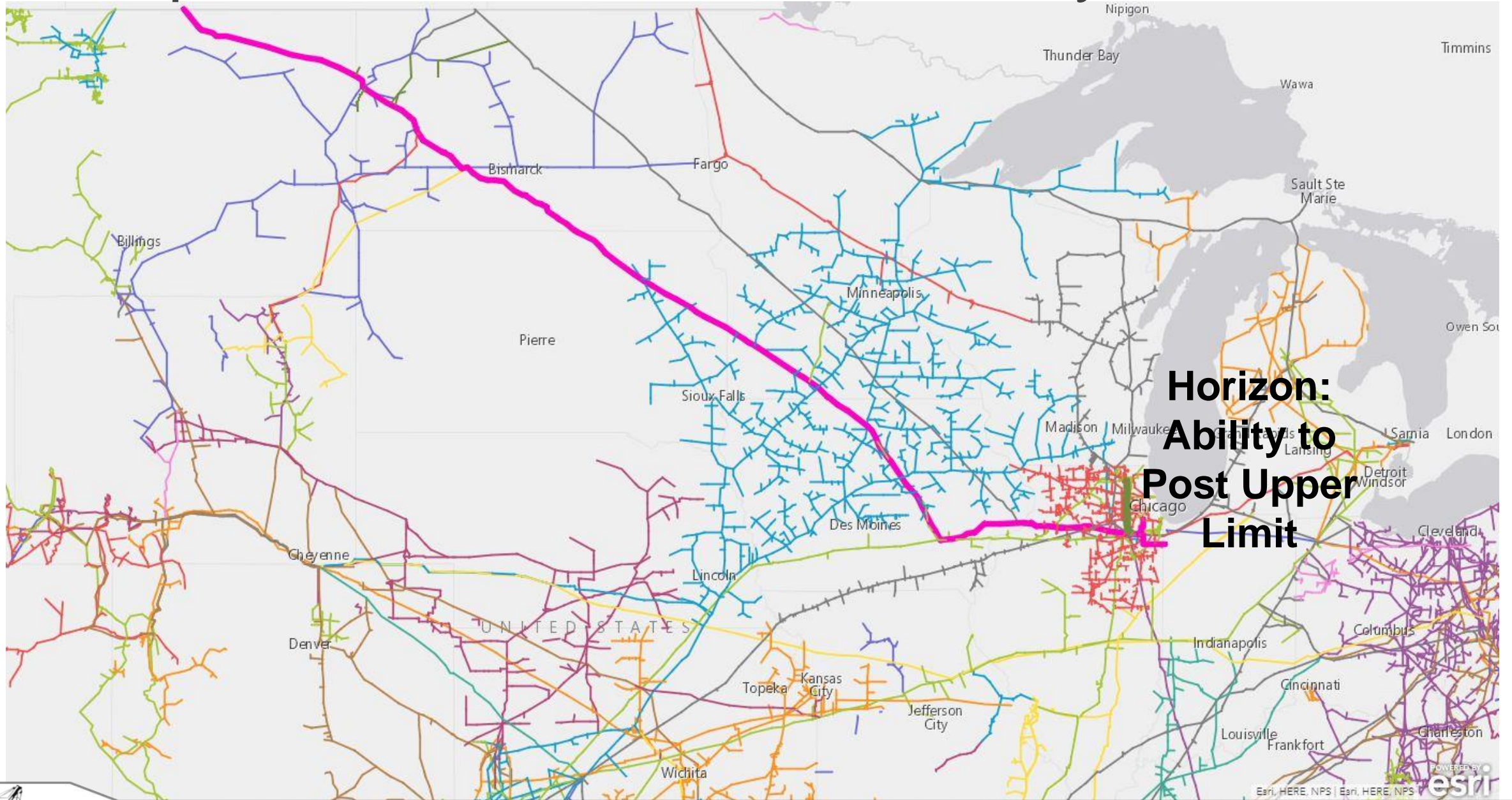
# NB Pipeline Interconnects With Known BTU Limits



