

TITAN Air Quality Study Facts

Background and Purpose

- The Barnett Shale Energy Education Council (BSEEC) commissioned an ambient air quality study to provide the public with scientifically sound data and fact-based information surrounding air emissions in the Barnett Shale.
- The study was designed and conducted by TITAN Engineering, Inc. (TITAN), an environmental engineering firm licensed in Texas and registered with the Texas Board of Professional Engineers.
- Ten natural gas sites – two compressor stations and eight completed well sites – located in Fort Worth and District 2 in Arlington were tested to assess ambient air quality in the vicinity of natural gas operations. The sites tested included both condensate-producing and dry natural gas wells.
- While previous air monitoring studies in Fort Worth have evaluated natural gas sites at random, TITAN's study focused on sites projected to have the highest benzene emissions.
- TITAN utilized best practices, analytical methods and standards used by the U.S. Environmental Protection Agency (EPA) and the American Society for Testing and Materials (ASTM). Samples were collected during normal facility operations on June 1-15, 2010.
- The full report is posted on the BSEEC web site www.bseec.org

Test Site Selection

- Two compressor stations were selected by the City of Fort Worth as having the highest potential benzene emissions:
 - Arc Park Compressor Station - District 4, City of Fort Worth (Operator: Chesapeake)
 - Lake Arlington Compressor Station - District 5, City of Fort Worth (Operator: Quicksilver)
- Eight completed well sites with the highest projected benzene emissions (one in each city council district) were selected by TITAN based on objective criteria. In two districts, sites projected to have the second highest benzene emissions were selected due to their closer proximity to homes and schools. Selected sites are:
 - Alliance Saratoga B – District 2, City of Fort Worth (Operator: Quicksilver) – **Dry natural gas**
 - Mercer Ranch – District 3, City of Fort Worth (Operator: Encana) – **Condensate producing natural gas**
 - Exelon North – District 5, City of Fort Worth (Operator: Quicksilver) – **Dry natural gas**
 - Lumbermen B – District 6, City of Fort Worth (Operator: Devon) – **Dry natural gas**
 - Hyde-Hickman – District 7, City of Fort Worth (Operator: Devon) – **Dry natural gas**

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- Indus – District 8, City of Fort Worth (Operator: Chesapeake) - ***Dry natural gas***
- Leggett & Platt – District 9, City of Fort Worth (Operator: Chesapeake) - ***Dry natural gas***
- Rose – District 2, City of Arlington (Operator: XTO) - ***Dry natural gas***

Data Collected

- One-hour and 24-hour VOCs (81 compounds, including benzene, analyzed by Test America using EPA Method TO-14A/15)
- One-hour reduced sulfur compounds (20 compounds, analyzed by Columbia Analytical Services using ASTM Method D 5504-08)
- One-hour formaldehyde (compressor sites only) (analyzed by Test America using EPA Method TO-11A)
- Sensitive analytical methods had detection limits below relevant risk-based screening levels for all compounds examined. Data met quality objectives and analytical laboratories completed required quality control tasks.

Data Evaluation

- Data were compared to relevant risk-based screening levels:
 - One-hour samples were compared to short-term TCEQ Air Monitoring Comparison Values (AMCVs) (odor- and health-based)
 - 24-hour samples were compared to long-term TCEQ AMCVs as a conservative preliminary screen; any exceedances were compared to the applicable [Agency for Toxic Substances & Disease Registry](#) (ATSDR) acute Minimal Risk Levels (MRLs)

Results

- VOCs
 - No one-hour samples exceeded short-term AMCVs
 - One 24-hour sample (collected at Mercer Ranch, the condensate-producing site) contained 1.96 ppb benzene, a concentrations slight greater than the long-term AMCV (1.4 ppb). This value is well below the ATSDR acute MRL for benzene (9 ppb).
- Reduced Sulfur Compounds
 - Hydrogen sulfide concentrations exceeded the short-term AMCV at two sites (EnCana Mercer Ranch and Devon Hyde-Hickman). TITAN determined that hydrogen sulfide originated from off-site sources at both locations.
 - Carbonyl sulfide was detected in excess of the odor-based AMCV levels at two sites (Chesapeake Leggett and Platt and Lake Arlington compressor station) (but well below the health-based AMCV level).
- Formaldehyde
 - Formaldehyde was not detected above the AMCV level at the Chesapeake Arc Park compressor station.

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- Formaldehyde concentrations exceeded the short-term AMCV in several samples at the Lake Arlington compressor station. TITAN determined that formaldehyde at this site originated from off-site sources.

Conclusion

- Based on this study, TITAN concluded that natural gas sites in Fort Worth and Arlington District 2 expected to have the highest benzene emissions are not emitting harmful levels of benzene or other compounds tested.