

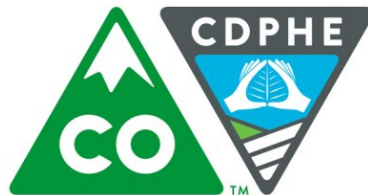
# Statewide Oil and Gas Hydrocarbon Emissions Reductions Initiative

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Planning and Policy Program

Energy & Environment Symposium - Oil  
and Gas Education for Local  
Government



**COLORADO**

**Air Pollution Control Division**

Department of Public Health & Environment



# Overview

- Basis for stakeholder process
- Pneumatic controller task force
- Hydrocarbon emission reduction strategies
- Next steps



# Basis

- Established by Air Quality Control Commission Regulation No. 7 “Statement of Basis and Purpose” (Nov. 2017)
  - Evaluate cost-effective hydrocarbon emission reductions from the statewide oil and natural gas sector
  - Study pneumatic controller emission reduction options, including causes of improper operation, techniques and costs, maintenance methods, definitions
- Two year stakeholder processes
- Consists of industry, local government, and environmental NGO representatives



# Pneumatic Controller Task Force

- Commission Directive: “Reassessment” provision for inspection and enhanced response
  - Examine emission reduction options
    - Rate, type, application, causes of improper operation
  - Inspection and repair techniques and costs
  - Available preventative maintenance methods
  - Definition appropriateness
    - “Enhanced response”, “pneumatic controller”
      - Including intermittent, no-bleed, and self-contained pneumatic types
  - More information needed regarding “good engineering and maintenance practices”
- Information used to reassess Section XVIII.F



# Pneumatic Controller Task Force

- Division-led study of pneumatic controller emission reduction options
  - Only in Denver Metro North Front Range (“DMNFR”) Ozone Nonattainment Area
- Task Force Scope
  - Data collection
    - Inventory of pneumatic devices (kinds, quantities, sizes)
    - Improper operation rates, causes & repair techniques
  - Data will guide recommendations



# Hydrocarbon stakeholder process

- Kick-off January 2018
  - Industry, local government (municipalities, counties), and environmental representatives
  - Statewide Hydrocarbon Emissions Reduction (SHER) Team
    - Developed goals
    - Monthly meetings
      - Transmission subgroup
      - Upstream/midstream subgroup
- Public comment meetings

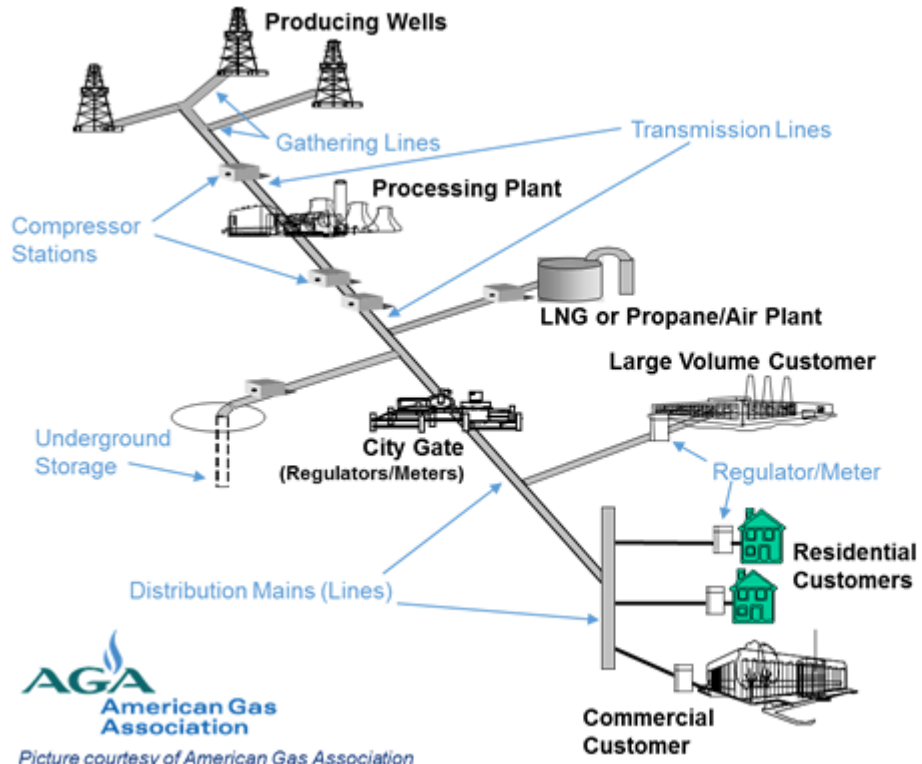


# SHER Team - goals

- Evaluate potential areas for hydrocarbon emission reductions from the oil and gas industry statewide (within Division jurisdiction)
  - Consider cost-effective strategies
  - Consider near-term and long-term strategies
  - Consider implementation flexibility
    - Consider operational and location difference
    - Consider regulatory and non-regulatory measures



# Oil and gas sectors



- Production**
- Pneumatic Controllers
  - Gathering/Boosting Stations
  - Tanks
  - Chemical Injection Pumps

