TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AGENDA ITEM REQUEST

for Adoption of State Implementation Plan Revision

AGENDA REQUESTED: 4/24/2024

DATE OF REQUEST: 4/5/2024

INDIVIDUAL TO CONTACT REGARDING CHANGES TO THIS REQUEST, IF NEEDED: Jamie Zech, Agenda Coordinator, (512) 239-3935

CAPTION: Docket No. 2023-1178-SIP. Consideration for adoption of the Dallas-Fort Worth Severe Area Attainment Demonstration State Implementation Plan (SIP) Revision for the 2008 Eight-Hour Ozone National Ambient Air Quality Standard (NAAQS).

The SIP revision includes a photochemical modeling analysis, a weight of evidence analysis, a reasonably available control technology analysis, a reasonably available control measures analysis, motor vehicle emissions budgets for 2026, and a contingency plan. (Rachel Melton, Terry Salem; Project No. 2023-107-SIP-NR)

Richard C. Chism
Director

Donna F. Huff
Division Deputy Director

Jamie Zech
Agenda Coordinator

Copy to CCC Secretary? NO ☒ YES ☐

Texas Commission on Environmental Quality
Interoffice Memorandum

To: Commissioners **Date:** April 5, 2024

Thru: Laurie Gharis, Chief Clerk
Kelly Keel, Executive Director

From: Richard C. Chism, Director *RCC*
Office of Air

Docket No.: 2023-1178-SIP

Subject: Commission Approval for Adoption of the Dallas-Fort Worth (DFW) Severe Area Attainment Demonstration (AD) State Implementation Plan (SIP) Revision for the 2008 Eight-Hour Ozone Standard Nonattainment Area

DFW 2008 Ozone NAAQS Severe AD SIP Revision
Non-Rule Project No. 2023-107-SIP-NR

Background and reason(s) for the SIP revision:
The DFW 2008 ozone NAAQS nonattainment area, consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties, was previously classified as serious nonattainment for the 2008 eight-hour ozone NAAQS of 0.075 parts per million (ppm) with a July 20, 2021, attainment date. Based on 2020 monitoring data, the DFW area did not attain the standard and did not qualify for a one-year attainment date extension in accordance with federal Clean Air Act (FCAA), §181(a)(5).[1] On October 7, 2022, the U.S. Environmental Protection Agency (EPA) published a final notice reclassifying the DFW area to severe nonattainment for the 2008 eight-hour ozone NAAQS, effective November 7, 2022 (87 *Federal Register* (FR) 60926).

Since the DFW area has been reclassified by EPA, the area is now subject to the severe nonattainment area requirements in FCAA, §182(d), and TCEQ is required to submit severe classification AD and reasonable further progress (RFP) SIP revisions to EPA. The attainment date for severe areas is July 20, 2027 with a 2026 attainment year (87 FR 60926).[2] EPA set a May 7, 2024, deadline for states to submit AD and RFP SIP revisions to address the 2008 eight-hour ozone standard severe nonattainment area requirements.

With the severe classification, the DFW 2008 ozone NAAQS nonattainment area is also subject to FCAA §182(d)(3), which requires states to submit plans to include requirements for the FCAA, §185 penalty fee. EPA set a November 7, 2025, deadline for states to submit a SIP revision to address the FCAA, §185 requirements (87 FR 60926). This requirement will be submitted in a future rulemaking.

Scope of SIP revision:
As a result of the reclassification, TCEQ is required to submit to EPA an AD SIP revision consistent with FCAA requirements for areas classified as severe nonattainment for the 2008 eight-hour ozone NAAQS. This DFW AD SIP revision is scheduled to be adopted in conjunction with the DFW

[1] An area that fails to attain the 2008 eight-hour ozone NAAQS by its attainment date would be eligible for the first one-year extension if, for the attainment year, the area's 4th highest daily maximum eight-hour average is at or below the level of the standard (75 parts per billion (ppb)); the DFW area's fourth highest daily maximum eight-hour average for 2020 was 77 ppb as measured at the Grapevine Fairway monitor (C70/A301/x182). The DFW area's design value for 2020 was 76 ppb.
[2] The attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment deadline.

and Houston-Galveston-Brazoria (HGB) 2008 Eight-Hour Ozone Severe Area RFP SIP Revision (Project Number 2023-108-SIP-NR).

A.) Summary of what the SIP revision will do:
This SIP revision includes a photochemical modeling analysis and a weight-of-evidence (WoE) analysis that evaluates the attainment status of the area. This SIP revision also includes a reasonably available control measures (RACM) analysis, a reasonably available control technology (RACT) analysis, and a contingency plan. To ensure that emissions from transportation projects that use federal transportation funding conform to the SIP, this DFW AD SIP revision contains nitrogen oxides (NO_x) and volatile organic compounds (VOC) motor vehicle emissions budgets (MVEB) for the 2026 attainment year.

This SIP revision incorporates concurrently adopted revisions to rules in 30 Texas Administrative Code (TAC) Chapters 115 (Rule Project No. 2023-116-115-AI) and 117 (Rule Project No. 2023-117-117-AI). Rules in both chapters address major source RACT requirements for NO_x and VOC associated with reclassification of the DFW nonattainment area from serious to severe. In addition to RACT, rules in 30 TAC Chapter 115 also correct inadvertent errors made in a previously adopted rulemaking that implemented EPA's 2016 Control Techniques Guidelines for the Oil and Natural Gas Industry (Rule Project No. 2020-038-115-AI) and address SIP contingency measure requirements under the 2008 ozone NAAQS. Rules in 30 TAC Chapter 117 also address a rule petition for stationary diesel engines and associated emissions monitoring requirements.

B.) Scope required by federal regulations or state statutes:
This DFW AD SIP revision is consistent with the requirements of FCAA, §182(d) and EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements; Final Rule* (2008 eight-hour ozone standard SIP requirements rule) published on March 6, 2015. The FCAA-required SIP elements include analyses for RACT and RACM, MVEBs, and a contingency plan. Consistent with EPA's November 2018 modeling guidance, this DFW AD SIP revision also includes a modeled attainment demonstration and a WoE analysis.[3]

The SIP revision also includes performance standard modeling for the existing vehicle inspection and maintenance (I/M) program and certification statements to confirm that clean fuel fleet, I/M, and nonattainment new source review requirements have been met for the DFW 2008 eight-hour ozone NAAQS severe nonattainment area. The severe classification vehicle miles traveled growth offset requirements under FCAA, §182(d)(1) are addressed in the concurrently adopted DFW-HGB severe classification RFP SIP revision for the 2008 eight-hour ozone NAAQS (Project No. 2023-108-SIP-NR).

C.) Additional staff recommendations that are not required by federal rule or state statute:
None.

Statutory authority:
The authority to propose and adopt SIP revisions is derived from the following sections of 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; TCAA, §382.011, which authorizes the commission to control the quality of the state's air; and TCAA, §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 will also be

[3] EPA. *Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze.* November 29, 2018. https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf

adopted under the commission's general authority under Texas Water Code, §5.102, General Powers and §5.105, General Policy. States are required to submit SIP revisions that specify the manner in which the NAAQS will be achieved and maintained within each air quality control region of the state by 42 United States Code, §§7420 *et seq.*, and implementing rules in 40 Code of Federal Regulations Part 51.

Effect on the:

A.) Regulated community:
The affected regulated community will be impacted by the concurrent Chapter 115 rulemaking (Rule Project No. 2023-116-115-AI) and Chapter 117 rulemaking (Rule Project No. 2023-117-117-AI), that, if adopted, will be incorporated as part of this DFW AD SIP revision to satisfy major source VOC and NO_x RACT. The concurrent rulemakings revise 30 TAC Chapter 115 and Chapter 117 to apply at a major source that emits or has the potential to emit 25 tons per year of VOC and NO_x, respectively, in the DFW severe ozone nonattainment area. The regulated community will be obligated to comply with any new requirements adopted by the commission and will incur costs associated with those requirements.

The DFW AD SIP revision contains a contingency plan, as required by FCAA, §172(c)(9) and §182(c)(9), which incorporates new control requirements in a concurrent VOC rulemaking (Rule Project No. 2023-116-115-AI). Contingency measures, as necessary, would be implemented to reduce VOC emissions if EPA determines that the DFW 2008 eight-hour ozone NAAQS nonattainment area did not attain the standard.

This SIP revision also provides compliance flexibility for emissions monitoring for owners or operators of non-exempt stationary diesel engines through the concurrent NO_x rulemaking (Rule Project No. 2023-117-117-AI). Owners or operators of affected units meeting specific criteria at major or minor sources of NO_x will not be required to use an emissions monitor for NO_x, nor will they be required to comply with existing ammonia monitoring requirements. Owners or operators will still be required to demonstrate initial compliance with pollutant emission specifications, which can be done with a stack test.

This SIP revision also impacts the regulated community by changing the SIP base emissions year for emissions banking and trading credit generation for the DFW 2008 ozone NAAQS nonattainment area to 2019 for point sources. On April 9, 2021, TCEQ communicated this change to regulated entities.

B.) Public:
The general public in the DFW ozone NAAQS nonattainment area may benefit from the DFW area ultimately meeting the ozone NAAQS and the area being redesignated as attainment for the 2008 eight-hour ozone NAAQS.

C.) Agency programs:
No additional burden on agency programs is anticipated as a result of this SIP revision.

Stakeholder meetings:
TCEQ hosted and attended multiple meetings for the DFW area related to this SIP revision. Agenda topics included the status of DFW photochemical modeling development, emissions inventories and trends, ozone design values, and planning activities for the DFW 2008 Eight-Hour Ozone Severe Area AD SIP Revision. Attendees included representatives from industry, county and city government, environmental groups, and the public.

Re: Docket No. 2023-1178-SIP

Public Involvement Plan
Yes.

Alternative Language Requirements
Yes. Spanish.

Public comment:
The public comment period opened on December 1, 2023, and closed on January 16, 2024. The commission held a public hearing for the proposed SIP revision in Arlington on January 11, 2024. Notice of the public hearing was published in English in the *Dallas Morning News* newspaper on December 1, 2023, and in Spanish in the *Al Día* newspaper on December 6, 2023. Notices in English and Spanish were also distributed to subscribers through GovDelivery and posted to TCEQ's website, and a notice was published in English in the *Texas Register* on December 15, 2023 (48 TexReg 7642). A plain language summary was provided in both English and Spanish. TCEQ staff were present and opened the hearing for public comment on this project. Spanish language interpreters were available at the hearing, the comments were recorded, and transcripts were prepared.

During the comment period, comments were received from EPA, 350Dallas, Air Alliance Houston, City of Dallas, Dallas Environmental Commission, Dallas Sierra Club, Earthjustice, Environment Texas, Environmental Integrity Project, Glenn Spring Neighborhood, Greater Fort Worth Sierra Club, the Justice Network of Tarrant County, Liveable Arlington, Lone Star Chapter of Sierra Club, North Central Texas Council of Governments, Public Citizen, Sierra Club, Tarrant County Coalition for Environmental Awareness, Texas Environmental Justice Advocacy Services, Texas Electric Transportation Resources Alliance, and 125 individuals. The public comments received are summarized and addressed in this DFW AD SIP Revision.

Significant changes from proposal:
The SIP revision adopts all contingency measures for DFW and revises the total amount of available contingency measures for DFW to include all adopted measures. This SIP revision provides the option to apply contingency measures to address either the 2008 ozone NAAQS serious or severe classification for DFW and calculates the 2008 ozone NAAQS serious contingency measure targets as 3% VOC (using base year VOC from the 2020 DFW and HGB Serious Classification RFP SIP revision for the 2008 Eight-Hour Ozone NAAQS (Project Number: 2019-079-SIP-NR)).

Staff inadvertently omitted some source categories and incorrectly stated multiple VOC content limits for other source categories in the industrial adhesives contingency measure of the concurrent Chapter 115 rulemaking proposal (Rule Project No. 2023-116-115-AI). This resulted in less emissions reductions available to fulfill contingency requirements in the DFW area. The executive director intends to immediately initiate rulemaking for commission consideration to restore the missing and incorrect VOC content limits to achieve the reductions originally intended.

Potential controversial concerns and legislative interest:
Although EPA finalized its 2015 eight-hour ozone standard SIP requirements rule (83 FR 62998), the final rule did not revoke the 2008 eight-hour ozone standard. EPA stated that revocation of the 2008 eight-hour ozone standard would be addressed in a separate future action. No further actions have been taken by EPA. However, because of the February 16, 2018, United States Court of Appeals for the District of Columbia Circuit opinion in the case *South Coast Air Quality Management District v. EPA, 882 F.3d 1138 (D.C. Cir. 2018)*, the requirement for EPA to reclassify the area and for TCEQ to submit this AD SIP revision is expected to remain even if the 2008 eight-hour ozone standard is revoked.

EPA released new draft guidance on contingency measures, published in the *Federal Register* for public comment on March 23, 2023 (88 FR 17571). The draft guidance proposed an entirely new scheme for determining the amount of emissions reductions necessary to address the contingency requirement. Since EPA had not issued final guidance to the states regarding the quantity of required reductions from contingency measures at the time this proposed DFW AD SIP revision was developed, this proposed SIP revision relies on the historically approved approach (3% of the 2011 RFP base year emissions) to determine the amount of emissions reductions necessary to address the contingency requirement.

Will 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 SIP revision?
The commission could choose to not comply with requirements to develop and submit an AD SIP revision to EPA. However, if the SIP revision is not submitted to EPA, EPA would issue a finding of failure to submit, requiring that TCEQ submit the required SIP revision within a specified time period, and imposing sanctions on the state. EPA would be required to promulgate a federal implementation plan (FIP) any time within two years after finding TCEQ failed to make the required submission. Sanctions could include transportation funding restrictions, grant withholdings, and 2-to-1 emissions offsets requirements for new construction and major modifications of stationary sources in the DFW 2008 ozone NAAQS nonattainment area. EPA would impose such sanctions and implement a FIP until the state submitted, and EPA approved, an AD SIP revision for the area.

Key points in the adoption SIP revision schedule:
Anticipated agenda date: April 24, 2024

Agency contacts:
Rachel Melton, SIP Project Manager, Air Quality Division (512) 239-1512
Terry Salem, Staff Attorney, Environmental Law Division, (512) 239-0469
Jamie Zech, Agenda Coordinator, Air Quality Division (512) 239-3935

cc: Chief Clerk, 2 copies
Executive Director's Office
Jim Rizk
Kimberly Robertson
Krista Kyle
Office of General Counsel
Rachel Melton
Terry Salem
Jamie Zech

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
AUSTIN, TEXAS 78711-3087

DALLAS-FORT WORTH SEVERE AREA ATTAINMENT DEMONSTRATION STATE IMPLEMENTATION PLAN REVISION FOR THE 2008 EIGHT-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD

PROJECT NUMBER 2023-107-SIP-NR
SFR-122/2023-107-SIP-NR

Adoption
April 24, 2024

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EXECUTIVE SUMMARY

Ten counties comprise the Dallas-Fort Worth (DFW) 2008 ozone National Ambient Air Quality Standard (NAAQS) (0.075 parts per million) nonattainment area: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties. Based on monitoring data from 2018, 2019, and 2020, the area did not attain the 2008 eight-hour ozone NAAQS by the attainment date for areas classified as serious, July 20, 2021, and did not qualify for a one-year attainment date extension in accordance with federal Clean Air Act (FCAA), §181(a)(5).[1] On October 7, 2022, the United States Environmental Protection Agency (EPA) published a final notice reclassifying the area from serious to severe, effective November 7, 2022 (87 *Federal Register* (FR) 60926).

The DFW 2008 ozone NAAQS nonattainment area is now subject to the requirements in FCAA, §182(d) for severe nonattainment areas. The Texas Commission on Environmental Quality (TCEQ) is required to submit severe ozone classification attainment demonstration (AD) and reasonable further progress (RFP) state implementation plan (SIP) revisions to EPA. The attainment date for areas classified as severe is July 20, 2027, with a 2026 attainment year (87 FR 60926).[2] The EPA set a May 7, 2024 deadline for states to submit AD and RFP SIP revisions to address the 2008 eight-hour ozone standard severe nonattainment area requirements. With the severe classification, the DFW 2008 ozone NAAQS nonattainment area is subject to the FCAA, §182(d)(3), which requires states to submit plans to include requirements for the FCAA, §185 penalty fee. EPA set a November 7, 2025, deadline for states to submit a SIP revision to address the FCAA §185 requirements (87 FR 60926).

This DFW AD SIP revision includes the following required SIP elements: photochemical modeling, a reasonably available control technology (RACT) analysis, a reasonably available control measures (RACM) analysis, a weight-of-evidence (WoE) analysis, a contingency plan, attainment year motor vehicle emissions budgets (MVEB) for transportation conformity purposes, performance standard modeling for the existing vehicle inspection and maintenance (I/M) program, and certification statements to confirm that I/M program requirements, nonattainment new source review, and clean fuel fleet program requirements have been met for the DFW 2008 ozone NAAQS nonattainment area. The severe classification vehicle miles traveled growth offset requirements under FCAA, §182(d)(1) are addressed in the concurrent DFW and Houston-Galveston-Brazoria (HGB) severe classification RFP SIP revision for the 2008 eight-hour ozone NAAQS (Project No. 2023-108-SIP-NR).

Contingency measures are control requirements that would take effect and result in emissions reductions if an area fails to attain a NAAQS by the applicable attainment date or fails to demonstrate RFP. EPA has interpreted recent court decisions to have invalidated key aspects of EPA's historical approach to implementing the contingency

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[1] An area that fails to attain the 2008 eight-hour ozone NAAQS by its attainment date would be eligible for the first one-year extension if, for the attainment year, the area's 4th highest daily maximum eight-hour average is at or below the level of the standard (75 parts per billion (ppb)). The DFW area's fourth highest daily maximum eight-hour average for 2020 was 77 ppb as measured at the Grapevine Fairway monitor (C70/A301/x182). The DFW area's design value for 2020 was 76 ppb.

[2] The attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment date.

measure requirement. At the time these contingency measures were being developed, EPA had historically accepted the use of surplus emissions reductions from previously implemented control measures to fulfill the contingency measure requirements. However, EPA's new draft guidance on contingency measures, published in the *Federal Register* for public comment on March 23, 2023 (88 FR 17571), indicates that contingency measures must be conditional and prospective (not previously implemented) based on the recent court rulings. The draft guidance also suggests an entirely new scheme for determining the amount of emissions reductions necessary to address the contingency requirement.

The contingency measures in the concurrent Chapter 115 rulemaking (Rule Project No. 2023-116-115-AI) are conditional and prospective (not previously implemented), which follows EPA's interpretation of recent court decisions. These measures do not rely on the historical approach of using surplus emissions reductions from previously implemented measures to fulfill contingency requirements. Since EPA had not issued final guidance to states regarding the amount of required reductions from contingency measures at the time this DFW AD SIP revision was developed, this SIP revision relies on the historically approved approach to determine the amount of emissions reductions necessary to address the contingency requirement.

Staff inadvertently omitted some source categories and incorrectly stated multiple VOC content limits for other source categories in the industrial adhesives contingency measure of the concurrent Chapter 115 rulemaking proposal (Rule Project No. 2023-116-115-AI). This resulted in less emissions reductions available to fulfill contingency requirements in the DFW area. The Executive Director intends to immediately initiate rulemaking for commission consideration to restore the missing and incorrect VOC content limits to achieve the reductions originally intended.

This DFW AD SIP revision is concurrent with the DFW and HGB 2008 Eight-Hour Ozone Severe Classification RFP SIP Revision (Project Number 2023-108-SIP-NR), the 30 Texas Administrative Code (TAC) Chapter 115 rulemaking (Rule Project No. 2023-116-115-AI), and the 30 TAC Chapter 117 rulemaking (Rule Project No. 2023-117-117-AI).

This DFW AD SIP revision includes a photochemical modeling analysis of reductions in nitrogen oxides (NO_X) and volatile organic compounds (VOC) emissions from existing control strategies and a WoE analysis. The peak ozone design value for the DFW 2008 ozone NAAQS nonattainment area is estimated to be 72 parts per billion (ppb) in 2026. The quantitative and qualitative analyses in Chapter 5: *Weight of Evidence* supplement the photochemical modeling analysis presented in Chapter 3: *Photochemical Modeling* to characterize 2026 future ozone conditions.

For the photochemical modeling analysis, this SIP revision includes a base case modeling episode of April through October of 2019. This modeling episode was chosen because the period is representative of the times of the year that eight-hour ozone levels above 75 ppb have historically been monitored within the nonattainment area. The model performance evaluation of the 2019 base case indicates the modeling is suitable for use in conducting the modeling attainment test. The modeling attainment

test was applied by modeling a 2019 base case and 2026 future case modeling results to estimate 2026 eight-hour ozone design values.[3]

Table ES-1: *Summary of 2019 Base and 2026 Future Case Anthropogenic Modeling Emissions for DFW 2008 Ozone NAAQS Nonattainment Area for the June 12 Episode Day* lists anthropogenic modeled emissions of NO_X and VOC in tons per day (tpd) by source category for a sample episode day of June 12 in the 2019 base and 2026 future case ozone modeling. The differences in modeled emissions between the 2019 base case and the 2026 future case reflect the net of economic growth and reductions from existing controls. The existing controls include both state and federal measures that have already been adopted as discussed in Chapter 4: *Control Strategies and Required Elements*.

Table ES-1: Summary of 2019 Base and 2026 Future Case Anthropogenic Modeling Emissions for DFW 2008 Ozone NAAQS Nonattainment Area for the June 12 Episode Day

Emissions Source Category	2019 NO_X (tpd)	2026 NO_X (tpd)	2019 VOC (tpd)	2026 VOC (tpd)
On-Road	102.22	60.12	48.89	33.31
Non-Road	38.77	32.03	41.44	44.13
Off-Road - Airports	17.13	18.02	4.32	4.57
Off-Road - Locomotives	10.53	6.57	0.49	0.29
Area	33.28	35.40	250.64	273.85
Oil and Gas - Drilling	0.20	0.18	0.01	0.01
Oil and Gas - Production	10.39	1.68	50.33	8.17
Point - Cement Kilns	9.78	15.12	1.25	1.45
Point - EGU	6.17	7.53	0.20	0.20
Point - Non-EGU	15.03	10.80	25.60	20.80
DFW Nonattainment Area Total	**243.50**	**187.45**	**423.17**	**386.78**

The future year on-road mobile source emission inventories for this SIP revision were developed using version 3 of EPA Motor Vehicle Emission Simulator (MOVES3) model. These 2026 attainment year inventories establish the NO_X and VOC MVEBs that, once found adequate or approved by EPA, must be used in transportation conformity analyses. The attainment MVEBs represent the 2026 on-road mobile source emissions that have been modeled for the AD and include the on-road control measures. The MVEBs are provided in Table 4-2: *2026 Attainment Demonstration MVEBs for the DFW 2008 Ozone NAAQS Nonattainment Area (tons per day).*

The eight-hour ozone design values for the 2019 base case design value (DVB) and modeled 2026 future case design value (DVF) for the regulatory ozone monitors in the DFW 2008 ozone NAAQS nonattainment area are shown in Table ES-2: *Summary of 2019 DVBs and Modeled 2026 DVFs for DFW 2008 Ozone NAAQS Nonattainment Area Monitors*. In accordance with EPA's 2018 *Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze*, the 2026 DVFs

[3] The future case modeling includes projected emissions for the attainment year of 2026 since that is the last full ozone season prior to the attainment date for the nonattainment area.

presented have been rounded to one decimal place and then truncated.[4] Based on TCEQ's modeling and available data, the DFW area is expected to attain the 2008 ozone NAAQS by the July 20, 2027, attainment date.

Table ES-2: Summary of 2019 DVBs and Modeled 2026 DVFs for DFW 2008 Ozone NAAQS Nonattainment Area Monitors

Monitor Name	CAMS Number	2019 DVB (ppb)	Relative Response Factor	2026 DVF (ppb)
Arlington Municipal Airport	0061	70.00	0.972	68
Cleburne Airport	0077	73.33	0.969	71
Dallas Executive Airport	0402	68.33	0.980	66
Dallas Hinton	0401	69.67	0.960	66
Dallas North #2	0063	74.00	0.958	70
Denton Airport South	0056	73.00	0.949	69
Eagle Mountain Lake	0075	74.33	0.961	71
Frisco	0031	75.33	0.957	72
Ft. Worth Northwest	0013	72.00	0.964	69
Grapevine Fairway	0070	75.00	0.956	71
Kaufman	0071	63.67	0.991	63
Keller	0017	73.00	0.960	70
Midlothian OFW	0052	64.00	0.982	62
Parker County	0076	68.67	0.965	66
Pilot Point	1032	73.00	0.963	70
Rockwall Heath	0069	63.00	0.974	61

This DFW AD SIP revision documents a photochemical modeling analysis and a WoE assessment that meets EPA modeling guidance.

[4] https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf

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. In 1989, the TCAA was codified as Chapter 382 of the Texas Health and Safety Code. The TCAA is frequently amended for various purposes during the biennial legislative sessions.

Originally, the TCAA stated that the Texas Air Control Board (TACB) was the state air pollution control agency and was 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). In 2001, the 77th Texas Legislature continued the existence of the TNRCC until September 1, 2013, and changed the name of the TNRCC to 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 TCEQ to September 1, 2011, unless continued in existence by the Texas Sunset Act. In 2011, the 82nd Texas Legislature continued the existence of TCEQ until 2023. In 2023, the 88th regular session of the Texas Legislature continued the existence of TCEQ until 2035.

With the creation of the TNRCC (and its successor the TCEQ), authority over air quality is found in both the Texas Water Code (TWC) and the TCAA. The general authority of TCEQ is found in TWC, Chapter 5 and enforcement authority is provided by TWC, Chapter 7. TWC, Chapter 5, Subchapters A - F, H - J, and L, include the general provisions, organization, and general powers and duties of TCEQ, and the responsibilities and authority of the executive director. TWC, Chapter 5 also authorizes TCEQ to implement action when emergency conditions arise and to conduct hearings. The TCAA specifically authorizes 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 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 TCEQ to enter property and make inspections. They also may

make recommendations to the commission concerning any action of TCEQ that affects their territorial jurisdiction, may bring enforcement actions, and may execute cooperative agreements with 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.

In addition, Subchapters G and H of the TCAA authorize 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, with the most recent effective date, unless otherwise noted.

TEXAS HEALTH & SAFETY CODE, Chapter 382	September 1, 2023
TEXAS WATER CODE	September 1, 2023

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, 5.231, 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, 7.178-7.183 only)

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, respectively

Chapter 19: Electronic Reporting — March 1, 2007

- Subchapter A: General Provisions
- Subchapter B: Electronic Reporting Requirements

Chapter 39: Public Notice
- Subchapter H: Applicability and General Provisions, §§39.402(a)(1) - (a)(6), (a)(8), and (a)(10) - (a)(12); §§39.405(f)(3) and (g), (h)(1)(A), (h)(2) - (h)(4), (h)(6), (h)(8) - (h)(11), (i) and (j), §39.407; §39.409; §§39.411(a), (e)(1) - (4)(A)(i) and (iii), (4)(B), (e)(5) introductory paragraph, (e)(5)(A), (e)(5)(B), (e)(6) - (e)(10), (e)(11)(A)(i), (e)(11)(A)(iii) - (vi), (11)(B) - (F), (e)(13), and (e)(15), (e)(16), and (f) introductory paragraph, (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), (c)(1)(D)(ii), (c)(2), (d) - (e), and (h), and Subchapter K: Public Notice of Air Quality Permit Applications, §§39.601 - 39.605 — September 16, 2021

Chapter 55: Requests for Reconsideration and Contested Case Hearings; Public Comment, all of the chapter, except §55.125(a)(5) and (a)(6) — September 16, 2021

Chapter 101: General Air Quality Rules — May 14, 2020

Chapter 106: Permits by Rule, Subchapter A — April 17, 2014

Chapter 111: Control of Air Pollution from Visible Emissions and Particulate Matter — November 12, 2020

Chapter 112: Control of Air Pollution from Sulfur Compounds — October 27, 2022

Chapter 114: Control of Air Pollution from Motor Vehicles — December 21, 2023

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    8. San Antonio Area (No change)
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LIST OF ACRONYMS

ACT	alternative control technique
AD	attainment demonstration
AEDT	Aviation Environmental Design Tool
APU	auxiliary power units
AQRP	Air Quality Research Program
AQS	Air Quality System
auto-GC	automated gas chromatography
$(BC)^2$	Black and Brown Carbon
BEIS	Biogenic Emission Inventory System
BELD5	Biogenic Emissions Land-use Database
CAMS	continuous ambient monitoring station
CAMx	Comprehensive Air Quality Model with Extensions
CFR	Code of Federal Regulations
CMV	commercial marine vessel
CSAPR	Cross-State Air Pollution Rule
CTG	control techniques guidelines
D.C.	District of Columbia
DERC	Discrete Emissions Reduction Credit
DERI	Diesel Emissions Reduction Incentive program
DFW	Dallas-Fort Worth
DV	design value
DVB	base case design value
DVF	future case design value
ECLIPSE	Evaluating the Climate and Air Quality Impact of Short-Lived Pollutants
EE	energy efficiency
EGU	electric generating unit
EI	emissions inventory
EIA	Energy Information Administration
EPA	United States Environmental Protection Agency
ERC	Emission Reduction Credit
ERG	Eastern Research Group
ESL	Energy Systems Laboratory

FAA	Federal Aviation Administration
FCAA	Federal Clean Air Act
FINN	Fire Inventory of National Center for Atmospheric Research
FIP	federal implementation plan
FR	*Federal Register*
GEOS-Chem	Goddard Earth Observing System
GSE	ground support equipment
HB	House Bill
HGB	Houston-Galveston-Brazoria
I/M	inspection and maintenance
IC/BC	initial and boundary conditions
ICI	Industrial, Commercial, and Institutional
IOP	increment of progress
km	kilometer
m	meter
m/s	meters per second
MDA8	maximum daily average eight-hour ozone
MODIS	Moderate-Resolution Imaging Spectroradiometer
MOVES	Motor Vehicle Emissions Simulator
MPE	model performance evaluation
MSA	metropolitan statistical area
MVEB	motor vehicle emissions budget
MW	megawatt
MWh	megawatt-hours
NAAQS	National Ambient Air Quality Standard
NCTCOG	North Central Texas Council of Governments
NMB	Normalized Mean Bias
NME	Normalized Mean Error
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSR	new source review
NTIG	New Technology Implementation Grant
PEI	periodic emissions inventory

$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion
ppbC	parts per billion by carbon
ppbV	parts per billion by volume
ppm	parts per million
PSM	performance standard modeling
RACM	reasonably available control measures
RACT	reasonably available control technology
RCP4.5	Representative Concentration Pathways
RE	renewable energy
RFP	reasonable further progress
RRF	relative response factor
RS	redesignation substitute
RVP	Reid vapor pressure
SB	Senate Bill
SIP	state implementation plan
SMOKE	Sparse Matrix Operation Kernel Emissions
SO_2	sulfur dioxide
SPRY	Seaport and Rail Yard Areas Emissions Reduction Program
STARS	State of Texas Air Reporting System
TAC	Texas Administrative Code
TACB	Texas Air Control Board
TAMIS	Texas Air Monitoring Information System
TCAA	Texas Clean Air Act
TCEQ	Texas Commission on Environmental Quality (commission)
TCFP	Texas Clean Fleet Program
TCM	transportation control measure
TDM	travel demand model
TERP	Texas Emissions Reduction Plan
TexN2	Texas NONROAD utility version 2
TIM	Technical Information Meeting
TNGVGP	Texas Natural Gas Vehicle Grant Program
TNMOC	total non-methane organic compounds

TNRCC	Texas Natural Resource Conservation Commission
tpd	tons per day
tpy	tons per year
TSD	technical support document
TTI	Texas Transportation Institute
TWC	Texas Water Code
TxDOT	Texas Department of Transportation
TxLED	Texas Low Emission Diesel
U.S.	United States
VMEP	Voluntary Mobile Source Emissions Reduction Program
VMT	vehicle miles traveled
VOC	volatile organic compounds
WoE	weight of evidence
WRF	Weather Research and Forecasting

LIST OF PREVIOUS STATE IMPLEMENTATION PLAN (SIP) REVISIONS AND REPORTS

The following list references SIP revisions and reports that were previously adopted by the commission and submitted to the United States Environmental Protection Agency (EPA). The list identifies how these SIP revisions are referenced in this document and contains the project number, adoption date, and full title. Copies of these SIP revisions are located on the Texas SIP Revisions webpage (https://www.tceq.texas.gov/air quality/sip/sipplans.html).

1999 DFW One-Hour Ozone AD SIP Revision (TCEQ Project No. 1998-046-SIP-AI, adopted February 24, 1999) Dallas-Fort Worth (DFW), One-Hour Ozone Attainment Demonstration (AD) State Implementation Plan (SIP) Revision

2000 DFW One-Hour Ozone AD SIP Revision (TCEQ Project No. 1999-055-SIP-AI, adopted April 19, 2000) Dallas-Fort Worth (DFW), One Hour Ozone Attainment Demonstration (AD) State Implementation Plan (SIP) Revision

2000 DFW One-Hour Ozone Inspection and Maintenance (I/M) SIP Revision (TCEQ Project No. 1999-055C-SIP-AI, adopted April 19, 2000) Dallas-Fort Worth (DFW), One-Hour Ozone Vehicle Inspection and Maintenance (I/M) State Implementation Plan (SIP) Revision

2001 DFW One-Hour Ozone AD SIP Revision (TCEQ Project No. 2001-025-SIP-AI, adopted August 22, 2001) Dallas-Fort Worth (DFW), One Hour Ozone Attainment Demonstration (AD) State Implementation Plan (SIP) Revision

2003 DFW One-Hour Ozone AD SIP Revision (TCEQ Project No. 2003-008-114-SIP-AI, adopted March 5, 2003) Dallas-Fort Worth (DFW), One-Hour Ozone Attainment Demonstration (AD) State Implementation Plan (SIP) Revision

2005 DFW Eight-Hour Ozone 5% IOP SIP Revision (TCEQ Project No. 2004-096-SIP-NR, adopted April 27, 2005) Dallas-Fort Worth (DFW), 5 Percent Increment of Progress (IOP) State Implementation Plan (SIP) Revision for the 1997 Eight-Hour Ozone Standard

2007 DFW Eight-Hour Ozone AD SIP Revision (TCEQ Project No. 2006-013-SIP-NR, adopted May 23, 2007) Dallas-Fort Worth (DFW), 1997 Eight-Hour Ozone Moderate Nonattainment Area, Attainment Demonstration (AD) State Implementation Plan (SIP) Revision

2007 DFW Eight-Hour Ozone RFP SIP Revision (TCEQ Project No. 2006-031-SIP-NR, adopted May 23, 2007) Dallas-Fort Worth (DFW), 1997 Eight-Hour Ozone Moderate Nonattainment Area, Reasonable Further Progress (RFP) State Implementation Plan (SIP) Revision

2008 DFW Eight-Hour Ozone AD (Contingency Measures Plan) SIP Revision (TCEQ Project No. 2008-016A-SIP-NR, adopted November 5, 2008) Dallas-Fort Worth (DFW), 1997 Eight-Hour Ozone Moderate Nonattainment Area, Attainment Demonstration (AD) Contingency Plan State Implementation Plan (SIP) Revision

2008 DFW Eight-Hour Ozone AD (DERC) SIP Revision (TCEQ Project No. 2008-016-SIP-NR, adopted December 10, 2008) Dallas-Fort Worth (DFW), 1997 Eight-Hour Ozone Standard DERC Program State Implementation Plan (SIP) Revision

2010 DFW Eight-Hour Ozone RACT, Rule, and Contingency SIP Revision (TCEQ Project No. 2009-018-SIP-NR, adopted March 10, 2010) Dallas-Fort Worth (DFW), RACT Update, 30 TAC Chapter 117 Rule, and Modified Failure to Attain Contingency Plan State Implementation Plan (SIP) Revision

2010 DFW Eight-Hour Ozone ESL SIP Revision (TCEQ Project No. 2009-026-SIP-NR, adopted August 25, 2010) Dallas-Fort Worth (DFW), Environmental Speed Limit (ESL) Control Strategy Conversion to a Transportation Control Measure (TCM) State Implementation Plan (SIP) Revision

2011 DFW Eight-Hour Ozone AD SIP Revision (TCEQ Project No. 2010-022-SIP-NR, adopted December 7, 2011) Dallas-Fort Worth (DFW) Attainment Demonstration State Implementation Plan (SIP) Revision for the 1997 Eight-Hour Ozone Standard

2011 DFW Eight-Hour Ozone RFP Revision (TCEQ Project No. 2010-023-SIP-NR, adopted December 7, 2011) Dallas-Fort Worth (DFW) Reasonable Further Progress (RFP) State Implementation Plan (SIP) Revision for the 1997 Eight-Hour Ozone Standard

2015 DFW 2008 Eight-Hour Ozone Standard AD SIP Revision (TCEQ Project No. 2013-015-SIP-NR, adopted June 3, 2015) Dallas-Fort Worth (DFW) 2008 Eight-Hour Ozone Nonattainment Area Attainment Demonstration (AD) State Implementation Plan (SIP) Revision

2015 DFW 2008 Eight-Hour Ozone Standard RFP SIP Revision (TCEQ Project No. 2013-014-SIP-NR, adopted June 3, 2015) Dallas-Fort Worth (DFW) 2008 Eight-Hour Ozone Nonattainment Area Reasonable Further Progress (RFP) State Implementation Plan (SIP) Revision

2015 DFW One-Hour and 1997 Eight-Hour Ozone RS Report (Submitted to EPA on August 18, 2015) Dallas-Fort Worth Redesignation Substitute Report for the One-Hour and 1997 Eight-Hour Ozone Standard

2016 DFW 2008 Eight-Hour Ozone Standard AD SIP Revision (TCEQ Project No. 2015-014-SIP-NR, adopted July 6, 2016) Dallas-Fort Worth (DFW) 2008 Eight-Hour Ozone Nonattainment Area Attainment Demonstration (AD) State Implementation Plan (SIP) Revision for the 2017 Attainment Year

2018 DFW RACT Update SIP Revision (TCEQ Project No. 2017-001-SIP-NR, adopted August 8, 2018) Dallas-Fort Worth (DFW) 2008 Eight-Hour Ozone Standard Nonattainment Area Reasonably Available Control Technology (RACT) Update State Implementation Plan (SIP) Revision

2019 DFW One-Hour and 1997 Eight-Hour Ozone Redesignation SIP Revision (TCEQ Project No. 2018-028-SIP-NR, adopted March 27, 2019) Dallas-Fort Worth (DFW) Redesignation Request and Maintenance Plan State Implementation Plan (SIP) Revision for One-Hour and 1997 Eight-Hour Ozone NAAQS

2020 DFW 2008 Eight-Hour Ozone Standard AD SIP Revision (TCEQ Project No. 2019-078-SIP-NR, adopted March 4, 2020) Dallas-Fort Worth (DFW) Serious Classification 2008 Eight-Hour Ozone Attainment Demonstration (AD) State Implementation Plan (SIP) Revision

2020 DFW and HGB 2008 Eight-Hour Ozone Standard RFP SIP Revision (TCEQ Project No. 2019-079-SIP-NR, adopted March 4, 2020) Dallas-Fort Worth (DFW) and Houston-Galveston-Brazoria (HGB) Serious Classification 2008 Eight-Hour Ozone Reasonable Further Progress (RFP) State Implementation Plan (SIP) Revision

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CHAPTER 1: GENERAL

1.1 BACKGROUND

Information on the Texas State Implementation Plan (SIP) and a list of SIP revisions and other air quality plans adopted by the commission can be found on the Texas State Implementation Plan webpage (https://www.tceq.texas.gov/airquality/sip) on the Texas Commission on Environmental Quality's (TCEQ) website (https://www.tceq.texas.gov/).

