

# Economic Best Management Practices for Small and Medium Sized Producers

Lessons Learned  
from Natural Gas STAR



Small and Medium Sized Producer Technology Transfer Workshop

Bill Barrett Corporation, Evergreen Resources Inc,  
Southern Gas Association and  
EPA's Natural Gas STAR Program

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# Economic BMPs: Agenda

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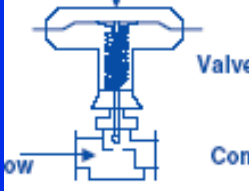
- What is the problem?
- BMP I: Identify and replace high-bleed pneumatic devices
- BMP II: Install flash tank separator on dehydrators
- BMP III: Additional profitable BMPs that reduce methane emissions
- Discussion questions



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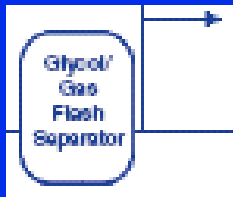
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# What is the Problem?



## □ Pneumatic devices

- ◆ 250 thousand gas pneumatic controllers in production sector
- ◆ Release gas to atmosphere by design
- ◆ Production operations emit 31 Bcf/yr



## □ Glycol dehydrators

- ◆ 38 thousand dehydrators in the gas industry
- ◆ Remove moisture from gas but also absorb methane, VOCs and HAPs
- ◆ Vent absorbed methane, VOCs and HAPs to atmosphere

## □ Other opportunities

- ◆ Stock tank venting, well venting, compressors, fugitives
- ◆ Releases of gas to atmosphere by design or unintentionally



# Solution: Implement BMPs

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- Best Management Practices (BMPs) posted on Gas STAR website
  - ◆ [www.epa.gov/gasstar](http://www.epa.gov/gasstar)
  - ◆ Program overview
  - ◆ Technical Support Documents: Lessons Learned
- Replacing high-bleed pneumatics
  - ◆ Saves gas for sale instead of venting
- Flash tank installation
  - ◆ Recovers all methane bypassed and most methane absorbed by glycol
- Partner Reported Opportunities (PROs)
  - ◆ Technical Support Documents



# BMP I for Pneumatic Devices

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## Replace High-Bleed Devices with Low-Bleed Devices



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# Replacing with Low-Bleed Benefits

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- Up to 80% of high-bleed devices can be replaced or retrofitted with low-bleed equipment
- Every low-bleed replacement/retrofit gives gas savings from \$135 to \$780 or more per year
  - ◆ Implementation cost often recovered in less than a year
  - ◆ Replacement/retrofit can provide better system-wide performance, reliability and monitoring



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# BMP II for Glycol Dehydrators

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## Install Flash Tank Separator (FTS)



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# Glycol Dehydrator Methane Emissions

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- While glycol removes moisture from gas, glycol also absorbs methane, VOCs and HAPs
- Dehydrators vent absorbed methane, VOCs and HAPs to the atmosphere, which wastes gas, costs money and contributes to air quality problems

