



January 2018 Monthly Update

North Dakota Pipeline Authority

Justin J. Kringstad

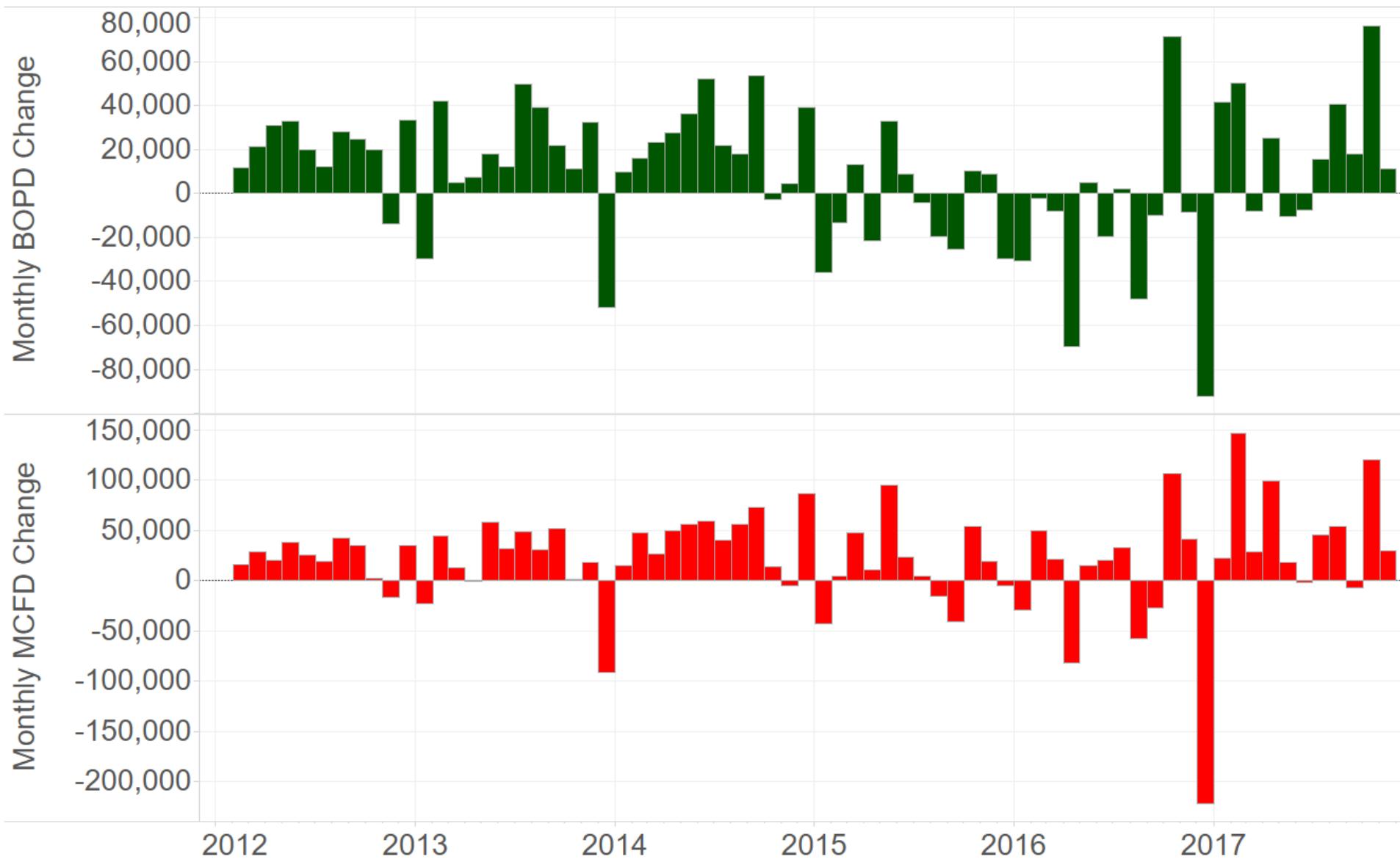
January 16, 2018

US Williston Basin Oil Production - 2017

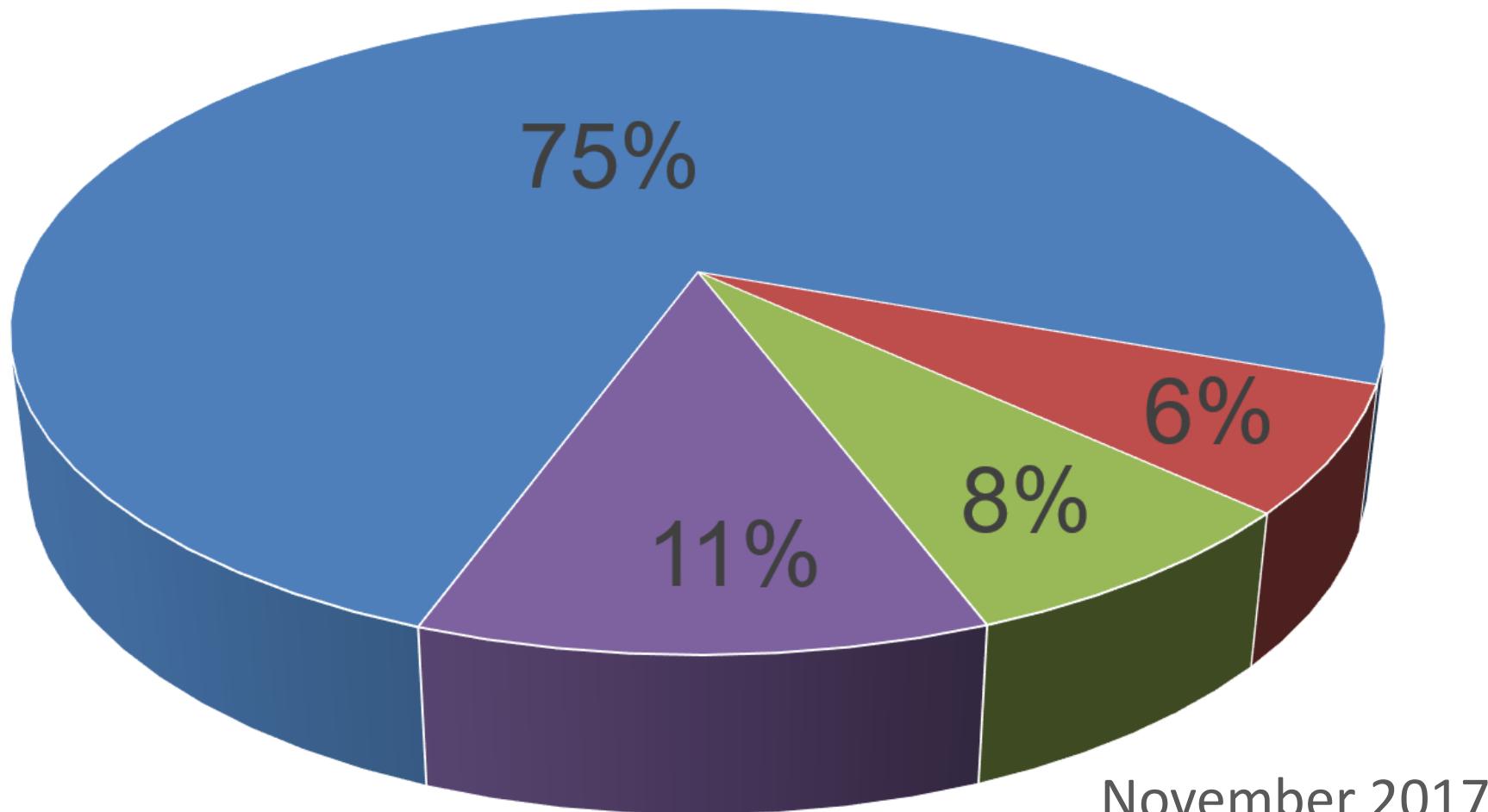
MONTH	ND	Eastern MT*	SD	TOTAL
January	983,840	52,727	3,553	1,040,120
February	1,034,148	53,959	3,718	1,091,825
March	1,025,932	52,901	3,705	1,082,537
April	1,050,892	52,437	3,768	1,107,096
May	1,040,658	52,980	3,389	1,097,027
June	1,032,921	52,947	3,563	1,089,430
July	1,048,560	51,767	3,529	1,103,856
August	1,089,289	51,041	3,565	1,143,894
September	1,107,345	51,184	3,568	1,162,096
October	1,183,810	49,385	3,611	1,236,806
November	1,194,920			
December				