1.2 INTRODUCTION

The following history of the one-hour and eight-hour ozone National Ambient Air Quality Standards (NAAQS) and summaries of the Dallas-Fort Worth (DFW) area one-hour and eight-hour ozone SIP revisions is provided to give context and greater understanding of the complex issues involved in the area's ozone challenge.

1.2.1 One-Hour Ozone NAAQS History (No change)

No change from the 2020 DFW Serious Classification Attainment Demonstration (AD) SIP revision for 2008 Eight-Hour Ozone NAAQS (Project Number: 2019-078-SIP-NR).

1.2.2 1997 Eight-Hour Ozone NAAQS History (No change)

No change from the 2020 DFW Serious Classification AD SIP revision for 2008 Eight-Hour Ozone NAAQS (Project Number: 2019-078-SIP-NR).

1.2.3 2008 Eight-Hour Ozone NAAQS History

On March 27, 2008, the United States Environmental Protection Agency (EPA) published a final rule revising the eight-hour ozone standard, lowering the primary and secondary eight-hour ozone NAAQS to 0.075 parts per million (ppm) or 75 parts per billion (ppb) (73 *Federal Register* (FR) 16436). Attainment of the standard (expressed as 0.075 ppm) is achieved when an area's design value does not exceed 75 ppb. On May 21, 2012, EPA published initial final designations for the 2008 eight-hour ozone standard with an effective date of July 20, 2012 (77 FR 30088). The EPA's classifications approach rule for the 2008 eight-hour ozone NAAQS, also published on May 21, 2012, established the air quality thresholds assigned to all nonattainment areas, as well as establishing December 31 of each relevant calendar year as the attainment date for all nonattainment area classification categories (77 FR 30160) and revoking the 1997 eight-hour ozone NAAQS for transportation conformity purposes.

The United States Court of Appeals for the District of Columbia (D.C. Circuit Court) published an opinion on December 23, 2014, agreeing with two challenges to EPA's May 21, 2012, classifications approach rule for the 2008 eight-hour ozone NAAQS. The court vacated the provisions of the rule relating to attainment deadlines and revocation of the 1997 eight-hour ozone NAAQS for transportation conformity purposes. As part of the final 2008 eight-hour ozone standard SIP requirements rule, published on March 6, 2015, 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, and revoked the 1997 eight-hour ozone NAAQS for all purposes (80 FR 12264).

On July 2, 2014, the commission adopted a SIP revision to satisfy the federal Clean Air Act (FCAA), §172(c)(3) and §182(a)(1) emissions inventory reporting requirements and establish a 2011 emissions inventory base year for the DFW and Houston-Galveston-Brazoria nonattainment areas. EPA published direct final approval of this SIP revision on February 20, 2015 (80 FR 9204).

1.2.3.1 Moderate Classification AD for the 2008 Eight-Hour Ozone NAAQS

No change from the 2020 DFW Serious Classification AD SIP revision for 2008 Eight-Hour Ozone NAAQS (Project Number: 2019-078-SIP-NR).

1.2.3.2 Reclassification to Serious for the 2008 Eight-Hour Ozone NAAQS

Based on monitoring data from 2015, 2016, and 2017, the DFW area did not attain the 2008 eight-hour ozone NAAQS in 2017 and did not qualify for a one-year attainment date extension in accordance with FCAA, §181(a)(5). On August 23, 2019, EPA published the final notice reclassifying the DFW nonattainment area from moderate to serious for the 2008 eight-hour ozone NAAQS, effective September 23, 2019 (84 FR 44238). As indicated in EPA's 2008 eight-hour ozone standard SIP requirements rule, the attainment date for a serious classification was July 20, 2021, with a 2020 attainment year. EPA set an August 3, 2020, deadline for states to submit AD and RFP SIP revisions to address the 2008 eight-hour ozone standard serious nonattainment area requirements.

On March 4, 2020, the commission adopted the 2020 DFW 2008 Eight-Hour Ozone Standard AD SIP Revision, which included the following analyses to reflect the 2020 attainment year: a modeled AD, corroborative analysis, an analysis of RACM, including RACT and contingency measures that provided additional emissions reductions. To ensure that federal transportation funding conforms to the SIP, the DFW AD SIP revision also contained 2020 attainment year MVEBs. The concurrent rulemaking to address NO_X requirements (Rule Project No. 2019-074-117-AI) revised 30 TAC Chapter 117 to amend the existing DFW NO_X RACT rules applicable in Wise County to apply at a threshold of actual emissions or the potential to emit of 50 tons per year (tpy). All unit types located at major source sites in the 2017 point source emissions inventory were addressed by this RACT rulemaking. The concurrent rulemaking to address VOC requirements (Rule Project No.2019-075-115-AI) revised 30 TAC Chapter 115, Subchapter B, Division 1, Storage of VOC, to amend the existing DFW VOC RACT rules in Wise County for fixed roof oil and condensate storage tanks to apply at a threshold of 50 tpy of actual emissions.

1.2.3.3 Reclassification to Severe for the 2008 Eight-Hour Ozone NAAQS

Based on monitoring data from 2018, 2019, and 2020, the DFW area did not attain the 2008 eight-hour ozone NAAQS in the 2020 attainment year and did not qualify for a one-year attainment date extension in accordance with FCAA, §181(a)(5).[5] On October 7, 2022, EPA published a final notice reclassifying the DFW nonattainment area from

[5] An area that fails to attain the 2008 eight-hour ozone NAAQS by its attainment date would be eligible for the first one-year extension if, for the attainment year, the area's 4th highest daily maximum eight-hour average is at or below the level of the standard (75 ppb); the DFW area's fourth highest daily maximum eight-hour average for 2020 was 77 ppb as measured at the Grapevine Fairway monitor (C70/A301/x182). The DFW area's design value for 2020 was 76 ppb.

serious to severe for the 2008 eight-hour ozone NAAQS, effective November 7, 2022 (87 FR 60926). The attainment date for the severe classification is July 20, 2027, with a 2026 attainment year. States must submit AD and RFP SIP revisions to EPA by May 7, 2024, 18 months from the effective date of the reclassification, to address the 2008 eight-hour ozone standard severe nonattainment area requirements.

1.2.4 2015 Eight-Hour Ozone NAAQS History

On October 1, 2015, EPA lowered the primary and secondary eight-hour ozone NAAQS to 0.070 ppm and published the final rule revising the NAAQS in the *Federal Register* on October 26, 2015, effective December 28, 2015 (80 FR 65292). On June 4, 2018, EPA published final designations for areas under the 2015 eight-hour ozone NAAQS (83 FR 25766). A nine-county DFW area including Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Tarrant, and Wise Counties was designated nonattainment and classified as marginal under the 2015 eight-hour ozone NAAQS, effective August 3, 2018.

1.2.4.1 Marginal Classification for the 2015 Eight-Hour Ozone NAAQS

Under a marginal classification, the DFW area was required to attain the 2015 eight-hour ozone standard by the end of 2020 to meet an August 3, 2021, attainment date. On June 10, 2020, the commission adopted the 2015 Eight-Hour Ozone NAAQS EI SIP Revision for the HGB, DFW, and Bexar County Nonattainment Areas (Non-Rule Project No. 2019-111-SIP-NR). The SIP revision satisfied FCAA, §172(c)(3) and §182(a)(1) EI reporting requirements for nonattainment areas under the 2015 eight-hour ozone NAAQS, including the DFW area. The revision also included certification statements to confirm that the emissions statement and nonattainment new source review requirements were met for the HGB, DFW, and Bexar County 2015 eight-hour ozone nonattainment areas. On June 29, 2021, EPA published final approval of the EI for the DFW 2015 ozone nonattainment area (86 FR 34139). On September 9, 2021, EPA published final approval of the nonattainment new source review and emissions statement portions of the SIP revision (86 FR 50456).

1.2.4.2 Reclassification for the 2015 Eight-Hour Ozone NAAQS

Based on monitoring data from 2018, 2019, and 2020, the DFW area did not attain the 2015 eight-hour ozone NAAQS in the 2020 attainment year and did not qualify for a one-year attainment date extension in accordance with FCAA, §181(a)(5).[6] On October 7, 2022, EPA published the final notice reclassifying the nine-county DFW nonattainment area from marginal to moderate for the 2015 eight-hour ozone NAAQS, effective November 7, 2022 (87 FR 60897). The attainment date for the moderate classification is August 3, 2024, with a 2023 attainment year. EPA set a January 1, 2023 deadline for states to submit AD and RFP SIP revisions to address the 2015 eight-hour ozone standard moderate nonattainment area requirements.

On October 12, 2023, Texas Governor Greg Abbott signed and submitted a letter to EPA to reclassify the Bexar County, DFW, and HGB moderate 2015 eight-hour ozone NAAQS nonattainment areas to serious. As indicated in EPA's *Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area*

[6] *Id.*

Classifications Approach; Final Rule published on March 9, 2018 (83 FR 10376), the attainment date for a serious classification is August 3, 2027, with a 2026 attainment year. EPA's proposal to reclassify these areas to serious in accordance with Governor Abbott's letter was published on January 26, 2024 (89 FR 5145).

1.2.5 Existing Ozone Control Strategies

Existing control strategies implemented to address the 1997 and 2008 eight-hour ozone standards are expected to continue to reduce emissions of ozone precursors in the DFW 2008 ozone NAAQS nonattainment area and positively impact progress toward attainment of the ozone NAAQS. The eight-hour ozone design values for the DFW area from 1991 through 2022 are illustrated in Figure 1-1: *Ozone Design Values and Population in the DFW Area*. Eight-hour design values have decreased over the past 31 years. The 2022 eight-hour ozone design value of 77 ppb represents a 27% decrease from the 1991 eight-hour ozone design value of 105 ppb. This decrease in design value occurred despite a 90% increase in area population from 1991 through 2021.

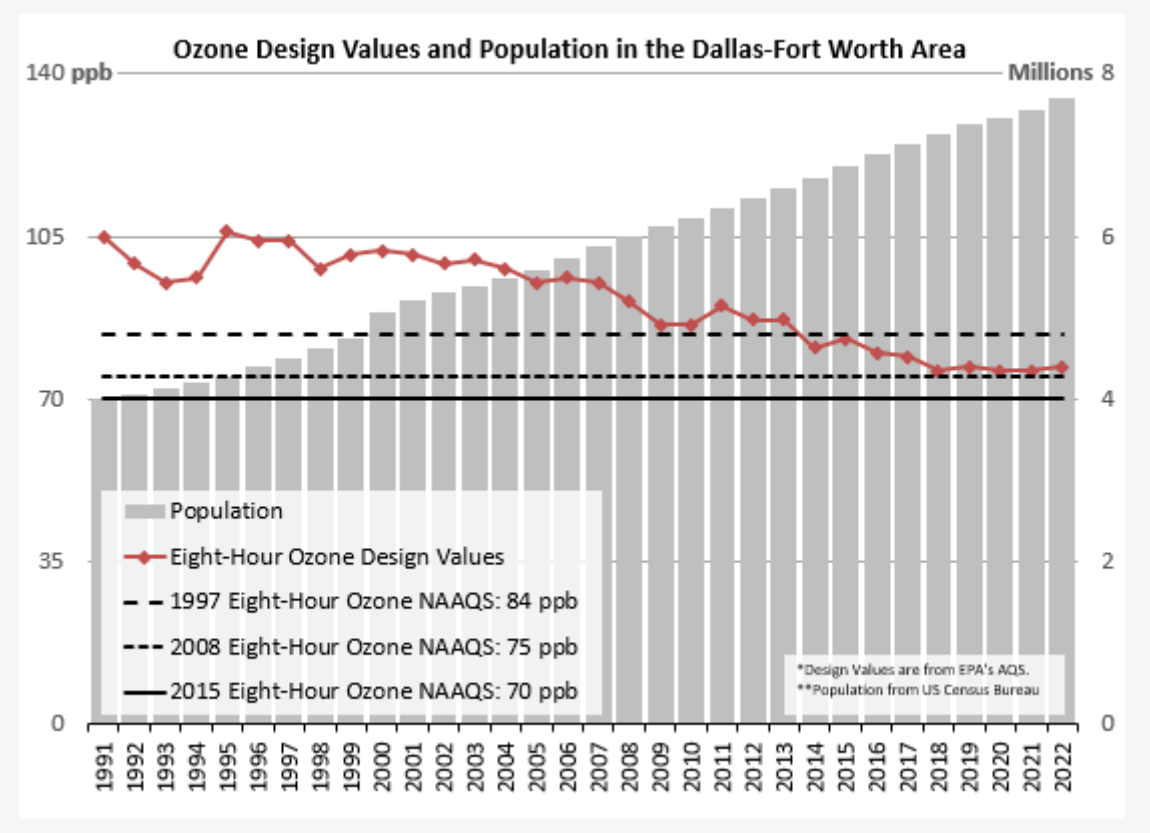

Figure 1-1: Ozone Design Values and Population in the DFW Area

1.3 HEALTH EFFECTS

In 2008, EPA revised the primary eight-hour ozone NAAQS to 0.075 ppm (75 ppb). To support the 2008 eight-hour primary ozone standard, EPA provided information that suggested that health effects may potentially occur at levels lower than the previous 0.08 ppm (84 ppb) standard. Breathing relatively high levels of ground-level ozone can cause acute respiratory problems like cough and decreases in lung function and can

aggravate the symptoms of asthma. Repeated exposures to high levels of ozone can potentially make people more susceptible to allergic responses and lung inflammation.

Children are at a relatively higher risk from exposure to ozone when compared to adults since they breathe more air per pound of body weight than adults and because children's respiratory systems are still developing. Children also spend a considerable amount of time outdoors during summer and during the start of the school year (August through October) when elevated ozone levels are typically measured. Adults most at risk from exposures to elevated ozone levels are people working or exercising outdoors and individuals with preexisting respiratory diseases.

1.4 STAKEHOLDER PARTICIPATION AND PUBLIC MEETINGS

1.4.1 DFW Virtual Technical Information Meetings (TIM)

The DFW Air Quality TIMs are provided to present technical and scientific information related to air quality modeling and analysis in the DFW nonattainment area. The TCEQ hosted virtual TIMs on July 1, 2021, and August 24, 2022. The TIMs included presentations on ozone planning, ozone design values, modeling platform updates, airport emissions inventory development, and an update from EPA. More information is available on the DFW Air Quality TIM webpage (https://www.tceq.texas.gov/air quality/airmod/meetings/aqtim-dfw.html).

1.4.2 DFW Stakeholder Meetings

The TCEQ hosted and attended multiple meetings in the DFW area related to the SIP revision. Agenda topics included the status of DFW photochemical modeling development, emissions inventories and trends, ozone design values, FCAA §185 fees, and planning activities for the DFW 2008 Eight-Hour Ozone Severe Classification AD SIP Revision. Attendees included representatives from industry, county and city government, environmental groups, and the public.

The TCEQ hosted virtual stakeholder outreach meetings on September 6, 2022, and September 7, 2022, to provide an update on planning for the development of 2008 and 2015 ozone NAAQS SIP submissions. These meetings provided a brief overview of the DFW area's air quality status, the plan requirements for moderate and severe ozone nonattainment areas, and also provided an opportunity for input on existing and potential NO_x and/or VOC emission reduction measures being implemented within the point, area, and mobile emissions source sectors in the region. Presentation topics included ozone planning, ozone design values, emissions inventories and trends, emission control strategies, contingency measures, FCAA §185 fees, and RACT.

1.5 PUBLIC HEARING AND COMMENT INFORMATION

The public comment period opened on December 1, 2023, and closed on January 16, 2024. The commission held a public hearing in Arlington on January 11, 2024, at 7:00 p.m. Notice for the Arlington public hearing was published in English in the *Dallas Morning News* newspaper on December 1, 2023, and in Spanish in *Al Día* newspaper on December 6, 2023. Notices in English and Spanish were also distributed to subscribers through GovDelivery and posted to TCEQ's website, and notices were published in English in the *Texas Register* on December 15, 2023 (48 TexReg 7642). A plain language summary was provided in both English and Spanish on TCEQ's website.

The public hearing area was opened, with testimony received and transcribed for the record. Spanish language interpreters were available at the hearing.

Written comments were accepted via mail, fax, or through TCEQ's Public Comment system (https://tceq.commentinput.com/). During the comment period, comments were received from EPA, 350Dallas, Air Alliance Houston, City of Dallas, Dallas Environmental Commission, Dallas Sierra Club, Earthjustice, Environment Texas, Environmental Integrity Project, Glenn Spring Neighborhood, Greater Fort Worth Sierra Club, the Justice Network of Tarrant County, Liveable Arlington, Lone Star Chapter of Sierra Club, North Central Texas Council of Governments, Public Citizen, Sierra Club, Tarrant County Coalition for Environmental Awareness, Texas Environmental Justice Advocacy Services, Texas Electric Transportation Resources Alliance, and 125 individuals. The public comments received are summarized and addressed in the Response to Comments for this SIP revision.

1.6 SOCIAL AND ECONOMIC CONSIDERATIONS

For a detailed explanation of the social and economic issues involved with the concurrent rule revisions associated with this SIP revision (Rule Project No. 2023-116-115-AI and Rule Project No. 2023-117-117-AI), refer to the preamble that precedes each rule package.

1.7 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: ANTHROPOGENIC EMISSIONS INVENTORY DESCRIPTION

2.1 INTRODUCTION

The federal Clean Air Act (FCAA) requires that attainment demonstration (AD) emissions inventories (EI) be prepared for ozone nonattainment areas (FCAA, §182(a) and April 16, 1992, 57 *Federal Register* (FR) 13498). Ground-level (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 anthropogenic sources of NO_x and VOC emissions that identifies the types of emissions sources present in an area, the amount of each pollutant emitted, and the types of processes and emissions control devices at each facility or source category. The total anthropogenic inventory of NO_x and VOC emissions for an area is derived from estimates developed for three general categories of emissions sources: point, area, and mobile (both non-road and on-road).

The EI also provides data for a variety of air quality planning tasks, including establishing baseline emissions levels, calculating emission 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.

This chapter discusses general EI development for each of the anthropogenic source categories. Chapter 3: *Photochemical Modeling* details specific EIs and emissions inputs developed for the Dallas-Fort Worth (DFW) 2008 ozone National Ambient Air Quality Standard (NAAQS) nonattainment area photochemical modeling.

2.2 POINT SOURCES

Stationary point source emissions data are collected annually from sites that meet the reporting requirements of 30 Texas Administrative Code (TAC) §101.10. This rule establishes EI reporting thresholds in ozone nonattainment areas that are currently at or less than major source thresholds in the DFW 2008 ozone NAAQS nonattainment area. Therefore, both major and some minor sources in the area report to the point source EI.

To collect the data, TCEQ provides detailed reporting instructions and tools for completing and submitting an EI. Companies submit EI data using a web-based system called the State of Texas Environmental Electronic Reporting System. Companies are required to report emissions data and to provide sample calculations used to determine the emissions. Information characterizing the process equipment, the emissions control devices, and the emission points is also required. As required by FCAA, §182(a)(3)(B), company representatives certify that reported emissions are true, accurate, and fully represent emissions that occurred during the calendar year to the best of the representative's knowledge.

All data submitted in the EI 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 webpage (https://www.tceq.texas.gov/airquality/point-source-ei/psei.html) contains guidance documents and historical point source

emissions data. Additional information is available upon request from TCEQ's Air Quality Division.

Stationary sources must have state implementation plan (SIP) emissions and meet other requirements to be able to generate emissions credits. SIP emissions are site- or facility-specific values based on the calendar year EI data used to develop the AD SIP revision's projection-base year inventory. The projection-base year is defined in 30 TAC §101.300(23) and refers to the EI year used to forecast future year emissions for modeling point sources.

For this AD SIP revision, TCEQ has designated the projection-base year for point sources as 2019 for electric generating units (EGU) with emissions recorded in the United States Environmental Protection Agency's (EPA) database for Air Markets Program Data and 2019 for all other stationary point sources (non-EGUs) with emissions recorded in the TCEQ STARS database. For more details on the projection-base year for point sources, please see Chapter 3, Section 3.4.2: *Emissions Inputs* and Section 3.3: *Point Sources* of Appendix A: *Modeling Technical Support Document (TSD).*

On April 9, 2021, TCEQ requested regulated entities submit revisions to the 2019 point source EI by July 9, 2021. The point source emissions in this SIP revision reflects updates submitted by the due date. The TCEQ provided notification to regulated entities and the public through its e-mail distribution system and by posting the notice on TCEQ's website.[7]

2.3 AREA SOURCES

Stationary emissions sources that do not meet the reporting requirements of 30 TAC §101.10 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 of air pollutants. Examples of typical sources of VOC 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 that emit NO_x include oil and gas production sources, stationary source fossil fuel combustion at residences and businesses, outdoor refuse burning, and structure fires.

Area source emissions are estimated and calculated as county-wide totals rather than as individual sources. Area source emissions are typically calculated by applying EPA- or TCEQ-developed emissions 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 include the amount of gasoline sold in an area, employment by industry type, and crude oil and natural gas production.

[7] https://wayback.archive-it.org/414/20220309051946/https://www.tceq.texas.gov/assets/public/implementation/air/ie/pseiforms/OzoneBumpUps_HGB-DFW-SAN.pdf

The emissions data for the different area source categories are developed, reviewed for quality assurance, stored in the Texas Air Emissions Repository database, and compiled to develop the statewide area source EI.

2.4 NON-ROAD MOBILE SOURCES

Non-road vehicles (non-road sources) do not normally operate on roads or highways and are often referred to as off-road or off-highway vehicles. Non-road sources include agricultural equipment, commercial and industrial equipment, construction and mining equipment, lawn and garden equipment, aircraft and airport equipment, locomotives, drilling rigs, and commercial marine vessels (CMV).

For this AD SIP revision, EIs for non-road sources were developed for the following subcategories: non-road model categories (as described further below), airports, locomotives, 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 relevant for airports. Since no commercial marine activities occur in the DFW 2008 ozone NAAQS nonattainment area, CMV EIs were not developed. The following sections describe the emissions estimates methodologies used for the non-road mobile source subcategories discussed below.

2.4.1 Non-Road Model Categories Emissions Estimation Methodology

The Motor Vehicle Emission Simulator 3 (MOVES3) model was EPA's latest mobile source emissions model available for estimating non-road source category emissions at the time of inventory development for this SIP revision. The MOVES4 model was not used in this SIP revision since TCEQ had already invested significant resources to develop a non-road mobile source EI using MOVES3 and since there was insufficient time to switch to MOVES4 between proposal and adoption. As EPA stated in its notice of availability published in the *Federal Register* on September 12, 2023, "[…] state and local agencies that have already completed significant work on a SIP with a version of MOVES3 (*e.g.,* attainment modeling has already been completed with MOVES3) may continue to rely on this earlier version of MOVES" (88 FR 62567, 62569). TCEQ has invested significant time and resources to develop a Texas-specific version of the non-road component of the MOVES model called Texas non-road utility version 2 (TexN2) that replaces EPA defaults used to determine emissions with county-specific activity data.[8] TCEQ uses TexN2 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 MOVES3 model or TexN2 utility, the emissions for these categories are estimated using other EPA-approved methods and guidance. Although emissions for drilling rigs are included in the MOVES3 model and TexN2 utility, alternate emissions estimates were developed for that source category in order to develop more accurate county-level inventories. The equipment populations for drilling rigs were set to zero in the TexN2 utility to avoid double counting emissions from these sources.

[8] https://www.tceq.texas.gov/downloads/air-quality/research/reports/emissions-inventory/5822111300fy2021-20210423-erg-texn2-update.pdf

2.4.2 Drilling Rig Diesel Engine Emissions Estimation Methodology

Drilling rig diesel engines used in upstream oil and gas exploration activities are included in the MOVES3 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, a 2015 survey of oil and gas exploration and production companies was used to develop updated drilling rig emissions characterization profiles.[9] The drilling rig emissions characterization profiles from this study were combined with drilling activity data obtained from the Railroad Commission of Texas to develop the EI for this source category.

2.4.3 Locomotive Emissions Estimation Methodology

The locomotive EI was developed from a TCEQ-commissioned study using EPA-accepted EI development methods.[10] The locomotive EI includes line haul and yard emissions activity data from all Class I and Class III (currently, there are no Class II operators in Texas) locomotive activity and emissions by rail segment.

2.4.4 Airport Emissions Estimation Methodology

The airport EI was developed from a TCEQ-commissioned study using the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) model.[11] AEDT is the most recent FAA model for estimating airport emissions and has replaced the FAA's Emissions and Dispersion Modeling System. The airport emissions categories used for this AD SIP revision included aircraft (commercial air carriers, air taxis, general aviation, and military), APU, and GSE operations.

2.5 ON-ROAD MOBILE SOURCES

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 from the vehicle. To calculate emissions, both the rate of emissions per unit of activity (emissions factors) and the number of units of activity must be determined.

This SIP revision includes on-road EIs developed using MOVES3. The MOVES4 model was not used in this SIP revision since TCEQ had already invested significant resources to develop an on-road mobile source EI using MOVES3 and since there was insufficient time to switch to MOVES4 between proposal and adoption. As EPA stated in its notice of availability published in the *Federal Register* on September 12, 2023, "[…] state and local agencies that have already completed significant work on a SIP with a version of MOVES3 (*e.g.,* attainment modeling has already been completed with MOVES3) may

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[9] https://wayback.archive-it.org/414/20210527185246/https://www.tceq.texas.gov/assets/public/implementation/air/am/contracts/reports/ei/5821552832FY1505-20150731-erg-drilling_rig_2014_inventory.pdf

[10] https://www.tceq.texas.gov/downloads/air-quality/research/reports/emissions-inventory/5822111027-20211015-tti-texas-locomotive-railyard-2020-aerr-trend-ei.pdf

[11] https://www.tceq.texas.gov/downloads/air-quality/research/reports/emissions-inventory/5822111196-20211015-tti-texas-airport-2020-aerr-trend-ei.pdf

continue to rely on this earlier version of MOVES" (88 FR 62567, 62569). Updated on-road EIs and emissions factors were developed using EPA's mobile emissions factor model, MOVES3. The MOVES3 model may be run using national default information or the default information may be modified to simulate data specific to the DFW 2008 ozone NAAQS nonattainment area, such as the control programs, driving behavior, meteorological conditions, and vehicle characteristics. The TCEQ parameters reflect local conditions to the extent that local values are available; these local values are reflected in the emissions factors calculated by the MOVES3 model. The localized inputs used for the on-road mobile EI development include vehicle speeds for each roadway link, vehicle populations, vehicle hours idling, temperature, humidity, vehicle age distributions for each vehicle type, percentage of miles traveled for each vehicle type, type of inspection and maintenance program, fuel control programs, and gasoline vapor pressure controls.

To estimate on-road mobile source emissions, emissions factors calculated by the MOVES3 model must be multiplied by the level of vehicle activity. On-road mobile source emissions factors are expressed in units of grams per mile, grams per vehicle (evaporative), and grams per hour (extended idle); therefore, the activity data required to complete the inventory calculation are vehicle miles traveled (VMT) in units of miles per day, vehicle populations, and source hours idling. The level of vehicle travel activity is developed using travel demand models (TDM) run by the Texas Department of Transportation or by the local metropolitan planning organizations. 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 EIs, VMT estimates are calibrated against outputs from the federal Highway Performance Monitoring System, a model built from a different set of traffic counters. Vehicle populations by source type are derived from the Texas Department of Motor Vehicles' registration database and, as needed, national estimates for vehicle source type population.

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 EI. Roadway speeds, required inputs for the MOVES3 model, are calculated by using the activity volumes from the TDMs and a post-processor speed model.

2.6 EI IMPROVEMENT

The TCEQ EI reflects years of emissions data improvement, including extensive point and area source inventory reconciliation with ambient emissions monitoring data. Reports detailing recent TCEQ EI improvement projects can be found at TCEQ's Air Quality Research and Contract Projects webpage (https://www.tceq.texas.gov/air quality/airmod/project/pj.html).

CHAPTER 3: PHOTOCHEMICAL MODELING

3.1 INTRODUCTION

This chapter describes attainment demonstration (AD) modeling conducted in support of this state implementation plan (SIP) revision. The Texas Commission on Environmental Quality (TCEQ) followed procedures recommended for AD modeling for the eight-hour ozone National Ambient Air Quality Standard (NAAQS) in the United States Environmental Protection Agency's (EPA) November 2018 *Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze* (EPA, 2018; referred to as the EPA modeling guidance).[12]

For the photochemical modeling analysis, this SIP revision includes a base case modeling episode of April through October of 2019. This modeling episode was chosen because the period is representative of the times of the year that eight-hour ozone levels above 75 ppb have historically been monitored within the nonattainment area. Base case modeling was used to evaluate the photochemical model's ability to replicate measured ozone and precursor concentrations for a past timeframe with monitored high-ozone concentrations and indicates the modeling is suitable for use in conducting the modeling attainment test.

The photochemical modeling analysis also includes a future case modeling analysis. Future case modeling estimates the change in ozone concentrations due to changes in anthropogenic emissions in a future year, the attainment year of 2026, while keeping the meteorological and natural emissions (biogenic and wildfires) inputs from the base case constant. Future case modeling answers the question: what would the estimated ozone concentrations be in the future if the same meteorological conditions (that resulted in a high ozone episode in the past) were to repeat?

Results of the 2019 base case and the 2026 future case photochemical modeling runs are presented, which were used to estimate the 2026 attainment year eight-hour ozone design values. This chapter summarizes the components of the AD modeling, such as episode selection, modeling domain, and model inputs. A detailed description of the various modeling elements can be found in Appendix A: *Modeling Technical Support Document (TSD)*.

3.2 MODELING EPISODE

The AD modeling used TCEQ's 2019 modeling platform, which has a modeling episode of April 1 through October 31, 2019. The EPA modeling guidance provides recommendations for choosing a modeling episode that will be appropriate for the modeled attainment test for eight-hour ozone AD SIP revisions. The recommendations are intended to ensure that the selected episode is representative of area-specific conditions that lead to exceedances of the eight-hour ozone NAAQS. This section provides an overview of the April through October 2019 modeling episode in the Dallas-Fort Worth (DFW) 2008 eight-hour ozone NAAQS severe nonattainment area (DFW 2008 ozone NAAQS nonattainment area).

[12] https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf

One of the recommended criteria for selecting a modeling episode is that the episode be in the recent past and contain a sufficient number of exceedance days. Exceedance days are defined as days when at least one regulatory monitor in the area had a Maximum Daily Eight-Hour Average (MDA8) ozone concentration that exceeded the 2008 ozone NAAQS of 75 parts per billion (ppb). Figure 3-1: *Exceedance Days in the DFW 2008 Ozone NAAQS Nonattainment Area by Year from 2012 through 2022* shows the number of exceedance days for the 2008 ozone NAAQS over an 11-year period in the DFW 2008 ozone NAAQS nonattainment area. The year 2019 had 13 days with MDA8 ozone above 75 ppb, which is a sufficient number of exceedance days for a modeling episode.

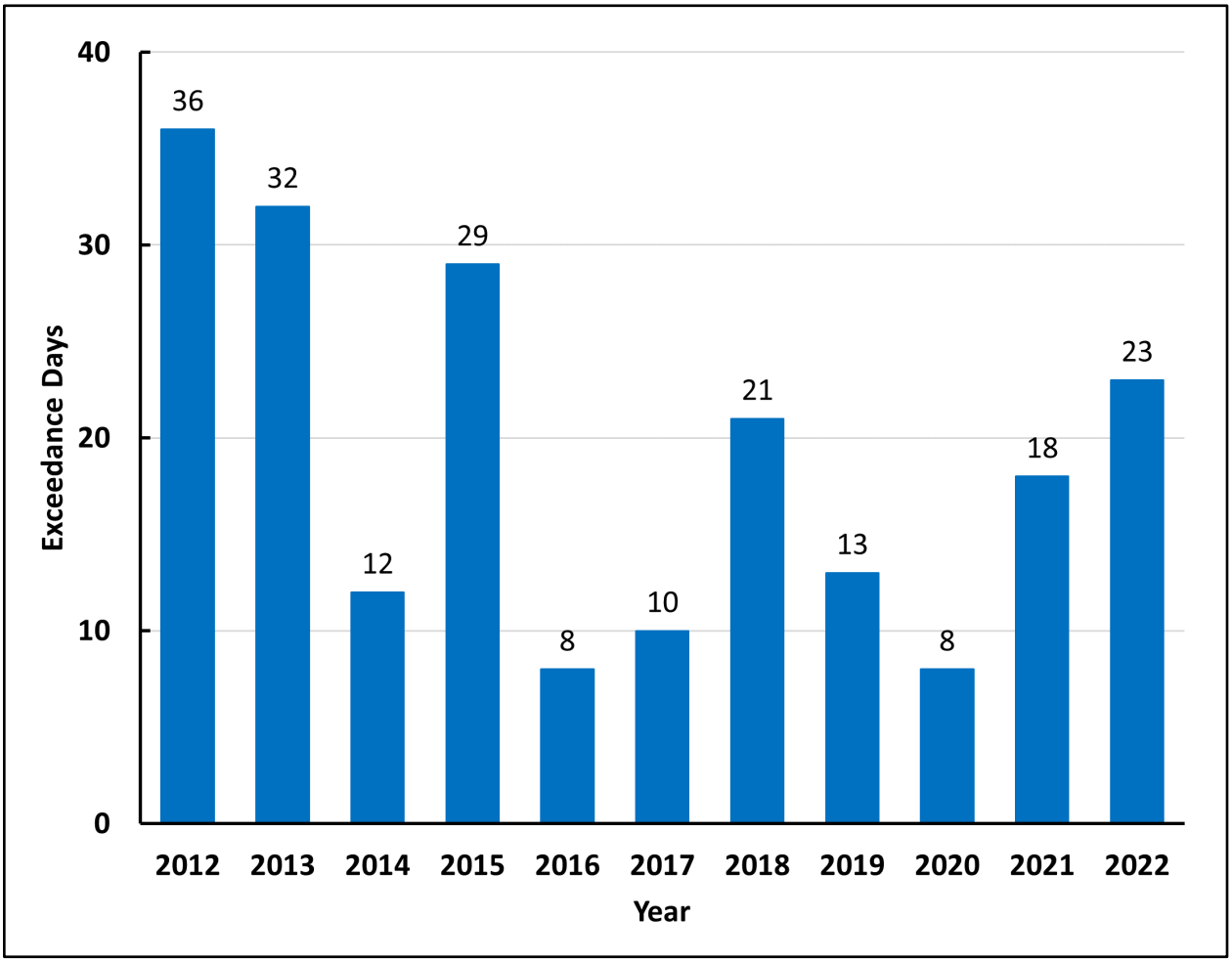

Figure 3-1: Exceedance Days in the DFW 2008 Ozone NAAQS Nonattainment Area by Year from 2012 through 2022

In selecting a modeling episode, EPA recommends that the exceedance days follow historically observed temporal trends. Figure 3-2: *Exceedance Days by Month from 2012 through 2022 in the DFW 2008 Ozone NAAQS Nonattainment Area* shows the exceedance days per month during the 11-year period from 2012 through 2022. Over the 11-year period, exceedances occurred from March through October, with the greatest number of exceedances during the months of May through September.

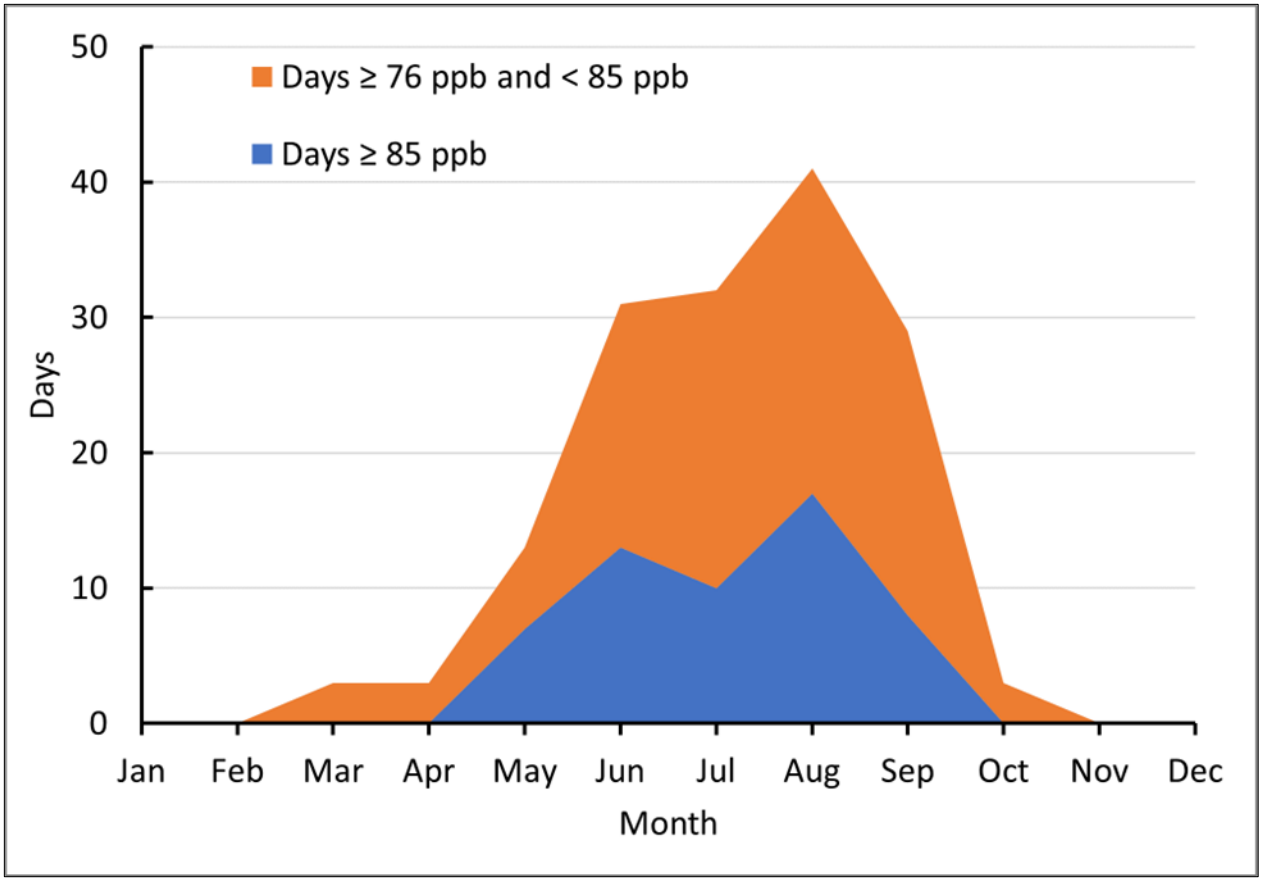

Figure 3-2: Exceedance Days by Month from 2012 through 2022 in the DFW 2008 Ozone NAAQS Nonattainment Area

Another recommendation from the EPA modeling guidance is to choose an episode when each regulatory monitor within the nonattainment area has at least five days during the episode when the MDA8 ozone concentration exceeded 60 ppb, the threshold for being included in the future year modeled attainment test. There are 17 monitors that measure ozone concentrations within the DFW 2008 ozone NAAQS nonattainment area, shown in Figure 3-3: *Regulatory Monitors that Measure Ozone in the DFW 2008 Ozone NAAQS Nonattainment Area*, labeled with their name and Continuous Ambient Monitoring Station (CAMS) number.[13] Each of the 17 monitors is a regulatory monitor, meaning it is used to determine the regulatory eight-hour ozone design value (DV) and will be included in the modeled attainment test. Table 3-1: *Exceedance Days and Ozone Conditions from April through October 2019 Modeling Episode at Regulatory Monitors* summarizes the exceedances and ozone conditions at each regulatory monitor during the modeling episode. The Italy monitor in the DFW 2008 ozone NAAQS nonattainment area only had two days that met the criterion when MDA8 ozone exceeded 60 ppb. Historically, the Italy monitor has recorded low ozone

[13]Maps in this document were generated by the Air Quality Division of the Texas Commission on Environmental Quality. The products are for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. They do not represent an on-the-ground survey and represent only the approximate relative location of property boundaries. For more information concerning these maps, contact the Air Quality Division at 512-239-1459.

monitoring values. The highest recorded MDA8 value at the Italy monitor in 2019 was 62 ppb, which was the lowest of all DFW area monitors. The 2019 DV at the Italy monitor was 65 ppb, attaining the 2008 ozone NAAQS.

