Review and Update of Methods Used for Air Emissions Leak Detection and Quantification

Energy Management Workshop
Kananaskis Lodge

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Company Name
ENVIROTECH ENGINEERING

Background

- Fugitive Equipment Leaks (CAPP National Inventory, 2004)
  - ~25% of CH_4 and VOC Emissions
  - ~12% of CO_2E Emissions
- EUB Directive 060 / CAPP Fugitive BMP
- Methodologies Previously Investigated by:
  - CAPP (1999)
  - U.S. Natural Gas STAR Program

Scope of Work

- Identify existing and emerging leak detection and quantification technologies
- Conduct evaluation based on costs and ability to identify, locate and quantify substances
- Summarize Key Benefits and Limitations

Project Approach

- Task 1 – Project Kickoff Meeting
- Task 2 – Desktop Review
- Task 3 – Interviews with the technology and product suppliers
- Task 4 – Interviews with Industry Reps

Project Approach (continued)

- Task 5 – Interim Meeting with Working Group
- Task 6 – Draft Report
- Task 7 – Finalization of Report
- Task 8 – PTAC Presentation

Deliverables

- Final Report
  - Technology descriptions and evaluations
- Excel-Based Decision-Making Tool
- PTAC Presentation

3 Main Topic Categories

- Point Source Leak Detection and Concentration Measurement Methods
  - Close Range Detection and Measurement Methods
  - Remote Sensing Methods
  - Airborne Methods (pipeline inspections)
- Point Source Leak Quantification Methods
- Area Source Leak Detection and Emissions Quantification Technologies

Point Source Methods
Definitions

- Leak Definition
  - Screening concentration of > 10,000 ppm
- Qualitative Method
  - Capable of detecting a leak meeting the leak definition, but is not able to provide quantitative output
- Quantitative Method
  - Provides quantitative output that can be related to the leak definition
- Semi-Quantitative Method
  - Provides quantitative output, but output cannot be related to the leak definition

Point Source Methods (continued)
Criteria Captured

- Method Strengths and Limitations
- Ability to Detect Desired Substance
- Selected Product Information
- Qualitative, Quantitative or Semi-Quantitative
- Product meets Method 21 instrument specifications?
- Product Applicable for Pipeline Leak Detection?
- Safety Classification
- Purchase Cost

Point Source Leak Quantification Methods

- Hi-Flow Sampler
- Bagging
- Rotameters
- Tracer Gas

Area Source Leak Detection and Emissions Quantification Technologies

- AIRDAR
- Differential Absorption LIDAR (DIAL)
- Open Path Tunable Diode Laser Absorption Spectroscopy (TDLAS)
- Open Path Fourier Transform Infrared (FTIR)

Why Develop a Fugitive Emissions Management Plan?

- Promotes a safe and healthy work environment through good operating practices.
- Significant benefits to the bottom line ($) through recovery of saleable gas that would otherwise be lost.
- New requirement of EUB Directive 060.
- Reductions in GHG emissions.