TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AGENDA ITEM REQUEST

for State Implementation Plan Revision Adoption

AGENDA REQUESTED: June 3, 2015

DATE OF REQUEST: May 15, 2015

INDIVIDUAL TO CONTACT REGARDING CHANGES TO THIS REQUEST, IF NEEDED: Joyce Spencer-Nelson, (512) 239-5017

CAPTION: Docket No. 2014-1249-SIP. Consideration of the adoption of the Dallas-Fort Worth (DFW) Reasonable Further Progress (RFP) State Implementation Plan (SIP) Revision for the 2008 Eight-Hour Ozone National Ambient Air Quality Standard (NAAQS).

To meet Federal Clean Air Act requirements, the DFW RFP SIP revision includes an analysis of reasonable further progress toward attainment of the 2008 eight-hour ozone NAAQS. Due to a change in attainment deadlines for the 2008 eight-hour ozone NAAQS by the United States Court of Appeals for the District of Columbia Circuit on December 23, 2014, this SIP revision provides an RFP analysis for a 2017 attainment year, including a contingency plan and a motor vehicle emissions budget (MVEB). This SIP revision also provides an alternative analysis to demonstrate an 18% emissions reduction in ozone precursors from the 2011 base year through a 2018 attainment year, a 3% emissions reduction demonstration for contingency for each milestone year, and updated RFP MVEB for each milestone year in the event that the 2018 attainment year requirement is reinstated by the Court. (Kristin Patton, Terry Salem) (Project No. 2013-014-SIP-NR)

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Copy to CCC Secretary? NO X YES

Texas Commission on Environmental Quality
Interoffice Memorandum

To: Commissioners **Date:** May 15, 2015

Thru: Bridget C. Bohac, Chief Clerk
Richard A. Hyde, P.E., Executive Director

From: Steve Hagle, P.E., Deputy Director
Office of Air

Docket No.: 2014-1249-SIP

Subject: Commission Approval for Adoption of the Dallas-Fort Worth (DFW) 2008 Eight-Hour Ozone Nonattainment Area Reasonable Further Progress (RFP) State Implementation Plan (SIP) Revision

DFW 2008 Eight-Hour Ozone Standard RFP SIP Revision
SIP Project No. 2013-014-SIP-NR

Background and reason(s) for the SIP revision:
The Federal Clean Air Act (FCAA) requires states to submit plans that demonstrate progress in reducing emissions for areas that are not attaining the National Ambient Air Quality Standards (NAAQS) within their jurisdictions. In July 1997, the United States Environmental Protection Agency (EPA) revised the NAAQS for ground-level ozone by promulgating an eight-hour standard set at 0.08 parts per million (ppm). Under the 0.08 ppm standard, the EPA designated Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties as nonattainment with a moderate classification. These nine counties were later reclassified as serious nonattainment when the DFW area failed to meet the attainment deadline under its moderate classification. On March 12, 2008, the EPA strengthened the eight-hour ozone standard from 0.08 ppm to 0.075 ppm. Under the 0.075 ppm (75 parts per billion) standard, the EPA designated Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties as nonattainment with a moderate classification, effective July 20, 2012. These counties form the DFW 2008 eight-hour ozone standard moderate nonattainment area. The attainment date for the DFW moderate nonattainment area was established in the EPA's implementation rule for the 2008 ozone NAAQS published in the *Federal Register* (FR) on May 21, 2012 (77 FR 30160) and was set as December 31, 2018. To fulfill FCAA requirements for moderate ozone nonattainment areas, the state is required to submit an RFP plan demonstrating that the DFW nonattainment area will reduce emissions of ozone precursors (volatile organic compounds (VOC) and nitrogen oxides (NO_X)) consistent with moderate nonattainment area requirements.

On December 23, 2014, the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit Court) issued an opinion in a rule challenge by the Natural Resources Defense Council, which resulted in vacatur of the EPA's December 31, 2018 attainment date for moderate nonattainment areas under the 2008 0zone NAAQS. As part of the EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements; Final Rule* (2008 ozone standard SIP

requirements rule) published on March 6, 2015 (80 FR 12264), the EPA modified 40 Code of Federal Regulations (CFR) §51.1103 consistent with the D.C. Circuit Court decision to establish attainment dates that run from the effective date of designation, i.e., July 20, 2012, rather than the end of the 2012 calendar year. As a result, the attainment date for the DFW moderate nonattainment area has changed from December 31, 2018 to July 20, 2018. In addition, because the attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment date, the attainment year for the DFW moderate nonattainment area has changed from 2018 to 2017. In order to address the change in the attainment year, this SIP revision now provides a required RFP analysis for the 2017 attainment year, including a contingency plan and a motor vehicle emissions budget (MVEB). This SIP revision also continues to demonstrate an 18% emissions reduction in ozone precursors from the 2011 base year through a 2018 attainment year, a 3% emissions reduction demonstration for contingency for each milestone year, and updated RFP MVEB for each milestone year, in the event that the 2018 attainment year requirement is reinstated.

For areas classified as moderate, states are required to submit SIP revisions by July 20, 2015 that demonstrate RFP for the 2008 eight-hour ozone NAAQS. The commission approved proposal of an RFP SIP revision for the DFW 2008 eight-hour ozone nonattainment area on December 10, 2014. The proposed SIP revision included all applicable FCAA and EPA requirements known at the time of proposal.

Scope of the SIP revision:
The DFW RFP SIP revision provides an analysis of the continued progress toward reducing ozone precursor emissions in the DFW 2008 eight-hour ozone moderate nonattainment area. An attainment demonstration is also required for the DFW area, the details of which are included in a separate memo (Project No. 2013-015-SIP-NR).

A.) Summary of what the SIP revision will do:
At the time of proposal, the DFW RFP SIP revision was required by the proposed 2008 ozone standard SIP requirements rule to demonstrate an 18% emissions reduction in ozone precursors from the 2011 base year through the 2018 attainment year and a 3% reduction for contingency for each milestone year for the DFW 2008 eight-hour ozone nonattainment area according to the following minimum increments:

- 15% emissions reduction in VOC for the six-year period from January 1, 2012 through December 31, 2017 for the newly designated one-county portion of the DFW 2008 ozone nonattainment area consisting of Wise County;
- 15% emissions reduction in VOC and/or NO_X for the six-year period from January 1, 2012 through December 31, 2017 for the previously designated nine-county portion of the DFW 2008 ozone nonattainment area consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties;

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 for all counties of the DFW 2008 eight-hour ozone nonattainment area;
- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 as an RFP milestone year contingency for all counties of the DFW 2008 ozone nonattainment area; and
- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2019 through December 31, 2019 as attainment year RFP contingency for all counties of the DFW 2008 ozone nonattainment area.

In addition to demonstrating the required emissions reductions, the DFW RFP SIP revision, as proposed, provides updated 2011 emissions inventories for point, area, non-road mobile, and on-road mobile sources as well as updated RFP MVEB for the 2017 and 2018 milestone years. An analysis of contingency measure requirements, to be implemented if the area fails to achieve the RFP milestones in 2017 and 2018, is also included.

With a 2017 attainment year, the DFW RFP SIP revision is required by the final 2008 ozone standard SIP requirements rule to demonstrate a 15% emissions reduction in ozone precursors from the 2011 base year through the 2017 attainment year and a 3% reduction for attainment year contingency for the DFW 2008 eight-hour ozone nonattainment area according to the following minimum increments:

- 15% emissions reduction in VOC for the six-year period from January 1, 2012 through December 31, 2017 for the newly designated one-county portion of the DFW 2008 ozone nonattainment area consisting of Wise County;
- 15% emissions reduction in VOC and/or NO_X for the six-year period from January 1, 2012 through December 31, 2017 for the previously designated nine-county portion of the DFW 2008 ozone nonattainment area consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties;
- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 as attainment year RFP contingency for all counties of the DFW 2008 ozone nonattainment area.

In addition to demonstrating the required emissions reductions with a 2017 attainment year, the DFW RFP SIP revision provides an MVEB for the 2017 attainment year and an analysis of contingency measure requirements, to be implemented if the area fails to achieve the RFP milestones in 2017.

The DFW RFP SIP revision demonstrates RFP for both the 2017 milestone year and 2018 attainment year as well as 2017 milestone year and 2018 attainment year RFP contingency, as proposed. Additionally, the DFW RFP SIP revision demonstrates RFP for a 2017

attainment year, as well as 2017 attainment year contingency, to account for the attainment date change resulting from the D.C. Circuit Court ruling and the final 2008 ozone standard SIP requirements rule.

The DFW RFP SIP revision includes an RFP analysis for both the originally proposed 2018 attainment year and the revised 2017 attainment year. The RFP analysis originally proposed for a 2018 attainment year is included to maintain consistency with the proposed version of the DFW RFP SIP revision and to serve as a reference for the calculations used to develop the RFP demonstration, contingency demonstration, and MVEB for the 2017 attainment year. The RFP analysis for the 2018 attainment year is also being included and submitted to the EPA in the event that the 2018 attainment year requirement is reinstated.

B.) Scope required by federal regulations or state statutes:
The DFW RFP SIP revision is required to demonstrate that the DFW moderate nonattainment area will achieve emissions reductions consistent with the requirements of FCAA, §182(b)(1) and the EPA's final 2008 ozone standard SIP requirements rule. Requirements for moderate ozone nonattainment areas under the FCAA include a 15% VOC emissions reduction within six years after designation; however, the EPA's final 2008 ozone standard SIP requirements rule allows ozone nonattainment areas with a previously approved plan meeting the 15% VOC requirement under either the one-hour ozone standard or the 1997 eight-hour ozone standard to substitute reductions in NO_X for VOC.[1]

All of the DFW 2008 eight-hour ozone nonattainment area counties, with the exception of Wise County, have met the 15% VOC-only emissions reduction requirement for RFP under the revoked one-hour ozone standard or the 1997 eight-hour ozone standard. The DFW RFP SIP revision, therefore, demonstrates the required 15% VOC-only emissions reduction for Wise County and demonstrates a 15% emissions reduction for the previously designated 1997 eight-hour ozone nonattainment counties by combining NO_X and VOC emissions reductions.

The RFP calculations documented in the DFW RFP SIP revision rely on an RFP base year of 2011 and a December 31, 2018 attainment date, as proposed. In order to address the D.C. Circuit Court ruling, RFP calculations based on a 2011 base year and 2017 attainment year were added to the DFW RFP SIP revision in Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year*.

C.) Additional staff recommendations that are not required by federal rule or state statute:
The proposed DFW RFP SIP revision included on-road mobile source emissions inventories and an RFP analysis based on the EPA's Motor Vehicle Emission Simulator (MOVES) 2010b model. The EPA made MOVES2014 available on July 31, 2014; officially

[1] NO_X may be substituted for VOC under conditions defined in the EPA's December 1993 NO_X Substitution Guidance (http://www.epa.gov/ttncaaa1/t1/memoranda/noxsubst.pdf).

released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343); and released an update to the model on October 27, 2014. Due to the delay of the MOVES2014 model finalization, the SIP development schedule did not allow time for inclusion of link-based MOVES2014 inventory values in the proposed version of this SIP revision. The Texas Commission on Environmental Quality (TCEQ) worked with the North Central Texas Council of Governments (NCTCOG) to develop 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. The TCEQ issued a supplement on January 12, 2015 to provide an RFP analysis using draft MOVES2014-based on-road emissions inventories for consideration during the public comment period.

In February 2015, the NCTCOG completed final MOVES2014-based on-road mobile emissions inventories and submitted the data to the TCEQ. Due to positive comments received from the City of Mesquite and the Regional Transportation Council (RTC) of the NCTCOG concerning the use of MOVES2014-based on-road mobile emissions inventories, staff recommends that the final MOVES2014-based emissions inventories be used for all RFP demonstrations, contingency requirements, and MVEBs adopted as part of the DFW RFP SIP revision.

Statutory authority:
The authority to propose and adopt SIP revisions is derived from Texas Health and Safety Code, Chapter 382, Texas Clean Air Act (TCAA), §382.002, which provides that the policy and purpose of the TCAA is to safeguard the state's air resources from pollution; §382.011, which authorizes the commission to control the quality of the state's air; and §382.012, which authorizes the commission to prepare and develop a general, comprehensive plan for the control of the state's air. This SIP revision is required by FCAA, §110(a)(1) and implementing rules in 40 Code of Federal Regulations Part 51.

Effect on the:

A.) Regulated community: The DFW RFP SIP revision sets a new MVEB for the 2017 attainment year, in accordance with the revised attainment date resulting from the D.C. Circuit Court ruling, which affects DFW area transportation planning. The DFW RFP SIP revision also provides for an alternative MVEB for the 2018 attainment year, in the event that the 2018 attainment year requirement is reinstated.

B.) Public: The DFW RFP SIP revision does not require rulemaking for additional emission reductions, but does set MVEBs, affecting DFW area transportation planning and citizens.

C.) Agency programs: The DFW RFP SIP revision would have no new impact on agency programs.

Stakeholder meetings:
The DFW RFP SIP revision went through a public review and comment period including two public hearings.

Public comment:
The commission held public hearings on the proposed DFW RFP SIP revision in Arlington on January 15, 2015 and in Austin on January 22, 2015. Notice of the public hearings was published in the *Texas Register* as well as the *Dallas Morning News, Houston Chronicle, and Austin American-Statesman* newspapers.

The public comment period opened on December 26, 2014 and was originally scheduled to close on January 30, 2015. However, a supplement to the proposed DFW RFP SIP revision was issued by the TCEQ on January 12, 2015 to provide additional technical detail regarding MOVES2014 on-road mobile source emissions estimates that became available after the SIP revision was approved for proposal by the commission on December 10, 2014. Due to the supplemental technical information, the comment period for the proposed SIP revision was extended to February 11, 2015 to allow for a full 30-day comment period for all components of the proposed SIP package.

The TCEQ received written comments on the DFW RFP SIP revision from the City of Mesquite, the RTC, the EPA, Sierra Club, Downwinders at Risk, and one individual. A summary of the comments and the TCEQ response is provided as part of this SIP revision in the Response to Comments.

Generally, comments provided support for the use of MOVES2014-based on-road mobile source emissions inventories. Comments also suggested that there were minor data and calculation errors presented in a small number of tables regarding RFP demonstration, contingency demonstration, and vehicle miles traveled. Comments concerning the enforceability of contingency measures and the inclusion of Wise County in the airport emissions inventory were also received.

Significant changes from proposal:
Due to the timing of the D.C. Circuit Court ruling and finalization of the 2008 ozone standard SIP requirements rule, the DFW RFP SIP revision includes an RFP analysis for a 2017 milestone year, 2018 attainment year, and 2019 contingency year, as proposed, and was modified between proposal and adoption to include clarifying language regarding the D.C. Circuit Court ruling as well as an additional chapter to discuss the RFP analysis specific to a 2017 attainment year.

The proposed DFW RFP SIP revision included on-road mobile source emissions inventories and an RFP analysis based on the EPA's MOVES2010b model. The EPA made MOVES2014 available on July 31, 2014; officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343); and released an update to the model on October 27, 2014. Due to the delay of the MOVES2014 model finalization, the SIP development schedule did not allow time for

inclusion of link-based MOVES2014 inventory values in the proposed version of this SIP revision. The TCEQ worked with the NCTCOG to develop 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. The TCEQ issued a supplement on January 12, 2015 to provide an RFP analysis using draft MOVES2014-based on-road emissions inventories for consideration during the public comment period. In February 2015, the NCTCOG completed final MOVES2014-based on-road mobile emissions inventories and submitted the data to the TCEQ. The MOVES2014-based on-road mobile source emissions inventories were fully incorporated into the DFW RFP SIP revision for adoption.

Emissions inventories for non-road mobile sources were developed for the proposed version of this SIP revision using version 1.6 of the Texas NONROAD (TexN) emissions model. An updated version (1.6.1) of the TexN model became available on July 30, 2014. Due to the timing of the model update, the SIP development schedule did not allow time for inclusion of inventory values based on the updated model in the proposed version of this SIP revision. Between proposal and adoption, the updated TexN model was used to revise the NONROAD model category emissions presented in this DFW RFP SIP revision.

A study contracted to Eastern Research Group (ERG) was completed on August 1, 2014 that updated emission rates for hydraulic pump engines and mud degassing activities associated with oil and gas production. The oil and gas emissions estimates included in the proposed DFW RFP SIP revision were developed with older emission factors for these types of activities. Between SIP proposal and adoption, the area source upstream oil and gas emissions were updated to incorporate refined emissions factors for oil and gas well mud degassing as well as hydraulic pump engines, based on the August 1, 2014 study.

Potential controversial concerns and legislative interest:
Due to the timing of the D.C. Circuit Court ruling and finalization of the 2008 ozone standard SIP requirements rule, the DFW RFP SIP revision includes an RFP analysis for a 2017 milestone year, 2018 attainment year, and 2019 contingency year, as proposed, and was modified between proposal and adoption to include clarifying language regarding the D.C. Circuit Court ruling as well as an additional chapter to discuss the RFP analysis specific to a 2017 attainment year. Although the DFW RFP SIP revision contains the same analyses included at proposal, the additional information regarding the 2017 attainment year change was not available for review during the public comment period. The analyses for the 2017 attainment year, however, are equivalent to the analyses for the 2017 milestone year provided for public comment.

The RFP analysis for the originally proposed 2018 attainment year also serves as support for the calculations used to develop the RFP demonstration, contingency demonstration, and MVEB for the 2017 attainment year.

The DFW RFP SIP revision includes Wise County as part of the DFW 2008 eight-hour ozone standard nonattainment area since it was designated as nonattainment by the EPA in the final designations rule published in the *Federal Register* on May 21, 2012 (77 FR

30088). However, the TCEQ and other concerned parties are currently challenging whether the EPA's inclusion of Wise County in the DFW 2008 eight-hour ozone nonattainment area was lawful. These challenges are currently pending in the United States Court of Appeals for the District of Columbia Circuit.

Does this SIP revision affect any current policies or require development of new policies?
No

What are the consequences if this SIP revision does not go forward? Are there alternatives to a SIP revision?
The commission could choose to not comply with requirements to develop and submit this DFW RFP SIP revision to the EPA. If the DFW RFP SIP revision is not submitted by July 20, 2015, the EPA could issue a finding of failure to submit, requiring that the TCEQ submit the required SIP revision within a specified time period, and imposing sanctions on the state. The EPA would be required to promulgate a Federal Implementation Plan (FIP) if the TCEQ failed to make the submission within two years. Sanctions could include transportation funding restrictions, grant withholdings, and 200% emissions offset requirements for new construction and major modifications of stationary sources in the DFW area. The EPA could impose such sanctions and implement the FIP until it approved a replacement SIP revision for the area.

Key points in the adoption SIP revision schedule:
Anticipated adoption date: June 3, 2015
EPA due date: July 20, 2015

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REVISIONS TO THE STATE OF TEXAS AIR QUALITY IMPLEMENTATION PLAN FOR THE CONTROL OF OZONE AIR POLLUTION

DALLAS-FORT WORTH 2008 EIGHT-HOUR OZONE STANDARD NONATTAINMENT AREA

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087
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DALLAS-FORT WORTH REASONABLE FURTHER PROGRESS STATE IMPLEMENTATION PLAN REVISION FOR THE 2008 EIGHT-HOUR OZONE STANDARD

PROJECT NUMBER 2013-014-SIP-NR

Adoption
June 3, 2015

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EXECUTIVE SUMMARY

The 1990 Federal Clean Air Act (FCAA) Amendments, §182, require ozone nonattainment areas designated with a classification of moderate or higher to submit plans showing reasonable further progress (RFP) toward attainment of the ozone National Ambient Air Quality Standard (NAAQS). On March 12, 2008, the United States Environmental Protection Agency (EPA) strengthened the eight-hour ozone standard from 0.08 parts per million (ppm) to 0.075 ppm. Under the 0.075 ppm (75 parts per billion) standard, the EPA designated Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties as nonattainment with a moderate classification, effective July 20, 2012. These 10 counties form the Dallas-Fort Worth (DFW) 2008 eight-hour ozone standard moderate nonattainment area. The attainment date for moderate nonattainment areas was established in the EPA's implementation rule for the 2008 ozone NAAQS, published in the *Federal Register* (FR) on May 21, 2012 (77 FR 30160), and was set as December 31, 2018. On December 23, 2014, the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit Court) ruled on a lawsuit filed by the Natural Resources Defense Council, which resulted in vacatur of the EPA's December 31 attainment date for the 2008 0zone NAAQS. As part of the EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements*; *Final Rule* (2008 ozone standard SIP requirements rule) published in the *Federal Register* on March 6, 2015 (80 FR 12264), the EPA modified 40 Code of Federal Regulations (CFR) §51.1103 consistent with the D.C. Circuit Court decision to establish attainment dates that run from the effective date of designation, i.e., July 20, 2012, rather than the end of the 2012 calendar year. As a result, the attainment date for the DFW moderate nonattainment area has changed from December 31, 2018 to July 20, 2018. In addition, because the attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment date, the attainment year for the DFW moderate nonattainment area has changed from 2018 to 2017.

In order to address the change in the attainment year, this state implementation plan (SIP) revision now provides a required RFP analysis for the 2017 attainment year, including a contingency plan and a motor vehicle emissions budget (MVEB), but also continues to demonstrate an 18% emissions reduction in ozone precursors from the 2011 base year through a 2018 attainment year, a 3% emissions reduction demonstration for contingency for each milestone year, and updated RFP MVEB for each milestone year, in the event that the 2018 attainment year requirement is reinstated.

This SIP revision is not required to demonstrate attainment of the ozone NAAQS but rather to demonstrate that the DFW nonattainment area will meet the RFP requirements for moderate ozone nonattainment areas. RFP requirements for moderate ozone nonattainment areas, as specified in Section 182(c)(2) of the 1990 FCAA Amendments and in 40 CFR §51.910, involve reducing ozone precursor emissions (nitrogen oxides (NO_X) and volatile organic compounds (VOC)) at annual increments between the base year and the attainment year.

With a 2017 attainment year, the DFW RFP SIP revision is required by the FCAA to demonstrate a 15% emissions reduction in ozone precursors from the 2011 base year through the 2017 attainment year and a 3% reduction for attainment year contingency for the DFW 2008 eight-hour ozone nonattainment area according to the following minimum increments:

- 15% emissions reduction in VOC for the six-year period from January 1, 2012 through December 31, 2017 for the newly designated one-county portion of the DFW 2008 ozone nonattainment area consisting of Wise County;

- 15% emissions reduction in VOC and/or NO_X for the six-year period from January 1, 2012 through December 31, 2017 for the previously designated nine-county portion of the DFW 2008 ozone nonattainment area consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties;

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 as attainment year RFP contingency for all counties of the DFW 2008 ozone nonattainment area.

Since the attainment date changed after proposal of this SIP revision, Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year,* was added to document RFP requirements based upon the revised attainment date.

Alternatively, if the 2018 attainment year is reinstated, this SIP revision would be required by the FCAA to demonstrate an 18% emissions reduction in ozone precursors from the 2011 base year through a 2018 attainment year as well as a 3% reduction for milestone year contingency and a 3% reduction for attainment year contingency for the DFW 2008 eight-hour ozone nonattainment area according to the following minimum increments:

- 15% emissions reduction in VOC for the six-year period from January 1, 2012 through December 31, 2017 for the newly designated one-county portion of the DFW 2008 ozone nonattainment area consisting of Wise County;

- 15% emissions reduction in VOC and/or NO_X for the six-year period from January 1, 2012 through December 31, 2017 for the previously designated nine-county portion of the DFW 2008 ozone nonattainment area consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties;

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 for all counties of the DFW 2008 eight-hour ozone nonattainment area;

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 as an RFP milestone year contingency for all counties of the DFW 2008 ozone nonattainment area; and

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2019 through December 31, 2019 as attainment year RFP contingency for all counties of the DFW 2008 ozone nonattainment area.

The 2017 attainment year requirements are identical to the 2017 milestone year requirements for the 2018 attainment year RFP demonstration, as documented above. The 2017 emissions inventories, non-creditable emissions reductions, target level of emissions, and creditable emissions reductions are the same as the RFP 2017 milestone year demonstration included in Chapters 2 through 4 of this DFW RFP SIP revision.

The DFW RFP SIP revision was proposed with on-road mobile source emissions inventories determined using the Motor Vehicle Emission Simulator (MOVES) 2010b model. Between proposal and adoption, a final on-road mobile source emissions inventory was completed using the MOVES2014 model. The final MOVES2014-based on-road mobile source emissions inventories were used to develop the RFP analysis presented in this SIP revision.

This SIP revision demonstrates RFP for a 2017 attainment year, to account for the attainment date change resulting from the D.C. Circuit Court ruling and finalization of the 2008 ozone standard SIP requirements rule. Additionally, this SIP revision demonstrates RFP for a 2017 milestone year and a 2018 attainment year, as proposed, as an alternate submittal in the event that the 2018 attainment year is reinstated. The 2018 attainment year RFP analysis serves as a reference for the calculations used to develop the RFP demonstration, contingency demonstration, and MVEB for the 2017 attainment year as provided in Chapter 6. Required RFP contingency reductions are also demonstrated in this SIP revision.

The RFP methodology involves development of the base year and milestone year emissions inventories, emissions reductions for each milestone year, and an estimate of the effects of non-creditable reductions due to rules promulgated prior to the 1990 FCAA Amendments. The amount of emissions reductions is determined through the RFP methodology. Once calculated, the milestone target levels and emissions inventories can be compared to determine if the forecasted post-control emissions inventories are less than the target level, thus meeting FCAA RFP requirements. The results of the DFW RFP milestone year comparisons are provided in Chapter 3: *Progress Toward Meeting Target Emissions Levels*.

This SIP revision also sets the NO_X and VOC MVEB for transportation conformity purposes. This SIP revision establishes an MVEB for a 2017 attainment year, as detailed in Chapter 6 and provides an alternative MVEB for a 2017 milestone year and 2018 attainment year, as proposed. An MVEB is the on-road mobile source allocation of the total allowable emissions for each applicable criteria pollutant or precursor, as defined in the SIP. Transportation conformity determinations must be performed using the budget test once the EPA determines the budget adequate for transportation conformity purposes. To pass the budget test, areas must demonstrate that the estimated emissions from transportation plans, programs, and projects do not exceed the MVEB for the established year.

This SIP revision includes Wise County as part of the DFW 2008 eight-hour ozone standard nonattainment area since it was designated as nonattainment by the EPA in the final designations rule published in the *Federal Register* on May 21, 2012 (77 FR 30088). However, the Texas Commission on Environmental Quality and other concerned parties are currently challenging whether the EPA's inclusion of Wise County in the DFW 2008 eight-hour ozone nonattainment area was lawful. These challenges are currently pending in the D.C. Circuit Court.

SECTION V-A: LEGAL AUTHORITY

General

The Texas Commission on Environmental Quality (TCEQ) has the legal authority to implement, maintain, and enforce the National Ambient Air Quality Standards (NAAQS) and to control the quality of the state's air, including maintaining adequate visibility.

The first air pollution control act, known as the Clean Air Act of Texas, was passed by the Texas Legislature in 1965. In 1967, the Clean Air Act of Texas was superseded by a more comprehensive statute, the Texas Clean Air Act (TCAA), found in Article 4477-5, Vernon's Texas Civil Statutes. The legislature amended the TCAA in 1969, 1971, 1973, 1979, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, and 2013. In 1989, the TCAA was codified as Chapter 382 of the Texas Health and Safety Code.

