State Implementation Plan Development

Heather Evans, Chris Kite, Donna Huff
Air Quality Division

Dallas-Fort Worth Air Quality Public Information Meeting
September 5, 2013
Topics

- State Implementation Plan (SIP) Elements and Timeline
- Photochemical Modeling Status
- Updates/Revisions
Background

- The 2008 Eight-Hour Ozone Standard is attained when the ozone design value is 75 parts per billion or less.

- Effective July 20, 2012 EPA designated the 10-county DFW area as nonattainment for the 2008 eight-hour ozone standard:
  - Consists of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties
  - Classified as moderate with an attainment deadline of December 31, 2018.
SIP Elements and Timeline
Elements of the Attainment Demonstration

- Demonstration that the state’s plan for the area will result in its attainment of the 2008 eight-hour ozone standard by December 31, 2018

- Photochemical modeling
  - Conceptual model
  - Emissions inventories
  - Modeling (base case, baseline, future baseline)
  - Attainment test
  - Corroborative analysis/weight of evidence
Elements of the Attainment Demonstration

- Control strategies:
  - Reasonably Available Control Technology (RACT)
  - Reasonably Available Control Measures (RACM)
  - Other measures necessary to attain
  - New contingency measures

- Reasonable Further Progress (RFP) analysis
Elements of the RFP Demonstration

• Demonstration that the state’s plan will reduce NO\textsubscript{X} and/or VOC emissions from base year through attainment year:
  
  • Base-year inventory: 2011
  
  • Must demonstrate 15% reduction of NO\textsubscript{X} and/or VOC emissions between 2011 and 2017
    – VOC only for Wise County
  
  • Must demonstrate an additional reduction of NO\textsubscript{X} and/or VOC emissions from 2017-2018
  
  • Contingency measures
SIP Timeline

- Initial future design value by November 2013
- Preliminary RFP values by March 2014
- RACT evaluation complete by Spring 2014
- Initial control measure stakeholder input by Summer 2014
- Proposal agenda for RACT, RFP, and Attainment Demonstration SIP revision and rules: December 2014
- Anticipated public comment period – December 2014 – January 2015
- Adoption agenda: May/June 2015
Photochemical Modeling Status
Modeling Overview

● Computer Simulation
  – Estimate pollutant concentrations in places without monitors

● Estimate the amount of emission reductions needed to attain the ozone standard
  – Model outcomes of scenarios to study effectiveness of plans and control measures
  – Demonstrate that the area will achieve the standard by the attainment date
The Big Picture

Meteorology

Emissions

Air Quality Model

Air Pollutant Concentrations
Modeling Procedures

1. Develop Protocol
2. Select domain and episode (dates)
3. Develop meteorology and emissions
4. Model the Base Case
5. Test proposed control strategies
6. Develop future emissions
7. Evaluate Base Case performance

Flowchart:
- Develop Protocol → Select domain and episode (dates)
- Develop meteorology and emissions → Model the Base Case
- Test proposed control strategies → Develop future emissions
- Evaluate Base Case performance
- Feedback loop from Evaluate Base Case to Develop Protocol
Comparing Ozone Modeling for Previous DFW SIP to Currently Proposed Work

- **Base case episodes:**
  - Continue to use June 2006 episode (May 31 – July 2) with improvements
  - Add an August/September 2006 episode (August 13 – September 15) with latest inputs

- **Modeling domain:**
  - Previous SIP domain covered two-thirds of eastern U.S. with a fine grid over the DFW area
  - Newer domain covers most of North America with a large fine grid over eastern Texas
Comparing Ozone Modeling for Previous DFW SIP to Currently Proposed Work

• Meteorological model:
  - Previous SIP relied on the Fifth Generation Mesoscale Model (MM5, http://www.mmm.ucar.edu/mm5/)
  - Newer work is being done with the Weather and Research Forecasting (WRF, http://www.wrf-model.org/index.php) model

• Photochemical model:
  - Previous SIP relied on the Comprehensive Air Quality Model with Extensions (CAM$_X$, http://camx.com/) version 5.20.1
  - CAM$_X$ version 6.00 released on May 6, 2013, and either it or future updates will be used
Comparing Ozone Modeling for Previous DFW SIP to Currently Proposed Work

• Speciation mechanism:
  – Previous SIP relied on the Carbon Bond 05 (CB-05) speciation mechanism
  – Current work is being done with the Carbon Bond 6 (CB6) mechanism

• Emissions inventory:
  – Latest available inputs for on-road, non-road, off-road, oil and gas, area, point
Ozone Modeling Domain for 2007 and 2011 DFW Attainment SIPs
## North American Regional Planning Organizations (RPO) Domains for Texas Air Quality Modeling Efforts

