

TAB 2 – Corridor Application Exhibits

- Appendix 2.A Bentek Energy LLC
North Dakota Forecast Study
July 2012 – pp. 47-49 only
- Appendix 2.B North Dakota Pipeline Authority
Slides from North Dakota Oil & Gas Research Council Presentation
May 23, 2013 – pp. 1-24 only
- Appendix 2.C Lynn Helms, NDIC
Director's Cut Presentation
May 13, 2015

WILLISTONBASIN



The Williston Basin:
Greasing the Gears for Growth in North Dakota



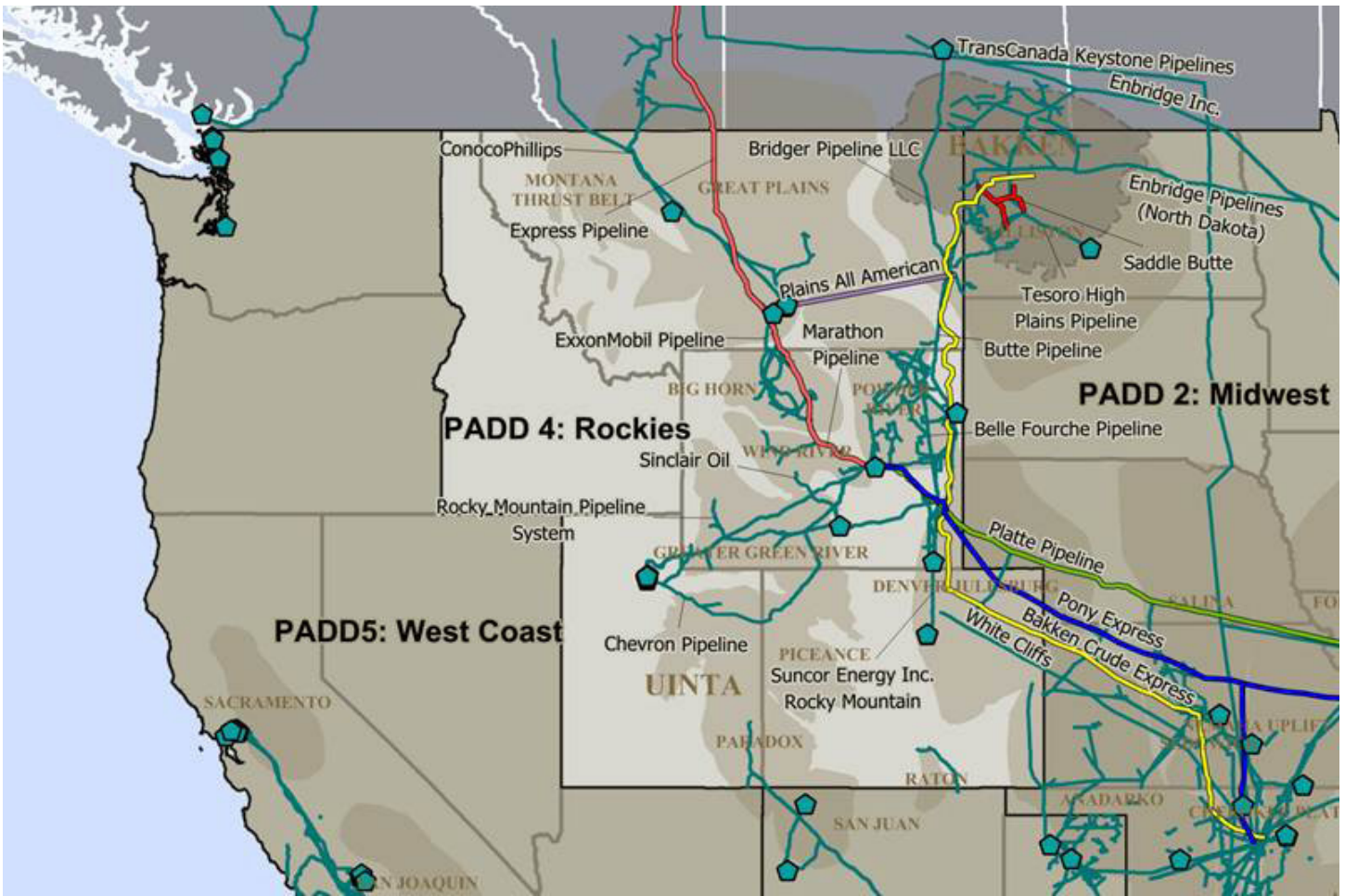


Figure 44. SOURCE: BENTEK

Oil Markets and Infrastructure

Crude oil production in the Williston Basin is transported to one local refinery and to downstream markets on two major pipelines and several rail facilities. These facilities have been barely enough to accommodate the rapid production growth in the basin, leading to at times steep price discounts to WTI. Four refinery expansions are planned in the basin that will add about 65 Mb/d of refining capacity over the next three years. In addition there are nine crude oil pipeline expansions planned that will add 1 MMb/d of takeaway capacity, and there are seven additional rail expansions planned to accommodate oil production growth. BENTEK estimates that the pipeline and refinery projects will be inadequate to keep up with expected growth and the producers in the basin

will continue to rely on more expensive transportation options such as rail and truck over the forecast period.

Refining

Tesoro’s Mandan Refinery began operations in 1954 and has a capacity of 58 Mb/d, which is being fully utilized. The refinery is served by a 750-mile crude oil gathering and mainline system. Mandan manufactures gasoline, diesel fuel, jet fuel and heavy fuel oil along with liquefied petroleum gas, all of which are shipped via truck to markets in North Dakota and Minnesota.

After local refining demand is satisfied, remaining Williston crude oil supply moves out of the area on two major pipelines, Enbridge’s 185 Mb/d North Dakota system and Bridgers’ 150 Mb/d Butte Pipeline. The Enbridge system ships about 211 Mb/d of crude eastward to the company’s terminal in Clearbrook, MN, and another 25 Mb/d north to the Enbridge mainline and on to

Clearbrook terminal. Butte takes 150 Mb/d of Bakken crude to Guernsey, WY.

Enbridge recently completed two expansion projects. The first expansion removed 5 Mb/d of sour crude transportation service from the pipeline and added 25 Mb/d of sweet crude capacity. The added capacity has been fully utilized. There also no longer are interruptions in pipeline flows to segregate shipments of sour and sweet crude. The second project on the Enbridge North Dakota system was the Portal Line Reversal, which involved the reactivation and flow reversal of 85.7 miles of existing pipeline between Berthold, ND, and Enbridge's Steelman terminal in Saskatchewan.

The Butte Pipeline is a 16-inch diameter, 323-mile crude oil pipeline system from Baker, MT, to Guernsey, WY. Bridger added 32 Mb/d of capacity to the system in 3Q2011, bringing capacity up to 150 Mb/d.

Oil Transportation Options

With the sudden growth of Williston Basin oil production, transportation capacity has struggled to keep pace. Two main oil transport options currently exist in the Williston Basin: pipeline and rail. Pipeline transport is the preferred option as it is the least expensive. However, all pipelines out of the Williston Basin are currently running near capacity.

Rail transport is more expensive than shipping on a pipeline on a variable cost basis. However, building a rail loading facility takes only 12 to 15 months, whereas trying to expand or build a new pipeline can take several years. Williston Basin producers have relied on rail as a quick fix to its growing production needs.

The third and final transport choice and option of last resort for Williston crude is long-haul trucking crude volumes to Canada. Again, this is a last resort due to the expense of such transport. However, during times of tight oil transportation, Williston producers have relied on long-haul trucking to Canada to fill the transportation gap.

Pipelines

Three main oil pipeline options exist for Williston Basin producers and are shown in Figure 44. The first option is to ship crude west into the Clearbrook, MN, market on Enbridge's North Dakota system. The North Dakota

system runs from the western part of North Dakota west into Clearbrook, MN. The pipeline has undergone several expansions and has the ability to transport 210 Mb/d. The pipeline is currently 100% utilized.

The second option is to ship crude north from the Williston Basin into Canada. Enbridge's newly-completed 25-Mb/d Portal Link project allows for the transfer of volumes from Berthold, ND, north to the Steelman terminal in Saskatchewan. At the terminal, the crude then flows on Enbridge's Westpur system where it connects to Enbridge's 2,500-Mb/d mainline system in Cromer, Manitoba. On the Enbridge Mainline, Bakken producers must compete for space with Canadian oil.

The third pipeline transport option for Bakken producers is to ship volumes south into the lower Rockies crude oil market. The Butte Pipeline transports 150 Mb/d from Baker, MT, to Guernsey, WY, and is currently the only pipeline which travels south out of the Bakken. At Guernsey, Bakken barrels compete for demand at local refineries and also for space to exit the PADD 4 market on the Platte Pipeline. The Platte Pipeline is a 165-Mb/d pipeline, which runs from Casper, WY, to Wood River, IL. The pipeline carries lower Rockies barrels (Powder River and Denver-Julesburg basin production) as well as Canadian barrels it receives from an interconnect with Express Pipeline. Platte Pipeline also runs full on a daily basis.

Rail

As stated earlier, rail transportation has been able to help fill the gap between growing production and pipeline capacity. Currently, there are 15 existing rail loading facilities in North Dakota with the ability to transport approximately 420 Mb/d. The main destination for railed volumes has been the Gulf Coast market. However, there has been talk of volumes going to California, Washington, Philadelphia and even to Eastern Canada via rail. While rail is a more expensive transport option when compared to pipelines, it does provide the flexibility to choose an end market and has been an integral part in the basin to help alleviate near-term transportation bottlenecks.

Truck

The final transport option is to truck volumes to nearby pipelines. The main long-haul route is north from the basin into Canada. In Canada, the volumes are then transferred to Enbridge's mainline where they are transported back into the U.S. to the Clearbrook, MN, market. During

the past few months, about 40 Mb/d was transported from the Bakken by truck into Canada.

Pipeline Expansions

Despite new transportation additions over the past several years, the transportation market remains tight in the basin. In anticipation of further growth in crude oil production and more transportation constraints in the Bakken, several companies have proposed new pipeline projects, including:

- ONEOK's Bakken Crude Express Pipeline has an announced capacity of 200 Mb/d and will transport crude 1,300 miles from the Bakken to Cushing, OK. The estimated in-service date is 2015.
- The expansion of the Butte Mainline will add 120 Mb/d of capacity from Baker, MT, to Guernsey, WY, beginning in 2015.
- Banner Pipeline's Banner project would transport 100 Mb/d of Bakken crude from Baker, Montana to the Pony Express Pipeline in Guernsey, Wyoming. An in-service date for this project has not been announced.

- Saddle Butte's High Prairie Pipeline has an announced capacity of 150 Mb/d and would transport Bakken crude to Enbridge's terminal in Clearbrook, MN. Recent news puts this project into question as Enbridge has refused to allow High Prairie an interconnect at the terminal.
- The Keystone XL project would add 508 Mb/d of capacity between Alberta, Canada and Steele City, NE. Approximately 100 Mb/d of this capacity would transport Bakken crude beginning in 2015.
- Enbridge announced the Sandpiper Pipeline project with 325 Mb/d of capacity with an estimated in-service date in 2015.

Considering only these larger projects, the Williston Basin stands to gain nearly 1 MMbbl/d of additional pipeline capacity by 2015. However, this capacity may not be sufficient to transport all of the oil that will be produced. Hence, BENTEK expects rail to be a necessity for Bakken producers to move crude out of the region. By the end of 2013, more than 400 Mb/d of rail capacity will be available for Bakken producers and BENTEK expects capacity to be nearly fully utilized by the end of 2013.