Monthly Production Change



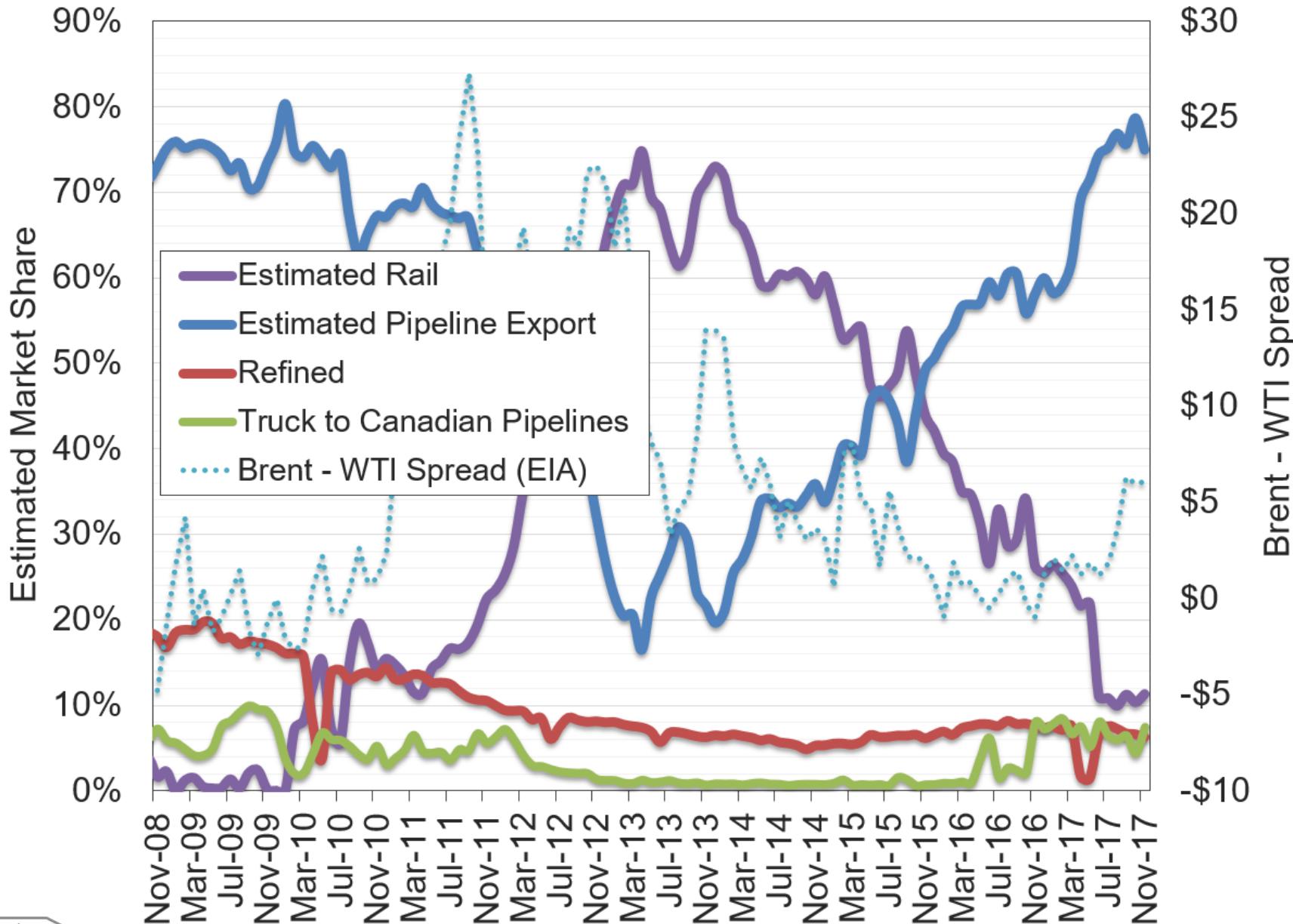
Estimated Williston Basin Oil Transportation



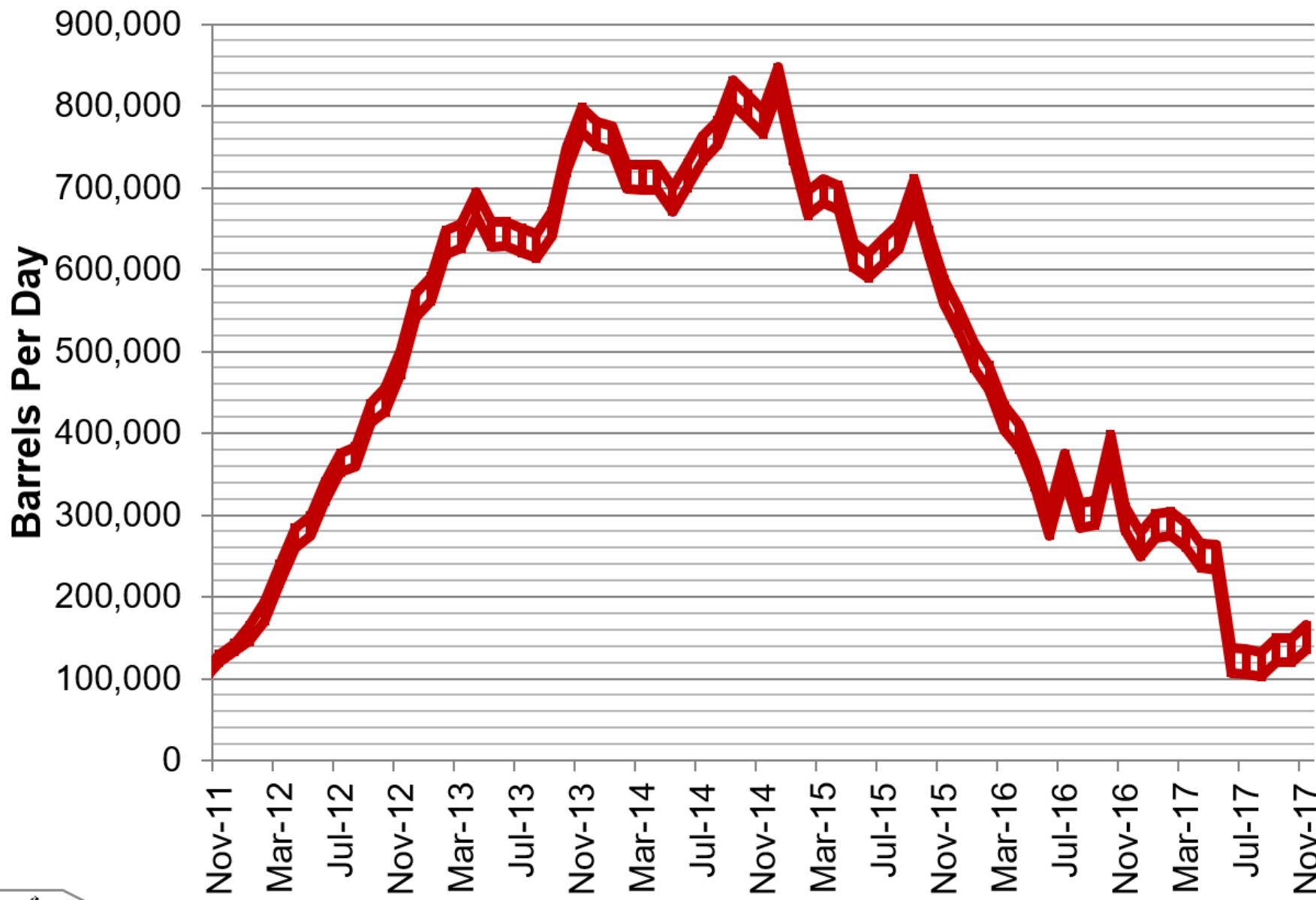
- Pipeline Export
- Truck to Canadian Pipelines
- Refined
- Estimated Rail