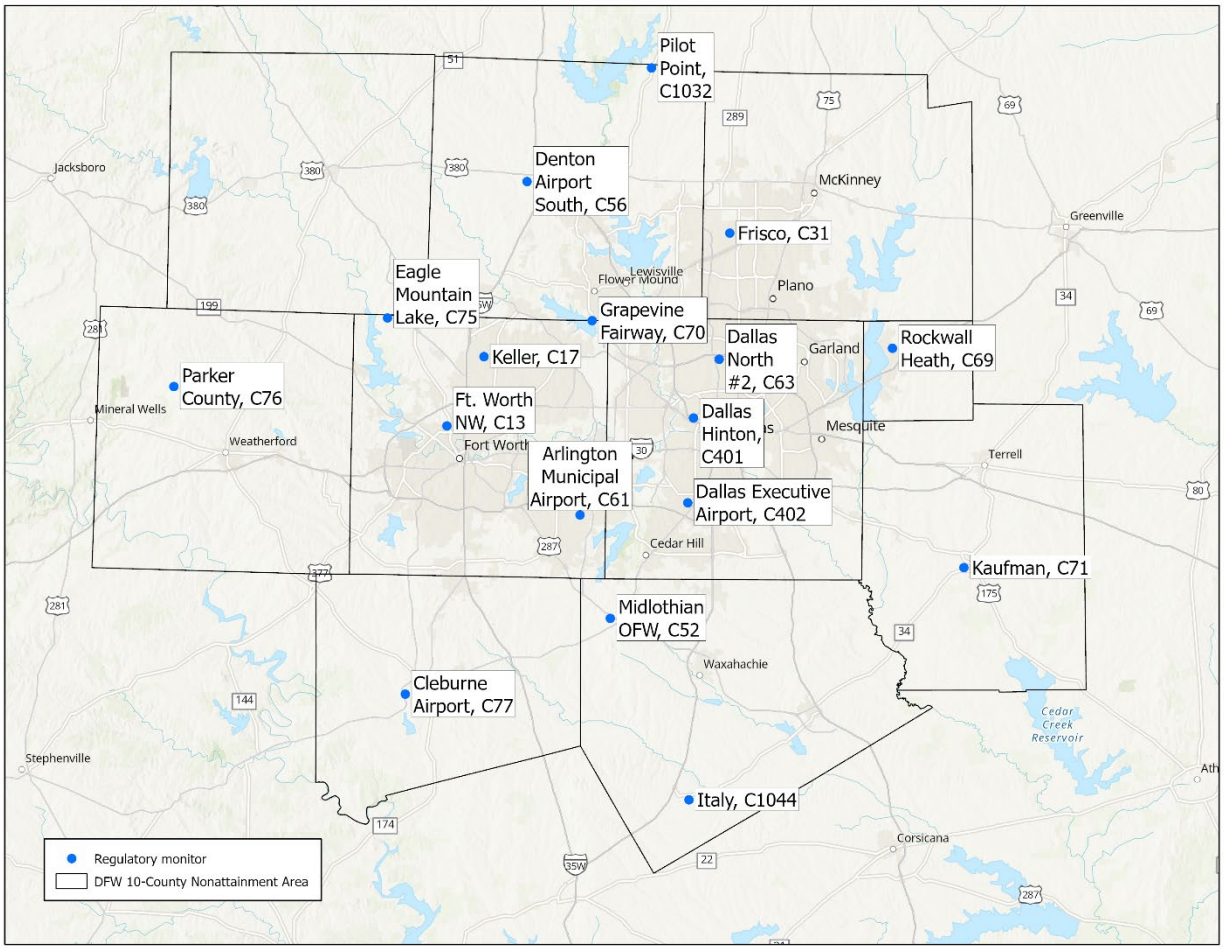

Figure 3-3: Regulatory Monitors that Measure Ozone in the DFW 2008 Ozone NAAQS Nonattainment Area

Table 3-1: Exceedance Days and Ozone Conditions from April through October 2019 Modeling Episode at Regulatory Monitors

Monitor Name	CAMS Number	Highest MDA8 Ozone (ppb)	Number of Days Above 60 ppb	Number of Days Above 75 ppb	2019 Eight-Hour Ozone DV (ppb)
Arlington Municipal Airport	0061	76	8	1	70
Cleburne Airport	0077	83	16	2	76
Dallas Executive Airport	0402	74	23	0	68
Dallas Hinton	0401	70	7	0	73
Dallas North #2	0063	83	22	2	77
Denton Airport South	0056	79	28	2	73
Eagle Mountain Lake	0075	82	27	3	73
Frisco	0031	88	24	4	72

Monitor Name	CAMS Number	Highest MDA8 Ozone (ppb)	Number of Days Above 60 ppb	Number of Days Above 75 ppb	2019 Eight-Hour Ozone DV (ppb)
Ft. Worth Northwest	0013	75	19	0	76
Grapevine Fairway	0070	81	17	1	75
Italy	1044	62	2	0	65
Kaufman	0071	68	5	0	63
Keller	0017	84	25	1	74
Midlothian OFW	0052	69	5	0	66
Parker County	0076	70	18	0	69
Pilot Point	1032	80	23	2	71
Rockwall Heath	0069	72	5	0	69

As shown in Table 3-1, the monitors with the highest number of exceedance days in the April through October 2019 episode were Frisco (four days) and Eagle Mountain Lake (three days).

The EPA modeling guidance also recommends that the episode include meteorological patterns that represent a variety of conditions that correspond to high ozone. An assessment of the meteorological conditions in the DFW area in 2019 showed that the year was not atypical, and therefore was reasonable for modeling ozone. Details of the episode selection process for TCEQ's 2019 modeling platform are provided in Section 1.2: *Modeling Episode Selection* of Appendix A.

3.3 PHOTOCHEMICAL MODELING

TCEQ used the Comprehensive Air Quality Model with Extensions (CAMx) version 7.20 for this AD modeling. The model software and the CAMx user's guide are publicly available (Ramboll, 2022). TCEQ's choice of CAMx meets the criteria specified in the EPA modeling guidance for model selection.

3.3.1 Modeling Domains

CAMx was configured with three nested domains: a 36-kilometer (km) grid resolution domain (named na_36km) covering most of North America, a 12 km grid resolution domain (named us_12km) covering the continental United States, and a 4 km grid resolution domain (named txs_4km) covering central and east Texas. Dimensions of the CAMx domains are shown in Table 3-2: *CAMx Horizontal Domain Parameters*. The geographical extent of each domain is mapped in Figure 3-4: *CAMx Domains.* The DFW 2008 ozone NAAQS nonattainment area is contained within txs_4km, the finest resolution domain, as shown in Figure 3-5: *DFW 2008 Ozone NAAQS Nonattainment Area and CAMx 4 km Modeling Domain*. In the vertical direction, each CAMx domain reaches up to over 18 km. The resolution of layers decreases with increasing distance from the surface, details of which are presented in Section 3.4.1: *Meteorological Inputs* of this chapter.

Table 3-2: CAMx Horizontal Domain Parameters

Domain Name	Range West to East (km)	Range South to North (km)	Number of Cells West to East	Number of Cells South to North	Cell Size (km)
na_36km	-2,952 to 3,240	-2,772 to 2,556	172	148	36
us_12km	-2,412 to 2,340	-1,620 to 1,332	396	246	12
txs_4km	-324 to 432	-1,584 to -648	189	234	4

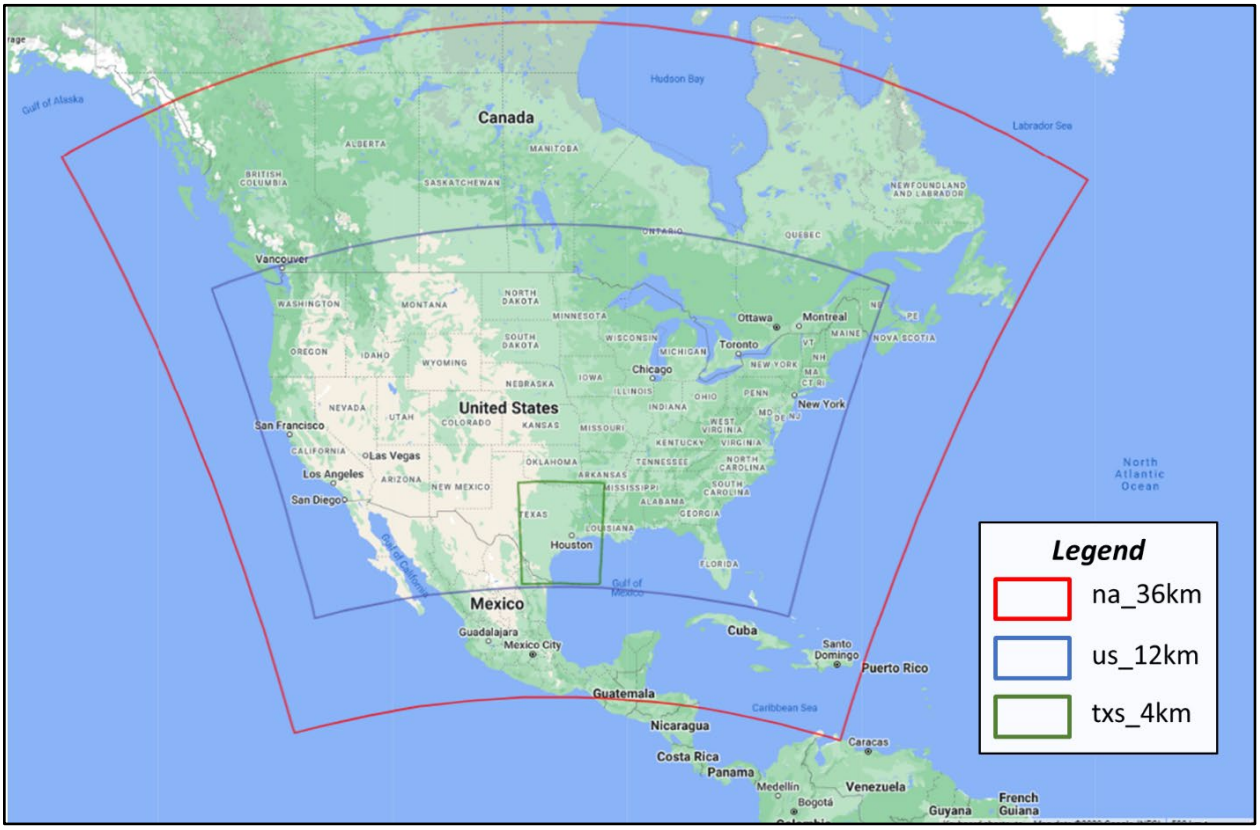

Figure 3-4: CAMx Domains

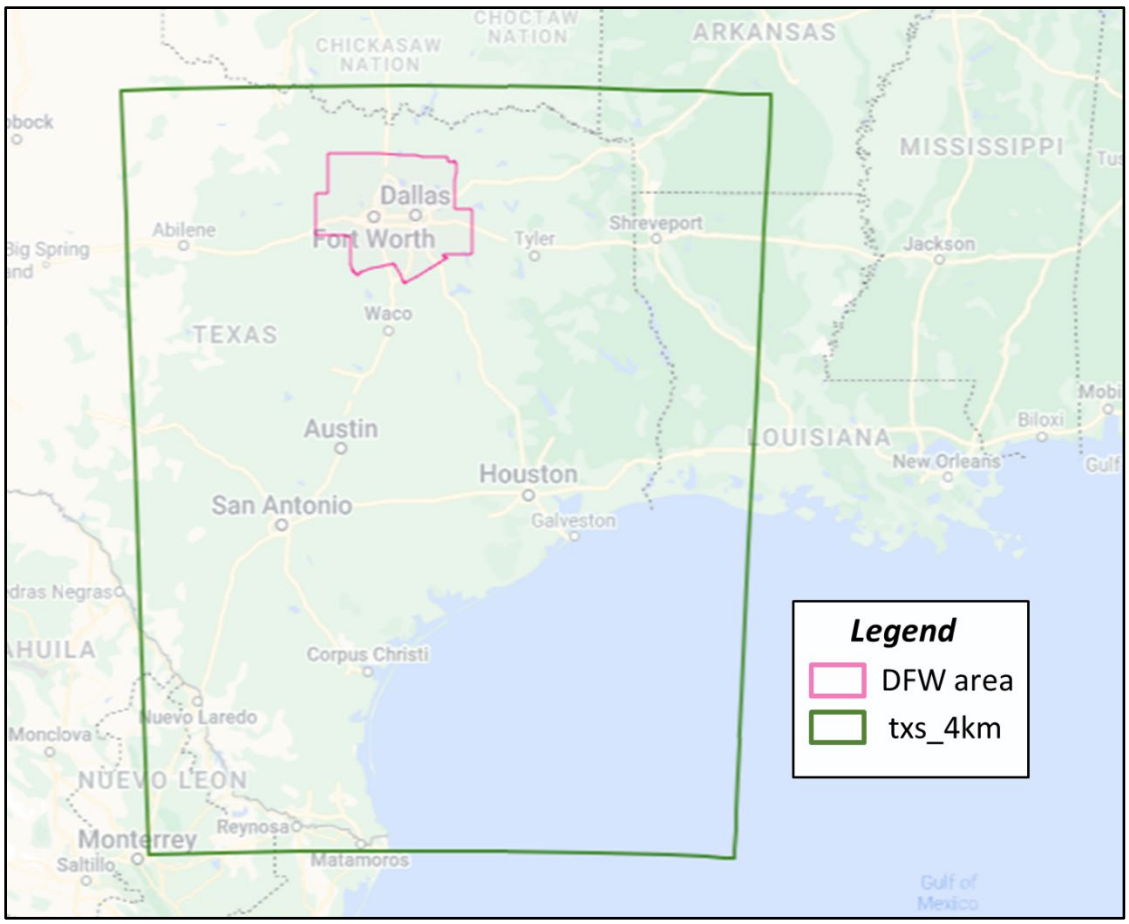

Figure 3-5: DFW 2008 Ozone NAAQS Nonattainment Area and CAMx 4 km Modeling Domain

3.3.2 CAMx Options

TCEQ used the CAMx options summarized in Table 3-3: *CAMx Configuration Options* for this SIP revision. Details regarding the configuration testing conducted by TCEQ to determine the dry deposition and vertical diffusion schemes is provided in Section 5.2.3: *Evaluation of CAMx Configuration Options* of Appendix A.

Table 3-3: CAMx Configuration Options

CAMx Option	Option Selected
Version	Version 7.20
Time Zone	Coordinated Universal Time
Chemistry Mechanism	Carbon Bond version 6 revision 5 gas-phase mechanism (CB6r5)
Photolysis Mechanism	Tropospheric Ultraviolet and Visible radiative transfer model, version 4.8, with Total Ozone Mapping Spectrometer ozone column data
Chemistry Solver	Euler-Backward Iterative
Dry Deposition Scheme	Zhang03
Vertical Diffusion	K-theory
Iodine Emissions	Oceanic iodine emission computed from saltwater masks

3.4 MODELING INPUTS

A photochemical air quality model requires several inputs to be able to simulate chemical and physical processes leading to ozone formation. The main inputs are meteorological parameters, emissions inputs, and initial and boundary conditions. The sections below provide an overview of the inputs used in this modeling. More details are provided in Section 2: *Meteorological Modeling* and Section 3: *Emissions Modeling* of Appendix A.

3.4.1 Meteorological Inputs

The TCEQ used the Weather Research and Forecasting (WRF) model version 4.1.5 to generate the meteorological inputs for the photochemical modeling supporting this SIP revision. The WRF modeling was conducted for March 15 to November 1, 2019, to cover ramp-up and ramp-down days needed by the CAMx modeling platform. A ramp-up period is the period of days that precede the actual time period of interest for modeling. The ramp-up period is used to ensure that the atmospheric conditions in the model are balanced.

WRF was configured with a 12 km horizontal grid resolution domain that covered most of North America, as depicted in Figure 3-6: *WRF and CAMx Domains*. A second 4 km fine grid domain covering the eastern half of Texas, which includes the 2008 ozone NAAQS nonattainment areas of DFW and Houston-Galveston-Brazoria, was also modeled. Each WRF domain embeds a corresponding CAMx domain of the same horizontal resolution. The WRF domains are larger than the corresponding CAMx domains, as seen in Figure 3-6, to ensure that the effects of boundary conditions are minimized and large-scale meteorological conditions are better captured. The na_36km and us_12km CAMx domains are centered at the same location as the 12 km WRF domain. The txs_4km CAMx domain is centered at the same point as the 4 km WRF domain. All domains use the Lambert Conformal map projection.

Figure 3-6: WRF and CAMx Domains

The WRF domains have 44 vertical layers extending to over 20 km from the Earth's surface to better capture tropospheric meteorological conditions and vertical mixing that are essential for chemical transport mechanisms. CAMx is set up to have 30 layers. The lowest CAMx layer covers the first two WRF layers. CAMx layers 2 through 21 align with WRF layers 3 through 22. CAMx layers 22 through 30 encompass multiple WRF layers as displayed in Figure 3-7: *WRF and CAMx Vertical Layers for the txs_4km Domain*.

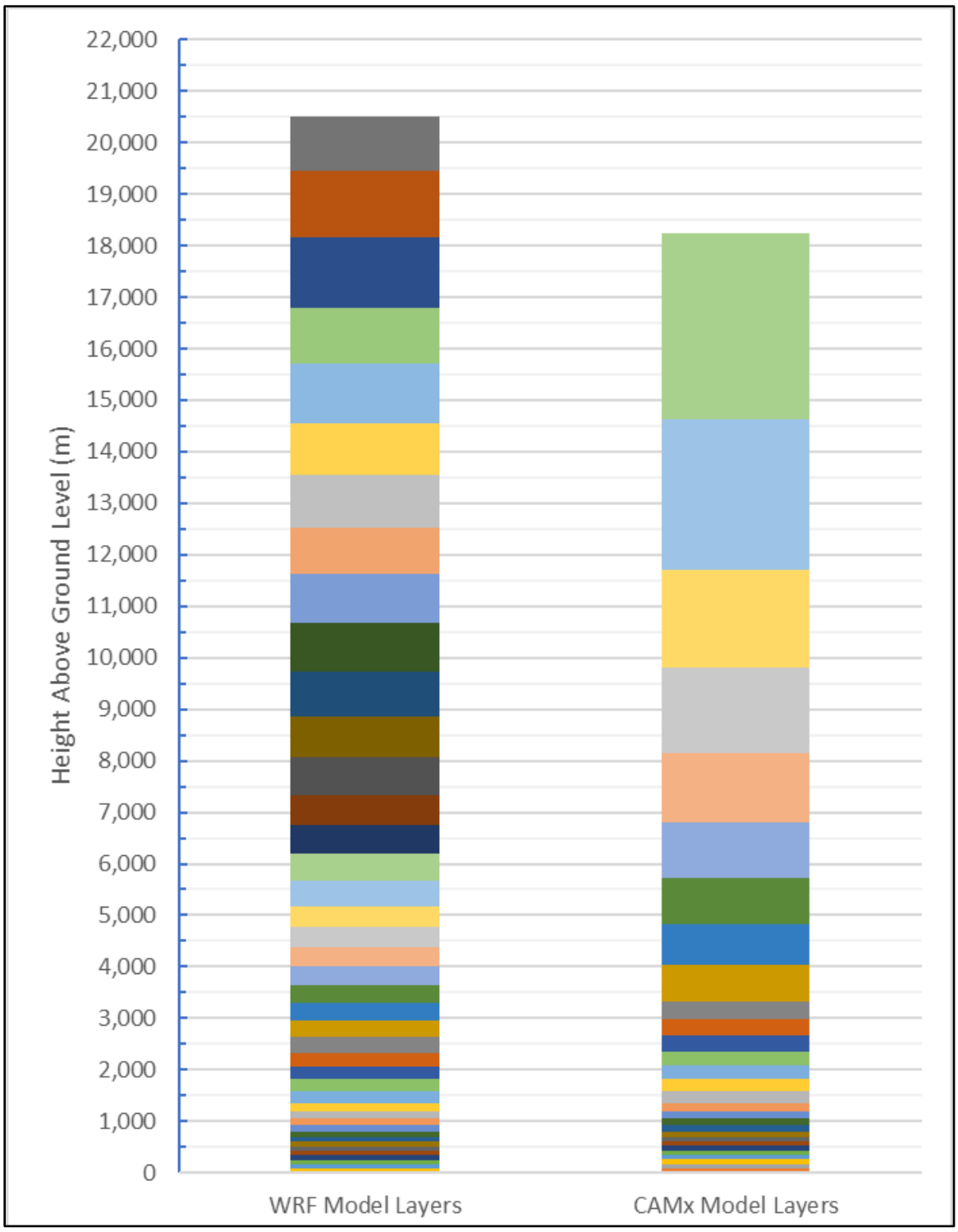

Figure 3-7: WRF and CAMx Vertical Layers for the txs_4km Domain

Details of the grid boundaries, horizontal and vertical grid cell geometry, land surface data, meteorological parameterizations, and WRF model performance evaluation are provided in Section 2: *Meteorological Modeling* of Appendix A.

3.4.2 Emissions Inputs

Model-ready hourly speciated emissions were developed for the April through October episode for the 2019 base case and the 2026 future case. This section provides an overview of the emission inputs used in this AD SIP modeling. Details about emissions inventory development are included in Section 3: *Emissions Modeling* of Appendix A.

Emissions inputs, or modeling emissions inventories (EI), include emissions sources from anthropogenic sectors such as point sources (e.g., electric generating units (EGU)), mobile sources (e.g., on-road vehicles), area sources (e.g., population-based emissions estimates), and natural emissions sources (e.g., fires). Based on the EPA modeling guidance, EI for each sector were developed using various datasets, models, and estimation techniques. The data sources and models used to develop the 2019 base case EI that were used in this SIP revision are listed in Table 3-4: *EI Data Sources for the TCEQ 2019 Base Case*. A variety of datasets and interpolation techniques were used to develop the EIs for the 2026 future case, which are described in Appendix A.

Table 3-4: EI Data Sources for the TCEQ 2019 Base Case

EI Source Category	Sector/Geographic Area	Datasets/Models Used for 2019 EI
Point	EGU	2019 Clean Air Market Program Data[14]
Point	Non-EGU, Texas (TX)	2019 State of Texas Air Reporting System[15]
Point	Non-EGU, Non-TX	EPA 2016v1 Modeling Platform[16]
Non-Point	Oil & Gas, TX	2019 Railroad Commission of Texas
Non-Point	Oil & Gas, Non-TX	EPA 2017 Modeling Platform[17]
Non-Point	Off-Shore	2017 Bureau of Ocean Energy Management[18]
Mobile	On-Road, TX nonattainment areas	Motor Vehicle Emission Simulator (MOVES3)[19] - link-based
Mobile	On-Road, other	MOVES3 - county based
Mobile	Non-Road, TX	TexN2.2
Mobile	Non-Road, Non-TX	MOVES3
Mobile	Off-Road Shipping, txs_4km domain	2019 Automatic Identification System and vessel characteristic IHS 2020; MARINER v1

[14] https://campd.epa.gov/
[15] https://www.tceq.texas.gov/airquality/point-source-ei/psei.html
[16] https://www.epa.gov/air-emissions-modeling/2016v1-platform
[17] https://www.epa.gov/air-emissions-modeling/2017-emissions-modeling-platform
[18] https://www.boem.gov/environment/environmental-studies/ocs-emissions-inventory-2017
[19] https://www.epa.gov/moves/moves-versions-limited-current-use

EI Source Category	Sector/Geographic Area	Datasets/Models Used for 2019 EI
Mobile	Off-Road Shipping, us_12km domain	EPA 2016v1 Modeling Platform
Mobile	Off-Road Airports, TX nonattainment areas	Texas Transportation Institute (TTI) 2020 data
Mobile	Off-Road Airports, other	EPA 2016v1 Modeling Platform
Mobile	Off-Road Locomotives, TX nonattainment areas	TTI 2019 data
Mobile	Off-Road Locomotives, other	EPA 2016v1 Modeling Platform
Area	Area, TX	2020 Air Emissions Reporting Requirements
Area	Area, Non-TX	EPA 2017 Modeling Platform
Natural	Biogenic	Biogenic Emissions Land-use Database (BELD5); BEIS v3.7[20] and Sparse Matrix Operation Kernel Emissions (SMOKE) v4.8
Natural	Fires	2019 MODIS and VIIRS; FINN v2.2
Other	International EI	2019 Community Emission Data System;[21] SMOKEv4.7_CEDS

The MOVES4 model was not used in this SIP revision since TCEQ had already invested significant resources to develop a non-road mobile source EI using MOVES3 and since there was insufficient time to switch to MOVES4 between proposal and adoption. As EPA stated in its notice of availability published in the *Federal Register* on September 12, 2023, "[…] state and local agencies that have already completed significant work on a SIP with a version of MOVES3 (*e.g.,* attainment modeling has already been completed with MOVES3) may continue to rely on this earlier version of MOVES" (88 FR 62567, 62569).

Total anthropogenic emissions for a model episode day of June 12 in the 2019 base case and 2026 future year from within the DFW 2008 ozone NAAQS nonattainment area are listed in tons per day (tpd) in Table 3-5: *June 12 Episode Day 2019 Base Case Anthropogenic EI in the DFW 2008 Ozone NAAQS Nonattainment Area* and Table 3-6: *June 12 Episode Day 2026 Future Case Anthropogenic EI in the DFW 2008 Ozone NAAQS Nonattainment Area*. Emissions from some categories differ on a daily basis and therefore a summary was prepared for a sample day from the modeling episode that had high monitored ozone concentrations in the nonattainment area. The June 12

[20] https://drive.google.com/drive/folders/1v3i0iH3lqW36oyN9aytfkczkX5hl-zF0
[21] https://data.pnnl.gov/group/nodes/project/13463

sample episode day was chosen since it had high monitored ozone concentrations in the nonattainment area.

Tables 3-5 and 3-6 show mobile sources contributed the greatest amount of nitrogen oxides (NO_x) emissions and carbon monoxide (CO) emissions in the area. Area sources contributed the greatest amount of volatile organic compound (VOC) emissions. While certain sectors increase in emissions, there is an overall decrease in NO_x, VOC, and CO emissions between the 2019 base case and the 2026 future case.

Table 3-5: June 12 Episode Day 2019 Base Case Anthropogenic EI in the DFW 2008 Ozone NAAQS Nonattainment Area (tons per day)

Source Category	NO_x (tpd)	VOC (tpd)	CO (tpd)
On-Road	102.22	48.89	941.25
Non-Road	38.77	41.44	835.82
Off-Road - Airports	17.13	4.32	43.70
Off-Road - Locomotives	10.53	0.49	2.60
Area Sources	33.28	250.64	54.64
Oil & Gas - Drilling	0.20	0.01	0.01
Oil & Gas - Production	10.39	50.33	7.66
Point - Cement Kilns	9.78	1.25	16.02
Point - EGU	6.17	0.20	3.69
Point - Non-EGU	15.03	25.60	19.71
Ten-County Total	**243.50**	**423.17**	**1,925.10**

Table 3-6: June 12 Episode Day 2026 Future Case Anthropogenic EI in the DFW 2008 Ozone NAAQS Nonattainment Area (tons per day)

Source Category	NO_x (tpd)	VOC (tpd)	CO (tpd)
On-Road	60.12	33.31	723.03
Non-Road	32.03	44.13	946.04
Off-Road - Airports	18.02	4.57	45.77
Off-Road - Locomotives	6.57	0.29	2.36
Area Sources	35.40	273.85	59.17
Oil & Gas - Drilling	0.18	0.01	0.01
Oil & Gas - Production	1.68	8.17	1.38
Point - Cement Kilns	15.12	1.45	18.66
Point - EGU	7.53	0.20	3.69
Point - Non-EGU	10.80	20.80	18.01
Ten-County Total	**187.45**	**386.78**	**1,818.12**
Difference between 2026 and 2019	**-56.05**	**-36.39**	**-106.98**

A map showing the spatial distribution changes in anthropogenic emissions of NO_x and VOC between the 2026 future case and the 2019 base case on a sample June 12 episode day is presented in Figure 3-8: *Difference in Anthropogenic NO_x between 2026 Future Case and 2019 Base Case on June 12 Modeled Episode Day* and Figure 3-9:

Difference in Anthropogenic VOC between 2026 Future Case and 2019 Base Case on June 12 Modeled Episode Day. The decreases in NO_x emissions from on-road mobile sources are evident in the spokes that come out of the center of the nonattainment area which correspond to roadways in the area. Changes in anthropogenic VOC emissions have a distinct spatial disparity between the Fort-Worth area (western counties) and the Dallas area (eastern counties). The decreases in VOC are driven by the overall decrease in non-point oil and gas emissions between 2019 and 2026, whereas the increases are driven by increases from area sources.

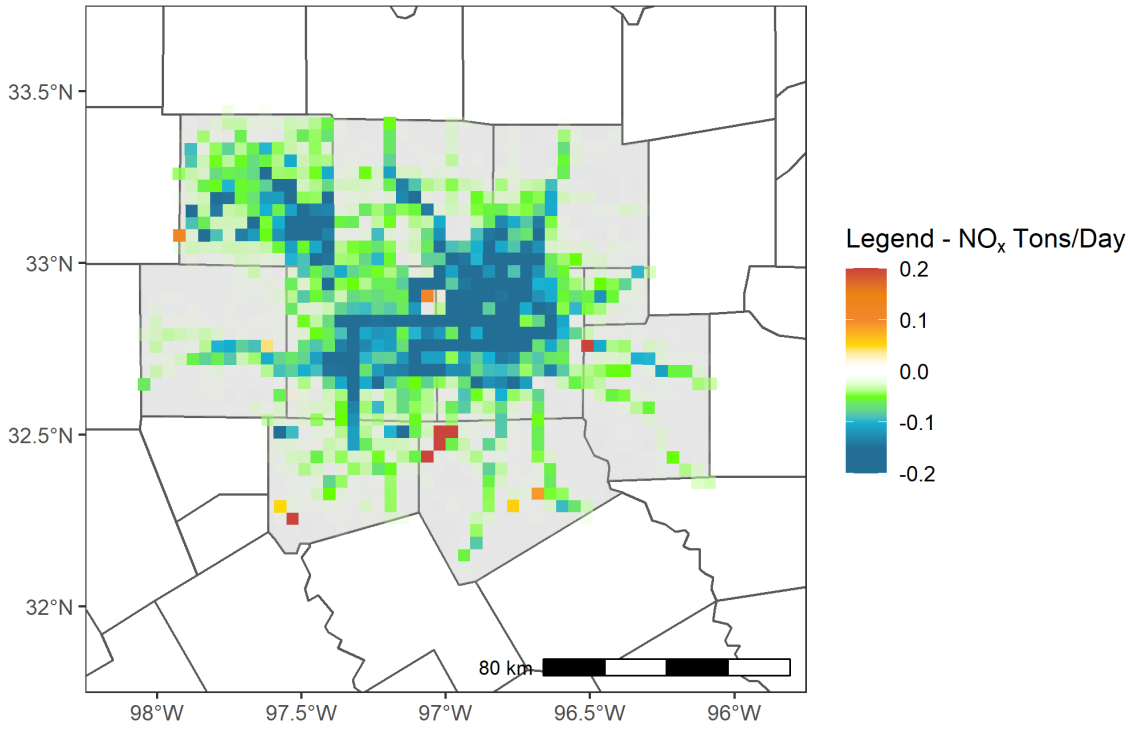

Figure 3-8: Difference in Anthropogenic NO_x between 2026 Future Case and 2019 Base Case on June 12 Modeled Episode Day

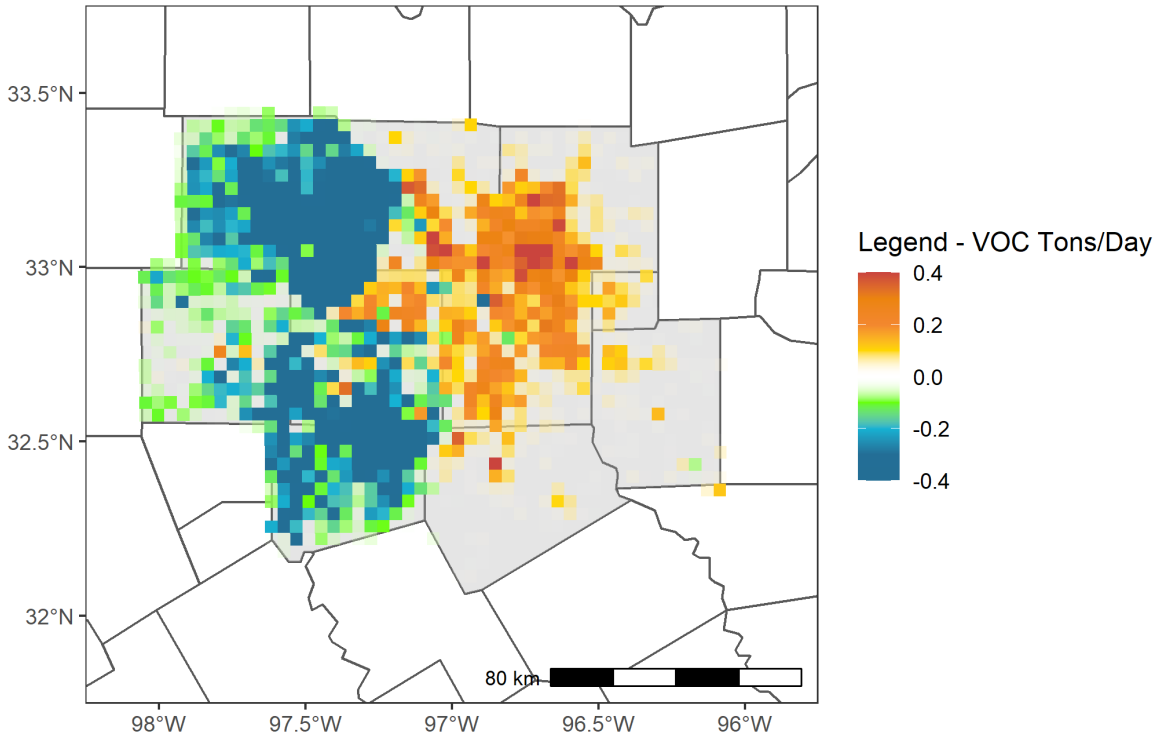

Figure 3-9: Difference in Anthropogenic VOC between 2026 Future Case and 2019 Base Case on June 12 Modeled Episode Day

3.4.3 Initial and Boundary Condition Inputs

In addition to emissions and meteorological inputs, CAMx requires initial and boundary conditions (IC/BC). Initial conditions refer to the state of the atmosphere in the modeling domain at the start of the modeling episode. Boundary conditions refer to the state of the atmosphere at the four lateral edges of a domain (North, South, East, West) and a top of a domain. IC/BC were derived from the Goddard Earth Observing Station global atmospheric model with Chemistry (GEOS-Chem) model runs for 2019 and 2026. Lateral boundary conditions were developed for each grid cell along all four lateral boundaries of the outer 36 km modeling domain. Top boundary conditions were also developed to represent pollutant concentrations from atmospheric layers above the highest CAMx vertical layer.

TCEQ contracted with the University of Houston to complete the GEOS-Chem model runs necessary for IC/BC development. The GEOS-Chem model simulations incorporated an eight-month period from March through October with a two-month ramp-up time (January - February). For both modeled years (2019 and 2026), GEOS-Chem version 12.7.1 was run at $2^{\circ} \times 2.5^{\circ}$ horizontal resolution using tropospheric chemistry with simplified secondary organic aerosols (Tropchem+simpleSOA) and 2019 meteorology from the Modern-Era Retrospective analysis for Research and Applications, Version 2 (MERRA-2). The 2026 future anthropogenic emissions were interpolated according to a moderate emission scenario from Representative Concentration Pathways (RCP4.5), with regional scaling factors for the United States, Canada, Mexico, and Asia. The 2023 and 2025 EI from EPA's 2016v1 modeling platform were used to develop scaling factors at the county level for the United States and

Mexico, and the provincial level for Canada. For Asia, gridded scaling factors were generated based on the latest available version (v6b) of the Evaluating the Climate and Air Quality Impact of Short-Lived Pollutants (ECLIPSE) inventory (Stohl et. al, 2015) from the International Institute for Applied Systems Analysis. Additional details of IC/BC development are presented in Section 4: *Initial and Boundary Conditions* of Appendix A.

3.5 PHOTOCHEMICAL MODEL PERFORMANCE EVALUATION

The purpose of model performance evaluation (MPE) is to determine how well the model reproduces measured concentrations of pollutants. The EPA modeling guidance recommends performing an operational model evaluation consisting of calculating multiple statistical parameters and graphical analyses. In addition, EPA also recommends comparing MPE results against other similar model applications, such as those reported in Emery et al. (2017) paper. The paper provides benchmarks for normalized mean bias (NMB), normalized mean error (NME), and correlation of one-hour and MDA8 ozone based on performance of many modeling applications in the U.S. Table 3-7: *Benchmarks for Photochemical Model Performance Evaluation Statistics* lists these benchmarks. The goal benchmarks correspond to the performance demonstrated by the top third of model runs evaluated and should be viewed as the best a model can be expected to achieve. The criteria benchmarks correspond to the performance achieved by the top two-thirds of model runs evaluated and should be viewed as what a majority of models can be expected to achieve.

In TCEQ's evaluation of the 2019 base case, statistical values near the goal or criteria benchmarks were used as indications that the model performance was good or acceptable, respectively.

Table 3-7: Benchmarks for Photochemical Model Performance Evaluation Statistics

Benchmark	NMB (%)	NME (%)	Correlation
Goal	Within range ± 5	Less than 15	Greater than 0.75
Criteria	Within range ± 15	Less than 25	Greater than 0.50

This section provides a broad overview of model performance in the DFW 2008 ozone NAAQS nonattainment area, with a more in-depth analysis available in Section 5: *Photochemical Model Performance Evaluation* of Appendix A.

TCEQ performed MPE by comparing 2019 base case CAMx modeling results to measured ozone concentrations at all ozone monitors in the DFW 2008 ozone NAAQS nonattainment area. For this evaluation, statistical performance measures of NMB and NME were calculated using measured and four-cell bi-linearly interpolated modeled ozone concentrations for all episode days and monitors. These statistical parameters were compared to benchmarks set by Emery et al. (2017).