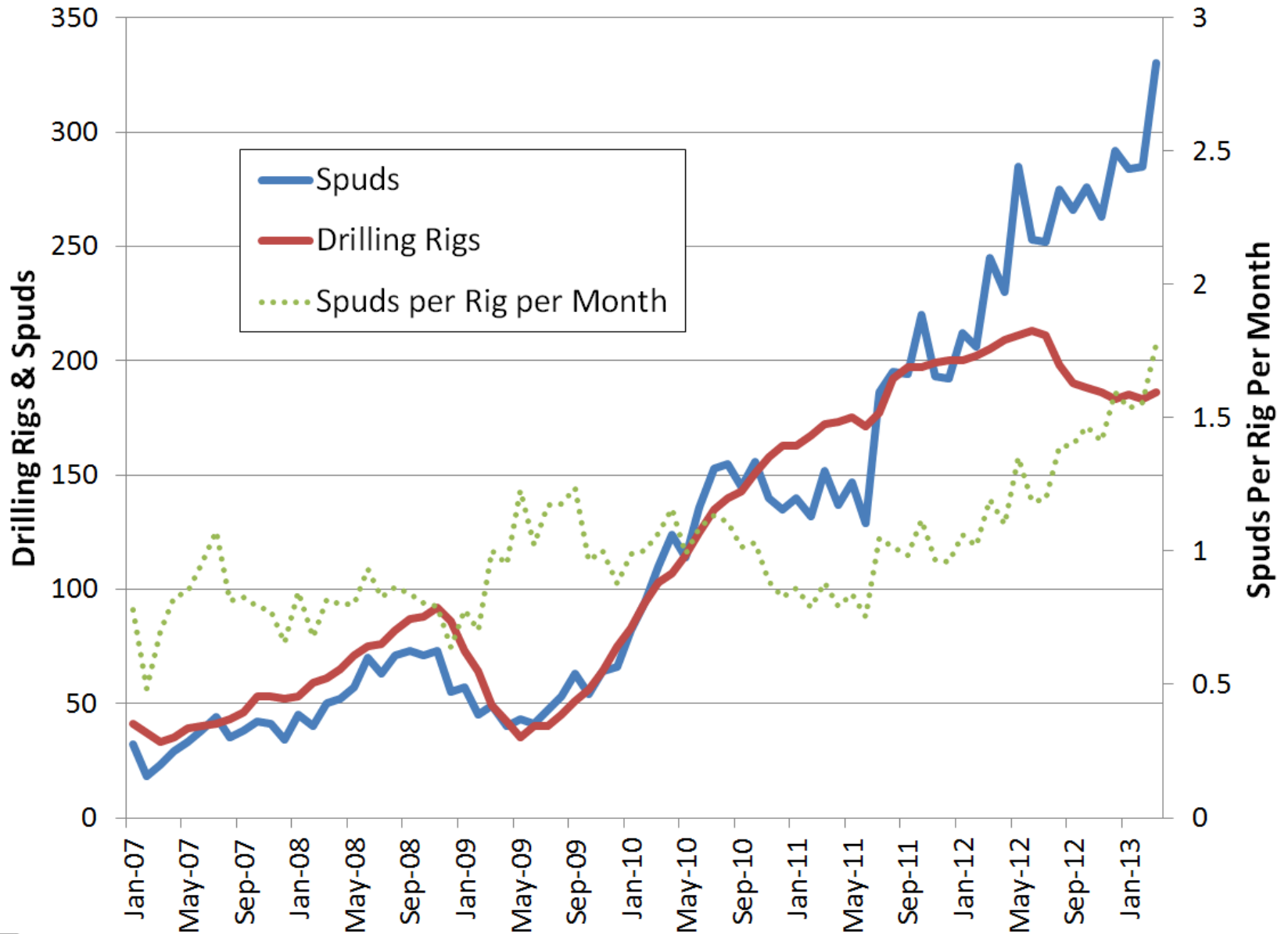
North Dakota Oil & Gas Research Council

North Dakota Pipeline Authority

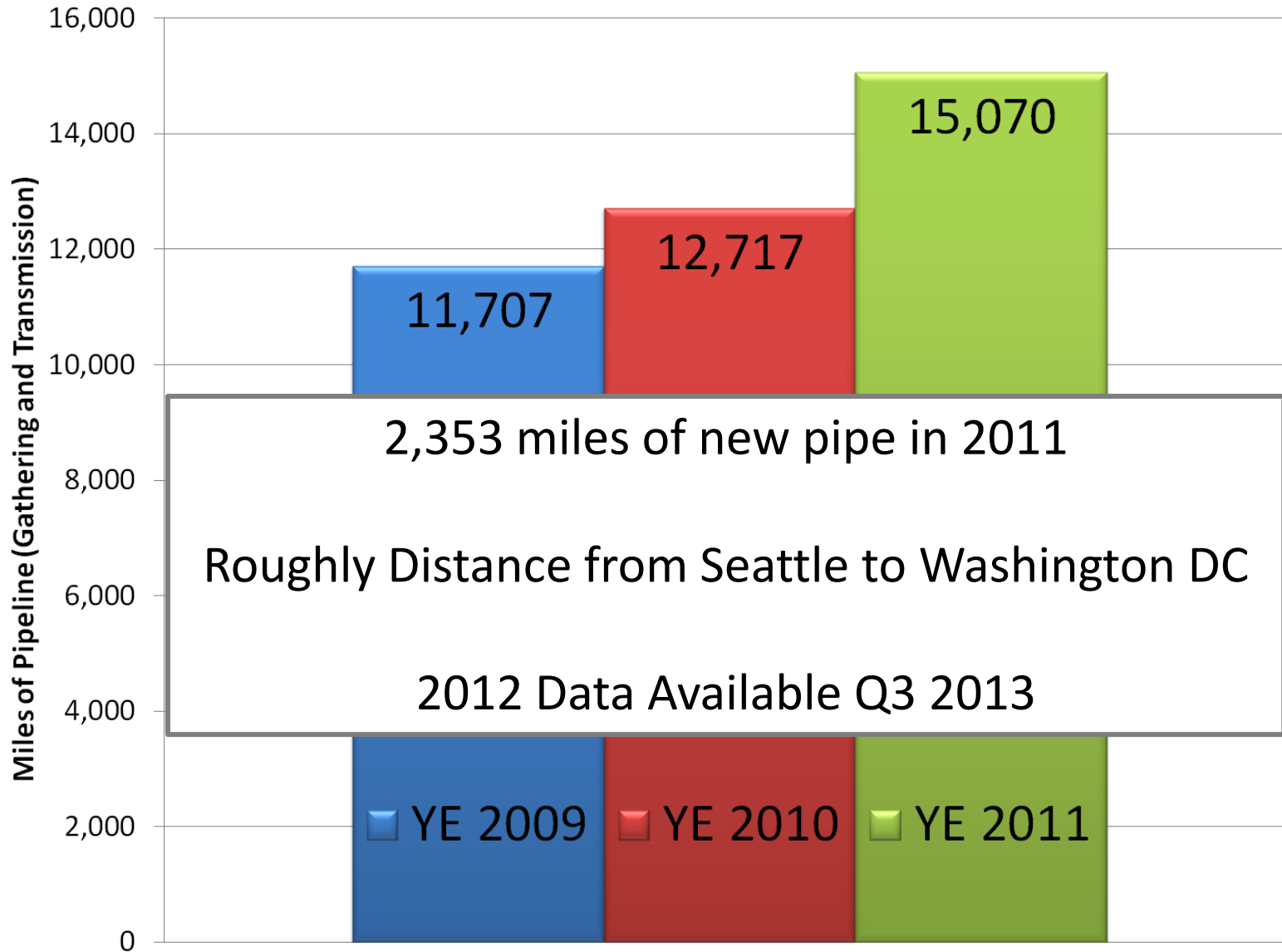
Justin J. Kringstad

May 23, 2013 – Bismarck, ND

ND Drilling Stats



North Dakota Pipeline Miles



Crude Oil

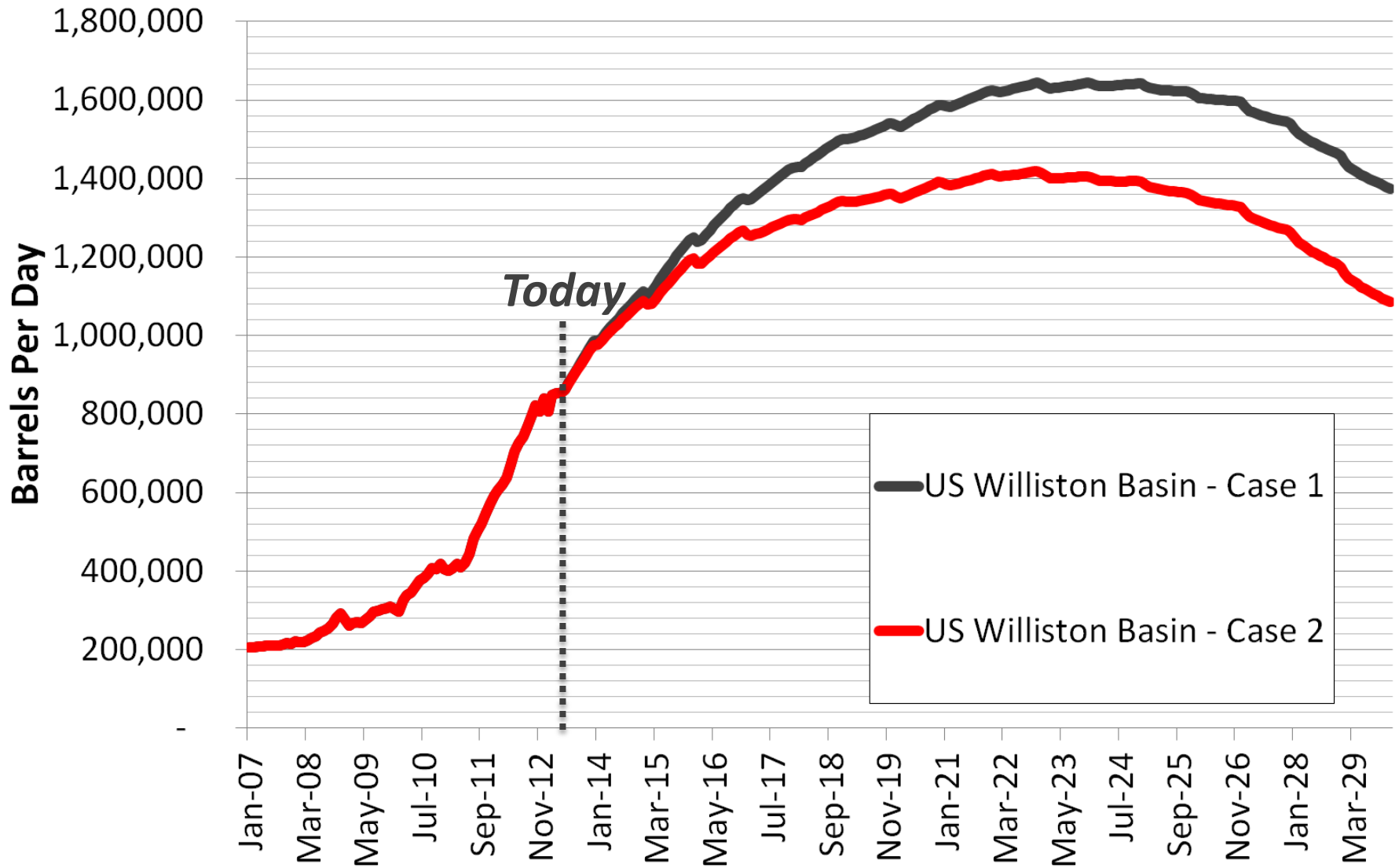
Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions



Forecasting Williston Basin Oil Production, BOPD



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



Crude Oil

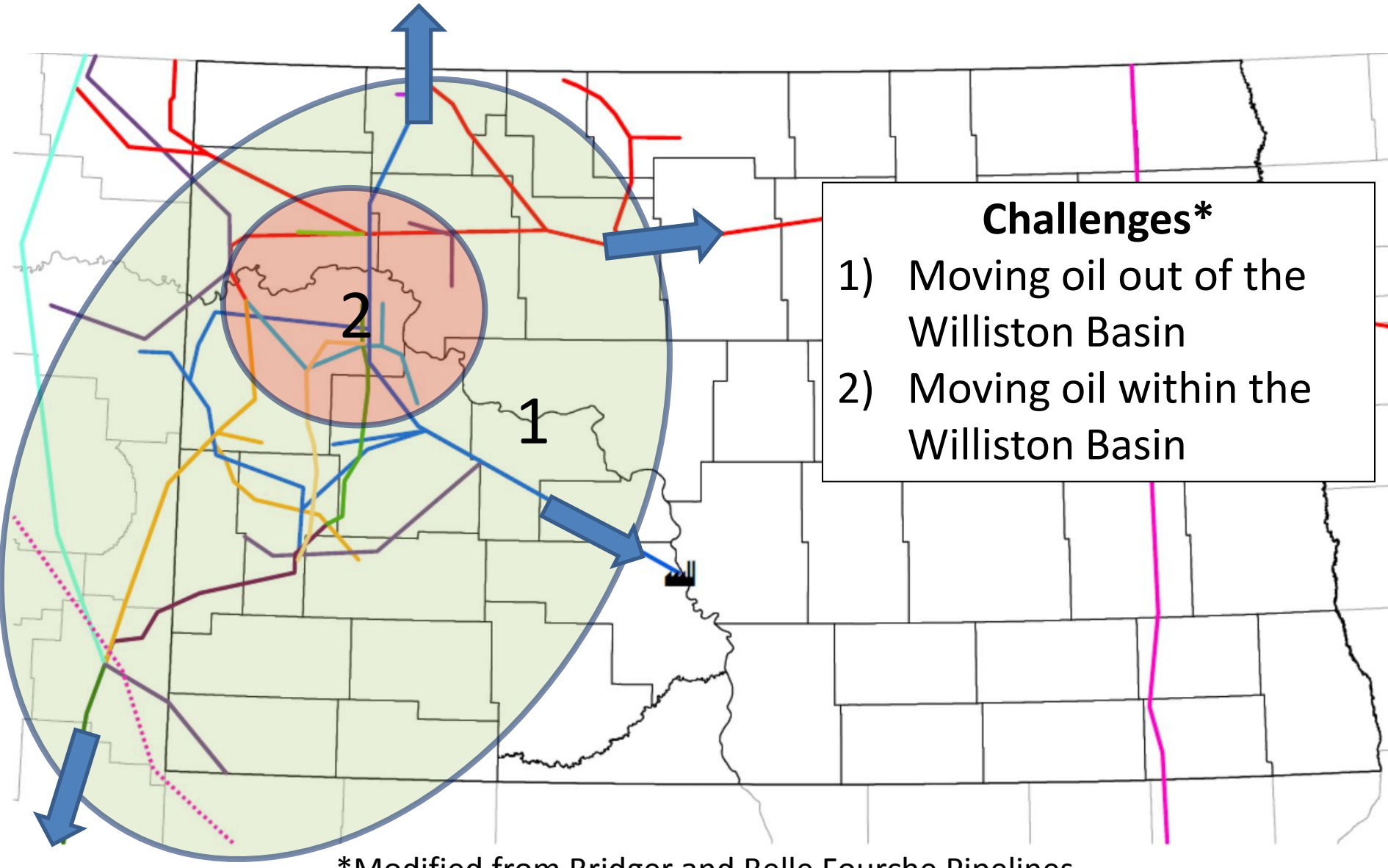
Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions



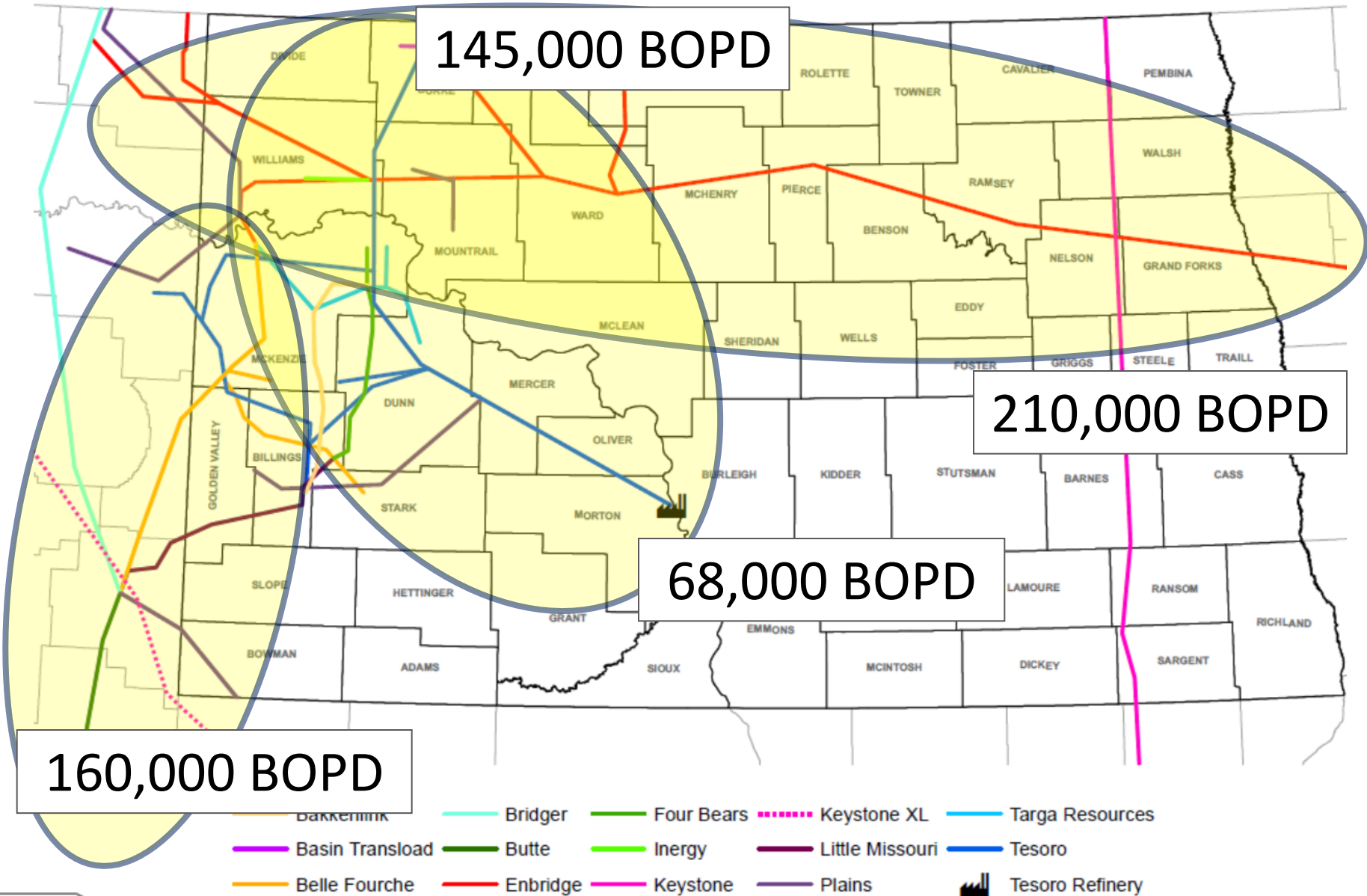
North Dakota Crude Oil Pipelines



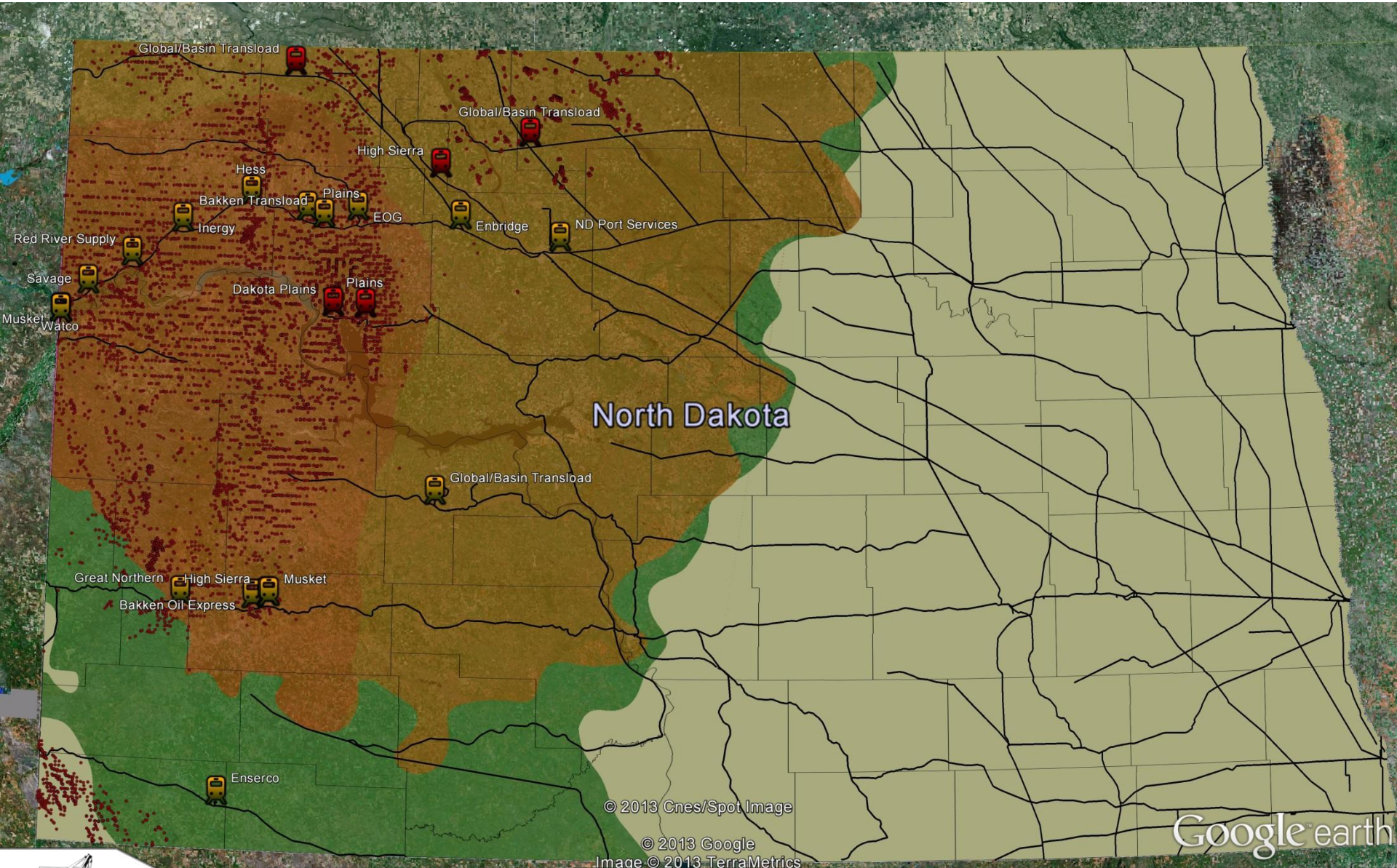
*Modified from Bridger and Belle Fourche Pipelines