Originally, the TCAA stated that the Texas Air Control Board (TACB) is the state air pollution control agency and is the principal authority in the state on matters relating to the quality of air resources. In 1991, the legislature abolished the TACB effective September 1, 1993, and its powers, duties, responsibilities, and functions were transferred to the Texas Natural Resource Conservation Commission (TNRCC). With the creation of the TNRCC, the authority over air quality is found in both the Texas Water Code and the TCAA. Specifically, the authority of the TNRCC is found in Chapters 5 and 7. Chapter 5, Subchapters A - F, H - J, and L, include the general provisions, organization, and general powers and duties of the TNRCC, and the responsibilities and authority of the executive director. Chapter 5 also authorizes the TNRCC to implement action when emergency conditions arise and to conduct hearings. Chapter 7 gives the TNRCC enforcement authority. In 2001, the 77th Texas Legislature continued the existence of the TNRCC until September 1, 2013, and changed the name of the TNRCC to the TCEQ. In 2009, the 81st Texas Legislature, during a special session, amended section 5.014 of the Texas Water Code, changing the expiration date of the TCEQ to September 1, 2011, unless continued in existence by the Texas Sunset Act. In 2011, the 82nd Texas Legislature continued the existence of the TCEQ until 2023.

The TCAA specifically authorizes the TCEQ to establish the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general, comprehensive plan. The TCAA, Subchapters A - D, also authorize the TCEQ to collect information to enable the commission to develop an inventory of emissions; to conduct research and investigations; to enter property and examine records; to prescribe monitoring requirements; to institute enforcement proceedings; to enter into contracts and execute instruments; to formulate rules; to issue orders taking into consideration factors bearing upon health, welfare, social and economic factors, and practicability and reasonableness; to conduct hearings; to establish air quality control regions; to encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and to establish and operate a system of permits for construction or modification of facilities.

Local government authority is found in Subchapter E of the TCAA. Local governments have the same power as the TCEQ to enter property and make inspections. They also may make recommendations to the commission concerning any action of the TCEQ that affects their territorial jurisdiction, may bring enforcement actions, and may execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA and the rules or orders of the commission.

Subchapters G and H of the TCAA authorize the TCEQ to establish vehicle inspection and maintenance programs in certain areas of the state, consistent with the requirements of the Federal Clean Air Act; coordinate with federal, state, and local transportation planning agencies to develop and implement transportation programs and measures necessary to attain and maintain the NAAQS; establish gasoline volatility and low emission diesel standards; and fund and authorize participating counties to implement vehicle repair assistance, retrofit, and accelerated vehicle retirement programs.

Applicable Law

The following statutes and rules provide necessary authority to adopt and implement the state implementation plan (SIP). The rules listed below have previously been submitted as part of the SIP.

Statutes

All sections of each subchapter are included, unless otherwise noted.

TEXAS HEALTH & SAFETY CODE, Chapter 382	September 1, 2013
TEXAS WATER CODE	September 1, 2013

Chapter 5: Texas Natural Resource Conservation Commission
- Subchapter A: General Provisions
- Subchapter B: Organization of the Texas Natural Resource Conservation Commission
- Subchapter C: Texas Natural Resource Conservation Commission
- Subchapter D: General Powers and Duties of the Commission
- Subchapter E: Administrative Provisions for Commission
- Subchapter F: Executive Director (except §§5.225, 5.226, 5.227, 5.2275,5.231, 5.232, and 5.236)
- Subchapter H: Delegation of Hearings
- Subchapter I: Judicial Review
- Subchapter J: Consolidated Permit Processing
- Subchapter L: Emergency and Temporary Orders (§§5.514, 5.5145, and 5.515 only)
- Subchapter M: Environmental Permitting Procedures (§5.558 only)

Chapter 7: Enforcement
- Subchapter A: General Provisions (§§7.001, 7.002, 7.0025, 7.004, and 7.005 only)
- Subchapter B: Corrective Action and Injunctive Relief (§7.032 only)
- Subchapter C: Administrative Penalties
- Subchapter D: Civil Penalties (except §7.109)
- Subchapter E: Criminal Offenses and Penalties: §§7.177, 7.179-7.183

Rules

All of the following rules are found in 30 Texas Administrative Code, as of the following latest effective dates:

Chapter 7: Memoranda of Understanding, §§7.110 and 7.119	December 13, 1996 and May 2, 2002
Chapter 19: Electronic Reporting	March 15, 2007
Chapter 35: Subchapters A-C, K: Emergency and Temporary Orders and Permits; Temporary Suspension or Amendment of Permit Conditions	July 20, 2006

Chapter 39: Public Notice, §§39.402(a)(1) - (6), (8), and (10) - (12), 39.405(f)(3) and (g), (h)(1)(A) - (4), (6), (8) - (11), (i) and (j), 39.407, 39.409, 39.411(a), (e)(1) - (4)(A)(i) and (iii), (4)(B), (5)(A) and (B), and (6) - (10), (11)(A)(i) and (iii) and (iv), (11)(B) - (F), (13) and (15), and (f)(1) - (8), (g) and (h), 39.418(a), (b)(2)(A), (b)(3), and (c), 39.419(e), 39.420 (c)(1)(A) - (D)(i)(I) and (II), (D)(ii), (c)(2), (d) - (e), and (h), and 39.601 - 39.605	April 17, 2014
Chapter 55: Requests for Reconsideration and Contested Case Hearings; Public Comment, §§55.150, 55.152(a)(1), (2), (5), and (6) and (b), 55.154(a), (b), (c)(1) - (3), and (5), and (d) - (g), and 55.156(a), (b), (c)(1), (e), and (g)	June 24, 2010
Chapter 101: General Air Quality Rules	April 17, 2014
Chapter 106: Permits by Rule, Subchapter A	April 17, 2014
Chapter 111: Control of Air Pollution from Visible Emissions and Particulate Matter	February 6, 2014
Chapter 112: Control of Air Pollution from Sulfur Compounds	July 16, 1997
Chapter 113: Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants	May 14, 2009
Chapter 114: Control of Air Pollution from Motor Vehicles	May 21, 2015
Chapter 115: Control of Air Pollution from Volatile Organic Compounds	October 2, 2014
Chapter 116: Permits for New Construction or Modification	July 31, 2014
Chapter 117: Control of Air Pollution from Nitrogen Compounds	May 2, 2013
Chapter 118: Control of Air Pollution Episodes	March 5, 2000
Chapter 122: §122.122: Potential to Emit	April 17, 2014
Chapter 122: §122.215: Minor Permit Revisions	June 3, 2001
Chapter 122: §122.216: Applications for Minor Permit Revisions	June 3, 2001
Chapter 122: §122.217: Procedures for Minor Permit Revisions	December 11, 2002
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ABY	adjusted base year
AERR	Air Emissions Reporting Requirements
APU	auxiliary power unit
ASLRRA	American Short Line and Regional Railroad Association
CFR	Code of Federal Regulations
DERC	Discrete Emissions Reduction Credit
DFW	Dallas-Fort Worth
EDMS	Emission and Dispersion Modeling System
EIA	United States Energy Information Administration
EIQ	emissions inventory questionnaire
EPA	United States Environmental Protection Agency
ERC	Emissions Reduction Credit
ERG	Eastern Research Group
FAA	Federal Aviation Administration
FCAA	Federal Clean Air Act
FMVCP	Federal Motor Vehicle Control Program
FR	*Federal Register*
GSE	ground support equipment
HPMS	highway performance monitoring system
I/M	inspection and maintenance
MOVES	Motor Vehicle Emission Simulator
MVEB	motor vehicle emissions budget
NAAQS	National Ambient Air Quality Standard
NCTCOG	North Central Texas Council of Governments
NEI	National Emissions Inventory
NO_X	nitrogen oxides
ppb	parts per billion
ppm	parts per million
RFG	reformulated gasoline
RFP	reasonable further progress
ROP	rate of progress
RRC	Railroad Commission of Texas
RVP	Reid vapor pressure

SCC	source classification code
SI	spark ignition
SIP	State Implementation Plan
STARS	State of Texas Air Reporting System
TAC	Texas Administrative Code
TACB	Texas Air Control Board
TCAA	Texas Clean Air Act
TCEQ	Texas Commission on Environmental Quality (commission)
TDM	travel demand model
TexAER	Texas Air Emissions Repository
TexN	Texas NONROAD Model
TNRCC	Texas Natural Resource Conservation Commission
tpd	tons per day
TxDOT	Texas Department of Transportation
TxLED	Texas Low Emission Diesel
VMT	vehicle miles traveled
VOC	volatile organic compounds

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CHAPTER 1: GENERAL

1.1 DALLAS-FORT WORTH REASONABLE FURTHER PROGRESS BACKGROUND

The History of the Texas State Implementation Plan, a comprehensive overview of the state implementation plan (SIP) revisions submitted to the United States Environmental Protection Agency (EPA) by the State of Texas, is available on the Introduction to the SIP Web page (http://www.tceq.texas.gov/airquality/sip/sipintro.html/) through the Texas Commission on Environmental Quality (TCEQ) website (http://www.tceq.texas.gov).

1.1.1 One-Hour Ozone Standard

Under the one-hour ozone National Ambient Air Quality Standard (NAAQS) of 0.12 parts per million (ppm), the Dallas-Fort Worth (DFW) nonattainment area comprised Collin, Dallas, Denton, and Tarrant Counties. The EPA designated this four-county area as a moderate nonattainment area in 1991 with an attainment date of November 15, 1996. The Texas Natural Resources Conservation Commission (TNRCC), a predecessor to the TCEQ, adopted a rate of progress (ROP) SIP revision on July 24, 1996, which demonstrated a 15% reduction in volatile organic compounds (VOC) between 1990 and 1996 for the moderate DFW one-hour ozone nonattainment area. The EPA fully approved this SIP revision on April 12, 2005 (70 *Federal Register* (FR) 18993).

On February 18, 1998, the EPA published a final determination that the DFW moderate one-hour ozone nonattainment area failed to attain the standard by the November 15, 1996 attainment date (63 FR 8128). The EPA reclassified the four-county DFW nonattainment area from moderate to serious, effective March 20, 1998, and established a new attainment date of November 15, 1999. On October 15, 1999 the TNRCC adopted a 9% ROP SIP revision for the DFW serious nonattainment area that included emissions reductions necessary to complete the ROP requirements for the years between 1996 and 1999. The EPA approved the 9% ROP SIP revision on January 12, 2000 (65 FR 1862). In June 2005, the one-hour ozone standard was revoked after being replaced by the more stringent eight-hour ozone standard in 1997.

1.1.2 1997 Eight-Hour Ozone Standard

In July 1997, the EPA revised the NAAQS for ground-level ozone and replaced the one-hour ozone standard with an eight-hour standard set at 0.08 ppm. The eight-hour ozone standard became effective on September 16, 1997. On April 30, 2004, nonattainment area designations were published as part of the first phase of the EPA's implementation rule for the 1997 eight-hour ozone standard (69 FR 23936). The DFW nonattainment area was redefined as Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties. The DFW 1997 eight-hour ozone nonattainment area was classified as a moderate, with an attainment date of June 15, 2010. The TCEQ was required to submit a reasonable further progress (RFP) SIP revision to the EPA for the DFW eight-hour ozone nonattainment area by June 15, 2007.

The second phase of EPA's implementation rule for the 1997 eight-hour ozone standard (70 FR 71612) established RFP submittal guidelines that required nonattainment areas partially composed of one-hour ozone standard nonattainment areas with approved 15% ROP SIP revisions, like the DFW area, to choose between two options. The first option was to submit a 1997 eight-hour ozone standard RFP SIP revision demonstrating 15% VOC emissions reductions for the entire eight-hour nonattainment area. The second option was to submit a 1997 eight-hour ozone standard RFP SIP revision demonstrating 15% VOC emissions reductions for the newly designated portion of the eight-hour nonattainment area and VOC and/or nitrogen oxides (NO_X) emissions reductions for the portion of the nonattainment area containing an approved

one-hour ozone standard 15% ROP SIP revision. On May 23, 2007, the commission adopted the 2007 Dallas-Fort Worth Eight-Hour Ozone Nonattainment Area Reasonable Further Progress State Implementation Plan Revision (Project No. 2006-031-SIP-NR) based on the second option. Since Collin, Dallas, Denton, and Tarrant Counties already had an approved plan containing the 15% VOC-only emissions reduction, only the five newly designated counties were required to demonstrate a 15% VOC reduction while the one-hour ozone nonattainment counties were permitted to substitute NO_X for VOC. The EPA approved the 1997 eight-hour ozone RFP SIP revision for the DFW nonattainment area on October 7, 2008 (73 FR 58475), including the 15% VOC-only emissions reduction for the newly designated counties.

The DFW area failed to meet the June 15, 2010 attainment deadline under its moderate classification. Effective January 19, 2011, the EPA published a final determination of failure to attain and reclassification of the DFW area from a moderate to a serious nonattainment area for the 1997 eight-hour ozone standard (75 FR 79302). The EPA set January 19, 2012 as the deadline for Texas to submit attainment demonstration and RFP SIP revisions addressing the serious ozone nonattainment area requirements of the Federal Clean Air Act (FCAA).

On December 7, 2011, the TCEQ adopted the 2011 DFW 1997 Eight-Hour Ozone RFP SIP Revision (Project No. 2010-023-SIP-NR). The 2011 RFP SIP revision demonstrated a 9% emissions reduction between 2008 and 2011 and a 3% emissions reduction between 2011 and 2012 and also included motor vehicle emissions budgets (MVEB) for each milestone year and a contingency plan. The 2011 RFP SIP revision used the EPA's Motor Vehicle Emission Simulator (MOVES) model to develop the base year and milestone year on-road mobile emissions inventories and the milestone year MVEB. The EPA published final approval of the 2011 DFW RFP SIP revision on November 12, 2014 (79 FR 67068).

1.1.3 2008 Eight-Hour Ozone Standard

On March 27, 2008, the EPA lowered the primary and secondary eight-hour ozone standard to 0.075 ppm (73 FR 16436). On May 21, 2012, the EPA published in the *Federal Register* final designations for the 2008 eight-hour ozone standard (77 FR 30088). A 10-county DFW area including Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties was designated nonattainment and classified moderate under the 2008 eight-hour ozone standard, effective July 20, 2012. The DFW 2008 eight-hour ozone nonattainment area includes the same nine counties that were designated nonattainment under the 1997 eight-hour ozone standard along with the addition of Wise County. The attainment date for moderate nonattainment areas was established in the EPA's implementation rule for the 2008 ozone NAAQS published on May 21, 2012 (77 FR 30160) and was set as December 31, 2018.

On December 23, 2014, the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit Court) ruled on a lawsuit filed by the Natural Resources Defense Council, which resulted in vacatur of the EPA's December 31 attainment date for the 2008 0zone NAAQS. As part of the EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements*; *Final Rule* (2008 ozone standard SIP requirements rule) published in the *Federal Register* on March 6, 2015 (80 FR 12264), the EPA modified 40 Code of Federal Regulations §51.1103 consistent with the D.C. Circuit Court decision to establish attainment dates that run from the effective date of designation, i.e., July 20, 2012, rather than the end of the 2012 calendar year. As a result, the attainment date for the DFW moderate nonattainment area has changed from December 31, 2018 to July 20, 2018. In addition, because the attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment date, the attainment year for the DFW moderate nonattainment area has changed from 2018 to 2017.

In order to address the change in the attainment year, this SIP revision now provides a required RFP analysis for the 2017 attainment year, including a contingency plan and an MVEB, but also continues to demonstrate an 18% emissions reduction in ozone precursors from the 2011 base year through a 2018 attainment year, a 3% emissions reduction demonstration for contingency for each milestone year, and updated RFP MVEB for each milestone year, in the event that the 2018 attainment year requirement is reinstated.

Since the attainment date changed after proposal of this SIP revision, Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year,* was added to document RFP requirements based upon the revised attainment date. The narrative in Chapters 2 through 5, however, reflects the EPA's original proposed attainment date of December 31, 2018.

This SIP revision demonstrates RFP for a 2017 attainment year, to account for the attainment date change resulting from the D.C. Circuit Court ruling and finalization of the 2008 ozone SIP requirements rule. Additionally, this SIP revision demonstrates RFP for a 2017 milestone year and a 2018 attainment year, as proposed, as an alternate submittal in the event that the 2018 attainment year is reinstated. The 2018 attainment year RFP analysis serves as a reference for the calculations used to develop the RFP demonstration, contingency demonstration, and MVEB for the 2017 attainment year as provided in Chapter 6. Required RFP contingency reductions are also demonstrated in this SIP revision.

This SIP revision includes Wise County as part of the DFW 2008 eight-hour ozone standard nonattainment area since it was designated as nonattainment by the EPA in the final designations rule published in the *Federal Register* on May 21, 2012 (77 FR 30088). However, the TCEQ and other concerned parties are currently challenging whether the EPA's inclusion of Wise County in the DFW 2008 eight-hour ozone nonattainment area was lawful. These challenges are currently pending in the D.C. Circuit Court.

1.2 RFP REQUIREMENTS

The 1990 FCAA amendments, 42 United States Code §7410, require states to submit SIP revisions that contain enforceable measures to achieve the NAAQS. The FCAA also requires states with ozone nonattainment areas classified as moderate or above to submit plans showing reasonable further progress toward attainment. The TCEQ is required to submit an RFP SIP revision for the DFW moderate nonattainment area to the EPA within three years of the effective date of designations, which is July 20, 2015. This RFP SIP revision is not required to demonstrate attainment of the ozone NAAQS but rather to demonstrate that ozone precursor emissions (NO_X and/or VOC) will be reduced by specified amounts between a 2011 base year and the DFW moderate nonattainment area's attainment year. This SIP revision includes an RFP analysis for a 2017 attainment year, to address the D.C. Circuit Court ruling and the final 2008 ozone standard SIP requirements rule, in Chapter 6, and an alternative RFP analysis for a 2018 attainment year, as proposed, in the event that the 2018 attainment year is reinstated.

This RFP SIP revision demonstrates that the DFW moderate nonattainment area will achieve emissions reductions consistent with the requirements of FCAA, §182(b)(1) and the EPA's final 2008 ozone standard SIP requirements rule. Requirements for moderate ozone nonattainment areas under the FCAA include a 15% VOC emissions reduction within six years after designation; however, the EPA's 2008 ozone standard SIP requirements rule allows nonattainment areas

with a previously approved plan meeting the 15% VOC requirement under either the one-hour ozone standard or the 1997 eight-hour ozone standard to substitute reductions in NO_X for VOC.[1]

All of the DFW 2008 eight-hour ozone nonattainment area counties, with the exception of Wise County, have met the 15% VOC-only emissions reduction requirement for RFP under the revoked one-hour ozone standard or the 1997 eight-hour ozone standard. This SIP revision, therefore, demonstrates the required 15% VOC-only emissions reduction for Wise County and demonstrates a 15% emissions reduction for the existing 1997 eight-hour ozone nonattainment counties by combining NO_X and VOC emissions reductions.

The RFP calculations documented in this SIP revision rely on an RFP base year of 2011 and a December 31, 2018, attainment date. Additionally, the RFP demonstration and related elements for a 2017 attainment year, in accordance with the D.C. Circuit Court ruling and final 2008 ozone standard SIP requirements rule, are presented in Chapter 6.

For the revised attainment date of July 20, 2018 (2017 attainment year), the 15% reduction requirement between the 2011 base year and 2017 attainment year covers the period from January 1, 2012 through December 31, 2017. An RFP analysis based on a 2011 base year and 2017 attainment year, in accordance with the D.C. Circuit Court ruling and the final 2008 ozone standard SIP requirements rule, is provided in Chapter 6.

To address a 2017 attainment year, this SIP revision includes minimum RFP emissions reductions of:

- 15% emissions reduction in VOC for the six-year period from January 1, 2012 through December 31, 2017 for the newly designated one-county portion of the DFW 2008 ozone nonattainment area consisting of Wise County;

- 15% emissions reduction in VOC and/or NO_X for the six-year period from January 1, 2012 through December 31, 2017 for the previously designated nine-county portion of the DFW 2008 ozone nonattainment area consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties;

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 as attainment year RFP contingency for all counties of the DFW 2008 ozone nonattainment area.

In addition to demonstrating the required emissions reductions for a 2017 attainment year, as detailed in Chapter 6, the DFW RFP SIP revision establishes an MVEB for the 2017 attainment year and an analysis of contingency measure requirements, to be implemented if the area fails to achieve the RFP milestones in 2017.

Alternatively, if the 2018 attainment year, as proposed, is reinstated, this SIP revision includes minimum RFP emissions reductions of:

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[1] NO_X may be substituted for VOC under conditions defined in the EPA's December 1993 NO_X Substitution Guidance (http://www.epa.gov/ttncaaa1/t1/memoranda/noxsubst.pdf).

- 15% emissions reduction in VOC for the six-year period from January 1, 2012 through December 31, 2017 for the newly designated one-county portion of the DFW 2008 ozone nonattainment area consisting of Wise County;

- 15% emissions reduction in VOC and/or NO_X for the six-year period from January 1, 2012 through December 31, 2017 for the previously designated nine-county portion of the DFW 2008 ozone nonattainment area consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties;

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 for all counties of the DFW 2008 eight-hour ozone nonattainment area;

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 as an RFP milestone year contingency for all counties of the DFW2008 ozone nonattainment area; and

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2019 through December 31, 2019 as attainment year RFP contingency for all counties of the DFW2008 ozone nonattainment area.

In accordance with the 2008 ozone standard SIP requirements rule, if a state chooses 2011 as a base year for a moderate area designated nonattainment in 2012, the 15% reduction requirement covers the period from January 1, 2012 through December 31, 2017. Since the six-year period concludes one year prior to the December 31, 2018 attainment date, additional reductions would be required to cover the 2018 attainment year. This SIP revision incorporates an additional 3% emissions reduction to cover the one-year period from January 1, 2018 through December 31, 2018. In addition, this SIP revision includes updated 2017 and 2018 RFP on-road MVEBs as well as emissions reductions for contingency to be implemented if the area fails to achieve the RFP milestones in 2017 and 2018.

The 2017 attainment year requirements are identical to the 2017 milestone year requirements for the 2018 attainment year RFP demonstration, as documented above. The 2017 emissions inventories, non-creditable emissions reductions, target level of emissions, and creditable emissions reductions are the same as the RFP 2017 milestone year demonstration included in Chapters 2 through 4 of this DFW RFP SIP revision.

This SIP revision also provides updated 2011 emissions inventories for point, area, non-road mobile, and on-road mobile sources.

The DFW RFP SIP revision was proposed with on-road mobile source emissions inventories determined using the EPA's MOVES2010b model. The EPA initially made MOVES2014 available on July 31, 2014 and officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343). An update was released on October 27, 2014. Due to the delay of the MOVES2014 model finalization, the SIP development schedule did not allow time for inclusion of link-based MOVES2014 inventory values in the proposed version of this SIP revision. The TCEQ issued a supplement on January 12, 2015 to provide an RFP analysis using a draft MOVES2014-based on-road emissions

inventory for consideration during the public comment period.[2] Comments were received from the City of Mesquite and the Regional Transportation Council of the North Central Texas Council of Governments (NCTCOG) in support of using MOVES2014 emissions inventories in the adopted version of the DFW RFP SIP revision. In February 2015, NCTCOG completed final MOVES2014-based on-road mobile emissions inventories and submitted the data to the TCEQ. The final MOVES2014-based on-road mobile source emissions inventories were used to develop the RFP analysis presented in this SIP revision.

This SIP revision demonstrates RFP for a 2017 attainment year, to account for the attainment date change resulting from the D.C. Circuit Court ruling and finalization of the 2008 ozone standard SIP requirements rule. Additionally, this SIP revision demonstrates RFP for a 2017 milestone year and 2018 attainment year, as proposed, as an alternate submittal in the event that the 2018 attainment year is reinstated. The 2018 attainment year RFP analysis serves as a reference for the calculations used to develop the RFP demonstration, contingency demonstration, and MVEB for the 2017 attainment year, as provided in Chapter 6. Required RFP contingency reductions and MVEBs are also included in this revision. A summary of the calculations performed to demonstrate the DFW area's progress toward meeting RFP requirements can be found in Appendix 1: *Reasonable Further Progress Demonstration Spreadsheet*.

1.3 PUBLIC HEARING AND COMMENT INFORMATION

The commission held public hearings on this SIP revision on January 15, 2015 at 6:30 p.m. in Arlington at the Arlington City Hall Council Chambers and on January 22, 2015 at 10:00 a.m. in Austin at the TCEQ Headquarters. Notice of the public hearings for this SIP revision was published in the *Texas Register* as well as the *Dallas Morning News*, *Houston Chronicle*, and *Austin American-Statesman* newspapers.

The public comment period opened on December 26, 2014 and was originally scheduled to close on January 30, 2015. However, a supplement to the proposed DFW RFP SIP revision was issued by the TCEQ on January 12, 2015 to provide additional technical detail regarding MOVES2014-based on-road mobile source emissions estimates that became available after the SIP revision was approved for proposal by the commission on December 10, 2014. Due to the supplemental technical information, the comment period for the proposed SIP revision was extended to February 11, 2015 to allow for a full 30-day comment period for all components of the proposed SIP package.

Written comments were accepted via mail, fax, and through the eComments (http://www1.tceq.texas.gov/rules/ecomments/index.cfm) system. The TCEQ received written comments on the DFW RFP SIP revision from the City of Mesquite, the RTC, the EPA, Sierra Club, Downwinders at Risk, and one individual. A summary of the comments and the TCEQ response is provided as part of this SIP revision in the Response to Comments.

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[2] The supplemental information issued on January 12, 2015 is provided in *Appendix 11: Technical Supplement to the December 10, 2014 proposal of the Dallas-Fort Worth Reasonable Further Progress State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard Nonattainment Area* of this SIP revision.

1.4 SOCIAL AND ECONOMIC CONSIDERATIONS

No new control strategies have been incorporated into this SIP revision. Therefore, there are no additional social or economic costs associated with this revision.

1.5 FISCAL AND MANPOWER RESOURCES

The state has determined that its fiscal and manpower resources are adequate and will not be adversely affected through the implementation of this plan.

CHAPTER 2: EMISSIONS INVENTORIES

2.1 INTRODUCTION

The Federal Clean Air Act (FCAA) Amendments of 1990 require that reasonable further progress (RFP) emissions inventories be prepared for ozone nonattainment areas. Tropospheric ozone is produced when ozone precursors, volatile organic compounds (VOC) and nitrogen oxides (NO_X), undergo photochemical reactions in the presence of sunlight.

The Texas Commission on Environmental Quality (TCEQ) maintains an inventory of current information for sources of NO_X and VOC that identifies the types of emissions sources present in an area, the amount of each pollutant emitted, and the types of processes and control devices employed at each plant or source category. The total inventory of NO_X and VOC emissions for an area is derived from estimates developed for four general categories of emissions sources: point, area, mobile (both non-road and on-road), and biogenic. The emissions inventory also provides data for a variety of air quality planning tasks, including establishing baseline emissions levels, calculating reduction targets, developing control strategies to achieve emissions reductions, developing emissions inputs for air quality models, and tracking actual emissions reductions against established emissions growth and control budgets.

Under the 1997 eight-hour ozone standard of 0.08 parts per million (ppm), the TCEQ was required to submit an RFP State Implementation Plan (SIP) revision for the nine-county Dallas-Fort Worth (DFW) serious nonattainment area to the United States Environmental Protection Agency (EPA) by January 19, 2012. On December 7, 2011, the commission adopted the 2011 DFW 1997 Eight-Hour Ozone RFP SIP Revision (Project No. 2010-023-SIP-NR) for submittal to the EPA. The EPA published final approval of the 2011 DFW RFP SIP revision in the *Federal Register* (FR) on November 12, 2014 (79 FR 67068). On March 27, 2008, the EPA strengthened the primary and secondary eight-hour ozone standard to 0.075 ppm (73 FR 16436). On May 21, 2012, the EPA published final designations for the 2008 eight-hour ozone standard, designating a 10-county DFW area including Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties as moderate nonattainment, effective July 20, 2012 (77 FR 30088). The DFW 2008 eight-hour ozone nonattainment area includes the same nine counties that were designated nonattainment under the 1997 eight-hour ozone standard along with the addition of Wise County. The attainment date for moderate nonattainment areas was established in the EPA's implementation rule for the 2008 ozone National Ambient Air Quality Standard (NAAQS) published on May 21, 2012 (77 FR 30160) and was set as December 31, 2018.

