

## Are oil and gas emissions equivalent to mobile emissions in the Dallas-Fort Worth (DFW) area?

The TCEQ's latest "Dallas-Fort Worth Attainment Demonstration State Implementation Plan (SIP) Revision for the 1997 Eight-Hour Ozone Standard Nonattainment Area"<sup>1</sup> estimated 2012 emissions of volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>) in the nine-county area as shown in Table 1: *Future Base Anthropogenic Modeling Emissions for DFW*. Compared to oil and gas production and drilling sources, all mobile sources (on-road, non-road, and off-road) emit more ozone precursors of NO<sub>x</sub> (282 mobile tons per day (tpd) vs 19 oil/gas tpd) and VOC (129 mobile tpd vs 114 oil/gas tpd).

**Table 1: 2012 Future Base Anthropogenic Modeling Emissions for DFW**

Category	2012 NO <sub>x</sub> tpd	2012 VOC tpd
On-Road Mobile	181	80
Non-Road (excl. Oil & Gas Drilling)	64	43
Off-Road	37	6
Point Source	51	39
Area (excl. Oil & Gas Production)	18	240
Oil & Gas Production	10	113
Oil & Gas Drilling	9	1
DFW Total	370	522

- Notes:
1. Point source emissions are based on non-startup Wednesday ARD emissions
  2. On-road emissions are summer season-specific weekday emissions
  3. Non-road, off-road and area emissions are year-specific OSD emissions
  4. Off-road emissions consist of airport and locomotive emissions
  5. VOC is reported as sum of Carbon Bond 05 modeled species

Based upon the latest available data, the DFW area oil and gas related estimated emissions are actually lower than that estimated in the DFW SIP revision. A Barnett-Shale specific pneumatic valve survey, conducted in late 2011, indicates a reduction of 49.6 tpd in estimated emission associated with those devices. This reduction is primarily associated with the use of low bleed, ultra low bleed, or no bleed pneumatic valves in the DFW area. The oil and gas production VOC emissions for 2012 would decrease to 63 tpd using this updated information, which is half of the mobile source VOC emissions, which are estimated at 129 tpd.

## What does this mean in terms of ozone formation in the DFW area?

Several variables in addition to the tons of ozone precursors emitted determine the potential impact of the emissions on ozone formation and concentration. Most of the oil and gas emissions are located north, west, and southwest of the DFW urban core, which is generally not upwind during conditions when the highest ozone concentrations are measured. Therefore these emissions are not available to significantly contribute to the formation of ozone.

<sup>1</sup> 2011 DFW Attainment Demonstration SIP Revision, <http://www.tceq.texas.gov/airquality/sip/dfw/dfw-latest-ozone>

NO<sub>x</sub> emissions are a more vital or limiting component than VOC emissions in ozone formation for the majority of days and monitors with highest ozone measurements. This is especially true in areas with abundant vegetation since trees emit naturally occurring VOC emissions that are ozone precursors. Therefore, controlling NO<sub>x</sub> emissions is a more efficient control strategy to minimize DFW area ozone. Oil and gas NO<sub>x</sub> emissions are estimated to have been reduced from 68 tpd in 2006 to 19 tpd in the latest DFW SIP revision. This reduction is primarily due to a TCEQ rule requiring the use of lower NO<sub>x</sub>-emitting large engines used at gas compressor stations and other sources. The estimated mobile source NO<sub>x</sub> emissions are approximately 15 times higher than the oil and gas NO<sub>x</sub> emission as a result of implementing this rule in the DFW area in 2012.