As discussed in EPA's modeling guidance, operational performance evaluations should be conducted across various temporal and spatial scales. The NMB and NME for high-ozone days with MDA8 ozone concentrations at or above 60 ppb for each monitor in the DFW 2008 ozone NAAQS nonattainment area for the whole modeling episode are presented in Figure 3-10: *NMB of MDA8 Ozone ≥ 60 ppb by Monitor* and Figure 3-11: *NME of MDA8 Ozone ≥ 60 ppb by Monitor*. Figure 3-10 shows that all monitors in the

DFW area have NMB for this data aggregation within the criteria range, with seven monitors meeting the goal range. Most monitors had a negative bias, apart from the Fort Worth Northwest (C13), Grapevine Fairway (C70), and Rockwall Heath (C69) monitors which were slightly positively biased. All monitors in the nonattainment area had NME within the goal range for this data aggregation. By these metrics, the base case CAMx modeling has overall good to acceptable performance when replicating MDA8 ozone concentrations greater than or equal to 60 ppb in the DFW area.

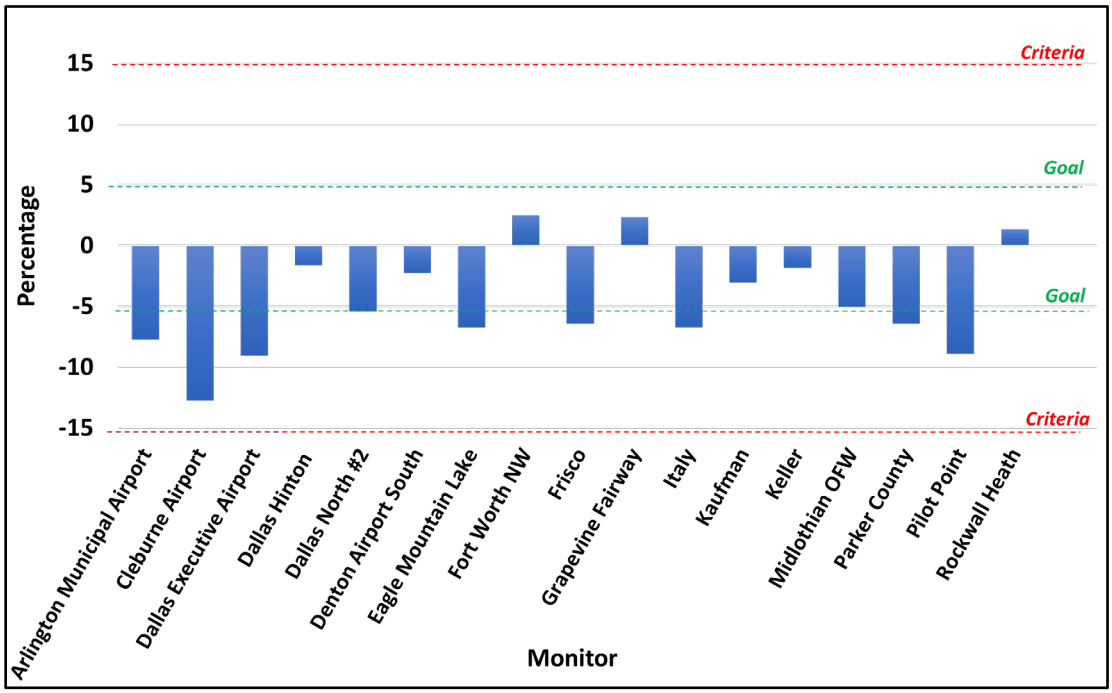

Figure 3-10: NMB of MDA8 Ozone ≥ 60 ppb by Monitor

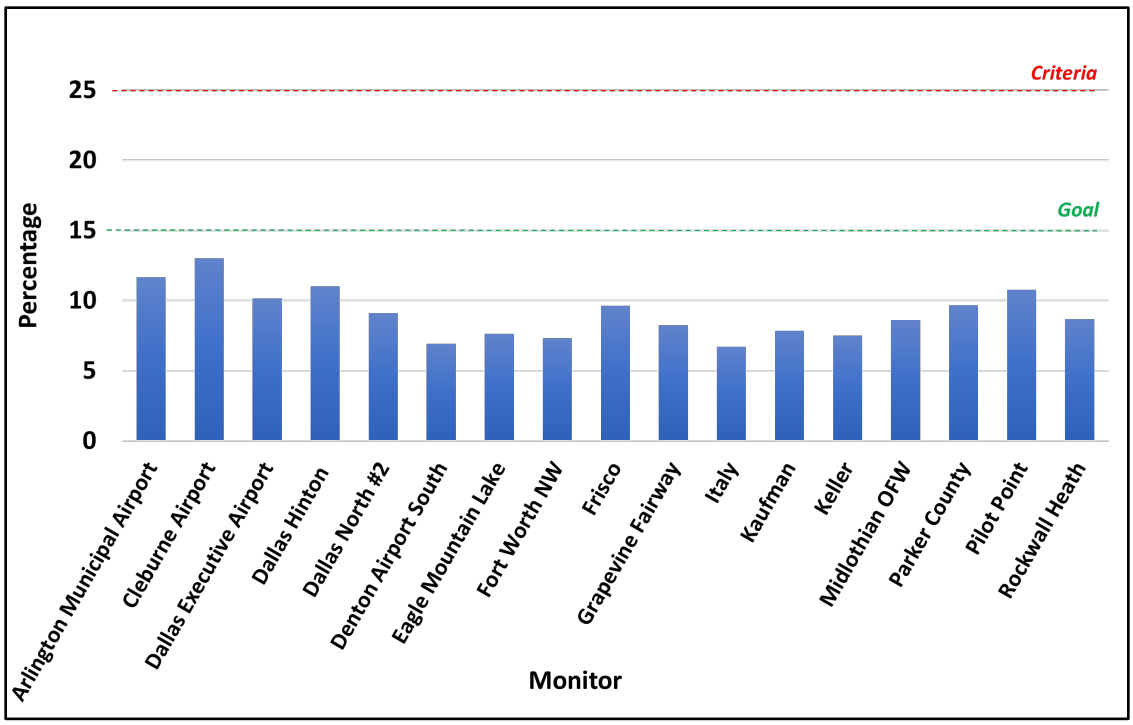

Figure 3-11: NME of MDA8 Ozone ≥ 60 ppb by Monitor

In addition to the episode-wide evaluation of model performance shown above, an evaluation of modeled eight-hour ozone concentrations for each month and for the entire seven-month episode is presented in Table 3-8: *NMB and NME of Eight-Hour Average Ozone in the DFW 2008 Ozone NAAQS Nonattainment Area.* The values represent monthly and seven-month averages from all DFW ozone monitors. Table 3-8 shows NMB and NME for three different subsections of the eight-hour average ozone data: all eight-hour averages when observed ozone was greater than or equal to 40 ppb, all MDA8 ozone values, and MDA8 ozone values when observed MDA8 ozone was greater than or equal to 60 ppb. From April through October and different subsections of data, NMB and NME metrics fell within the goal or criteria ranges. These metrics indicate that the 2019 base case CAMx modeling run had good performance relative to the performance benchmarks for ozone photochemical models during the entire seven-month episode.

Table 3-8: NMB and NME of Eight-Hour Average Ozone in the DFW 2008 Ozone NAAQS Nonattainment Area

Month	NMB All Obs. ≥ 40 ppb (%)	NME All Obs. ≥ 40 ppb (%)	NMB MDA8 Ozone (%)	NME MDA8 Ozone (%)	NMB MDA8 Ozone ≥ 60 ppb (%)	NME MDA8 Ozone ≥ 60 ppb (%)
Apr	-4.07	10.62	4.28	16.13	-5.80	9.26
May	2.40	12.34	13.86	19.80	-5.83	7.58
Jun	-4.18	16.56	5.40	18.41	-12.64	14.86
Jul	2.47	10.40	7.19	13.78	-4.15	10.44
Aug	2.49	9.66	3.96	10.85	-4.58	7.52
Sep	5.38	10.31	4.33	9.25	1.66	6.24

Month	NMB All Obs. ≥ 40 ppb (%)	NME All Obs. ≥ 40 ppb (%)	NMB MDA8 Ozone (%)	NME MDA8 Ozone (%)	NMB MDA8 Ozone ≥ 60 ppb (%)	NME MDA8 Ozone ≥ 60 ppb (%)
Oct	-2.8	8.47	2.61	10.43	-5.24	8.00
Apr through Oct	-0.03	11.34	5.98	14.12	-4.89	9.12

Figure 3-12: *Monthly NMB (for observed MDA8 ≥ 60 ppb) in the DFW 2008 Ozone NAAQS Nonattainment Area* shows that the bias changes depending on the monitor location and the month. Cool colors (light or dark blue) indicate underprediction (negative bias) of MDA8 ozone, and warm colors (yellow, orange, or red) indicate overprediction (positive bias). While all ozone monitors within the DFW 2008 ozone NAAQS nonattainment area exhibited negative bias in June, monitors showed either negative bias or positive bias for the rest of the modeled episode. Not all monitors recorded MDA8 ozone greater than or equal to 60 ppb for all months, and NMB could not be calculated at those monitors for those months.

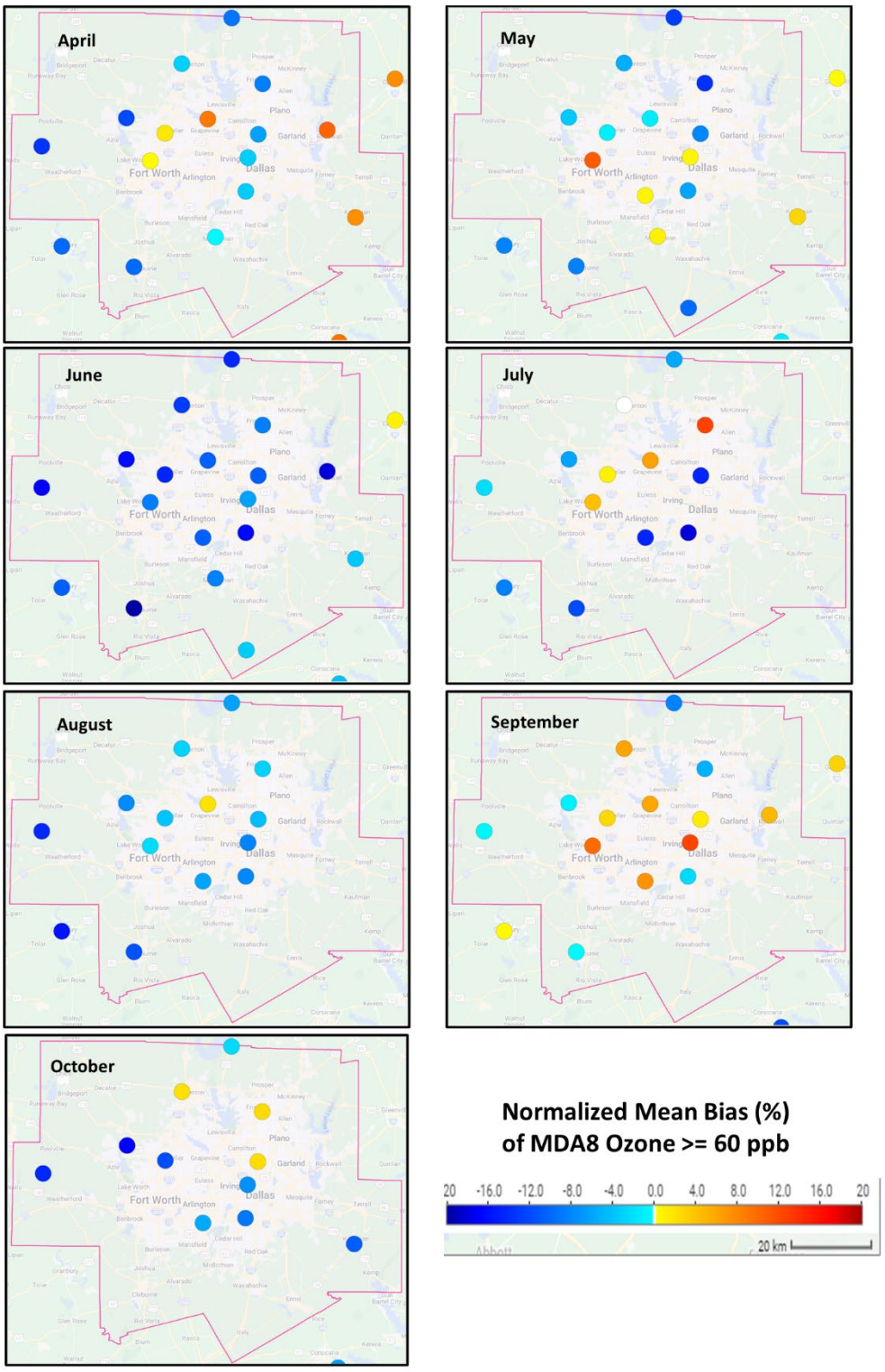

Figure 3-12: Monthly NMB (for observed MDA8 ≥ 60 ppb) in the DFW 2008 Ozone NAAQS Nonattainment Area

The performance evaluation of the base case modeling demonstrates the adequacy of the model to replicate the relationship between ozone levels and the emissions of NO_X

and VOC precursors in the atmosphere. The model's ability to suitably replicate this relationship is necessary to have confidence in the model's simulation of the future year ozone and the response to various control measures. Additional detailed evaluations are included in Section 5: *Photochemical Model Performance Evaluation* of Appendix A.

3.6 MODELED ATTAINMENT TEST

3.6.1 Future Year Design Values

In accordance with the EPA modeling guidance, the top 10 base case episode days with modeled eight-hour maximum concentrations above 60 ppb, per monitor, were used for the modeled attainment test. The relative response factor (RRF) that is used in the modeled attainment test was calculated based on the EPA modeling guidance as follows:

- from the base case modeling, the maximum concentrations of the three-by-three grid cell array surrounding each monitor were averaged over the top-10 modeled days to produce the top-10 day average base case MDA8 values;
- from the future case modeling, the concentrations from the corresponding base case top-10 modeled days and maximum grid cells were averaged to calculate the top-10 day average future case MDA8 values; and
- the RRF was calculated for each monitor as a ratio of the top-10 day average future case MDA8 values to the top-10 day average base case MDA8 values.

RRFs for each monitor included in the modeled attainment test are shown in Table 3-9: *DFW Monitor-Specific Relative Response Factors for Modeled Attainment Test*. The Italy monitor was the only monitor that did not meet the criteria to be included in the RRF calculation, as it did not have at least five days with observed MDA8 ozone greater than or equal to 60 ppb in the modeling episode. All other regulatory monitors in the nonattainment area were included in the RRF calculation.

Table 3-9: DFW Monitor-Specific Relative Response Factors for Modeled Attainment Test

Monitor Name	CAMS Number	2019 Top 10-Day Modeled MDA8 Mean (ppb)	2026 Top 10-Day Modeled MDA8 Mean (ppb)	Relative Response Factor (RRF)
Arlington Municipal Airport	0061	68.22	66.31	0.972
Cleburne Airport	0077	67.47	65.38	0.969
Dallas Executive Airport	0402	67.41	66.06	0.980
Dallas Hinton	0401	72.71	69.80	0.960
Dallas North #2	0063	74.06	70.95	0.958
Denton Airport South	0056	75.43	71.58	0.949
Eagle Mountain Lake	0075	73.62	70.75	0.961
Frisco	0031	75.16	71.93	0.957
Ft. Worth Northwest	0013	72.91	70.29	0.964
Grapevine Fairway	0070	76.70	73.33	0.956

Monitor Name	CAMS Number	2019 Top 10-Day Modeled MDA8 Mean (ppb)	2026 Top 10-Day Modeled MDA8 Mean (ppb)	Relative Response Factor (RRF)
Kaufman	0071	65.87	65.28	0.991
Keller	0017	73.97	71.01	0.960
Midlothian OFW	0052	65.36	64.18	0.982
Parker County	0076	69.74	67.30	0.965
Pilot Point	1032	70.92	68.30	0.963
Rockwall Heath	0069	70.68	68.84	0.974

The RRF is then multiplied by the 2019 base case design value (DVB) to obtain the 2026 future case design value (DVF) for each ozone monitor. The 2019 DVB is calculated as the average of the 2019, 2020, and 2021 regulatory DVs, which is shown in Figure 3-13: *Example Calculation for the 2019 DVB*.

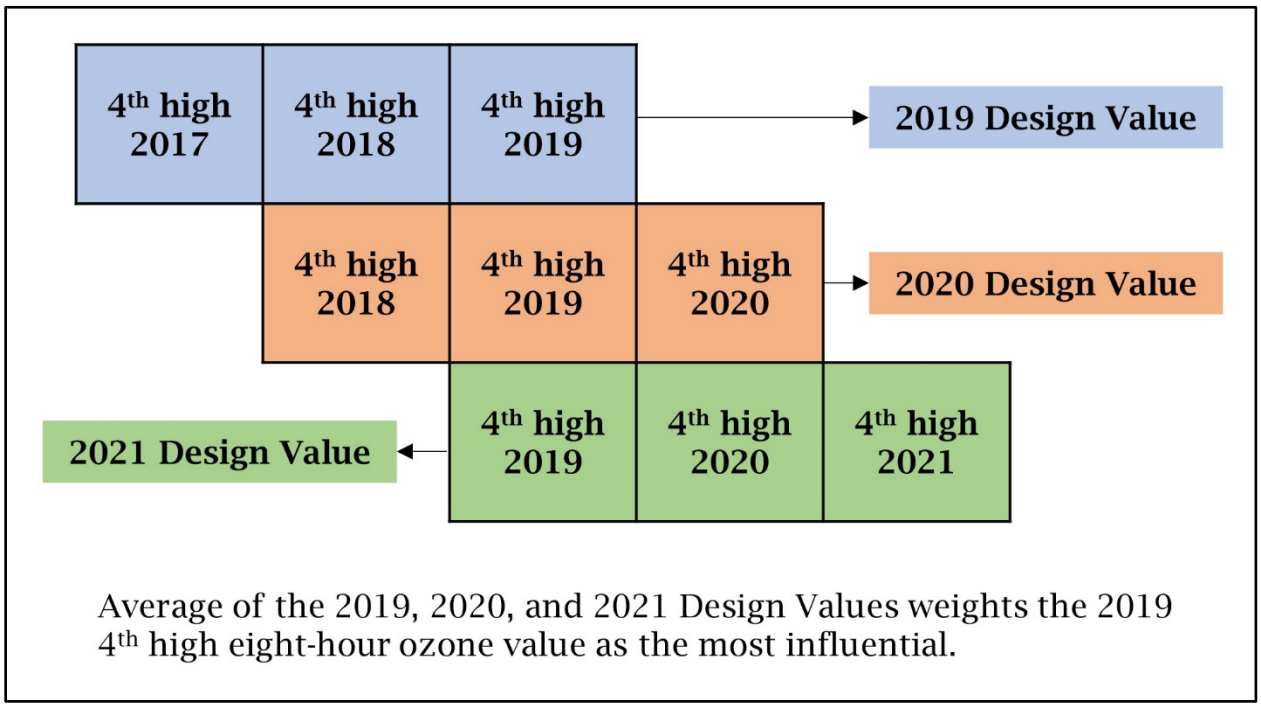

Figure 3-13: Example Calculation for the 2019 DVB

As required by EPA's modeling guidance, the final regulatory DVF is obtained by rounding to the tenths digit and truncating to zero decimal places. The DVFs for the DFW 2008 ozone NAAQS nonattainment area are presented in Table 3-10: *Summary of the 2026 DVF for the Modeled Attainment Test.* Application of the modeled attainment test shows that in 2026, the DVF of all monitors are below the 2008 eight-hour ozone standard of 75 ppb. The highest DVF value is 72 ppb at the Frisco monitor. The monitors are mapped with their projected future year attainment status in Figure 3-14: *2026 DVF in the DFW 2008 Ozone NAAQS Nonattainment Area.*

Table 3-10: Summary of the 2026 DVF for the Modeled Attainment Test

Monitor Name	CAMS Number	2019 DVB (ppb)	2026 Pre-Truncated DVF (ppb)	2026 Truncated DVF (ppb)
Arlington Municipal Airport	0061	70.00	68.07	68
Cleburne Airport	0077	73.33	71.04	71
Dallas Executive Airport	0402	68.33	66.94	66
Dallas Hinton	0401	69.67	66.89	66
Dallas North #2	0063	74.00	70.09	70
Denton Airport South	0056	73.00	69.29	69
Eagle Mountain Lake	0075	74.33	71.43	71
Frisco	0031	75.33	72.09	72
Ft. Worth Northwest	0013	72.00	69.43	69
Grapevine Fairway	0070	75.00	71.70	71
Kaufman	0071	63.67	63.07	63
Keller	0017	73.00	70.05	70
Midlothian OFW	0052	64.00	62.84	62
Parker County	0076	68.67	66.28	66
Pilot Point	1032	73.00	70.31	70
Rockwall Heath	0069	63.00	61.39	61

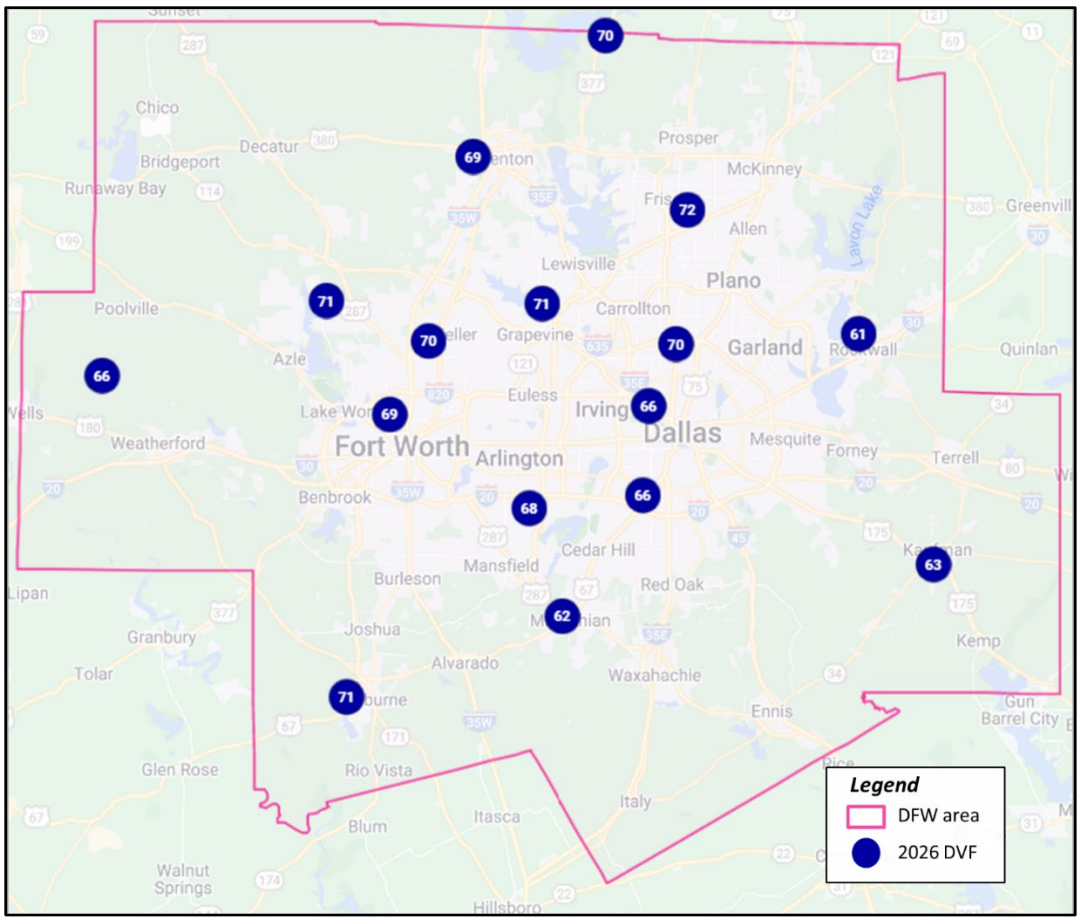

Figure 3-14: 2026 DVF in the DFW 2008 Ozone NAAQS Nonattainment Area

3.6.2 Unmonitored Area Analysis

The standard modeled attainment test is applied only at monitor locations. EPA's modeling guidance recommends that areas not near monitoring locations (unmonitored areas) be subject to an unmonitored area (UMA) analysis. The UMA analysis is intended to demonstrate that unmonitored areas are expected to reach attainment by the required future year or identify any areas outside monitoring location that are at risk of not meeting the ozone standard.

EPA developed Software for the Modeled Attainment Test - Community Edition (SMAT-CE) that allows states to perform the recommended UMA analysis. However, EPA also allows states to develop alternative techniques suitable for states' needs. To conduct the UMA analysis, TCEQ developed its own software, the TCEQ Attainment Test for Unmonitored Areas (TATU), that is integrated into TCEQ's model post-processing stream. Similar to SMAT-CE, TATU incorporates modeled predictions into spatial interpolation procedure using the Voronoi Neighbor Averaging technique. More information about TATU is provided in Appendix A.

The spatially analyzed 2026 future case design values obtained from the UMA analysis is presented in Figure 3-15: *Spatially Analyzed 2026 DVF in the DFW 2008 Ozone NAAQS Nonattainment Area*. The figure shows the extent and magnitude of the

expected improvements in ozone design values, with all grid cells below the 2008 ozone NAAQS. The maximum value in the nonattainment area is 72 ppb.

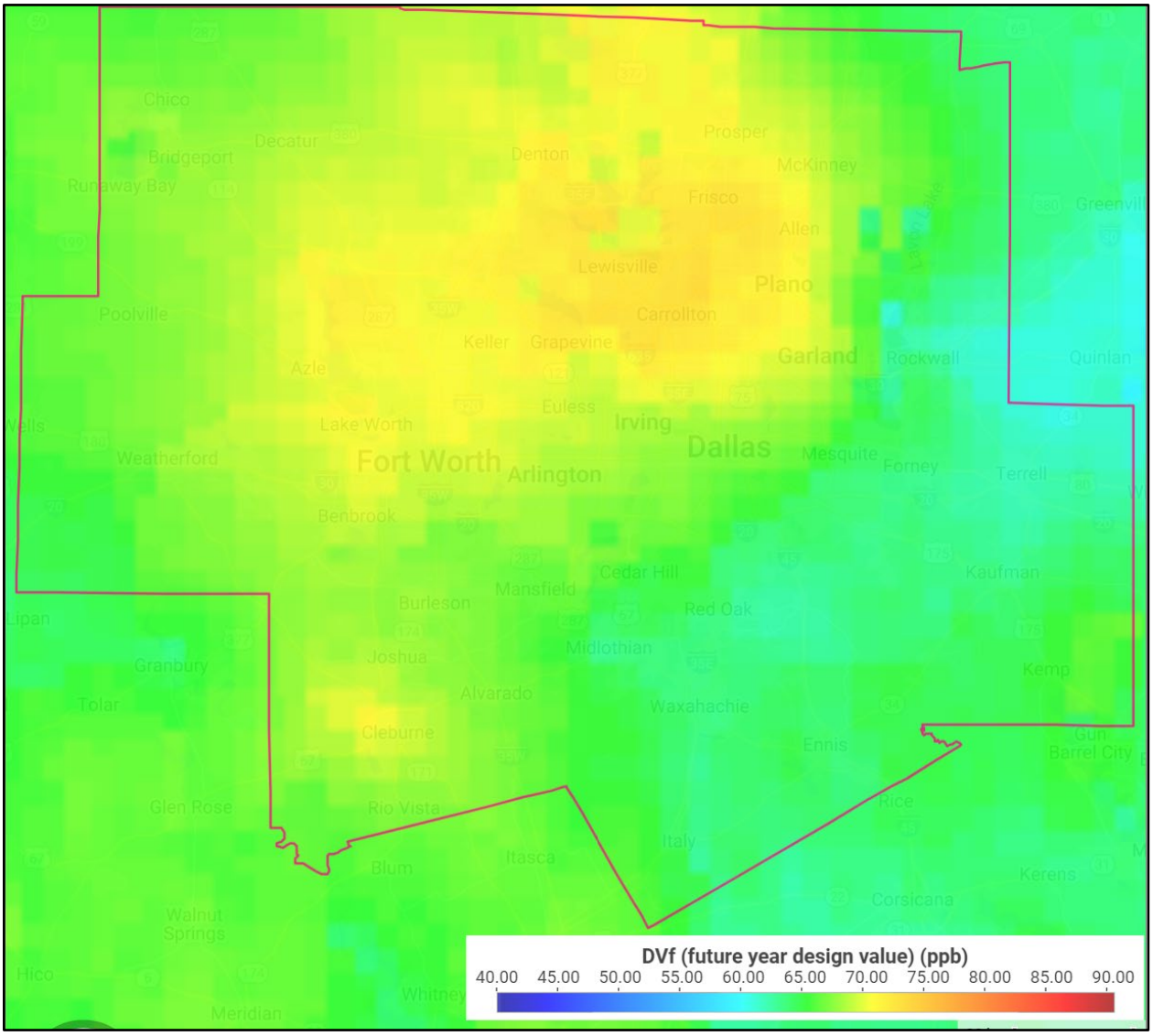

Figure 3-15: Spatially Analyzed 2026 DVF in the DFW 2008 Ozone NAAQS Nonattainment Area

3.6.3 Emission Reduction Credits (ERC) Sensitivity Test

A sensitivity modeling run was performed to determine the impact of certified and potential (submitted applications that have not yet been certified) ERC on the 2026 DVF in the DFW 2008 ozone NAAQS nonattainment area. The sensitivity modeling run was performed to ensure that emissions associated with ERCs remain surplus, as required by 30 Texas Administrative Code Chapter 101, Subchapter H, Division 1.

The ERC sensitivity test resulted in a 0.15 ppb increase to the maximum 2026 DVF in the DFW 2008 ozone NAAQS nonattainment area (72.09 ppb to 72.24 ppb at the Frisco monitor). The pre-truncated DVF increased across all regulatory monitors, with a

maximum increase of 0.17 ppb at the Denton Airport South monitor. After rounding and truncation, the 2026 DVF for the ERC sensitivity did not change for any monitor except for the three monitors: Dallas Executive Airport (increased from 66 to 67 ppb), Dallas Hinton (increased from 66 to 67 ppb), and Dallas North #2 (increased from 70 to 71 ppb). The maximum 2026 DVF in DFW remains at 72 ppb at the Frisco monitor. Results from the ERC sensitivity test are listed in Table 3-11: *DFW Future Year Design Values for ERC Sensitivity Test*. Additional details of the ERC sensitivity are provided in Section 3.3.1.3: *Sources in Non-Attainment Areas* of Appendix A.

Table 3-11: DFW Future Year Design Values for ERC Sensitivity Test

DFW Monitor	CAMS Number	ERC Sensitivity 2026 Pre-Truncated DVF (ppb)	Difference in 2026 DVF from ERC Sensitivity (ppb)	ERC Sensitivity 2026 Truncated DVF (ppb)
Arlington Municipal Airport	0061	68.23	0.16	68
Cleburne Airport	0077	71.13	0.09	71
Dallas Executive Airport	0402	67.07	0.13	67
Dallas Hinton	0401	67.04	0.15	67
Dallas North #2	0063	71.05	0.15	71
Denton Airport South	0056	69.46	0.17	69
Eagle Mountain Lake	0075	71.56	0.13	71
Frisco	0031	72.24	0.15	72
Ft. Worth Northwest	0013	69.57	0.14	69
Grapevine Fairway	0070	71.84	0.14	71
Italy	1044	62.64	0.05	62
Kaufman	0071	63.13	0.05	63
Keller	0017	70.18	0.13	70
Midlothian OFW	0052	62.89	0.05	62
Parker County	0076	66.42	0.14	66
Pilot Point	1032	70.44	0.13	70
Rockwall Heath	0069	61.51	0.12	61

3.6.4 Texas Low Emission Diesel (TxLED) Program Sensitivity Test

The Texas Low Emission Diesel (TxLED) program was initially implemented in May 2000 to reduce emissions of NO_x from diesel-powered on-road vehicles and non-road engines operating in 110 central and eastern Texas counties.[22] An EPA memorandum from September of 2001 specified the following NO_x emission reductions for TxLED:[23]

- 4.8% for 2002-and-newer diesel on-road vehicles;
- 6.2% for 2001-and-older diesel on-road vehicles;
- 4.8% for non-road engines meeting Tier 3 and Tier 4 emission standards;

[22] https://www.tceq.texas.gov/airquality/mobilesource/txled
[23] https://www.epa.gov/sites/default/files/2016-11/documents/tx-led-fuel-benefit-2001-09-27.pdf

- 6.2% for non-road engines meeting Base, Tier 0, Tier 1, and Tier 2 emission standards; and
- 0% for non-road engines less than or equal to 50 horsepower (hp).

These TxLED NO_X reduction benefits from September of 2001 were incorporated into the on-road and non-road AD modeling runs for both the 2019 base case and 2026 future case. In February 2023, EPA released updated guidance (referred to as 2023 EPA Cetane Program guidance) that modifies the way that the TxLED emissions reductions are estimated.[24] EPA specifies a formula in the 2023 EPA Cetane Program guidance that modifies the TxLED NO_X reductions to roughly:

- 0% for 2003-and-newer diesel on-road vehicles;
- 1.5% for 2002-and-older diesel on-road vehicles;
- 0% for non-road engines meeting Tier 3 and Tier 4 emission standards; and
- 1.5% for non-road engines meeting Base, Tier 0, Tier 1, and Tier 2 emission standards.

A sensitivity modeling run was performed to determine the impact of quantifying NO_X benefits for the TxLED program based on the 2023 EPA Cetane Program guidance on the 2026 DVF in the DFW 2008 ozone NAAQS nonattainment area. This sensitivity modeling run required changing the estimated on-road and non-road TxLED NO_X reductions in the 110 central and eastern Texas counties for both the 2019 base case and the 2026 future year.

Results from the TxLED program sensitivity test show that the pre-truncated DVF in the DFW 2008 ozone NAAQS nonattainment area decreased across all regulatory monitors, with a maximum decrease of 0.36 ppb at the Kaufman monitor, except the Midlothian OFW monitor, which increased 0.02 ppb. In addition, the maximum 2026 pre-truncated DVF decreased 0.04 ppb at the Frisco monitor (from 72.09 ppb to 72.05 ppb). After rounding and truncation, the 2026 DVF for the TxLED program sensitivity did not change for any monitor except for the Kaufman monitor, which decreased from 63 to 62 ppb, with a 0.36 ppb difference. The maximum 2026 DVF in DFW remains at 72 ppb at the Frisco monitor. Results from the TxLED program sensitivity test are listed in Table 3-12: *DFW Future Year Design Values for TxLED Program Sensitivity Test*. Details about NO_X emissions for the TxLED program sensitivity test for on-road and non-road sources are provided in Section 3.4.1 and 3.5.3 of Appendix A, respectively.

[24] https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1016IFV.pdf

Table 3-12: DFW Future Year Design Values for TxLED Program Sensitivity Test

DFW Monitor	CAMS Number	TxLED 2026 Pre-Truncated DVF (ppb)	Difference in 2026 DVF from TxLED (ppb)	TxLED 2026 Truncated DVF (ppb)
Arlington Municipal Airport	0061	67.95	-0.12	68
Cleburne Airport	0077	70.01	-0.03	70
Dallas Executive Airport	0402	66.92	-0.02	66
Dallas Hinton	0401	66.87	-0.02	66
Dallas North #2	0063	70.87	-0.03	70
Denton Airport South	0056	69.26	-0.03	69
Eagle Mountain Lake	0075	71.40	-0.03	71
Frisco	0031	72.05	-0.04	72
Ft. Worth Northwest	0013	69.40	-0.03	69
Grapevine Fairway	0070	71.67	-0.03	71
Italy	1044	62.57	-0.02	62
Kaufman	0071	62.71	-0.36	62
Keller	0017	70.01	-0.04	70
Midlothian OFW	0052	62.86	0.02	62
Parker County	0076	66.25	-0.03	66
Pilot Point	1032	70.28	-0.03	70
Rockwall Heath	0069	61.38	-0.01	61

3.7 MODELING REFERENCES

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CHAPTER 4: CONTROL STRATEGIES AND REQUIRED ELEMENTS

4.1 INTRODUCTION

The Dallas-Fort Worth (DFW) 2008 ozone National Ambient Air Quality Standard (NAAQS) nonattainment area, which consists of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties, includes a wide variety of major and minor industrial, commercial, and institutional entities. The Texas Commission on Environmental Quality (TCEQ) has implemented regulations that address emissions of nitrogen oxides (NO_X) and volatile organic compounds (VOC) from these sources. This chapter describes existing ozone control measures for the DFW ozone nonattainment area as well as reasonably available control technology (RACT), reasonably available control measures (RACM), motor vehicle emissions budgets (MVEB), and contingency for the DFW nonattainment area under the 2008 ozone NAAQS.

4.2 EXISTING CONTROL MEASURES

Since the early 1990s, a broad range of control measures have been implemented for each emission source category for ozone planning in the DFW ozone nonattainment area(s). Under the one-hour ozone NAAQS, the DFW ozone nonattainment area consisted of four counties: Collin, Dallas, Denton, and Tarrant. Under the 1997 eight-hour ozone NAAQS, the DFW ozone nonattainment area consisted of nine counties: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant. Wise County was added to the existing nine-county nonattainment area under the 2008 eight-hour ozone NAAQS, resulting in a 10-county ozone nonattainment area. Table 4-1: *Existing Ozone Control and Voluntary Measures Applicable to the DFW 10-County Nonattainment Area* lists all existing ozone control strategies implemented under the 1979 one-hour and the 1997 and 2008 eight-hour ozone standards throughout the 10 counties comprising the DFW 2008 ozone NAAQS nonattainment area.