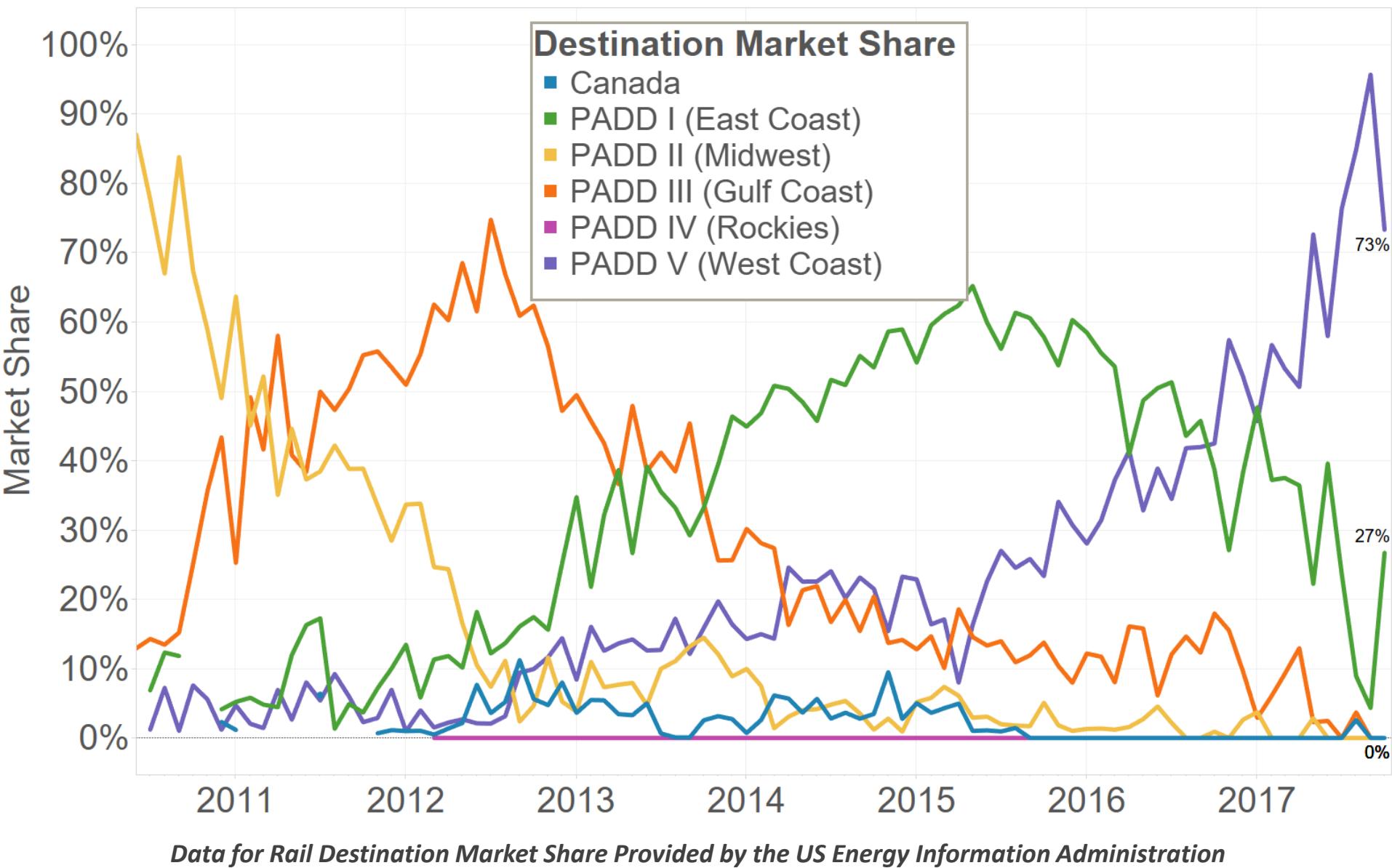
Estimated Williston Basin Oil Transportation



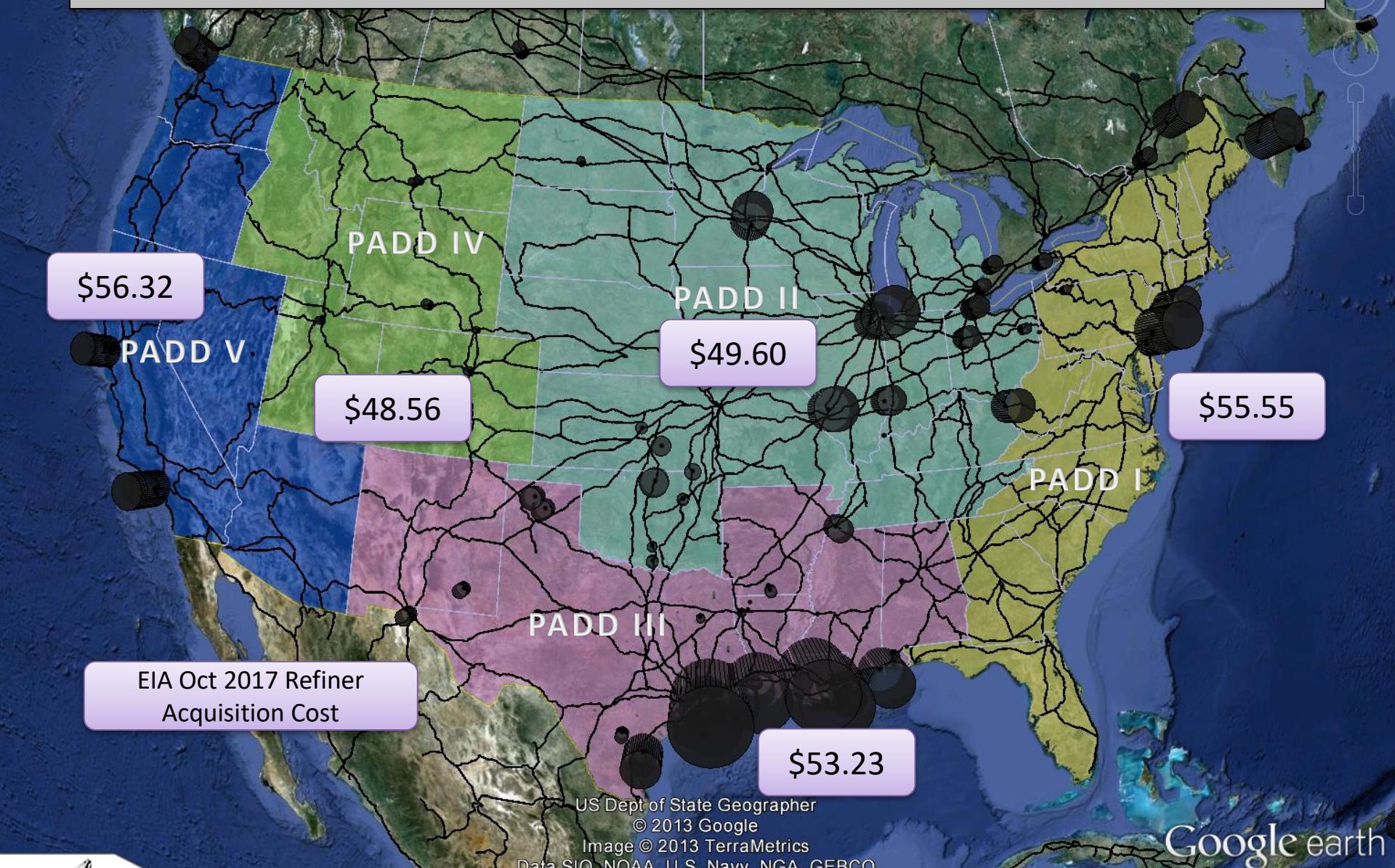
Estimated ND Rail Export Volumes



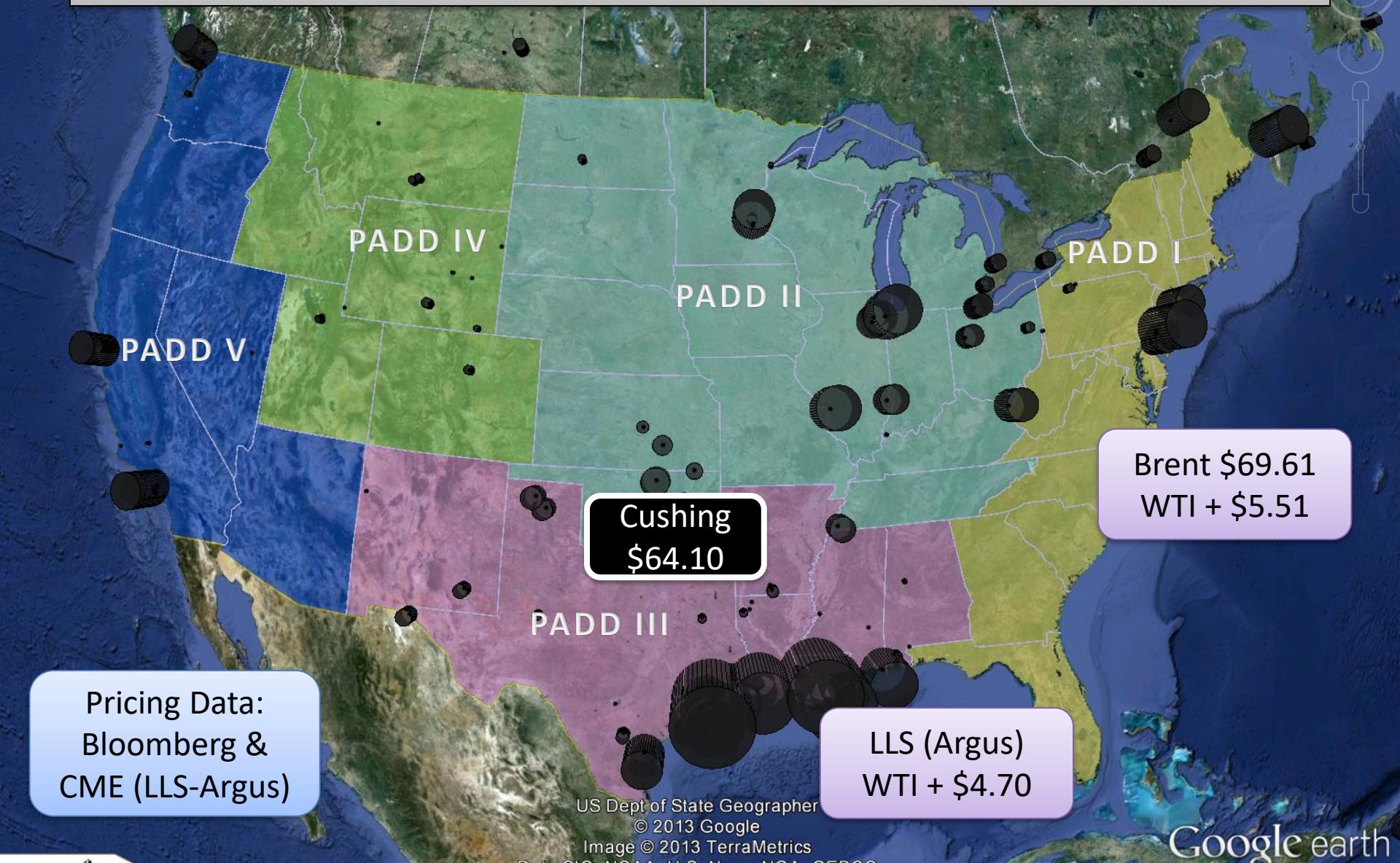
Rail Destinations Market Share (Oct 2017)