# NB Pipeline Interconnects With BTU Limits > 1,100



# NB Pipeline Interconnects With Ability to Add Limits

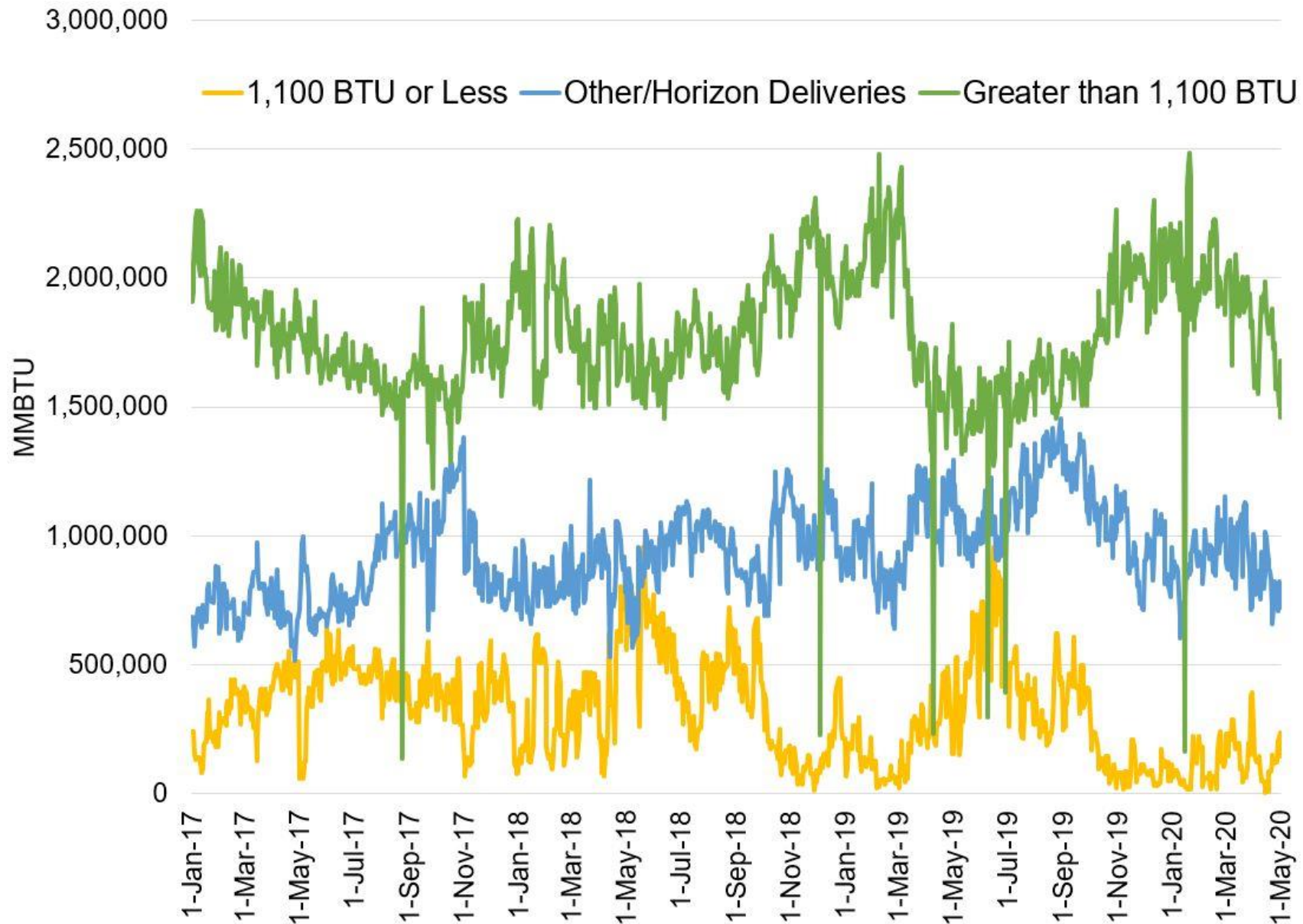


**Horizon:  
Ability to  