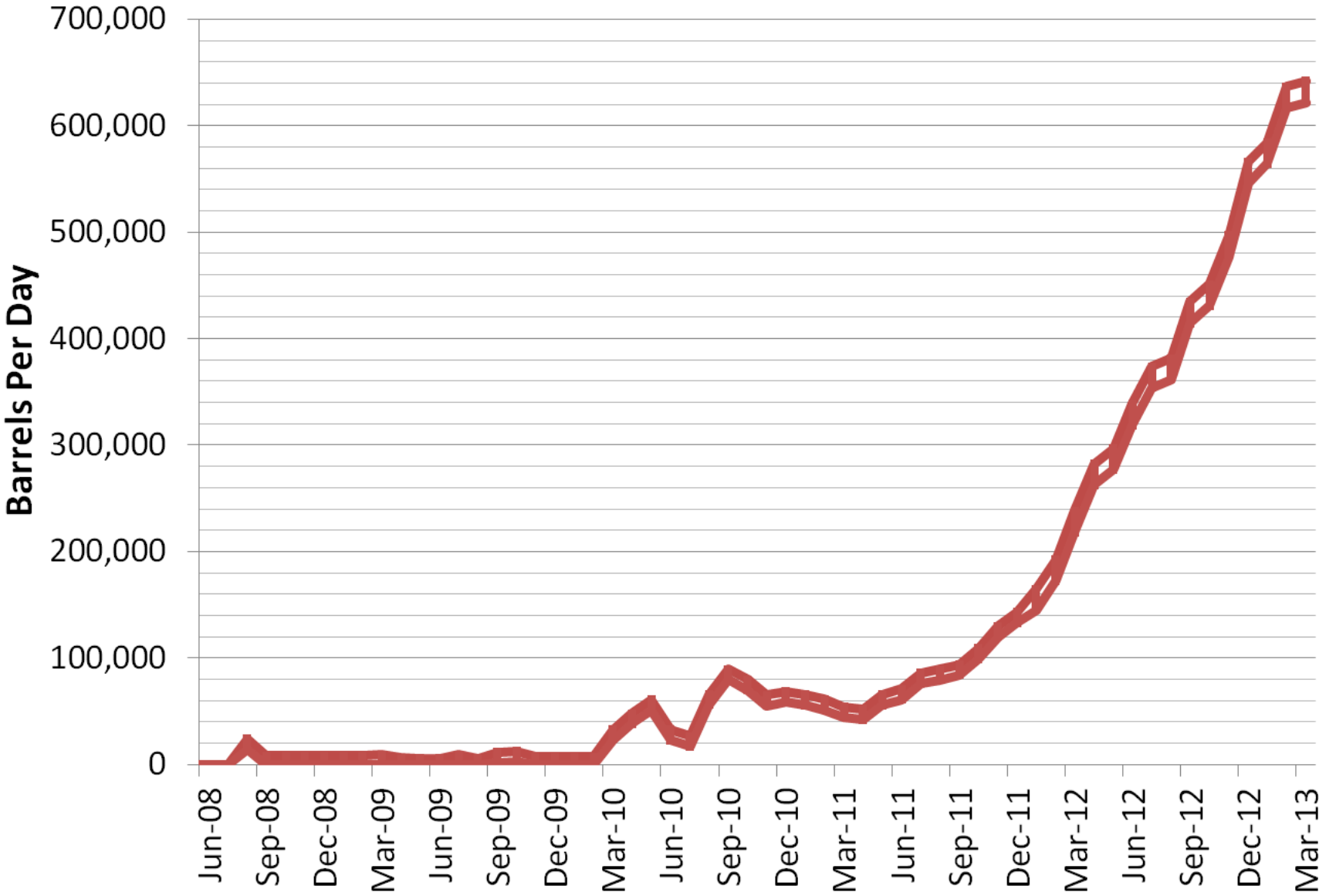
North Dakota Crude Oil Pipelines



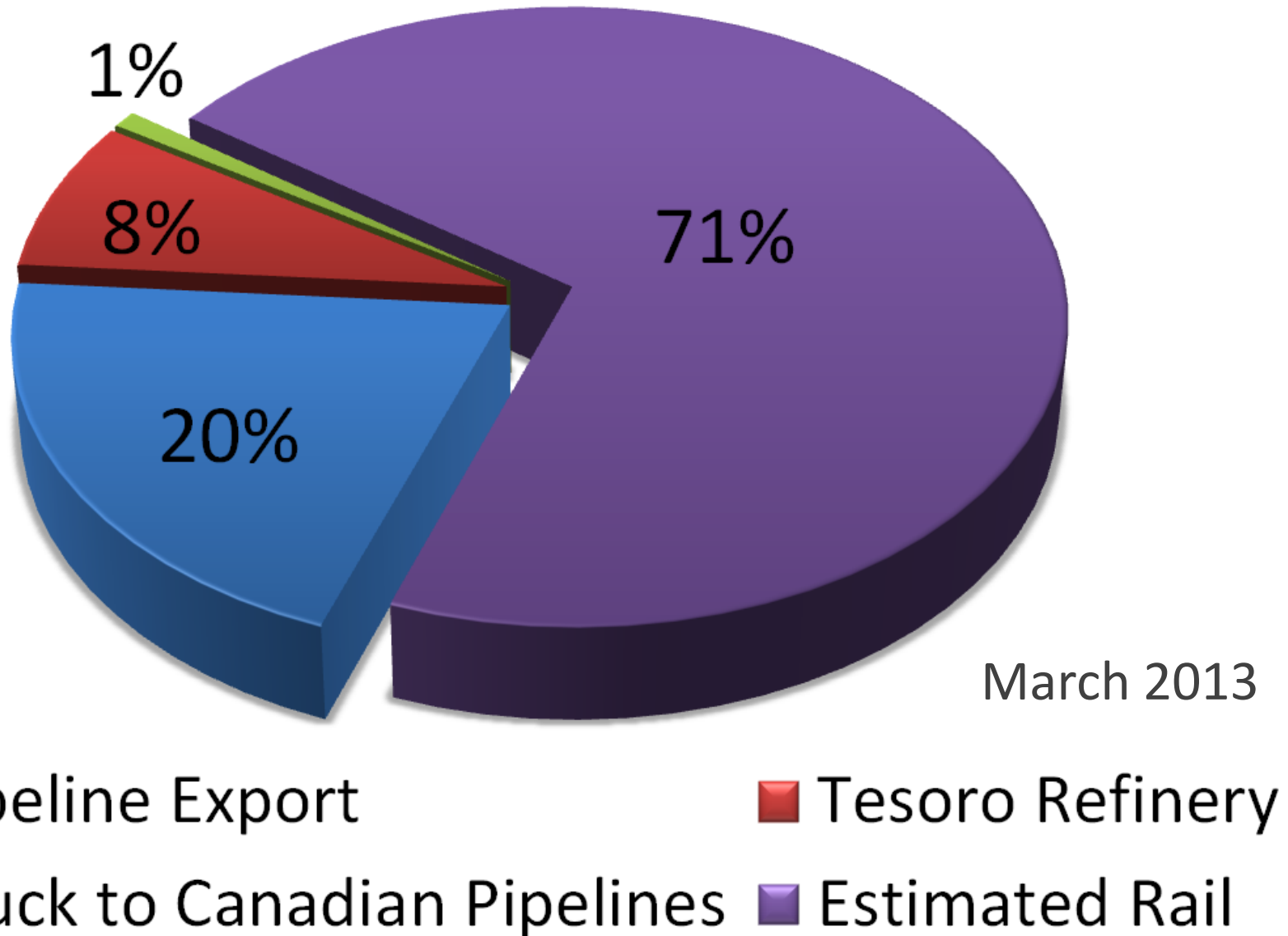
Oil Loading Rail Facilities



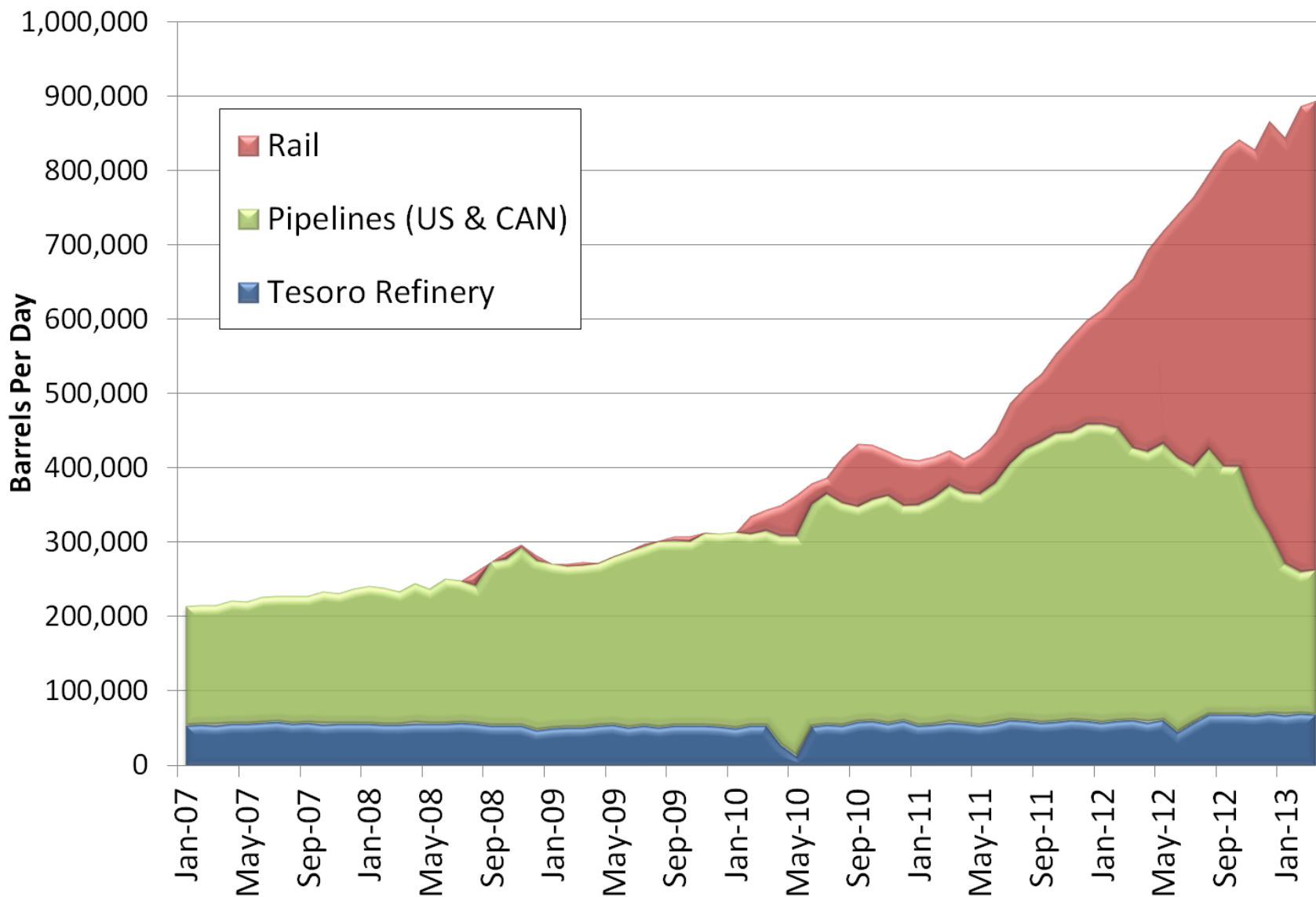
Estimated ND Rail Export Volumes



Estimated Williston Basin Oil Transportation



