

EPA Stakeholder Workshop
GHG Data on Petroleum and Natural
Gas Systems
19 November 2015
Pittsburgh, PA



Observations on Select Emission Factors for Onshore Production

Outline

- Production Segment – Pneumatic Controllers
- Production Segment – Liquids Unloading

Goals of Presentation

- I. Provide a limited comparison of CH₄ emission factors derived from data reported to the Greenhouse Gas Reporting Program (GHGRP) to those used for the national GHG Inventory (GHGI)

- II. Propose approaches to enhance utilization of GHGRP based information in order to improve the derivation of national CH₄ emissions from natural gas systems



Natural Gas Production Segment

Pneumatic Controllers

Production Sector – Pneumatic Controllers

2013 National GHGI	Methane emissions, tonnes CH ₄ , net	# Pneumatic Controllers
Natural Gas Systems	538,602	459,304
Petroleum Systems	220,600	452,169
TOTAL	759,202	911,473

GHGRP Data	Methane emissions, tonnes CH ₄	# Pneumatic Controllers
2013 (9/30/14)	974,200	Not available
2013 (11/4/15)	1,002,025	686,029
2014 (11/4/15)	1,002,599	785,113

Pneumatic Controllers – Default Emission Factors

	GHGI Emission Factors	GHGRP Emission Factors
All pneumatics	167.3 scfd/device*	
High Bleed	330 scfd/device**	895.2 scfd/device (37.3 scfh/device)
Low Bleed	52 scfd/device**	33.4 scfd/device (1.39 scfh/device)
Intermittent Bleed	NA	324 scfd/device (13.5 scfh/device)

* Average regional emission factor used for Natural Gas Systems in the GHGI

** GHGI has separate emission factors for high bleed and low bleed pneumatics for Petroleum Systems

Conclusions for Pneumatic Controllers

- Counts of controllers are higher in the GHGRP than GHGI
- Both programs use outdated emission factors
- Corrections to emission factors should offset the increase in activity data



Natural Gas Production Segment

Gas Well Venting for Liquids Unloading

Gas Well Venting for Liquids Unloading

- EPA revised the emission factors used in the GHGI for deriving national emissions based on findings from the API/ANGA study
- Under the GHGRP companies report emissions data based either on engineering estimate or on the basis of representative measurements
- An initial comparison shown in the table that follows is based on detailed analysis of 2012 data

Comparison of 2012 Emission Factors

- GHGRP data may overstate emissions, so careful assessment of potential outliers is required
 - Outlying data may be detected when erroneous CO₂/CH₄ ratios are reported

	Gas Wells with Plunger Lifts, scf CH ₄ /well	Gas Wells without Plunger Lifts, scf CH ₄ /well
API/ANGA Study	272,130	239,590
2012 GHGI	246,215	215,209
2012 GHGRP Data (9/30/14)	320,731	152,112
2012 GHGRP Data (9/30/14) outliers removed	184,538	152,112

Plunger lifts are a tool to manage wellbore liquids not an emissions control device

Conclusions for Liquids Unloading

- More detailed information is available for 2014 data
 - Allows further analysis of emissions characteristics for this source
 - GHGRP 2014 data also includes corrections to previous year data
- Data released 11/4/15 need further analysis
 - Contains data points with CO₂ emissions > CH₄
 - Inconsistencies in values reported for
 - # wells vented for liquids unloading
 - # unloadings vented
 - # plunger lifts
 - Further QA/QC needed?

General Recommendations for Pneumatics and Liquids Unloading

- Data from GHGRP provide a better basis for emission estimates than the GHGI EF approach
- A thorough examination of available GHGRP data is needed to update data for the GHGI that is at times decades old
- Emerging research may provide new emission data and independent evaluations of assumptions made for many key GHG sources

Thank you for your attention

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