Post Upper  
Limit**

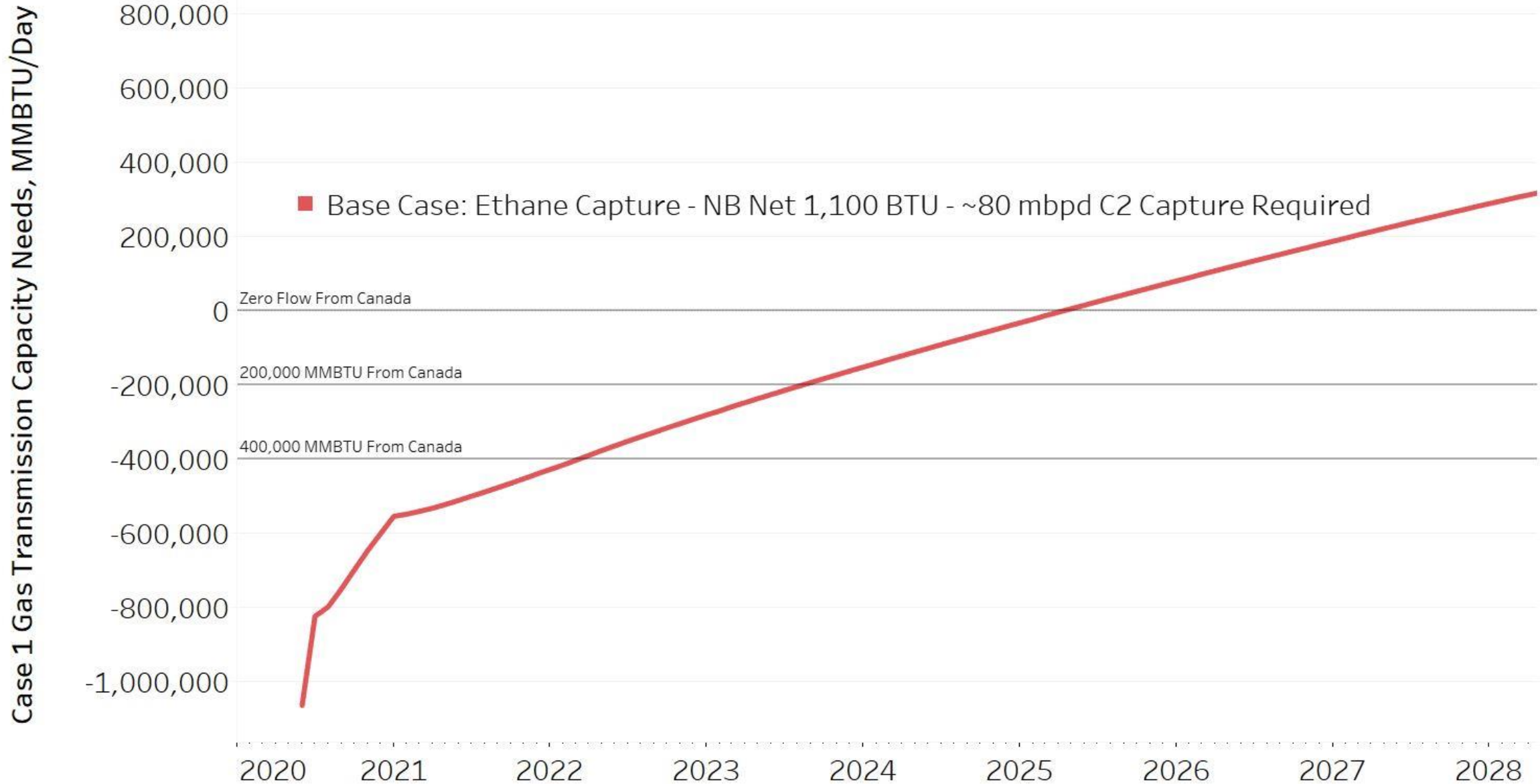




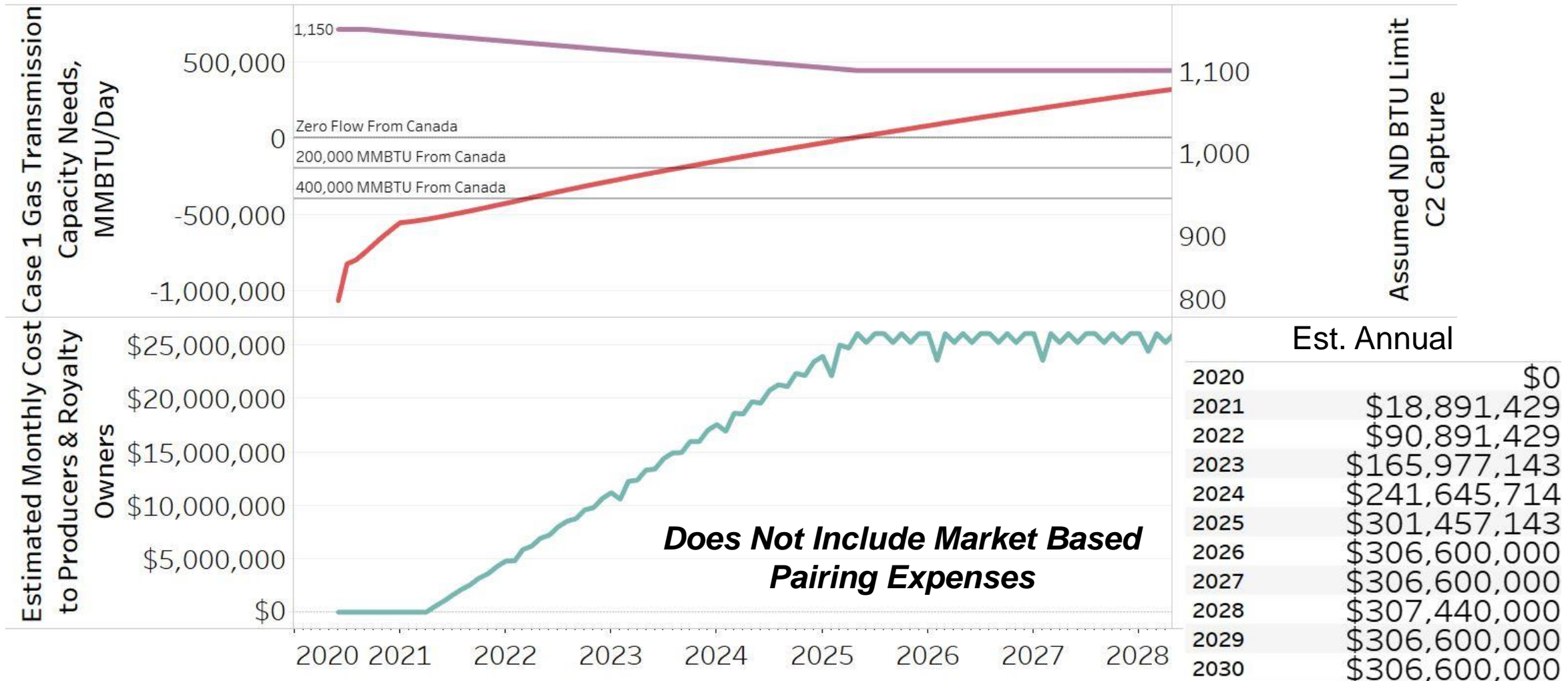
# NB Pipeline Downstream Deliveries & BTU Limit