On December 23, 2014, the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit Court) ruled on a lawsuit filed by the Natural Resources Defense Council, which resulted in vacatur of the EPA's December 31 attainment date for the 2008 0zone NAAQS. As part of the EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements; Final Rule* (2008 ozone standard SIP requirements rule) published in the *Federal Register* on March 6, 2015 (80 FR 12264), the EPA modified 40 Code of Federal Regulations §51.1103 consistent with the D.C. Circuit Court decision to establish attainment dates that run from the effective date of designation, i.e., July 20, 2012, rather than the end of the 2012 calendar year. As a result, the attainment date for the DFW moderate nonattainment area has changed from December 31, 2018 to July 20, 2018. In addition, because the attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment date, the attainment year for the DFW moderate nonattainment area has changed from 2018 to 2017. Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year*, has been added to demonstrate RFP requirements for a 2017 attainment year.

The narrative in this chapter reflects the EPA's originally proposed attainment date of December 31, 2018. However, the relevant emissions inventory statements for the 2017 milestone year, as proposed, are also valid for the 2017 attainment year.

This SIP revision demonstrates RFP for a 2017 attainment year, to account for the attainment date change resulting from the D.C. Circuit Court ruling and finalization of the 2008 ozone standard SIP requirements rule. Additionally, this SIP revision demonstrates RFP for a 2017 milestone year and a 2018 attainment year, as proposed, as an alternate submittal in the event that the 2018 attainment year is reinstated.

The 2017 attainment year requirements are identical to the 2017 milestone year requirements for the 2018 attainment year RFP demonstration. The 2017 emissions inventories, non-creditable emissions reductions, target level of emissions, and creditable emissions reductions are the same as the RFP 2017 milestone year demonstration included in Chapters 2 through 4 of this DFW RFP SIP revision. The 2018 attainment year RFP analysis serves as a reference for the calculations used to develop the RFP demonstration, contingency demonstration, and motor vehicle emissions budget (MVEB) for the 2017 attainment year as provided in Chapter 6.

All of the DFW 2008 eight-hour ozone nonattainment area counties, with the exception of Wise County, have met the 15% VOC-only emissions reduction requirement for RFP under the revoked one-hour ozone standard or the 1997 eight-hour ozone standard. This SIP revision, therefore, demonstrates the required 15% VOC-only emissions reduction for Wise County and demonstrates a 15% emissions reduction for the existing 1997 eight-hour ozone nonattainment counties by combining NO_X and VOC emissions reductions. For RFP calculation purposes, the inventories for the nine previously designated counties are separated from the Wise County inventory.

To satisfy RFP requirements under §182(b)(1) of the FCAA, states must demonstrate at least a 15% reduction in VOC emissions within the first six years from the baseline year. To complete the RFP calculations, a set of inventories and control measures reduction estimates is required. In accordance with the requirement for emissions inventories and control measures reduction estimates, this SIP revision includes the documentation of emissions inventories for the 2011 base year, for the 2017 and 2018 milestone years, and for the attainment year RFP contingency requirement. Those emissions inventories provide the basis for demonstrating how the required RFP emissions reductions will be met.

To develop an RFP SIP revision, states must: (1) determine the base year emissions for NO_X and VOC, which includes adjusting the inventory to remove certain emissions reductions for which credit cannot be taken; (2) calculate RFP target emissions reductions levels based on the 3% per year requirement; (3) determine milestone year inventories for 2017 and 2018 based upon RFP requirements; and, (4) subtract RFP-creditable emissions reductions from milestone year uncontrolled or (for point and area sources) existing controlled NO_X and VOC emissions that include growth between the baseline year and the milestone year. When the RFP controlled emissions reductions meet or exceed the calculated target emissions reductions, then RFP is demonstrated.

This DFW RFP SIP revision includes:

- a 2011 base year emissions inventory;

  The base year emissions inventory is the starting point for calculating the target levels of emissions. A base year of 2011 was selected in accordance with EPA's 2008 ozone

standard SIP requirements rule. The EPA recommended that states use the most recent triennial emissions inventory year at the time of RFP development, which was the 2011 triennial emissions inventory year.

- 2017 and 2018 adjusted base year (ABY) emissions inventories;

  The current ABY emissions inventories are adjusted for the fleet turnover effects of the pre-1990 Federal Motor Vehicle Control Program (FMVCP) and the 1992 Reid Vapor Pressure (RVP) control. All of these controls are on-road mobile source controls; therefore, only the on-road mobile source is adjusted as part of calculating the ABY emissions inventories for this RFP SIP revision.

- for mobile sources, 2017 and 2018 uncontrolled emissions inventories;

  The RFP analysis requires an uncontrolled emissions inventory with growth between the base year and a milestone year. The uncontrolled emissions inventories serve as the basis for determining the amount of emissions reductions required to meet the RFP target for each milestone year.

- for point and area sources, 2017 and 2018 emissions inventories developed using 2011 or prior controls;

  For stationary (point and area) sources, any controls implemented by the end of 2011 limit future emissions growth from these sources. Forecasted inventories for the milestone years are developed that reflect growth using existing controls implemented by the end of the base year. These inventories are referenced as "existing controlled" inventories.

- 2017 and 2018 milestone year control reductions;

  The RFP analysis requires the calculations of emissions reductions for control strategies, which are then subtracted from the uncontrolled or existing controlled emissions to determine the controlled RFP inventory value. The RFP emissions reductions for each control strategy that pertains to particular source categories are individually quantified. The controlled projected RFP emissions inventory is the result of subtracting the emissions reductions for controls that are used to demonstrate RFP from the uncontrolled or existing controlled projected emissions inventory. A discussion of RFP control strategies is provided in Chapter 4: *Control Measures to Achieve Target Levels*.

- 2017 and 2018 controlled emissions inventories; and

  The controlled emissions inventories represent the projected (forecasted) emissions inventories with all controls implemented, even controls not used or not creditable to demonstrate RFP. Due to the inclusion of non-creditable controls, these inventories may be less than the RFP emissions inventories that include only creditable controls used to demonstrate RFP.

- 2018 attainment year RFP contingency control reductions.

  The RFP analysis requires the calculation of the emissions reductions for control strategies for the year following the attainment year. These control reductions can be

implemented if a milestone requirement is not met. A discussion of the RFP contingency control strategies for this SIP revision is provided in Chapter 4.

2.1.1 Updated Uncontrolled Milestone Year Inventories for Mobile Sources

Uncontrolled milestone year emissions inventories for mobile sources represent what each milestone year's emissions would be if the post-1990 mobile control strategies were never implemented. First, emissions inventories are calculated for each source category using EPA-approved methodologies. The inventories are then combined to derive the total uncontrolled milestone year emissions inventory for NO_X and VOC. The uncontrolled milestone year emissions inventories include1990 or prior FCAA and/or state controls as well as growth in activity from 2011 to the milestone year, but the inventories do not include post-1990 FCAA and/or state controls.

2.1.2 Updated Existing Controlled Inventories for Stationary Sources

Existing controlled milestone year emissions inventories represent the estimate milestone year's emissions if no further action to control emissions growth were taken beyond the controls already accounted for in the 2011 base year emissions inventory. First, emissions inventories are calculated for each source category using EPA-approved methodologies. The inventories are then combined to derive the total milestone year emissions inventory for NO_X and VOC that reflects all controls implemented by the end of the base year. The milestone year emissions inventories include 2011 or prior FCAA and/or state controls as well as growth in activity from 2011 to the milestone year that reflects these controls, but the inventories do not include post-2011 FCAA and/or state controls.

2.1.3 Updated Controlled or Post-2011 Controlled Milestone Year Inventories

The controlled milestone year emissions inventories represent projected emissions for each milestone year, accounting for emissions growth from the 2011 base year, and any applicable controls. Emissions inventories are calculated for each inventory category using EPA-approved methodologies. Then, the inventories are combined to obtain the total controlled milestone year emissions inventories for NO_X and VOC. The controlled milestone year emissions inventories include 2011 or prior FCAA and/or state controls, growth in activity from the base year to the milestone year, and post-2011 FCAA and/or state controls used to meet RFP target emissions levels. The inventories do not include post-2011 FCAA controls that are not creditable towards (i.e., used to) meet RFP target emissions levels.

2.1.4 Updated Adjusted Base Year Inventories

The 2017 and 2018 RFP ABY emissions inventories represent the 2011 base year emissions inventory adjusted to account for reductions from non-creditable control programs that were promulgated prior to the 1990 FCAA Amendments. The controls that are non-creditable for this SIP revision include the fleet turnover effects of the pre-1990 FMVCP and the 1992 RVP control. Both of these non-creditable controls are for on-road mobile sources; therefore, only the on-road mobile source is adjusted as part of calculating the ABY emissions inventories for this RFP SIP revision. For point, area, and non-road mobile sources, the ABY emissions inventory is equal to the base year emissions inventory. For each milestone year, the ABY emissions inventory for on-road mobile sources is added to the base year emissions inventories for the other source categories to obtain the total ABY emissions inventories for VOC and NO_X. The 2017 and 2018 ABY emissions inventories are used to calculate the RFP percent reductions. The on-road mobile source ABY emissions inventories are also used to quantify the non-creditable reductions that are used in the RFP target calculations.

2.2 POINT SOURCES

2.2.1 Emissions Inventory Development

Stationary point source emissions data are collected annually from sites that meet the reporting requirements of Title 30 Texas Administrative Code (TAC) § 101.10. The TCEQ emissions inventory reporting rule establishes emissions inventory reporting thresholds in ozone nonattainment areas that are currently at or less than major source thresholds in the DFW area. Therefore, some minor sources in the DFW ozone nonattainment area report to the point source emissions inventory. To collect the data, the TCEQ provides detailed reporting instructions and tools for completing and submitting emissions inventory questionnaires (EIQ). Companies may either download and complete a paper EIQ or submit emissions inventory data using a Web-based system. Companies are required to report emissions data and to provide sample calculations used to determine the emissions. Information characterizing the process equipment, the abatement units, and the emission points is also required.

All data submitted in the EIQ are reviewed for quality assurance purposes and then stored in the State of Texas Air Reporting System (STARS) database. The TCEQ's Point Source Emissions Inventory Web page (https://www.tceq.texas.gov/airquality/point-source-ei/psei.html) contains EIQ guidance documents and other historical point source emissions of major pollutants. Additional information is available upon request from the TCEQ's Air Quality Division.

2.2.2 Updated 2011 Base Year Inventory

The TCEQ extracted the 2011 base year inventory data from STARS on June 5, 2014. The extracted data included reported ozone season daily emissions of NO_X and VOC from each site in the DFW area that submitted a 2011 EIQ and reflected revisions made on or before the extract date.

2.2.3 Updated Milestone Year Inventories

Updated milestone inventories were developed according to the general requirements described in Section 2.1: *Introduction*. The TCEQ designated the 2012 inventory as the starting point for emission inventory projections for each of the milestone years (2017 and 2018) because 2012 is the most recent year with available point source data. The 2012 point source inventory data were extracted from STARS on June 5, 2014. The dataset included reported ozone season daily emissions of NO_X and VOC for each site in the DFW area that submitted a 2012 EIQ and reflected revisions submitted by May 1, 2014.

In the development of the milestone year 2017 and 2018 inventories, the TCEQ projected 2012 emissions from major and minor sources separately and then applied available emissions credits to the inventories as detailed in Appendix 2: *Development of Reasonable Further Progress Point Source Emissions Inventories for the Dallas-Fort Worth Nonattainment Area*.

For each future milestone year inventory (2017 and 2018), the TCEQ reviewed both the major and minor sources separately. For major sources, the TCEQ evaluated cement kilns separately from other major sources. Cement kiln NO_X emissions were projected using the 30 TAC Chapter 117 cap, which limits future emissions growth to the cap levels. The 30 TAC Chapter 117 cap provides a conservative estimate of emissions growth.

Other major source emissions were projected by adding emissions growth allowed under the major modification thresholds. For the nine-county DFW area, which is currently classified as serious nonattainment for the 1997 eight-hour ozone standard, the serious nonattainment major modification threshold for ozone precursors of 25 tons per year was applied. For Wise County,

which is currently classified as moderate nonattainment for the 2008 eight-hour ozone standard, the moderate nonattainment major modification threshold for ozone precursors of 40 tons per year was applied. A daily average of this growth was calculated as detailed in Appendix 2 and this value was added to each site's 2012 emissions value for the 2017 milestone year. Title V operating permit data were reviewed to identify sites that were major for ozone precursors.

Future minor source emissions were projected by growth factors for each milestone year. Growth factors for sites associated with oil and gas exploration were derived from area source growth factors for the Barnett Shale. These growth factors reflect recent oil and gas activity in the DFW area and are consistent with area source inventory development methods. Growth factors for other minor source emissions were derived from the Moody's Economy, Inc. factor set updated in 2010. The Moody's Economy, Inc. factors were the most current county-level emissions growth factors available at the time of this inventory development.

Finally, each of the milestone year inventories were adjusted to account for emissions credits. Emissions credits are banked emissions reductions that may be added back to the airshed in the future through the use of these emissions credits either to modify existing facilities, construct new facilities, or by facilities to demonstrate compliance with emissions limit obligations where provided for in commission rules. To account for the possible use of the banked NO_X and VOC emissions, unused Emissions Reduction Credits (ERCs) and Discrete Emissions Reduction credits (DERCs) were applied to the inventories, as discussed in Appendix 2.

A summary of the point source RFP inventories is presented in the following tables:

- Table 2-1: *DFW RFP Point Source NO_X Emissions for Nine Previously Designated Counties*;
- Table 2-2: *DFW RFP Point Source VOC Emissions for Nine Previously Designated Counties*;
- Table 2-3: *DFW RFP Point Source NO_X Emissions for Wise County*; and
- Table 2-4: *DFW RFP Point Source VOC Emissions for Wise County*.

Rules controlling ozone precursor emissions from stationary sources, such as 30 TAC Chapter 117, were accounted for in the base year inventory, the 2012 inventory, and the milestone year inventories as appropriate. No additional controls were incorporated into the 2017 and 2018 milestone year inventories; see Appendix 2 and Chapter 4 for additional details.

Concurrent with this SIP revision, the commission is adopting two rulemakings (Rule Project Numbers 2013-048-115-AI and 2013-049-117-AI) to fulfill reasonably available control technology (RACT) requirements in Wise County for all control techniques guidelines (CTG) emission source categories and all non-CTG major sources of VOC and NO_X as required by FCAA, §172(c)(1) and §182(b)(2). These controls were not incorporated into this SIP revision because they are not needed in order to demonstrate RFP. In addition, the TCEQ and other concerned parties are currently challenging whether the EPA's inclusion of Wise County in the DFW 2008 eight-hour ozone nonattainment area was lawful. These challenges are currently pending in the D.C. Circuit Court.

More details on point source method development are available in Appendix 2.

Table 2-1: DFW RFP Point Source NO_X Emissions for Nine Previously Designated Counties

RFP Analysis Year Inventory	Existing Controlled NO_X (as of 2011, tons per day)	Post-2011 Controlled NO_X (tons per day)
2011 Base Year	31.34	31.34
2017 Milestone Year	46.71	46.71
2018 Attainment Year	45.90	45.90

Table 2-2: DFW RFP Point Source VOC Emissions for Nine Previously Designated Counties

RFP Analysis Year Inventory	Existing Controlled VOC (as of 2011, tons per day)	Post-2011 Controlled VOC (tons per day)
2011 Base Year	27.66	27.66
2017 Milestone Year	30.84	30.84
2018 Attainment Year	29.83	29.83

Table 2-3: DFW RFP Point Source NO_X Emissions for Wise County

RFP Analysis Year Inventory	Existing Controlled NO_X (as of 2011, tons per day)	Post-2011 Controlled NO_X (tons per day)
2011 Base Year	8.61	8.61
2017 Milestone Year	10.21	10.21
2018 Attainment Year	9.71	9.71

Table 2-4: DFW RFP Point Source VOC Emissions for Wise County

RFP Analysis Year Inventory	Existing Controlled VOC (as of 2011, tons per day)	Post-2011 Controlled VOC (tons per day)
2011 Base Year	2.14	2.14
2017 Milestone Year	3.41	3.41
2018 Attainment Year	2.88	2.88

2.3 AREA SOURCES

Stationary emissions sources that do not meet the reporting requirements for point sources are classified as area sources. Area sources are small-scale stationary industrial, commercial, and residential sources that use materials or perform processes that generate emissions.

2.3.1 Emissions Inventory Development

Area source emissions are calculated as county-wide totals rather than as individual sources. Examples of typical sources of volatile organic compounds emissions include: oil and gas production sources; printing operations; industrial coatings; degreasing solvents; house paints; gasoline service station underground tank filling; and vehicle refueling operations. Examples of typical fuel combustion sources include: oil and gas production sources; stationary source fossil fuel combustion at residences and businesses; outdoor refuse burning; structural fires; and

wildfires. Area source emissions are typically calculated by multiplying an established emission factor (emissions per unit of activity) by the appropriate activity or activity surrogate responsible for generating emissions. Population is one of the more commonly used activity surrogates for area source calculations. Other activity data commonly used is the amount of gasoline sold in an area, employment by industry type, and crude oil and natural gas production.

2.3.2 Updated 2011 Base Year Inventory

The 2011 area source inventory was developed in accordance with the requirements of the Air Emissions Reporting Requirements (AERR) rule. The 2011 inventory was developed using EPA-generated emissions inventories, TCEQ-contracted projects to develop emission inventories; TCEQ staff projects to develop emission inventories; and projecting 2008 emissions inventories projected by applying growth factors derived from Eastern Research Group (ERG) study data, the Economy and Consumer Credit Analytics website (http://www.economy.com/default.asp), and the United States Energy Information Administration's (EIA) *Annual Energy Outlook* publication. The documentation for the development of the ERG study factors can be found in Appendix 3: *Projection Factors for Point and Area Sources.*

The EPA developed emissions inventories for states to use for many area source categories as part of the National Emissions Inventory (NEI). The states access these individual inventories through the EPA's NEI website (ftp://ftp.epa.gov/EmisInventory/2011nei/doc/). These source categories include but are not limited to: industrial coatings; degreasing; residential, commercial/institutional, and industrial fuel use; commercial cooking; aviation fuel use; and consumer products. For some source categories, the TCEQ developed state-specific emissions estimates by acquiring current state-specific activity data and applying appropriate emissions factors. These source categories include but are not limited to: storage tanks; structural fires; dry cleaners; and automobile fires.

Additionally, the TCEQ committed significant resources to improve the oil and gas area source inventory production categories for the 2011 base year inventory. The improvements included the development and refinement of a state-specific oil and gas area source emissions calculator. This oil and gas area source emissions calculator uses county-level production and local equipment activity data with local emissions requirements to estimate emissions from individual production categories including compressors engines, condensate and oil storage tanks, loading operations, heaters, and dehydrators. The documentation for the development of the oil and gas emissions calculator can be found in Appendix 4: *Characterization of Oil and Gas Production Equipment and Develop a Methodology to Estimate Statewide Emissions and Specified Oil and Gas Well Activities Emissions Inventory Update*. A significant improvement made to the oil and gas calculator for the 2011 base year inventory was the development of refined emission factors for VOC emissions from condensate storage tanks. The documentation for the refined emission factors can be found in Appendix 5: *Condensate Tank Oil and Gas Activities*. Additionally, a study completed by ERG on August 1, 2014 developed refined emissions factors for oil and gas well mud degassing and hydraulic pump engines. Between SIP proposal and adoption, the area source upstream oil and gas emissions were updated based on the refined emissions factors. These updates are incorporated in the inventories presented in this section. The documentation for these refined emission factors can be found in Appendix 4.

For those area source categories affected by TCEQ rules, rule effectiveness factors are applied to the baseline emissions to estimate controlled emissions. These factors address the efficiency of the controls and the percentage of the category's population affected by the rule. Quality assurance of area source emissions involves ensuring that the activity data used for each separate category is current and valid. Data such as current population figures, fuel usage, and

material usage were updated and the EPA guidance on emissions factors was used. Other routine efforts such as checking calculations for errors and conducting reasonableness and completeness checks were implemented.

2.3.3 Updated Milestone Year Inventories

In the development of the milestone year inventories, the TCEQ projected 2011 emissions to the 2017 and 2018 milestone years. The TCEQ designated the 2011 inventory as the starting point for emission inventory projections for each of the milestone years because it is the most recent periodic inventory year.

The updated 2017 and 2018 milestone year inventories for the area source categories were developed using two methods. First, for most area source categories, the updated milestone year inventories were developed using factors derived from Appendix 3. The study in this appendix contains individual growth factors for each source category and for each forecasting year. This projection method is the EPA standard, accepted method for developing future year emissions inventories. Second, for counties with oil and gas production that reside in the Barnett Shale, specifically Dallas, Denton, Ellis, Johnson, Parker, Tarrant and Wise Counties, growth factors developed by ERG in the report in Appendix 6: *Forecasting Oil and Gas Activities,* were used. These ERG-derived factors deal specifically with oil and gas sources in the Barnett Shale area and employ category-oriented growth factors for each forecasting year.

The 2017 and 2018 area source emissions inventories were developed by applying the selected emission factor to the 2011 emissions for each area source category to account for any growth in emissions. Rules controlling emissions from industrial coatings, portable fuel containers, 30 TAC Chapter 117 Subchapter D controls on minor sources in ozone nonattainment areas, and gasoline station underground tank filling (Stage I) and vehicle refueling (Stage II) were applied in the base year inventory. No additional controls were incorporated into the milestone year inventories; see Chapter 4 for additional details.

Concurrent with this SIP revision, the commission is adopting two rulemakings (Rule Project Numbers 2013-048-115-AI and 2013-049-117-AI) to fulfill RACT requirements in Wise County for all CTG emission source categories and all non-CTG major sources of VOC and NO_X as required by FCAA, §172(c)(1) and §182(b)(2). These controls were not incorporated into this SIP revision because they are not needed in order to demonstrate RFP. In addition, the TCEQ and other concerned parties are currently challenging whether the EPA's inclusion of Wise County in the DFW 2008 eight-hour ozone nonattainment area was lawful. These challenges are currently pending in the D.C. Circuit Court.

A summary of the area source RFP inventories is presented in the following tables:

- Table 2-5: *DFW RFP Area Source NO_X Emissions for Nine Previously Designated Counties*;
- Table 2-6: *DFW RFP Area Source VOC Emissions for Nine Previously Designated Counties*;
- Table 2-7: *DFW RFP Area Source NO_X Emissions for Wise County*; and
- Table 2-8: *DFW RFP Area Source VOC Emissions for Wise County*.

Table 2-5: DFW RFP Area Source NO_X Emissions for Nine Previously Designated Counties

RFP Analysis Year Inventory	Existing Controlled NO_X (as of 2011, tons per day)	Post-2011 Controlled NO_X (tons per day)
2011 Base Year	37.69	37.69
2017 Milestone Year	36.69	36.69
2018 Attainment Year	34.32	34.32

Table 2-6: DFW RFP Area Source VOC Emissions for Nine Previously Designated Counties

RFP Analysis Year Inventory	Existing Controlled VOC (as of 2011, tons per day)	Post-2011 Controlled VOC (tons per day)
2011 Base Year	262.36	262.36
2017 Milestone Year	265.39	265.39
2018 Attainment Year	258.12	258.12

Table 2-7: DFW RFP Area Source NO_X Emissions for Wise County

RFP Analysis Year Inventory	Existing Controlled NO_X (as of 2011, tons per day)	Post-2011 Controlled NO_X (tons per day)
2011 Base Year	13.29	13.29
2017 Milestone Year	10.61	10.61
2018 Attainment Year	8.12	8.12

Table 2-8: DFW RFP Area Source VOC Emissions for Wise County

RFP Analysis Year Inventory	Existing Controlled VOC (as of 2011, tons per day)	Post-2011 Controlled VOC (tons per day)
2011 Base Year	28.95	28.95
2017 Milestone Year	23.57	23.57
2018 Attainment Year	19.04	19.04

2.3.4 Barnett Shale Special Emissions Inventory

The TCEQ is committed to improving air quality in the DFW nonattainment area and continues to work toward reducing ozone precursors. The TCEQ is investing resources into technological research and development for advancing pollution control technology, improving the science for ozone modeling and analysis, and refining quantification of emissions. Refining emissions quantification methodologies help improve understanding of ozone formation, which benefits the SIP. Additionally, the TCEQ is working with the EPA, area leaders, the scientific community, and the public to improve emission estimates and SIP modeling.

Toward that goal, the TCEQ initiated the Barnett Shale Special Inventory in 2010 one of several completed technical projects that will assist with improving air quality in Texas and the DFW area. The Barnett Shale is a geological formation that produces natural gas and is located in part

of the DFW 2008 eight-hour ozone nonattainment area. The Barnett Shale formation extends west and south from the city of Dallas, covering approximately 5,000 square miles.

The TCEQ completed the second phase of a special inventory in 2011 under the authority of 30 TAC §101.10(b)(3) to gather detailed information about Barnett Shale emissions sources on the source (unit) level, including emissions data and authorization information. The TCEQ contacted 279 companies in the Barnett Shale area and requested companies with 2009 production or transmission of oil or gas from the Barnett Shale formation to complete standardized forms detailing source emissions data, source location, information on receptors located within one-quarter mile of a source, and authorization information. Data for over 8,000 sites were received in 2011. Data for sites that submitted a point source emissions inventory were removed from the Barnett Shale area special emissions inventory.

Results from the Barnett Shale area special emissions inventory project were used to review and improve the area source inventory estimates presented in this DFW RFP SIP revision. Specifically, compressor engine, pneumatic devices, and storage tank estimates were improved using the Barnett Shale emissions inventory data, and the data are being analyzed for use in future emissions inventory improvement projects.

2.4 NON-ROAD MOBILE SOURCES

Non-road vehicles do not normally operate on roads or highways and are often referred to as off-road or off-highway vehicles. Non-road emissions sources include, but are not limited to: agricultural equipment; commercial and industrial equipment; construction and mining equipment; lawn and garden equipment; aircraft and airport equipment; locomotives; and commercial marine vessels. For this RFP SIP revision, emissions inventories for non-road sources were developed for the following subcategories: NONROAD model categories; airports; locomotive; and drilling rigs used in upstream oil and gas exploration activities. The airport subcategory includes estimates for emissions from the aircraft, auxiliary power units (APU), and ground support equipment (GSE) subcategories added together and presented as a total. The sections below describe the emissions estimates methodologies used for the non-road mobile source subcategories.

2.4.1 NONROAD Model Categories Emissions Estimation Methodology

A Texas-specific version of the EPA's latest NONROAD 2008a model, called the Texas NONROAD (TexN) model, was used to calculate emissions from all non-road mobile source equipment and recreational vehicles, with the exception of airports, locomotives, and drilling rigs used in upstream oil and gas exploration activities. Because emissions for airports and locomotives are not included in either the NONROAD model or the TexN model, the emissions for these categories are estimated using other EPA-approved methods and guidance. Although emissions for drilling rigs are included in the NONROAD model, alternate emissions estimates were developed for that source category in order to develop more accurate inventories[3].The equipment populations for drilling rigs were set to zero in the TexN model to avoid double counting emissions from these sources.

The TexN model is a software tool for estimating emissions for non-road mobile source categories that are included in the EPA NONROAD model, with the exception of drilling rigs, as

[3] Eastern Research Group, Inc., "Oil and Gas Exploration – Drilling Rig Engines," TCEQ Contract No. 582-07-83985, Work Order No. 582-07-83985-FY09-01, July 15, 2009.

discussed above, and it was developed to help provide high quality non-road emissions inventories for Texas. The model allows air quality planners to replace the EPA's default emissions data used in the NONROAD model with more specific local survey emissions data, a practice encouraged by the EPA. Local, county-level input data are incorporated into the TexN model as it becomes available to the TCEQ. Several equipment survey studies have been conducted in Texas to improve upon the default emissions data available in the EPA's NONROAD model. Those studies focused on various equipment categories operating in different areas of the state, including: diesel construction equipment; liquid propane gas powered forklifts; transportation refrigeration units; commercial lawn and garden equipment; agricultural equipment; and recreational marine vessels. Input data used for the TexN model produce a more accurate representation of non-road emissions for the DFW nonattainment area. The NONROAD model category emissions included in the proposed version of this SIP revision were developed using version 1.6 of the TexN emissions model. An updated version (1.6.1) of the TexN model became available on July 30, 2014. Due to the timing of the model update the SIP development schedule did not allow time for inclusion of inventory values based on the updated model in the proposed version of this SIP revision. Between proposal and adoption, the updated TexN model was used to revise the NONROAD model category emissions presented in this section.