Table 4-1: Existing Ozone Control and Voluntary Measures Applicable to the DFW 10-County Nonattainment Area

Measure	Description	Start Date(s)
DFW Industrial, Commercial, and Institutional (ICI) Major Source Rule 30 Texas Administrative Code (TAC) Chapter 117, Subchapter B, Division 4	Applies to major sources (50 tons per year (tpy) of NO_X or more) with affected units in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant and Wise Counties NO_X emission limits for affected source categories include: boilers; process heaters; stationary gas turbines, and duct burners used in turbine exhaust ducts; lime kilns; heat treat and reheat metallurgical furnaces; stationary internal combustion engines; incinerators; glass, fiberglass, and mineral wool melting furnaces; fiberglass and mineral wool curing ovens; natural gas-fired ovens and heaters; brick and ceramic kilns; lead smelting reverberatory and blast furnaces; natural gas-fired dryers used in organic solvent, printing ink, clay, brick, ceramic tile, calcining, and vitrifying processes; and wood-fired boilers	March 1, 2009 or March 1, 2010, depending on source category January 1, 2017 for Wise County and for wood-fired boilers in all 10 counties of the DFW area
DFW ICI Minor Source Rule 30 TAC Chapter 117, Subchapter D, Division 2	Applies to all minor sources (less than 50 tpy of NO_X) with stationary internal combustion engines in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties NO_X emission limits for stationary gas-fired, dual-fuel, and diesel-fired reciprocating internal combustion engines	March 1, 2009 for rich-burn gas-fired engines, diesel-fired engines, and dual-fuel engines March 1, 2010 for lean-burn gas-fired engines
Stationary Diesel and Dual-Fuel Engines 30 TAC Chapter 117, Subchapter B, Division 4 and Subchapter D, Division 2	Restrictions on operating stationary diesel and dual-fuel engines for testing and maintenance purposes between 6:00 a.m. and noon in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties	March 1, 2009

Measure	Description	Start Date(s)
DFW Major Utility Electric Generation Source Rule 30 TAC Chapter 117, Subchapter C, Division 4	NO_X control requirements for major source (50 tpy of NO_X or more) utility electric generating facilities in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties Applies to utility boilers, auxiliary steam boilers, stationary gas turbines, and duct burners used in turbine exhaust ducts used in electric power generating systems	March 1, 2009 for Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties January 1, 2017 for Wise County
Utility Electric Generation in East and Central Texas 30 TAC Chapter 117, Subchapter E, Division 1	NO_X emission limits for electric power boilers and stationary gas turbines (including duct burners used in turbine exhaust ducts) at utility electric generation sites in East and Central Texas, including Parker County	May 1, 2003 through May 1, 2005
DFW Cement Kiln Rule 30 TAC Chapter 117, Subchapter E, Division 2	NO_X emission limits for all Portland cement kilns located in Ellis County Voluntary agreed order No. 2017-1648-SIP with TXI Operations, LP, limits #5 Kiln to 1.95 pounds of NO_X per ton of clinker	March 1, 2009 and August 8, 2018
NO_X Emission Standards for Nitric Acid Manufacturing – General 30 TAC Chapter 117, Subchapter F, Division 3	NO_X emission limits for nitric acid manufacturing facilities (state-wide rule – no nitric acid facilities in the DFW area)	November 15, 1999
East Texas Combustion Sources 30 TAC Chapter 117, Subchapter E, Division 4	NO_X emission limits for stationary rich-burn, gas-fired internal combustion engines (240 horsepower and greater) Measure implemented to reduce ozone in the DFW area although controls not applicable in the DFW area	March 1, 2010
Natural Gas-Fired Small Boilers, Process Heaters, and Water Heaters 30 TAC Chapter 117, Subchapter E, Division 3	NO_X emission limits on small-scale residential and industrial boilers, process heaters, and water heaters equal to or less than 2.0 million British thermal units per hour (state-wide rule)	July 1, 2002

Measure	Description	Start Date(s)
NO_x RACT for Major Sources in Wise County 30 TAC Chapter 117	Implements RACT to reflect lowering of the major source emissions threshold for source categories in Wise County due to reclassification change to serious for the 2008 eight-hour ozone NAAQS	July 20, 2021
VOC Control Measures 30 TAC Chapter 115	VOC control measures adopted to satisfy reasonably available control technology (RACT) and other SIP planning requirements for sources including: vent gas, industrial wastewater, water separation, municipal solid waste landfills, batch processes, loading and unloading operations, VOC leak detection and repair, solvent-using processes, fugitive emission control in petroleum refining, natural gas/gasoline processing, and petrochemical processing, cutback asphalt, and pharmaceutical manufacturing facilities	December 31, 2002 and earlier for Collin, Dallas, Denton, and Tarrant Counties March 1, 2009 for Ellis, Johnson, Kaufman, Parker, and Rockwall Counties January 1, 2017 for Wise County
Degassing Operations 30 TAC, Chapter 115, Subchapter F, Division 3	VOC control requirements for degassing during, or in preparation of, cleaning any storage tanks and transport vessels in Collin, Dallas, Denton, and Tarrant Counties	May 21, 2011
Storage of VOC 30 TAC Chapter 115, Subchapter B, Division 1	Controls on fixed and floating roof tanks storing VOC liquids, including oil and condensate, based on the size of the tank and vapor pressure of the liquid being stored in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties Audio-visual-olfactory inspections, repair requirements, and associated recordkeeping for certain fixed-roof oil and condensate tanks	January 1, 2017 and earlier

Measure	Description	Start Date(s)
Solvent-Using Processes 30 TAC Chapter 115, Subchapter E	Revised to implement RACT requirements per control technique guidelines published by the United States Environmental Protection Agency (EPA) Control, testing, monitoring and recordkeeping requirements for: paper, film, and foil coatings; large appliance coatings; metal furniture coatings; miscellaneous metal and plastic parts coatings; automobile and light-duty truck coating; industrial cleaning solvents; miscellaneous industrial adhesives; offset lithographic printing; and flexible package printing in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties	March 1, 2013 for industrial cleaning solvents March 1, 2011 for major source offset lithographic printing lines March 1, 2012 for minor source offset lithographic printing lines January 1, 2017 for Wise County
Petroleum Dry Cleaning Systems 30 TAC Chapter 115, Subchapter F, Division 4	Control requirements for petroleum dry cleaning system dryers and filters at sources that use less than 2,000 gallons of petroleum solvent per year in Collin, Dallas, Denton, and Tarrant Counties	May 21, 2011
Rules for the Oil and Natural Gas Industry 30 TAC Chapter 115 Subchapter B Division 7	VOC measures adopted for RACT addressing the emission source categories in the Control Techniques Guidelines for the Oil and Natural Gas Industry published by EPA on October 20, 2016	January 1, 2023
Refueling – Stage I 30 TAC, Chapter 115, Subchapter C, Division 2	Captures gasoline vapors that are released when gasoline is delivered to a storage tank Vapors returned to tank truck as storage tank is filled with fuel, rather than released into ambient air	1979 January 1, 2017 for Wise County A SIP revision related to Stage I regulations was approved by EPA, effective June 29, 2015
Voluntary Texas Emissions Reduction Plan (TERP) 30 TAC Chapter 114, Subchapter K	Provides grant funds for on-road and non-road heavy-duty diesel engine replacement/retrofit	January 2002 See Section 5.3.1.4: *Texas Emissions Reduction Plan (TERP)*

Measure	Description	Start Date(s)
Texas Low Emission Diesel 30 TAC Chapter 114, Subchapter H, Division 2	Requires all diesel fuel for both on-road and non-road use to have a lower aromatic content and a higher cetane number	Phased in from October 31, 2005 through January 31, 2006
Vehicle Inspection/ Maintenance (I/M) 30 TAC Chapter 114, Subchapter C	Yearly computer checks for model year 2-24 gasoline-powered vehicles The DFW area meets the federal Clean Air Act (FCAA), §182(c)(3) requirements to implement an I/M program, and according to 40 Code of Federal Regulations (CFR) §51.350(b)(2), an I/M program is required to cover the entire urbanized area based on the 1990 census.	May 1, 2002 in Collin, Dallas, Denton, and Tarrant Counties May 1, 2003 in Ellis, Johnson, Kaufman, Parker, and Rockwall Counties
30 TAC Chapter 114, Subchapter I, Division 3	Standards for non-road gasoline engines 25 horsepower and larger	May 1, 2004
Transportation Control Measures	Various measures implemented under the previous one-hour and 1997 eight-hour ozone standards (see Appendix D: *Reasonably Available Control Technology Analysis* of the *2007 DFW 1997 Eight-Hour Ozone Attainment Demonstration SIP Revision*) The North Central Texas Council of Governments (NCTCOG) has implemented all TCM commitments and provides an accounting of TCMs as part of the transportation conformity process.	Phased in through 2016
Voluntary Energy Efficiency/Renewable Energy (EE/RE)	See Section 5.3.1.2: *Energy Efficiency and Renewable Energy Measures*	See Section 5.3.1.2
Voluntary Mobile Emissions Reduction Program	Various pedestrian, bicycle, traffic, and mass transit voluntary measures committed to as part of the 2007 DFW 1997 Eight-Hour Ozone Attainment Demonstration SIP Revision and administered by NCTCOG	Phased in through 2009

Measure	Description	Start Date(s)
Federal On-Road Measures	Series of emissions limits implemented by EPA for on-road vehicles Included in measures: Tier 1, Tier 2, and Tier 3 light-duty and medium-duty passenger vehicle standards, heavy-duty vehicle standards, low sulfur diesel standards, National Low Emission Vehicle standards, and reformulated gasoline	Phased in through 2010 Tier 3 phase in from 2017 through 2025
Federal Area/Non-Road Measures	Series of emissions limits implemented by EPA for area and non-road sources Examples: diesel and gasoline engine standards for locomotives and leaf-blowers	Phased in through 2018
DFW Area On-road & Non-road Reformulated Gasoline (RFG)	Requires all gasoline sold year-round to have low Reid vapor pressure to meet federal RFG requirements	January 1, 1995 in Collin, Dallas, Denton, and Tarrant Counties November 7, 2023 in Ellis, Johnson, Kaufman, Parker, Rockwall, and Wise Counties

4.3 UPDATES TO EXISTING CONTROL MEASURES

4.3.1 Updates to Mobile Source Control Measures

On April 15, 2022, TCEQ adopted a rulemaking to update rule language to be consistent with a change to the Texas Transportation Code required by Senate Bill (SB) 604, 86th Legislature, 2019 (SB 604), relating to the display of a vehicle's registration insignia for certain commercial fleet or governmental entity vehicles on a digital license plate in lieu of attaching the registration insignia to the vehicle's windshield (Rule Project No. 2021-029-114-AI). The rulemaking to implement SB 604 did not include any new control measures. On November 29, 2023, the commission adopted the I/M SIP revision (Project No. 2022-027-SIP-NR), which incorporated the adopted rulemaking to implement SB 604. The adopted rulemaking and SIP revision were submitted to EPA on December 18, 2023.

On November 29, 2023, the commission adopted revisions to 30 Texas Administrative Code (TAC) Chapter 114 to implement I/M in Bexar County, make minor cleanup revisions resulting from a statutorily required 2019 review of the rules in Chapter 114 for obsolescence, and to remove Ellis, Johnson, Kaufman, Parker, Rockwall and Wise Counties from the list of affected counties required to comply with the state's low Reid vapor pressure (RVP) control requirements (Rule Project No. 2022-026-114-AI). Removal of the six counties from the state low RVP program does not interfere with attainment or maintenance of the NAAQS for the DFW area due to implementation of federal reformulated gasoline requirements, effective November 7, 2023. Federal RFG requirements are more stringent than the state rules.

4.3.2 Updates to NO_X Control Measures

A concurrent NO_X rulemaking (Rule Project No. 2023-117-117-AI) satisfies major source NO_X RACT requirements for the DFW severe ozone nonattainment area for the 2008 eight-hour ozone NAAQS. While RACT is currently in place through the existing 30 TAC Chapter 117 NO_X rules at the serious major source threshold of 50 tpy, rulemaking was necessary to ensure RACT is in place for all sources that became major sources under the more stringent severe major source threshold of 25 tpy. The concurrent NO_X rulemaking revises 30 TAC Chapter 117 to apply at a major source that actually emits or has the potential to emit 25 tpy of NO_X in the DFW severe ozone nonattainment area. All unit types located at major source sites in the 2019 point source emissions inventory (EI) are addressed by this RACT rulemaking. Details of the RACT analysis are provided in Appendix D: *Reasonably Available Control Technology Analysis*.

In response to a rule petition for changes to existing rule provisions in Chapter 117 (Project No. 2023-127-PET-NR), owners or operators of stationary diesel engines designed, constructed, operated, and certified to meet the requirements of 40 CFR Part 1039 would not be required to use a continuous or predictive emissions monitoring system to monitor NO_X emissions from the affected unit. Owners or operators would furthermore not be required to monitor ammonia emissions pursuant to existing Chapter 117 ammonia emission monitoring requirements. The affected unit would still be subject to a NO_X and an ammonia emission specification, and the owner or operator would still be required to test the unit to demonstrate initial compliance with the respective emission specification. The concurrent Chapter 117 rulemaking (Rule Project No. 2023-117-117-AI) provides the compliance flexibility through rule updates in Subchapter B, Division 3 for major sources of NO_X and in Subchapter D, Division 1 for minor sources of NO_X.

4.3.3 Updates to VOC Control Measures

Control measures addressing FCAA, §172 and §182 for the 2008 DFW ozone nonattainment area were last updated in a 30 TAC Chapter 115 rulemaking adopted June 30, 2021 (Rule Project No. 2020-038-115-AI) to implement RACT for the oil and natural gas emission source categories covered in EPA's control techniques guidelines (CTG) document, *Control Techniques Guidelines for the Oil and Natural Gas Industry* published in 2016 (EPA-453/B-16-001 2016/10). EPA published final approval of the rule revisions on August 15, 2023, effective September 14, 2023 (88 FR 55379).

Updates were needed to correct errors made in the June 2021 Chapter 115 rulemaking. These updates are included in a concurrent 30 TAC Chapter 115 rulemaking (Rule Project No. 2023-116-115-AI) and more closely align the requirements in Chapter 115 with EPA's CTG. The revisions include exemptions inadvertently omitted from Chapter 115, allowing audio, visual, or olfactory monitoring for equipment in heavy liquid service, and correcting errors in the rule language providing for a reduced monitoring frequency based on good performance. All corrections are consistent with the recommendations in the CTG.

The concurrent Chapter 115 VOC rulemaking (Rule Project No. 2023-116-115-AI) also addresses VOC RACT requirements for the DFW severe ozone nonattainment area for the 2008 eight-hour ozone NAAQS. While RACT is currently in place through the

existing 30 TAC Chapter 115 VOC rules at the serious major source threshold of 50 tpy, rulemaking is necessary to ensure RACT is in place for all existing sources that became major sources under the more stringent severe major source threshold of 25 tpy. The concurrent rulemaking revises VOC rules for the DFW ozone nonattainment area to apply VOC RACT requirements at a major source that emits or has the potential to emit 25 tpy of VOC. All unit types located at major source sites in the 2019 point source EI are addressed by this RACT rulemaking. Details of the RACT analysis are provided in Appendix D.

4.4 NEW CONTROL MEASURES

4.4.1 Stationary Sources

Necessary emissions reductions needed for attainment consist of the application of existing rules to smaller sources of NO_X and VOC emissions, as described in Section 4.3 *Updates to Existing Control Measures*. The concurrent Chapter 115 rulemaking also includes new contingency measures to satisfy FCAA contingency measure requirements. These contingency measures are described in Section 4.9: *Contingency Plan*.

4.5 RACT ANALYSIS

4.5.1 General Discussion

Ozone nonattainment areas classified as moderate and above are required to meet the mandates of the federal Clean Air Act (FCAA) under §172(c)(1) and §182(b)(2) and (f) to address RACT. According to EPA's *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements: Final Rule* (2008 eight-hour ozone standard SIP requirements rule) published on March 6, 2015, states containing areas classified as moderate ozone nonattainment or higher must submit a SIP revision to fulfill the RACT requirements for all CTG emission source categories and all non-CTG major sources of NO_X and VOC (80 *Federal Register* (FR) 12264). Specifically, this DFW Attainment Demonstration (AD) SIP revision must contain adopted RACT regulations, certifications where appropriate that existing provisions are RACT, and/or negative declarations that there are no sources in the nonattainment area covered by a specific CTG source category.

The DFW area was previously classified as serious nonattainment under the 2008 eight-hour ozone NAAQS with an attainment date of July 20, 2021 (84 FR 44238). Based on monitoring data from 2018 through 2020, the DFW serious ozone nonattainment area did not attain the 2008 eight-hour ozone NAAQS in the 2020 attainment year and did not qualify for a one-year attainment date extension in accordance with FCAA, §181(a)(5). On October 7, 2022, EPA published the final notice reclassifying the DFW nonattainment area from serious to severe for the 2008 eight-hour ozone NAAQS, effective November 7, 2022 (87 FR 60926).

The major source threshold for severe nonattainment areas is 25 tpy of actual or potential emissions of either NO_X or VOC. This RACT analysis evaluated requirements at the revised major source threshold of 25 tpy of NO_X or VOC in the 10-county DFW 2008 ozone NAAQS nonattainment area. Details of TCEQ's analysis of the sources and the applicable rules to demonstrate that the state is fulfilling the RACT requirements for the DFW area are provided in Appendix D.

RACT is defined as the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility (44 FR 53761, September 17, 1979). RACT requirements for moderate and higher classification nonattainment areas are included in the FCAA to ensure that significant source categories at major sources of ozone precursor emissions are controlled to a reasonable extent but not necessarily to the best available control technology (BACT) levels expected of new sources or to the maximum achievable control technology levels required for major sources of hazardous air pollutants.

Details of TCEQ's analysis of the sources and the applicable rules to demonstrate that the state is fulfilling the RACT requirements for the DFW 2008 eight-hour severe ozone nonattainment area are provided in Appendix D.

4.5.2 NO_X RACT Determination

The TCEQ reviewed the 2019 point source EI to verify that the NO_X controls and reductions implemented through 30 TAC Chapter 117 for the 10-county DFW ozone nonattainment area continue to address RACT for the 2008 ozone NAAQS. The current EPA-approved 30 TAC Chapter 117 rules continue to fulfill RACT requirements for all NO_X source categories identified in EPA alternative Control Technology (ACT) guidance documents. Because the concurrent Chapter 117 rulemaking applies existing NO_X rules at a more stringent major source emission threshold of 25 tpy, all NO_X major sources in the DFW 2008 eight-hour severe ozone nonattainment area are covered by emission limits that EPA has previously approved. Details of this analysis are included in Appendix D.

4.5.3 VOC RACT Determination

In the 10 DFW area counties that were classified severe nonattainment under the 2008 eight-hour ozone NAAQS, all VOC emission source categories addressed by CTG and ACT documents in the DFW area are controlled through existing rules in 30 TAC Chapter 115 or other approved regulations that fulfill RACT requirements. Tables D-2: *State Rules Addressing VOC RACT Requirements in CTG Reference Documents* and D-3: *State Rules Addressing VOC RACT Requirements in ACT Reference Documents* of Appendix D provide additional details on the CTG and ACT source categories.

TCEQ is removing its previous negative declarations for three categories of VOC sources in Wise County: Wood Furniture Manufacturing, Flexible Package Printing, and Graphic Arts Rotogravure and Flexographic Printing. For this analysis, TCEQ was unable to confirm that these sources do not exist in Wise County because sources may exist that are small enough to not require registered air permits or emission inventory reporting but are above the CTG applicability threshold. These changes are reflected in the concurrent Chapter 115 rulemaking (Project No. 2023-116-115-AI.)

TCEQ submits negative declarations for the following CTG source categories for the 10-county DFW 2008 eight-hour ozone nonattainment area:

- Fiberglass Boat Manufacturing Materials;
- Refinery Vacuum Producing Systems and Process Unit Turnarounds (Wise County only);

- Manufacture of Pneumatic Rubber Tires;
- Shipbuilding and Ship Repair Surface Coating Operations;
- Flat Wood Paneling Coatings, Group II issued in 2006;
- Letterpress Printing; and
- Manufacture of Synthesized Pharmaceutical Products (Wise County only).

For all non-CTG and non-ACT major VOC emission sources for which VOC controls are technologically and economically feasible, RACT is fulfilled through previous SIP approved rules, concurrently adopted 30 TAC Chapter 115 rules, and other federally enforceable measures. Additional VOC controls on certain major sources were determined either not to be economically feasible or not to be technologically feasible. Appendix D, Table D-5: *State Rules Addressing VOC RACT Requirements for Major Emission Sources in the 10-County DFW Area* provides additional detail on the non-CTG and non-ACT major emission sources.

4.6 RACM ANALYSIS

4.6.1 General Discussion

FCAA, §172(c)(1) requires states to provide for implementation of all RACM as expeditiously as practicable and to include RACM analyses in the SIP. In the general preamble for implementation of the FCAA Amendments published in the April 16, 1992, issue of the *Federal Register*, EPA explained that it interprets FCAA, §172(c)(1) as a requirement that states incorporate into their SIPs all RACM that would advance a region's attainment date; however, states are obligated to adopt only those measures that are reasonably available for implementation in light of local circumstances (57 FR 13498).

When performing RACM analyses, TCEQ uses the general criteria specified by EPA in the proposed approval of the New Jersey RACM analysis published in the January 16, 2009, issue of the *Federal Register* (74 FR 2945) and finalized by EPA in the May 15, 2009, issue of the *Federal Register* (74 FR 22837).

RACM is defined by EPA as any potential control measure for application to point, area, on-road, or non-road emission source categories that meets the following criteria:

- the control measure is technologically feasible;
- the control measure is economically feasible;
- the control measure does not cause "substantial widespread and long-term adverse impacts;"
- the control measure is not "absurd, unenforceable, or impracticable;" and
- the control measure can advance the attainment date by at least one year.

The EPA did not provide guidance on how to interpret the criteria "advance the attainment date by at least one year." Considering the July 20, 2027, attainment date for this DFW AD SIP revision, TCEQ evaluated this aspect of RACM based on advancing the attainment date by one year, to July 20, 2026.

4.6.2 Results of the RACM Analysis

TCEQ determined that no potential control measures met the criteria to be considered RACM. As discussed in Chapter 3: *Photochemical Modeling* of this SIP revision, the current modeling results indicate that the DFW area will demonstrate attainment by its July 20, 2027, attainment date.

To determine if attainment can be reached by July 20, 2026, the TCEQ estimated the potential 2025 design value using both modeled 2026 future design value (DVF) of 72 ppb and the preliminary 2023 monitored design value (2023 DV) of 81 ppb as of September 8, 2023. Assuming that changes in design value are linear, the per year change in design value needed to reach the 2026 modeled DVF of 72 ppb from the preliminary monitored 2023 DV of 81 ppb is 3.0 ppb. Using the 3.0 ppb per year change in design value, the estimated potential 2025 design value would be 75 ppb, which would be in attainment of the 2008 eight-hour ozone NAAQS. Therefore, no additional RACM measures are necessary to advance attainment of the 2008 eight-hour ozone NAAQS by one year.

4.7 MOTOR VEHICLE EMISSIONS BUDGETS

An attainment-year MVEB represents the maximum allowable emissions from on-road mobile sources for an applicable criteria pollutant or precursor as defined in the SIP for the attainment year. Adequate or approved MVEBs must be used in transportation conformity analyses. The MVEB represents the summer weekday on-road mobile source emissions that have been modeled for the AD and include all the on-road control measures reflected in Chapter 4: *Control Strategies and Required Elements* of this SIP revision. The on-road NO_X and VOC EI establishing these MVEBs were developed with version 3 of the Motor Vehicle Emission Simulator (MOVES3) model, and the resulting MVEBs are shown in Table 4-2: *2026 Attainment Demonstration MVEBs for the DFW 2008 Ozone NAAQS Nonattainment Area (tons per day).* These on-road NO_X and VOC totals include the impacts of implementing RFG in the six counties of Ellis, Johnson, Kaufman, Parker, Rockwall, and Wise, as discussed in Section 4.3.1. For more detail on the modeling of RFG for these six counties, please see Chapter 3, Section 3.4.2: *Estimation of Emissions due to Implementation of the Federal Reformulated Gasoline (RFG) Program* of Appendix A: *Modeling Technical Support Document (TSD).*

Table 4-2: 2026 Attainment Demonstration MVEBs for the DFW 2008 Ozone NAAQS Nonattainment Area (tons per day)

Description	NO_X (tpd)	VOC (tpd)
2026 On-Road MVEBs based on MOVES3	60.12	33.31

The MOVES4 model was not used in this SIP revision since TCEQ had already invested significant resources to develop an on-road mobile source EI using MOVES3 and since there was insufficient time to switch to MOVES4 between proposal and adoption. As EPA stated in its notice of availability published in the *Federal Register* on September 12, 2023, "[….]state and local agencies that have already completed significant work on a SIP with a version of MOVES3 (*e.g.,* attainment modeling has already been completed with MOVES3) may continue to rely on this earlier version of MOVES" (88 FR 62567, 62569).

For additional details regarding on-road mobile EI development, refer to Section 3: *Emissions Modeling* of Appendix A.

4.8 MONITORING NETWORK

The ambient air quality monitoring network provides data to verify the attainment status for areas under the 2008 eight-hour ozone NAAQS. The TCEQ monitoring network in the DFW area consists of 17 regulatory ambient air ozone monitors located in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties. The TCEQ, and its local partners, operate these ozone monitors at the following air monitoring sites:

- Arlington Municipal Airport (484393011);
- Cleburne Airport (482510003);
- Dallas Hinton (481130069);
- Dallas North number #2 (481130075);
- Dallas Redbird Airport Executive (481130087);
- Denton Airport South (481210034);
- Eagle Mountain Lake (484390075);
- Fort Worth Northwest (484391002);
- Frisco (480850005);
- Grapevine Fairway (484393009);
- Italy (481391044);
- Kaufman (482570005);
- Keller (484392003);
- Midlothian OFW (481390016);
- Parker County (483670081);
- Pilot Point (481211032), and
- Rockwall Heath (483970001).

The monitors are managed in accordance with EPA requirements prescribed by 40 CFR Part 58 to verify the area's attainment status. The TCEQ commits to maintaining an air monitoring network that meets EPA regulatory requirements in the DFW area. The TCEQ continues to work with EPA through the air monitoring network review process, as required by 40 CFR Part 58, to determine: the adequacy of the ozone monitoring network, additional monitoring needs, and recommended monitor decommissions. Details regarding the annual review of the air monitoring network are located on TCEQ's Air Monitoring Network Plans webpage (https://www.tceq.texas.gov/air quality/monops/past_network_reviews). Air monitoring data from these monitors continue to be quality assured, reported, and certified according to 40 CFR Part 58.

4.9 CONTINGENCY PLAN

AD SIP revisions for nonattainment areas are required by FCAA, §172(c)(9) and §182(c)(9) to provide for specific contingency measures that would take effect and result in emissions reductions if an area fails to attain a NAAQS by the applicable attainment date or fails to demonstrate reasonable further progress (RFP). EPA has interpreted recent court decisions to have invalidated key aspects of EPA's historical approach to implementing the contingency measure requirement. At the time this AD SIP revision was being developed, EPA had historically accepted the use of surplus emissions reductions from previously implemented control measures to fulfill the contingency measure requirements. However, EPA's new draft guidance on contingency measures, published in the *Federal Register* for public comment on March 23, 2023 (88 FR 17571), indicates that contingency measures must be conditional and prospective (not previously implemented) based on EPA's interpretation of the recent court rulings. The draft guidance also establishes an entirely new scheme for determining the amount of emissions reductions necessary to address the contingency requirement.

The contingency measures in the concurrent 30 TAC Chapter 115 rulemaking (Rule Project No. 2023-116-115-AI) are conditional and prospective (not previously implemented), which follows EPA's interpretation of recent court decisions. These measures do not rely on the historical approach of using surplus emissions reductions to fulfill the contingency measure requirements. Since EPA had not issued final guidance to states regarding the amount of required reductions from contingency measures at the time this SIP revision was developed, this AD SIP revision relies on the historically approved approach (3% of the RFP base year emissions) to determine the amount of emissions reductions necessary to address the contingency requirement. Under the historical approach, in the General Preamble for implementation of the FCAA published in the April 16, 1992, *Federal Register*, EPA interpreted the contingency requirement to mean additional emissions reductions that are sufficient to equal 3% of the emissions in the baseline year inventory (57 FR 13498).

The emission reduction targets associated with the contingency measures were calculated using the DFW-area 2011 RFP base year inventory from the concurrent DFW and HGB Severe Classification RFP SIP Revision for the 2008 Eight-Hour Ozone NAAQS (Project No. 2023-108-SIP-NR). The 3% contingency reduction requirement is based on a 0% reduction in NO_x and a 3% reduction in VOC. The contingency measures would be triggered upon EPA publication of a notice in the *Federal Register* that the DFW area failed to attain the 2008 ozone NAAQS and TCEQ's subsequent publication in the *Texas Register* specifying what contingency measures are being implemented and establishing the compliance date, which is by no later than 270 days after *Texas Register* publication.

During review of comments submitted, TCEQ staff realized that they had omitted a portion of the intended VOC content limit tables from the proposed 30 TAC Chapter 115 rulemaking (Project No. 2023-116-115-AI), as published in the *Texas Register* on December 15, 2023 (48 TexReg 7290). The omitted content limits were included in the emissions reductions calculation in this concurrently proposed DFW AD and DFW-HGB RFP SIP revisions. In addition, staff inadvertently used inconsistent VOC content limits in the proposed rule language and the emissions reductions calculations.

As proposed and adopted in the 30 TAC Chapter 115 rulemaking and this DFW AD SIP revision, the VOC emissions reductions from the industrial adhesives contingency measure are documented as 1.05 tpd in the DFW area. The Executive Director intends to immediately initiate an Industrial Adhesives Contingency Measure Corrections rulemaking (corrections rulemaking) for commission consideration to amend the adhesive VOC content limits in the concurrently adopted 30 TAC Chapter 115 rulemaking to match the originally intended limits and to add additional source categories that were inadvertently excluded from the industrial adhesives category.

If adopted, the potential corrections rulemaking would result in additional VOC emissions reductions of 2.26 tpd in the DFW area resulting in final emissions reductions of 3.31 tpd in the DFW area. Therefore, if adopted, the corrections rulemaking would restore the emissions reductions to the amounts described in the contingency plan narratives in this DFW AD SIP revision and the DFW-HGB RFP SIP revision (Project 2023-108-SIP-NR).

If proposed and adopted, the corrections rulemaking would amend Table 1 of Figures 30 TAC §115.473(e) and (f) as shown below by adding underlined text, deleting text marked with strikethrough, and revising the first column name for clarity. If proposed and adopted, the corrections rulemaking would also add definitions to 30 TAC §115.470(b) for adhesive categories inadvertently omitted.

Table 1.	
Application Specific Adhesives	Grams of volatile organic compounds (VOC) per liter adhesive
Architectural Applications	
Building Envelope Membrane Adhesive	250
Carpet Pad Adhesive	50
Ceramic Glass, Porcelain, & Stone Tile Adhesive	65
Cove Base Adhesive	50
Dry Wall and Panel Adhesive	50
Multi-Purpose Construction Adhesives	70
Roofing	
Hot Applied Modified Bitumen/Built Up Roof Adhesive	30
EPDM/TPO Single Ply Roof Membrane Adhesive	250
Single Ply Roof Membrane Adhesive (Except EPDM/TPO)	250
Shingle Laminating Adhesive	30
All Other Roof Adhesives	250
Rubber Floor Adhesive	60
Structural Glazing Adhesive	100
Structural Wood Member Adhesive	140
Subfloor Adhesive	50
VCT and Asphalt Tile Adhesive	50

Table 1.	
Application Specific Adhesives	Grams of volatile organic compounds (VOC) per liter adhesive
Wood Flooring Adhesive	20
All Other Indoor Floor Covering Adhesives	50
All Other Outdoor Floor Covering Adhesives	50
Computer Diskette Manufacturing Adhesive	350
Contact Adhesive	80
Edge Glue Adhesive	250
Plastic Welding Cement	
ABS Welding Cement	325
ABS to PVC Transition Cement	425~~510~~
CPVC Welding Cement	400~~490~~
CPVC For Life-Safety Systems	490
Higher Viscosity CPVC	400~~490~~
PVC Welding Cement	425~~510~~
All Other Plastic Welding Cements	100
Rubber Vulcanization Adhesive	250~~850~~
Special Purpose Contact Adhesive	250
Thin Metal Laminating Adhesive	780
Tire Tread Adhesive	100
Top and Trim Adhesive	250~~540~~
Waterproof Resorcinol Glue	170
All Other Adhesives	250

Since the fiscal note information published in the proposal for the 30 TAC Chapter 115 rulemaking (Project No. 2023-116-115-AI), reflected the cost per ton of VOC to achieve the intended emissions reductions, as documented in the concurrently proposed DFW AD and RFP SIP revisions, the public has already been informed of all expected costs to affected businesses that would result if the corrections rulemaking were proposed and adopted.

A summary of the contingency analysis for the severe classification is provided in Table 4-4: *DFW 2008 Ozone NAAQS Nonattainment Area Severe Attainment Contingency Plan as Adopted (tons per day unless otherwise noted)* and Table 4 5: *DFW 2008 Ozone NAAQS Nonattainment Area Severe Attainment Contingency Plan as Adopted and Industrial Adhesives Contingency Measure Corrections Rule (tons per day unless otherwise noted).* The analyses in Tables 4-4 and 4-5 demonstrate that the contingency reductions meet the 3% emissions reduction requirement using conditional and prospective measures either with or without the correction rule. The contingency reduction is based on a 3% reduction in VOC emissions from the 2011 RFP base year for the severe classification under the 2008 eight-hour ozone NAAQS, which equals a 14.81 tpd contingency reduction total target.

Because the triggering statements for these contingency measures are not tied to a particular attainment date for the 2008 eight-hour ozone NAAQS, TCEQ can apply emissions reductions from the concurrent Chapter 115 rulemaking to either a finding for the DFW area of failure to attain the 2008 eight-hour ozone NAAQS for the severe classification or failure to attain for the serious classification. On October 3, 2023, EPA published final disapproval of the contingency measures element of the 2020 DFW and HGB 2008 Eight-Hour Ozone Serious Classification RFP SIP Revision (Project No. 2019-079-SIP-NR) submitted to EPA on May 13, 2020 (88 FR 67957). If TCEQ were to apply some or all of the contingency measures in the concurrent 30 TAC Chapter 115 rulemaking to the 2008 eight-hour ozone NAAQS failure to attain for the serious classification, the calculated amount of reductions required for contingency would be different than the amounts described in Tables 4-4 and 4-5. A summary of the contingency analyses for the serious classification is provided in Table 4-6 *DFW 2008 Ozone NAAQS Nonattainment Area Serious Attainment Contingency Plan as Adopted (tons per day unless otherwise noted*) and Table 4 7 *DFW 2008 Ozone NAAQS Nonattainment Area Serious Attainment Contingency Plan as Adopted and Industrial Adhesives Contingency Measure Corrections Rule (tons per day unless otherwise noted).* The contingency reduction is based on a 3% reduction in VOC emissions from the serious 2011 RFP base year for the serious classification under the 2008 eight-hour ozone NAAQS, which equals a 13.95 tpd contingency reduction total target. TCEQ's publication in the *Texas Register* will specify the contingency measures, NAAQS, classification, and purpose (failure to attain or failure to achieve an RFP milestone) for which contingency measures will be triggered.

Additional documentation for the attainment contingency demonstration calculations is available in Appendix 1: *Dallas-Fort Worth (DFW) Reasonable Further Progress (RFP) Demonstration Spreadsheet* of the DFW-HGB 2008 Ozone NAAQS Severe RFP SIP Revision (Project No. 2023-108-SIP-NR).

4.9.1 Area Source and Point Source Contingency Measure Controls

Six area and point source control measures in a concurrent rulemaking for 30 TAC Chapter 115 (Rule project 2023-116-115-AI) will fulfill SIP contingency requirements in the DFW 2008 ozone NAAQS nonattainment area, if adopted. The rulemaking covers the following source categories: degreasing, industrial maintenance coatings, industrial cleaning solvents, emulsified asphalt paving, traffic marking coatings, and industrial adhesives. Three of these source categories are a mix of area and point sources: degreasing, industrial cleaning solvents, and industrial adhesives. The other three; industrial maintenance coatings, emulsified asphalt paving, and traffic marking coatings, are area sources. A summary of the VOC emissions reductions in tpd from each contingency measure is provided in Table 4-3: *10-County DFW 2008 Ozone NAAQS Nonattainment Area VOC Contingency Measure Reductions.*

4.9.1.1 Degreasers

This measure would reduce VOC emissions from solvent degreasers by adopting requirements which would establish a new limit for VOC content for the solvents used in these applications of 25 grams per liter (g/l). TCEQ estimates reductions from degreasing contingency measures to be 9.8 tpd for the DFW 2008 ozone NAAQS nonattainment area.

4.9.1.2 Industrial Maintenance Coatings

This measure would reduce VOC emissions from industrial maintenance coatings by adopting requirements which would establish a new limit for VOC content for the coating products used for these applications of 250 g/l of VOC. TCEQ estimates reductions from industrial maintenance coatings contingency measures to be 2.95 tpd for the DFW 2008 ozone nonattainment area.

4.9.1.3 Industrial Cleaning Solvents

This measure would reduce VOC emissions from cleaning solvents by adopting requirements which would establish a more stringent limit for VOC content for cleaning solvents used to clean general materials of 25 g/l of VOC. The existing VOC limit to clean all materials is 50 g/l. The current rule has exemptions for cleaning certain specialty materials, which are assumed to currently be cleaned with very high VOC content cleaners. The contingency measure would remove these exemptions and set limits proven to be feasible in other states and lower than the assumed current use. The measure would remove the existing exemption for stationary source solvent cleaning operations that emit less than 3 tpy of VOC. TCEQ estimates reductions from industrial cleaning solvents contingency measures to be 1.92 tpd for the DFW 2008 ozone nonattainment area. This measure is included in the concurrent 30 TAC Chapter 115 rulemaking and SIP revision proposal documents but would only be adopted for the DFW 2008 ozone NAAQS nonattainment area if other measures change in response to comment such that additional reductions are necessary to cover the 3% emissions reduction requirement for contingency.

4.9.1.4 Emulsified Asphalt Paving

This measure would reduce VOC emissions from emulsified asphalt operations by adopting requirements which would establish a more stringent limit for VOC content for emulsified asphalt of 0.5% VOC content by weight. TCEQ estimates reductions from emulsified asphalt contingency measures to be 1.32 tpd for the DFW 2008 ozone nonattainment area.

4.9.1.5 Traffic Marking Coatings

This measure would reduce VOC emissions from traffic marking coatings by adopting requirements which would establish a more stringent limit for VOC content for traffic marking coatings of 100 g/l of VOC. The existing DFW VOC limit in the National Volatile Organic Compound Emission Standards for Architectural Coatings Rule (63 FR 48848) is 150 g/l. TCEQ estimates reductions from traffic marking coatings contingency measures to be 1.10 tpd for the DFW 2008 ozone nonattainment area.

4.9.1.6 Industrial Adhesives

This measure would reduce VOC emissions from industrial adhesives by adopting requirements that would establish limits for VOC content of industrial adhesives by category that are more stringent on net across categories. Current 30 TAC Chapter 115 VOC limits are based on EPA's 2008 Control Techniques Guidelines for Miscellaneous Industrial Adhesives (EPA 453/R-08-005 2008/09). The revised limits, which are based on current rules in other states, would be the same or more stringent for some categories of adhesives and less stringent for others. As originally intended, TCEQ estimates net reductions from industrial adhesives contingency measures will be 3.31

tpd for the DFW 2008 ozone nonattainment area. However, this will require an additional rulemaking effort as described in Section 4.9.

Table 4-3: 10-County DFW 2008 Ozone NAAQS Nonattainment Area VOC Contingency Measure Reductions

Control Measure	VOC Reductions (tpd)	Previous VOC Limits (Percent or g/l of Product)	VOC Limits (Percent or g/l of Product)	Location in Chapter 115
Degreasing	9.86	None	25 g/l	Subchapter E, Division 1
Industrial Maintenance Coatings	2.95	450 g/l	250 g/l	Subchapter E, Division 5
Industrial Cleaning Solvents	1.92	50 g/l	25 g/l general and higher specialty limits[1]	Subchapter E, Division 6
Emulsified Asphalt Paving	1.32	Use-specific percentages by weight	0.5% VOC by weight	Subchapter F, Division 1
Traffic Marking Coatings	1.10	150 g/l	100 g/l	Subchapter E, Division 5
Industrial Adhesives Adopted	1.05[4]	Use-specific limits[2]	Use-specific limits[3]	Subchapter E, Division 7
Industrial Adhesives Contingency Measure Corrections Rule	2.26[4]	Use-specific limits[2]	Use-specific limits[3]	Subchapter E, Division 7
Total Reductions (all measures)	**20.46**	**N/A**	**N/A**	**N/A**

Note 1: Limits are based on the material being cleaned.
Note 2: Use-specific limits developed in accordance with Control Techniques Guidelines for Miscellaneous Industrial Adhesives (EPA 453/R-08-005 2008/09).
Note 3: Use-specific limits developed in accordance with rules in other states.
Note 4: Please refer to Section 4.9: *Contingency Plan* for an explanation on the Industrial Adhesives Contingency Measure Corrections Rule.