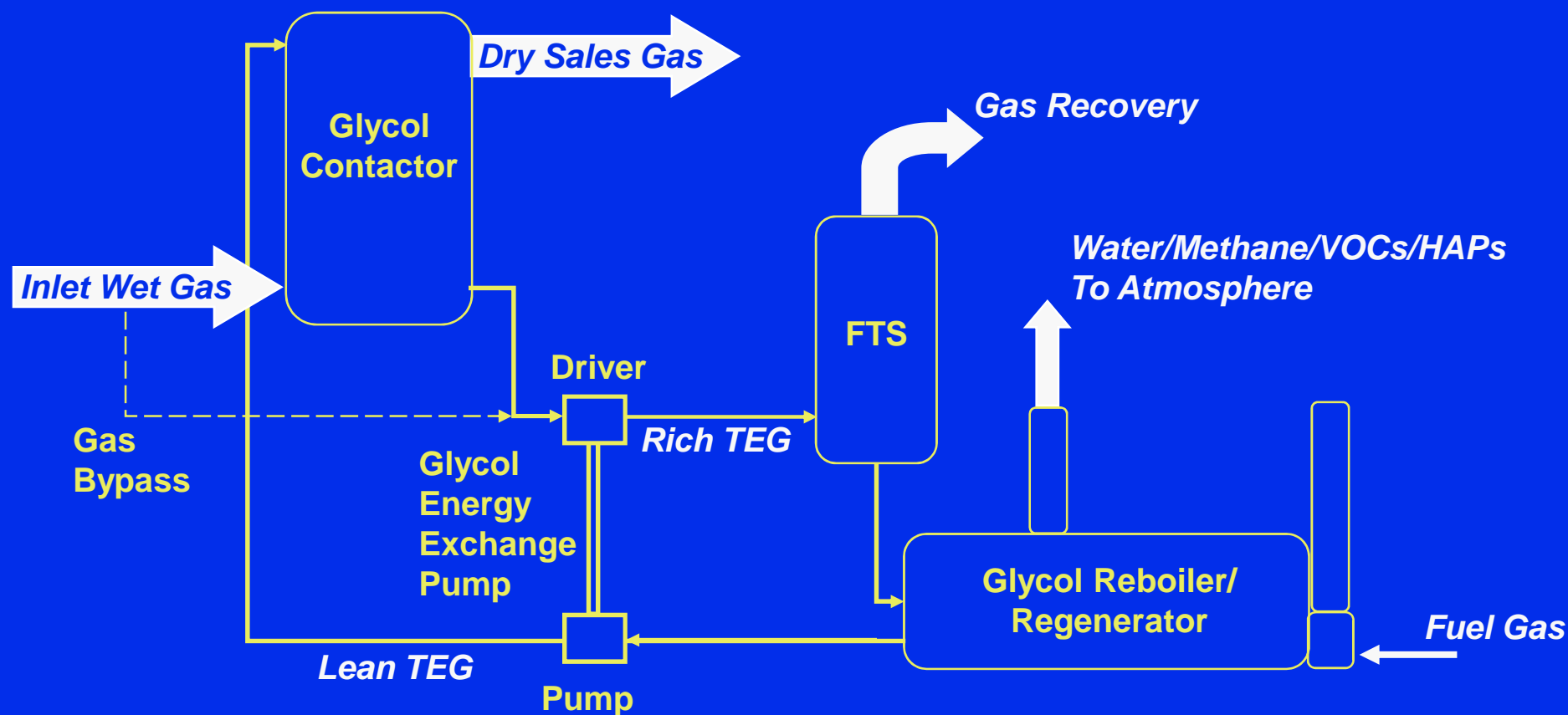


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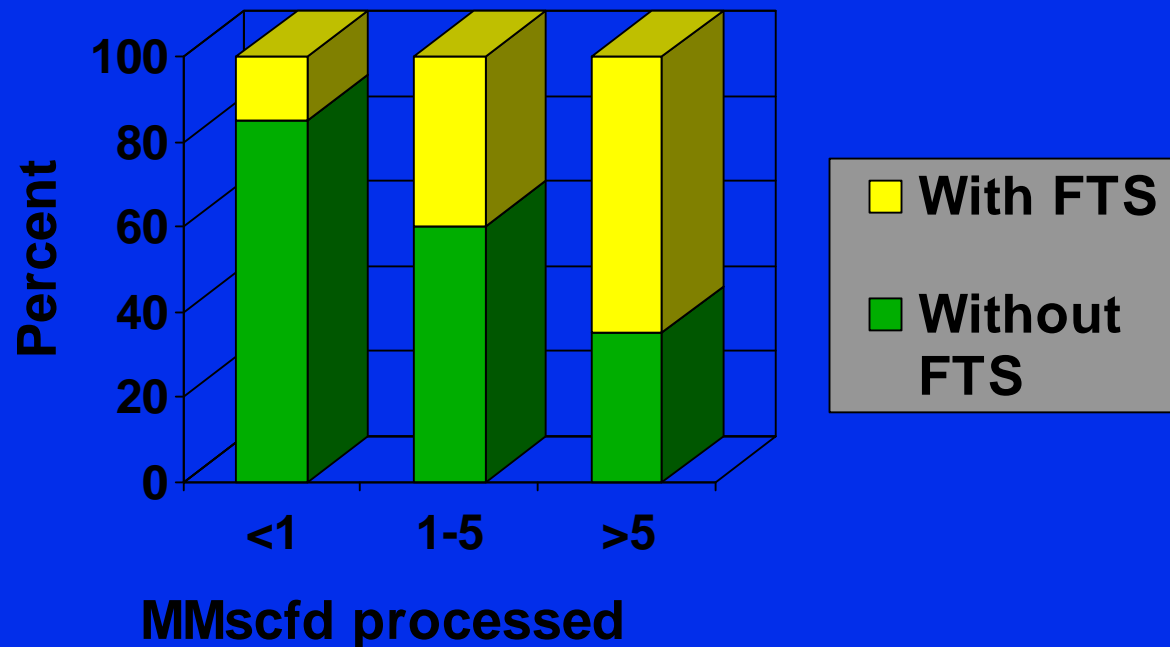
# Glycol Dehydrator Methane Emissions



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# Installing Flash Tank Separator

- Flashed methane can be captured using an FTS
- Many units are not using an FTS



# How Can Glycol Dehydrator Emissions Be Minimized?

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- Flash tank installation
  - ◆ Recovers all methane bypassed and most methane absorbed by glycol
- Optimized glycol circulation rates
  - ◆ Methane emissions are directly proportional to glycol circulation rate
- Electric pump installation
  - ◆ Eliminates need to bypass gas for motive force
  - ◆ Twice as much gas bypassed as absorbed
  - ◆ Eliminates lean glycol contamination by rich glycol



# Installing Flash Tank Benefits

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- ❑ Most dehydrators send the glycol/gas mixture from pump driver to regenerator
- ❑ An FTS, operating at fuel gas system or compressor suction pressure, recovers ~90% of methane and 10 to 40% of VOCs
- ❑ Low capital cost; short payback period