2.4.2 Airport Emissions Estimation Methodology

Airport emissions in the DFW nonattainment area were developed using the Federal Aviation Administration's (FAA) Emission and Dispersion Modeling System (EDMS) model. The airport emissions categories used for this RFP analysis included aircraft (commercial air carriers, air taxis, general aviation, and military), Auxiliary Power Units (APU), and Ground Support Equipment (GSE) operations.

The 2011 airport emissions inventory was developed by the North Central Texas Council of Governments (NCTCOG) for the nine previously designated counties. Wise County airport emissions estimates are from a statewide county-specific airport inventory developed by ERG. The 2017 and 2018 aircraft, APU, and GSE emissions were prepared by TCEQ staff using the annual emissions inventory data obtained from the NCTCOG and ERG studies. The documentation of procedures used in developing the original airport emissions inventories can be found in Appendix 9: *Development of Annual Emissions Inventories and Activity Data for Airports in the 12-County Dallas-Fort Worth Area* and *Development of Statewide Annual Emissions Inventory and Activity Data for Airports.*

2.4.3 Locomotive Emissions Estimation Methodology

The 2011 locomotive emissions inventory developed from a TCEQ-commissioned study was extracted from the TexAER database. The locomotive emissions inventory includes line haul and yard emissions activity data from all Class I, II, and III locomotive activity and emissions by rail segment. Between proposal and adoption, the emissions inventory for locomotives was revised to include TxLED reductions for applicable counties; the revised numbers are presented in this section. Revised documentation of methods and procedures used to develop the 2011 locomotive emissions inventories can be found in Appendix 7: *2011 Texas Railroad Emission Inventory Report*.

2.4.4 Drilling Rigs Diesel Engines Emissions Estimation Methodology

Drilling rig diesel engines used in upstream oil and gas exploration activities are included in the NONROAD model category "Other Oilfield Equipment," which includes various types of equipment; however, due to significant growth in the oil and gas exploration and production

industry, the emissions inventory for drilling rigs was developed from a TCEQ-commissioned study conducted by ERG.[4]

A survey of oil and gas exploration and production companies was used to develop improved drilling rig emissions characterization profiles. The uncontrolled and controlled drilling rig emissions characterization profiles from this study were combined with 2011 drilling activity data obtained from the Railroad Commission of Texas (RRC) to develop the 2011 inventory. Controlled and uncontrolled emissions trends were developed by projecting oil and gas production data for 2011 to 2017 and 2018.

The documentation of procedures used in developing the drilling rigs emissions inventories can be found in Appendix 8: *Development of Texas Statewide Drilling Rigs Emission Inventories for the Years 1990, 1993, 1996, and 1999 through 2040*.

2.4.5 Updated 2011 Base Year Inventory

2.4.5.1 Updated 2011 Base Year NONROAD Model Category Inventory

The 2011 base year inventory used for all of the non-road mobile source categories was developed using the latest version of the TexN model, which incorporates updated county-specific input data. More detailed information on the Texas NONROAD (TexN) emissions model, guidance document, and updates to the model can be found in the TexN directory (ftp://amdaftp.tceq.texas.gov/pub/Nonroad_EI/TexN/) on the TCEQ's Air Modeling and Data Analysis FTP site.

2.4.5.2 Updated 2011 Base Year Airport Inventory

The 2011 airport emissions were prepared by NCTCOG using the FAA's EDMS. To estimate the 2011 emissions from the airport sources, a survey was conducted to collect updated information on aircraft activity, fleet mix, and other EDMS model input parameters for airports within the DFW area. Model input data was then compiled and reviewed, and any identified data gaps were replaced with values developed using the most closely related data available. Documentation of methodology and procedures used to develop the DFW airport 2011 inventories can be found in Appendix 9.

2.4.5.3 Updated 2011 Base Year Locomotive Inventory

The 2011 Texas locomotive inventory was developed by ERG. The 2011 Texas locomotive emissions inventory includes Class I, II, and III locomotive activity and emissions by rail segment for all counties within Texas. Locomotive line haul and yard activity data were compiled from companies operating in Texas to create a county-level Class I line haul inventory. 2008 activity and emissions profiles were used for Class II and Class III railroads; these data were developed by Eastern Regional Technical Advisory Committee in collaboration with the Federal Railroad Administration, the American Short Line and Regional Railroad Association (ASLRRA), and members of the Class II and III railroad communities. To calculate annual gallons of fuel used by railroads, data compiled by ASLRRA from the Class II and III railroads, including total industry fuel use in 2008 for locomotives and total Class II/III route miles, were used. Based on the EIA's latest *Annual Energy Outlook*, 2008 fuel usage values were grown to estimate 2011 emissions. Documentation of methods and procedures used in developing the locomotive emissions inventories can be found in Appendix 7.

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[4] Eastern Research Group, Inc., "Oil and Gas Exploration – Drilling Rig Engines," TCEQ Contract No. 582-07-83985, Work Order No. 582-07-83985-FY09-01, July 15, 2009.

2.4.5.4 Updated 2011 Base Year Drilling Rig Diesel Engines Inventory

The 2011 inventories for the drilling rig diesel engines used in upstream oil and gas exploration activities were developed as part of a statewide emissions inventory improvement study. Well activity data were obtained through the acquisition of the "Drilling Permit Master and Trailer" database from the Railroad Commission of Texas (RRC) and through a survey of oil and gas exploration and production companies, which was used to develop improved drilling rig emissions characterization profiles. Documentation of methods and procedures used in developing the drilling rig diesel engine emissions inventories can be found in Appendix 8. An improvement made for the 2011 inventory involved updating the projected 2011 drilling activity data from the study with actual 2011 drilling activity data obtained from the RRC.

2.4.6 Updated Uncontrolled Milestone Year Inventories

The NONROAD model category uncontrolled emissions for each analysis year (2017, 2018, and 2019) were calculated by removing all federal and state controls from the model runs. The TCEQ calculated updated, uncontrolled emissions from airports based on the information provided by NCTCOG. The updated uncontrolled milestone year emissions for the locomotive sources were primarily determined by applying activity adjustment factors by source classification code (SCC) to the 2011 base year inventory, except as specified. The activity adjustment factors used were based on the EIA's Transportation Sector Key Indicators and Delivered Energy Consumption data (http://www.eia.gov/forecasts/aeo/tables_ref.cfm). The uncontrolled 2011 emissions inventory for drilling rigs was developed using the uncontrolled factors from the ERG report found in Appendix 8. The emissions were then projected to 2017 and 2018 using the factors contained in the ERG report found in Appendix 6. These ERG-derived factors deal specifically with oil and gas sources in the Barnett Shale area and employ category-oriented growth factors for each forecasting year.

2.4.7 Updated Controlled Milestone Year Inventories

For the NONROAD model category sources, the TCEQ developed county-level controlled inventories for each milestone year (2017, 2018, and 2019) using the latest version of the TexN model. The model runs were performed accounting for all state and federal control measures. The TCEQ then modeled a set of uncontrolled scenarios, effectively disabling all state and federal controls simultaneously for each county and target year. Emissions reductions for individual control measures were assessed through a series of TexN model runs for both controlled and uncontrolled scenarios for each federal and state control measure.

The updated controlled milestone year emissions for the airports were calculated by the TCEQ based on the information provided by NCTCOG. Control strategies for airport emissions included emission credits from the GSE and APU electric conversions.

Controlled emissions for locomotive sources were determined by applying activity adjustment factors by SCC, and emission rate adjustment factors. The emission rate adjustment factors were obtained from the EPA's Emission Factors for Locomotives Fact Sheet (http://www.epa.gov/otaq/regs/nonroad/locomotv/420f09025.pdf). The activity adjustment factors used were based on the EIA's Transportation Sector Key Indicators and Delivered Energy Consumption data (http://www.eia.gov/forecasts/aeo/tables_ref.cfm).

Diesel drilling rigs emissions trends were developed based on the controlled 2011 emissions inventory, projected to 2017 and 2018 using the ERG report *Forecasting Oil and Gas Activities*, and the resulting controlled emissions estimates for 2017 and 2018 were used.

Summaries for all of the non-road mobile source RFP emissions inventories are presented in the following tables:

- Table 2-9: *DFW RFP NO_X Emissions for Non-Road Mobile Sources for Nine Previously Designated Counties*
- Table 2-10: *DFW RFP VOC Emissions for Non-Road Mobile Sources for Nine Previously Designated Counties*
- Table 2-11: *DFW RFP NO_X Emissions for Non-Road Mobile Sources for Wise County*
- Table 2-12: *DFW RFP VOC Emissions for Non-Road Mobile Sources for Wise County*

Table 2-9: DFW RFP NO_X Emissions for All Non-Road Mobile Sources for Nine Previously Designated Counties

RFP Analysis Year Inventory	Uncontrolled NO_X (tons per day)	Controlled NO_X (tons per day)
2011 Base Year	186.76	110.26
2017 Milestone Year	204.19	82.79
2018 Attainment Year	203.62	77.45

Table 2-10: DFW RFP VOC Emissions for All Non-Road Mobile Sources for Nine Previously Designated Counties

RFP Analysis Year Inventory	Uncontrolled VOC (tons per day)	Controlled VOC (tons per day)
2011 Base Year	133.58	53.38
2017 Milestone Year	147.14	37.61
2018 Attainment Year	149.13	36.67

Table 2-11: DFW RFP NO_X Emissions for All Non-Road Mobile Sources for Wise County

RFP Analysis Year Inventory	Uncontrolled NO_X (tons per day)	Controlled NO_X (tons per day)
2011 Base Year	12.14	6.69
2017 Milestone Year	10.14	4.56
2018 Attainment Year	9.58	4.04

Table 2-12: DFW RFP VOC Emissions for All Non-Road Mobile Sources for Wise County

RFP Analysis Year Inventory	Uncontrolled VOC (tons per day)	Controlled VOC (tons per day)
2011 Base Year	2.77	1.25
2017 Milestone Year	2.71	0.82
2018 Attainment Year	2.67	0.77

2.5 ON-ROAD MOBILE SOURCES

The 2011, 2017, and 2018 on-road mobile source emissions inventories for this DFW RFP SIP revision were developed using the latest available data, current emissions factors and models, and the most current planning assumptions. The inventories include the 10 DFW area counties designated as nonattainment for the 2008 ozone NAAQS. On-road inventory estimates were developed under contract by NCTCOG. As required by the RFP implementation rules, the on-road inventories are based on vehicle miles traveled (VMT) estimates and emission rates for an average summer work weekday. The EPA's Motor Vehicle Emission Simulator (MOVES) model, MOVES2014, was used to estimate the summer weekday emission rates in units of grams per mile for NO_X and VOC. The roadway link-level VMT estimates were obtained from travel demand modeling for the 10-county DFW area for each analysis year.

As stated above, the on-road mobile source category emissions inventories for this SIP revision were developed using the MOVES2014 model. The EPA initially made MOVES2014 available on July 31, 2014 and officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343). An update was released on October 27, 2014. The schedule for the inventory development for the proposed version of this SIP revision did not allow time to incorporate MOVES2014. The recently completed MOVES2014-based on-road emissions inventories replace the MOVES2010b-based on-road emissions inventories used in the proposed version of this SIP revision. The planning assumptions, fleet characteristics, and VMT estimates were also updated to incorporate the latest available information at the time the inventories were developed. As a result of the update to MOVES2014, the final emissions values are different than those in the proposed version of this SIP revision.

2.5.1 On-Road Emissions Inventory Development

On-road mobile emissions sources consist of automobiles, trucks, motorcycles, and other motor vehicles traveling on public roadways. On-road mobile source ozone precursor emissions are usually categorized as combustion-related emissions or evaporative hydrocarbon emissions. Combustion-related emissions are estimated for vehicle engine exhaust. Evaporative hydrocarbon emissions are estimated for the fuel tank and other evaporative leak sources on the vehicle. To calculate emissions, both the rate of emissions per unit of activity (emission factors) and the number of units of activity must be determined.

Emission factors for this SIP revision were developed using the EPA's mobile emissions factor model, MOVES2014. The MOVES2014 model may be run using national default information or the default information may be modified to simulate data specific to the DFW area, such as the control programs, driving behavior, meteorological conditions, and vehicle characteristics. Because modifications influence the emission factors calculated by the MOVES2014 model, to the extent that local values are available, parameters that are used reflect local conditions rather than national default values. The localized inputs used for the DFW RFP on-road mobile emissions inventory development include vehicle speeds for each roadway link, temperature, humidity, vehicle age distributions for each vehicle type, percentage of miles traveled for each vehicle type, type of inspection and maintenance (I/M) program, fuel control programs, and gasoline vapor pressure controls.

To estimate on-road mobile source emissions, emission factors calculated by the MOVES2014 model must be multiplied by the level of vehicle activity. On-road mobile source emission factors are expressed in units of grams per mile; therefore, the activity information that is required to complete the inventory calculation is VMT in units of miles per day. The level of vehicle travel activity is developed using travel demand models (TDM) run by the Texas

Department of Transportation (TxDOT) or by the local metropolitan planning organizations (MPO). The TDMs are validated against a large number of ground counts, i.e., traffic passing over counters placed in various locations throughout a county or area. For SIP inventories, VMT estimates are calibrated against outputs from the federal HPMS, a model built from a different set of traffic counters.

In addition to the number of miles traveled on each roadway link, the speed on each roadway type or segment is also needed to complete an on-road emissions inventory. Roadway speeds, required inputs for the MOVES2014 model, are calculated by using the activity volumes from the TDM and a post-processor speed model.

A summary of the on-road mobile source VMT used to develop the various NO_X and VOC emissions estimates for the nine previously designated non-attainment counties and Wise County are presented separately in the following tables:

- Table 2-13: *DFW RFP Ozone Season Weekday On-Road Mobile Source VMT for Nine Previously Designated Counties (miles per day), and*

- Table 2-15: *DFW RFP Ozone Season Weekday On-Road Mobile Source VMT for Wise County (miles per day).*

The on-road mobile adjusted base year (ABY) emissions inventories for the same county distribution are summarized in the following tables:

- Table 2-14: *DFW RFP Ozone Season Weekday On-Road Mobile Source Adjusted Base Year NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day),* and

- Table 2-16: *DFW RFP Ozone Season Weekday On-Road Mobile Source Adjusted Base Year NO_X and VOC Emissions for Wise County (tons per day).*

The RFP controlled and uncontrolled on-road mobile source emissions inventories are summarized within the following tables:

- Table 2-17: *DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X Emissions for Nine Previously Designated Counties,*

- Table 2-18: *DFW RFP Ozone Season Weekday On-Road Mobile Source VOC Emissions for Nine Previously Designated Counties,*

- Table 2-19: *DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X Emissions for Wise County*, and

- Table 2-20: *DFW RFP Ozone Season Weekday On-Road Mobile Source VOC Emissions for Wise County*.

For complete documentation of the development of the on-road mobile source emissions inventories for the DFW RFP demonstration, refer to Appendix 10: *Development of On-Road Emission Inventories for the Years 2011, 2017, 2018, and 2019*. The complete set of input and output files are available upon request from the TCEQ's Air Quality Division.

Table 2-13: DFW RFP Ozone Season Weekday On-Road Mobile Source VMT for Nine Previously Designated Counties (miles per day)

RFP Analysis Year	Adjusted Base Year VMT	Uncontrolled Emissions Inventory VMT	Controlled Emissions Inventory VMT
2011 Base Year	184,647,241	184,647,241	184,647,241
2017 Milestone Year	184,647,241	212,516,292	212,516,292
2018 Attainment Year	184,647,241	217,843,427	217,843,427

Table 2-14: DFW RFP Ozone Season Weekday On-Road Mobile Source Adjusted Base Year NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day)

RFP Analysis Year Inventory	Adjusted Base Year NO_X	Adjusted Base Year VOC
2011 Base Year	729.90	329.84
2017 Milestone Year	727.03	334.29
2018 Attainment Year	726.45	334.06

Table 2-15: DFW RFP Ozone Season Weekday On-Road Mobile Source VMT for Wise County (miles per day)

RFP Analysis Year	Adjusted Base Year VMT	Uncontrolled Emissions Inventory VMT	Controlled Emissions Inventory VMT
2011 Base Year	3,304,507	3,304,507	3,304,507
2017 Milestone Year	3,304,507	3,581,429	3,581,429
2018 Attainment Year	3,304,507	3,677,105	3,677,105

Table 2-16: DFW RFP Ozone Season Weekday On-Road Mobile Source Adjusted Base Year NO_X and VOC Emissions for Wise County (tons per day)

RFP Analysis Year Inventory	Adjusted Base Year NO_X	Adjusted Base Year VOC
2011 Base Year	16.40	4.41
2017 Milestone Year	16.19	4.49
2018 Attainment Year	16.19	4.49

Table 2-17: DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X Emissions for Nine Previously Designated Counties

RFP Analysis Year Inventory	Uncontrolled NO_X (tons per day)	Controlled NO_X (tons per day)
2011 Base Year	729.90	235.23
2017 Milestone Year	852.34	131.70
2018 Attainment Year	873.63	118.12

Table 2-18: DFW RFP Ozone Season Weekday On-Road Mobile Source VOC Emissions for Nine Previously Designated Counties

RFP Analysis Year Inventory	Uncontrolled VOC (tons per day)	Controlled VOC (tons per day)
2011 Base Year	329.84	102.39
2017 Milestone Year	387.01	69.04
2018 Attainment Year	396.67	65.05

Table 2-19: DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X Emissions for Wise County

RFP Analysis Year Inventory	Uncontrolled NO_X (tons per day)	Controlled NO_X (tons per day)
2011 Base Year	16.40	5.90
2017 Milestone Year	18.37	3.17
2018 Attainment Year	18.83	2.82

Table 2-20: DFW RFP Ozone Season Weekday On-Road Mobile Source VOC Emissions for Wise County

RFP Analysis Year Inventory	Uncontrolled VOC (tons per day)	Controlled VOC (tons per day)
2011 Base Year	4.41	1.73
2017 Milestone Year	4.99	1.12
2018 Attainment Year	5.12	1.04

2.5.2 On-Road Mobile Updated 2011 Base Year Inventory

The 2011 base year emissions inventory for on-road mobile sources was updated using emission factors calculated using the MOVES2014 model. Additional updates were made to incorporate the latest activity estimates from the DFW TDM 2011 network. Only control strategies implemented prior to 2011 were included in the input to the emissions inventory development for the 2011 on-road mobile source base year emissions inventory. Those controls include: the pre-1990 FMVCP; the 1990 to 2011 FMVCP; reformulated gasoline (RFG); the East Texas Regional Low RVP Gasoline Program, the DFW vehicle I/M program, and on-road Texas Low Emission Diesel (TxLED). The activity levels used to calculate the emissions inventory reflect the 2011 roadway network with 2011 VMT and speeds. A summary of the emissions inventory is presented in Tables 2-17 through 2-20. For complete documentation of the development of the emissions inventory and details on MOVES2014 model inputs, refer to Appendix 10.

2.5.3 On-Road Mobile Updated 2011 Adjusted Base Year Inventories for the Base and Milestone Years

The RFP planning process includes calculating the ABY emissions inventory, from which required percent emission reductions are calculated. The ABY emissions inventory is calculated by subtracting non-creditable controls from the base year emissions inventory. As specified by the FCAA, certain on-road mobile source emissions reductions are not creditable toward the required percentage reductions. The non-creditable reductions include reductions from controls that were promulgated prior to the 1990 FCAA Amendments. The two rules that are non-creditable for this SIP revision are pre-1990 FMVCP and pre-1990 promulgated federal fuel volatility regulations (summertime gasoline RVP limits beginning in 1992). Both controls are for

on-road mobile sources and are accounted for in the on-road mobile source ABY emissions inventories.

An ABY emissions inventory for on-road mobile sources, which reflects only control strategies implemented prior to 1990, is developed for each milestone year using emission factors from the MOVES2010b model. By projecting the pre-1990 FMVCP into future years, the effects of additional fleet turnover benefit due to the new standards is reflected in the emission factors. The controls included in the ABY emissions inventory development include pre-1990 FCAA FMVCP and the 1992 summertime RVP control. The activity levels used to calculate the ABY emissions inventories reflect the 2011 roadway network with 2011 VMT and speeds. The estimated non-creditable emissions reductions due to pre-1990 controls are calculated by subtracting the 2011 ABY emissions inventory that is relative to the milestone year from the 2011 adjusted base year emissions inventory. A summary of the emissions inventories and associated non-creditable emissions reductions for the nine previously designated and Wise County are presented in the following tables:

- Table 2-21: *Summary of DFW RFP On-Road Mobile Source Non-Creditable NO_X Reductions for Nine Previously Designated Counties (tons per day),*
- Table 2-22: *Summary of DFW RFP On-Road Mobile Source Non-Creditable VOC Reductions for Nine Previously Designated Counties (tons per day),*
- Table 2-23: *Summary of DFW RFP On-Road Mobile Source Non-Creditable NO_X Reductions for Wise County (tons per day),* and
- Table 2-24*: Summary of DFW RFP On-Road Mobile Source Non-Creditable VOC Reductions for Wise County (tons per day).*

Creditable controls are discussed in Section 2.5.5: *On-Road Mobile Updated Controlled Milestone Years Emissions Inventories*. For complete documentation of the development of the emissions inventory and details on MOVES2014 model inputs, refer to Appendix 10.

Table 2-21: Summary of DFW RFP On-Road Mobile Source Non-Creditable NO_X Reductions for Nine Previously Designated Counties (tons per day)

RFP Analysis Year	Adjusted Base Year NO_X	Incremental Non-Creditable NO_X Emissions Reductions
2011 Base Year	729.90	N/A
2017 Milestone Year	727.03	2.87
2018 Attainment Year	726.45	0.58

Table 2-22: Summary of DFW RFP On-Road Mobile Source Non-Creditable VOC Reductions for Nine Previously Designated Counties (tons per day)

RFP Analysis Year	Adjusted Base Year VOC	Incremental Non-Creditable VOC Emissions Reductions
2011 Base Year	329.84	N/A
2017 Milestone Year	334.29	−4.45[1]
2018 Attainment Year	334.06	0.23

Note 1: Non-creditable reductions are calculated based on output from the MOVES2010b model and VMT. Non-creditable reductions may become negative as reductions from the pre-1990 fleet turnover effects approach zero.

Table 2-23: Summary of DFW RFP On-Road Mobile Source Non-Creditable NO_X Reductions for Wise County (tons per day)

RFP Analysis Year	Adjusted Base Year NO_X	Incremental Non-Creditable NO_X Emissions Reductions
2011 Base Year	16.40	N/A
2017 Milestone Year	16.19	0.21
2018 Attainment Year	16.19	0.00

Table 2-24: Summary of DFW RFP On-Road Mobile Source Non-Creditable VOC Reductions for Wise County (tons per day)

RFP Analysis Year	Adjusted Base Year VOC	Incremental Non-Creditable VOC Emissions Reductions
2011 Base Year	4.41	N/A
2017 Milestone Year	4.49	−0.08[1]
2018 Attainment Year	4.49	0.00

Note 1: Non-creditable reductions are calculated based on output from the MOVES2010b model and VMT. Non-creditable reductions may become negative as reductions from the pre-1990 fleet turnover effects approach zero.

2.5.4 On-Road Mobile Updated Uncontrolled Milestone Year Inventories

The uncontrolled on-road mobile emissions inventories for each RFP milestone year were developed using emission factors that reflect only control strategies implemented prior to 1990. Those controls include pre-1990 FMVCP and the 1992 RVP control. MOVES2014 was used to develop the emissions inventories for this SIP revision. The activity levels were updated to include the latest output from the DFW TDM. The activity levels used to calculate the emissions inventory reflect the milestone roadway network, with milestone year VMT and speeds. A summary of the emissions inventories is presented in Tables 2-17 through 2-20. For complete documentation of the development of the emissions inventory and details on MOVES2014 model inputs, refer to Appendix 10.

2.5.5 On-Road Mobile Updated Controlled Milestone Year Inventories

The controlled on-road mobile emissions inventories for each RFP milestone year were developed using emission factors that include: the effects of pre-1990 control strategies, the effects of all control strategies between 1990 and 2011, and the effects of all control strategies through each milestone year. The effects of the post-1990 control strategies between 2011 and each milestone year are creditable reductions used to demonstrate compliance with RFP

requirements. The pre- and post-1990 controls include pre-1990 FMVCP, post-1990 FMVCP, RFG, the East Texas Regional Low RVP Gasoline Program, the DFW vehicle I/M program, and TxLED. All control strategies used to demonstrate the RFP for DFW are documented in Chapter 4: *Control Measures to Achieve Target Levels*. The on-road control strategies are documented in Section 4.5: *On-road Mobile Source Controls*. Control scenario inventory values include both the post-control emissions inventory and the level of reductions for each control strategy. A summary of the uncontrolled on-road mobile emissions inventory, the on-road mobile control reductions, and the resulting controlled on-road mobile emissions inventory for each milestone year are summarized in the following tables:

- Table 2-25: *2017 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Nine Previously Designated Counties*,
- Table 2-26: *2018 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Nine Previously Designated Counties*,
- Table 2-27: *2017 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Wise County, and*
- Table 2-28*: 2018 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Wise County*.

Quantification of individual control reductions are documented in Chapter 4. MVEB calculations for each milestone year are documented in Chapter 5: *Motor Vehicle Emissions Budgets*.

The activity levels used to calculate the emissions inventory reflect the milestone roadway network, with milestone year VMT and speeds. For complete documentation of the development of the emissions inventory and details on MOVES2014 model inputs, refer to Appendix 10.

Table 2-25: 2017 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Nine Previously Designated Counties

RFP Analysis Year and Inventory or On-Road Mobile Emissions Inventory Strategies	NO_X (tons per day)	VOC (tons per day)
2017 Uncontrolled Inventory	852.34	387.01
Creditable RFP Reductions: FMVCP, RFG, East Texas Regional Low RVP Gasoline Program, I/M Program, TxLED	720.64	317.97
2017 Controlled Inventory	131.70	69.04

Table 2-26: 2018 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Nine Previously Designated Counties

RFP Analysis Year and Inventory or On-Road Mobile Emissions Inventory Strategies	NO_X (tons per day)	VOC (tons per day)
2018 Uncontrolled Inventory	873.63	396.67

RFP Analysis Year and Inventory or On-Road Mobile Emissions Inventory Strategies	NO_X (tons per day)	VOC (tons per day)
Creditable RFP Reductions: FMVCP, RFG, East Texas Regional Low RVP Gasoline Program, I/M Program, TxLED	755.51	331.62
2018 Controlled Inventory	118.12	65.05

Table 2-27: 2017 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Wise County

RFP Analysis Year and Inventory or On-Road Mobile Emissions Inventory Strategies	NO_X (tons per day)	VOC (tons per day)
2017 Uncontrolled Inventory	18.37	4.99
Creditable RFP Reductions: FMVCP, East Texas Regional Low RVP Gasoline Program, TxLED	15.20	3.87
2017 Controlled Inventory	3.17	1.12

Table 2-28: 2018 DFW RFP Ozone Season Weekday On-Road Mobile Source NO_X and VOC Emissions and Control Strategy Reductions for Wise County

RFP Analysis Year and Inventory or On-Road Mobile Emissions Inventory Strategies	NO_X (tons per day)	VOC (tons per day)
2018 Uncontrolled Inventory	18.83	5.12
Creditable RFP Reductions: FMVCP, East Texas Regional Low RVP Gasoline Program, TxLED	16.01	4.08
2018 Controlled Inventory	2.82	1.04

2.6 BIOGENIC SOURCES

Biogenic sources include VOC emissions from crops, lawn grass, and trees as well as small amounts of NO_X from soils. Previously, under the Consolidated Emissions Reporting Rule (June 2002) and earlier emissions reporting rules, biogenic sources were required to be reported along with point, nonpoint, on-road mobile, and non-road mobile sources. Beginning with the AERR (December 2008), the emissions required to be reported to the EPA no longer include emissions from biogenic sources. Therefore, as of the 2011 reporting year, the TCEQ's comprehensive triennial emissions inventory no longer includes emissions from biogenic sources. Biogenic inventories may still be developed for air quality modeling purposes as necessary.