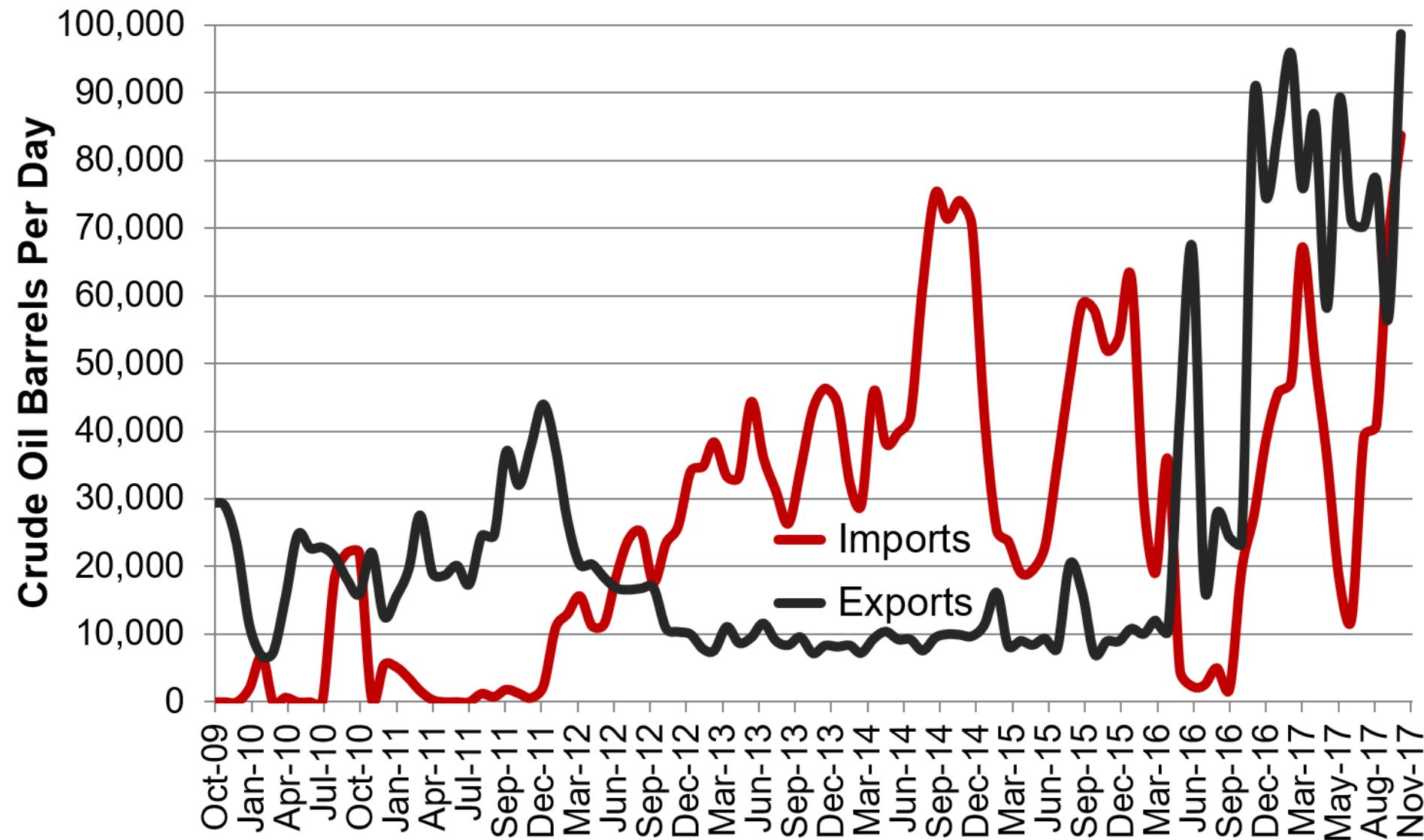
Major Rail Lines and Refineries



Crude Oil Prices – Jan. 16, 2018



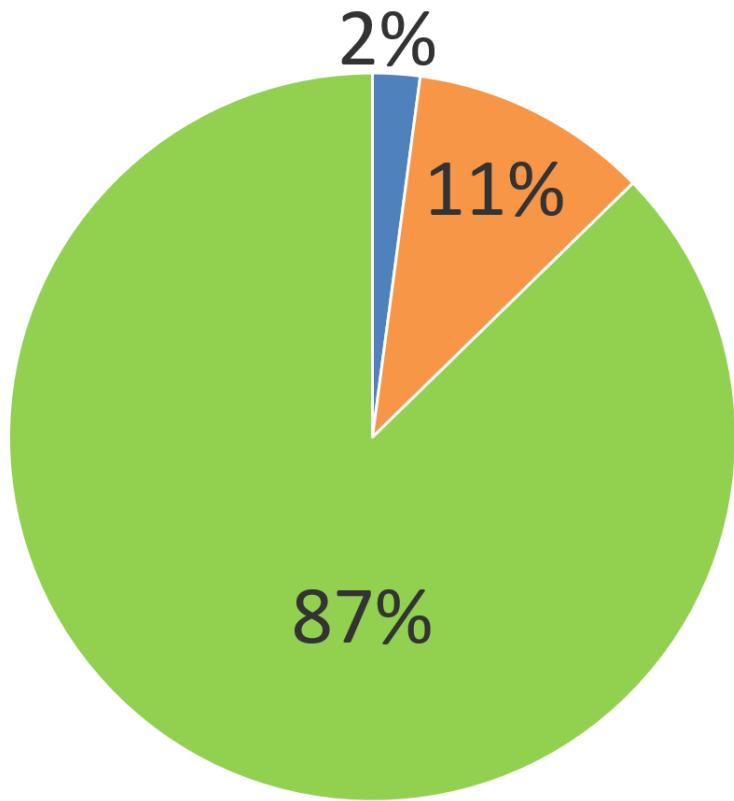
Williston Basin Truck Imports and Exports with Canada



Data for truck imports/exports chart is provided by the US International Trade Commission