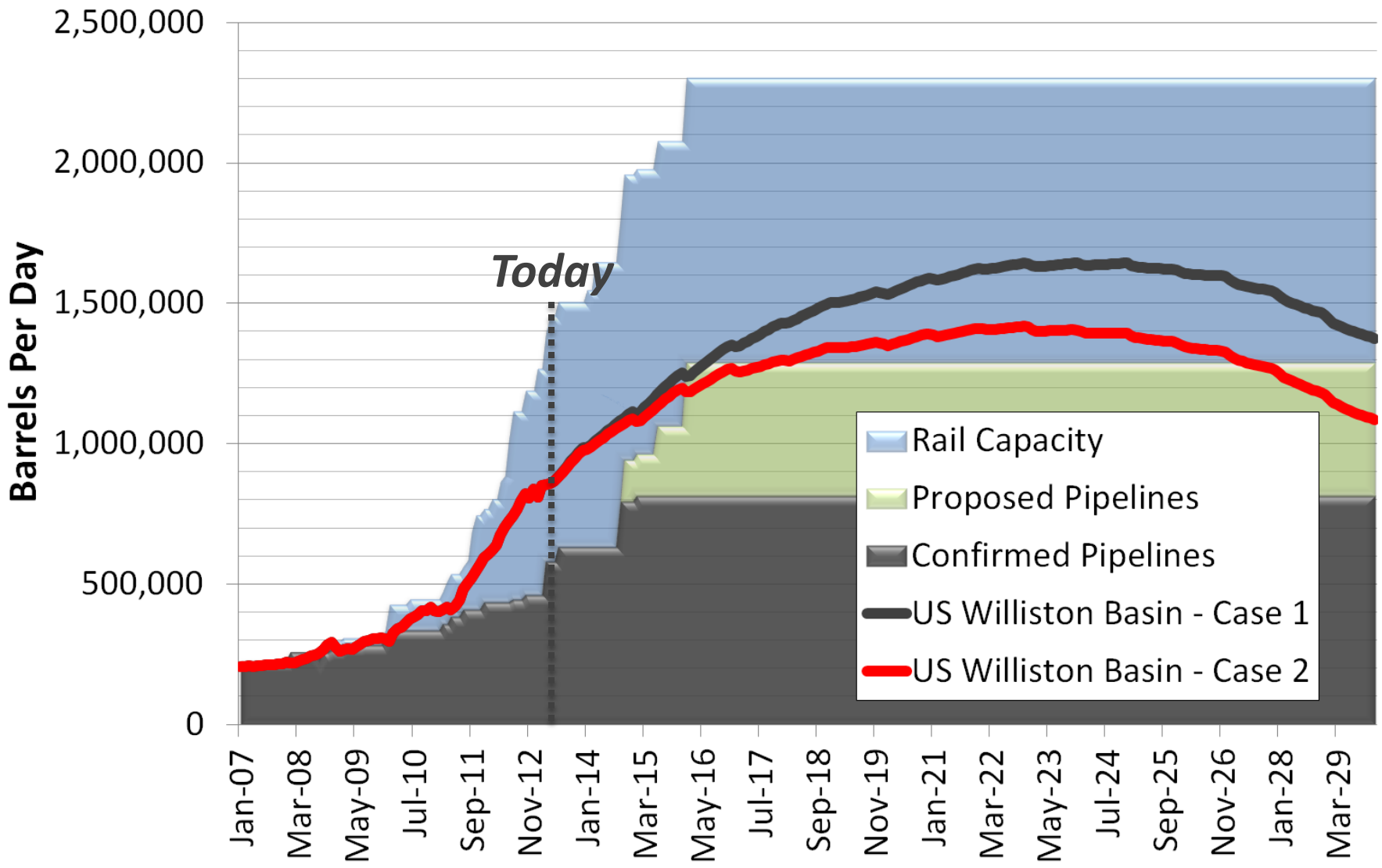
US Williston Basin Oil Transport*



**Some data based on estimates or assumptions*



Williston Basin Oil Production & Export Capacity, BOPD



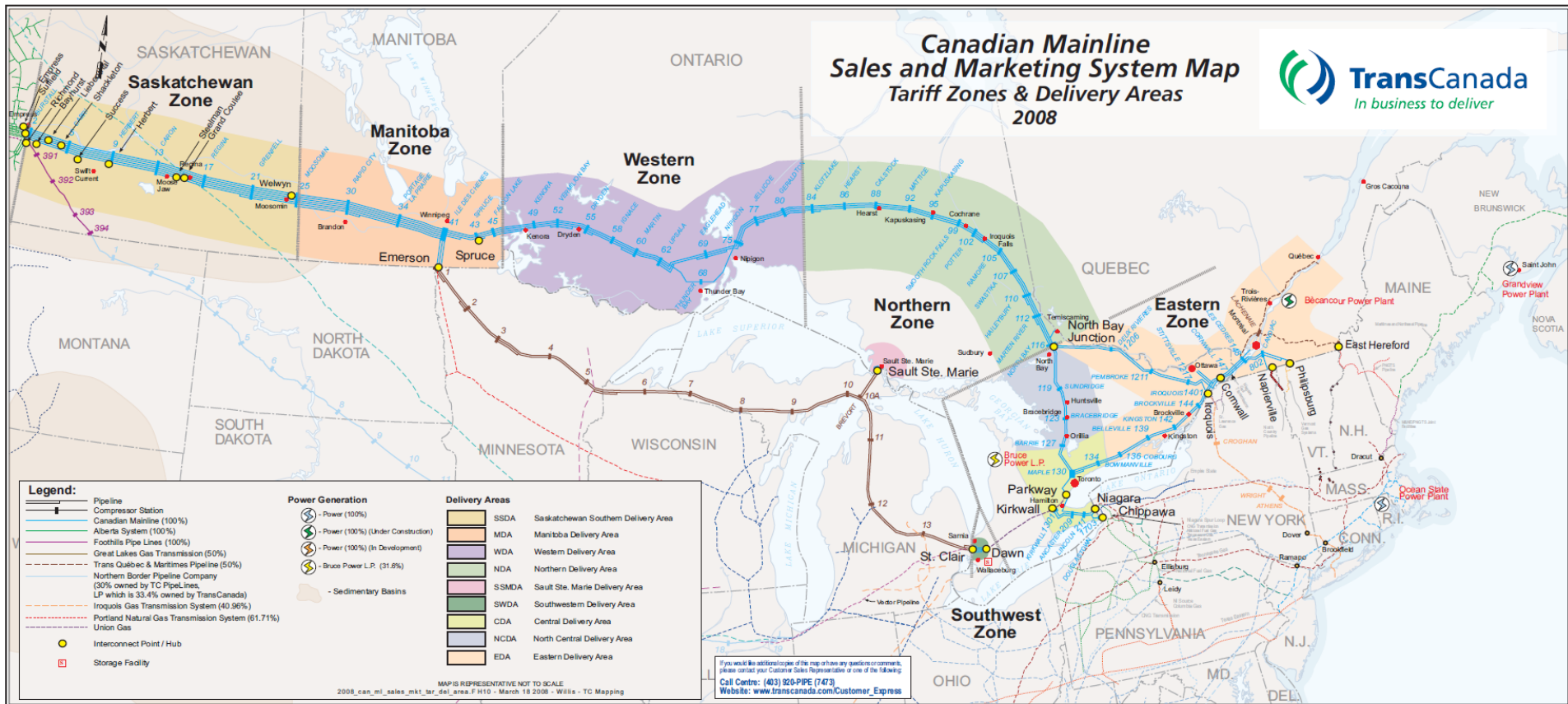
Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.