The RFP demonstrations are based upon the emissions from anthropogenic sources only. The guidance for RFP calculations shows the first step is to subtract the emissions from biogenic sources from the total base year emissions to obtain the total anthropogenic emission inventory. As of 2011, under the AERR, the base year emissions do not include biogenic sources and already represent the total anthropogenic emissions. In this case, step one of the RFP process is not needed, and the inclusion of emissions from biogenic sources is unnecessary. Therefore, this SIP revision does not include quantification of emissions from biogenic sources.

2.7 EMISSIONS SUMMARY

Uncontrolled and controlled base year NO_X and VOC emissions in the DFW area for each RFP source category are summarized for the nine previously designated counties and Wise County in the following tables:

- Table 2-29*: Summary of the 2011 Base Year Average Summer Weekday NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day)* and
- Table 2-30*: Summary of the 2011 Average Summer Weekday NO_X and VOC Emissions for Wise County (tons per day).*

For the 2017 milestone year, the DFW area uncontrolled and controlled NO_X and VOC emissions for each RFP source category and milestone year are summarized for the nine previously designated counties and Wise County in the following tables:

- Table 2-31: *Summary of the 2017 Average Summer Weekday NO_X and VOC Emissions for the Nine Previously Designated Counties (tons per day)* and
- Table 2-32*: Summary of the 2017 Average Summer Weekday NO_X and VOC Emissions for Wise County*.

For the attainment year, 2018, the DFW area uncontrolled and controlled NO_X and VOC emissions for each RFP source category are summarized for the nine previously designated counties as well as Wise County in the following tables:

- Table 2-33: *Summary of the 2018 Average Summer Weekday NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day)* and
- Table 2-34: *Summary of the 2018 Average Summer Weekday NO_X and VOC Emissions for Wise County*.

Where there is no difference between the uncontrolled and controlled (post-control) emissions for the base year and all milestone years, there were no controls applied to the projected source inventories.

Table 2-29: Summary of the 2011 Base Year Average Summer Weekday NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day)

Emissions Inventory Source	Uncontrolled NO_X	Controlled NO_X	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	186.76	110.26	133.58	53.38
On-Road Mobile Sources (MOVES 2014)	729.90	235.23	329.84	102.39
Emissions Inventory Source	**Existing Controlled NO_X (as of 2011)**	**Post-2011 Controlled NO_X**	**Existing Controlled VOC**	**Post-2011 Controlled VOC**
Area Sources	37.69	37.69	262.36	262.36
Point Sources	31.34	31.34	27.66	27.66
Total of All Sources	985.69	414.52	753.44	445.79

Table 2-30: Summary of the 2017 Average Summer Weekday NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day)

Emissions Inventory Source	Uncontrolled NO_X	Controlled NO_X	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	204.19	82.79	147.14	37.61
On-Road Mobile Sources (MOVES 2014)	852.34	131.70	387.01	69.04
Emissions Inventory Source	**Existing Controlled NO_X (as of 2011)**	**Post-2011 Controlled NO_X**	**Existing Controlled VOC**	**Post-2011 Controlled VOC**
Area Sources	36.69	36.69	265.39	265.39
Point Sources	46.71	46.71	30.84	30.84
Total of All Sources	1,139.93	297.89	830.38	402.88

Table 2-31: Summary of the 2018 Average Summer Weekday NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day)

Emissions Inventory Source	Uncontrolled NO_X	Controlled NO_X	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	203.62	77.45	149.13	36.67
On-Road Mobile Sources (MOVES 2014)	873.63	118.12	396.67	65.05
Emissions Inventory Source	**Existing Controlled NO_X (as of 2011)**	**Post-2011 Controlled NO_X**	**Existing Controlled VOC**	**Post-2011 Controlled VOC**
Area Sources	34.32	34.32	258.12	258.12
Point Sources	45.90	45.90	29.83	29.83
Total of All Sources	1,157.47	275.79	833.75	389.67

Table 2-32: Summary of the 2011 Base Year Average Summer Weekday NO_X and VOC Emissions for Wise County (tons per day)

Emissions Inventory Source	Uncontrolled NO_X	Controlled NO_X	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	12.14	6.69	2.77	1.25
On-Road Mobile Sources (MOVES 2014)	16.40	5.90	4.41	1.73
Emissions Inventory Source	**Existing Controlled NO_X (as of 2011)**	**Post-2011 Controlled NO_X**	**Existing Controlled VOC**	**Post-2011 Controlled VOC**
Area Sources	13.29	13.29	28.95	28.95
Point Sources	8.61	8.61	2.14	2.14
Total of All Sources	50.44	34.49	38.27	34.07

Table 2-33: Summary of the 2017 Average Summer Weekday NO_X and VOC Emissions for Wise County (tons per day)

Emissions Inventory Source	Uncontrolled NO_X	Controlled NO_X	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	10.14	4.56	2.71	0.82
On-Road Mobile Sources (MOVES 2014)	18.37	3.17	4.99	1.12
Emissions Inventory Source	**Existing Controlled NO_X (as of 2011)**	**Post-2011 Controlled NO_X**	**Existing Controlled VOC**	**Post-2011 Controlled VOC**
Area Sources	10.61	10.61	23.57	23.57
Point Sources	10.21	10.21	3.41	3.41
Total of All Sources	49.33	28.55	34.68	28.92

Table 2-34: Summary of the 2018 Average Summer Weekday NO_X and VOC Emissions for Wise County (tons per day)

Emissions Inventory Source	Uncontrolled NO_X	Controlled NO_X	Uncontrolled VOC	Controlled VOC
Non-Road Mobile Sources	9.58	4.04	2.67	0.77
On-Road Mobile Sources (MOVES 2014)	18.83	2.82	5.12	1.04
Emissions Inventory Source	**Existing Controlled NO_X (as of 2011)**	**Post-2011 Controlled NO_X**	**Existing Controlled VOC**	**Post-2011 Controlled VOC**
Area Sources	8.12	8.12	19.04	19.04
Point Sources	9.71	9.71	2.88	2.88
Total of All Sources	46.24	24.69	29.71	23.73

CHAPTER 3: PROGRESS TOWARD MEETING TARGET EMISSIONS LEVELS

3.1 INTRODUCTION

This chapter describes how the Dallas-Fort Worth (DFW) reasonable further progress (RFP) demonstration is calculated, documents the RFP calculations, and provides a summary of the DFW RFP demonstration for all RFP milestone years. Based upon the United States Environmental Protection Agency's (EPA) implementation rule for the 2008 ozone National Ambient Air Quality Standard (NAAQS) published in the *Federal Register* (FR) on May 21, 2012 (77 FR 30160), the attainment date for moderate nonattainment areas was December 31, 2018. As discussed in Chapter 1: *General*, the attainment date for moderate nonattainment areas changed to July 20, 2018 after proposal of this state implementation plan (SIP) revision. Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year* has been added to demonstrate RFP requirements for the 2017 attainment year. The narrative in this chapter, however, reflects the EPA's original proposed attainment date of December 31, 2018. These numbers are included to maintain consistency with the proposed version of the DFW RFP SIP revision; to serve as a reference for the calculations used to develop the RFP demonstration, contingency demonstration, and motor vehicle emissions budget (MVEB) for the 2017 attainment year as provided in Chapter 6; and to provide an alternative submittal in the event that the 2018 attainment year requirement is reinstated.

The EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements; Final Rule* (2008 ozone standard SIP requirements rule), published in the *Federal Register* on March 6, 2015 (80 FR 12264), requires states with moderate nonattainment areas to submit an RFP plan with a 15% emissions reduction, as described in the following paragraph. For this DFW RFP SIP revision, a base year of 2011 was used to harmonize the RFP base year with the triennial reporting requirement of the Air Emissions Reporting Requirements (AERR) rule. In accordance with the 2008 ozone standard SIP requirements rule, if a state chooses 2011 as a base year for a moderate area designated nonattainment in 2012, the 15% reduction requirement covers the period from January 1, 2012 through December 31, 2017. Since the six-year period concludes one year prior to the December 31, 2018 attainment date, additional reductions are required to cover the 2018 attainment year. This SIP revision incorporates an additional 3% emissions reduction to cover the one-year period from January 1, 2018 through December 31, 2018.

The first 15% RFP reduction achieved by an area must be from volatile organic compounds (VOC). For areas, or county groups within areas, that have already achieved the required 15% reduction in VOC, the RFP guidance in the 2008 ozone standard SIP requirements rule allows the 15% reduction to be from VOC and/or nitrogen oxides[5] (NO_X) as long as the RFP demonstration is done independently from any newly designated counties. Guidance from the EPA requires states to demonstrate RFP every third year after the first six years as well as the attainment year. The RFP calculations documented in this SIP revision rely on an RFP base year of 2011 and a December 31, 2018 attainment date. The demonstration for the July 20, 2018 attainment date (2017 attainment year) is included in Chapter 6.

The RFP assessments for the newly designated county are done separately from the previously designated counties. Therefore, this DFW RFP analysis includes two milestone years, 2017 and

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[5] NO_X may be substituted for VOC under conditions defined in the EPA's December 1993 NO_X Substitution Guidance (http://www.epa.gov/ttncaaa1/t1/memoranda/noxsubst.pdf).

2018, and two county groups. The first county group consists of the nine previously designated counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties) and the second county group consists of the one newly designated county under the 2008 eight-hour ozone standard (Wise County). Between 2011 and 2017, 15% VOC-only emissions reductions were calculated for Wise County and 15% VOC and NO_X emissions reductions were calculated for the nine previously designated counties that have already demonstrated the initial 15% VOC reduction requirement. The RFP milestone year requirements for this proposal are a minimum of:

- a 15% VOC emissions reduction for the six-year period between 2011 and 2017 (January 1, 2012 through December 31, 2017) for the one newly designated county (Wise County);
- a 15% VOC and/or NO_X emissions reduction for the six-year period between 2011 and 2017 for the nine counties previously designated under the 1997 eight-hour ozone standard (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall and Tarrant Counties);
- a 3% VOC and/or NO_X emissions reduction for the one-year period between 2017 and 2018 (January 1, 2018 through December 31, 2018) for Wise County;
- a 3% VOC and/or NO_X emissions reduction for the one-year period between 2017 and 2018 for the nine previously designated counties;
- a 3% emissions reduction for the one-year period between 2017 and 2018 as an RFP milestone year contingency for Wise County;
- a 3% emissions reduction for the one-year period between 2017 and 2018 as an RFP milestone year contingency for the nine previously designated counties;
- a 3% emissions reduction for the one-year period between 2018 and 2019 (January 1, 2019 through December 31, 2019) as an attainment year RFP contingency for Wise County; and
- a 3% emissions reduction for the one-year period between 2018 and 2019 as an attainment year RFP contingency for the nine previously designated counties.

Progress toward the 2017 and 2018 milestone year emissions reductions requirements is demonstrated using EPA methodologies to calculate the elements of the RFP demonstration and complete the RFP analyses. First, the emissions inventories, control reductions, and non-creditable emissions reductions are developed for each milestone year. Second, the target level of emissions is calculated for each milestone year. Third, the RFP control measure reductions for each milestone year are subtracted from the uncontrolled or existing controlled emissions inventory for the corresponding milestone year. The difference includes growth from the base year to the selected milestone year. When the combined uncontrolled and existing controlled projected inventory for each milestone year minus the RFP controls is less than or equal to the target level of emissions for VOC and/or NO_X, the RFP requirement has been met. Required moderate nonattainment area RFP elements for DFW include:

- the 2011 base year emissions;
- non-creditable reductions for 2011, 2017 and 2018;
- 2017 and 2018 emissions target levels;

- 2017 and 2018 projected emissions, with growth; and

- individually quantified emissions reductions from control measures for 2017 and 2018.

The on-road mobile source category emissions inventories, and the corresponding DFW RFP demonstrations, for this DFW RFP SIP revision were developed using the EPA's Motor Vehicle Emission Simulator (MOVES) 2014 model. The EPA initially made MOVES2014 available on July 31, 2014 and officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343). An update was released on October 27, 2014. The schedule for the inventory development for the proposed version of this DFW RFP SIP revision did not allow time to incorporate MOVES2014. The Texas Commission on Environmental Quality (TCEQ), working with the North Central Texas Council of Governments (NCTCOG), recently completed development of 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. The MOVES2014 results replace the MOVES2010b inventories and control reductions used to develop the RFP demonstrations in this chapter. The planning assumptions, fleet characteristics, and vehicle miles traveled (VMT) estimates were also updated to incorporate the latest available information at the time the inventories were developed. It is expected that the final on-road control reductions would be different than those reported in this proposal. As a result of the update to MOVES2014, the final RFP demonstration results are different than those in the proposed version of this SIP revision.

3.2 TARGET LEVEL METHODOLOGY

EPA guidance specifies the method that should be used to calculate the maximum amount of emissions a nonattainment area can emit for each RFP milestone year. Those RFP target levels of emissions are calculated using a six step process, which is used for this SIP revision.

1. Determine the 2011 base year emissions inventory.

2. Determine the 2011 RFP base year emissions inventory.

3. Determine the adjusted base year (ABY) emissions inventories for 2011, 2017, and 2018.

4. Calculate the non-creditable fleet turnover correction for each RFP milestone year.

5. Calculate the required 15% emissions reduction amount between 2011 and 2017.

6. Calculate the required 3% per year emissions reduction amount between 2017 and 2018.

7. Calculate the 2017 and 2018 emissions target levels for VOC and NO_X.

3.3 CALCULATION OF TARGET EMISSIONS LEVELS

A summary of the six step process described above for target calculations for 2017 for each of the two county groups is presented in the following tables:

- Table 3-1: *Summary of the Calculation Process for 2017 DFW RFP Target Levels for Nine Previously Designated Counties* and

- Table 3-2: *Summary of the Calculation Process for 2017 DFW RFP Target Levels for Wise County*.

The summary table serves as an example of how all target levels for each milestone year are calculated. Summaries of VOC and NO_X target levels for each of the two county groups are found in the following tables:

- Table 3-9: *Post-2011 RFP Target Level of NO_X Emissions for Nine Previously Designated Counties (tons per day),*
- Table 3-10: *Post-2011 RFP Target Level of VOC Emissions for Nine Previously Designated Counties (tons per day)*
- Table 3-11: *Post-2011 RFP Target Level of NOX Emissions for Wise County (tons per day), and*
- Table 3-12: *Post-2011 RFP Target Level of VOC Emissions for Wise County (tons per day).*

Table 3-1: Summary of the Calculation Process for 2017 DFW RFP Target Levels for Nine Previously Designated Counties

Line	Description	NO_X	VOC
Line 1	Step 1: 2011 nine-county base year emissions inventory (see Table 2-29)	414.52	445.79
Line 2	Step 2: Add or subtract emissions that are to be included from outside the nonattainment area	0.00	0.00
Line 3	Revised 2011 nine-county RFP base year emissions inventory (see Table 2-29) **(Line 1 minus Line 2)**	414.52	445.79
Line 4	Step 3a: 2011 nine-county on-road ABY emissions inventory (see Table 2-14)	729.90	329.84
Line 5	Step 3b: 2017 nine-county on-road ABY emissions inventory (see Table 2-14)	727.03	334.29
Line 6	Step 4: Calculate nine-county non-creditable reductions between 2011 and 2017 (see Tables 2-21 and 2-22) **(Line 4 minus Line 5)**	2.87	−4.45
Line 7	2017 ABY emissions inventory for the nine previously designated counties **(Line 3 minus Line 6)**	411.65	450.24
Line 8	Percent of NO_X (PN) and VOC (PV) to meet 15% reduction requirement (PN plus PV = 15)	10.0	5.0
Line 9	Step 5: Calculate the 15% NO_X and VOC reduction requirement for the nine previously designated counties between 2011 and 2017 **(Line 7 multiplied by Line 8)**	41.17	22.51
Line 10	Step 6: Calculate the 2017 target level of emissions for the nine previously designated counties **(Line 3 minus Line 6 minus Line 9)**	370.48	427.73

Table 3-2: Summary of the Calculation Process for 2017 DFW RFP Target Levels for Wise County

Line	Description	NO_X	VOC
Line 1	Step 1: 2011 base year emissions inventory for Wise County (see Table 2-32)	34.49	34.07
Line 2	Step 2: Add or subtract emissions that are to be included from outside the nonattainment area	0.00	0.00
Line 3	Revised 2011 RFP base year emissions inventory for Wise County (see Table 2-32) **(Line 1 minus Line 2)**	34.49	34.07
Line 4	Step 3a: 2011 on-road ABY emissions inventory for Wise County (see Table 2-16)	16.40	4.41
Line 5	Step 3b: 2017 on-road ABY emissions inventory for Wise County (see Tables 2-16)	16.19	4.49
Line 6	Step 4: Calculate non-creditable reductions between 2011 and 2017 for Wise County (see Tables 2-23 and 2-24) **(Line 4 minus Line 5)**	0.21	−0.08
Line 7	2017 ABY emissions inventory for Wise County	34.28	34.15
Line 8	15% VOC to meet 15% VOC reduction requirement for Wise County	N/A	15.0
Line 9	Step 5: Calculate the 15% VOC reduction requirement for Wise County between 2011 and 2017 **(Line 7 multiplied by Line 8)**	N/A	5.18
Line 10	Step 6: Calculate the target level of emissions **(Line 3 minus Line 6 minus Line 9)**	34.28	29.03

Step one of the RFP target calculation process involves the development of the 2011 base year emissions inventory. EPA guidance specifies the methodology that must be used to develop the base year emissions inventory and all other SIP emissions inventories.[6] Details of the development of the 2011 DFW base year emissions inventory are discussed in Chapter 2: *Emissions Inventories*. Summaries for the 2011 DFW base year NO_X and VOC emissions inventories are presented in the following tables:

- Table 2-14: *DFW RFP Ozone Season Weekday On-Road Mobile Source Adjusted Base Year NO_X and VOC Emissions for Nine Previously Designated Counties (tons per day)*, and
- Table 2-16: *DFW RFP Ozone Season Weekday On-Road Mobile Source Adjusted Base Year NO_X and VOC Emissions for Wise County (tons per day)*.

Step two of the RFP target calculation process adds or subtracts any emissions from outside the nonattainment area that need to be included with or excluded from the nonattainment area emissions inventory. The resulting, revised emissions inventory becomes the 2011 RFP base year emissions inventory, which represents the total anthropogenic emissions for the area. In the final 2008 ozone standard SIP requirements rule, the EPA indicates that emissions and

[6] References for guidance documents used for emissions inventory development in this SIP proposal are listed in the *References for Guidance Documents* section at the end of this document.

emissions reductions from outside the nonattainment area cannot be used as part of the demonstration of RFP. For this RFP SIP revision the amount of emissions from outside the area has been set to zero for both VOC and NO_X. The revised 2011 RFP base year emissions inventory is the same as the 2011 base year emissions inventory.

In the proposed version of the 2008 ozone standard SIP requirements rule the EPA sought comment on elimination of the requirement to account for the non-creditable reductions due to the pre-1990 Federal Clean Air Act (FCAA) controls. These controls include the pre-Tier 1 on-road federal motor vehicle control program (FMVCP) and the federal low Reid vapor pressure (RVP) fuel requirement for 1992. For the analysis years required for areas designated nonattainment under the 2008 eight-hour ozone NAAQS, the effects of the non-creditable pre-1990 controls is nearing zero. In commenting on the proposed rule, the TCEQ supported the elimination of the requirement to account for the pre-1990 non-creditable controls.

Since the final rule eliminates this requirement, Steps 3 and 4 of the target calculation will no longer be needed. However, the EPA published the final 2008 ozone standard SIP requirements rule after the DFW RFP SIP revision was proposed, so steps three and four of the target calculation are included for reference.

Step three of the RFP target calculation process involves the development of the on-road ABY emissions inventories for 2011, 2017, and 2018. Those emissions inventories are mathematical interpretations of projected emissions totals if VMT and base year controls remained static at 2011 levels. These inventories are used only to calculate the effects of the pre-1990 FCAA Amendments controls projected to the RFP base and milestone years. As such, those emissions inventories can be used to estimate the differences in emissions due to pre-1990 FCAA controls, between milestone years. That estimation allows for the calculation of the non-creditable control reduction, which occurs in step four. The emissions rates for an ABY emissions inventory are developed using the EPA's MOVES emission factor model, MOVES2014. The model input file is configured to turn off all effects due to the FCAA Amendments of 1990, and the model evaluation year is set to the RFP base or milestone year. The model is run to determine emission factors for each base or milestone year with only pre-1990 FCAA controls applied. The emission factors for all years are then multiplied by the 2011 base year VMT. Since all of the emissions inventories use the base year VMT, the emissions inventories are referred to as RFP ABY emissions inventories. Details of the development of the DFW RFP ABY emissions inventories are documented in Chapter 2 of this document and in Appendix 10: *Development of On-Road Emission Inventories for the Years 2011, 2017, 2018, and 2019*.

Step four of the RFP target calculation process, calculating the non-creditable fleet turnover correction, is accomplished by subtracting the RFP ABY emissions inventory for each milestone year from the ABY emissions inventory for the previous RFP milestone year. Since the ABY emissions inventories estimate the effects of the non-creditable pre-1990 FCAA controls, the difference between RFP ABY emissions inventories represent an estimate of the non-creditable RFP emissions reductions, also referred to as the fleet turnover correction. A summary of the fleet turnover corrections for all RFP milestone years, for the two RFP county groups is provided in the following tables:

- Table 3-3: *Summary of Non-Creditable NO_X Fleet Turnover Reduction for Nine Previously Designated Counties (tons per day),*

- Table 3-4: *Summary of Non-Creditable VOC Fleet Turnover Reduction for Nine Previously Designated Counties (tons per day),*

- Table 3-5: *Summary of Non-Creditable NO_X Fleet Turnover Reduction for Wise County (tons per day)*, and

- Table 3-6: *Summary of Non-Creditable VOC Fleet Turnover Reduction for Wise County (tons per day).*

The equations for calculating the fleet turnover correction between two milestone years are shown below:

Equation 3-1A: $FTC_{MSY, VOC} = ABY_{(MSY-1), VOC} - ABY_{MSY, VOC}$

and

Equation 3-1B: $FTC_{MSY, NOx} = ABY_{(MSY-1), NOx} - ABY_{MSY, NOx}$

where:

MSY = RFP milestone year

MSY – 1 = previous RFP milestone year

$FTC_{MSY, VOC}$ = VOC fleet turnover correction for year MSY

$FTC_{MSY, NOx}$ = NO_X fleet turnover correction for year MSY

$ABY_{MSY, VOC}$ = MSY adjusted base year emissions inventory for VOC

$ABY_{MSY, NOx}$ = MSY adjusted base year emissions inventory for NO_X

$ABY_{(MSY-1), VOC}$ = previous MSY adjusted base year emissions inventory for VOC

$ABY_{(MSY-1), NOx}$ = previous MSY adjusted base year emissions inventory for NO_X

Table 3-3: Summary of Non-Creditable NO_X Fleet Turnover Reduction for Nine Previously Designated Counties (tons per day)

RFP Analysis Year	On-road Mobile ABY NO_X	Non-creditable NO_X Fleet Turnover Reduction	Non-creditable Pre-1990 CAA Fleet Turnover Reduction Years
2011 Base Year	729.90	N/A	N/A
2017 Milestone Year	727.03	2.87	Baseline 2011 through 2017
2018 Attainment Year	726.45	0.58	2017 through 2018

Table 3-4: Summary of Non-Creditable VOC Fleet Turnover Reduction for Nine Previously Designated Counties (tons per day)

RFP Analysis Year	On-road Mobile ABY VOC	Non-creditable VOC Fleet Turnover Reduction	Non-creditable Pre-1990 CAA Fleet Turnover Reduction Years
2011 Base Year	329.84	N/A	N/A
2017 Milestone Year	334.29	−4.45[1]	Baseline 2011 through 2017
2018 Attainment Year	334.06	0.23	2017 through 2018

Note 1: Non-creditable reductions are calculated based on output from the MOVES2014 model and VMT. Non-creditable reductions may become negative as reductions from the pre-1990 fleet turnover effects approach zero.

Table 3-5: Summary of Non-Creditable NO_X Fleet Turnover Reduction for Wise County (tons per day)

RFP Analysis Year	On-road Mobile ABY NO_X	Non-creditable NO_X Fleet Turnover Reduction	Non-creditable Pre-1990 CAA Fleet Turnover Reduction Years
2011 Base Year	16.40	N/A	N/A
2017 Milestone Year	16.19	0.21	Baseline 2011 through 2017
2018 Attainment Year	16.19	0.00	2017 through 2018

Table 3-6: Summary of Non-Creditable VOC Fleet Turnover Reduction for Wise County (tons per day)

RFP Analysis Year	On-road Mobile ABY VOC	Non-creditable VOC Fleet Turnover Reduction	Non-creditable Pre-1990 CAA Fleet Turnover Reduction Years
2011 Base Year	4.41	N/A	N/A
2017 Milestone Year	4.49	−0.08[1]	Baseline 2011 through 2017
2018 Attainment Year	4.49	0.00	2017 through 2018

Note 1: Non-creditable reductions are calculated based on output from the MOVES2014 model and VMT. Non-creditable reductions may become negative as reductions from the pre-1990 fleet turnover effects approach zero.

Step five of the RFP target calculation process, calculating the emissions reduction amount required per year for each milestone year, is accomplished by multiplying the RFP milestone year ABY emissions inventory values by the percent reduction needed to meet RFP requirements. For the DFW nonattainment area, the first requirement is to reduce emissions by 15% between 2011 and 2017. The post-2017 requirement is to reduce emissions by 3% per year from 2017 to the attainment year. Since the DFW attainment year is 2018, a 3% reduction in emissions is required between 2017 and 2018.

The EPA's final 2008 ozone standard SIP requirements rule allows ozone nonattainment areas to substitute NO_X reductions for VOC reductions, but use of NO_X emissions reductions must meet the criteria in §182(c)(2)(C) in the FCAA. For newly designated Wise County, the 15% reduction requirement between 2011 and 2017 must consist entirely of VOC emissions. The nine counties previously designated nonattainment under the one-hour ozone NAAQS and the 1997 eight-hour ozone NAAQS have already satisfied the 15% VOC emissions reduction requirement; therefore, an equivalent percentage of NO_X reductions may be substituted for VOC reductions in those nine counties between 2011 and 2017. After 2017, all 10 DFW nonattainment counties may substitute NO_X reductions for VOC under the conditions detailed in the EPA's NO_X substitution guidance.[7] The total of the percent NO_X and VOC reductions must equal the total emissions reduction requirements for each milestone year.

For 2017, the reduction requirement is met for the one nonattainment county added under the 2008 eight-hour ozone standard through a 15% VOC emissions reduction. The 2017 reduction requirement is met for the nine previously designated nonattainment counties through a 10% NO_X reduction and 5% VOC reduction. For the 2018 milestone year, the reduction requirement for this DFW RFP SIP revision is satisfied by taking a 2% reduction from NO_X emissions and a 1% reduction from VOC for the nine previously designated nonattainment counties. For Wise County, the entire 3% for between 2017 and 2018 is taken in VOC reductions. Equation 3-2 describes the method to calculate the percentage of NO_X emissions substituted for VOC emissions:

Equation 3-2: $N_{MSY} = [3 \times (CY_{MSY} - CY_{MSY-1})] - V_{MSY}$

where:

MSY = RFP milestone year

MSY –1 = previous RFP milestone year

N_{MSY} = percentage NO_X reductions for year MSY

CY = calendar year

V_{MSY} = percentage VOC reductions for year MSY

Emissions reductions percentages are multiplied by their corresponding NO_X and VOC milestone year ABY emissions inventories to calculate the required NO_X and VOC emissions reductions for each milestone year. Tables 3-7: *Calculation of Required 15% and 3% per Year NO_X and VOC Reductions for Nine Previously Designated Counties* and 3-8*: Calculation of Required 15% and 3% per Year NO_X and VOC Reductions for Wise County* provide a summary of the NO_X and VOC reductions needed to satisfy the initial 15% and the subsequent 3% per year requirement for all RFP milestone years. The equations for calculating the 3% required reductions for NO_X and VOC are shown in Equations 3-3A and 3-3B.