# Northern Border – BTU Calculations\*



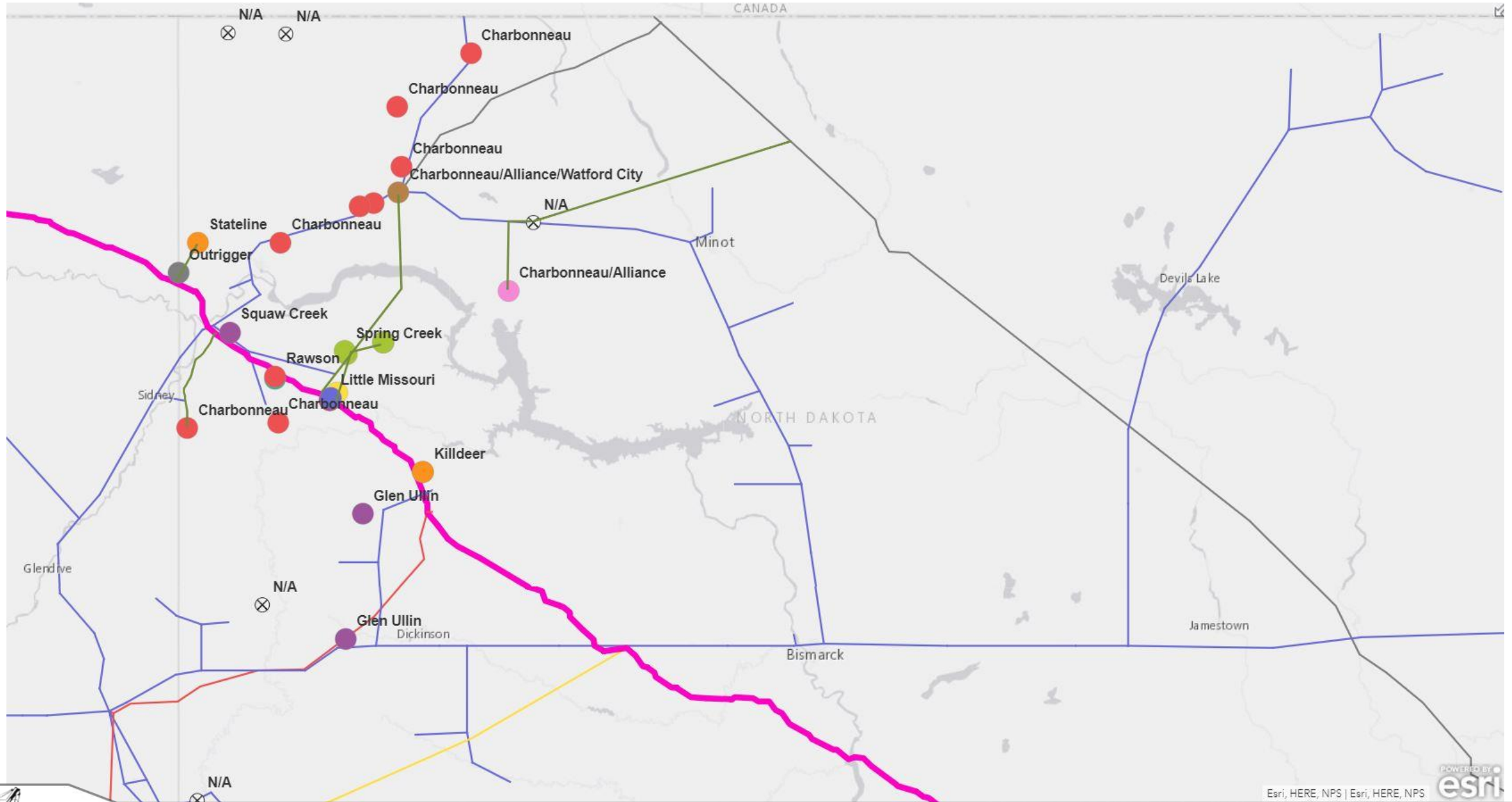
# Northern Border – BTU Calculations\*



- Base Case: Ethane Capture - NB Net 1,100 BTU - ~80 mbpd C2 Capture Required
- Assumed ND BTU Limit C2 Capture
- Estimated Monthly Cost of Ethane Capture to Producer & Royalty Owners (-\$0.25/gal)



# Plant Interconnect to Northern Border



# BTU Calculations to Meet Proposed 1,100 BTU Spec.

## Approximate Q1-20 BTU Breakdown

Owner Company	Facility	NB Connection	Connection BTU	Major Pts	Glen Ullin	Glen Ullin
Arrow Field Services	Bear Den I	Alexander	1160	1144	1106	2,555,130
Arrow Field Services	Bear Den II	Alexander				
Steel Reef	Lignite	Charbonneau	1185			
ONEOK	Grasslands	Charbonneau				
True Oil	Red Wing Creek	Charbonneau				
Whiting Oil & Gas	Ray	Charbonneau				
Andeavor	Robinson Lake	Charbonneau				
XTO - Nesson	Ray	Charbonneau				
Hess	Tioga	Charbonneau				
Kinder Morgan	Norse	Charbonneau				
Liberty Midstream Solutions	County Line	Charbonneau				
1804 Ltd	Spring Brook	Charbonneau				
Petro Hunt	Little Knife	Glen Ullin	1124			
Andeavor	Belfield	Glen Ullin	1124			
Caliber Midstream	Hay Butte	Hay Butte	1224			
ONEOK	Bear Creek	Killdeer	1136			
ONEOK	Bear Creek II	Killdeer	1136			
Targa Resources	Badlands (LM1,	Little Missouri	1169			
Targa Resources	Badlands (LM3)	Little Missouri	1169			
Kinder Morgan	Roosevelt	North Roosevelt	1170			
Outrigger Energy II	N/A	Outrigger	#DIV/0!			
ONEOK	Lonesome Creek	Rawson	1151			
Kinder Morgan	Roosevelt	Roosevelt	1155			
Targa/Hess JV	LM4	SE Little Missouri	1159			
ONEOK	Garden Creek I	Spring Creek	1155			
ONEOK	Garden Creek II	Spring Creek				
ONEOK	Garden Creek III	Spring Creek				
ONEOK	Demicks Lake	Spring Creek				
ONEOK	Demicks Lake II	Spring Creek				
ONEOK	Demicks Lake III	Spring Creek				
ONEOK	Wild Basin	Spring Creek				
Oasis	Wild Basin	Spring Creek				
Kinder Morgan	Watford City	Squaw Creek	1175			
ONEOK	Stateline I	Stateline	1020			
ONEOK	Stateline II	Stateline	1020			
Hess	Tioga	Watford City	1011			
Hebron	Hebron	Hebron	975			
Manning	Manning	Manning	1127			
Port of Morgan	Port of Morgan	Port of Morgan	1029			