<table>
<thead>
<tr>
<th>Domain Name</th>
<th>Grid Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>tx_4km</td>
<td>16,576</td>
</tr>
<tr>
<td>tx_12km</td>
<td>6,580</td>
</tr>
<tr>
<td>rpo_36km</td>
<td>41,638</td>
</tr>
</tbody>
</table>
Updates/Revisions
Area Source Condensate Tank VOC Emissions Factors

- TCEQ contracted Eastern Research Group, Inc. to develop new factors for eight areas in Texas
- 2011 area source condensate tank VOC emissions were reduced by 75% (600,940 tons of VOC)
- Previous factor was developed in 2006 using a limited data set
- Current factor is based on more recent data and a larger data set
New factor accounts for reductions from:

- Effects of new rules and permitting requirements
- Industry outreach
- Improved guidance for determining condensate storage tank emissions
- Production weighting of data to develop emissions factors
Reasonably Available Control Technology (RACT) and Reasonably Available Control Measures (RACM)

- FCAA §172(c)(1) requires states to implement all RACM as expeditiously as practicable
- FCAA also requires states to implement RACT for certain named source categories and major sources from unnamed categories
- RACT for the DFW area must be implemented by January 1, 2017
To be considered RACM a potential control measure must meet the following criteria:

- technologically feasible;
- economically feasible;
- does not cause adverse impacts;
- enforceable and practicable;
- ozone reduction benefit; and
- reduce emissions before the beginning of the ozone season prior to the attainment date (March 1, 2018)
Previously Implemented Measures for Stationary Sources

NO\textsubscript{x} rule amendments

- Cement kilns (2007)
- Electric generating units in DFW (2007)
- Gas-fired engines (2005)
- Major stationary sources >= 50 tpy (2007) including:
  - boilers, engines, and turbines;
  - lime, brick, and ceramic kilns;
  - industrial furnaces and ovens; and
  - industrial dryers
- Minor stationary source engines < 50 tpy (2007)
- Rich burn engines in East TX (2007)
Previously Implemented Measures for Stationary Sources

VOC rule amendments

- Cleaning solvents (2011)
- Cutback asphalt (2006)
- Degreasing (2006)
- Gasoline terminals (2006)
- Petroleum dry cleaning (2010)
- Storage tanks (2006, 2011)
- Tank degassing (2010)
- Vent gas (2006)
Previously Implemented Measures for Mobile/Area Sources

- Vehicle Idling Restrictions
- Vehicle Inspection/Maintenance
- Texas Low Emission Diesel
- Texas Emission Reduction Plan
- Reformulated Gasoline
Previously Implemented Measures for Mobile/Area Sources

- Transportation Control Measures
- Heavy-Duty Diesel Engine Standards
- Large Non-Road Spark Ignition Standards
- Voluntary Mobile Emission Reductions
- Stage I Vapor Recovery
DFW Control Strategy Planning

• Requesting potential strategies:
  – Suggestions for new control strategies
  – Modifications of existing control strategies
  – Stationary source or mobile source ideas

• When submitting comments:
  – Describe technical and economic feasibility
  – Provide as much detail and technical information as possible
  – Provide a copy, Web link, or citation for suggested rules
  – Identify any confidential information
  – Explain feasibility information provided on a dollar per ton basis.
Please send comments by postal mail or e-mail to:

Chance Goodin – Stationary source ideas
chance.goodin@tceq.texas.gov

Amy Muttoni – Mobile source ideas
amy.muttoni@tceq.texas.gov

Texas Commission on Environmental Quality
12100 Park 35 Circle, Mail Code MC-206
Austin, Texas 78753
Wise County

- Extension of applicable stationary source rules necessary to satisfy RACT
  - Rules applicable in the other nine DFW counties
  - Especially:
    - Storage tanks
    - VOC fugitives
    - Vent gas
    - Engines
    - Electric generating units
    - Major NOX sources

- RFP Reductions
  - Different from other 9 counties
  - 15% reduction from VOC only

- No Inspection/Maintenance requirement
Email Notifications

To receive e-mail notification of updates on SIP revisions and SIP-related news items:

- Go to TCEQ’s Web site at: [http://www.tceq.texas.gov](http://www.tceq.texas.gov)
- Choose “Sign up for e-mail updates”
- From the list of choices, look under Air Quality and select “SIP Hot Topics”
Contact Information

Heather Evans
DFW SIP Project Manager
heather.evans@tceq.texas.gov
512.239.4675

Chris Kite – Modeling Lead
chris.kite@tceq.texas.gov
512.239.1959

Donna Huff, Manager
Air Quality Planning Section
donna.huff@tceq.texas.gov
512.239.6628