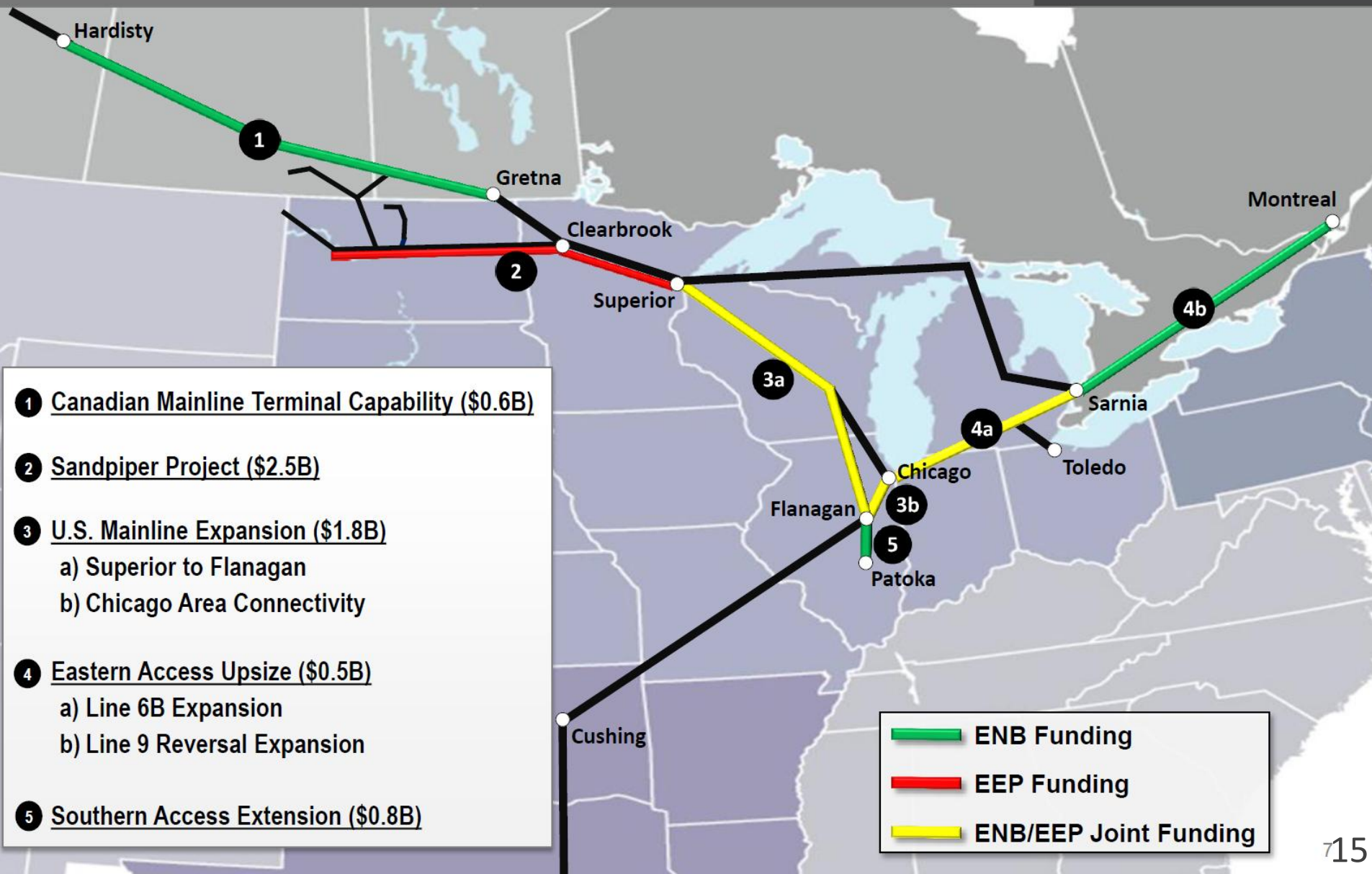
TransCanada Open Season

April 15-June 17 Up to 850 mbpd

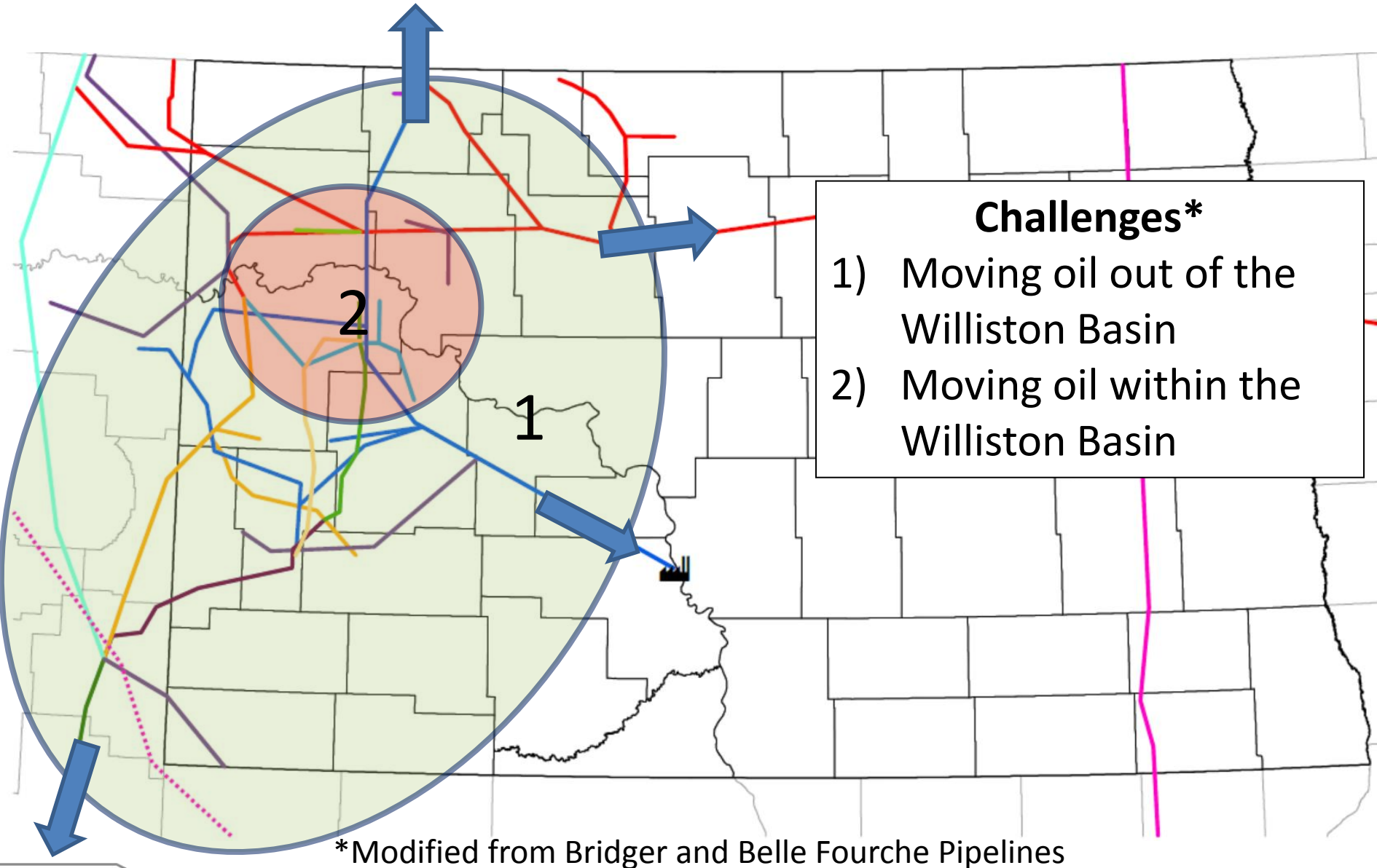
Proposed In-Service 2017/18



\$6.2 Billion – Light Oil Market Access

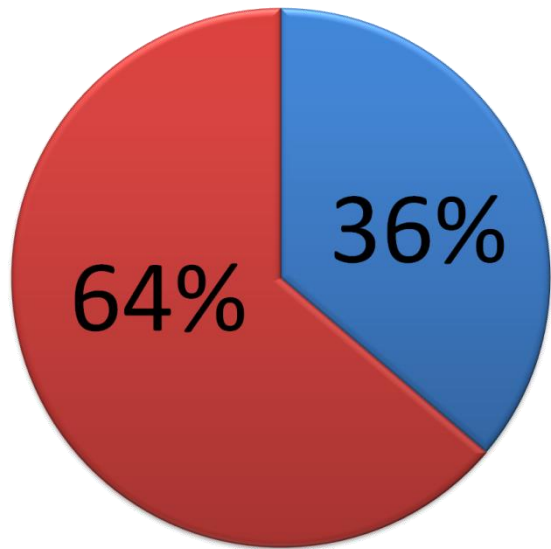


North Dakota Crude Oil Pipelines



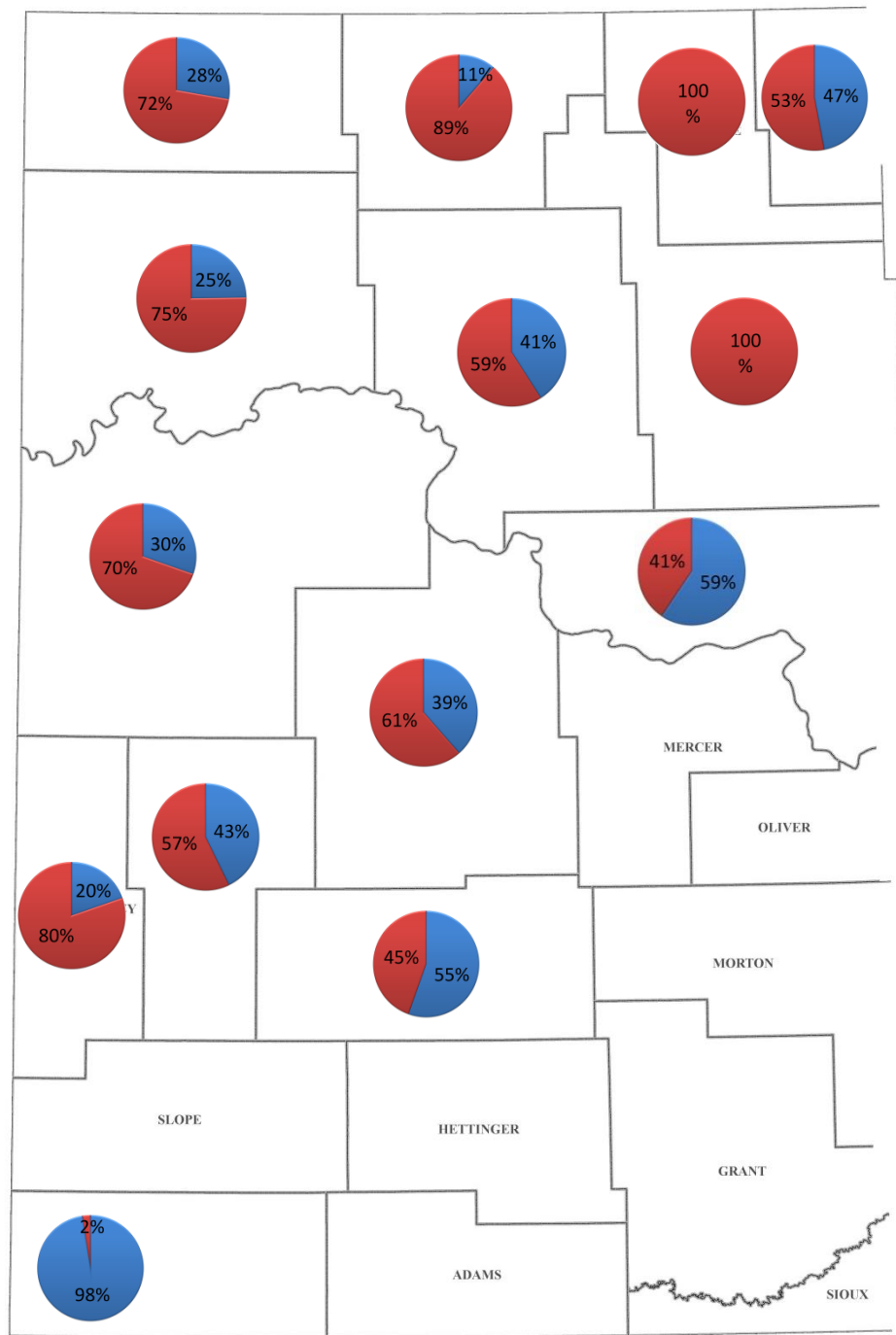
ND Crude Oil Gathering

Red – Trucked
Blue – Pipeline



All ND Production

Sep 2012 Estimates – Some data incomplete or unavailable



Crude Oil

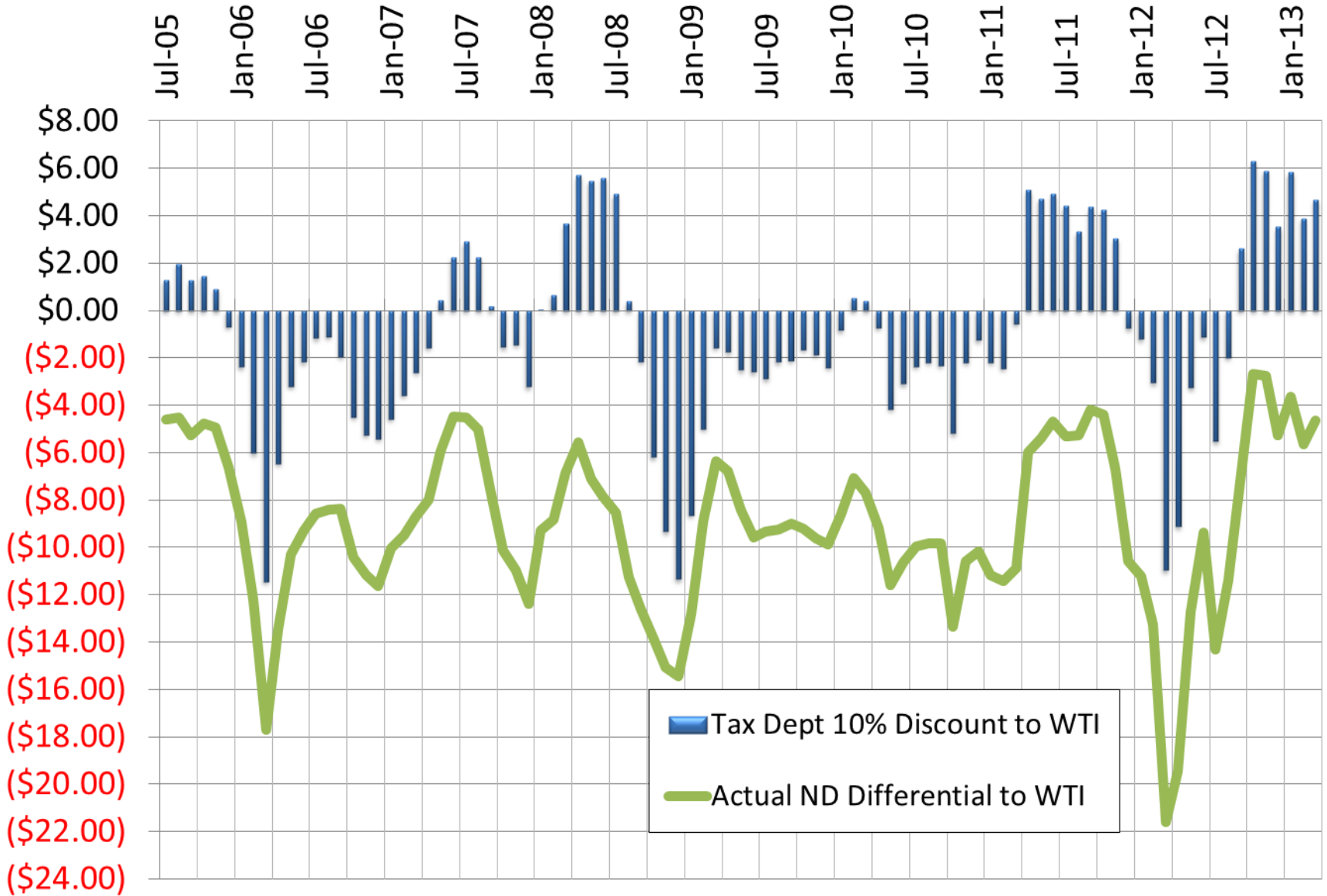
Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions



ND Oil Pricing



Crude Oil Prices – May 15, 2013

Clearbrook*

\$89.95

WTI - \$3.25

*Bloomberg

Brent \$102.36

WTI + \$9.16

Cushing

\$93.20

Brent \$102.36

WTI + \$9.16

Brent \$102.36

WTI + \$9.16

PADD IV

PADD II

PADD I

PADD V

PADD III

US Dept of State Geographer

© 2013 Google

Image © 2013 TerraMetrics

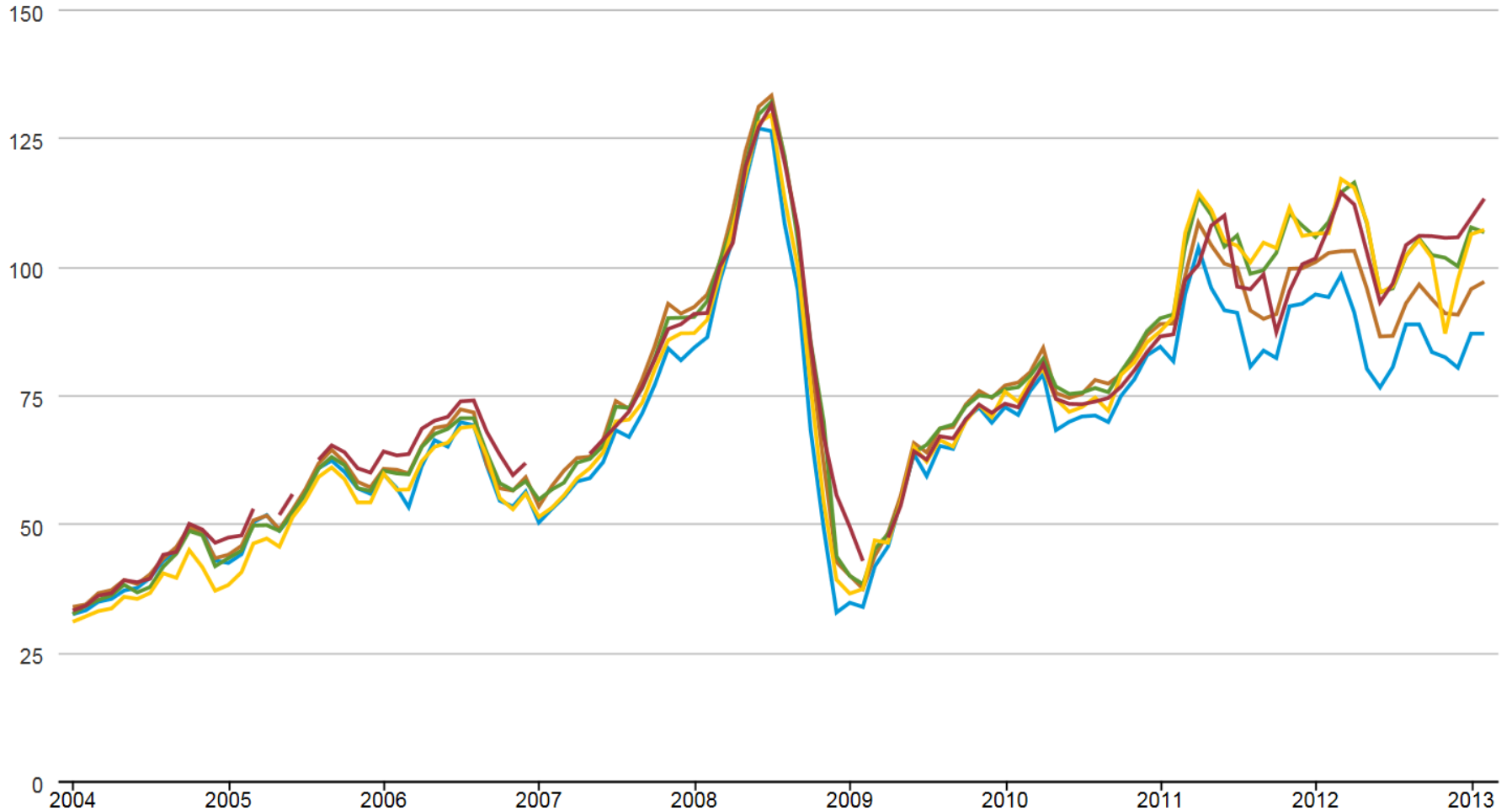
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth



Refiner Acquisition Cost of Crude

\$/bbl

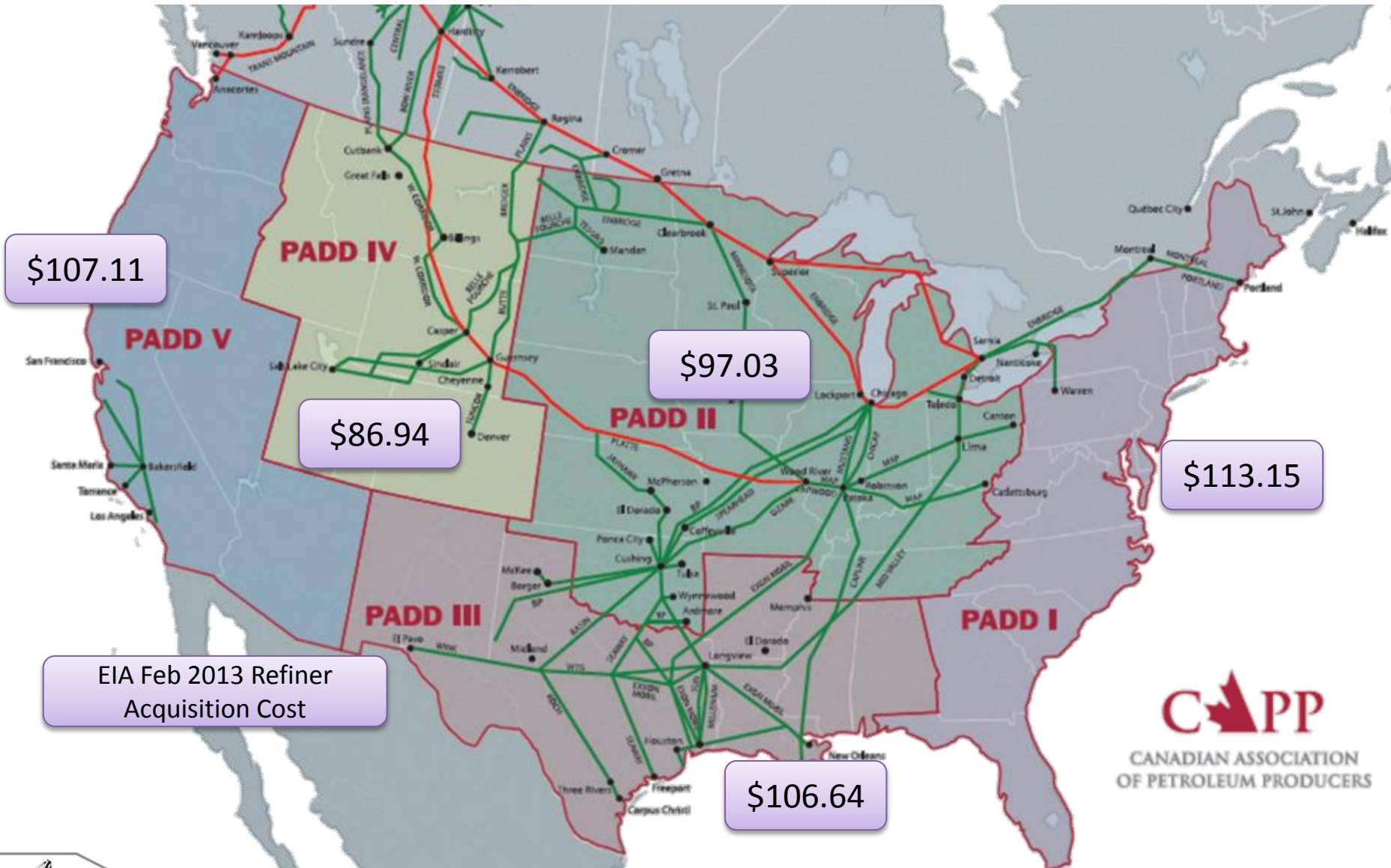


- Rocky Mountain (PADD 4) Crude Oil Domestic Acquisition Cost by Refiners
- Midwest (PADD 2) Crude Oil Domestic Acquisition Cost by Refiners
- Gulf Coast (PADD 3) Crude Oil Domestic Acquisition Cost by Refiners
- West Coast (PADD 5) Crude Oil Domestic Acquisition Cost by Refiners
- East Coast (PADD 1) Crude Oil Domestic Acquisition Cost by Refiners

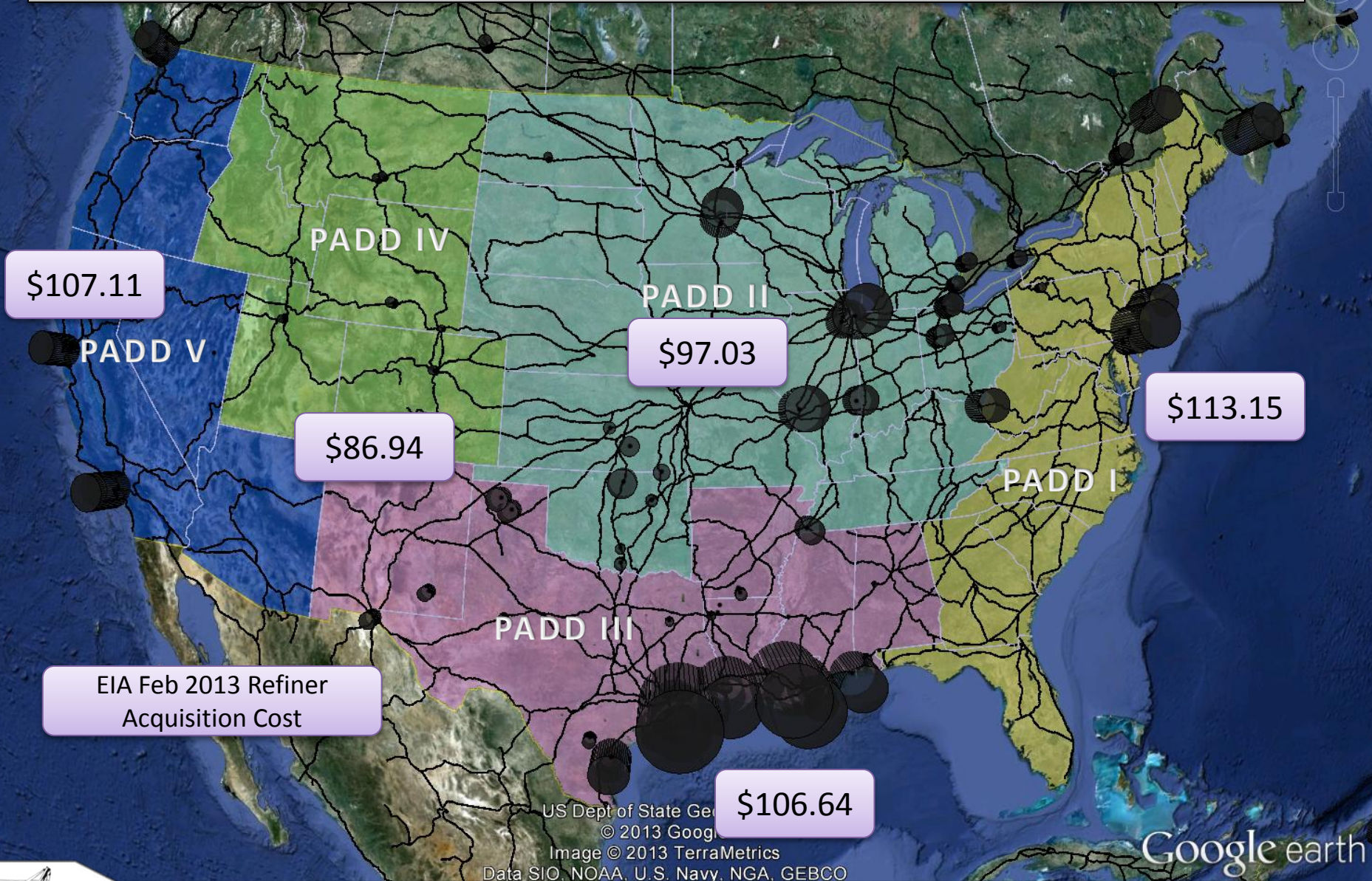
Source: U.S. Energy Information Administration