Equation 3-3A: $RPR_{MSY, VOC} = [\, BY_{2011, VOC} - (\, ABY_{2011, VOC} - ABY_{MSY, VOC}\,)\,] \times PV_{MSY}$

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[7] NO_X may be substituted for VOC under conditions defined in the EPA's December 1993 NO_X Substitution Guidance (http://www.epa.gov/ttncaaa1/t1/memoranda/noxsubst.pdf).

and

Equation 3-3B: $RPR_{MSY, NOx} = [BY_{2011, NOx} - (ABY_{2011, NOx} - ABY_{MSY, NOx})] \times PN_{MSY}$

where:

MSY = RFP milestone year

$RPR_{MSY, VOC}$ = required VOC emission reductions between 2011 and MSY

$RPR_{MSY, NOx}$ = required NO_X emission reductions between 2011 and MSY

$BY_{2011, VOC}$ = 2011 base year emissions inventory for VOC

$BY_{2011, NOx}$ = 2011 base year emissions inventory for NO_X

$ABY_{2011, VOC}$ = 2011 adjusted base year emissions inventory for VOC

$ABY_{2011, NOx}$= 2011 adjusted base year emissions inventory for NO_X

$ABY_{MSY, VOC}$ = MSY adjusted base year emissions inventory for VOC

$ABY_{MSY, NOx}$ = MSY adjusted base year emissions inventory for NO_X

PV_{MSY} = percentage VOC reductions for year MSY

PN_{MSY} = percentage NO_X reductions for year MSY

Table 3-7: Calculation of Required 15% and 3% per Year NO_X and VOC Reductions for Nine Previously Designated Counties

RFP Analysis Year	Total Percent Reduction Requirement	Percent NO_X	Percent VOC	ABY Emissions Inventory NO_X	ABY Emissions Inventory VOC	Required Reductions NO_X (tpd)	Required Reductions VOC (tpd)
2017	15.0	10.0	5.0	411.65	450.24	41.17	22.51
2018	3.0	2.0	1.0	411.07	450.01	8.22	4.50

Table 3-8: Calculation of Required 15% and 3% per Year NO_X and VOC Reductions for Wise County

RFP Analysis Year	Total Percent Reduction Requirement	Percent NO_X	Percent VOC	ABY Emissions Inventory NO_X	ABY Emissions Inventory VOC	Required Reductions NO_X (tpd)	Required Reductions VOC (tpd)
2017	15.0	N/A	15.0	34.28	34.15	N/A	5.12
2018	3.0	0.0	3.0	34.28	34.15	0.00	1.02

Step six of the RFP target calculation process, calculating RFP target levels of emissions, is accomplished by subtracting the required emissions reductions (step five) and the fleet turnover correction factor (step four) from the 2011 base year emissions inventory. The target level represents the level of emissions for each RFP milestone year, for each county group, for the DFW nonattainment area to meet its 2008 eight-hour ozone standard RFP requirements. Because the fleet turnover correction affects both NO_X and VOC emissions, target levels are calculated for both pollutants even when the entire reduction requirement is taken from one pollutant or the other. The method for calculating the target levels of emissions for the DFW RFP milestone years is shown in Equation 3-4.

Equation 3-4: $TL_{MSY,\,X} = TL_{(MSY-1),\,X} - RPR_{MSY,\,X} - FTC_{MSY,\,X}$

where:

MSY = RFP milestone year

MSY – 1 = previous RFP milestone year

$TL_{MSY,\,X}$ = target level of emissions for MSY

$TL_{(MSY-1),\,X}$ = target level of emissions for the previous RFP milestone year (Note: For 2017, the target level of emissions for the previous RFP milestone year is equal to the 2011 base year emissions inventory.)

$RPR_{MSY,\,X}$ = emission reduction requirement for MSY for pollutant X

$FTC_{MSY,\,X}$ = fleet turnover correction term for MSY for pollutant X

X = either VOC or NO_X

Appendix 1: *Reasonable Further Progress Demonstration Spreadsheet* documents the calculation of the target values for all RFP milestone years. Table 3-1 provides a step-by-step summary of the calculation of the target levels for 2011 for the nine previously designated nonattainment counties in the DFW nonattainment area. The calculation of the target levels of VOC and NO_X for all RFP milestone years and for each DFW county group are summarized in Tables 3-9 through 3-12.:

In Section 3.5: *RFP Demonstration*, the target levels are integrated into the RFP demonstration.

Table 3-9: Post-2011 RFP Target Level of NO_X Emissions for Nine Previously Designated Counties (tons per day)

RFP Milestone Year	Previous Target	FMVCP Non-Creditable Reduction	Post-2011 Percent Reduction Requirement NO_X	NO_X Target
2011 Base Year	N/A	N/A	N/A	414.52[1]
2017 Milestone Year	414.52	2.87	41.17	370.48
2018 Attainment Year	370.49	0.58	8.22	361.68

Note 1: This number is the base year emissions inventory, which is the starting point for calculating target values.

Table 3-10: Post-2011 RFP Target Level of VOC Emissions for Nine Previously Designated Counties (tons per day)

RFP Milestone Year	Previous Target	FMVCP Non-Creditable Reduction	Post-2011 Percent Reduction Requirement VOC	VOC Target
2011 Base Year	N/A	N/A	N/A	445.79[1]
2017 Milestone Year	445.79	−4.45[2]	22.51	427.73
2018 Attainment Year	427.73	0.23	4.50	423.00

Note 1: This number is the base year emissions inventory, which is the starting point for calculating target values.
Note 2: Non-creditable reductions are calculated based on output from the MOVES2014 model and VMT. Negative non-creditable reductions reflect increases rather than decreases. Non-creditable reductions may become negative as reductions from the pre-1990 fleet turn over effects approach zero.

Table 3-11: Post-2011 RFP Target Level of NO_X Emissions for Wise County (tons per day)

RFP Milestone Year	Previous Target	FMVCP Non-Creditable Reduction	Post-2011 Percent Reduction Requirement NO_X	NO_X Target
2011 Base Year	N/A	N/A	N/A	34.49[1]
2017 Milestone Year	34.49	0.21	N/A	34.28
2018 Attainment Year	34.28	0.00	0.00	34.28

Note 1: This number is the base year emissions inventory, which is the starting point for calculating target values.

Table 3-12: Post-2011 RFP Target Level of VOC Emissions for Wise County (tons per day)

RFP Milestone Year	Previous Target	FMVCP Non-Creditable Reduction	Post-2011 Percent Reduction Requirement VOC	VOC Target
2011 Base Year	N/A	N/A	N/A	34.07[1]
2017 Milestone Year	34.07	−0.08[2]	5.12	29.03
2018 Attainment Year	29.03	0.00	1.02	28.01

Note 1: This number is the base year emissions inventory, which is the starting point for calculating target values.
Note 2: Non-creditable reductions are calculated based on output from the MOVES2014 model and VMT. Negative non-creditable reductions reflect increases rather than decreases. Non-creditable reductions may become negative as reductions from the pre-1990 fleet turn over effects approach zero.

3.4 GROWTH

The DFW RFP SIP revision must account for any growth in emissions between 2011 and each RFP milestone year. The NO_X and VOC uncontrolled (for mobile sources) or existing controlled (for stationary sources) projected milestone years emissions inventories are derived by applying the appropriate projection methodologies to the 2011 base year emissions inventory, emission factor development, and/or to activity level estimates. The resulting emissions inventories include any growth between 2011 and each projected year through 2018. The projection methodology for the uncontrolled or existing controlled RFP emissions inventory excludes

changes in the emissions factor due to control strategies so that the projections represent the total growth in emissions. When the creditable RFP control reductions are subtracted from uncontrolled or existing controlled projected emissions inventories that include growth, the result will be the forecast controlled RFP emissions. The controlled RFP emissions are compared to the target emissions levels to determine if a nonattainment area successfully demonstrates RFP, thereby meeting RFP requirements. The method for accounting for growth is based on EPA guidance for performing RFP calculations.[8] The development of the uncontrolled or existing controlled projected emissions inventory is documented in Chapter 2. The development of the projected control reductions are documented in Chapter 4: *Control Measures to Achieve Target Levels*.

3.5 RFP DEMONSTRATION

The EPA's final 2008 ozone standard SIP requirements rule requires the RFP control strategy plan to show emissions reductions that will reduce controlled RFP milestone year emissions inventories to values less than the emissions target values for those milestone years. The creditable RFP control reductions are subtracted from the uncontrolled or existing controlled forecast emissions inventory for each RFP milestone year. For milestone year 2018, the controls that are reserved to demonstrate RFP milestone year contingency are added to the controlled RFP inventory because the creditable reductions for 2018 include the reductions reserved for the 2017 RFP milestone year contingency.

The final 2008 ozone standard SIP requirements rule allows ozone nonattainment areas to substitute NO_X reductions for VOC reductions, but use of NO_X emissions reductions must meet the criteria in §182(c)(2)(C) of the FCAA. For the nine DFW nonattainment area counties that were previously designated nonattainment for ozone, an equivalent NO_X reduction may be substituted for VOC reduction requirements for all RFP milestone years. For the one newly designated county, Wise County, the 15% reduction between 2011 and 2017 must consist entirely of VOC emissions. However, the VOC emissions reductions to meet the 15% requirement may come across the entire nonattainment area. For Wise County, equivalent NO_X reduction may be substituted for VOC reduction requirements for all post-2017 RFP milestone years. The RFP requirement is met for each milestone year if the resulting controlled RFP emissions inventory forecast is less than the target level of emissions.

The RFP demonstration calculations were completed for the 2017 and 2018 milestone years. Summaries of the demonstrations for all RFP milestone years, for the two RFP county groups are provided in the following tables:

- Table 3-13: *Summary of the 2017 DFW RFP Demonstration for the Nine Previously Designated Counties (tons per day),*
- Table3-14: *Summary of the 2017 DFW RFP Demonstration for Wise County (tons per day),*
- Table 3-15: *Summary of the 2018 DFW RFP Demonstration for the Nine Previously Designated Counties (tons per day),* and

[8] United States Environmental Protection Agency, "Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard; Final Rule," *Federal Register* (70 FR 71631), November 29, 2005.

- Table 3-16: *Summary of the 2018 DFW RFP Demonstration for Wise County (tons per day).*

As concluded in the final row of each of these tables, the DFW area demonstrates the required RFP emission reductions for each milestone year, for the nine previously designated counties and Wise County. All RFP calculations, including the required reductions, the fleet turnover correction factor, and the target emissions levels, are calculated and shown in Appendix 1. Details of the emissions reductions used to calculate the creditable RFP control reductions for each milestone year are documented in Chapter 4 and summarized in the following tables:

- Table 4-1: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2017 for Nine Previously Designated Counties (tons per day),*

- Table 4-2: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2018 for Nine Previously Designated Counties (tons per day),*

- Table 4-3: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2017 for Wise County (tons per day),* and

- Table 4-4: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2018 for Wise County (tons per day).*

Table 3-13: Summary of the 2017 DFW RFP Demonstration for the Nine Previously Designated Counties (tons per day)

Line	Description	NO_X	VOC
Line 1	Uncontrolled or existing controlled 2017 emissions forecast with growth for nine previously designated counties	1,139.93	830.38
Line 2	Creditable RFP control reductions for nine previously designated counties between 2011 and 2017	830.79	427.25
Line 3	Controlled 2017 RFP emissions forecast for nine previously designated counties **(Line 1 minus Line 2)**	309.14	403.13
Line 4	Amount of NOx and VOC reduction to transfer to Wise County RFP demonstration	0.00	1.00
Line 5	Amount of NO_X reduction substitution	0.00	0.00
Line 6	Controlled 2017 RFP forecast for nine previously designated counties accounting for transfer and NO_X substitution **(Line 3 plus Line 4 plus Line 5)**	309.14	404.13
Line 7	2017 RFP target level of emissions for nine previously designated counties	370.48	427.73
Line 8	Excess (+) / Shortfall (−), **(Line 7 minus Line 6)**	61.34	23.60
Line 9	**Is controlled RFP emissions inventory less than target level of emissions?**	Yes	Yes

Table 3-14: Summary of the 2017 DFW RFP Demonstration for Wise County (tons per day)

Line	Description	NO_X	VOC
Line 1	Uncontrolled or existing controlled 2017 emissions forecast with growth for Wise County	49.33	34.68
Line 2	Creditable RFP control reductions for Wise County between 2011 and 2017	18.94	5.48
Line 3	Controlled 2017 RFP emissions forecast for Wise County **(Line 1 minus Line 2)**	30.39	29.20
Line 4	Amount of NOx and VOC reduction to transfer from RFP demonstration for nine previously designated counties	0.00	−1.00
Line 5	Controlled 2017 RFP forecast for Wise County accounting for transfer and NO_X substitution **(Line 3 plus Line)**	30.39	28.20
Line 6	2017 RFP target level of emissions for Wise County	34.28	29.03
Line 7	Excess (+) / Shortfall (−), **(Line 6 minus Line 5)**	3.89	0.83
Line 8	**Is controlled RFP emissions inventory less than target level of emissions?**	Yes	Yes

Table 3-15: Summary of the 2018 DFW RFP Demonstration for the Nine Previously Designated Counties (tons per day)

Line	Description	NO_X	VOC
Line 1	Uncontrolled or existing controlled 2018 emissions forecast with growth for nine previously designated counties	1,157.47	833.75
Line 2	Creditable RFP control reductions for nine previously designated counties between 2011 and 2017	830.79	427.25
Line 3	Creditable RFP control reductions for nine previously designated counties between 2017 and 2018	40.88	17.17
Line 4	Controlled 2018 RFP emissions forecast for nine previously designated counties **(Line 1 minus Line 2 minus Line 3)**	285.80	389.33
Line 5	Amount of creditable reductions reserved for 2017 RFP milestone contingency for nine previously designated counties	8.23	4.50
Line 6	Controlled 2018 RFP emission forecast with milestone contingency for nine previously designated counties **(Line 4 plus Line 5)**	294.03	393.83
Line 7	Amount of NOx and VOC reduction to transfer to RFP demonstration for Wise County	0.00	0.00
Line 8	Amount of NO_X reduction substitution (see Sheet 9 of Appendix 1)	0.00	0.00
Line 9	Controlled 2018 RFP forecast for nine previously designated counties, without reductions reserved for contingency, accounting for reduction transfer to newly designated county, and accounting for NOx substitution **(Line 6 plus Line 7 plus Line 8)**	294.03	393.83

Line	Description	NO_X	VOC
Line 10	2018 RFP target level of emissions for nine previously designated counties	361.68	423.00
Line 11	Excess (+) / Shortfall (−), **(Line 10 minus Line 9)**	67.65	29.17
Line 12	**Is controlled RFP emissions inventory less than target level of emissions?**	Yes	Yes

Table 3-16: Summary of the 2018 DFW RFP Demonstration for Wise County (tons per day)

Line	Description	NO_X	VOC
Line 1	Uncontrolled or existing controlled 2018 emissions forecast with growth for Wise County	46.24	29.71
Line 2	Creditable RFP control reductions for Wise County between 2011 and 2017	18.94	5.48
Line 3	Creditable RFP control reductions for Wise County between 2017 and 2018	0.97	0.30
Line 4	Controlled 2018 RFP emissions forecast for Wise County **(Line 1 minus Line 2 minus Line 3)**	26.33	23.93
Line 5	Amount of creditable reductions reserved for 2017 RFP milestone contingency for Wise County	0.69	0.34
Line 6	Controlled RFP emission forecast with milestone contingency for Wise County **(Line 4 plus Line 5)**	27.02	24.27
Line 7	Amount of NOx and VOC reduction to transfer from RFP demonstration for nine previously designated counties	0.00	0.00
Line 8	Controlled 2018 RFP forecast for Wise County without reductions reserved for contingency and accounting for NO_X substitution **(Line 6 plus Line 7)**	27.02	24.27
Line 9	2018 RFP target level of emissions for Wise County	34.28	28.01
Line 10	Excess (+) / Shortfall (−), **(Line 8 minus Line 7)**	7.26	3.74
Line 11	**Is controlled RFP emissions inventory less than target level of emissions?**	Yes	Yes

CHAPTER 4: CONTROL MEASURES TO ACHIEVE TARGET LEVELS

4.1 OVERVIEW OF CONTROL MEASURES

This chapter describes the methods used to achieve the emissions reductions in volatile organic compounds (VOC) and nitrogen oxides (NO_X) required to demonstrate reasonable further progress (RFP) for the Dallas-Fort Worth (DFW) 2008 eight-hour ozone nonattainment area (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties). For the purposes of demonstrating RFP, the 10 counties are divided into two groups: the nine counties previously designated under the 1997 eight-hour ozone standard (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant) and the one county newly designated under the 2008 eight-hour ozone standard (Wise County).

As discussed in Chapter 1: *General*, the attainment date for moderate nonattainment areas changed from December 31, 2018 to July 20, 2018 after proposal of this state implementation plan (SIP) revision. Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year* has been added to demonstrate RFP requirements for the 2017 attainment year. The narrative in this chapter, however, reflects the United States Environmental Protection Agency's (EPA) original proposed attainment date of December 31, 2018. These numbers are included to maintain consistency with the proposed version of the DFW RFP SIP revision; to serve as a reference for the calculations used to develop the RFP demonstration, contingency demonstration, and motor vehicle emissions budget (MVEB) for the 2017 attainment year as provided in Chapter 6; and to provide an alternative submittal in the event that the 2018 attainment year requirement is reinstated.

The projected emissions reductions reflect the identified federal and state emissions controls. All state control measures are codified in regulations for the State of Texas. Control measures used for RFP do not include all emissions reduction programs for the DFW area. Only the controls used to meet the DFW RFP requirements for 2017 and 2018 are presented in the following tables:

- Table 4-1: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2017 for Nine Previously Designated Counties (tons per day),*
- Table 4-2: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2018 for Nine Previously Designated Counties (tons per day),*
- Table 4-3: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2017 for Wise County (tons per day),* and
- Table 4-4: *Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2018 for Wise County (tons per day).*

Individual and total values shown in the summary tables have been extracted from the spreadsheet in Appendix 1: *Reasonable Further Progress Demonstration Spreadsheet*. All values represent the numbers rounded to two decimal places.

The on-road mobile source category emissions inventories, and the corresponding on-road mobile source control strategy reductions, for this DFW RFP SIP revision were developed using the Motor Vehicle Emission Simulator (MOVES) 2014 model. The EPA initially made MOVES2014 available on July 31, 2014 and officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR

60343). An update was released on October 27, 2014. The schedule for the inventory development for the proposed version of this DFW RFP SIP revision did not allow time to incorporate MOVES2014. The Texas Commission on Environmental Quality (TCEQ), working with the North Central Texas Council of Governments (NCTCOG), recently completed development of 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. The planning assumptions, fleet characteristics, and vehicle miles traveled (VMT) estimates were also updated to incorporate the latest available information at the time the inventories were developed. As a result of the update to MOVES2014, the final on-road control reductions are different than those reported in the proposed version of this SIP revision.

Table 4-1: Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2017 for Nine Previously Designated Counties (tons per day)

Control Strategy Description	NO_X Reductions	VOC Reductions
Chapter 117 NO_X point source controls	0.00	0.00
Chapter 115 storage tank rule	0.00	0.00
Coating/printing rules	0.00	0.00
Portable fuel container rule	0.00	0.00
Federal Motor Vehicle Control Program (FMVCP)	637.38	283.41
Inspection and maintenance (I/M)	12.26	10.57
Reformulated gasoline (RFG)/ East Texas Regional Low Reid Vapor Pressure (RVP) Gasoline Program	52.63	21.27
On-road Texas low emission diesel (TxLED)	3.77	0.00
Tier 1 and 2 locomotive NO_X standards	0.10	0.20
Small non-road spark ignition (SI) engines (Phase 1)	−3.44[1]	32.27
Heavy duty non-road engines	25.39	9.43
Tiers 2 and 3 non-road diesel engines	33.56	6.54
Small non-road SI engines (Phase 2)	2.40	31.24
Large non-road SI and recreational marine	32.71	13.84
Non-road TxLED	2.33	0.00
Non-road RFG	−0.47[2]	1.37
Tier 4 non-road diesel engines	15.55	0.85
Diesel recreational marine	0.00	0.00
Small SI (Phase 3)	2.02	13.54
Chapter 117 NO_X area source engine controls	0.00	0.00
Drilling rig low emission diesel	0.00	0.00
2017 Low Sulfur Gasoline Standard	14.60	2.72
Sum of cumulative reductions from projected uncontrolled or existing controlled emissions	**830.79**	**427.25**

Note 1: The small SI Phase 1 rule is shown to provide a substantial reduction in VOC emissions. A slight increase in NOx emissions is due to the engine modifications required to meet the VOC and CO standards of the Small SI Phase 1.

Note 2: RFG benefits are only observed in the four core counties (Collin, Dallas, Denton, and Tarrant) where this fuel is used, producing substantial decreases in VOC emissions. A slight increase in NOx emissions is due to the addition of oxygenates in the fuel.

Table 4-2: Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2018 for Nine Previously Designated Counties (tons per day)

Control Strategy Description	NO_X Reductions	VOC Reductions
Chapter 117 NO_X point source controls	0.00	0.00
Chapter 115 storage tank rule	0.00	0.00
Coating/printing rules	0.00	0.00
Portable fuel container rule	0.00	0.00
FMVCP	678.58	298.78
I/M	10.87	10.06
RFG/East Texas Regional Low RVP Gasoline Program	48.71	20.10
On-road TxLED	3.38	0.00
Tier 1 and 2 locomotive NO_X standards	0.20	0.30
Small non-road SI engines (Phase 1)	−3.50[1]	32.81
Heavy duty non-road engines	26.08	9.70
Tiers 2 and 3 non-road diesel engines	35.03	6.77
Small non-road SI engines (Phase 2)	2.44	31.77
Large non-road SI and recreational marine	34.14	14.65
Non-road TxLED	2.16	0.00
Non-road RFG	−0.54[2]	1.59
Tier 4 non-road diesel engines	18.02	0.95
Diesel recreational marine	0.00	0.00
Small SI (Phase 3)	2.13	14.26
Chapter 117 NO_X area source engine controls	0.00	0.00
Drilling rig low emission diesel	0.00	0.00
2017 Low Sulfur Gasoline Standard	13.97	2.68
Sum of incremental reductions from projected uncontrolled or existing controlled emissions	**871.67**	**444.42**

Note 1: The small SI Phase 1 rule is shown to provide a substantial reduction in VOC emissions. A slight increase in NOx emissions is due to the engine modifications required to meet the VOC and CO standards of the Small SI Phase 1.

Note 2: RFG benefits are only observed in the four core counties (Collin, Dallas, Denton, and Tarrant) where this fuel is used, producing substantial decreases in VOC emissions. A slight increase in NOx emissions is due to the addition of oxygenates in the fuel.

Table 4-3: Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2017 for Wise County (tons per day)

Control Strategy Description	NO_X Reductions	VOC Reductions
Chapter 117 NO_X point source controls	0.00	0.00
Chapter 115 storage tank rule	0.00	0.00
Coating/printing rules	0.00	0.00
Portable fuel container rule	0.00	0.00

Control Strategy Description	NO_X Reductions	VOC Reductions
FMVCP	14.01	3.63
East Texas Regional Low RVP Gasoline Program	0.77	0.19
On-road TxLED	0.11	0.00
Tier 1 and 2 locomotive NO_X standards	0.01	0.02
Small non-road SI engines (Phase 1)	−0.03[1]	0.21
Heavy duty non-road engines	1.22	0.49
Tiers 2 and 3 non-road diesel engines	1.48	0.16
Small non-road SI engines (Phase 2)	0.02	0.21
Large non-road SI and recreational marine	0.20	0.28
Non-road TxLED	0.07	0.00
Tier 4 non-road diesel engines	0.75	0.03
Diesel recreational marine	0.00	0.00
Small SI (Phase 3)	0.02	0.21
Chapter 117 NO_X area source engine controls	0.00	0.00
Drilling rig low emission diesel	0.00	0.00
2017 Low Sulfur Gasoline Standard	0.31	0.05
Sum of incremental reductions from projected uncontrolled or existing controlled emissions	**18.94**	**5.48**

Note 1: The small SI Phase 1 rule is shown to provide a substantial reduction in VOC emissions. A slight increase in NOx emissions is due to the engine modifications required to meet the VOC and CO standards of the Small SI Phase 1.

Table 4-4: Summary of DFW NO_X and VOC Cumulative Emissions Reductions from Control Strategies for 2011 through 2018 for Wise County (tons per day)

Control Strategy Description	NO_X Reductions	VOC Reductions
Chapter 117 NO_X point source controls	0.00	0.00
Chapter 115 storage tank rule	0.00	0.00
Coating/printing rules	0.00	0.00
Portable fuel container rule	0.00	0.00
FMVCP	14.91	3.84
East Texas Regional Low RVP Gasoline Program	0.70	0.19
On-road TxLED	0.10	0.00
Tier 1 and 2 locomotive NO_X standards	0.02	0.03
Small non-road SI engines (Phase 1)	−0.03[1]	0.22
Heavy duty non-road engines	1.23	0.50
Tiers 2 and 3 non-road diesel engines	1.51	0.17
Small non-road SI engines (Phase 2)	0.02	0.21
Large non-road SI and recreational marine	0.21	0.30
Non-road TxLED	0.06	0.00
Tier 4 non-road diesel engines	0.86	0.04
Diesel recreational marine	0.00	0.00

Control Strategy Description	NO_X Reductions	VOC Reductions
Small SI (Phase 3)	0.02	0.23
Chapter 117 NO_X area source engine controls	0.00	0.00
Drilling rig low emission diesel	0.00	0.00
2017 Low Sulfur Gasoline Standard	0.30	0.05
Sum of incremental reductions from projected uncontrolled or existing controlled emissions	**19.91**	**5.78**

Note 1: The small SI Phase 1 rule is shown to provide a substantial reduction in VOC emissions. A slight increase in NOx emissions is due to the engine modifications required to meet the VOC and CO standards of the Small SI Phase 1.

4.2 POINT SOURCE CONTROLS

Point source controls required by state rules and the associated emissions reductions were incorporated into the 2011 base year inventory. These controls include Title 30 Texas Administrative Code (TAC) Chapter 117 reductions of NO_X emissions from electric generating units, internal combustion engines, and heaters in the DFW area, which had compliance deadlines before 2011. 30 TAC Chapter 117 site-wide NO_X emissions caps on cement plants were used as a conservative projection; projected emissions for 2017 and 2018 using the methods detailed in Appendix 2: *Development of Reasonable Further Progress Point Source Emissions Inventories for the Dallas-Fort Worth Nonattainment Area* are below the cap. No further reductions are necessary to meet RFP requirements, and no new reductions were applied as point source control strategies for this RFP SIP revision.

Concurrent with this SIP revision, two rulemakings are being proposed (Rule Project Numbers 2013-048-115-AI and 2013-049-117-AI) to fulfill reasonably available control technology (RACT) requirements in Wise County for all control techniques guidelines (CTG) emission source categories and all non-CTG major sources of VOC and NO_X as required by Federal Clean Air Act (FCAA), §172(c)(1) and §182(b)(2). These proposed controls were not incorporated into this SIP revision because they are not needed in order to demonstrate RFP. In addition, the TCEQ and other concerned parties are currently challenging whether the EPA's inclusion of Wise County in the DFW 2008 eight-hour ozone nonattainment area was lawful. These challenges are currently pending in the United States Court of Appeals for the District of Columbia Circuit.