## Demo Pairing Exercise to Meet 1,100 or Less\*

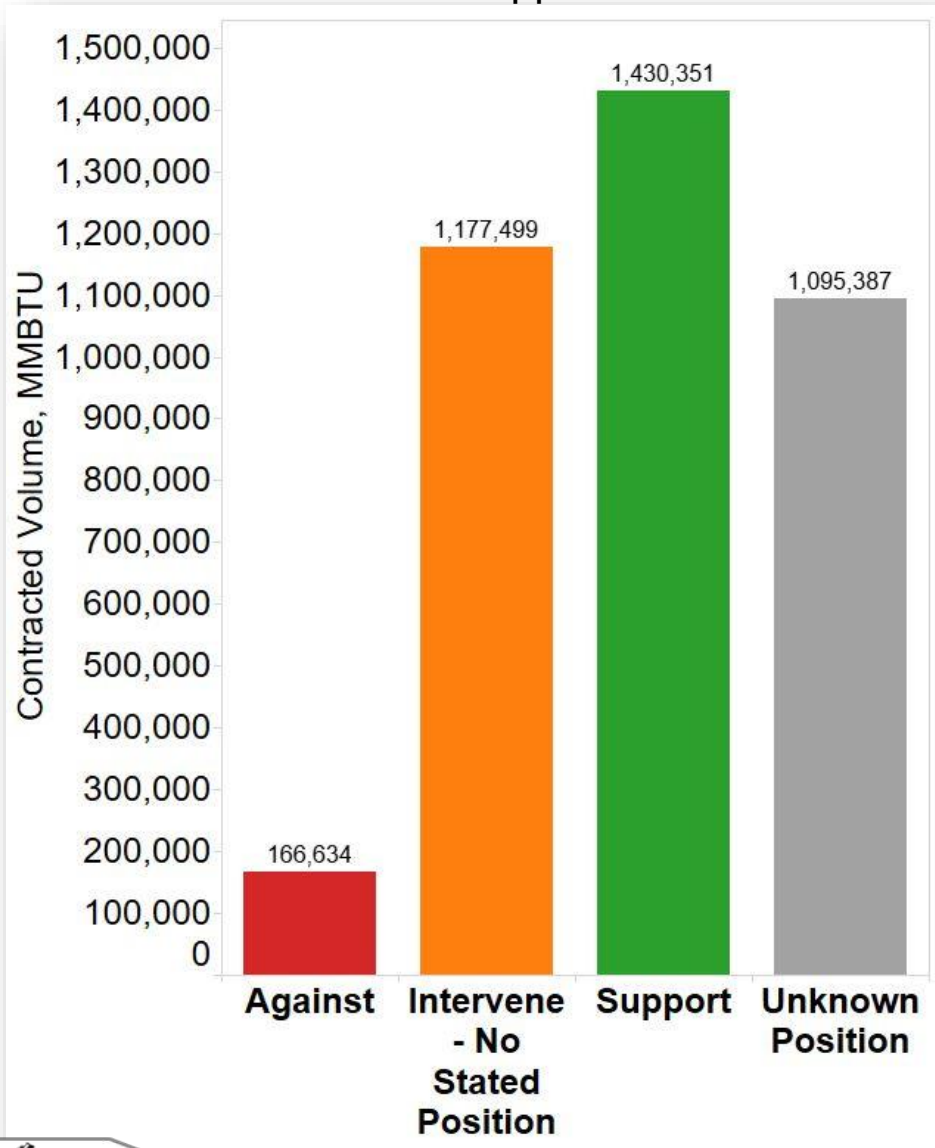
Owner Company	Facility	NB Connection	Connection BTU	Major Pts	Glen Ullin	Glen Ullin
Arrow Field Services	Bear Den I	Alexander	1096	1095	1091	2,520,288
Arrow Field Services	Bear Den II	Alexander				
Steel Reef	Lignite	Charbonneau	1163			
ONEOK	Grasslands	Charbonneau				
True Oil	Red Wing Creek	Charbonneau				
Whiting Oil & Gas	Ray	Charbonneau				
Andeavor	Robinson Lake	Charbonneau				
XTO - Nesson	Ray	Charbonneau				
Hess	Tioga	Charbonneau				
Kinder Morgan	Norse	Charbonneau				
Liberty Midstream Solutions	County Line	Charbonneau				
1804 Ltd	Spring Brook	Charbonneau				
Petro Hunt	Little Knife	Glen Ullin	1124			
Andeavor	Belfield	Glen Ullin	1124			
Caliber Midstream	Hay Butte	Hay Butte	1224			
ONEOK	Bear Creek	Killdeer	1065			
ONEOK	Bear Creek II	Killdeer	1065			
Targa Resources	Badlands (LM1,	Little Missouri	1116			
Targa Resources	Badlands (LM3)	Little Missouri	1116			
Kinder Morgan	Roosevelt	North Roosevelt	1100			
Outrigger Energy II	N/A	Outrigger	1020			
ONEOK	Lonesome Creek	Rawson	1080			
Kinder Morgan	Roosevelt	Roosevelt	1080			
Targa/Hess JV	LM4	SE Little Missouri	1159			
ONEOK	Garden Creek I	Spring Creek	1111			
ONEOK	Garden Creek II	Spring Creek				
ONEOK	Garden Creek III	Spring Creek				
ONEOK	Demicks Lake	Spring Creek				
ONEOK	Demicks Lake II	Spring Creek				
ONEOK	Demicks Lake III	Spring Creek				
ONEOK	Wild Basin	Spring Creek				
Oasis	Wild Basin	Spring Creek				
Kinder Morgan	Watford City	Squaw Creek	1100			
ONEOK	Stateline I	Stateline	1020			
ONEOK	Stateline II	Stateline	1020			
Hess	Tioga	Watford City/WBI	1020			
Hebron	Hebron	Hebron	975			
Manning	Manning	Manning	1127			
Port of Morgan	Port of Morgan	Port of Morgan	#DIV/0!			

\*Exact plant specifications are not publicly available and many assumptions needed to be made for demo pairing. Table may contain errors.