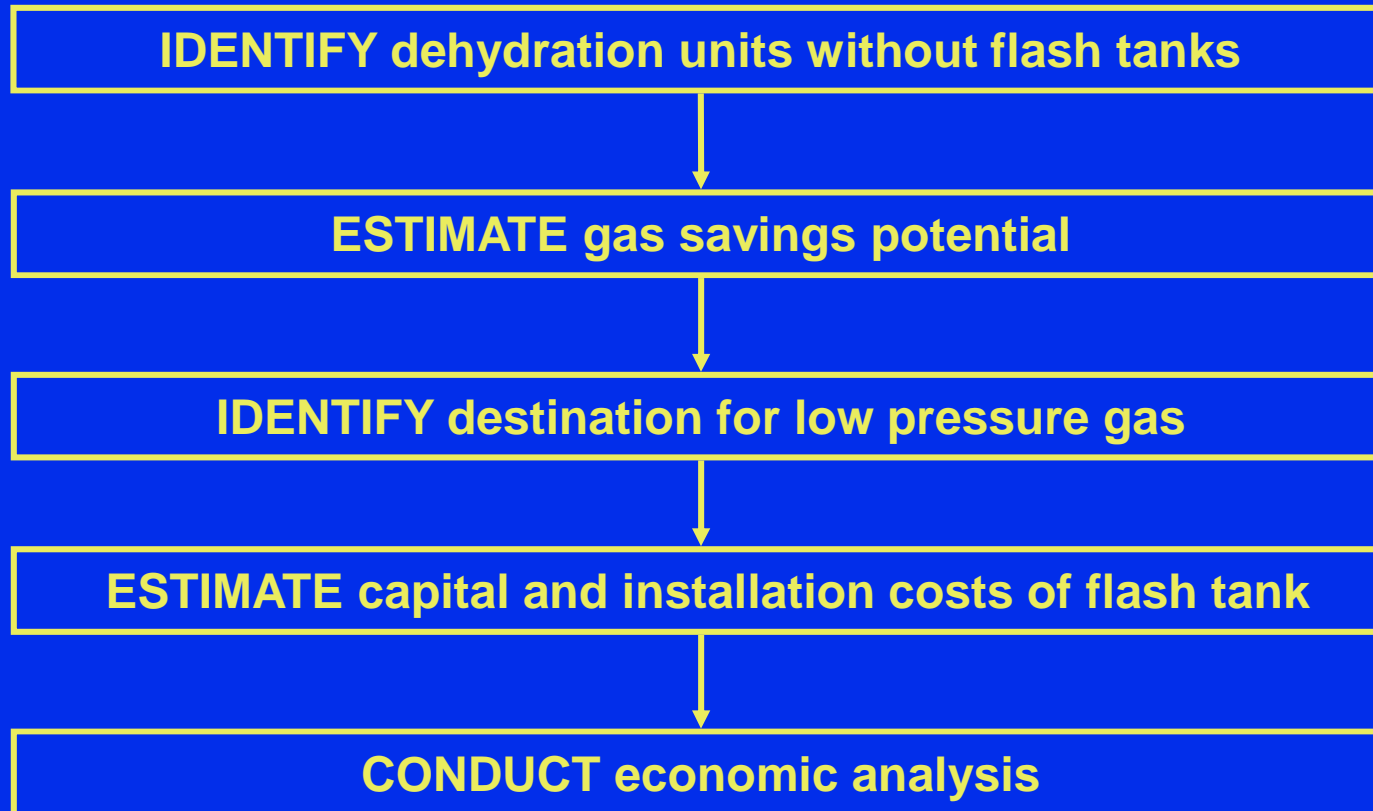


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# Installing Flash Tank Decision Process

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# Flash Tank Economics

Option	Capital Costs	Annual O&M Costs	Emissions Savings	Payback Period
Install Flash Tank	\$5,000 - \$14,000	Negligible	236 – 7,098 Mcf/yr	5 months – 17 months



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# Partner Experiences

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- Shell Exploration and Production Company installed flash tank separators on 106 dehydrators over an 8-year period
  - ◆ Estimated methane emissions reduction of 216 MMcf/yr
  - ◆ Estimated savings of \$650,000
  - ◆ Capital and installation costs of \$15 to \$30 thousand per dehydrator
  - ◆ 3-year payback period



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# BMP III

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## Partner Reported Opportunities



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# BMP III: PROs

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- Many production facilities have identified practical, cost-effective methane emissions reduction practices
- Production partners report saving 187 Bcf since 1990, 80% from PROs
- PRO Fact Sheets from Annual Reports 1994-2002
- 38 PROs applicable to production
  - ◆ 56 total PROs



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# Discussion Questions

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- ❑ To what extent are you implementing these BMPs?
- ❑ What are the barriers (technological, economic, lack of information, regulatory, etc.) that are preventing you from fully implementing these BMPs?
- ❑ What PROs have you identified in your operations?



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