Marathon’s Participation in the EPA Natural Gas STAR Program

April 29, 2008

Agenda

• The GHG Challenge
• Participation in the EPA Natural Gas STAR Program
  – Domestic
  – International
• Activities in Colorado
The GHG Challenge

- Reduce GHG impact through improved energy efficiency and methane capture
- Highlight best industry practices and affordable technologies
- Participate in the EPA Natural Gas STAR Program and the World Bank Global Gas Flaring Reduction program

The GHG Challenge

- Individual business units develop a GHG reduction plan
  - Highlight effectiveness in both savings and GHG reductions
- Use EPA Natural Gas STAR Lessons Learned and Fact Sheets for ideas and comparisons
- Marathon is implementing 6 of the top 10 technologies and practices employed in the production sector.
Marathon and the Natural Gas STAR Program

- Became a Natural Gas STAR Partner in 1994
- Became an International Gas STAR Partner in 2006
  - Equatorial Guinea
  - United Kingdom
  - Ireland
- Founding member of U.S. and international programs
- Production Partner of the Year in 1997 and 2006

Marathon’s Natural Gas STAR Results

- Approximately 2 BCF of new reductions in 2005-2006

![Graph showing natural gas reductions from 1990 to 2006](image-url)
Marathon’s Natural Gas STAR Results

- Cumulative 1994-2006 reductions of 48.8 Bcf
- Equivalent to savings of $29,000,000 (assuming $6/mscf)
- Reduction of over 19 million tonnes of CO2 eq emissions

Marathon’s Natural Gas STAR Results

1994-2006 CH₄ "Reductions"

- Install VRUs: 36%
- Replace high-bleed pneumatics: 28%
- Install flares: 14%
- Install plunger lifts: 9%
- Other: 13%
Technologies Under Consideration

- **Heaters**
  - Automatic Secondary Air Control (ASAC)
  - Turbulators

- **Compressors**
  - Install Electric Compressors

- **Pneumatic Controllers**
  - Gas Pneumatic Control Conversion to Instrument Air
  - High Bleed Gas Pneumatics Conversion to Low Bleed Gas Pneumatics

- **Fugitive Emissions**
  - Optical Imaging of Fugitive Emissions
  - Reciprocating Compressor Seals

- **Flash Losses**
  - Optimizing Operating Pressures
  - Vapor Recovery

- **Wells**
  - Green Completions
  - Velocity Strings and Plunge Lifts

- **Chemical Pumps**
  - Conversion of Gas Operated Chemical Pumps to air

2007 Natural Gas STAR Projects

New Methane Reductions ~ 0.8 BCF
International Practices

- Offshore production in Equatorial Guinea, Ireland, and United Kingdom

- Projects include
  - Flaring reduction
  - Process improvements
  - Compressor seal maintenance
  - Leak detection and repair programs

- Estimated reduction of ~2.0 BCF from 2005 - 2007

Activities in Colorado

- Marathon is currently developing assets in the Piceance Basin
- 8,700 acres in Garfield County
- Expect 700 wells in the next 10 years
- Production commenced in late 2007
Technologies Used in Colorado

- Ability to implement Natural Gas STAR technologies from the initial field development

- All new wells feature:
  - Green completions
  - Low-bleed pneumatic devices
  - Plunger lift systems

- In addition, implement IR leak detection and repair programs for the entire field life

Estimated Reductions in Colorado

- Estimate total savings of ~1,500 mscf per year per well

- Total savings of ~23,000 mscf per well over a 10-year period

- Over a 10-year period, save $160,000 and 9,300 tonnes CO2e per well
Questions?

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