Point source emissions for milestone years 2017 and 2018 are summarized in the following tables:

- Table 4-5: *DFW RFP 2017 Point Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-6: *DFW RFP 2018 Point Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-7: *DFW RFP 2017 Point Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day),* and
- Table 4-8: *DFW RFP 2018 Point Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day).*

Table 4-5: DFW RFP 2017 Point Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	46.71	30.84
RFP Point Source Reduction	0.00	0.00
RFP Post-2011 Control Emissions	46.71	30.84

Table 4-6: DFW RFP 2018 Point Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	45.90	29.83
RFP Point Source Reduction	0.00	0.00
RFP Post-2011 Control Emissions	45.90	29.83

Table 4-7: DFW RFP 2017 Point Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	10.21	3.41
RFP Point Source Reduction	0.00	0.00
RFP Post-2011 Control Emissions	10.21	3.41

Table 4-8: DFW RFP 2018 Point Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	9.71	2.88
RFP Point Source Reduction	0.00	0.00
RFP Post-2011 Control Emissions	9.71	2.88

4.3 AREA SOURCE CONTROLS

Area source controls required by state and federal rules and the associated emissions reductions were incorporated into the 2011 base year inventory. These controls include 30 TAC Chapter 117 reductions of NO_X emissions from internal combustion engines in the DFW area, which had compliance deadlines before 2011; and the federal portable fuel containers rule, which also had compliance deadlines prior to 2011. No further reductions, including Federal New Source Performance Standards Subpart OOOO emissions reductions, are necessary to meet RFP requirements, and no new reductions were applied as area source control strategies for this RFP.

Concurrent with this SIP revision, two rulemakings are being proposed (Rule Project Numbers 2013-048-115-AI and 2013-049-117-AI) to fulfill RACT requirements in Wise County for all CTG emission source categories and all non-CTG major sources of VOC and NO_X as required by FCAA, §172(c)(1) and §182(b)(2). These proposed controls were not incorporated into this SIP revision because they are not needed in order to demonstrate RFP. In addition, the TCEQ and other concerned parties are currently challenging whether the EPA's inclusion of Wise County in

the DFW 2008 eight-hour ozone nonattainment area was lawful. These challenges are currently pending in the United States Court of Appeals for the District of Columbia Circuit.

Area source emissions for milestone years 2017 and 2018 are summarized in the following tables:

- Table 4-9: *DFW RFP 2017 Area Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-10: *DFW RFP 2018 Area Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-11: *DFW RFP 2017 Area Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day),* and
- Table 4-12: *DFW RFP 2018 Area Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day).*

Table 4-9: DFW RFP 2017 Area Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	36.69	265.39
RFP Area Source Reduction	0.00	0.00
RFP Post-2011 Control Emissions	36.69	265.39

Table 4-10: DFW RFP 2018 Area Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	34.32	258.12
RFP Area Source Reduction	0.00	0.00
RFP Post-2011 Control Emissions	34.32	258.12

Table 4-11: DFW RFP 2017 Area Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	10.61	23.57
RFP Area Source Reduction	0.00	0.00
RFP Post-2011 Control Emissions	10.61	23.57

Table 4-12: DFW RFP 2018 Area Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Existing Controlled Emissions (as of 2011)	8.12	19.04
RFP Area Source Reduction	0.00	0.00

Emissions	NO_X	VOC
RFP Post-2011 Control Emissions	8.12	19.04

4.4 NON-ROAD MOBILE SOURCE CONTROLS

For most non-road mobile source categories, emissions were calculated using a Texas-specific version of the EPA's NONROAD 2008a model, called the Texas NONROAD (TexN) model. Although operating the EPA's model with all of the default surrogates is acceptable, the EPA encourages states to update the model with local, county-level data based on surveys and other relevant information. The TexN model is a software tool for developing emissions estimates for non-road mobile sources in Texas using county-specific activity data. The model allows air quality planning staff to replace the EPA's default data with local county-level data as they become available.

Because emissions for airports and locomotives are not included in either the NONROAD model or the TexN model, the emissions for these categories are estimated using other EPA-approved methods and guidance. Although emissions for drilling rigs are included in the NONROAD model, alternate emissions estimates were developed for that source category in order to develop more accurate inventories[9].The equipment populations for drilling rigs were set to zero in the TexN model to avoid double counting emissions from these sources.

Emissions reductions required by state and federal rules for milestone years 2017 and 2018 were calculated as detailed in the following sections. Summaries of all non-road mobile source RFP emissions inventories and control strategy reductions are presented in:

- Table 4-13: *DFW RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-14: *DFW RFP 2018 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-15: *DFW RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day),* and
- Table 4-16: *DFW RFP 2018 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day).*

Table 4-13: DFW RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	204.19	147.14
RFP Non-Road Source Reduction	121.40	109.53
RFP Post-Control Emissions	82.79	37.61

[9] Eastern Research Group, Inc., "Oil and Gas Exploration – Drilling Rig Engines," TCEQ Contract No. 582-07-83985, Work Order No. 582-07-83985-FY09-01, July 15, 2009.

Table 4-14: DFW RFP 2018 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	203.62	149.13
RFP Non-Road Source Reduction	126.17	112.46
RFP Post-Control Emissions	77.45	36.67

Table 4-15: DFW RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	10.14	2.71
RFP Non-Road Source Reduction	5.58	1.89
RFP Post-Control Emissions	4.56	0.82

Table 4-16: DFW RFP 2018 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	9.58	2.67
RFP Non-Road Source Reduction	5.54	1.90
RFP Post-Control Emissions	4.04	0.77

4.4.1 NONROAD Model Categories

For this DFW RFP SIP revision, the TexN model was run using county-specific population and activity files, where available. The effects of federal and state control programs were evaluated. The TexN model was run for ozone season daily emissions for 2011, 2017, 2018, and 2019.

To evaluate RFP requirements, a series of TexN model runs was performed for both controlled and uncontrolled scenarios for each federal and state control program and each analysis year. The applicable federal and state rules that were modeled are located in Section 4.1*: Overview of Control Measures*. The emissions inventories developed include county-level ozone season day controlled and uncontrolled emissions estimates for 2011, 2017, 2018, and 2019 for the DFW nonattainment area.

Emissions reductions from individual federal and state controls for non-road equipment were calculated by subtracting the post-control emissions estimates from the uncontrolled emissions estimates.

4.4.2 Non-Road Categories Not Included in the EPA's NONROAD Model

Emissions from the non-road mobile sources that are not estimated using the TexN model include locomotives, aircraft and GSE, and drilling rigs used in upstream oil and gas exploration activities. Emissions for those source categories were calculated using alternate methods.

The locomotive emissions inventory includes line haul and yard data from all Class I, II, and III locomotive activity and emissions by rail segment. The 2011 locomotive emissions inventory developed by Eastern Research Group (ERG) for the TCEQ was extracted from the TexAER

database. Controlled emissions for locomotive sources were determined by applying activity adjustment factors by source classification code, and emission rate adjustment factors. The emission rate adjustment factors were obtained from the EPA's Emission Factors for Locomotives Fact Sheet (http://www.epa.gov/otaq/regs/nonroad/locomotv/420f09025.pdf). Documentation of methods and procedures used by ERG in developing the 2011 locomotive emissions inventories can be found in Appendix 7: *2011 Texas Railroad Emission Inventory Report*. The emissions inventories developed include county-level ozone season day controlled and uncontrolled emissions estimates for 2011, 2017, and 2018, for the previously designated nine-county DFW nonattainment area and the newly designated Wise County.

Emissions for aircraft and GSE were calculated using the Federal Aviation Administration Emissions and Dispersion Modeling System, version 5.1.3. The updated controlled milestone year emissions for the airports were calculated by the TCEQ based on the information provided by North Central Texas Council of Governments. Control strategies for airport emissions included emission reductions GSE and auxiliary power unit electric conversions.

The 2011 emissions inventory for drilling rig diesel engines was developed as part of a statewide emissions inventory improvement study. Well activity data were obtained through the acquisition of the "Drilling Permit Master and Trailer" database from the Railroad Commission of Texas (RRC) and through a survey of oil and gas exploration and production companies, which was used to develop improved drilling rig emissions characterization profiles. The uncontrolled and controlled drilling rig emissions characterization profiles from this study were combined with 2011 drilling activity data obtained from the RRC to develop the 2011 inventory.

Documentation of methods and procedures used in developing the drilling rig diesel engine emissions inventories can be found in Appendix 8: *Development of Texas Statewide Drilling Rigs Emission Inventories for the Years 1990, 1993, 1996, and 1999 through 2040*. An improvement made for the 2011 inventory involved updating the projected 2011 drilling activity data from the study with actual 2011 drilling activity data obtained from the RRC.

Emissions trends were developed by projecting oil and gas production data for 2011 to 2017 and 2018. Emissions reductions from individual federal and state controls for these specific types of non-road equipment were calculated by subtracting the post-control emissions estimates from the uncontrolled emissions estimates.

4.5 ON-ROAD MOBILE SOURCE CONTROLS

The on-road mobile source category emissions inventories, and the corresponding on-road mobile source control strategy reductions, for this DFW RFP SIP revision were developed using the MOVES2014 model. The EPA initially made MOVES2014 available on July 31, 2014 and officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343). An update was released on October 27, 2014. The schedule for the inventory development for the proposed version of this DFW RFP SIP revision did not allow time to incorporate MOVES2014. The TCEQ, working with NCTCOG, recently completed development of 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. The planning assumptions, fleet characteristics, and VMT estimates were also updated to incorporate the latest available information at the time the inventories were developed. As a result of the update to MOVES2014, the final on-road control reductions are different than those reported in proposed version of this SIP revision.

4.5.1 DFW RFP On-Road Mobile Source Control Strategies

The on-road mobile emissions inventories for each DFW RFP analysis year were developed using emission factors that reflect all control strategies for each analysis year. The controls that were modeled include: pre-1990 FMVCP, post-1990 FMVCP, summer RFG, the East Texas Regional Low RVP Gasoline Program, the DFW vehicle I/M program, the DFW anti-tampering program, Tier 3 FMVCP, the lower sulfur gasoline associated with Tier 3 FMVCP, and TxLED. The Tier 3 FMVCP and corresponding lower sulfur gasoline rule was finalized in March 2014 and will begin implementation in 2017. The 2017, 2018, and 2019 emissions in the proposed version of this SIP revision did not include the effects of Tier 3 because MOVES2010b was released before the final Tier 3 rule took effect and cannot assess Tier 3 benefits. With MOVES2014 replacing MOVES2010b between proposal and adoption of this SIP revision, the effects of the Tier 3 FMCVP and the associated lower sulfur gasoline standard are now included in the on-road mobile control strategies. A summary of the DFW on-road mobile source control strategies used for the DFW RFP are presented in Table 4-17: *Summary DFW On-Road Mobile Control Strategies*.

Table 4-17: Summary DFW On-Road Mobile Control Strategies

Control Program Description	Additional Information	Year Control Program Started	Creditable for RFP
Pre-1990 FMVCP	Pre-1990 control	Pre-1990	No
1992 Federal Controls on Gasoline Volatility	Pre-1990 control. Collin, Dallas, Denton and Tarrant Counties: Maximum Reid Vapor Pressure of 7.8 pounds per square inch Ellis, Johnson, Kaufman, Parker, Rockwall and Wise: Maximum Reid Vapor Pressure of 9.0 pounds per square inch	1992	No
Anti-Tampering Program (Dallas and Tarrant counties only)	None	1986	Yes
I/M Program (Dallas and Tarrant counties only)	None	1990	Yes
Tier 1, FMVCP	None	1994	Yes
Reformulated Gasoline	Collin, Dallas, Denton and Tarrant Counties only	1995 for phase one, 2000 for phase two	Yes
East Texas Regional Low RVP Gasoline Program	Ellis, Johnson, Kaufman, Parker, Rockwall and Wise Counties	2000	Yes
National Low Emission Vehicle Program	None	2001	Yes
Expanded I/M and ATP	Expanded to Collin, Denton counties	2002	Yes
Expanded I/M and ATP	Expanded to Ellis, Johnson, Kaufman, Parker, and Rockwall Counties	2003	Yes

Control Program Description	Additional Information	Year Control Program Started	Creditable for RFP
Tier 2, FMVCP	Phase in from 2004 to 2009	2004	Yes
TxLED	15 parts per million maximum for sulfur. Low aromatic hydrocarbon and high cetane number to control NO_X	2006	Yes
Federal Low-Sulfur Highway Diesel	15 parts per million maximum sulfur content	2006	Yes
2007 Heavy duty FMVCP	Phase in from 2007 to 2010	2007	Yes
Tier 3, FMVCP	Phase in from 2017 to 2025	2017	Yes

4.5.2 On-Road Mobile Source Control Strategy Reductions

The projected mobile source emissions inventories documented in Appendix 10: *Development of On-Road Emission Inventories for the Years 2011, 2017, 2018, and 2019* includes quantification of emissions reductions for all federal and state on-road mobile source control rules for each RFP milestone year for the DFW nonattainment area. A summary of the on-road mobile controls included in the 2011, 2017, 2018, and 2019 RFP emissions inventories is presented in Table 4-18: *Control Programs Modeled for RFP Control Scenarios.* The summary of 2017 and 2018 uncontrolled emissions, source reductions, and post-control emissions for on-road mobile sources in the DFW nonattainment area may be found in the following tables:

- Table 4-19: *DFW RFP 2017 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-20: *DFW RFP 2018 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day),*
- Table 4-21: *DFW RFP 2017 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)*, and
- *Table 4-22: DFW RFP 2018 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day).*

Table 4-18: Control Programs Modeled for RFP Control Scenarios

Control Program Description	Additional Information	Creditable for RFP
Pre-1990 FMVCP	Pre-1990 control	No
1992 Federal Controls on Gasoline Volatility	Pre-1990 control. Maximum Reid Vapor Pressure of 7.8 pounds per square inch	No
FMVCP (Tier 1 FMVCP, Tier 2 FMVCP, 2007 heavy duty diesel FMVCP, Tier 3 FMVCP)	Modeled in MOVES as all controls on, individual control reductions for each component of the FMVCP are not calculated	Yes
Federal RFG	Collin, Dallas, Denton and Tarrant Counties	Yes

Control Program Description	Additional Information	Creditable for RFP
East Texas Regional Low RVP Gasoline Program	Ellis, Johnson, Kaufman, Parker, Rockwall and Wise Counties	Yes
I/M Program	Implemented and expanded from 1986 through 2003, see Table 4-1 for implementation details	Yes
Lower sulfur gasoline associated with Tier 3 FMVCP	10 parts per million maximum for sulfur	Yes
TxLED	15 parts per million maximum for sulfur. Low aromatic hydrocarbon and high cetane number to control NO_X	Yes

Table 4-19: DFW RFP 2017 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	852.34	387.01
RFP On-Road Source Reduction	720.64	317.97
RFP Post-Control Emissions	131.70	69.04

Table 4-20: DFW RFP 2018 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Nine Previously Designated Counties (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	873.63	396.67
RFP On-Road Source Reduction	755.51	331.62
RFP Post-Control Emissions	118.12	65.05

Table 4-21: DFW RFP 2017 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	18.37	4.99
RFP On-Road Source Reduction	15.20	3.87
RFP Post-Control Emissions	3.17	1.12

Table 4-22: DFW RFP 2018 On-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC for Wise County (tons per day)

Emissions	NO_X	VOC
Uncontrolled Emissions	18.83	5.12
RFP On-Road Source Reduction	16.01	4.08
RFP Post-Control Emissions	2.82	1.04

4.6 CONTINGENCY MEASURES

In the event of a milestone failure, contingency control measures estimated to reduce emissions by an additional 3% between each milestone year and the next calendar year are required. As with the 3% per year reduction requirement, the 3% contingency requirement is based on the adjusted base year (ABY) and may be met using VOC and/or NO_X reductions. This section contains a milestone year RFP contingency demonstration and an attainment year RFP contingency demonstration based on the original proposed 2018 attainment year. These numbers are included to maintain consistency with the proposed version of the DFW RFP SIP revision; to serve as a reference for the calculations used to develop the contingency demonstration for the 2017 attainment year as provided in Chapter 6; and to provide an alternative submittal in the event that the 2018 attainment year requirement is reinstated.

Table 4-23: *DFW RFP Contingency Demonstration for the 2017 Milestone Year for Nine Previously Designated Counties (tons per day)* and Table 4-24*: DFW RFP Contingency Demonstration for the 2017 Milestone Year for Wise County (tons per day)* show the milestone year 2017 contingency, for which the 3% contingency analysis is based on a 2% reduction in NO_X and 1% reduction in VOC, for both county groups, to be achieved between 2017 and 2018. Reductions needed for milestone year contingency were reserved from the 2018 milestone year target reductions. The milestone year contingency reductions are subtracted from creditable control reductions for milestone year 2018 to account for the contingency requirements for the year following the 2017 milestone year.

The on-road mobile source category emissions inventories and control reductions, which are components of the contingency demonstration calculations for this DFW RFP SIP revision, were developed using the MOVES2014 model. The EPA initially made MOVES2014 available on July 31, 2014 and officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343). An update was released on October 27, 2014. The schedule for the inventory development for the proposed version of this DFW RFP SIP revision did not allow time to incorporate MOVES2014. The TCEQ, working with NCTCOG, recently completed development of 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. The planning assumptions, fleet characteristics, and VMT estimates were also updated to incorporate the latest available information at the time the inventories were developed. For this adoption version of the DFW RFP SIP revision, the MOVES2014 results have replaced the MOVES2010b results included at proposal. As a result of the update to MOVES2014,the final milestone year and attainment year RFP contingency demonstrations are different than those reported in the proposed version of this SIP revision.

Table 4-23: DFW RFP Contingency Demonstration for the 2017 Milestone Year for Nine Previously Designated Counties (tons per day)

Contingency Demonstration Description	NO_X	VOC
2017 ABY emissions inventory for nine previously designated counties	411.65	450.24
Percent for 2017 milestone contingency calculation (total of 3%)	2.00	1.00
Required contingency reductions between 2017 and 2018 for nine previously designated counties (ABY emissions inventory multiplied by contingency percent)	8.23	4.50
Control reductions to meet contingency requirements		
Reserved excess reductions from 2018 RFP demonstration for nine previously designated counties	8.23	4.50
Total contingency reductions	8.23	4.50
Contingency Excess (+) or Shortfall (−)	0.00	0.00
Are contingency reductions equal to or greater than required contingency reduction?	**Yes**	**Yes**

Table 4-24: DFW RFP Contingency Demonstration for the 2017 Milestone Year for Wise County (tons per day)

Contingency Demonstration Description	NO_X	VOC
2017 ABY emissions inventory for Wise County	34.28	34.15
Percent for milestone contingency calculation (total of 3%)	2.00	1.00
Required contingency reductions between 2017 and 2018 for Wise County (ABY emissions inventory multiplied by contingency percent)	0.69	0.34
Control reductions to meet contingency requirements		
Reserved excess reductions from 2018 RFP demonstration for Wise County	0.69	0.34
Total contingency reductions	0.69	0.34
Contingency Excess (+) or Shortfall (−)	0.00	0.00
Are contingency reductions equal to or greater than required contingency reduction?	**Yes**	**Yes**

The 3% attainment year RFP contingency analysis is based on a 2% reduction in NO_X, and 1% emissions reductions in VOC, to be achieved between 2018 and 2019. Emissions inventory analyses were performed on the fleet turnover effects for the federal emissions certification programs for on-road and non-road vehicles. The emissions reductions for the year between 2018 and 2019 were estimated for those programs. Controlled (post-control) emissions reductions not previously used in the 2018 milestone year demonstration may also be used to satisfy contingency requirements, so the excess emissions reductions from the 2018 RFP demonstration are included in the contingency analysis. This DFW RFP SIP revision provides for an MVEB safety margin using some of the excess emissions reductions from the 2018 RFP demonstration, those emissions are subtracted from the amount available to demonstrate RFP

contingency for the 2018 attainment year. The MVEB safety margin has been set to 10% for both NO_X and VOC and is reflected in the calculation. A summary of the 2018 attainment year RFP contingency analysis is provided in the following tables:

- Table 4-25*: DFW RFP Contingency Demonstration for the 2018 Attainment Year for Nine Previously Designated Counties (tons per day)*, and,
- Table 4-26: *DFW RFP Contingency Demonstration for the 2018 Attainment Year for Wise County (tons per day)*.

The analysis demonstrates that the attainment year RFP contingency reductions exceed the 3% reduction requirement; therefore, the RFP contingency requirement is fulfilled for the DFW area.

Table 4-25: DFW RFP Contingency Demonstration for the 2018 Attainment Year for Nine Previously Designated Counties (tons per day)

Contingency Demonstration Description	NO_X	VOC
2018 ABY emission inventory for nine previously designated counties	411.07	450.01
Percent for 2018 attainment year contingency calculation (total of 3%)	2.00	1.00
Required contingency reductions between 2018 and 2019 for nine previously designated counties (ABY emissions inventory multiplied by contingency percent)	8.22	4.50
Control reductions to meet contingency requirements		
Excess reductions from 2018 RFP demonstration for nine previously designated counties	67.65	29.17
Subtract 2018 RFP demonstration MVEB safety margin from excess reductions from 2018 RFP demonstration	−12.09	−6.61
FMVCP, I/M, RFG, East Texas Regional Low RVP Gasoline Program, and TxLED	30.15	11.83
Federal non-road mobile new vehicle certification standards, non-road RFG, and non-road TxLED	5.01	2.81
Total RFP demonstration contingency reductions	89.77	37.18
Contingency Excess (+) or Shortfall (–)	**81.55**	**32.68**

Table 4-26: DFW RFP Contingency Demonstration for the 2018 Attainment Year for Wise County (tons per day)

Contingency Demonstration Description	NO_X	VOC
2018 ABY emissions inventory for Wise County	34.28	34.15
Percent for 2018 attainment year contingency calculation (total of 3%)	2.00	1.00
Required contingency reductions between 2018 and 2019 for Wise County (ABY emissions inventory multiplied by contingency percent)	0.69	0.34
Control reductions to meet contingency requirements		

Contingency Demonstration Description	NO_X	VOC
Excess reductions from 2018 RFP demonstration for Wise County	7.26	3.74
Subtract 2018 RFP demonstration MVEB safety margin from excess reductions from 2018 RFP demonstration	0.00	0.00
FMVCP, East Texas Regional Low RVP Gasoline Program, and on-road TxLED	0.75	0.18
Federal non-road mobile new vehicle certification standards and non-road TxLED	0.12	0.05
Total RFP demonstration contingency reductions	8.13	3.97
Contingency Excess (+) or Shortfall (-)	**7.44**	**3.63**

CHAPTER 5: MOTOR VEHICLE EMISSIONS BUDGETS

5.1 INTRODUCTION

The Dallas-Fort Worth (DFW) reasonable further progress (RFP) state implementation plan (SIP) revision establishes motor vehicle emissions budgets (MVEB), setting the allowable on-road mobile emissions an area can produce while continuing to demonstrate RFP. The DFW RFP MVEBs are calculated by subtracting the on-road mobile source control strategies emissions reductions necessary to demonstrate RFP from the uncontrolled, projected on-road mobile source emissions for RFP milestone years. Local transportation planning organizations use the MVEBs to demonstrate that projected emissions from transportation plans, programs, and projects are equal to or less than the MVEBs, as required by the federal transportation conformity rule.

Although the DFW RFP SIP revision demonstrates RFP for two county groups within the DFW area, the MVEBs are set using the two county groups combined into one 10-county area (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties). The MVEBs for each milestone year combine the on-road emissions and the creditable on-road emission reductions into the totals for the 10-county area to calculate the MVEBs for the entire transportation planning area. The summary tables include the values for the county groups and the 10-county totals to document the process of transforming the on-road emissions for two county groups into MVEBs for the 10-county area.

The on-road mobile source category emissions inventories, and the corresponding MVEBs, for this DFW RFP SIP revision were developed using the United States Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) 2014 model. The EPA initially made MOVES2014 available on July 31, 2014 and officially released the MOVES2014 version of the model as a replacement to MOVES2010b for SIP applications on October 7, 2014 (70 FR 60343). An update was released on October 27, 2014. The schedule for the inventory development for the proposed version of this DFW RFP SIP revision did not allow time to incorporate MOVES2014. The Texas Commission on Environmental Quality (TCEQ), working with the North Central Texas Council of Governments (NCTCOG), recently completed development of 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. The planning assumptions, fleet characteristics, and vehicle miles traveled estimates were also updated to incorporate the latest available information at the time the inventories and MVEBs were developed. Between proposal and adoption, the MOVES2014-based emissions inventories replaced the MOVES2010b-based emissions inventories. As a result of the update to MOVES2014, the final MVEBs are different than those reported in the proposed version of this SIP revision.

As discussed in Chapter 1: *General*, the attainment date for moderate nonattainment areas changed from December 31, 2018 to July 20, 2018 after proposal of this SIP revision. Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year* has been added to demonstrate RFP requirements for the 2017 attainment year, including an MVEB. The narrative in this chapter, however, reflects the EPA's original proposed attainment date of December 31, 2018. These numbers are included to maintain consistency with the proposed version of the DFW RFP SIP revision; to serve as a reference for the calculations used to develop the MVEB for the 2017 attainment year as provided in Chapter 6; and to provide an alternative submittal in the event that the 2018 attainment year requirement is reinstated.

5.2 OVERVIEW OF METHODOLOGIES AND ASSUMPTIONS

The TCEQ developed updated on-road mobile source emissions inventories and control strategies reductions estimates using the latest planning assumptions and the EPA's MOVES2014 emissions factor model. Updated emissions inventory development included development of a 2011 base year emissions inventory, adjusted base-year emissions inventories for 2011, 2017, and 2018, uncontrolled milestone years emissions inventories for 2017 and 2018, controlled milestone years emissions inventories for 2017 and 2018, and control strategies reduction estimates for RFP milestone and contingency years 2017, 2018, and 2019. The TCEQ contracted NCTCOG to develop the RFP emissions inventories and control strategies reductions. Detailed documentation of the on-road mobile emissions inventory development is provided in the NCTCOG contractor report in Appendix 10: *Development of On-Road Emission Inventories for the Years 2011, 2017, 2018, and 2019.*

5.3 MOTOR VEHICLE EMISSIONS BUDGETS FOR RFP MILESTONE YEARS

The RFP MVEBs reflect the on-road mobile source emissions inventories for RFP milestone years, the on-road mobile source reductions strategies used to demonstrate RFP, and a transportation conformity safety margin, if one is used. A transportation conformity safety margin is allowed when there is an excess of emissions reductions beyond those required to demonstrate RFP for a milestone year. The amount of the safety margin must be less than the total in excess emissions reductions for nitrogen oxides (NO_X) and volatile organic compounds (VOC); therefore, even if the safety margin is used for a transportation conformity determination, the DFW 2008 eight-hour ozone nonattainment area will meet the 2008 eight-hour ozone standard RFP requirements for all milestone years. Summaries of the MVEB calculations for each RFP milestone year are presented in the following tables:

- Table 5-1: *2017 RFP Motor Vehicle Emissions Budgets for the 10-County DFW Ozone Nonattainment Area (tons per day)*, and,

- Table 5-2: *2018 RFP Motor Vehicle Emissions Budgets for the 10-County DFW Ozone Nonattainment Area (tons per day)*.

Details for MVEB calculations are documented in Appendix 1: *Reasonable Further Progress Demonstration Spreadsheet*. The RFP control strategy produces more than the required emissions reductions for each milestone year. Some of the excess in emissions reductions for the 2017 and 2018 milestone years is used to provide a 10% MVEB safety margin for both NO_X and VOC. This safety margin is less than the total emissions reductions needed for the RFP demonstration; therefore, even if this safety margin is used, the DFW area will still demonstrate RFP for each milestone.

The on-road mobile source category emissions inventories, and the corresponding MVEBs, for this DFW RFP SIP revision were developed using the MOVES2014 model. The TCEQ, working with NCTCOG, recently completed development of 2011, 2017, 2018, and 2019 on-road emission inventories using MOVES2014 for the DFW area. Between proposal and adoption, the MOVES2014-based emissions inventories replaced the MOVES2010b-based emissions inventories included in the proposed version of the DFW RFP SIP revision. As a result of the update to MOVES2014, the final MVEBs are different than those reported in the proposed version of this DFW RFP SIP revision.