Solving the Flaring Challenge



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

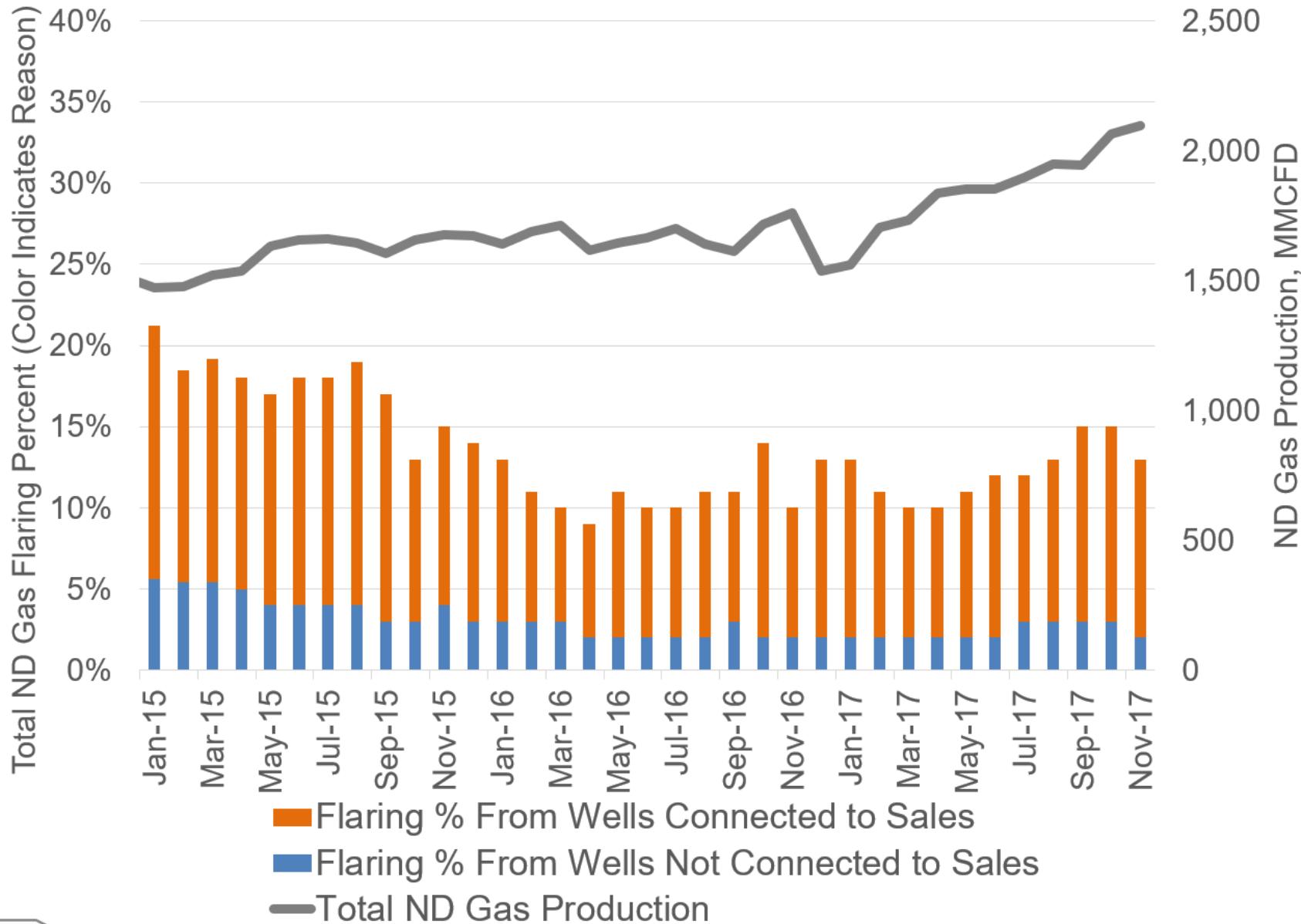
Simple Terms

Blue – Lack of pipelines
Orange – Challenges on existing infrastructure

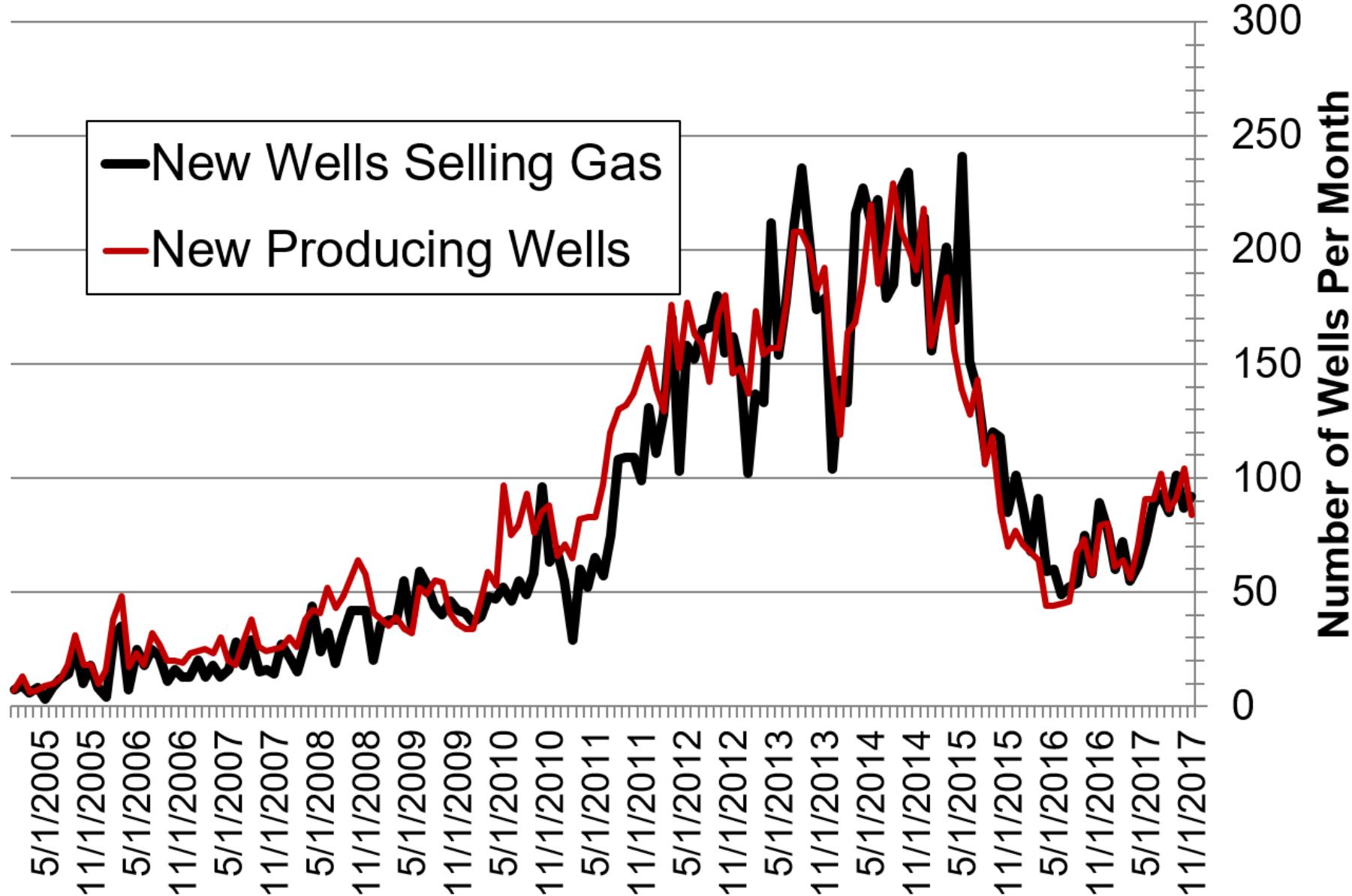
Nov 2017 Data – Non-Confidential Wells



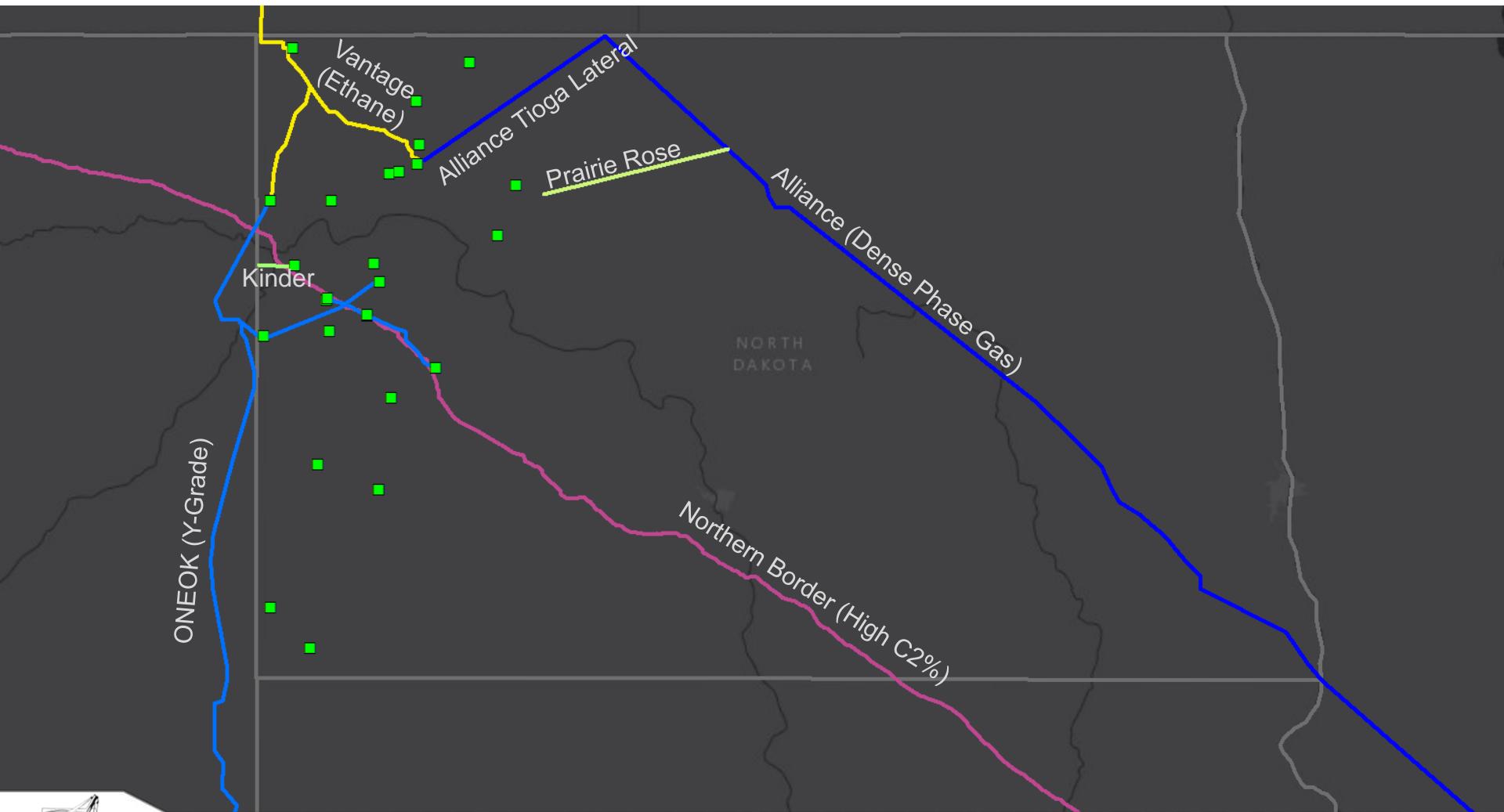
Solving the Flaring Challenge



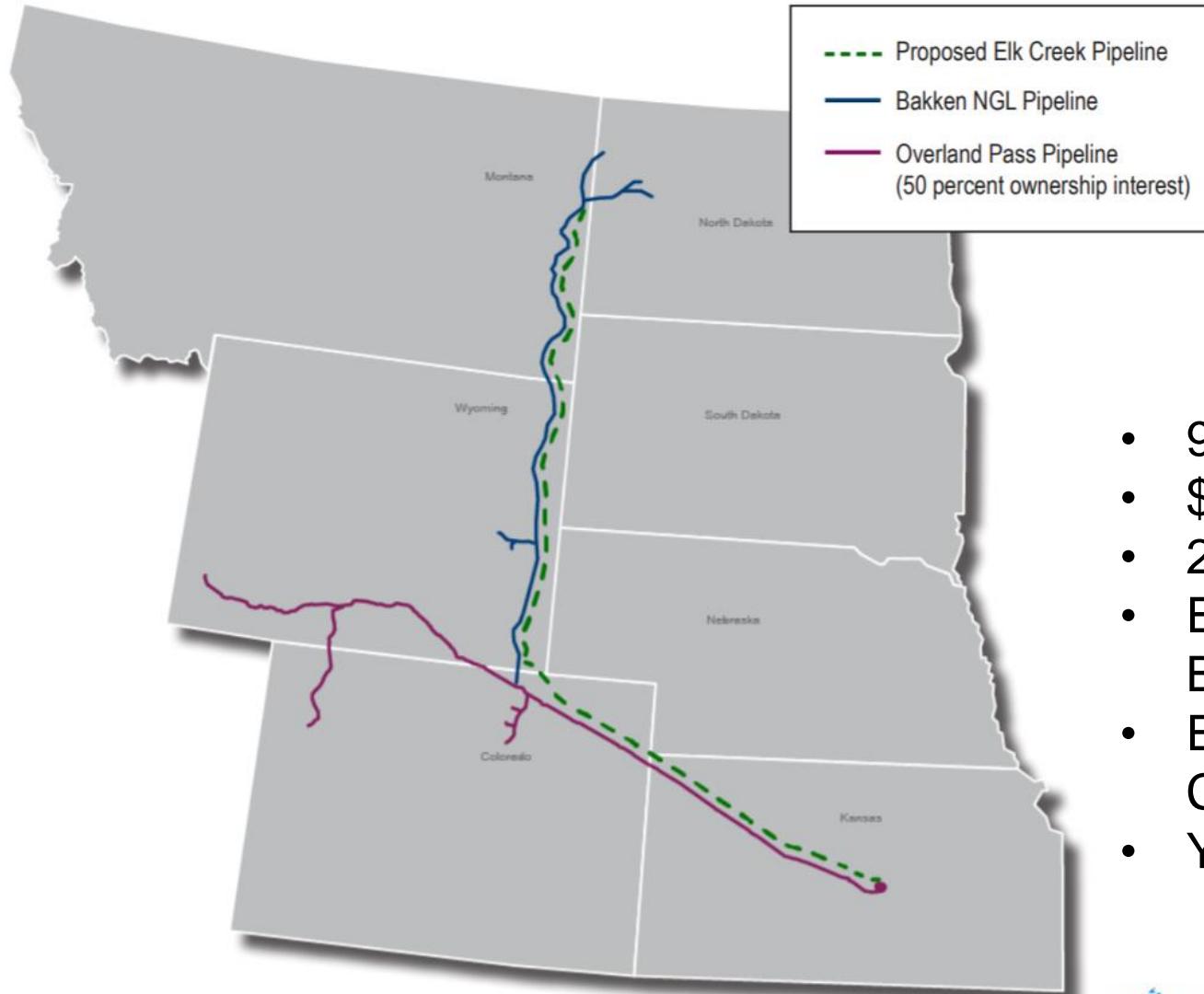
Solving the Flaring Challenge



Major NGL Pipeline and Processing Infrastructure



ONEOK Elk Creek NGL Pipeline

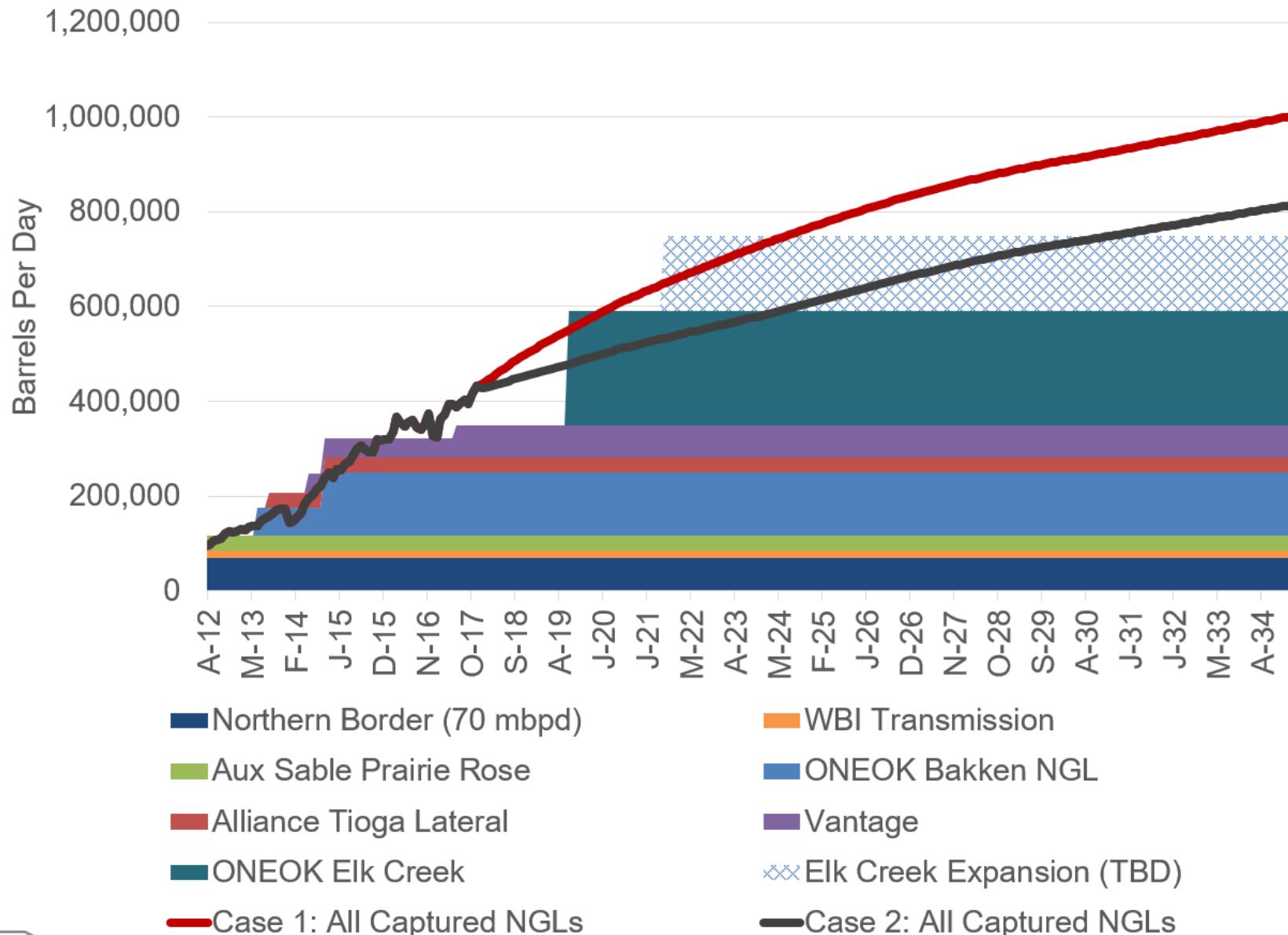


Project Highlights

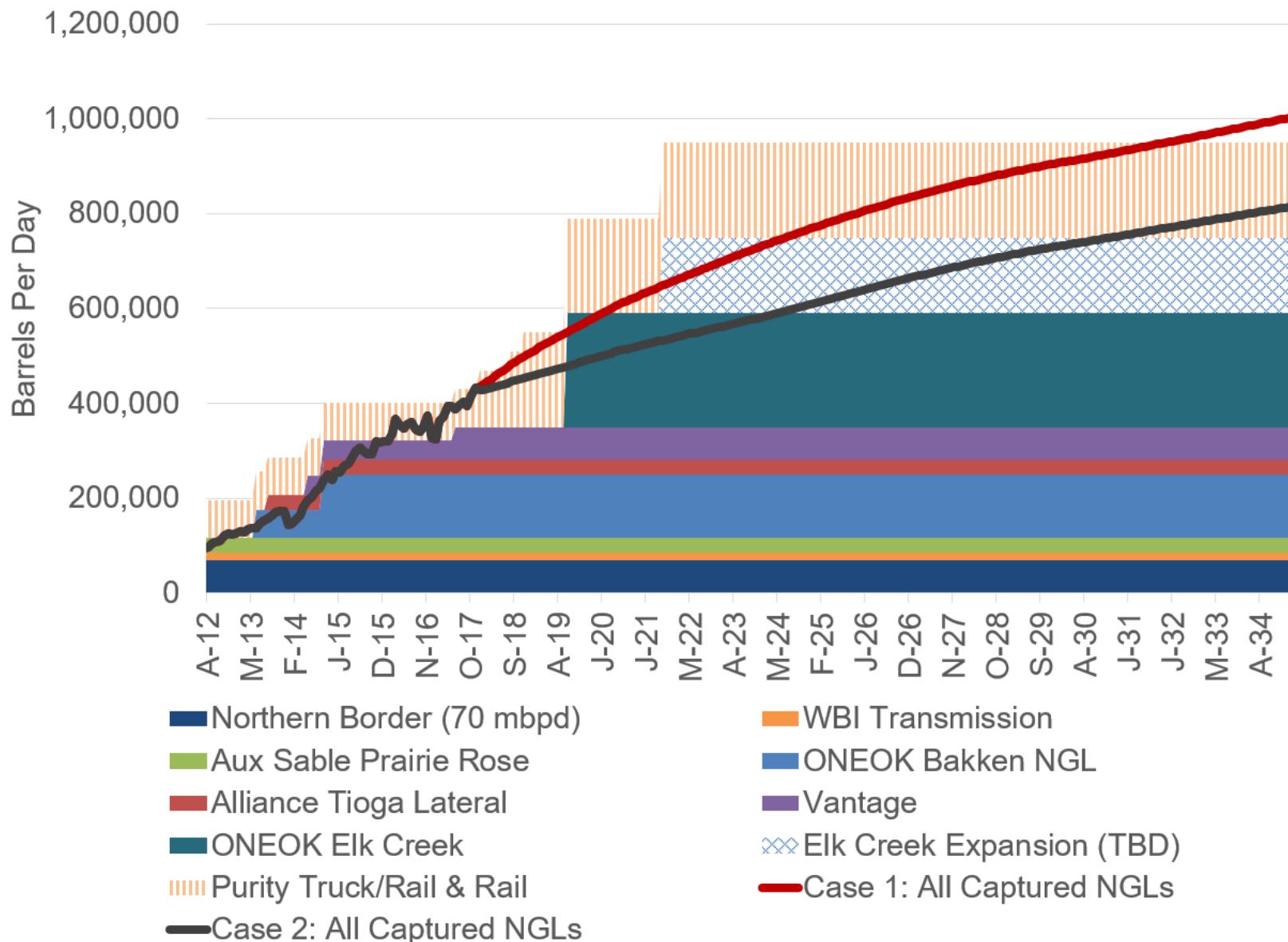
