EPA Oil and Gas Emissions Estimation Tool Improvements for 2014

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EPA Oil and Gas Emission Estimation Tool

• Access-based emissions estimation calculator
  – County-level activity data
  – County-level process characterization data
  – Emission factors
  – Generates county-level emission estimates by SCC
  – EIS export to National Emission Inventory (NEI)

• State application
  – Portable
  – User-defined inputs

• EPA application
  – Gapfill NEI where no state data available
Tool/NEI Evolution

- **2008 NEI**
  - State-provided data for 8 states
  - No EPA gap-filling

- **2011 Tool Development**
  - Tool developed based on CenSARA and TCEQ Methodologies
  - County-level activity and emissions compiled for entire US

- **2011 Tool Improvements**
  - Restructured to allow factors at the county level (previously basin-level)
  - User inputs (activity data, basin factors)
  - U.S. EPA GHGRP and GHG EI Updates
  - U.S. EPA gas composition updates (rulemaking)
2014 Improvements

• Tool structural updates
• Updated activity analysis
• State activity/factor updates
• Gas composition updates
• Emission factor updates
• GHGRP Subpart W updates
Tool Structural Updates

• 2011 user interface
Tool Structural Updates (cont.)

- 2014 user interface
Tool Structural Updates (cont.)

- Excel Export/Import Routines

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Step 2 – The User can edit the yellow-shaded cells.
Tool Structural Updates (cont.)

• Re-coding of Tool to resolve emission factors at the state/basin/attainment level
• Inclusion of a change log to document changes to the Tool
• Inclusion of 2011 legacy data
• Synchronization of hydraulic fracturing and unconventional well completion activity
Updated Activity Analysis

• Conventional/Unconventional Activity
  - Developed for DrillingInfo-derived data
  - Updated Tool data tables
  - Not currently utilized in calculations

• 100 MCF/BBL used to distinguish gas/oil wells
  - Consistent with EPA GHG EI
  - Consistent with EPA Regulatory initiatives
  - Consistent with State application (TX, PA, WY)
  - Caused shift from gas to oil (condensate to crude oil)
2014 State Activity/Factor Updates

• State activity data updates provided
  - KS, MI, OH, TN, TX, WV

• Basin factor updates
  - WV
  - TX (also applied to NM Permian Basin counties)
  - AK (closed liquids collection system)
  - NM
Gas Composition Updates

- Kansas
- WRAP
  - Uinta Basin
- EPA SPECIATE data
  - CA, CO, MT, NE, NM, SD, TX, UT, WY
- BOEM Study
  - Alaska’s North Slope
Emission Factor Updates

- **NOx emission factor for heaters**
  - Based on CARB report
- **VOC emission factor for flares**
  - AP-42 Section 13.5 update (April, 2015)
- **Unconventional oil well completion**
  - Developed based on NSPS OOOOa development
- **Carbon tetrachloride EF removed**
  - (compressor engines, artificial lift)
    - Based on non-detect values
GHGRP Subpart W Updates

• Expanded reporting requirements
  - Evolving program year-over-year

• November, 2015 Updates (2014 RY)
  - Associated Gas Venting and Flaring (fraction flared)
  - Condensate Tanks (fraction flared)
  - Crude Oil Tanks (fraction flared)
  - Heaters (number of heaters per well)
  - Pneumatic Devices (number of low, intermittent, and high-bleed devices per well)
GHGRP Subpart W Updates (cont.)

• February, 2017 Updates (2015 RY)
  - Fraction of gas wells requiring compression
• June, 2017 Updates (2015 RY)
  - Wellhead compressor engine sizes
  - Based on TCEQ analysis
Tool Results - NOx

2014 NOx (tons per year):
- Wellhead Compressor Engines: 29,367
- Artificial Lifts: 32,005
- Lateral/Gathering Compressor Engines: 45,164
- Drill Rigs: 129,836
- Hydraulic Fracturing: 130,068
- Heaters: 138,025
- All Others: 221,206

2011 NOx (tons per year):
- Wellhead Compressor Engines: 350,041
- Lateral/Gathering Compressor Engines: 12,592
- Drill Rigs: 115,793
- Artificial Lifts: 111,383
- Dehydrators: 128,459
- Heaters: 98,277
- All Others: 65,408
Tool Results - VOC

2014 VOC (tons per year):
- Crude Oil Tanks: 975,375
- Pneumatic Devices: 330,080
- Fugitives: 183,145
- Condensate Tanks: 160,132
- Gas-Actuated Pumps: 526,722
- Associated Gas: 562,766
- All Others: 358,954

2011 VOC (tons per year):
- Crude Oil Tanks: 777,076
- Pneumatic Devices: 348,451
- Condensate Tanks: 428,799
- Fugitives: 140,174
- Gas-Actuated Pumps: 179,877
- Well Completions: 627,925
- All Others: 475,188
Improvements Planned for 2017

• SCC disaggregation (flaring, multi-process equipment)
• Improved activity analysis (crude oil vs. condensate)
• Additional source types
  – Coalbed methane dewatering pumps
  – Others?
• Additional control options/scenarios
  – Electric-powered compressor engines
  – Vapor recovery units
Improvements Planned for 2017 (cont.)

• Update basin factors
  – Subpart W data
  – Gas composition speciation

• Enclosed ground flare updates for 2017?
  - Proposed AP-42 Section 13.5 update (June, 2017)
  - Tool does not currently differentiate flare types
Questions?