Table 5-1: 2017 RFP Motor Vehicle Emissions Budgets for the 10-County DFW Ozone Nonattainment Area (tons per day)

Control Strategy Description	NO_X	VOC
2017 on-road emissions projection without post-1990 Federal Clean Air Act (FCAA) controls for nine previously designated counties	852.34	387.01
2017 on-road emissions projection without post-1990 FCAA controls for Wise County	18.37	4.99
2017 on-road emissions projection without post-1990 FCAA controls for 10-county 2008 eight-hour ozone nonattainment area	870.71	392.00
Federal Motor Vehicle Control Program (FMVCP), inspection and maintenance (I/M), reformulated gasoline (RFG), East Texas Regional Low Reid Vapor Pressure (RVP) Gasoline Program, and on-road Texas low emission diesel (TxLED)	735.84	321.84
2017 on-road emissions projection with post-1990 FCAA controls (uncontrolled emissions inventory minus control reductions)	134.87	70.16
Add transportation conformity safety margin	13.49	7.02
2017 RFP MVEBs with safety margin	**148.36**	**77.18**

Table 5-2: 2018 RFP Motor Vehicle Emissions Budgets for the 10-County DFW Ozone Nonattainment Area (tons per day)

Control Strategy Description	NO_X	VOC
2018 on-road emissions projection without post-1990 FCAA controls for nine previously designated counties	873.63	396.67
2018 on-road emissions projection without post-1990 FCAA controls for Wise County	18.83	5.12
2018 on-road emissions projection without post-1990 FCAA controls for 10-county 2008 eight-hour ozone nonattainment area	892.46	401.79
FMVCP, RFG, East Texas Regional Low RVP Gasoline Program, I/M program, and on-road TxLED	771.52	335.70
2018 on-road emissions projection with post-1990 FCAA controls (uncontrolled emissions inventory minus control reductions)	120.94	66.09
Add transportation conformity safety margin	12.09	6.61
2018 RFP MVEBs with safety margin	**133.03**	**72.70**

CHAPTER 6: RFP DEMONSTRATION AND RELATED ELEMENTS FOR A 2017 ATTAINMENT YEAR

On December 23, 2014. the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit Court) ruled on a lawsuit filed by the Natural Resources Defense Council, which resulted in vacatur of the United States Environmental Protection Agency's (EPA) December 31 attainment date for the 2008 0zone National Ambient Air Quality Standard. As part of the EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements*; *Final Rule* (2008 ozone standard SIP requirements rule) published in the *Federal Register* (FR) on March 6, 2015 (80 FR 12264), the EPA modified 40 Code of Federal Regulations §51.1103 consistent with the D.C. Circuit Court decision to establish attainment dates that run from the effective date of designation, i.e., July 20, 2012, rather than the end of the 2012 calendar year. As a result, the attainment date for the Dallas-Fort Worth (DFW) moderate nonattainment area has changed from December 31, 2018 to July 20, 2018. In addition, because the attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment date, the attainment year for the DFW moderate nonattainment area has changed from 2018 to 2017.

Since the attainment date changed after proposal of this DFW reasonable further progress (RFP) state implementation plan (SIP) revision, this chapter has been added to provide the RFP elements required for a 2017 attainment year, as required by the 2008 ozone standard SIP requirements rule.

For a 2017 attainment year, this DFW RFP SIP revision is required by the Federal Clean Air Act (FCAA) to demonstrate a 15% emissions reduction in ozone precursors from the 2011 base year through the 2017 attainment year and a 3% reduction for attainment year contingency for the DFW 2008 eight-hour ozone nonattainment area according to the following minimum increments:

- 15% emissions reduction in volatile organic compounds (VOC) for the six-year period from January 1, 2012 through December 31, 2017 for the newly designated one-county portion of the DFW 2008 ozone nonattainment area consisting of Wise County;

- 15% emissions reduction in VOC and/or nitrogen oxides (NO_X) for the six-year period from January 1, 2012 through December 31, 2017 for the previously designated nine-county portion of the DFW 2008 ozone nonattainment area consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties; and

- 3% emissions reduction in VOC and/or NO_X for the one-year period from January 1, 2018 through December 31, 2018 as attainment year RFP contingency for all counties of the DFW 2008 ozone nonattainment area.

The 2017 RFP demonstration sets a NO_X and VOC motor vehicle emissions budget (MVEB) for transportation conformity purposes for 2017. An MVEB is the on-road mobile source allocation of the total allowable emissions for each applicable criteria pollutant or precursor, as defined in the SIP.

The 2017 attainment year requirements are identical to the 2017 milestone year requirements for the 2018 attainment year RFP demonstration, as documented elsewhere in this SIP revision. The 2017 emissions inventories, non-creditable emissions reductions, target level of emissions,

and creditable emissions reductions are the same as the RFP 2017 milestone year demonstration included in Chapters 2 through 4 of this DFW RFP SIP revision.

The applicable 2017 RFP demonstration, post-attainment year contingency demonstration and MVEB quantification are reproduced below with appropriate title updates. The emissions reduction requirement for the one year period between the 2017 milestone year and 2018 attainment year is not applicable with a 2017 attainment year and is not included in this chapter.

6.1 RFP DEMONSTRATION FOR THE 2017 ATTAINMENT YEAR

Summaries of the demonstrations for 2017 for the two RFP county groups are provided in the following tables:

- Table 6-1: *Summary of the 2017 DFW RFP Demonstration for the Nine Previously Designated Counties (tons per day) (reference Table 3-13)* and
- Table6-2: *Summary of the 2017 DFW RFP Demonstration for Wise County (tons per day) (reference Table 3-14).*

As concluded in the final row of each of these tables, the DFW area meets the required RFP emission reductions for the 2017 attainment year for both the nine previously designated counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties) and the one newly designated county under the 2008 eight-hour ozone standard (Wise County). All RFP calculations, including the required reductions, the fleet turnover correction factor, and the target emissions levels, are calculated and shown in Appendix 1: *Reasonable Further Progress Demonstration Spreadsheet*. Details of the emissions reductions used to calculate the creditable RFP control reductions for each milestone year are documented in Chapter 4: *Control Measures to Achieve Target Levels*.

Table 6-1: Summary of the 2017 DFW RFP Demonstration for the Nine Previously Designated Counties (tons per day) (Reference Table 3-13)

Line	Description	NO_X	VOC
Line 1	Uncontrolled or existing controlled 2017 emissions forecast with growth for nine previously designated counties	1,139.93	830.38
Line 2	Creditable RFP control reductions for nine previously designated counties between 2011 and 2017	830.79	427.25
Line 3	Controlled 2017 RFP emissions forecast for nine previously designated counties **(Line 1 minus Line 2)**	309.14	403.13
Line 4	Amount of NO_X and VOC reduction to transfer to Wise County RFP demonstration	0.00	1.00
Line 5	Amount of NO_X reduction substitution	0.00	0.00
Line 6	Controlled 2017 RFP forecast for nine previously designated counties accounting for transfer and NO_X substitution **(Line 3 plus Line 4 plus Line 5)**	309.14	404.13
Line 7	2017 RFP target level of emissions for nine previously designated counties	370.48	427.73
Line 8	Excess (+) / Shortfall (–), **(Line 7 minus Line 6)**	61.34	23.60
Line 9	**Is controlled RFP emissions inventory less than target level of emissions?**	Yes	Yes

Table 6-2: Summary of the 2017 DFW RFP Demonstration for Wise County (tons per day) (Reference Table 3-14)

Line	Description	NO_X	VOC
Line 1	Uncontrolled or existing controlled 2017 emissions forecast with growth for Wise County	49.33	34.68
Line 2	Creditable RFP control reductions for Wise County between 2011 and 2017	18.94	5.48
Line 3	Controlled 2017 RFP emissions forecast for Wise County **(Line 1 minus Line 2)**	30.39	29.20
Line 4	Amount of NO_X and VOC reduction to transfer from RFP demonstration for nine previously designated counties	0.00	−1.00
Line 5	Controlled 2017 RFP forecast for Wise County accounting for transfer and NO_X substitution **(Line 3 plus Line)**	30.39	28.20
Line 6	2017 RFP target level of emissions for Wise County	34.28	29.03
Line 7	Excess (+) / Shortfall (−), **(Line 6 minus Line 5)**	3.89	0.83
Line 8	**Is controlled RFP emissions inventory less than target level of emissions?**	Yes	Yes

6.2 CONTINGENCY MEASURES

In the event of a milestone failure, contingency control measures estimated to reduce emissions by an additional 3% between each milestone year and the next calendar year are required. As with the 3% per year reduction requirement, the 3% contingency requirement is based on the adjusted base year (ABY) and may be met using VOC and/or NO_X reductions.

For the 2017 attainment year, this SIP revision includes an attainment year RFP contingency demonstration for the one-year period from January 1, 2018 through December 31, 2018. Because the only RFP milestone year is the attainment year, the milestone year RFP contingency demonstration is the same as the attainment year contingency.

The 3% attainment year RFP contingency analysis is based on a 2% emissions reduction in NO_X and 1% emissions reduction in VOC to be achieved between 2017 and 2018. Emissions inventory analyses were performed on the fleet turnover effects for the federal emissions certification programs for on-road and non-road vehicles. The emissions reductions for the year between 2017 and 2018 were estimated for those programs. Controlled (post-control) emissions reductions not previously used in the 2017 attainment year demonstration may also be used to satisfy contingency requirements, so the excess emissions reductions from the 2017 RFP demonstration are included in the contingency analysis. The emission reductions needed for both the MVEB safety margin and the 2017 RFP milestone contingency are accounted for within the RFP demonstration calculations. A summary of the 2017 attainment year RFP contingency analysis is provided in the following tables:

- Table 6-3: *DFW RFP Contingency Demonstration for the 2017 Attainment Year for Nine Previously Designated Counties (tons per day), (Reference Table 4-23)* and

- Table 6-4: *DFW RFP Contingency Demonstration for the 2017 Attainment Year for Wise County (tons per day) (Reference Table 4-24).*

The analysis demonstrates that the attainment year RFP contingency reductions meet the 3% reduction requirement; therefore, the RFP contingency requirement is fulfilled for both the nine previously designated counties and Wise County.

Table 6-3: DFW RFP Contingency Demonstration for the 2017 Attainment Year for Nine Previously Designated Counties (tons per day) (Reference Table 4-23)

Contingency Demonstration Description	NO_X	VOC
2017 ABY emissions inventory for nine previously designated counties	411.65	450.24
Percent for 2017 milestone contingency calculation (total of 3%)	2.00	1.00
Required contingency reductions between 2017 and 2018 for nine previously designated counties (ABY emissions inventory multiplied by contingency percent)	8.23	4.50
Control reductions to meet contingency requirements		
Reserved excess reductions from 2018 RFP demonstration for nine previously designated counties	8.23	4.50
Total contingency reductions	8.23	4.50
Contingency Excess (+) or Shortfall (−)	**0.00**	**0.00**
Are contingency reductions equal to or greater than required contingency reduction?	**Yes**	**Yes**

Table 6-4: DFW RFP Contingency Demonstration for the 2017 Attainment Year for Wise County (tons per day) (Reference Table 4-24)

Contingency Demonstration Description	NO_X	VOC
2017 ABY emissions inventory for Wise County	34.28	34.15
Percent for milestone contingency calculation (total of 3%)	2.00	1.00
Required contingency reductions between 2017 and 2018 for Wise County (ABY emissions inventory multiplied by contingency percent)	0.69	0.34
Control reductions to meet contingency requirements		
Reserved excess reductions from 2018 RFP demonstration for Wise County	0.69	0.34
Total contingency reductions	0.69	0.34
Contingency Excess (+) or Shortfall (−)	**0.00**	**0.00**
Are contingency reductions equal to or greater than required contingency reduction?	**Yes**	**Yes**

6.3 MOTOR VEHICLE EMISSIONS BUDGETS

The RFP MVEBs reflect the on-road mobile source emissions inventories for RFP milestone years, the on-road mobile source reductions strategies used to demonstrate RFP, and a transportation conformity safety margin. A transportation conformity safety margin is allowed when there is an excess of emissions reductions beyond those required to demonstrate RFP for a milestone year. The amount of the safety margin must be less than the total in excess emissions

reductions for NO_X and VOC; therefore, even if the safety margin is used for a transportation conformity determination, the DFW 2008 eight-hour ozone nonattainment area will meet the 2008 eight-hour ozone standard RFP requirements for all milestone years.

Although the DFW RFP SIP revision demonstrates RFP for two county groups within the DFW area, the MVEBs are set using the two county groups combined into one 10-county area (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties). The MVEBs combine the on-road emissions and the creditable on-road emission reductions into the totals for the 10-county area to calculate the MVEBs for the entire transportation planning area. The summary tables include the values for the county groups and the 10-county totals to document the process of transforming the on-road emissions for two county groups into MVEBs for the 10-county area. A summary of the MVEB calculations for the 2017 RFP attainment year is presented in the following table:

- Table 6-5: *2017 RFP Motor Vehicle Emissions Budgets for the 10-County DFW 2008 Ozone Standard Nonattainment Area (tons per day) (Reference Table 5-1).*

This RFP SIP revision provides for an MVEB safety margin using some of the excess emissions reductions from the 2017 RFP demonstration; these excess emissions are subtracted from the amount available to demonstrate RFP contingency for the 2017 attainment year. The MVEB safety margin has been set to 10% for both NO_X and VOC and is reflected in the calculation. Further details for MVEB calculations are documented in Chapter 5: *Motor Vehicle Emissions Budgets* and Appendix 1.

Table 6-5: 2017 RFP Motor Vehicle Emissions Budgets for the 10-County DFW 2008 Ozone Standard Nonattainment Area (tons per day) (Reference Table 5-1)

Control Strategy Description	NO_X	VOC
2017 on-road emissions projection without post-1990 FCAA controls for nine previously designated counties	852.34	387.01
2017 on-road emissions projection without post-1990 FCAA controls for Wise County	18.37	4.99
2017 on-road emissions projection without post-1990 FCAA controls for 10-county 2008 eight-hour ozone standard nonattainment area	870.71	392.00
Federal Motor Vehicle Control Program (FMVCP), inspection and maintenance (I/M), reformulated gasoline (RFG), East Texas Regional Low Reid Vapor Pressure (RVP) Gasoline Program, and on-road Texas low emission diesel (TxLED)	735.84	321.84
2017 on-road emissions projection with post-1990 FCAA controls (uncontrolled emissions inventory minus control reductions)	134.87	70.16
Add transportation conformity safety margin	13.49	7.02
2017 RFP MVEBs with safety margin	**148.36**	**77.18**

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Appendices Available Upon Request

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RESPONSE TO COMMENTS RECEIVED REGARDING THE DALLAS-FORT WORTH (DFW) REASONABLE FURTHER PROGRESS (RFP) STATE IMPLEMENTATION PLAN (SIP) REVISION FOR THE 2008 EIGHT-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS)

The Texas Commission on Environmental Quality (TCEQ or commission) offered two public hearings for this SIP revision: in Arlington on January 15, 2015 at 6:30 p.m. at the City of Arlington Council Chamber and in Austin on January 22, 2015 at 10:00 a.m. at the commission's central office. No oral comments regarding the DFW RFP SIP revision were received at the Arlington hearing. The public hearing in Austin was not opened as no one signed in to provide comments.

The comment period opened December 26, 2014 and closed February 11, 2015. The TCEQ received written comments from the City of Mesquite, the Regional Transportation Council for the North Central Texas Council of Governments (RTC), the Sierra Club, Downwinders at Risk (Downwinders), the United States Environmental Protection Agency (EPA), and one individual.

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GENERAL COMMENTS

The EPA commented that because of the December 23, 2014 decision made by the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit Court) regarding attainment deadlines for the 2008 ozone NAAQS, the TCEQ should revise the applicable elements of the DFW attainment demonstration SIP revision (Project Number 2013-015-SIP-NR) to reflect a 2017 attainment year.

The D.C. Circuit Court's ruling, which impacts both the DFW attainment demonstration and RFP SIP revisions, was not made until December 23, 2014 and the TCEQ did not receive this comment from the EPA until February 11, 2015. The commission approved proposal of the DFW RFP SIP revision on December 10, 2014. The proposed SIP revision was developed based on the EPA's May 21, 2012 classifications rule for the 2008 ozone NAAQS (77 FR 30088), which set 2018 as the attainment year for areas classified as moderate. The deadline to submit RFP SIP revisions for areas classified as moderate for the 2008 ozone NAAQS is July 20, 2015.

The 2017 attainment year RFP requirements are identical to the 2017 milestone year requirements for a 2018 attainment year RFP demonstration, as included at proposal. The 2017 emissions inventories, non-creditable emissions reductions,

target level of emissions, and creditable emissions reductions are therefore the same as the RFP 2017 milestone year demonstration presented in Chapters 2 through 4 of the DFW RFP SIP revision. In response to this comment, the DFW RFP SIP revision was modified between proposal and adoption to include clarifying language regarding the D.C. Circuit Court ruling. In addition, the applicable 2017 attainment year RFP demonstration, post-attainment year contingency demonstration and motor vehicle emissions budget quantification were reproduced with appropriate title updates and included as Chapter 6: *RFP Demonstration and Related Elements for a 2017 Attainment Year*, and the RFP analysis for a 2018 attainment year is also being submitted in the event that the 2018 attainment year requirement is reinstated.

One individual commented on perceived inadequacies of the DFW Attainment Demonstration SIP revision for the 2008 ozone NAAQS, including underrepresentation of oil and gas emissions, failure to protect human health, and lack of additional control measures.

Responses to these comments pertaining to the DFW Attainment Demonstration SIP revision (Project Number 2013-015-SIP-NR) are addressed in the Response to Comments section of that SIP revision.

RFP DEMONSTRATION

The EPA commented that the Wise County volatile organic compounds (VOC) 2018 emissions target value should be 28.29 but is shown as 28.30 in Table 3-12: *Post-2011 RFP Target Level of VOC Emissions for Wise County (tons per day)* and Appendix 1: *Reasonable Further Progress Demonstration Spreadsheet*, Sheet 18.

The target values used in this DFW RFP SIP revision were developed using numbers with two decimal places for all inputs and resultant values. The electronic tool used to calculate the resultant values sometimes adds additional significant figures to values during the calculation process. When the resultant values are rounded to two decimal places, rounding errors may occur. The difference in 28.29 versus 28.30 was due to a rounding error that has now been corrected.

All RFP elements, including the VOC target values for Wise County, have been updated between proposal and adoption to incorporate MOVES2014 and other emissions inventory updates. The Wise County VOC target is now 28.01 tons per day, the value has been updated in Table 3-12 and Appendix 1, Sheet 18, and we have adjusted the electronic spreadsheet to assure that rounding errors did not occur.

The EPA commented that the creditable 2017 to 2018 RFP nitrogen oxides (NO_X) control reductions for the nine DFW counties previously designated as nonattainment under the 1997 ozone NAAQS were underestimated by 23.14 tons per day in Table 3-15: *Summary of the 2018 DFW RFP Demonstration for the Nine Previously Designated Counties (tons per day)*, Line 3.

The creditable RFP reductions for the 2018 attainment year were calculated by subtracting the 2011 to 2017 creditable reductions from the 2011 to 2018 creditable reductions. For RFP calculation purposes, the RFP elements for the nine previously

designated counties were developed separately from the one newly designated county (Wise County).

However, when calculating the 2017 to 2018 incremental reduction for the nine previously designated counties, the 2011 to 2017 reduction for Wise County was inadvertently deducted from the 2018 creditable reductions, in addition to the 2011 to 2017 reduction for the nine previously designated counties. The 2011 to 2017 creditable reduction for Wise County was 23.14 in the DFW RFP SIP proposal. This resulted in the creditable NO_X reductions for the nine previously designated counties being underestimated by 23.14 tons per day.

In response to this comment, the equation for calculating the 2018 creditable NO_X reductions for the nine previously designated counties has been corrected. Although the 2017 to 2018 incremental reduction does not apply to the revised 2017 attainment year, the correction was made to ensure consistency and to avoid confusion, and to ensure that the alternative 2018 RFP analysis is correct and complete. The RFP calculation results, including Table 3-15, and the SIP narrative have been updated. Please note that the values in the tables and narrative will differ from the proposed values due to emissions inventory updates, including MOVES2014 updates.

CONTINGENCY MEASURES

The EPA commented that the RFP contingency demonstration for the 2017 milestone year in Table 4-23: *DFW RFP Contingency Demonstration for the 2017 Milestone Year for Nine Previously Designated Counties (tons per day)* and Table 4-24*: DFW RFP Contingency Demonstration for the 2017 Milestone Year for Wise County (tons per day)* reference 2018 dates and values.

The EPA's comment was focused on what is now the alternative 2018 RFP analysis. The 2017 RFP milestone year contingency for a 2018 attainment year analysis calculates the 3% milestone contingency required between 2017 and 2018. Generally the adjusted base year (ABY) emissions inventory for the first milestone year (2017) would be used as the basis for the 3% calculation. Because 2018 is the year following the first milestone year and was the attainment year for DFW when this RFP submittal was proposed, the 2018 ABY values were readily available and were used in the 2017 to 2018 milestone year contingency calculation.

In this adopted SIP revision, the commission is providing an RFP analysis for a 2017 attainment year, and an alternative submittal for a 2018 attainment year. Using the 2017 ABY emissions inventory for the milestone year contingency calculation is more conservative than using the 2018 ABY emissions inventory, and now that the attainment year has changed to 2017, it is the appropriate year and inventory. Using the 2017 ABY emissions inventory for the milestone year contingency calculation is also consistent with previous milestone year contingency calculations.

In response to this comment, the TCEQ modified the 2017 milestone contingency calculations and updated Tables 4-23 and 4-24 for the alternative 2018 RFP

analysis. The calculations now use the 2017 ABY emissions inventory as the basis for the 3% reductions requirement.

The Sierra Club and Downwinders commented that the contingency measures detailed in the DFW RFP SIP revision, primarily state mobile source measures and emissions reductions achieved through incentive programs, fail to meet the criteria for enforceability and are therefore not creditable as reductions.

The TCEQ disagrees with this comment. The contingency measures for both the RFP and attainment demonstration are the Federal Motor Vehicle Control Program, the state inspection and maintenance program, the East Texas Low Reid Vapor Pressure Gasoline Program, the Texas Low Emission Diesel Program, federal non-road mobile new vehicle certification standards, non-road federal reformulated gasoline, and the non-road Texas Low Emission Diesel Program.

All of these programs are enforceable, quantifiable, permanent, and surplus. The reductions from these controls are creditable toward RFP and contingency requirements. Voluntary or incentive-based programs are not used as contingency measures for either RFP milestone years or attainment. No changes were made in response to this comment.

MOBILE SOURCE ACTIVITY DATA AND EMISSIONS ESTIMATES

The City of Mesquite and the RTC supported the use of the EPA's MOVES2014 model to determine RFP on-road mobile source emissions inventories.

The commission appreciates the commenters' support for using the MOVES2014 model to develop on-road mobile source emissions inventories for the DFW RFP SIP revision. This SIP revision uses MOVES2014 for final on-road mobile source emissions inventories.

The EPA commented that the DFW RFP SIP revision omitted Wise County airport emissions.

Wise County airport emissions were not omitted in the proposal and are included in the RFP demonstration spreadsheet in Appendix 1, sheet 20, as proposed.

In response to this comment, the DFW RFP SIP revision narrative has been updated to provide clarification on Wise County airport emissions development. The Eastern Research Group report that details the airport emissions development method for Wise County and other counties has been added to Appendix 9, which has been renamed to: *Development of Annual Emissions Inventories and Activity Data for Airports in the 12-County Dallas-Fort Worth Area and Development of Statewide Annual Emissions Inventories and Activity Data for Airports*.

The RTC commented that there was a potential error in the total vehicle miles traveled (VMT) in Table 2-13: *DFW RFP Ozone Season Weekday On-Road Mobile Source VMT for Nine Previously Designated Counties (miles per day)* and Table 2-15: *DFW RFP Ozone Season Weekday On-Road Mobile Source VMT for Wise County (miles per day)*. The numbers appear to have been inadvertently truncated.

In response to this comment, the values in Tables 2-13 and 2-15 have been updated to reflect the units listed in the table titles.

The vehicle miles traveled used to develop the information in this DFW RFP SIP revision were in units of 1,000 miles per day. The TCEQ inadvertently did not convert these values to units of miles per day in the proposal version of the DFW RFP SIP revision.

ORDER ADOPTING
REVISIONS TO THE STATE IMPLEMENTATION PLAN

Docket No. 2014-1249-SIP
Project No. 2013-014-SIP-NR

On June 3, 2015, the Texas Commission on Environmental Quality (Commission), during a public meeting, considered adoption of the Dallas-Fort Worth (DFW) 2008 Eight-Hour Ozone Standard Reasonable Further Progress (RFP) SIP. The Commission adopts the DFW 2008 Eight-Hour Ozone Standard RFP SIP. The DFW RFP SIP revision includes an analysis of the reasonable further progress toward attainment of the 2008 eight-hour ozone NAAQS. Due to a change in attainment deadlines for the 2008 eight-hour ozone NAAQS resulting from a court decision that was issued December 23, 2014, this SIP revision provides an RFP analysis for a 2017 attainment year, including a contingency plan and a motor vehicles emission budget (MVEB). This SIP revision also provides an alternative analysis to demonstrate an 18% emissions reduction in ozone precursors from the 2011 base year through a 2018 attainment year, a 3% emissions reduction demonstration for contingency for each milestone year, and updated RFP MVEB for each milestone year in the event that the 2018 attainment year requirement is reinstated. Under Tex. Health & Safety Code Ann. §§ 382.011, 382.012, and 382.023 (West 2010), the Commission has the authority to control the quality of the state's air and to issue orders consistent with the policies and purposes of the Texas Clean Air Act, Chapter 382 of the Tex. Health & Safety Code. Notice of the proposed DFW 2008 Eight-Hour Ozone Standard RFP SIP was published for comment in the December 26, 2014, issue of the *Texas Register* (39 TexReg 10548).

Pursuant to 40 Code of Federal Regulations § 51.102 and after proper notice, the Commission conducted public hearings to consider the revisions to the SIP. Proper notice included prominent advertisement in the areas affected at least 30 days prior to the dates of the hearings. Public hearings were held in Arlington on January 15, 2015 and in Austin on January 22, 2015.

The Commission circulated hearing notices of its intended action to the public, including interested persons, the Regional Administrator of the EPA, and all applicable local air pollution control agencies. The public was invited to submit data, views, and recommendations on the proposed SIP revisions, either orally or in writing, at the hearings or during the comment period. Prior to the scheduled hearings, copies of the proposed SIP revisions were available for public inspection at the Commission's central office and on the Commission's website.

Data, views, and recommendations of interested persons regarding the proposed SIP revisions were submitted to the Commission during the comment period, and were considered by the Commission as reflected in the analysis of testimony incorporated by reference to this Order. The Commission finds that the analysis of testimony includes the

names of all interested groups or associations offering comment on the SIP revisions and their position concerning the same.

IT IS THEREFORE ORDERED BY THE COMMISSION that revisions to the SIP incorporated by reference to this Order are hereby adopted. The adopted revisions to the SIP are incorporated by reference in this Order as if set forth at length verbatim in this Order.

IT IS FURTHER ORDERED BY THE COMMISSION that on behalf of the Commission, the Chairman should transmit a copy of this Order, together with the adopted revisions to the SIP, to the Regional Administrator of EPA as a proposed revision to the Texas SIP pursuant to the Federal Clean Air Act, codified at 42 U.S. Code Ann. §§ 7401 - 7671q, as amended.

If any portion of this Order is for any reason held to be invalid by a court of competent jurisdiction, the invalidity of any portion shall not affect the validity of the remaining portions.

Date issued:

TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY

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Bryan W. Shaw, Ph.D., P.E., Chairman