- 900 Miles - 20" Pipeline
- \$1.4 Billion
- 240,000 BPD Capacity
- Expandable to 400,000 BPD
- End of 2019 Proposed Completion
- Y-Grade Transportation



NGL Pipeline Takeaway Options



NGL Takeaway Options With Truck & Rail



Bakken Economics

Breakeven Analysis

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North Dakota Pipeline Authority

January 16, 2018



Objective

Define where the Bakken/Three Forks system may be economic in various price scenarios.

Method

Analyze past well performance across the region and estimate well economics for various production levels.

Disclaimer

The goal of this work is not to imply individual company actions or intentions. All views expressed are strictly that of Justin J. Kringstad.

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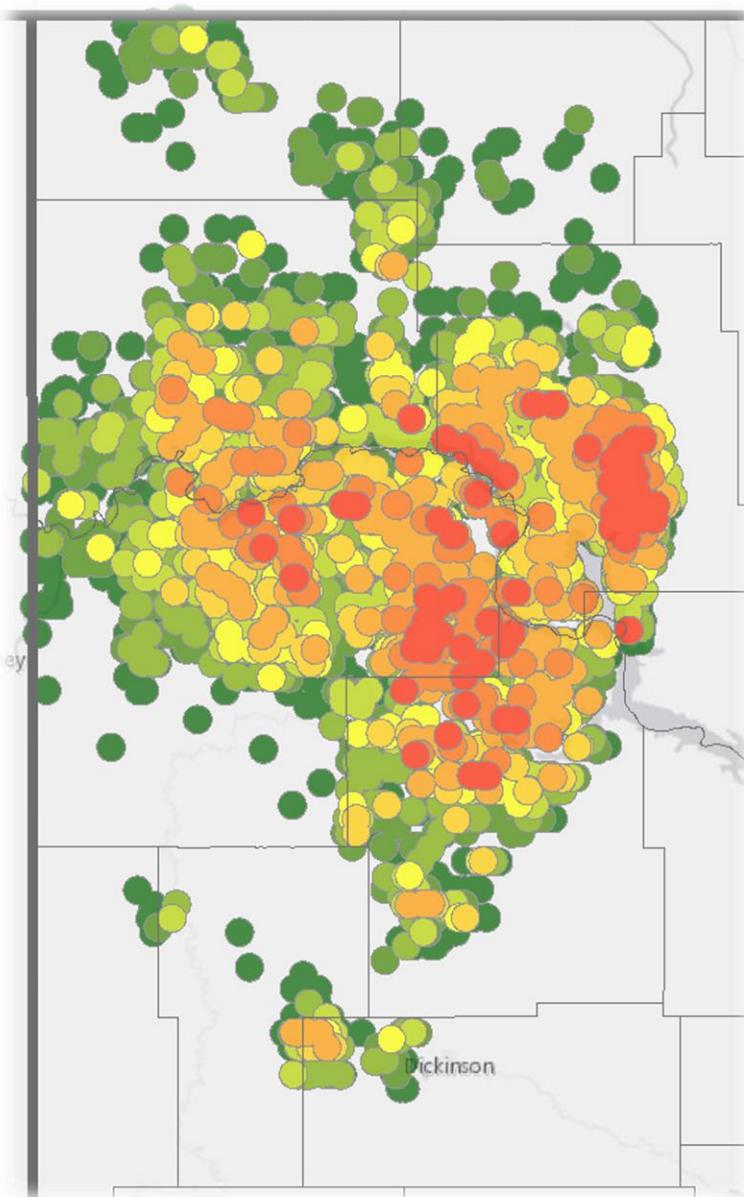
Bakken Breakeven Analysis

Important Considerations

- Breakeven areas were determined by neighboring well performance and are expected to expand as new completion technology is applied in areas outside “the core.”
- Just because an area is considered “economic” **does not mean that it is the most economic** option for the industry participant(s). Competition for capital continues to exist inside and outside the region.