# Northern Border FERC Positions\*

## Contracted Shipper Positions



## Parties who Filed Protests or Comments Opposing the Filing

Continental Resources, Inc. (Continental)  
 Flatirons Field Services LLC (Flatirons)  
 Hiland Partners Holdings LLC (Hiland)  
 ConocoPhillips Company and XTO Energy Inc. (Indicated Shippers)  
 Independent Petroleum Association of America (IPAA)  
 Oasis Petroleum Marketing LLC and OMP Operating LLC (Oasis Intervenors)  
 Outrigger Energy II LLC (Outrigger)  
 Steel Reef Burke LLC (Steel Reef)  
 Targa Badlands LLC and Andeavor Field Services LLC (Targa-Andeavor)  
 WBI Energy Transmission, Inc. (WBI)  
 Whiting Oil and Gas Corporation (Whiting)

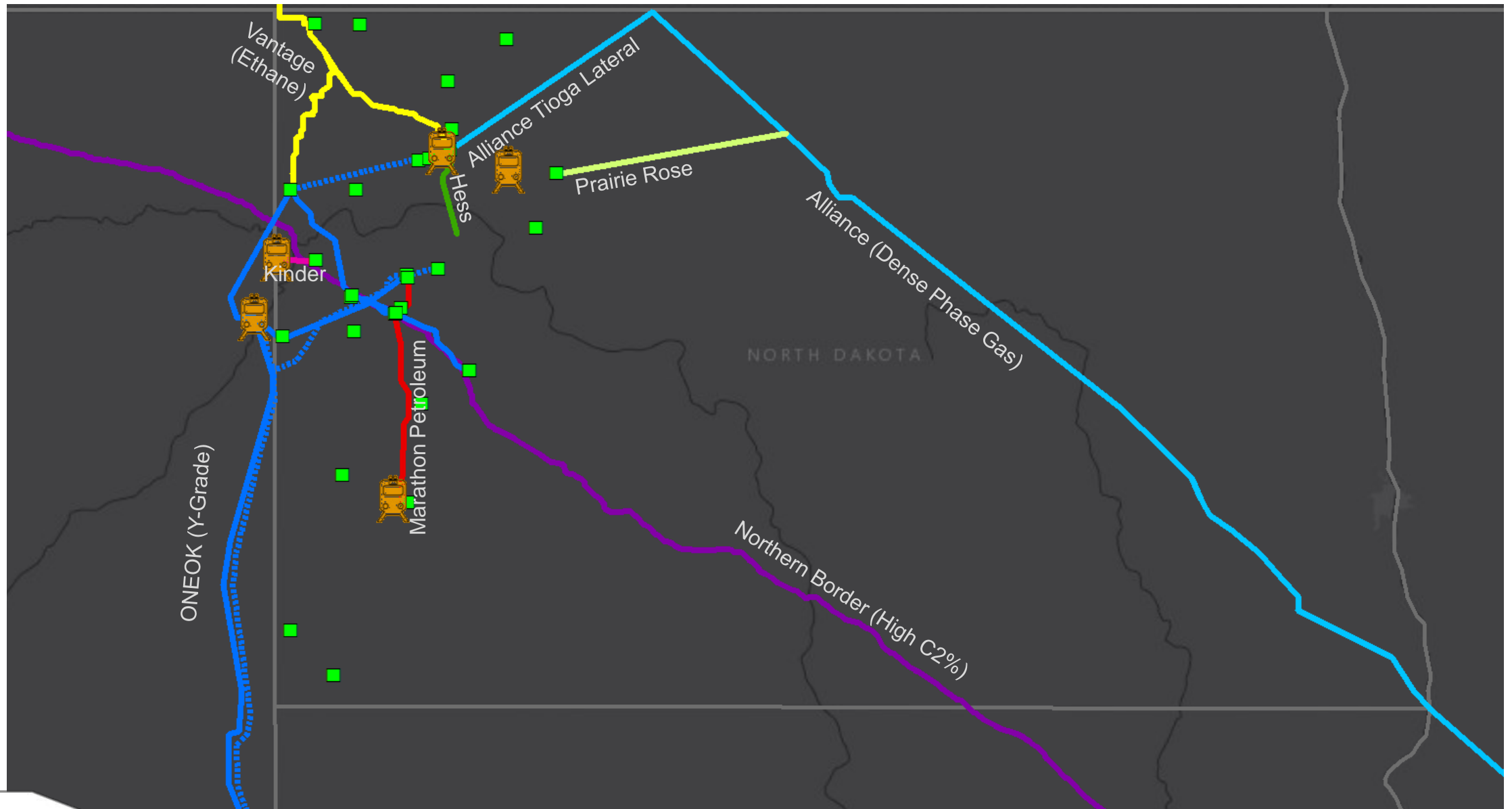
## Parties who Filed Comments in Support of the Filing

Ameren Illinois Company (Ameren)  
 Basin Electric Power Cooperative (Basin)  
 CenterPoint Energy Resources Corporation d/b/a CenterPoint Energy Minnesota Gas (CenterPoint)  
 Encore Energy Services (Encore)  
 MidAmerican Energy Company (MidAmerican)  
 Northern Illinois Gas Company d/b/a/ Nicor Gas Company (Nicor)  
 Northern States Power Company and Northern States Power Company (NSP Companies)  
 SEMCO Energy Gas Company (SEMCO)  
 Tenaska Marketing Ventures (Tenaska)  
 Vector Pipeline L.P. (Vector)  
 Watertown Municipal Utilities (Watertown)