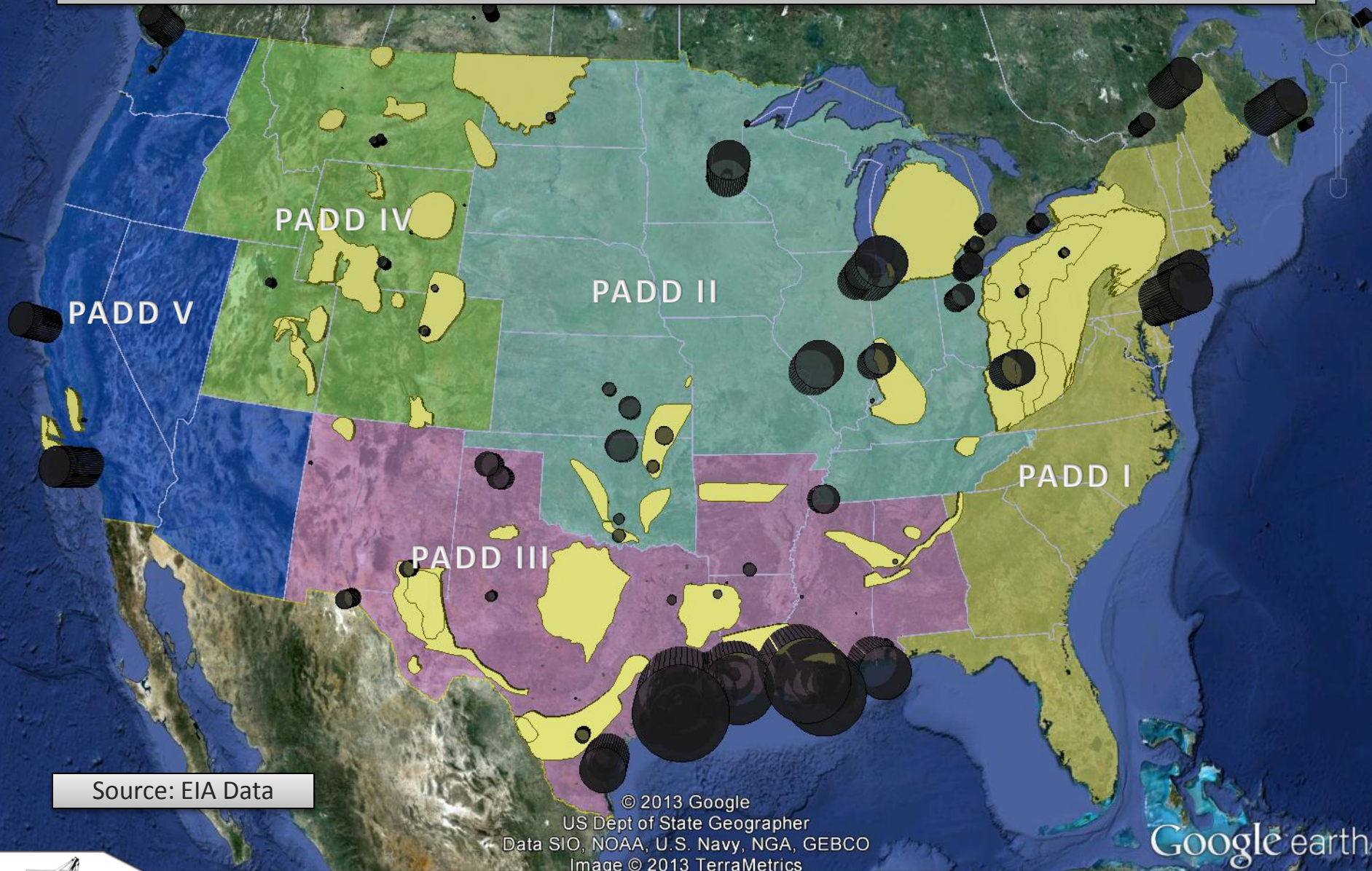
Major Pipelines and Refining Centers



Major Rail Lines and Refineries



US Shale Plays and Refineries



Source: EIA Data

© 2013 Google
US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2013 TerraMetrics

Google earth



Director's Cut

Lynn Helms

NDIC Department of Mineral Resources

Feb Oil 32,986,298 barrels = 1,178,082 barrels/day

Mar Oil 36,908,068 barrels = 1,190,583 barrels/day (preliminary)(all-time high was Dec 2014 1,227,483 barrels/day)

1,129,174 barrels per day or 95% from Bakken and Three Forks

61,409 barrels per day or 5% from legacy conventional pools

Feb Gas 41,311,066 MCF = 1,475,395 MCF/day

Mar Gas 47,165,803 MCF = 1,521,478 MCF/day (preliminary)(all-time high was Dec 2014 1,570,858 MCF/day)

Feb Producing Wells = 12,199

Mar Producing Wells = 12,439 (preliminary)(NEW all-time high)

9,397 wells or 76% are now unconventional Bakken – Three forks wells

3,037 wells or 24% produce from legacy conventional pools

Feb Permitting: 197 drilling and 0 seismic

Mar Permitting: 190 drilling and 0 seismic

Apr Permitting: 168 drilling and 1 seismic (all time high was 370 in 10/2012)

¹Feb Sweet Crude Price = \$34.11/barrel

Mar Sweet Crude Price = \$31.47/barrel

Apr Sweet Crude Price = \$38.33/barrel

Today Sweet Crude Price = \$46.00/barrel (all-time high was \$136.29 7/3/2008)

Feb rig count 133

Mar rig count 108

Apr rig count 91

Today's rig count is 83 (lowest since January 2010)(all-time high was 218 on 5/29/2012)

The statewide rig count is down 62% from the high and in the five most active counties rig count is down as follows:

Divide -77% (high was 3/2013)

Dunn -74% (high was 6/2012)

McKenzie -52% (high was 1/2014)

Mountrail -63% (high was 6/2011)

Williams -63% (high was 10/2014)

¹ Source: Flint Hills Resources

<http://www.fhr.com/refining/bulletins.aspx?AspxAutoDetectCookieSupport=1>

Comments:

The drilling rig count dropped 25 from February to March, 17 more from March to April, and has since fallen 8 more from April to today. The number of well completions² rose sharply from 42(final) in February to 189(preliminary) in March. Oil price is by far the biggest driver of the slow-down followed by oil extraction tax triggers, NDIC gas capture goals, and NDIC oil conditioning rules. There were no major precipitation events, 8 days with wind speeds in excess of 35 mph (too high for completion work), and 1 day with temperatures below -10F.

Over 99% of drilling now targets the Bakken and Three Forks formations.

At the end of March there were an estimated 880 wells waiting on completion services, a decrease of 20. To maintain production near 1.2 million barrels per day, 110-120 completions must be made per month.

Crude oil take away capacity depends on rail deliveries to coastal refineries to remain adequate.

Rig count in the Williston Basin has fallen rapidly. Utilization rate for rigs capable of 20,000+ feet is about 45%, and for shallow well rigs (7,000 feet or less) about 25%.

Drilling permit activity decreased slightly from February to March and significantly more from March to April as operators positioned themselves for low price 2015 budget scenarios.

The number of rigs actively drilling on federal surface in the Dakota Prairie Grasslands is unchanged at 0.

Activity on the Fort Berthold Reservation is as follows:

8 drilling rigs (2 on fee lands and 6 on trust lands)

382,159 barrels of oil per day (164,012 from trust lands & 218,147 from fee lands)

1,458 active wells (1,103 on trust lands & 355 on fee lands)

80 wells waiting on completion

455 approved drilling permits (321 on trust lands & 134 on fee lands)

1,910 additional potential future wells (1,165 on trust lands & 745 on fee lands)

Seismic activity is in the mid-winter slow down with 5 surveys active/recording, 0 remediating, 0 suspended, and 0 permitted. There are now 5 buried micro-seismic arrays in North Dakota for monitoring and optimizing hydraulic fracturing.

² Disclaimer: The number of completions is an estimate on the part of the director based on idle well count and a typical five year average. Neither the State of North Dakota, nor any agency officer, or employee of the State of North Dakota warrants the accuracy or reliability of this product and shall not be held responsible for any losses caused by this product. Portions of the information may be incorrect or out of date. Any person or entity that relies on any information obtained from this product does so at his or her own risk.

North Dakota leasing activity is limited to renewals and top leases in the Bakken - Three Forks area.

US natural gas storage is now 3.6% below the five-year average indicating slightly higher prices in the future. North Dakota shallow gas exploration could be economic at future gas prices, but is not at the current price. As you are aware the exploration well in Emmons County is no longer on confidential status as of 12/23/14. The well has not been completed yet, but appears to contain 2 pay sections totaling about 80 feet thick with very good gas shows.

The price of natural gas delivered to Northern Border at Watford City is up \$0.09 to \$2.28/MCF. This results in a current oil to gas price ratio of 20 to 1. The percentage of gas flared was unchanged at 19%. The Tioga gas plant was steady at 83% of full capacity, but expansion of gas gathering from south of Lake Sakakawea remains delayed. The March capture percentage was 81% with the daily volume of gas flared from February to March increased 7.7 MMCFD. The historical high flared percent was 36% in 09/2011.

Gas capture statistics are as follows:

Statewide 80%

Statewide Bakken 81%

Non-FBIR Bakken 80%

FBIR Bakken 85%

Trust FBIR Bakken 86%

Fee FBIR 80%

October 2014 capture target =74%

January 2015 capture target =77%

BLM revised final regulations for hydraulic fracturing on federal and Indian lands were published in the CFR on 3/26/15 so they will go into effect 6/26/15. North Dakota and Colorado have intervened in the Wyoming legal challenge of the rules and plan to seek an injunction or temporary restraining order to prevent the rules going into effect until the case is settled.

The North Dakota Legislature passed HB1432 which sets up a council to address Clean Water Act, Safe Drinking Water Act, Clean Air Act, and Endangered Species Act issues: BLM has started the process of new venting and flaring regulations with input sessions in Denver, Albuquerque, Dickinson, and Washington, DC.

EPA published an advanced notice of proposed rule-making to seek comment on the information that should be reported or disclosed for hydraulic fracturing chemical substances and mixtures and the mechanism for obtaining this information. The proposed rule-making is in response to a petition from Earthjustice and 114 other groups who are opposed to the use of the GWPC-IOGCC FracFocus website process of chemical disclosure and any type of trade secret protection for hydraulic fracturing fluid mixtures. These groups are

requesting EPA regulation of chemical disclosure under the federal Toxic Substances Control Act. Thanks to all who provided comments in support of a “states first” policy.

The comment period for the EPA and USACOE proposed rule redefining “Waters of the United States” ended 11/14/14. No prospective date for the final rule has been published.

Obama administration officials have proposed a plan under which the oil and gas industry would have to cut methane emissions by 40 to 45 percent below 2012 levels by 2025. U.S. EPA will issue new regulations this summer under the Clean Air Act, and a final rule could be in place in 2016. EPA's rulemaking will be done under Section 111(b) of the Clean Air Act, which allows regulation of new sources along the oil and gas supply chain. So the new regulations would apply to new and modified pieces of equipment only and would leave older pieces of equipment unregulated. In North Dakota the Clean Air Act is enforced by the Department of Health. Please monitor future Director's cuts for information on the status and how to comment on the proposed rule.

The USFWS has made a decision to list the Dakota Skipper and Poweshiek Skipperling to receive protection under the Endangered Species Act. Additional potential listing of concern are the Rufa Red Knot, Sprague's Pipit, Greater Sage Grouse, Monarch Butterfly, Sturgeon Chub, and Sicklefin Chub.