4.9.2 Contingency Measure Summary

The contingency measure reductions are conditional and prospective (not previously implemented) and will reduce VOC emissions in the DFW 2008 ozone NAAQS nonattainment area if they are triggered. A summary of the contingency measure demonstration is located below in Tables 4-4 through Table 4-7. Excess reductions are available to help satisfy requirements for whichever event may trigger the measures first, either a failure to meet an RFP milestone or a failure to attain the 2008 eight-hour ozone NAAQS for the DFW area under the severe classification, or failure to attain the 2008 eight-hour ozone NAAQS under the serious classification. Excess reductions are not necessary to reach the required 14.81 tpd contingency reduction total for the DFW area severe classification. If TCEQ were to apply the contingency measure reductions to the 2008 eight-hour ozone NAAQS failure to attain contingency requirement for the

serious classification, the calculated amount of reductions available for contingency would change accordingly in Tables 4-4 and 4-5 for the severe classification.

Table 4-4: DFW 2008 Ozone NAAQS Nonattainment Area Severe Attainment Contingency Plan as Adopted (tons per day unless otherwise noted)

Line	Contingency Plan Description	NO_x	VOC
1	10-county 2011 controlled base year EI	448.09	493.56
2	Percent for contingency calculation (total of 3%)	0.00	3.00
3	10-county DFW required contingency reductions (Line 1 x Line 2 expressed as a percent)	0.00	14.81
	Control reductions to meet contingency requirements	**NO_x**	**VOC**
4	Total 10-county DFW contingency reductions	0.00	18.20
5	Contingency Excess (+) or Shortfall (-)	0.00	3.39
6	Are the contingency reductions greater than or equal to the required contingency reductions?	**Yes**	**Yes**

Table 4-5: DFW 2008 Ozone NAAQS Nonattainment Area Severe Attainment Contingency Plan as Adopted and Industrial Adhesives Contingency Measure Corrections Rule (tons per day unless otherwise noted)

Line	Contingency Plan Description	NO_x	VOC
1	10-county DFW 2011 controlled base year EI	448.09	493.56
2	Percent for contingency calculation (total of 3%)	0.00	3.00
3	10-county DFW required contingency reductions (Line 1 x Line 2 expressed as a percent)	0.00	14.81
	Control reductions to meet contingency requirements	**NO_x**	**VOC**
4	10-county DFW contingency reductions adopted	0.00	18.20
5	10-county DFW contingency reductions from Industrial Adhesives Contingency Measure Corrections Rule	0.00	2.26
6	Total 10-county DFW contingency reductions (Line 4 + Line 5)	0.00	20.46
7	Contingency Excess (+) or Shortfall (-)	0.00	5.65
8	Are the contingency reductions greater than or equal to the required contingency reductions?	**Yes**	**Yes**

Table 4-6: DFW 2008 Ozone NAAQS Nonattainment Area Serious Attainment Contingency Plan as Adopted (tons per day unless otherwise noted)

Line	Contingency Plan Description	NO_x	VOC
1	10-county DFW 2011 controlled base year EI	422.04[1]	464.92[1]
2	Percent for contingency calculation (total of 3%)	0.00	3.00
3	10-county DFW required contingency reductions (Line 1 x Line 2 expressed as a percent)	0.00	13.95
	Control reductions to meet contingency requirements	**NO_x**	**VOC**
4	Total 10-county DFW contingency reductions	0.00	18.20
5	Contingency Excess (+) or Shortfall (-)	0.00	4.25
6	Are the contingency reductions greater than or equal to the required contingency reductions?	**Yes**	**Yes**

Note 1: Values are from Table 4-17: *DFW RFP Contingency Demonstration for the 2020 Attainment Year (tons per day unless otherwise noted)* in the DFW and HGB 2008 Eight-Hour Ozone Serious Classification RFP SIP Revision (Project No. 2019-079-SIP-NR). The 10-county DFW 2011 controlled base year EI for NO_x and VOC are different for the serious and severe classifications because the latest 2011 inventory at the time of SIP development is used.

Table 4-7: DFW 2008 Ozone NAAQS Nonattainment Area Serious Attainment Contingency Plan as Adopted and Industrial Adhesives Contingency Measure Corrections Rule (tons per day unless otherwise noted)

Line	Contingency Plan Description	NO_x	VOC
1	10-county DFW 2011 controlled base year EI	422.04[1]	464.92[1]
2	Percent for contingency calculation (total of 3%)	0.00	3.00
3	10-county DFW required contingency reductions (Line 1 x Line 2 expressed as a percent)	0.00	13.95
	Control reductions to meet contingency requirements	**NO_x**	**VOC**
4	10-county DFW contingency reductions adopted	0.00	18.20
5	10-county DFW contingency reductions from Industrial Adhesives Contingency Measure Corrections Rule	0.00	2.26
6	Total 10-county DFW contingency reductions (Line 4+ Line 5)	0.00	20.46
7	Contingency Excess (+) or Shortfall (-)	0.00	6.51
8	Are the contingency reductions greater than or equal to the required contingency reductions?	**Yes**	**Yes**

4.10 ADDITIONAL FCAA REQUIREMENTS

FCAA, §182 sets out a graduated control program for ozone nonattainment areas. According to EPA's final 2015 eight-hour ozone standard SIP requirements rule, states must submit a SIP element to meet each FCAA, §182 nonattainment area planning requirement for the 2015 eight-hour ozone NAAQS (83 FR 62998) and the EPA interprets this requirement to also apply to nonattainment area requirements for the 2008 eight-hour ozone NAAQS. Where an air agency determines that an existing regulation is adequate to meet the applicable nonattainment area planning requirements of FCAA, §182 for a revised ozone NAAQS, that air agency's SIP revision may provide a written statement certifying that determination in lieu of submitting new revised regulations. This section certifies that Texas meets all additional FCAA nonattainment area requirements applicable to the DFW 2008 ozone NAAQS nonattainment area for the severe classification, including I/M program requirements, nonattainment new source review (NSR) program requirements, and vehicle miles traveled (VMT) growth offset requirements, along with the clean fuel fleet program requirement for areas classified as serious and above. A SIP revision to address FCAA, §185 fee requirements is due to EPA by November 7, 2025 and is not addressed in this SIP revision.

4.10.1 I/M Program

Texas established a vehicle emissions testing program on January 1, 1995, meeting the EPA's requirements for I/M programs. Enhanced vehicle emissions inspections have been implemented in nine of the 10 counties in the DFW 2008 ozone NAAQS nonattainment area (Collin, Dallas, Denton, and Tarrant Counties on May 1, 2002, and in Ellis, Johnson, Kaufman, Parker and Rockwall Counties on May 1, 2003). I/M program requirements are codified in 30 TAC Chapter 114, Subchapter C.

The DFW area meets the FCAA, §182(c)(3) requirements that an I/M program be in place in the DFW area that is consistent with a serious or higher ozone classification. On June 14, 2017, EPA approved the portions of the 2016 DFW 2008 Eight-Hour Ozone Standard AD SIP Revision that describe how FCAA requirements for I/M are met in the DFW area for the 2008 eight-hour ozone NAAQS (82 FR 27122). The TCEQ has determined that the I/M program SIP requirements are met for Texas for the DFW 2008 ozone NAAQS nonattainment area under the severe classification.

A demonstration addressing the EPA's requirement for I/M performance standard modeling for existing I/M programs is provided in Section 4.12: *I/M Program Performance Standard Modeling (PSM).*

4.10.2 Vehicle Miles Traveled (VMT) Growth Demonstration

For areas designated as severe ozone nonattainment, a VMT growth demonstration is required. The VMT growth demonstration for the DFW 2008 severe ozone NAAQS nonattainment area is provided in the concurrent DFW-HGB Severe Classification RFP SIP Revision for the 2008 Eight-Hour Ozone NAAQS (Project No. 2023-108-SIP-NR).

4.10.3 Nonattainment NSR Program

Ozone nonattainment area SIP revisions must include provisions to require permits for the construction and operation of new or modified major stationary sources. Major stationary sources in severe ozone nonattainment areas are those sources emitting at least 25 tpy of a regulated pollutant. Minor stationary sources are all sources that are not major stationary sources.

An NSR permitting program for nonattainment areas is required by FCAA, §182(a)(2)(C) and further defined in 40 CFR Part 51, Subpart I (Review of New Sources and Modifications). Under these requirements, new major sources or major modifications at existing sources in an ozone nonattainment area must comply with the lowest achievable emissions rate and obtain sufficient emissions offsets.

Nonattainment NSR permits for ozone authorize construction of new major sources or major modifications of existing sources of NO_X or VOC in an area that is designated nonattainment for the ozone NAAQS. Emissions thresholds and pollutant offset requirements under the nonattainment NSR program are based on the nonattainment area's classification. The NSR offset ratio for severe ozone nonattainment areas is 1.3:1.

The EPA initially approved Texas' nonattainment NSR regulation for ozone on November 27, 1995 (60 FR 49781). The TCEQ has determined that because the Texas SIP already includes 30 TAC §116.12 (Nonattainment and Prevention of Significant Deterioration Review Definitions) and 30 TAC §116.150 (New Major Source or Major Modification in Ozone Nonattainment Area), the nonattainment NSR SIP requirements are met for Texas for the DFW 2008 ozone NAAQS nonattainment area under the severe classification.

4.10.4 Clean Fuel Fleet Program

The clean fuel fleet program is required by FCAA, §182(c)(4) for serious areas and above. FCAA, §182(c)(4)(B) allows states to opt-out with an adequate substitute

program. Texas has a currently approved substitute program in 30 TAC Chapter 114, Subchapter K, Division 5. On January 31, 2014, EPA published direct final approval of revisions to the Texas motor vehicle rules in 30 TAC Chapter 114 that established the substitute program and affirmed that Texas' substitute program continues to meet clean fuel fleet program requirements (79 FR 5287).

4.10.5 FCAA, §185 Fee

With the severe classification, the DFW 2008 ozone NAAQS nonattainment area is subject to FCAA, §182(d)(3), which requires states to submit plans to include the requirements of §185, Enforcement for Severe and Extreme Ozone Nonattainment Areas for Failure to Attain.

The FCAA, §185(a) requires each SIP to impose a penalty fee for major stationary sources of VOC located in the nonattainment area if the area fails to attain the ozone NAAQS by the applicable attainment date. The FCAA, §182(f) requires all SIP requirements that apply for VOC emissions to also apply for NO_x emissions, so the fee would apply to both ozone precursors. The fee is required to be imposed for each calendar year after the missed attainment date until EPA redesignates the area as attainment for the 2008 eight-hour ozone NAAQS. If the state does not impose and collect the fee, or if the state's fee provisions do not meet the FCAA requirements, then FCAA, §185(d) requires that EPA impose and collect the fee with interest. The fee and interest would not be returned to the state.

EPA is requiring states to submit a SIP revision that addresses these requirements to EPA by November 7, 2025 (87 FR 60926, 60931). This SIP revision does not address this requirement.

4.11 EMISSION CREDIT GENERATION

The Emissions Banking and Trading rules in 30 TAC Chapter 101, Subchapter H, Divisions 1 and 4 require sources in nonattainment areas to have SIP emissions to be eligible to generate emission credits. SIP emissions are the actual emissions from a facility or mobile source during the SIP emissions year, not to exceed any applicable local, state, or federal requirement. For point sources, the SIP emissions cannot exceed the amount reported to the state's EI; if no emissions were reported for a point source facility in the SIP emissions year, then the facility is not eligible for credits.

This SIP revision revises the SIP emissions year used for emission credit generation. If adopted and submitted to EPA, the new SIP emissions year will be 2019 for point source electric generating units with emissions recorded in EPA's Air Markets Program Data, 2019 for all other point sources with emissions recorded in TCEQ's STARS emissions database, 2019 for oil and gas area sources, 2020 for all other area sources, and 2019 for all mobile sources.[25]

On April 9, 2021, TCEQ sent notice to point sources through the agency's e-mail system and posted notice on TCEQ's website that 2019 point source emissions

[25] The total amount of SIP emissions available for credit generation as defined in 30 TAC 101.300(30)(C) will be based on emissions data used as inputs for modeling in this attainment demonstration for each sector.

revisions for the STARS database must be provided by July 9, 2021 to be included in this SIP revision; as discussed in Chapter 2: *Anthropogenic Emissions Inventory Description*, those revision were incorporated into this SIP revision.

4.12 I/M PROGRAM PERFORMANCE STANDARD MODELING (PSM)

On October 7, 2022, EPA published the final *Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of Areas Classified as Marginal for the 2015 Ozone National Ambient Air Quality Standards* (87 FR 60897). This rule requires states to provide a demonstration that the existing or proposed I/M program for a newly designated or reclassified ozone nonattainment area meets the emissions reduction benchmarks specified for the area's ozone NAAQS classification level. The EPA interprets the I/M performance requirement to mean upon designation or reclassification that a proposed or existing I/M program must meet the I/M performance benchmark. These I/M emissions reductions should be realized in the attainment year or program implementation year. However, an I/M performance standard demonstration completed for any ozone NAAQS is applicable until a new version of EPA's on-road mobile emissions model is released, as long as the most stringent applicable performance standard is used in the initial assessment.

Texas established a vehicle emissions testing program on January 1, 1995, meeting EPA's requirements for I/M programs. Enhanced vehicle emissions inspections have been implemented in nine of the 10 counties in the DFW 2008 ozone NAAQS nonattainment area (Collin, Dallas, Denton, and Tarrant Counties on May 1, 2002, and in Ellis, Johnson, Kaufman, Parker and Rockwall Counties on May 1, 2003). I/M program requirements are codified in 30 TAC Chapter 114, Subchapter C.

TCEQ performed the required performance standard modeling analysis of the DFW 2008 and 2015 ozone NAAQS nonattainment areas using the requirements in EPA's guidance document, *Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model* (EPA-420-B-22-034, October 2022). Because the performance standard modeling results apply to all ozone NAAQS, TCEQ specifically used the Enhanced Performance Standard that reflects the I/M program design elements specified in 40 CFR §51.351(i) that are implemented in the DFW area and are consistent with a serious or higher ozone classification. The assessment uses a 2023 analysis year, an analysis year under both the 2008 and 2015 ozone NAAQS, for the first MOVES3 PSM assessment completed for the DFW ozone nonattainment area. The PSM analysis was performed for each of the nine counties within the DFW 2008 ozone NAAQS nonattainment area in which the DFW I/M program is required to operate. Wise County does not have an I/M program as it is not required. Wise County, which is a rural county with a low population density, is not included in the I/M program since the current I/M program in the DFW ozone nonattainment area sufficiently covers a population equal to the DFW urbanized area as required by federal law. Summaries of the 2023 I/M enhanced PSM analysis are provided in:

- Table 4-8: *Summary of NO_x Enhanced Performance Standard Evaluation for the DFW Ozone Nonattainment Area Existing I/M Program using MOVES3*; and
- Table 4-9: *Summary of VOC Enhanced Performance Standard Evaluation for the DFW Ozone Nonattainment Area Existing I/M Program using MOVES3*.

Evaluating whether an existing I/M program meets the enhanced performance standard requires demonstrating that the existing program emission rates for NO_x and VOC do not exceed the benchmark program's emission rates. The benchmark program's emission rates include a 0.02 gram per mile buffer for each pollutant, as noted in Tables 4-8 and 4-9. The analysis demonstrates that the existing DFW area I/M program emissions rates do not exceed the performance standard benchmark emission rates for all nine counties required to operate an I/M program within the DFW 2008 ozone NAAQS nonattainment area. Therefore, the DFW area I/M program performance requirement is met.

All required documentation for the I/M program performance standard benchmark assessment is available in Appendix C: *Inspection and Maintenance (I/M) Program Performance Standard Modeling (PSM) for the Existing I/M Program in the DFW Ozone Nonattainment Area.*

Table 4-8: Summary of NO_x Enhanced Performance Standard Evaluation for the DFW Ozone Nonattainment Area Existing I/M Program using MOVES3

County	I/M Program NO_x Emission Rate	I/M NO_x Performance Standard Benchmark	I/M NO_x Performance Standard Benchmark Plus Buffer	Does Existing Program Meet I/M Performance Standard?
Collin	0.25	0.25	0.27	Yes
Dallas	0.26	0.26	0.28	Yes
Denton	0.30	0.29	0.31	Yes
Ellis	0.40	0.40	0.42	Yes
Johnson	0.47	0.47	0.49	Yes
Kaufman	0.46	0.46	0.48	Yes
Parker	0.54	0.54	0.56	Yes
Rockwall	0.33	0.33	0.35	Yes
Tarrant	0.26	0.26	0.28	Yes

Table 4-9: Summary of VOC Enhanced Performance Standard Evaluation for the DFW Ozone Nonattainment Area Existing I/M Program using MOVES3

County	I/M Program VOC Emission Rate	I/M VOC Performance Standard Benchmark	I/M VOC Performance Standard Benchmark Plus Buffer	Does Existing Program Meet I/M Performance Standard?
Collin	0.17	0.17	0.19	Yes
Dallas	0.14	0.14	0.16	Yes
Denton	0.18	0.18	0.20	Yes
Ellis	0.14	0.14	0.16	Yes
Johnson	0.19	0.20	0.22	Yes
Kaufman	0.14	0.14	0.16	Yes
Parker	0.17	0.17	0.19	Yes
Rockwall	0.18	0.19	0.21	Yes
Tarrant	0.16	0.17	0.19	Yes

CHAPTER 5: WEIGHT OF EVIDENCE

5.1 INTRODUCTION

The corroborative analyses presented in this chapter demonstrate the progress that the Dallas-Fort Worth (DFW) 2008 ozone National Ambient Air Quality Standard (NAAQS) nonattainment area is making towards attainment of the 75 parts per billion (ppb) standard. This corroborative information supplements photochemical modeling analyses presented in Chapter 3: *Photochemical Modeling*. The United States Environmental Protection Agency's (EPA) *Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze* (EPA 2018; hereafter referred to as EPA modeling guidance states that all modeled attainment demonstrations (AD) should include supplemental evidence that conclusions derived from basic attainment modeling are supported by other independent sources of information. This chapter details this supplemental evidence, i.e., the corroborative analyses, for this DFW AD State Implementation Plan (SIP) revision.

This chapter describes analyses that corroborate the conclusions of Chapter 3. Topics covered include ambient and emissions trends, background ozone trends, ozone chemistry, and meteorological influences on ozone. Analyses of ambient measurements corroborate modeling analyses and independently support the AD. More detail on ozone and emissions in the DFW 2008 ozone NAAQS nonattainment area is provided in Appendix B: *Conceptual Model for the Dallas-Fort Worth Nonattainment Area for the 2008 Eight-Hour Ozone National Ambient Air Quality Standards*. Finally, this chapter describes air quality control measures that are not quantified but are nonetheless expected to yield tangible air quality benefits, even though they were not included in the AD SIP modeling discussed in Chapter 3.

5.2 ANALYSIS OF AMBIENT TRENDS AND EMISSIONS TRENDS

EPA modeling guidance states that examining recently observed air quality and emissions trends is an acceptable method to qualitatively assess progress toward attainment. Declining trends in observed concentrations of ozone, its precursors and emissions, past and projected, are consistent with progress toward attainment. The strength of evidence produced by emissions and air quality trends is increased if an extensive monitoring network exists.

The DFW 2008 ozone NAAQS nonattainment area, roughly comparable to what the United States (U.S.) Census Bureau defines as the Dallas-Fort Worth-Arlington Metropolitan Statistical Area (MSA), is located in north-central Texas, and is the fourth largest MSA in the U.S., home to over 7.7 million residents as of 2021 (U.S. Census Bureau, 2022). Ten counties in the DFW area were designated nonattainment for the 2008 eight-hour ozone NAAQS of 75 ppb: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise.

The ten-county DFW 2008 ozone NAAQS nonattainment area has an extensive continuous air monitoring station (CAMS) network and as of 2022 has 17 regulatory ozone monitors, 15 nitrogen oxides (NO_x) monitors, and 15 automated gas chromatographs (auto-GC) for monitoring volatile organic compounds (VOC). An additional three regulatory ozone monitors are included in many of the following analyses but are outside the ten-county DFW 2008 ozone NAAQS nonattainment area

(Corsicana Airport in Navarro County, Granbury in Hood County, and Greenville in Hunt County). All ozone monitors in the ten-county DFW 2008 ozone NAAQS nonattainment area are regulatory monitors that report to EPA. Details for these monitors are listed in Table 5-1: *Monitor Information for the DFW 2008 Ozone NAAQS Nonattainment Area*. More detail on monitors, monitor locations, and other parameters measured per monitor can be found on the Texas Commission on Environmental Quality (TCEQ) Air Monitoring Sites webpage.[26] Ozone data used for the analysis presented in this chapter are from EPA's Air Quality System (AQS), which has been quality assured by EPA. All other pollutant data are from Texas Air Monitoring Information System (TAMIS), unless otherwise noted.

Table 5-1: Monitor Information for the DFW 2008 Ozone NAAQS Nonattainment Area

Monitor Name	AQS No.	CAMS No.	Compound or Parameter Measured
Frisco	480850005	0031, 0680	Ozone, meteorology
Dallas Hinton	481130069	0060, 0161, 0401, 3002	Ozone, meteorology, VOC, $PM_{2.5}$[1], NO_2
Dallas North #2	481130075	0063, 0679	Ozone, NO_X, meteorology
Dallas Redbird Airport Executive	481130087	0402	Ozone, NO_X, meteorology
Dallas LBJ Freeway	481131067	1067	NO_X, meteorology
Dallas Elm Fork	481131505	1505	VOC, meteorology
Denton Airport South	481210034	0056, 0157, 0163	Ozone, NO_X, $PM_{2.5}$, meteorology
Flower Mound Shiloh	481211007	1007	VOC, meteorology
DISH Airfield	481211013	1013	VOC, meteorology
Pilot Point	481211032	1032	Ozone, meteorology
Midlothian OFW	481390016	0052, 0137	Ozone, NO_X, $PM_{2.5}$, meteorology
Italy	481391044	1044	Ozone, NO_X, meteorology
Granbury	482210001	0073, 0681	Ozone, meteorology
Greenville	482311006	0198, 1006	Ozone, NO_X, meteorology
Cleburne Airport	482510003	0077, 0682	Ozone, meteorology
Mansfield Flying L Lane	482511063	1063	VOC, meteorology
Godley FM2331	482511501	1501	VOC, meteorology
Kaufman	482570005	0071	Ozone, NO_X, $PM_{2.5}$, meteorology

[26] https://www.tceq.texas.gov/airquality/monops/sites/air-mon-sites

Monitor Name	AQS No.	CAMS No.	Compound or Parameter Measured
Corsicana Airport	483491051	1051	Ozone, NO_X, $PM_{2.5}$, meteorology
Parker County	483670081	0076	Ozone, meteorology
Rockwall Heath	483970001	0069	Ozone, meteorology
Eagle Mountain Lake	484390075	0075	Ozone, NO_X, VOC, meteorology
Fort Worth Northwest	484391002	0013	Ozone, NO_X, VOC, $PM_{2.5}$, meteorology
Everman Johnson Park	484391009	1009	VOC, meteorology
Arlington UT Campus	484391018	1018	VOC, meteorology
Fort Worth California Parkway North	484391053	1053	$PM_{2.5}$, NO_X, meteorology
Kennedale Treepoint Drive	484391062	1062	VOC, meteorology
Fort Worth Joe B. Rushing Road	484391065	1065	VOC, meteorology
Fort Worth Benbrook Lake	484391503	1503	VOC, meteorology
Keller	484392003	0017	Ozone, NO_X, meteorology
Grapevine Fairway	484393009	0070, 0182	Ozone, NO_X, meteorology
Arlington Municipal Airport	484393011	0061	Ozone, NO_X, meteorology
Decatur Thompson	484970088	0088	VOC, meteorology
Rhome Seven Hills Road	484971064	1064	VOC, meteorology

[1] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

This section examines ambient concentrations and precursor emissions trends from the extensive ozone and ozone precursor monitoring network in the DFW 2008 ozone NAAQS nonattainment area. Appendix B provides additional details on ozone formation in the region. Overall, observed ozone levels have declined since 2012 despite increases in the population of the DFW 2008 ozone NAAQS nonattainment area, a strong economic development pattern, and growth in vehicle miles traveled (VMT).

5.2.1 Ozone Trends

Because ozone varies both temporally and spatially, there are several ways that trends in ozone concentrations are analyzed. For this analysis, TCEQ examined trends in ozone design value, fourth-highest eight-hour ozone concentrations, and background ozone to assess progress toward attainment.

5.2.1.1 Ozone Design Value Trends

A design value is the statistic used to determine compliance with the NAAQS (40 CFR §50.15(b); 40 CFR Part 50, Appendix P). For the 2008 eight-hour ozone NAAQS, design values are calculated by averaging the fourth-highest daily maximum eight-hour averaged (MDA8) ozone values at each regulatory monitor over three years. The eight-hour ozone design value for a metropolitan area is the maximum design value from all

the area's regulatory monitors' individual design values. Design values of 76 ppb and greater exceed the 2008 eight-hour ozone NAAQS of 75 ppb.

Figure 5-1: *Eight-Hour Ozone Design Values in the DFW 2008 Ozone NAAQS Nonattainment Area* shows that ozone design values have decreased in the area. The 2022 eight-hour ozone design value is 77 ppb, a slight increase from the 2021 value of 76 ppb, the lowest ever recorded in the DFW 2008 ozone NAAQS nonattainment area. This 2022 value is an 11% decrease from the 2012 design value of 87 ppb. Ozone decreases may be due to changes in any or all of the factors that drive ozone formation: meteorology, background ozone, and emissions.

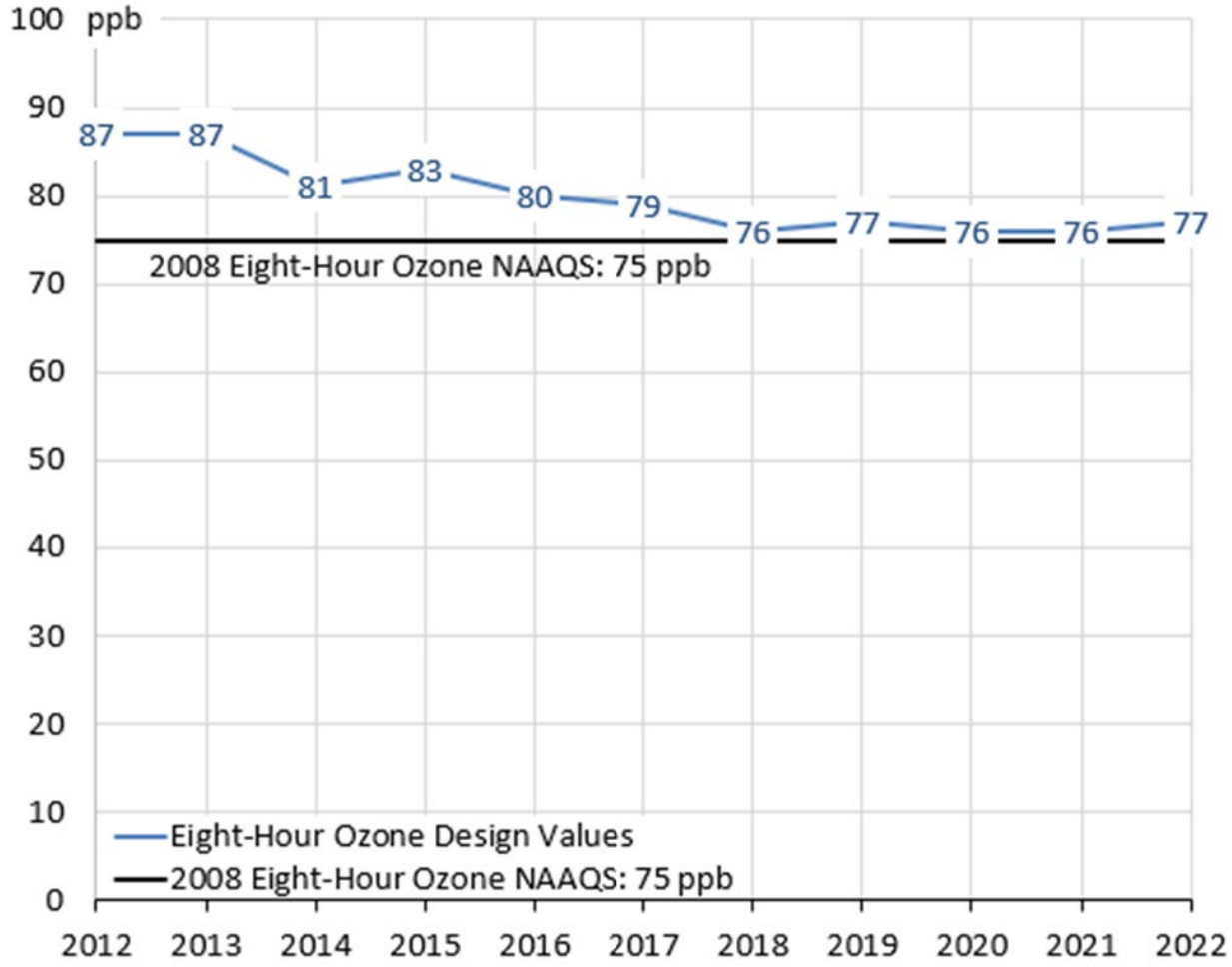

Figure 5-1: Eight-Hour Ozone Design Values in the DFW 2008 Ozone NAAQS Nonattainment Area

Because ozone levels vary spatially, it is also prudent to investigate trends at all monitors in an area. Figure 5-2: *Eight-Hour Ozone Design Values by Monitor in the DFW 2008 Ozone NAAQS Nonattainment Area* displays eight-hour design values from 2012 through 2022 at each monitor in the area. The individual monitors' trends are less important for assessing trends than the overall range in design values across the area. The figure demonstrates that design values have been decreasing across the DFW 2008 ozone NAAQS nonattainment area, not only at the monitor with the highest design

value. In 2012, only two monitors in the area measured below the 2008 ozone NAAQS. In 2022, three-quarters of DFW monitors recorded design values below the NAAQS.

Figure 5-2 also shows how the monitor with the highest eight-hour ozone design value in the area changed over time. In 2012, Keller recorded the highest design value in the DFW 2008 ozone NAAQS nonattainment area. For the next five years, Denton Airport South recorded the highest design values. The highest design value monitor was Grapevine Fairway in 2018, then Dallas North No. 2 in 2019, then Grapevine Fairway again in 2020. Finally, in 2021 and 2022, Pilot Point recorded the highest design values.

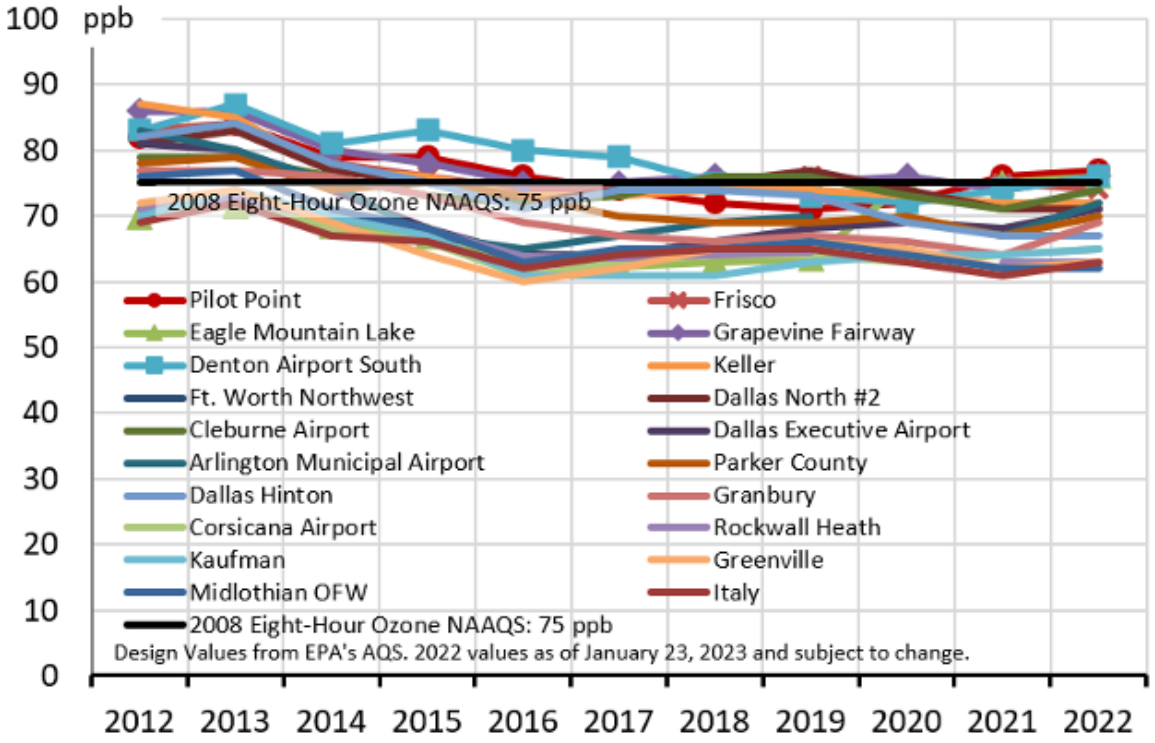

Figure 5-2: Eight-Hour Ozone Design Values by Monitor in the DFW 2008 Ozone NAAQS Nonattainment Area

Displaying eight-hour ozone design values on a map can provide better insight into ozone formation patterns within the DFW 2008 ozone NAAQS nonattainment area. Figure 5-3: *Map of 2022 Design Values at the DFW 2008 Ozone NAAQS Nonattainment Area Monitors* shows that six of 17 ozone monitors in the area attained both the 2015 ozone NAAQS of 70 ppb and the 2008 ozone NAAQS of 75 ppb in 2022, while six attained the 2008 ozone NAAQS of 75 ppb only, and five failed to attain either.[27] Three

[27] Disclaimer: Maps in this document were generated by the Air Quality Division of the Texas Commission on Environmental Quality. The products are for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. They do not represent an on-the-ground survey and represent only the approximate relative location of property boundaries. For more information concerning these maps, contact the Air Quality Division at 512-239-1459.

monitors in counties outside, but adjacent to, the ten-county DFW 2008 ozone NAAQS nonattainment area also attained the 2015 NAAQS of 70 ppb.

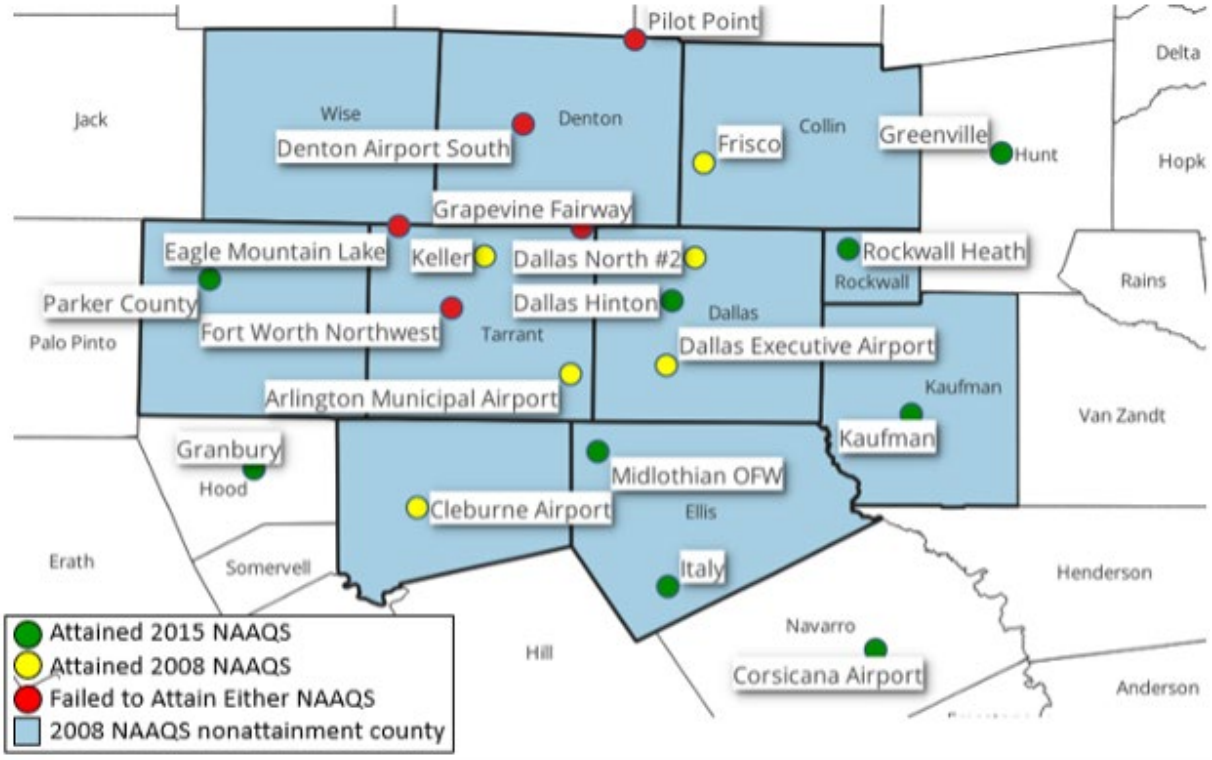

Figure 5-3: Map of 2022 Design Values at the DFW 2008 Ozone NAAQS Nonattainment Area Monitors

Eight-hour ozone design values in the DFW 2008 ozone NAAQS nonattainment area from 2012, 2017, and 2022 were also interpolated spatially using the kriging method.[28] Figure 5-4: *Map of Eight-Hour Ozone Design Values for the DFW Nonattainment Area* shows how much eight-hour ozone design values have decreased across the area. As eight-hour ozone design values have decreased across the area, the highest design values continue to occur to the north and northwest of the DFW 2008 ozone NAAQS nonattainment area, while the lowest design values continue to be observed to the east and southeast. This supports the findings of prior DFW ozone formation investigations that showed prevailing winds from the east or southeast carry ozone and precursors across the most urbanized portions of Dallas and Fort Worth to the north and northwest of the metro area.

[28] Kriging interpolation is a method that uses a limited set of sampled points to estimate the value of a variable over a continuous spatial field.