FERC Order – May 29, 2020:  
 Docket No. RP20-859-000

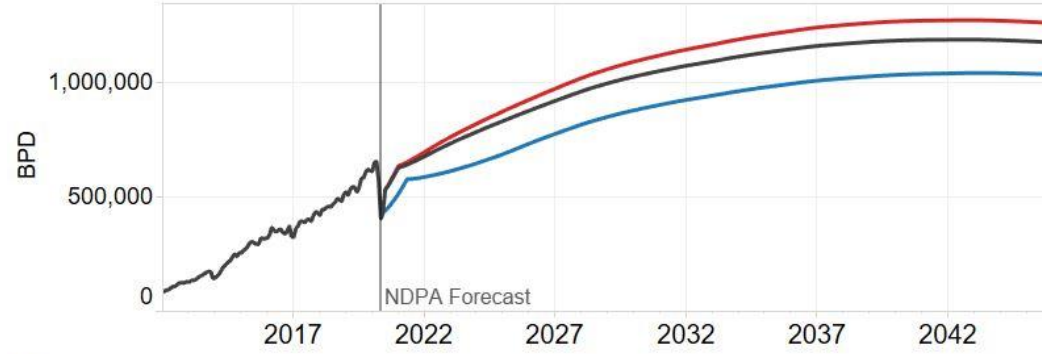


# Regional NGL Infrastructure

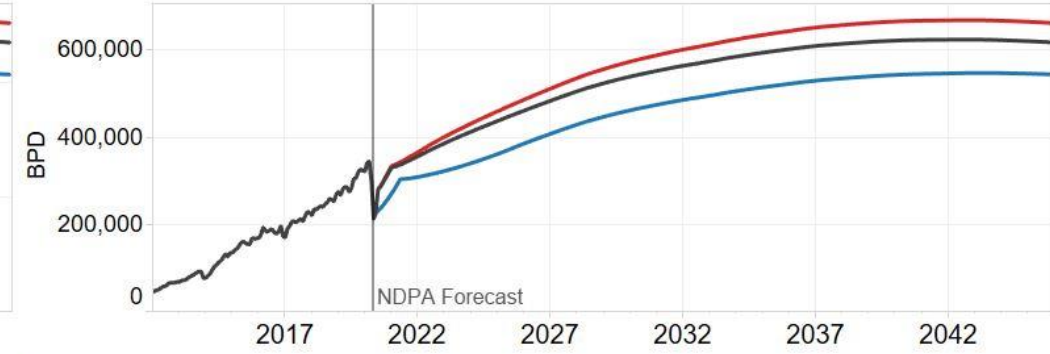


# North Dakota Captured\* NGL's

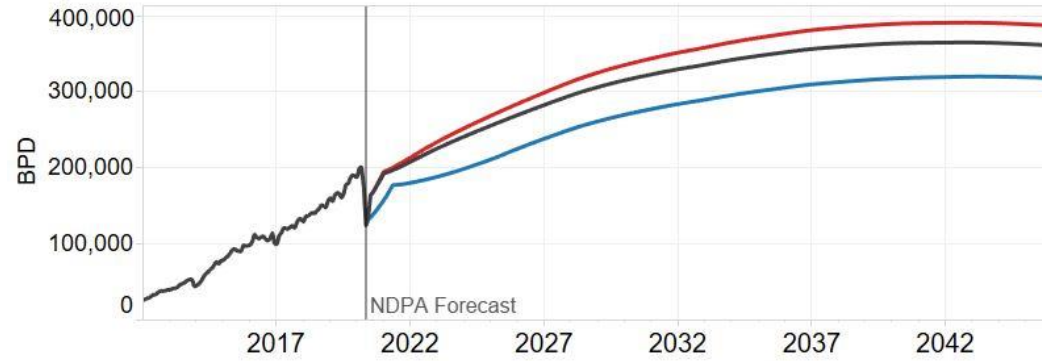
All Natural Gas Liquids



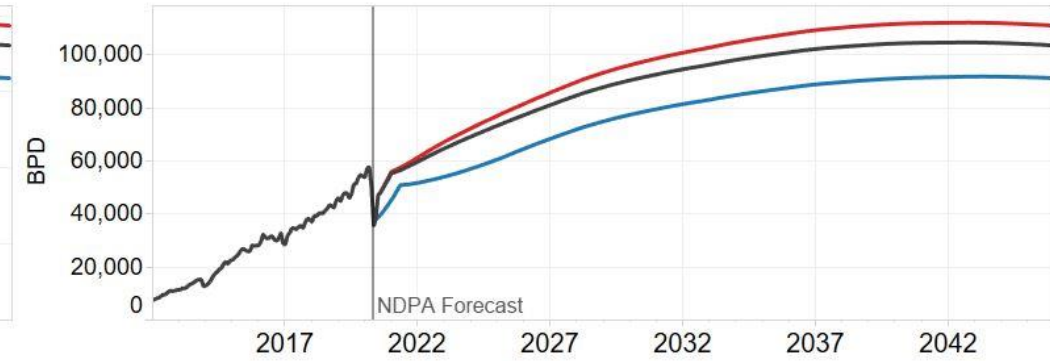
Ethane



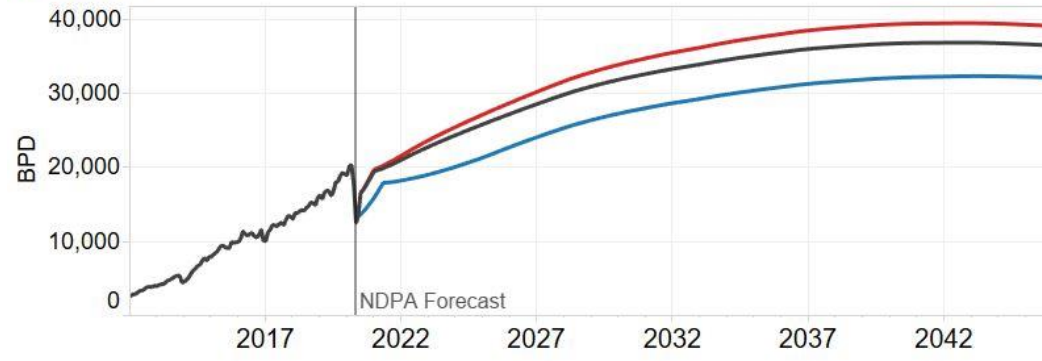
Propane



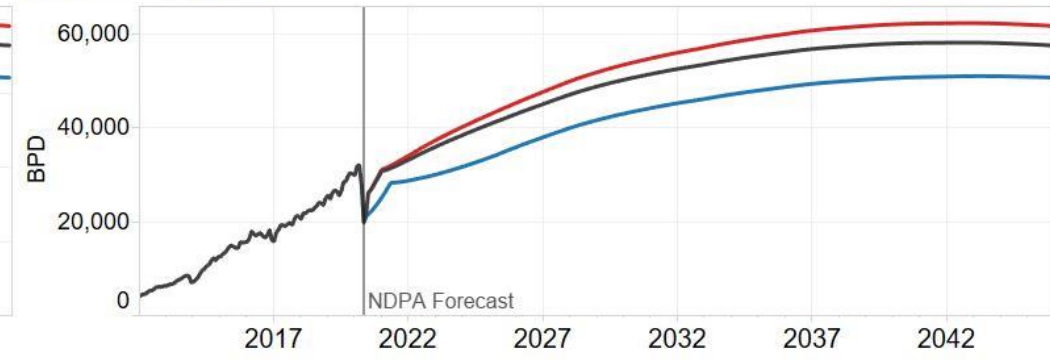
Butane



Isobutane