- Gathering and Processing**
- Reciprocating Compressors
  - Centrifugal Compressors
  - Gas Engines
  - Blowdowns/Venting

- Transmission**
- Reciprocating Compressors
  - Station Fugitives
  - Engines
  - Pipelines

- Distribution**
- Mishaps (Dig-ins)
  - Residential
  - Mains - Unprotected Steel
  - Services - Unprotected Steel

**AGA**  
American Gas Association  
*Picture courtesy of American Gas Association*





# Opportunity to Innovate

- Strong engagement by key stakeholders
  - Exchange ideas and determine what works best for Colorado
- Not limited by an EPA framework
  - SHER Team is separate from any ozone State Implementation Plan (SIP) or federal emission standard



# Hydrocarbon emission reduction strategies

- Oil and gas sector (upstream, midstream, transmission) statewide
- Hydrocarbon emissions
- Cost-effective strategies



# Hydrocarbon emission reduction strategies

- Strategies
  - Dehydrators
  - Flash gas/flaring
  - LACT/load-out
  - Tankless production
  - Well liquids unloading
  - Pneumatic devices
  - Leak detection, monitoring
  - Downstream transmission
  - Infrastructure, inventory



# Hydrocarbon emission reduction strategies

- Flash gas/flaring
  - Strategy: reduce flash gas emissions
  - Remove entrained oxygen from flash gas allowing up to 100% of site flash gas to be captured and sold instead of combusted



Courtesy of EcoVapor



# Hydrocarbon emission reduction strategies

- Tankless production
  - Strategy: reduce emissions from storage tanks and load-out
  - Tankless production = tanklite
    - Oil tankless - eliminates oil tank emissions, oil truck loadout emissions, reduces truck traffic
    - No tanks - eliminates oil and water tank emissions, oil and water truck loadout emissions, reduces truck traffic



# Hydrocarbon emission reduction strategies

- Well liquids unloading
  - Strategy: reduce emissions from well liquids unloading
  - When the reservoir energy is insufficient to lift the produced liquid up the wellbore, liquids accumulate and need to be removed to maintain production
  - Liquids unloading techniques
    - Formation energy dependent (e.g., plunger lifts, vent cycles)
    - Added energy dependent (e.g., pumps)
    - Surface compression
  - Liquids unloading does not always result in vented emissions



# Hydrocarbon emission reduction strategies

- Pneumatic devices
  - Strategy: reduce emissions from natural gas driven pneumatic controllers and pneumatic pumps
    - Pneumatic controllers - replace with zero bleed if technically feasible
    - Pneumatic controllers - direct measurement of continuous bleed
    - Pneumatic controllers - implement the find and fix program statewide
    - Pneumatic pumps - replace with zero bleed if technically feasible
    - Pneumatic pumps - implement 95% control statewide



# Hydrocarbon emission reduction strategies

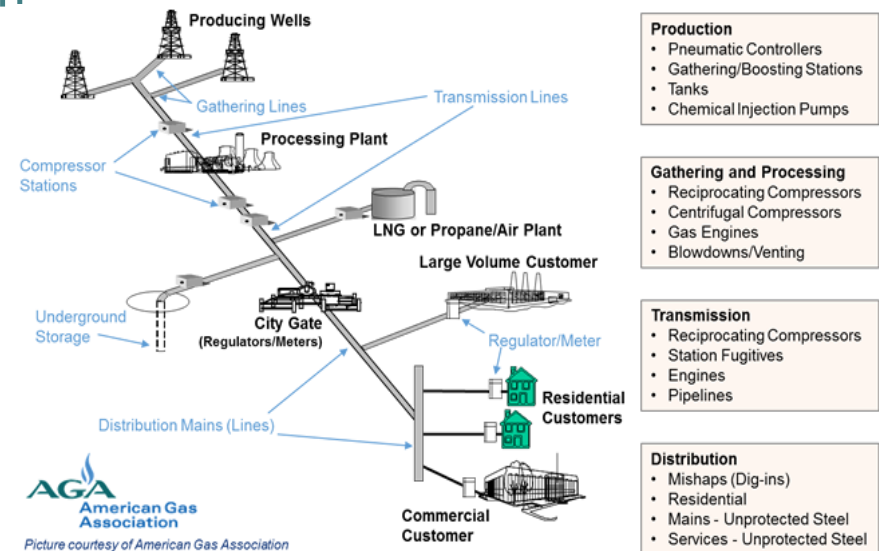
- Leak detection
  - Strategies: reduce fugitive emissions from components
    - Monitoring - aerial monitoring
    - Monitoring - remote sensing technology pilot
    - Inspection frequency - increase inspection frequencies at smaller well production facilities and natural gas compressor stations





# Hydrocarbon emission reduction strategies

- Downstream transmission
  - Strategy: reduce emissions from downstream transmission compressors and compressor stations
- Compressor stations LDAR
- Reciprocating compressor rod packing replacements
- Segment based reductions





## Next steps

- Spring 2019: complete evaluation
- Fall 2019: determine recommendations
- January 2020: present recommendations
  - Speaking role for industry, local government, and environmental organizations
- May 2020: Pneumatic Controller Task Force report



# Questions?