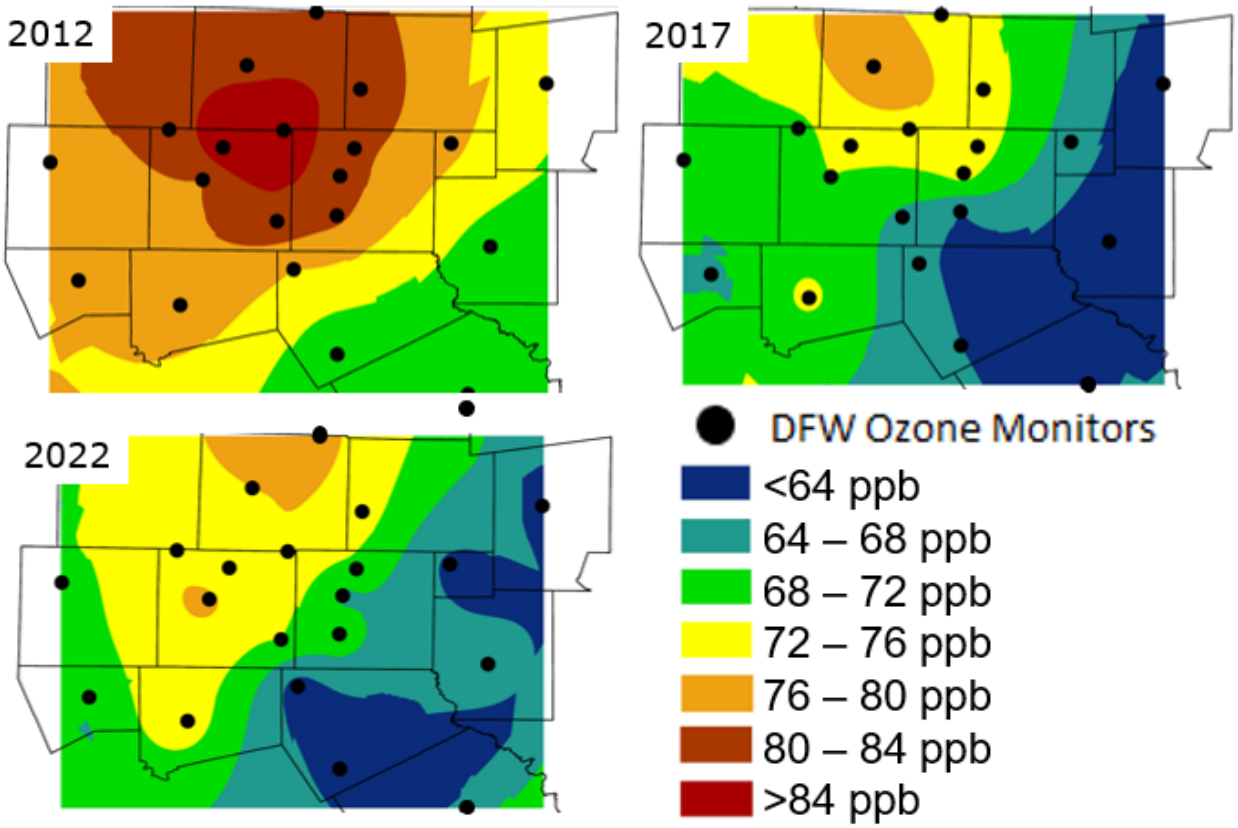

Figure 5-4: Map of Eight-Hour Ozone Design Values for the DFW 2008 Ozone NAAQS Nonattainment Area

5.2.1.2 Fourth-Highest Eight-Hour Ozone Trends

Because eight-hour ozone design values are three-year averages, trends tend to be smooth, making year-to-year variations in ozone concentrations due to factors such as meteorology less apparent. Investigating trends in annual fourth-highest MDA8 ozone concentrations can provide more insight into each individual year. Area-wide annual fourth-highest MDA8 ozone trends would not be very instructive because design values are calculated on a per monitor basis. Instead, fourth-highest MDA8 ozone trends are investigated at each monitor. Figure 5-5: *Fourth-Highest MDA8 Ozone Concentration by Monitor in the DFW 2008 Ozone NAAQS Nonattainment Area* shows data from 2010 though 2022 to examine all years used in 2012 through 2022 design value computations.

These trends show there is greater variability in fourth-highest MDA8 ozone values compared to design values, so a single adverse year can disrupt years of progress. Ozone concentrations are subject to substantial variability from factors interacting with ozone-conducive meteorology, which are discussed later in Section 5.2.6 *Meteorological Influences on Ozone* of this chapter. For example, the 2020 annual fourth-highest reading at Pilot Point was 70 ppb. This is evidence that monitors that record the highest fourth-highest ozone concentrations can record much lower values but for meteorological variability or other factors beyond the control of state and local authorities. Even though some DFW monitors occasionally record annual fourth-

highest values in the upper 70s and 80s, they frequently record values much lower, often in attainment.

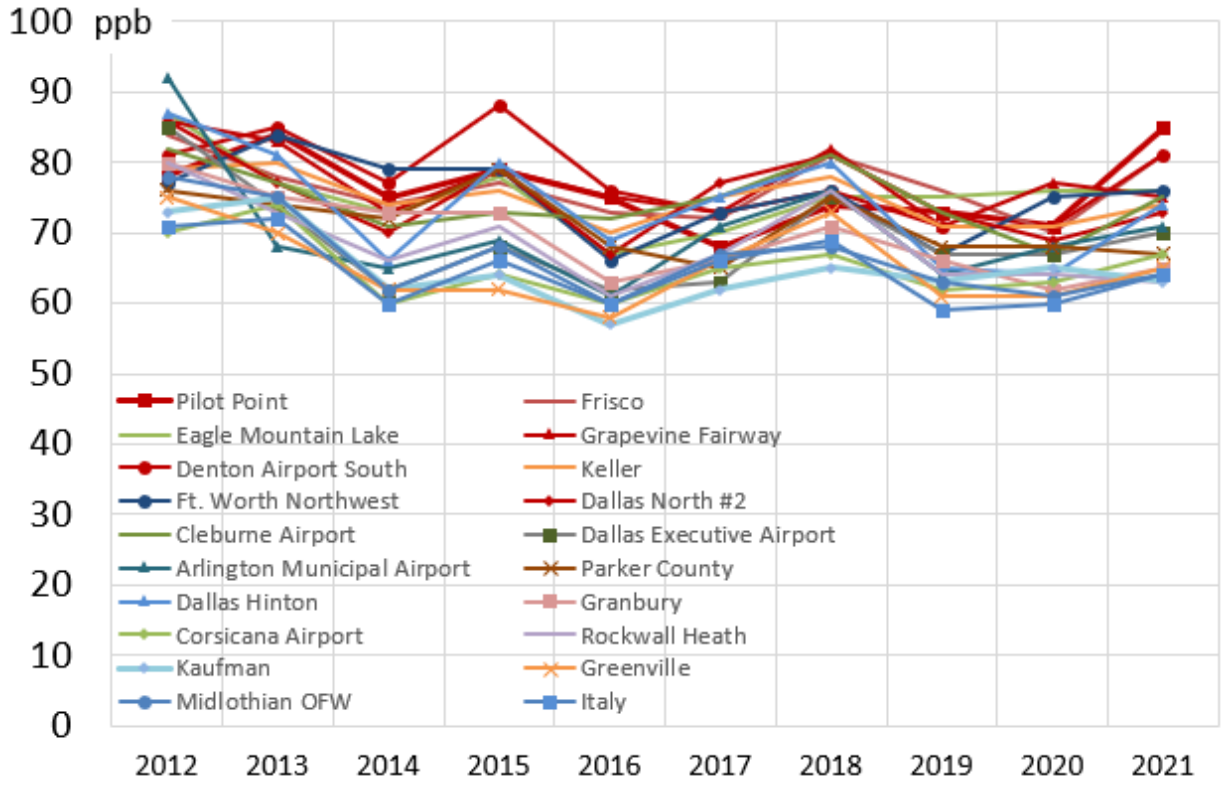

Figure 5-5: Fourth-Highest MDA8 Ozone Concentration by Monitor in the DFW 2008 Ozone NAAQS Nonattainment Area

5.2.1.3 Background Ozone Trends

Regional background ozone (background ozone) reflects the ozone produced from all sources outside the ten-county DFW 2008 ozone NAAQS nonattainment area. Examination of background ozone trends provides insight into whether observed ozone changes are from locally produced ozone or from transported ozone. The technique for estimating background ozone concentrations is detailed in Appendix B. The technique uses the lowest MDA8 ozone value from selected sites located at the outskirts of the nonattainment area to determine background ozone concentrations.

Locally produced ozone (within the DFW 2008 ozone NAAQS nonattainment area) was calculated by subtracting the estimated background ozone concentration from the highest MDA8 ozone value for the area. Results were then separated into low ozone days and high ozone days to investigate if high ozone is due to changes in background ozone or changes in local ozone. For this analysis, high ozone days include all days with an MDA8 ozone value greater than 75 ppb. Low ozone days include all days with an MDA8 ozone value less than or equal to 75 ppb.

To focus on months that observe the highest eight-hour ozone concentrations, this analysis used ozone data from only the months of March through October, ozone season.

Figure 5-6: *Ozone Season Trends in MDA8 Ozone, Background Ozone, and Locally Produced Ozone for High versus Low Ozone Days in the DFW 2008 Ozone NAAQS Nonattainment Area* shows that the 2022 area-wide median background ozone was 37 ppb on low ozone days and 47 ppb on high ozone days. Although background ozone is higher on high ozone days, local ozone production is also higher on these days. For both high and low ozone days, background ozone accounts for approximately two thirds of the MDA8 ozone, and locally produced ozone accounts for approximately one third of the MDA8 ozone. Background ozone, MDA8 ozone, and locally produced ozone are stable on low ozone days. On high ozone days, background ozone concentrations are slightly lower over the 10-year period, and locally produced ozone concentrations are slightly higher, resulting in a flat MDA8 ozone trend.

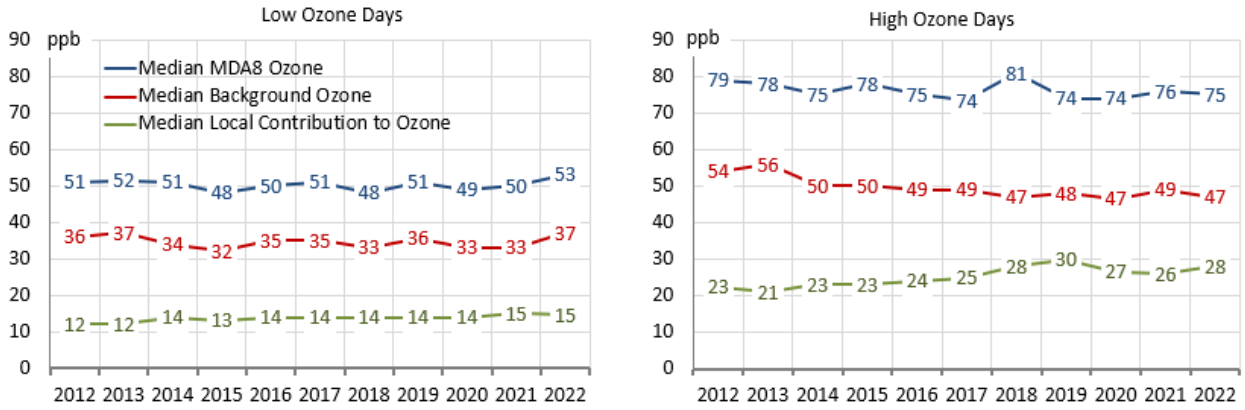

Figure 5-6: Ozone Season Trends in MDA8 Ozone, Background Ozone, and Locally Produced Ozone for High versus Low Ozone Days in the DFW 2008 Ozone NAAQS Nonattainment Area

5.2.2 NO_X Trends

NO_X, a precursor to ozone formation, is a mixture of nitrogen oxide (NO) and nitrogen dioxide (NO_2). NO_X is primarily emitted by fossil fuel combustion, lightning, biomass burning, and soil. Examples of common NO_X emission sources in urban areas are automobiles, diesel engines, other small engines, residential water heaters, industrial heaters, flares, and industrial and commercial boilers. Mobile, residential, and commercial NO_X sources are usually numerous smaller sources distributed over a large geographic area, while industrial sources are usually large point sources or numerous small sources clustered in a small geographic area. Because of the large number of NO_X sources, elevated ambient NO_X concentrations can occur throughout the DFW 2008 ozone NAAQS nonattainment area.

Because NO_X reacts in the presence of sunlight, NO_X concentrations tend to be lower in the summer and higher in the winter. To focus on NO_X values that lead to ozone formation, this analysis used only NO_X concentrations that occurred during the ozone season, from March through October.

Since 2012, there have been at least 15 regulatory NO_X monitors operating in the DFW 2008 ozone NAAQS nonattainment area, all of which report data to EPA. Two monitors are near highly trafficked roadways: Dallas LBJ Freeway (Interstate 635, began operation April 1, 2014) and Fort Worth California Parkway North (Interstate 20, began

March 12, 2015). These near-road monitors provide valuable information about on-road mobile sources, but because of their proximity to sources, they tend to record high NO_X concentrations, which would skew results when compared to years that did not include those monitors.

All valid hours and years of ozone season NO_X concentrations were used to calculate median and 95th percentile NO_X trends. The 95th percentile represents NO_X values at the upper end of the distribution, which are most influential on ozone formation, while the median represents a typical NO_X concentration. Figure 5-7: *Ozone Season NO_X Trends in the DFW 2008 Ozone NAAQS Nonattainment area* shows the 95th percentile of the NO_X distribution increased 20% from 2012 through 2022. The median ozone season NO_X concentration was steady over this period. Excluding near-road monitors, 95th percentile and median NO_X concentrations fell 13.0% and 10.4%, respectively. More detailed analysis of NO_X trends, including monitor level trends, is available in Appendix B.

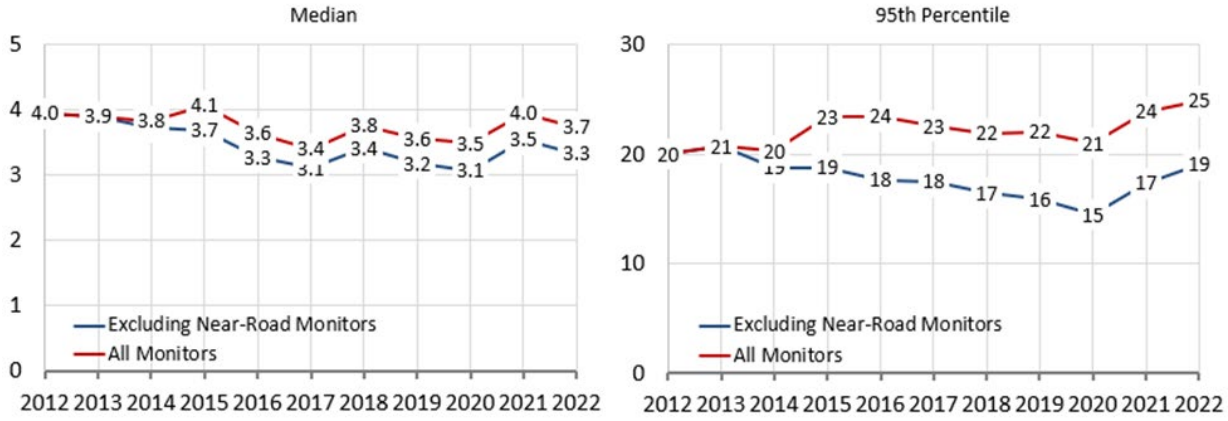

Figure 5-7: Ozone Season NO_X Trends in the DFW 2008 Ozone NAAQS Nonattainment Area

Like ozone, NO_X concentrations can vary based on location. NO_X values tend to be higher at monitors located in urban areas or near large NO_X sources. Due to these variations, ozone season NO_X trends were examined at the 15 NO_X monitors used to determine area-wide trends. In addition, NO_X concentrations were checked for completeness because incomplete data may show inaccurate trends. Only days and years with at least 75% complete data were used in this analysis.

From the late 1990s to the present, federal, state, and local measures have resulted in significant NO_X reductions from on-road and non-road mobile sources within the DFW 2008 ozone NAAQS nonattainment area. The TCEQ funded a study by the Texas A&M Transportation Institute (TTI) to estimate on-road mobile emissions trends throughout Texas from 1999 through 2050 using the 2014a version of the Motor Vehicle Emission Simulator (MOVES2014a) model (TTI 2015). On-road emissions in the DFW 2008 ozone NAAQS nonattainment area were estimated to decrease significantly from 1999 through 2021 and beyond, even as daily VMT is estimated to increase. This reduction in on-road NO_X is projected to continue as older, higher-emitting vehicles are removed from the fleet and replaced with newer, lower-emitting vehicles.

A similar pattern is reflected in a TCEQ non-road emissions trends analysis using the Texas NONROAD (TexN) model. Non-road emissions are estimated to decrease from 1999 through 2021 and beyond even as the number of non-road engines, based on equipment population, is expected to increase. As with the on-road fleet turnover effect, reductions in non-road NO_X emissions are projected to continue as older, higher-emitting equipment is removed from the fleet and replaced with newer, lower-emitting equipment.

Point source NO_X emission trends from the State of Texas Air Reporting System (STARS) were also investigated. These emissions are from sources that meet the reporting requirements under TCEQ's emissions inventory rule (30 Texas Administrative Code (TAC) §101.10). The emissions trends analysis uses 10 years of data from 2012 through 2021; emissions from 2022 were not available in time to be included in this analysis.

Emissions trends in tons per year (tpy) by site are displayed in Figure 5-8: *DFW 2008 ozone NAAQS nonattainment area Point Source NO_X Emissions by Site*. Because the DFW 2008 ozone NAAQS nonattainment area has many point sources, only the top emitters are displayed. All other point source emissions in the DFW 2008 ozone NAAQS nonattainment area were added together and displayed in the Sum of All Others category in the chart. Point source NO_X emission trends show that the top nine reporting sites accounted for 60% of the total point source NO_X emissions in the DFW 2008 ozone NAAQS nonattainment area in 2021. Each of these sites reports total NO_X emissions exceeding 200 tons in 2021.The overall trend in NO_X emissions is a decline of 26% since 2012.

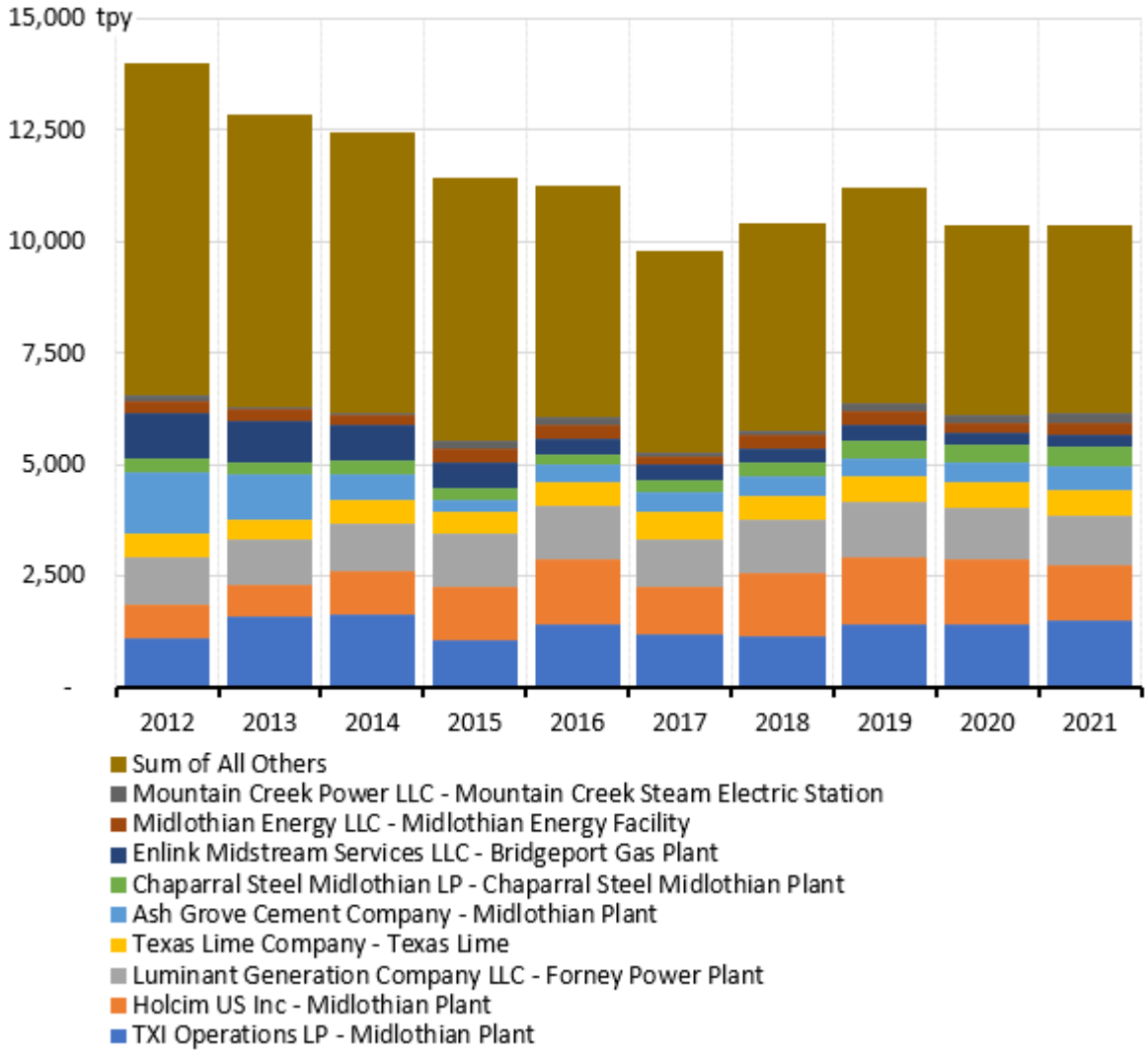

Figure 5-8: DFW 2008 Ozone NAAQS Nonattainment Area Point Source NO_x Emissions by Site

Figure 5-9: *Map of Stationary NO_x Emissions Sources in the DFW 2008 Ozone NAAQS Nonattainment Area* shows that NO_x emissions sources are scattered throughout the metropolitan area, with the largest NO_x emitters located south and southeast. On typical high ozone days, winds travel from the southeast where the largest NO_x sources are located. The winds carry these emissions over the city centers where they mix with other urban emissions and form ozone. Over the course of the morning and early afternoon, this ozone is then conveyed to the north and northwest where it is measured by surface monitors in mid-afternoon.

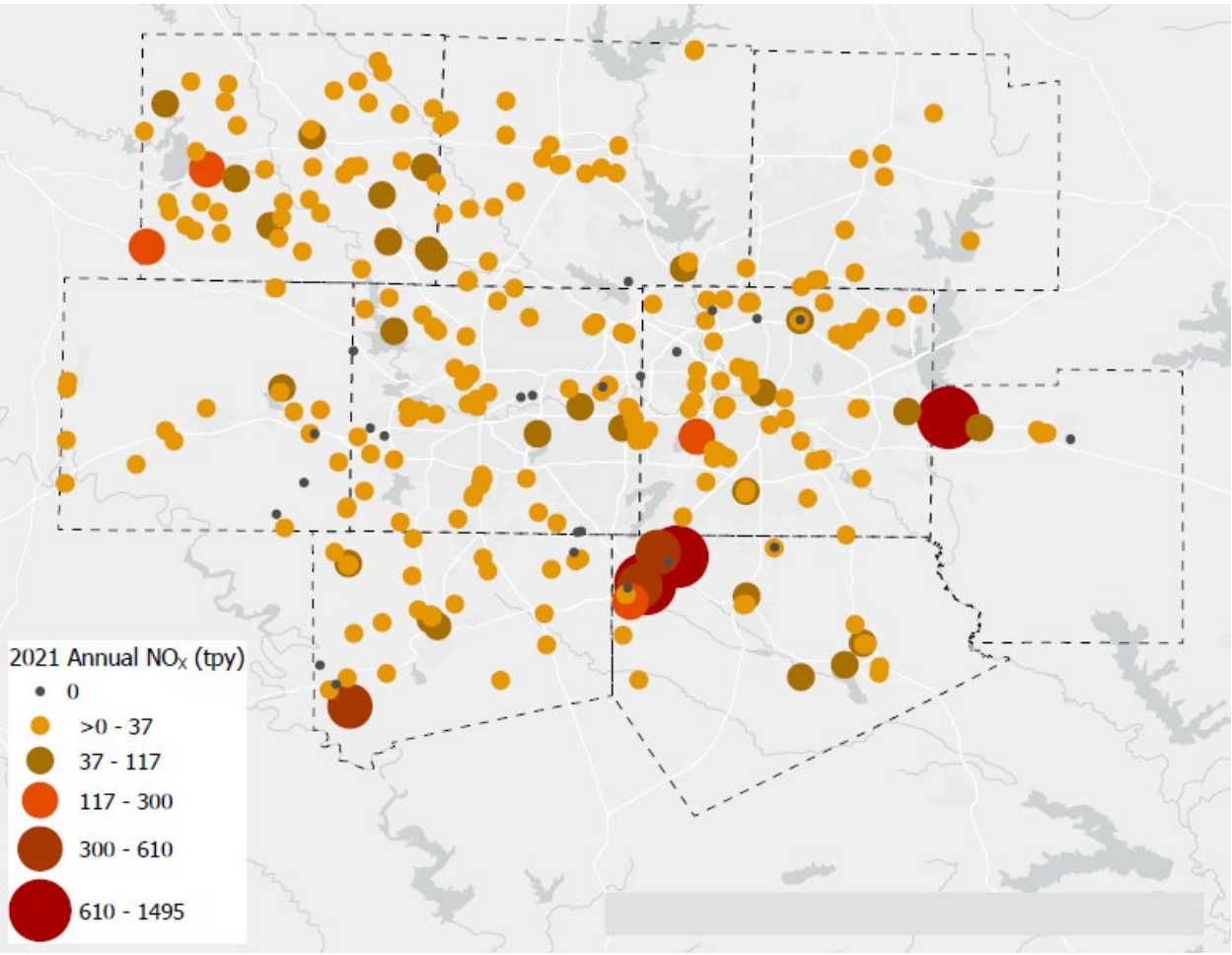

Figure 5-9: Map of Stationary NO_x Emissions Sources in the DFW 2008 Ozone NAAQS Nonattainment Area

5.2.3 VOC Trends

Total non-methane organic compounds (TNMOC), which is a term used to represent total VOC concentrations, can enhance ozone production in combination with NO_x and sunlight. VOC is emitted from numerous sources, including large industrial processes, automobiles, solvents, paints, dry cleaning, fuels, and even natural sources such as trees.

Two types of instruments record VOC data in the DFW 2008 ozone NAAQS nonattainment area: auto-GCs, which record hourly measurements; and canisters, which record 24-hour totals. Due to the reactive nature of VOC, hourly auto-GC measurements are preferred when assessing trends. The DFW 2008 ozone NAAQS nonattainment area currently has 15 auto-GC monitors. To focus on VOC concentrations that affect ozone formation, this analysis used only ozone season data from March through October. To remove effects of incomplete data on VOC trends, data were first checked for validity. Fourteen of fifteen monitors had nine or more valid years of data for ozone seasons from 2012 through 2021 and were used in this analysis. A year was considered valid if there were at least 75% valid days of data

during ozone season, and a day was considered valid if there were at least 75% valid hours recorded for that day.

All valid hours and years were used to calculate ozone season median and 95th percentile ambient TNMOC trends. The 95th percentile shows trends at the highest levels while the median shows the central tendency. Figure 5-10*: Ozone Season Median and 95th Percentile TNMOC Trends in the DFW 2008 Ozone NAAQS Nonattainment Area* shows both ozone season median and 95th percentile TNMOC concentrations have declined over the period, with the median declining 17% and the 95th percentile declining 27%. The declines occurred before 2017, with no trend in the median since 2017 and a slight increase in the 95th percentile.

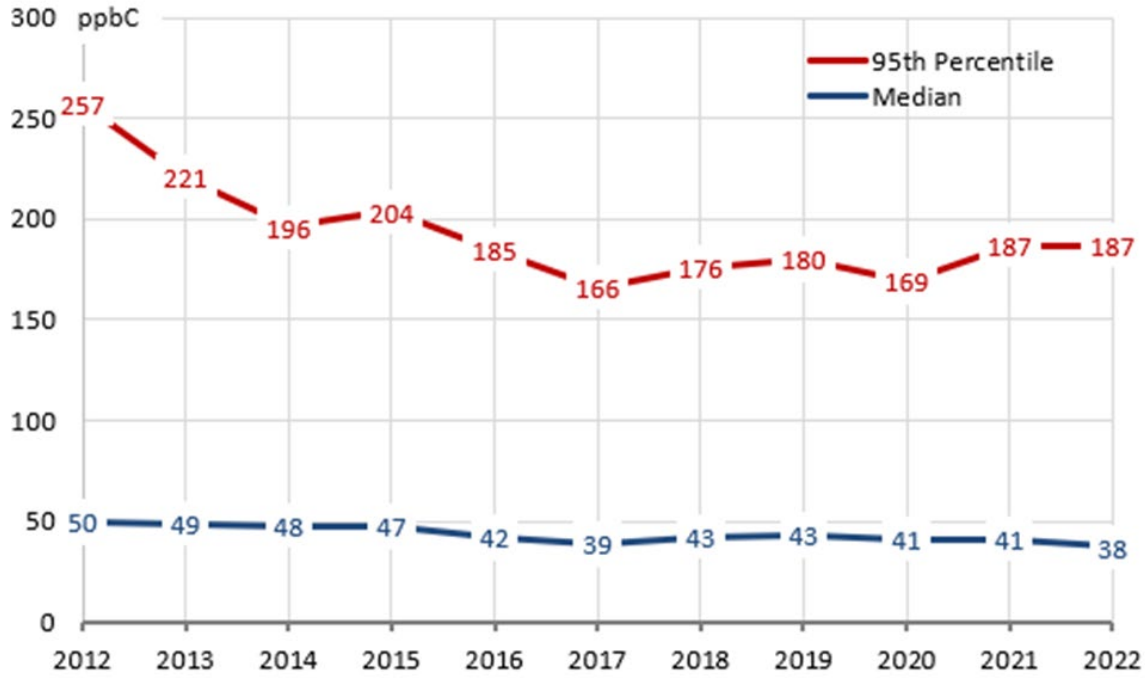

Figure 5-10: Ozone Season Median and 95th Percentile TNMOC Trends in the DFW 2008 Ozone NAAQS Nonattainment Area

From the late 1990s to the present, federal, state, and local measures have resulted in VOC reductions from on-road and non-road emissions sources within the DFW 2008 ozone NAAQS nonattainment area. The TCEQ studies mentioned in Section 5.2.2 *Background Ozone Trends* showed decreases in on-road and non-road VOC from 1999 through the present. These reductions are projected to continue as older, higher-emitting vehicles and equipment are removed from the fleet and replaced with newer, lower-emitting ones.

Point source VOC emission trends from STARS were also investigated. Figure 5-11: *DFW 2008 Ozone NAAQS Nonattainment Area Point Source VOC Emissions by Site* shows that the top six reporting sites accounted for 27% of the total DFW 2008 ozone NAAQS nonattainment area point source VOC emissions in 2021. Each of these sites reported total VOC emissions exceeding 250 tons in 2021, with the three largest emitters reporting 20% of the total. Overall, VOC emissions are decreasing, with a 32%

decrease from 2012 through 2021, though the rate of decline slowed after 2016. This correlates with ambient VOC trends for the DFW 2008 ozone NAAQS nonattainment area. For more information, see Appendix B.

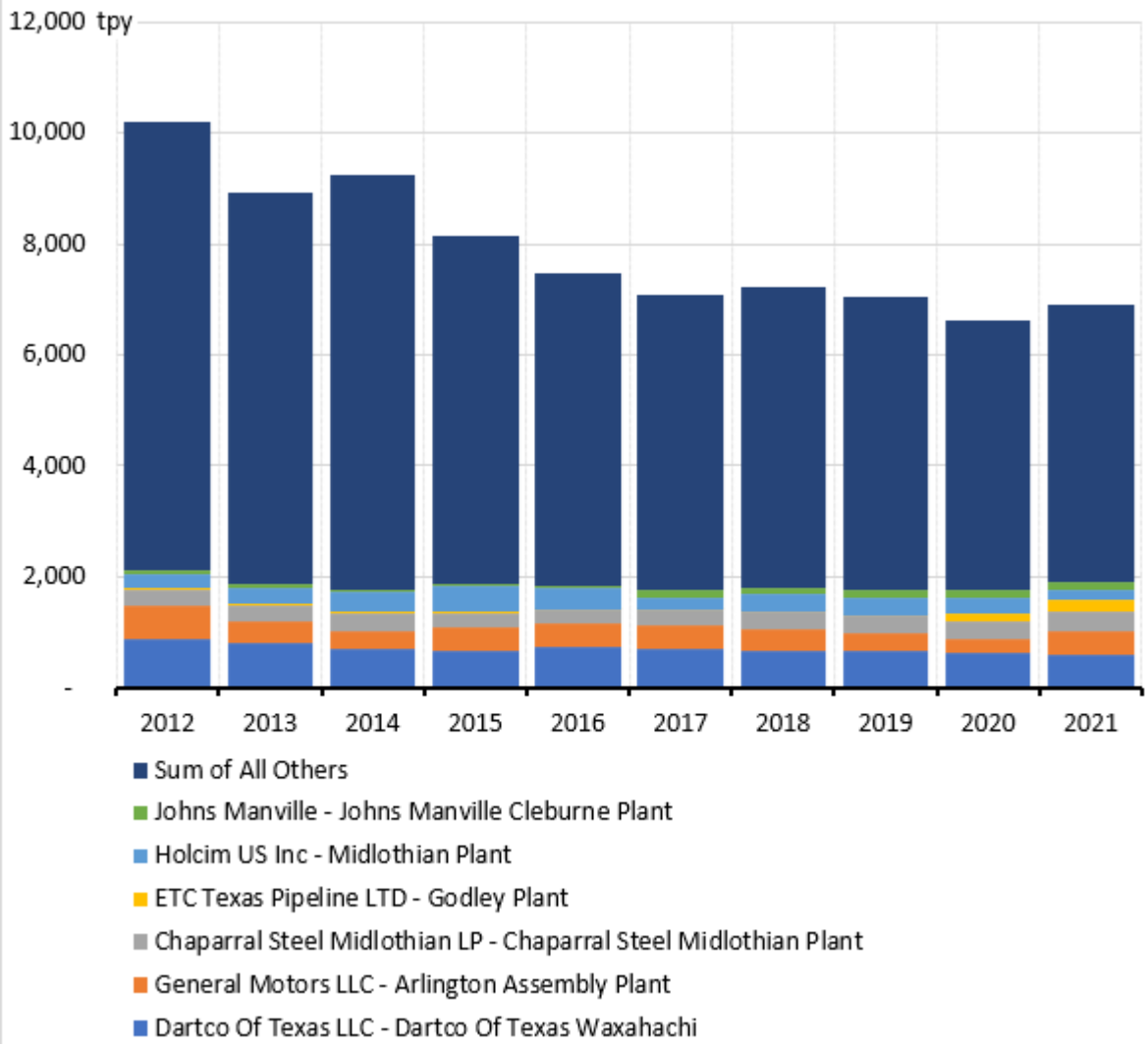

Figure 5-11: DFW 2008 Ozone NAAQS Nonattainment Area Point Source VOC Emissions by Site

5.2.4 VOC and NO_x Limitation

Ozone is formed from interaction of precursors (NO_x and VOC) in proportions determined by their molecular properties. Therefore, unless precursors are present in these exact proportions in an airshed, ozone formation will be governed by whichever precursor is more scarce or limited. If one precursor is present in excess in the atmosphere, that excess will be unused in chemical reactions that form ozone; and ozone formation will be more dependent on the presence of the other precursor.

Because VOC and NO_x react together to form ozone, the relative proportion of these precursors in an airshed is an indicator of the likely efficacy of an emission control strategy. This proportion is often expressed as the VOC-to-NO_x ratio, which signifies

the abundance or scarcity of one in relation to the other, suggesting how proximate reductions in one or the other might affect the duration and magnitude of ozone formation. When this ratio indicates that one is in short supply in an airshed, that is, it is limited in relation to the other, ozone formation will be limited by how much of the first compound is available to form ozone. Excess of the other would not matter for ozone production because there would not be sufficient quantities of the first to complete the reaction. A NO_X limited regime occurs when radicals from VOC oxidation are abundant and ozone formation is more sensitive to the amount of NO_X in the atmosphere. In these NO_X limited regimes, controlling NO_X would be more effective in reducing ozone concentrations. In VOC limited regimes, NO_X is abundant and ozone formation is more sensitive to the number of radicals from VOC oxidation in the atmosphere. In VOC-limited regimes, controlling VOC emissions would be more effective in reducing ozone concentrations. Areas where ozone formation is not strongly limited by either VOC or NO_X are considered transitional, and controlling either VOC or NO_X emissions might reduce ozone concentrations.

VOC-to-NO_X ratios are calculated by dividing hourly TNMOC in parts per billion by carbon (ppbC) by hourly NO_X concentrations in parts per billion by volume (ppbV). Ratios less than 5 ppbC/ppbV are considered VOC-limited, ratios above 15 ppbC/ppbV are considered NO_X-limited, and ratios between 5 ppbC/ppbV and 15 ppbC/ppbV are considered transitional. The understanding of VOC-to-NO_X ratios in an airshed is limited by the number of collocated VOC and NO_X monitors available in the area. In addition, VOC monitors are often source oriented and primarily provide information on the air mass located near the source, which may not be reflective of the wider area.

The DFW 2008 ozone NAAQS nonattainment area has 15 auto-GC instruments, three of which are collocated with NO_X monitors: Dallas Hinton, Eagle Mountain Lake, and Fort Worth Northwest. Ozone season measurements from March through October, 2012 through 2022, were used to assess VOC-to-NO_X ratios in DFW. Ratios were calculated for each hour of the day for the ozone season and then aggregated to determine the median ratio for each year.

Figure 5-12: *Median VOC-to-NO_X Ratios During the Ozone Season in the DFW 2008 Ozone NAAQS Nonattainment Area* shows the evolving nature of the relationship between these two ozone precursors over the decade. At Dallas Hinton, the ratio began near the VOC sensitive regime and rose to be clearly transitional. Eagle Mountain Lake began as NO_X sensitive but then became transitional. Fort Worth Northwest had annual fluctuations but was consistently transitional. There is also an evolution from more VOC limited to more NO_X limited as a site is more westerly and northerly located in the DFW 2008 ozone NAAQS nonattainment area, which has important implications for ozone formation. Sites in the DFW 2008 ozone NAAQS nonattainment area with the highest measured ozone concentrations, those that determine the regulatory design value for the area, such as Pilot Point, Frisco, and Grapevine Fairway, tend to be to the north and west. Overall, it is likely that controlling NO_X would be more effective at influencing the DFW ozone design value than controlling VOC, although ozone formation may respond to VOC reductions in some parts of the metro area and at certain times of day.

