Connecting Local Businesses to the Shale Gas Supply Chain
Jim Ladlee, Penn State Marcellus Center (MCOR) & Shale Training and Education Center (ShaleTEC)

Opportunity & Perspective

Ladlee, 2012
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Fitting the Oil/Gas Patch

• Know the high priority occupations (HPO’s)
• Be ready
  – Strong work ethic
  – Problem solver
  – Basic knowledge of natural gas production
  – Pass a drug test
• Network (high contact)
• Patience and perseverance (polite persistence)
• Get ready
  – Have a plan
  – Take your safety training

The Timeline

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Pennsylvania Highlands Community College
November 20, 2012

Workforce & Economic Development

Historical Pennsylvania July Rig Count

Current Rig Count November 9, 2012

Sources: Baker-Hughes Investor Relations (November 9, 2012)

Rig Count by County Pennsylvania (68 Rigs)

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Jim Ladlee
jladlee@psu.edu
(814) 470-3459
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Rig Count by County
Ohio (25 Rigs)

Rig Count by County
West Virginia (27 Rigs)
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Pennsylvania Rig Locations
January 13, 2012
142 Rigs
Source: Rig Data

Pennsylvania Rig Locations
November 9, 2012
80 Rigs
Source: Rig Data

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jladlee@psu.edu
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Workforce & Economic Development

Size of workforce will depend on number of wells drilled each year.

More wells drilled per year

No change in wells drilled per year

Less wells drilled per year

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Natural Gas Price (July) 2002-2012

Sources: Energy Information Administration

Working Natural Gas in Underground Storage

Source: Energy Information Administration (November 12, 2012)

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Development Patterns

- E&P vs. subcontractor
- Hot spot vs. overall
- Development type
  - Appalachian Basin
  - Regional offices/centers
  - Field offices
  - Field location
- Pace
  - Price
  - Inventory
  - Production
  - Utilization
- Federal/State Policy

Source: PA Marcellus Shale Workforce Needs Assessment http://www.msetc.org/
**Employment (2009Q1 to 2012Q1)**

- Core industries up 19,100 (+177.5%).
- Ancillary industries up 13,700 (+7.2%).
- All industries up 43,300 (+0.8%).
- 2012Q1 Marcellus Shale related industries total employment was 234,000.

**Establishments (2009Q1 to 2012Q1)**

- 1,165 establishments added
  - 408 core, 757 ancillary
    - Core 65.0% growth
    - Ancillary 6.2% growth
    - All PA Industries 4.0% growth
- 13,065 Shale establishments in 2012Q1
PA Wages (2011Q2 through 2012Q1)

- Average across all industries $47,861
- Average in core industries $83,065
- Average for ancillary industries $64,799

Ancillary Industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>2009Q1</th>
<th>2012Q1</th>
<th>Actual Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialized Freight Trucking</td>
<td>1,042</td>
<td>9,336</td>
<td>1,286</td>
<td>12,983</td>
</tr>
<tr>
<td>General Freight Trucking</td>
<td>1,206</td>
<td>8,085</td>
<td>1,409</td>
<td>10,513</td>
</tr>
<tr>
<td>Testing Laboratories</td>
<td>394</td>
<td>7,224</td>
<td>403</td>
<td>8,774</td>
</tr>
<tr>
<td>Highway, Street, &amp; Bridge Const.</td>
<td>532</td>
<td>17,591</td>
<td>535</td>
<td>19,090</td>
</tr>
<tr>
<td>Engineering Services</td>
<td>2,462</td>
<td>41,691</td>
<td>2,588</td>
<td>42,999</td>
</tr>
<tr>
<td>Const., Mine, &amp; Forest Equip Rent</td>
<td>115</td>
<td>2,202</td>
<td>164</td>
<td>3,382</td>
</tr>
<tr>
<td>Geophysical Survey &amp; Map Srvs</td>
<td>55</td>
<td>237</td>
<td>59</td>
<td>344</td>
</tr>
<tr>
<td>Oil &amp; Gas Machine &amp; Equip Mfg</td>
<td>8</td>
<td>338</td>
<td>10</td>
<td>427</td>
</tr>
</tbody>
</table>
Biggest Challenge Finding Workers

- Willing to work hours: 54%
- Good work history: 36%
- Clean criminal background: 22%
- Free from drugs: 25%
- Experience needed: 71%
- Technical skill needed: 63%
- Proper degree/certification: 45%
- Proper interpersonal skills: 24%


Business Impacts Hotel Tax

<table>
<thead>
<tr>
<th>County</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bradford</td>
<td>$171,903</td>
<td>$222,524</td>
<td>$411,521</td>
<td>$674,083</td>
</tr>
<tr>
<td>Lycoming</td>
<td>$465,690</td>
<td>$525,702</td>
<td>$242,000</td>
<td>$345,411</td>
</tr>
<tr>
<td>Tioga</td>
<td>$213,083</td>
<td>$193,882</td>
<td>$450,032</td>
<td>$450,032</td>
</tr>
</tbody>
</table>

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Utilization

Transportation
- Compressed Natural Gas (CNG)
- Liquefied Natural Gas (LNG)
- Gas to Liquids (GTL)
- Co-fueling
  - Diesel/Natural Gas
  - Electric/Natural Gas

Manufacturing
- Strong energy users
  - Paper
  - Steel
  - Plastics
  - Glass
  - Agriculture

Power Generation
- Combined Heat and Power
- Coal Conversion
- Peaking Power

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Thank You

Questions Contact:
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