Bakken Breakeven Price Range (20% ATIRR)



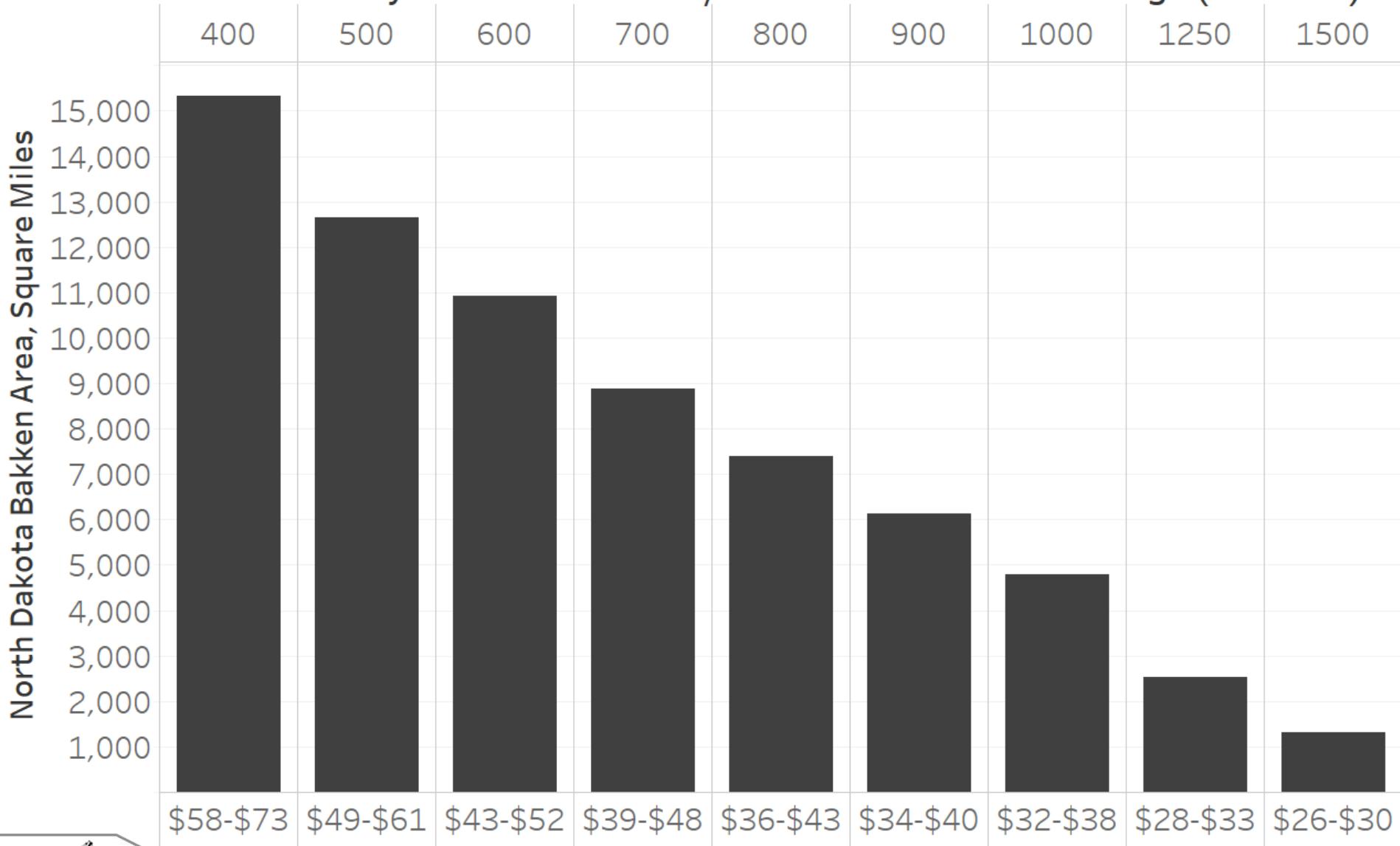
Bakken Breakeven Prices
\$6 - \$8 Million
Completed Wells Cost

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



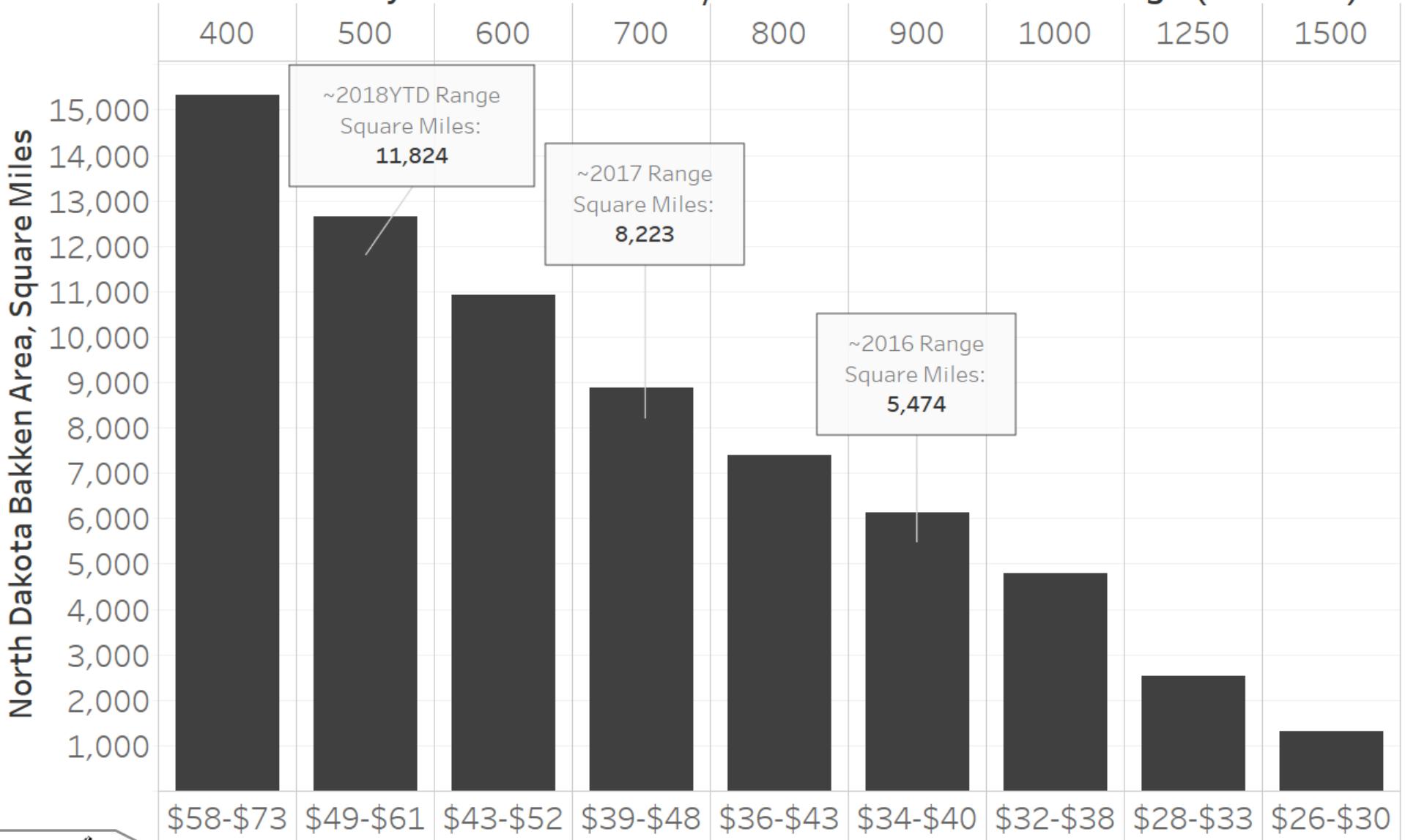
Bakken Breakeven Economics

Peak 30-Day Production Level / Wellhead Breakeven Range (20% IRR)



44% Economic Area Increase 2017 to 2018

Peak 30-Day Production Level / Wellhead Breakeven Range (20% IRR)



Key Economic Assumptions

- \$6-\$8 Million Well Costs
- \$59/BBL & \$5.00/MCF Wellhead Pricing
- 1/6 Royalty
- Zero Flaring
- Assumed 10-20% IRR to drill (calculated after production taxes and royalties)
- No Tax Incentives Included
- Production rate is 30-day average
- All Bakken/Three Forks wells drilled in 2008+



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



JJ Kringstad - North Dakota Pipeline Authority

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