ENERGY DEVELOPMENT AND TRANSMISSION COMMITTEE

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North Dakota Oil Differential

Based on EIA Data

North Dakota-WTI Differential
North Dakota-Brent Differential

Based on EIA Data
North Dakota Drilling Activity

Drilling Rigs & Spuds

Spuds Per Rig Per Month

- Spuds
- Drilling Rigs
- Spuds per Rig per Month

North Dakota Forecast Activity Assumptions

- **ND New Wells Case 1**
- **ND New Wells Case 2**

The chart shows the trend of ND New Wells Added Per Month from 2014 to 2022, with forecasts for the 2015-17, 2017-19, and 2019-21 bienniums.
North Dakota Oil Production Forecast

- ND Oil Case 1
- ND Oil Case 2

North Dakota Oil Production, BOPD

2,100,000
2,000,000
1,900,000
1,800,000
1,700,000
1,600,000
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000


NDPA Forecast

2015-17 Biennium
2017-19 Biennium
2019-21 Biennium
North Dakota Forecast Activity Assumptions

The graph illustrates the forecast activity of new wells added per month in North Dakota, with two cases indicated: ND New Wells Case 1 and ND New Wells Case 2. The NDPA Forecast is also shown, indicating a projected trend for these activities.
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.

220,000 BPD Upland Pipeline Dept. of State Review Paused (Request From Developer)

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NDPA ND Gas Production Forecast

![Graph showing natural gas production forecast from 2009 to 2035 with two cases: ND Gas Case 1 and ND Gas Case 2. The graph indicates a steady increase in production with a sharp rise starting in 2017.](image-url)
North Dakota Captured* NGL’s

*Non-flared NGL’s & Assumes 10 GPM
Major NGL Pipeline and Processing Infrastructure
Bakken Refracs
Refractions In the Bakken*

*While careful work was performed to discover as many non-confidential, modern refracs as possible, this data set is likely not all inclusive.
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Example: Pre/Post Refrac Oil
Example: Pre/Post Refrac Oil

BOPD

Production Month
Example: Pre/Post Refrac Oil
Example: Pre/Post Refrac Oil
Performance Pre/Post Refrac
Performance Pre/Post Refrac

- BILLINGS
- BURKE
- DIVIDE
- DUNN
- MCKENZIE
- MOUNTRAIL
- WILLIAMS

MCFD

Avg. Max Original Completion
Avg. Max Recompletion
Avg. Max Original Completion
Avg. Max Recompletion
Avg. Max Original Completion
Avg. Max Recompletion
Avg. Max Original Completion
Avg. Max Recompletion
Avg. Max Original Completion
Avg. Max Recompletion
Example: 209,000 BBLs of Incremental Production
Example: 257,000 BBLS of Incremental Production
Example: 253,000 BBLs of Incremental Production

- Incremental Production (Refrac)
- Original Decline
- Original Production

Production Month: 1, 10, 19, 28, 37, 46, 55, 64, 73, 82, 91, 100, 109, 118, 127, 136, 145, 154, 163, 172, 181, 190, 199
Refrac Candidates

• Refrac selection is based on a number of criteria, many of which are not available in the public domain
• Refracs have been performed with success on a wide range of well ages and performance
• Refracs are designed to address one or more reservoir level issues impacting well performance (e.g. scaling, embedment, proppant rearrangement, fines generation, etc)
• The following work is not intended to imply a well will be refraced, but rather that the wells fit a certain criteria that may make them a near term candidate for refrac.
Peak Month Minimum
200 BOPD

3,074 BKN Wells
Spud 2007-2011

Potential Near term
Refrac Candidates?
Proximity to High Performing Wells

2.5 Mile Historic Peak Month Buffer Zone

1,955 Wells Within the 800+ BOPD Buffer

Buffer Zone
- 1250
- 800
Incremental Production Above Original Well Decline Profile
Assumes Refrac Decline Curve Profile Matches Original Well
Refrac Summary of $40 Wellhead Oil
Refrac Breakeven Summary

Incremental Oil, BBL / Refrac Cost

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