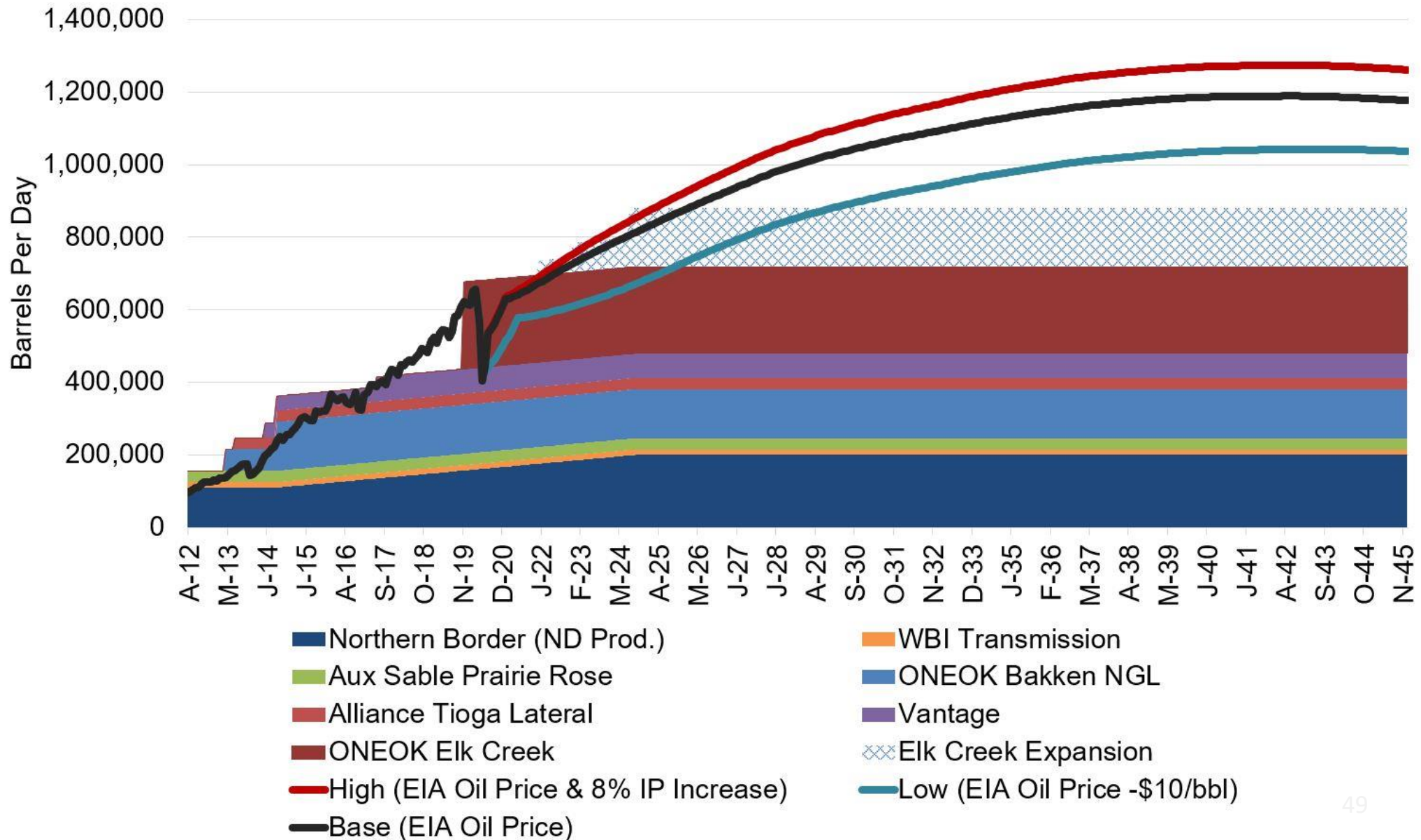


Natural Gasoline





# NGL Pipeline Takeaway Options



# **Bakken & Three Forks Natural Gas Liquids Chemistry**

## **EERC Study Update**

# Contact Information

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[www.pipeline.nd.gov](http://www.pipeline.nd.gov)  
[www.northdakotapipelines.com](http://www.northdakotapipelines.com)



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