Status and Trends in Oil and Gas of Eastern Kentucky

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Shale Gas, Oil, and Fracking Workshop (NARO)
Pikeville, Kentucky, 4-Jun-2013
“Arise storms
North winds blow, south winds blow
Typhoons, hurricanes, earthquakes, smog
Flash lightning strike the rabbit
What have I done?? I've killed the rabbit....”

Note: copyrighted background image from Merrie Melodies cartoon cited below was removed for posting presentation on web.

What’s Opera Doc, Merrie Melodies, 1957
Kentucky Shale Wells

- First wells* – 1858
- ≥ 15,000 wells
- ≥ 5 trillion cubic feet
- \( N_2 \) frac

* Wells were drilled for brine and co-produced shale gas was used as fuel
Kentucky Oil Production Rising

2012: 3.2 MMbo

Highest since 1996 at 3.4 MMbo
Oil Production, 2012

3.2 MMbo

- Oil producing county
- Top 5
- Largest decrease

36.0%
11.3%
52.7%

? – Production reported, but no known producing wells
Natural Gas Production, 2012

278.5 Bcf

Gas producing county

Top 5

Largest decrease

0.1%
0.4%
99.5%

? – Production reported, but no known producing wells
Statewide Permits Issued
East Kentucky Permits Issued

Average >90% of Proposed horizontal wells
Horizontal Wells Permitted 2012 to Date

1 to 5: 26 permits issued
6 to 10: 25 permits issued
11 or more: 26 permits issued

Total permits issued: 85
Horizontal Well Targets, 2000 to Date

- Lower Huron: 752 permits issued
- Cleveland: 293 permits issued
- Berea: 186 permits issued
- New Albany: 41 permits issued

Permits issued
Pike County Gas Production

- **State**
- **Pike**
- **Horizontal**

Horizontal wells permitted

Billion Cubic Feet

Years:
- 2000
- 2002
- 2004
- 2006
- 2008
- 2010
- 2012

Billion Cubic Feet:
- 0
- 50
- 100
- 150
- 200
- 250
- 300
- 350
- 400
- 450

Horizontal wells permitted:
- 0
- 2000
- 4000
Floyd County – Game Changer

Billion Cubic Feet

State
Pike
Floyd
Horizontal

Horizontal wells permitted

0 50 100 150 200 250 300 350 400 450
Kentucky Top 10 Producing Counties

Million Barrels of Oil Equivalent

0 50 100 150

FLOYD  PIKE  KNOTT  LETCHER  PERRY  MARTIN  LESLIE  HARLAN  CLAY  KNOX

2000 to 2012 data
Permits Issued & Gas Wells Completed

2000 to 2013 data

FLOYD
PIKE
KNOTT
LESTER
PERRY
MARTIN
LESLIE
HARLAN
CLAY
KNOX

Gas Wells
Permitted

KNOX
CLAY
HARLAN
LESLIE
MARTIN
PERRY
LETCHER
FLOYD
PIKE
Horizontal Wells

2000 to 2013 data
Performance of Shale Wells

Drilled since 2000 with reported production data
Big Sandy Pipeline connects Langley to Tennessee Gas Pipeline System.

- Big Sandy
  - Berea and Huron shale
  - In service in 2008

- Langley
  - 160 MMcf/d cryogenic
  - 75 MMcf/d refrigeration
MarkWest Gas Processing

- The Ranger NGL pipeline connects Langley to fractionation, shipping, and storage at South Shore, Greenup County.

Pipeline data from U.S. EIA state energy profiles: [www.eia.gov/state/]
Berea Oil Production

Barrels of Oil

Thousands

Nitrogen and slickwater fracks
OTHER TRENDS AND ACTIVITIES
Bluegrass Liquids Pipeline

- Williams & Boardwalk Pipeline Partners (JV)
- 200,000 bbl/d
- In service late 2015

Pipeline data from U.S. EIA state energy profiles: www.eia.gov/state/
CNG Vehicles

- RAM 2500 HD CNG
- Ford F-150, Westport, Louisville, Ky
- Honda Civic CNG

Oct-2012: 22 states fleet procurement deal
House Bill 212, 2013

• AN ACT relating to clean and alternative transportation fuels
  – CNG, LNG, LPG
  – Synthetic fuels
    • Coal to liquids
    • Coal gasification

• Signed by Governor Beshear, 4-April-2013
Opportunity for Growth: 3 Public CNG Fill Stations

Prices in $/gge
*November, 2012

$2.49*
$2.39*
$1.80

Somerset
Distributed Generation

Standalone power generation or on-demand conditioning of remote legs on power grid.
Somerset Refinery

- Capacity 5,000 to 5,500 bo/d
- Refining 1,200 to 1,500 bo/d
- Possible liquids market?
Eastern Kentucky Summary

• More horizontal wells
• Oil production likely on rise
  – Berea, Weir, and other shallow oil plays
• Gas drilling and production steady to declining (controlled by price)
• CNG and LNG opportunities
• Natural gas liquids?
  – Bluegrass pipeline
• Natural gas for electricity generation
Thanks. Questions?

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