North Dakota Department of Mineral Resources

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Bismarck, ND 58505-0840
(701) 328-8020   (701) 328-8000

http://www.oilgas.nd.gov   http://www.state.nd.us/ndgs
Development area
> 15,000 sq mi
Size of West Virginia
2,400 wells = 90MW
Geologic Structure Map
Subsea Structure on Top Spearfish (10' contour interval)

Corinthian Leasehold within requested 320 Acre Drilling Units
- Up to 12 horizontals in the Spearfish zone per Drilling Unit

Reference Well Log
Trend Moen Trust Permit #11548

350-375 wells 2013-2020
Western North Dakota

- 1,100 to 2,700 wells/year = 2,000 expected
  - 185 rigs = 22,000 temporary drilling jobs
  - Another 13,000 temporary jobs building infrastructure
  - 2,000-3,000 permanent jobs added each year

- 185 rigs will complete the first phase of drilling in 6-12 months
- 185 rigs will require about 20 years to complete phase 2 drilling

- 2,000 new wells per year requires 11-22 million gallons of frac water per day
- 40,000-45,000 new wells = 40,000-70,000 long term jobs
  17-28 million gallons per day maintenance water
The North Dakota Challenges
New Bakken Well – Truckload Timeline

- Fracturing Phase – 834 loads total (15 day average)
- Drilling Preparation – 75 loads (3 days total)
- Drilling Phase – 167 loads total (19 day average)
- Location & Production Prep (71 loads) from Permit Issued Day 0 (time can vary – used 30 days)
- Rig down – 50 loads (2 days total)
- Production Phase
  - 3 trucks/day = Year 1
  - 1 truck/day = Year 2
  - Drops to 0 if pipelined = Year 4 (Day 1636), otherwise 3 trucks/day = Year 2
- Production Equipment Move
  - (14 loads over 130 days)
  - Pit Reclamation (6 loads over 76 days)
  - (30-35 loads – emptying water, drilling fluid over 7-14 days, used 10 day average)

Wait for Frack (90-120 days)

Total: 2,000 year 1

Bakken Wells 2-4 – Truckload Timeline

- Fracturing Phase – (250 less loads)
- 454 tank loads + 130 trucks per well = 584 loads (15 day average)
- Could be 0 with fresh and salt water pipelines

- Drilling Preparation = 25 loads (3 days total)
- Drilling Phase = 167 loads total (19 day average)
- Location & Production Prep Completed with first well. No additional trucks
- Rig down = 6 loads (2 days total)
- Wait for Frack (90-120 days)

Production Phase
- Production Equipment Move
  - (14 loads over 130 days)
  - Pit Reclamation (6 loads over 76 days)
  - (30-35 loads – emptying water, drilling fluid over 7-14 days, used 10 day average)

Total: 837 could be 250 with pipelines
Capturing the 15%
Faster Well Connections

First Time Gas Sales Per Month
Expected Case

North Dakota Oil Industry Jobs


Jobs:
- Prod jobs
- Gathering jobs
- Fracing jobs
- Drilling jobs
Western North Dakota Jobs

• 1,100 to 2,700 wells/year = 2,000 expected
  – 185 rigs = 22,000 temporary drilling jobs
  – Another 13,000 temporary jobs building infrastructure
  – 2,000-3,000 permanent jobs added each year

  – Year end 2012 jobs = 38,500
    • 7,300 permanent production
    • 22,000 temporary drilling
    • 6,800 temporary completion
    • 2,400 temporary construction
### Western North Dakota Housing

#### District Field Office Housing Survey 1-Mar-13

<table>
<thead>
<tr>
<th></th>
<th>Dickinson</th>
<th>Williston</th>
<th>Minot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
<td>2012</td>
<td>current</td>
</tr>
<tr>
<td>Housing Cost</td>
<td>$75,000.00</td>
<td>$150,000.00</td>
<td>$150,000.00</td>
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<tr>
<td>New Construction</td>
<td>$170,000.00</td>
<td>$177,000.00</td>
<td>$222,000.00</td>
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<tr>
<td>Apt Rental</td>
<td>$600/mo</td>
<td>$3000/mo</td>
<td>$2400/mo</td>
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<tr>
<td>Hotel rates</td>
<td>$69/night</td>
<td>$189/night</td>
<td>$165/night Govt rate rarely available</td>
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</tbody>
</table>

If recent trends in housing construction continue, the state’s overall housing stock will expand by only 16 percent (51,292 units) from 2010 to 2025. Housing supply forecasts for the same time period based on population change show an increase in the state’s overall housing stock of 29 percent (90,469 units); this number is higher than the projected increase in demand for housing (83,429 units) because supply modeling incorporates vacancies.

MINOT – The successful completion of the first phase of Washington Townhomes was celebrated today in conjunction with the groundbreaking for another 32 affordable housing units. “The dedication and groundbreaking of Washington Townhomes is a significant milestone in Minot’s efforts to recover and grow in the aftermath of the historic 2011 flood event,” said Gov. Jack Dalrymple, who attended today’s ceremony. “A strong partnership between the public and private sectors helped make this project a reality for the community. More than $3.4 million in state funding, including $750,000 from the governor’s discretionary fund, was provided for this project to help bring additional affordable housing opportunities to Minot and the region.”

Successful Affordable Townhomes Project Will Be Repeated
A three-person household that earns $35,000 or less would be income qualified to rent one of the townhomes with two-bedroom units renting for $650 per month and three-bedroom units for $795.
Western North Dakota Water

• 1,100 to 2,700 wells/year = 2,000 expected

  – 185 rigs will complete the first phase of drilling in 6-12 months
  – 185 rigs will require about 20 years to complete phase 2 drilling

  – 2,000 new wells per year requires 11-22 million gallons of frac water per day

  – 40,000-45,000 new wells = 17-28 million gallons per day maintenance water
# Western North Dakota Power

## Electrical Demand - All Regions

![Electrical Demand Graph](image)

**Figure 10: Electrical Demand - All Regions**
*Source: KLJ*

### Forecasted Electrical Loads - All Regions

<table>
<thead>
<tr>
<th>Demand (MW)</th>
<th>2012</th>
<th>2017</th>
<th>2022</th>
<th>2027</th>
<th>2032</th>
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</thead>
<tbody>
<tr>
<td>Region 1</td>
<td>701</td>
<td>1,256</td>
<td>1,599</td>
<td>1,828</td>
<td>1,998</td>
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<tr>
<td>Region 2</td>
<td>404</td>
<td>838</td>
<td>1,139</td>
<td>1,348</td>
<td>1,495</td>
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<tr>
<td>Region 3</td>
<td>104</td>
<td>195</td>
<td>210</td>
<td>218</td>
<td>228</td>
</tr>
<tr>
<td>Total Demand</td>
<td>1,209</td>
<td>2,288</td>
<td>2,948</td>
<td>3,395</td>
<td>3,721</td>
</tr>
</tbody>
</table>

### Energy (MWh)

| Region 1    | 3,977,246 | 7,945,361 | 10,387,903 | 12,058,128 | 13,217,653 |
| Region 2    | 2,476,678  | 5,677,350  | 7,887,167  | 9,445,752  | 10,489,326  |
| Region 3    | 600,749    | 1,272,543  | 1,356,960  | 1,404,199  | 1,449,922   |
| Total Energy| 7,054,673  | 14,895,254 | 19,632,031 | 22,908,079 | 25,156,901  |

**Table 3: Forecasted Electrical Loads - All Regions**
*Source: KLJ*
County by County Outlook