North Dakota Pipeline Miles

2,470 miles of new pipe in 2012

Roughly Distance from Los Angeles to New York City
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.

JJ Kringstad - North Dakota Pipeline Authority
Forecasting Challenges

Current Model
- Approx. 30,000 New Wells Out to Dec 2029
- Average EUR Roughly 400,000 BBLS
- Average First Month Production of 347 BOPD

Ongoing Considerations
- Increased Density Drilling
- Drilling Efficiencies
- Improving Completion Techniques
- Productivity of the Lower Three Forks
- Eastern Montana Success

Long Term Considerations
- EOR Opportunities
- Pricing
- Competition
- Additional Williston Basin Plays
Challenges*
1) Moving oil out of the Williston Basin
2) Moving oil within the Williston Basin

*Modified from Bridger and Belle Fourche Pipelines
North Dakota Crude Oil Pipelines

- 210,000 BOPD
- 145,000 BOPD
- 68,000 BOPD
- 40,000 BOPD
- 160,000 BOPD
Oil Loading Rail Facilities
Estimated Williston Basin Oil Transportation

- Estimated Pipeline Export: 30%
- Tesoro Refinery: 6%
- Truck to Canadian Pipelines: 6%
- Estimated Rail: 1%

April 2014
Estimated Williston Basin Oil Transportation

- Estimated Rail
- Estimated Pipeline Export
- Tesoro Refinery
- Truck to Canadian Pipelines
- Brent - WTI Spread (EIA)

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Estimated Williston Basin Oil Transportation

- Rail
- Pipelines (US & CAN)
- Tesoro Refinery
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.
Confirmed Pipeline Projects

Butte Loop
- In-service Date: Q3 2014
- 110,000 BOPD
- Service to Guernsey, WY

Hiland Double H
- In-service Date: Q4 2014
- 50,000 BOPD (Expandable up to 100,000 BOPD)
- Extended Open Season to April 16, 2014
- Service to Guernsey, WY

Plains Bakken North
- In-service Date: May 2014
- 40,000 BOPD (Expandable up to 70,000 BOPD)
- Movement North to Canadian Interconnect
Pipeline Projects In Business Development or Regulatory

North Dakota Pipeline Company Sandpiper
- Open Season Successful: 155,000 BOPD Committed
- 225,000 BOPD ND Capacity to Clearbrook, MN (24”)
- 375,000 BOPD Clearbrook, MN to Superior, WI (30”)
- In-service Date: Q1 2016

Enterprise Pipeline
- 200,000-250,000 BOPD
- Route: Stanley, ND to Cushing, OK 1,200 miles, 30”
- In-service Date: Q4 2016

TransCanada Keystone XL
- Up to 100,000 BOPD
- Timeline Uncertain

Energy Transfer Partners
- Binding Open Season Launched March 12, 2014
- Additional Project Details Unavailable
Challenges*
1) Moving oil out of the Williston Basin
2) Moving oil within the Williston Basin

*Modified from Bridger and Belle Fourche Pipelines
ND Oil Gathering

Red – Trucked
Blue – Pipeline

All ND Production

Sep 2013 Estimates
Some data incomplete or unavailable

Oil Gathering

%Piped (Sum)
%Trucked (Sum)

Oil Production

Produced (Sum)

3.738.00
8.350.326.00
US Refining Markets

EIA March 2014 Refiner Acquisition Cost

- PADD IV: $104.76
- PADD V: $88.81
- PADD II: $95.30
- PADD I: $104.97

- PADD III: $100.64
US Shale Plays and Refineries

Source: EIA Data

Source: EIA Data

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

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Rich Natural Gas

Raw Natural Gas (1500+ BTU) → Processing Plant

- Consumer Quality Dry Natural Gas
  - Methane
  - Ethane 41.64%
  - Propane 28.33%
  - Butane 16.53%
  - Natural Gasoline 13.51%

NGL’S (8-12 gpm) Y-Grade or Fractionated

*Using NGL breakdown from the July 2012 BENTEK Natural Gas Study*
North Dakota Natural Gas Production

Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.
Natural Gas Flaring Facts/Challenges

**Primary Challenges**
- Size of resource
- Young age of development
- Harsh winter conditions
- Resource potential still being explored

**Regulations**
- Flaring regulated by the ND Industrial Commission/Oil & Gas Division with existing penalties and incentives in place to reduce flaring
Solving the Flaring Challenge

- NDPA Case 1 Forecast*
- NDPA Case 2 Forecast*
- Actual Flared, MCFD
- Target Case 1 Volume

74% Q4-14
77% Q1-15
85% Q1-16
90-95% Q4-20
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

April 2014 Data – Non-Confidential Wells
Capturing the 10% Faster Well Connections

- New Wells Selling Gas
- New Producing Wells

Number of Wells Per Month

Date:
- 2/1/2005
- 7/1/2005
- 12/1/2005
- 5/1/2006
- 10/1/2006
- 3/1/2007
- 8/1/2007
- 1/1/2008
- 6/1/2008
- 11/1/2008
- 4/1/2009
- 9/1/2009
- 2/1/2010
- 7/1/2010
- 12/1/2010
- 5/1/2011
- 10/1/2011
- 3/1/2012
- 8/1/2012
- 1/1/2013
- 6/1/2013
- 11/1/2013
- 4/1/2014
Major Gas Projects in Development

WBI Energy – Dakota Pipeline
- 400-500 MMCFD
- 375 Miles, 24”
- Proposed In-service: 2017

Northern Border – Bakken Header
- 400 MMCFD
- 55 Miles, 20”
- Proposed In-service: Late 2016
Governor’s Pipeline Technology Working Group

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PHMSA  North Dakota® Public Service Commission

NORTH DAKOTA PETROLEUM COUNCIL

TRUE  ALIANCE pipeline  WBI ENERGY

NORTH DAKOTA OIL AND GAS DIVISION  NDSU NORTH DAKOTA STATE UNIVERSITY
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