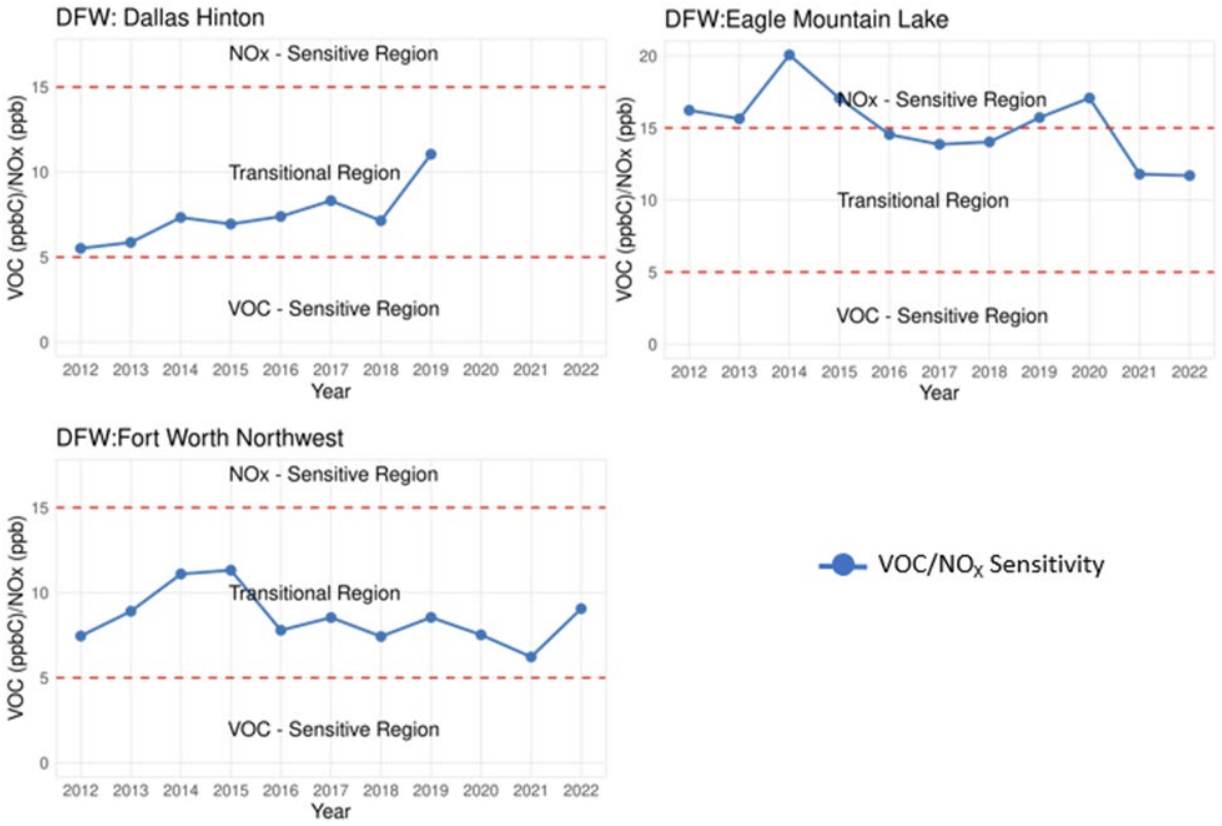

Figure 5-12: Median VOC-to-NO_X Ratios During the Ozone Season in the DFW 2008 Ozone NAAQS Nonattainment Area

5.2.4.1 Modeling Sensitivity Analysis

Photochemical modeling of the 2019 base case was performed with reduced anthropogenic VOC and NO_x emissions in and around the DFW 2008 ozone NAAQS nonattainment area to assess the impact these reduced emissions would have on the 2019 ozone Base Case Design Value (DVB). The DVB calculation and its use in an attainment test is described in Chapter 3: *Photochemical Modeling*. Figure 5-13: *Modeling Domain and Monitors for DFW VOC and NO_x Sensitivity Analysis* shows a map with a blue outline surrounding the DFW 2008 ozone NAAQS nonattainment area and parts of adjacent counties that comprise the modeling domain, with the various monitors used for this analysis represented as circles within the modeling domain. Anthropogenic emissions within this modeling domain were reduced by 20% relative to emissions in each grid for the sensitivity analysis.

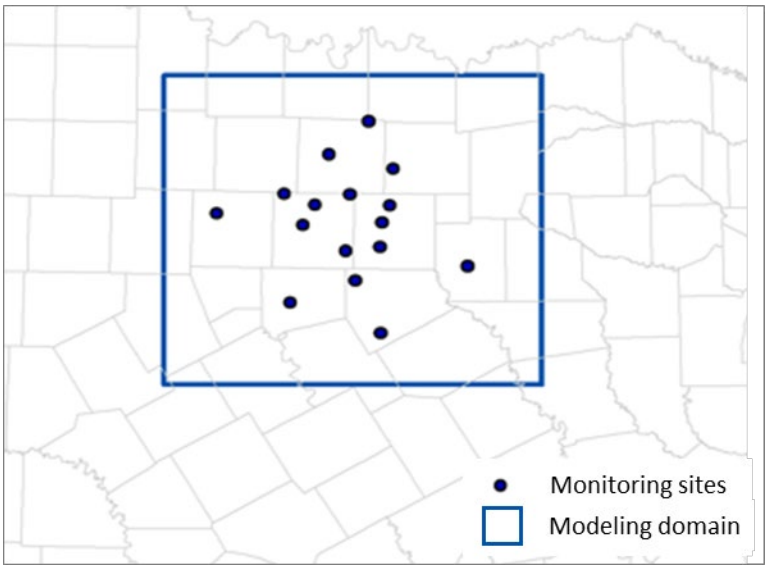

Figure 5-13: Modeling Domain and Monitors for DFW VOC and NO_x Sensitivity Analysis

The impact on the 2019 ozone DVB was estimated for the top modeled 10 days within the months of April through October by completing three model runs—a 2019 base case scenario, a 20% anthropogenic NO_x emissions reduction scenario, and a 20% anthropogenic VOC emissions reduction scenario. The impact was estimated by calculating a ratio of the average MDA8 ozone from the top 10 days from the 20% anthropogenic emissions reduction emission scenario to the average MDA8 ozone from the top 10 days from the base case scenario for each monitor and adjusting the 2019 DVB with the ratio. Results show that although ozone decreased when VOC or NO_x was decreased, reductions in NO_x were more impactful, which agrees with the results of the VOC-to-NO_x ratio analysis discussed above. Figure 5-14: *Modeled Impact of VOC and NO_x Reductions on 2019 Ozone DVB* shows the estimated change in the 2019 ozone DVB at each monitor due to a 20% reduction in anthropogenic NO_x and VOC emissions in and around the DFW 2008 ozone NAAQS nonattainment area. The maximum estimated decrease in ozone base case design value resulting from a 20% NO_x reduction was 2.4 ppb but only 0.6 ppb resulting from a 20% VOC reduction.

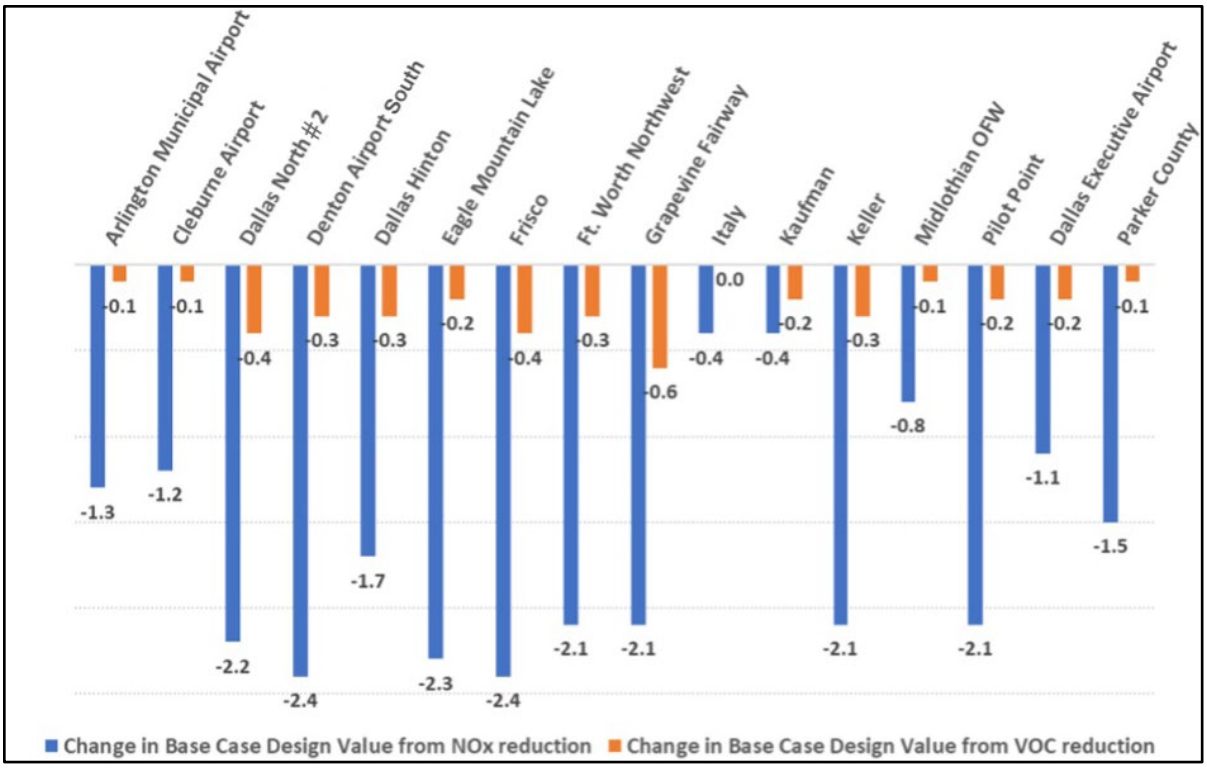

Figure 5-14: Modeled Impact of VOC and NO_x Reductions on 2019 Ozone DVB

Modeling results show that the impact of NO_x reductions on 2019 ozone base case design values is higher than the impact from VOC reductions. The impact from NO_x reductions is higher at monitors located on the west side of the DFW 2008 ozone NAAQS nonattainment area compared to monitors on the east side.

5.2.5 Meteorological Influences on Ozone

Meteorological conditions play an important role in ozone formation. Year-to-year variability in meteorological conditions, in turn, contributes to variability in ozone concentrations. Although design values account for some of this variability by averaging fourth highest MDA8 ozone over three-years, this is often not enough to account for years with extreme meteorological conditions such as low wind speeds, drought, or extremely high temperatures. Investigating meteorological influences on ozone facilitates analysis of how ozone concentrations respond to changes in emissions rather than changes in meteorology.

Meteorologically adjusted MDA8 ozone values represent what ozone would have been if effects of anomalous meteorology on ozone formation are removed. Without the influence of unusual meteorology, changes observed in ozone concentrations are more likely due to emission changes than extreme meteorological events. EPA developed a statistical model that uses local weather data to adjust ozone trends according to meteorology for that year (Wells et al. 2021). These trends compare the average and meteorologically adjusted average of the 90th percentile and 98th percentile MDA8 ozone from May through September. EPA calculated these trends for each ozone monitor in the DFW 2008 ozone NAAQS nonattainment area from 2012 through 2022 (EPA 2023). Although results for all statistics were examined, only 98th percentile

trends are shown since it is the metric most closely related to the formula used in design value calculations.

Figure 5-15: *Meteorologically Adjusted Ozone Trends for May Through September in the DFW 2008 Ozone NAAQS Nonattainment Area* shows the entire range of 98th percentile ozone concentrations at the 20 DFW 2008 ozone NAAQS nonattainment area ozone monitors. The effect of meteorology appears to vary from year to year. Correcting for meteorology yields a more robust trend with less year-to-year variability, as shown in 2015 and 2018 where higher ozone concentrations are adjusted lower when meteorology is removed. Likewise, lower ozone concentrations in 2014, 2017, and 2019 are adjusted higher when meteorology is removed.

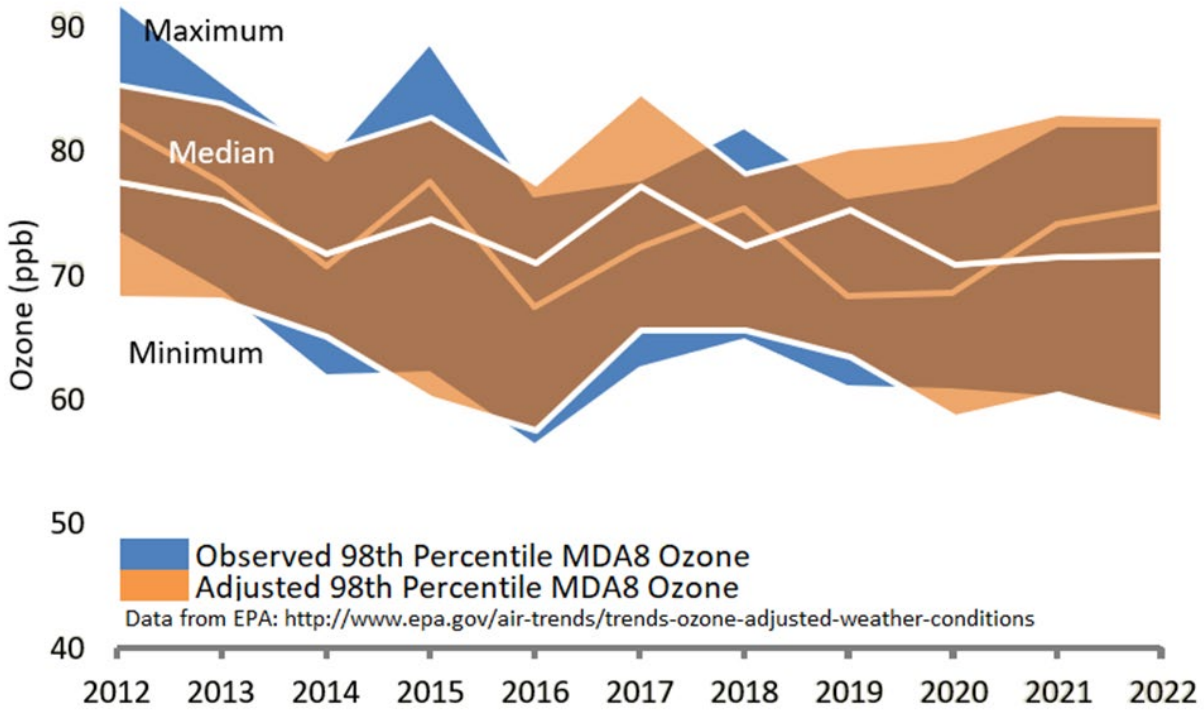

Figure 5-15: Meteorologically Adjusted Ozone Trends for May through September in the DFW 2008 Ozone NAAQS Nonattainment Area

5.3 QUALITATIVE CORROBORATIVE ANALYSIS

Emission reduction measures that were not included in the photochemical modeling are expected to further reduce ozone levels in the DFW ozone nonattainment area. Various federal, state, and local control measures exist that are anticipated to provide real emissions reductions; however, these measures are not included in the photochemical model because they may not meet all EPA's standard tests of SIP creditability (permanent, enforceable, surplus, and quantifiable), but they are crucial to the success of the air quality plan in the DFW area.

5.3.1 Additional Measures

5.3.1.1 SmartWay Transport Partnership and the Blue Skyways Collaborative

Among its various efforts to improve air quality in Texas, TCEQ continues to promote two voluntary programs in cooperation with EPA: SmartWay Transport Partnership and Blue Skyways Collaborative.

The SmartWay Transport Partnership is a market-driven partnership aimed at helping businesses move goods in the cleanest, most efficient way possible. This is a voluntary EPA program primarily for the freight transport industry that promotes strategies and technologies to help improve fleet efficiency while reducing air emissions.

There are nearly 4,000 SmartWay partners in the U.S., including most of the nation's largest truck carriers, all the Class 1 rail companies, and many of the top Fortune 500 companies. Since its founding, SmartWay has reduced oil consumption by 357 million barrels.[29] Since 2004, SmartWay partners have prevented the release of 2,700,000 tons of NO_X and 112,000 tons of particulate matter into the atmosphere.[30] Approximately 247 Texas companies are SmartWay partners, 74 of which are in the DFW area.[31] The SmartWay Transport Partnership will continue to benefit the DFW area by reducing emissions as more companies and affiliates join and additional idle reduction, trailer aerodynamic kits, low-rolling resistance tire, and retrofit technologies are incorporated into SmartWay-verified technologies.

The Blue Skyways Collaborative was created to encourage voluntary air emission reductions by planning or implementing projects that use innovations in diesel engines, alternative fuels, and renewable energy technologies applicable to on-road and non-road emissions sources.[32] The Blue Skyways Collaborative partnerships include international, federal, state, and local governments, non-profit organizations, environmental groups, and private industries.

5.3.1.2 Energy Efficiency and Renewable Energy (EE/RE) Measures

Energy efficiency (EE) measures are typically programs that reduce the amount of electricity and natural gas consumed by residential, commercial, industrial, and municipal energy consumers. Examples of EE measures include increasing insulation in homes; installing light-emitting diode or compact fluorescent light bulbs; and replacing motors and pumps with high efficiency units. Renewable energy (RE) measures include programs that generate energy from resources that are replenished or are otherwise not consumed as with traditional fuel-based energy production. Examples of renewable energy include wind, solar, and battery storage energy projects.

Texas leads the nation in RE generation from wind. As of 2021, Texas has 34,370 megawatts (MW) of installed wind generation capacity, 25.9% of the 132,753 MW installed wind capacity in the U.S. Texas' total net electrical generation from renewable wind generators in 2021 was 99.47 million megawatt-hours (MWh), [33] approximately

[29] https://www.epa.gov/smartway/smartway-program-successes
[30] *Id*
[31] https://www.epa.gov/smartway/smartway-partner-list
[32] https://blueskyways.org/
[33] https://www.eia.gov/electricity/annual/html/epa_04_07_b.html

26.3% of the 378.2 million MWh total wind net electrical generation for the U.S.[34] In 2021, total net electrical generation from renewable wind generators in Texas was 11.9% more than in 2020.[35]

Texas non-residential solar electricity generation in 2021 totaled 17.2 million MWh, a 69.5% increase from 2020.[36] The 2021 total installed solar electricity generation capacity in Texas was 10,374 MW, a 73% increase from 2020.[37]

While EE/RE measures are beneficial and do result in lower overall emissions from fossil fuel-fired power plants in Texas, emission reductions resulting from these programs are not explicitly included in photochemical modeling for SIP purposes because local efficiency or renewable energy efforts may not result in local emissions reductions or may be offset by increased demand in electricity. The complex nature of the electrical grid makes accurately quantifying emission reductions from EE/RE measures difficult.

The Texas A&M Engineering Experiment Station's Energy Systems Laboratory estimates energy savings and emissions reductions from EE/RE measures. House Bill 4885 from the 88th Texas Legislature, Regular Session increased funding up to $500,000 from $216,000 per fiscal year for the Energy Systems Laboratory to evaluate emission reductions from wind and other renewable energy sources, energy efficiency programs of the Public Utility Commission of Texas or the State Energy Conservation Office, and the implementation of advanced building codes. While specific emission reductions from EE/RE measures are not provided in the SIP, persons interested in estimates of energy savings and emission reductions from EE/RE measures can access additional information and reports from the Texas A&M Engineering Experiment Station's Energy Systems Laboratory (ESL) website (http://esl.tamu.edu/). Reports submitted to TCEQ regarding EE/RE measures are available on the ESL website.

5.3.1.3 Cross-State Air Pollution Rule (CSAPR)

The EPA originally finalized CSAPR to help eastern states meet FCAA interstate transport obligations for the 1997 eight-hour ozone, 1997 fine particulate matter ($PM_{2.5}$), and 2006 $PM_{2.5}$ NAAQS by requiring reductions in electric generating unit (EGU) emissions that cross state lines. The rule required reductions in ozone season NO_X emissions for states under the ozone requirements and in annual sulfur dioxide (SO_2) and NO_2 for states under $PM_{2.5}$ requirements. Texas was included in the original CSAPR program for the 1997 eight-hour ozone and 1997 $PM_{2.5}$ standards. As of 2016, Texas is no longer subject to the original CSAPR trading programs for the 1997 eight-hour ozone and $PM_{2.5}$ standards but became subject to EPA's CSAPR Update Rule to address transport obligations under the 2008 eight-hour ozone standard and EPA's transport FIP for the 2015 eight-hour ozone standard.

On August 8, 2018, the commission adopted the 2015 Ozone NAAQS Transport SIP Revision (Non-Rule Project No. 2017-039-SIP-NR), which included a modeling analysis

[34] https://www.eia.gov/electricity/annual/xls/epa_03_01_b.xlsx
[35] *Id*
[36] https://www.eia.gov/electricity/annual/xls/epa_03_21.xlsx
[37] https://www.eia.gov/electricity/annual/html/epa_04_07_b.html

demonstrating that Texas does not contribute to nonattainment or interfere with maintenance of the 2015 ozone NAAQS in any other state. On March 30, 2021, EPA published final disapproval of the portion of the 2015 Ozone NAAQS Transport SIP Revision relating to visibility transport with a determination that visibility transport requirements for the 2015 ozone NAAQS are met through federal implementation plans (FIP) in place for the Texas Regional Haze program, and no further federal action is required (86 FR 16531). On February 22, 2022, EPA proposed disapproval of the remaining portions of the 2015 Ozone NAAQS Transport SIP Revision (87 FR 9798), which EPA finalized on February 13, 2023 (88 FR 9336).

On June 5, 2023, EPA published a final FIP (the Good Neighbor Plan) to address obligations for 23 states, including Texas, to eliminate significant contribution to nonattainment, or interference with maintenance, of the 2015 ozone NAAQS in other states (88 FR 36654). As part of the final FIP to address interstate transport obligations for the 2015 ozone NAAQS, EPA is including Texas and 21 other states, in a revised and strengthened CSAPR NO_X Ozone Season Group 3 Trading Program for EGUs beginning in the 2023 ozone season. EPA is also establishing emissions limitations beginning in 2026 for non-EGU sources located within 20 states, including Texas. The control measures for the identified EGU and non-EGU sources apply to both existing units and any new, modified, or reconstructed units meeting the final rule's applicability criteria.

Multiple parties have challenged the final FIP in multiple federal courts, including Texas, resulting in multiple orders by courts to stay the effectiveness of the FIP in several jurisdictions. As a result of those court orders, on July 31, 2023, the EPA published an interim final rule to stay the implementation of the Good Neighbor Plan for certain states, including Texas (88 FR 49295).

5.3.1.4 Texas Emissions Reduction Plan (TERP)

The TERP program was created in 2001 by the 77th Texas Legislature to provide grants to offset the incremental costs associated with reducing NO_X emissions from high-emitting heavy-duty internal combustion engines on heavy-duty vehicles, non-road equipment, marine vessels, locomotives, and some stationary equipment.

The primary emissions reduction incentives are awarded under the Diesel Emissions Reduction Incentive (DERI) program. DERI incentives are awarded to projects to replace, repower, or retrofit eligible vehicles and equipment to achieve NO_X emission reductions in Texas ozone nonattainment areas and other counties identified as affected counties under the TERP program where ground-level ozone is a concern.

From 2001 through July 2023, TCEQ awarded $1,314,330,754 in DERI grants for projects projected to help reduce a projected 190,070 tons of NO_X in the period over which emissions reductions are reported for each project under the program. This includes $425,897,757 going to activities in the DFW area, with a projected 65,411 tons of NO_X reduced in the DFW area in the period over which emissions reductions are reported for each project under the program.

Three other incentive programs under the TERP program will result in the reduction in NO_X emissions in the DFW area: the Drayage Truck Incentive Program, the Texas Clean Fleet Program (TCFP), and the Texas Natural Gas Vehicle Grant Program (TNGVGP). The

Drayage Truck Incentive Program was established in 2013 to provide grants for the replacement of drayage trucks operating in and from seaports and rail yards located in nonattainment areas. In 2017, the name of this program was changed to the Seaport and Rail Yard Areas Emissions Reduction Program (SPRY), and replacement and repower of cargo handling equipment was added to the eligible project list. Through July 2023, the program awarded $37,137,756, with a projected 1,643 tons of NO_X reduced in the period over which emissions reductions are reported for each project under the program. In the DFW area $1,644,277 was awarded to projects with a projected 72 tons of NO_X reduced in the period over which emissions reductions are reported for each project under the program.

The TCFP was established in 2009 to provide grants for the replacement of light-duty and heavy-duty diesel vehicles with vehicles powered by alternative fuels, including: natural gas, liquefied petroleum gas, hydrogen, methanol (85% by volume), or electricity. This program is for larger fleets; therefore, applicants must commit to replacing at least 10 eligible diesel-powered vehicles with qualifying alternative fuel or hybrid vehicles. From 2009 through July 2023, $81,617,123 in TCFP grants were awarded for projects to help reduce a projected 750 tons of NO_X in the period over which emissions reductions are reported for each project under the program. In the DFW area, $23,353,114 in TCFP grants were awarded with a projected 277 tons of NO_X reduced in the period over which emissions reductions are reported for each project under the program.

The TNGVGP was established in 2011 to provide grants for the replacement of medium-duty and heavy-duty diesel vehicles with vehicles powered by natural gas. This program may include grants for individual vehicles or multiple vehicles. From 2011 through July 2023, $59,636,804 in TNGVGP grants were awarded for projects to help reduce a projected 1,723 tons of NO_X in the period over which emissions reductions are reported for each project under the program. In the DFW area, $20,840,556 in TNGVGP grants were awarded to projects with a projected 602 tons of NO_X reduced in the period over which emissions reductions are reported for each project under the program.

Through FY 2017, both the TCFP and TNGVGP required that the majority of the grant-funded vehicle's operation occur in the Texas nonattainment areas, other counties designated as affected counties under the TERP, and the counties in and between the triangular area between Houston, San Antonio, and Dallas-Fort Worth. Legislative changes in 2017 expanded the eligible areas into a new Clean Transportation Zone, to include the counties in and between an area bounded by Dallas-Fort Worth, Houston, Corpus Christi, Laredo, and San Antonio.

5.3.1.5 Clean School Bus Program

House Bill 3469, 79th Texas Legislature, 2005, Regular Session, established the Clean School Bus Program, which provides monetary incentives to school districts in the state for reducing emissions of diesel exhaust from school buses through retrofit of older school buses with diesel oxidation catalysts, diesel particulate filters, and closed crankcase filters. As a result of legislative changes in 2017, this program also includes replacement of older school buses with newer, lower-emitting models. Through July 2023, TCEQ's Clean School Bus Program has awarded $76,900,769 in grants for retrofit and replacement activities across the state, resulting in a projected 302 tons of NO_X

reduced in the period over which emissions reductions are reported for each project under the program. This amount includes $4,694,101 in federal funds. Of the total amount, $11,171,324 was used for school bus retrofit and replacement activities in the DFW area, resulting in a projected 52 tons of NO_X reduced in the period over which emissions reductions are reported for each project under the program.

5.3.1.6 88th Texas Legislature

The bills passed during the 88th Texas Legislature, 2023, Regular and Special Sessions, that have the potential to impact air quality in the DFW area include HB 4885 and Rider 7 in the General Appropriations Act for TCEQ. For legislative updates regarding EE/RE measures and programs, see Section 5.3.1.2: *Energy Efficiency and Renewable Energy Measures.*

HB 4885, Relating to programs established and funded under the Texas emissions reduction plan.

HB 4885 changes the Texas Emissions Reduction Plan (TERP) programs to establish the Texas hydrogen infrastructure, vehicle, and equipment (THIVE) grant program and add downstream "refining" oil and gas activities to projects eligible for the New Technology Implementation Grant Program (NTIG). These programs are expected to accelerate the replacement of older, more polluting equipment with newer and cleaner equipment. New grant application periods for these programs are expected in Fiscal Year 2024 with public webinars to explain program requirements.

General Appropriations Act for the TCEQ, Rider 7 - Air Quality Planning

Rider 7 of the General Appropriations Act for TCEQ appropriated $2,500,000 for air quality planning activities to reduce fine particulate matter ($PM_{2.5}$) in affected counties not designated nonattainment for $PM_{2.5}$ NAAQS as of September 1, 2023, which includes the DFW area. Grants will be issued to local governments for inventorying emissions, monitoring of pollution levels, air pollution and data analysis; modeling pollution levels; and administration of the program. Because NO_X and VOC are precursors for both ozone and $PM_{2.5}$, these efforts may also help reduce ozone concentrations in the DFW area.

5.3.1.7 Local Initiatives

The North Central Texas Council of Governments submitted an assortment of locally implemented strategies in the DFW ozone nonattainment area that include projects, programs, partnerships, and policies. These strategies are currently being implemented in the DFW 2008 ozone NAAQS nonattainment area, and emissions benefits are ongoing. A summary of each strategy is included in Appendix E: *Local Initiatives Submitted by the North Central Texas Council of Governments.*

5.4 CONCLUSIONS

The TCEQ has used several sophisticated technical tools to evaluate the past and present causes of high ozone in the DFW 2008 ozone NAAQS nonattainment area to evaluate the area's future air quality. Historical trends in ozone and ozone precursor concentrations and their causes have been investigated extensively and result in the following conclusions.

The eight-hour ozone design value decreased from 2012 through 2022. The preliminary 2022 eight-hour design value for the DFW 2008 ozone NAAQS nonattainment area is 77 ppb, an 11% decrease from the 2012 design value of 87 ppb. The largest design value decreases occurred prior to 2014. After 2017, ozone declines in the DFW 2008 ozone NAAQS nonattainment area stagnated. This trend of recent slight decreases is seen not only in ozone design values, but also in the fourth-highest eight-hour ozone values and background ozone.

In general, background ozone accounts for approximately two-thirds of ozone in the DFW 2008 ozone NAAQS nonattainment area, and locally produced ozone accounts for approximately one-third of ozone in the area. Ambient concentrations of ozone precursors, point source emissions of ozone precursors, and meteorologically adjusted ozone appear to be trending down from 2012 through 2022. With precursor emissions and ambient concentrations also trending downward, it appears that most of the recent changes observed in ozone concentrations are due to meteorology.

Trends in VOC-to-NO_x ratios show that, although all three monitors measure in the transitional regime at some point over the 10-year period studied, one site to the northwest, Eagle Mountain Lake, has become NO_x-limited. While controls on either NO_x or VOC emissions may be effective in reducing ozone in the DFW 2008 ozone NAAQS nonattainment area, controls on either VOC or NO_x may not result in equal reductions in ozone, as one species may reduce ozone at greater rates than the other. Modeling shows that, although some monitors observe a benefit from VOC reductions, ozone decreases in larger amounts with NO_x reductions, especially in the areas with higher ozone readings.

This DFW AD SIP revision documents a fully evaluated photochemical modeling analysis and a thorough weight-of-evidence assessment. Based on TCEQ's modeling and available data, the DFW 2008 ozone NAAQS nonattainment area is expected to attain the 2008 ozone NAAQS by the July 20, 2027, attainment date.

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CHAPTER 6: ONGOING AND FUTURE INITIATIVES

6.1 INTRODUCTION

The Texas Commission on Environmental Quality (TCEQ) is committed to maintaining healthy air quality in the Dallas-Fort Worth (DFW) 2008 eight-hour ozone NAAQS severe nonattainment area (DFW 2008 ozone NAAQS nonattainment area) and continues to work toward this goal. Texas continues to invest resources in air quality scientific research related to better understanding of atmospheric chemical processes, the advancement of pollution control technology, refining quantification of emissions, and improving the science for ozone modeling. Additionally, TCEQ is working with the United States Environmental Protection Agency (EPA), local area leaders, and the scientific community to evaluate new measures for addressing ozone precursors. This chapter describes ongoing technical work that will be beneficial for identifying effective and efficient approaches for improving air quality in Texas and the DFW 2008 ozone NAAQS nonattainment area.

6.2 ONGOING WORK

6.2.1 Other Emissions Inventory Improvement Projects

The TCEQ emissions inventory (EI) reflects years of emissions data improvement, including extensive point and area source inventory reconciliation with ambient emissions monitoring data. Reports detailing recent TCEQ EI improvement projects are available at TCEQ's Air Quality Research and Contract Projects webpage (https://www.tceq.texas.gov/airquality/airmod/project/pj.html).

6.2.2 Air Quality Research Program

6.2.2.1 TCEQ Applied Research Programs

The TCEQ sponsors applied research projects to support the State Implementation Plan (SIP) and other agency requirements. Previous project goals included improving the understanding of ozone and particulate matter formation, developing advanced modeling techniques, enhancing emission estimates, and air quality monitoring during special studies. Final project reports can be found at TCEQ's Air Quality Research and Contract Projects webpage (https://www.tceq.texas.gov/airquality/airmod/project/pj.html).

6.2.2.2 Black and Brown Carbon ($(BC)^2$) Monitoring

The $(BC)^2$ monitoring project was created to identify the influence of wildfires and dust events on urban air quality in Texas. The study started in 2019 as a pilot study in El Paso sampling aerosol properties as indicators of biomass burning and dust impacts. The study expanded in 2020, adding three sites in the Houston area. After continued measurements in 2021 and 2022, the study is being enhanced with two sites in the DFW area. The $(BC)^2$ project has identified periods when biomass burning events are most likely in eastern Texas and has improved the understanding of dust effects in El Paso. The $(BC)^2$ data contribute to analyses studying the relationship between biomass burning and exceptional ozone and particulate matter air quality events.

6.2.2.3 Texas Air Quality Research Program (AQRP)

The AQRP program began in 2010 and has supported research in Houston, Dallas, San Antonio, and El Paso. Details about the AQRP and past research can be found at the University of Texas at Austin's AQRP webpage (https://aqrp.ceer.utexas.edu).

The goals of the AQRP are:

- to support scientific research related to Texas air quality in the areas of emissions inventory development, atmospheric chemistry, meteorology, and air quality modeling; and
- to integrate AQRP research with the work of other organizations and to communicate the results of AQRP research to air quality decision-makers and stakeholders.

The AQRP is supporting seven projects during the 2022-2023 biennium. Four projects that could have findings relevant to the DFW 2008 ozone NAAQS nonattainment area are listed below.

Statewide projects:

- Evaluating the Ability of Statistical and Photochemical Models to Capture the Impacts of Biomass Burning Smoke on Urban Air Quality in Texas (project number 22-003);
- Hydrogen Cyanide for Improved Identification of Fire Plumes in the $(BC)^2$ Network (project number 22-006); and
- Refining Ammonia Emissions Using Inverse Modeling and Satellite Observations Over Texas and the Gulf of Mexico and Investigating Its Effect On Fine Particulate Matter (project number 22-019).

Dallas-area project:

- Dallas Field Study; Ozone Precursors, Local Sources and Remote Transport Including Biomass Burning (project number 22-010).

6.2.3 Wildfire and Smoke Impact

The TCEQ is reviewing ambient air monitoring data from monitors in the DFW area and will flag the relevant data in the Air Quality System that are found to be of regulatory significance. Flagged data are considered to be influenced by emissions from wildfires, and TCEQ will further investigate the circumstances that affected the development of these ozone episodes.

Appendices Available Upon Request

Rachel Melton
Rachel.Melton@tceq.texas.gov
512.239.1512

RESPONSE TO COMMENTS RECEIVED CONCERNING THE DALLAS-FORT WORTH (DFW) SEVERE AREA ATTAINMENT DEMONSTRATION (AD) STATE IMPLEMENTATION PLAN (SIP) REVISION FOR THE 2008 EIGHT-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS)

The Texas Commission on Environmental Quality (commission or TCEQ) offered a public hearing in Arlington on January 11, 2024, at 7:00 p.m. During the comment period, which opened on December 1, 2024 and closed on January 16, 2024, the commission received comments from the U.S. Environmental Protection Agency (EPA), 350Dallas, Air Alliance Houston, City of Dallas, Dallas Environmental Commission, Dallas Sierra Club, Earthjustice, Environment Texas, Environmental Integrity Project, Glenn Springs Neighborhood, Greater Fort Worth Sierra Club, the Justice Network of Tarrant County, Liveable Arlington, Lone Star Chapter of Sierra Club, North Central Texas Council of Governments (NCTCOG), Public Citizen, Sierra Club, Tarrant County Coalition for Environmental Awareness, Texas Environmental Justice Advocacy Services (TEJAS), Texas Electric Transportation Resources Alliance (TxETRA) and 125 individuals.

In this response to comments, the commission uses "DFW area" to refer to the 2008 eight-hour ozone nonattainment area, consisting of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties, unless otherwise specified.

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GENERAL COMMENTS

Air Alliance Houston, Sierra Club, Environment Texas, Environmental Integrity Project TEJAS, and Earthjustice commented requesting a 30-day extension to the comment period. The extension was requested due to the amount of material to be reviewed in the proposed SIP and the coinciding holiday season. An additional public hearing was also requested to accommodate for the possible impact of the holidays on attendance at the originally scheduled hearing and to provide adequate opportunity for public participation.

The commission encourages public participation in the SIP development process and makes every effort to hold hearings in locations and at times that are accessible and convenient to the public. In addition to providing the opportunity to

comment at a public hearing, TCEQ also provides the public with the option to submit written comments by mail, fax, or electronically through TCEQ's Public Comment system. Instructions for the submittal of written comments were provided in the proposed SIP revision documents and public notices.

The commission strives to give all citizens of Texas appropriate prior notification and opportunity to comment. This SIP revision was filed with TCEQ's Chief Clerk's Office and made available to the public on TCEQ's website on November 20, 2023. Listserv subscribers received an e-mail notification on November 20, 2023, that this SIP revision was scheduled to be considered by the commission for proposal on November 29, 2023. On November 30, 2023, another e-mail was sent to listserv subscribers notifying the public that the commission had approved publication of, and hearing on, the proposal. These notices also directed the public to TCEQ's website, where all SIP revision documents and the public hearing notice were posted. The hearing notice for this SIP revision was published in English in the *Dallas Morning News* on December 1, 2023, in Spanish in *Al Día* on December 6, 2023. A hearing notice was also published in English in the *Texas Register* on December 15, 2023 (48 Texas Register 7642-7643).

The public comment period was open from December 1, 2023 through January 16, 2024, providing an additional 15 days beyond the required 30-day comment period in order to account for scheduling around the holidays. During this time, the public had the opportunity to provide both written and oral comment regarding this SIP revision to TCEQ. A public hearing was offered in Arlington on January 11, 2024.

The commission did not extend the comment period or hold additional hearings on this SIP revision. An extension of the public comment period would not allow staff time to adequately respond to comments, route SIP and rule revision documents through the required channels and submit adopted revisions to EPA by the required May 7, 2024 deadline. Commenters were notified of this decision on December 19, 2023, before the close of the comment period.

Air Alliance Houston, Sierra Club, Environment Texas, Public Citizen, TEJAS, and Earthjustice commented that TCEQ has failed to bring ozone levels in the Dallas area into compliance with levels protective of public health. The commenters stated that failure to attain the 2008 ozone standard continues to harm communities in these areas. Sierra Club and Earthjustice commented the Dallas-Fort Worth area was reclassified from serious to severe nonattainment under the 2008 ozone NAAQS effective November 7, 2022. The commenters stated this action by EPA means that air quality is currently unhealthy to breathe for millions of Texans who live, work, and recreate in the broader nonattainment area. Additionally, an individual stated that there was no justification for allowing DFW to continue failing the national health-based standards, as it has since 1991, and expressed gratitude at the redesignation of air quality in the area to severe. The Lonestar Chapter of Sierra Club stated the Houston-Galveston-Brazoria (HGB) and DFW areas fail to comply with the 2008 and 2015 ozone NAAQS, and Bexar County fails to comply with the 2015 ozone NAAQS.

Sierra Club and Earthjustice stated Texas's persistent and decades-long nonattainment crisis has real-world, everyday impacts on families, businesses, and tourism. Sierra Club, Earthjustice and 55 individuals commented Texans are facing the very real and

dangerous consequences of TCEQ's failure to submit state plans that meet the federal requirements for NAAQS. The commenters urged TCEQ to implement the most stringent plan possible to bring the DFW nonattainment area back into attainment for ozone pollution in accordance with the 2008 NAAQS, as required by the CAA. Public Citizen and three individuals also requested this plan be the most stringent plan possible, stating DFW has failed to be in compliance with the CAA since 1990. Another individual commented it is time to start taking action to make the entire region comply with the CAA. Sierra Club, Earthjustice, and one individual stated we must get back into attainment as soon as possible.

Two individuals requested a stringent plan to meet the CAA. Sierra Club, Earthjustice, and one individual stated this SIP revision needs to protect citizens to meet federal ozone standards. Sierra Club and Earthjustice added this SIP revision should include clearly enforceable mechanisms to reduce emissions in order to meet the CAA. Liveable Arlington requested meaningful revisions to TCEQ's SIP in order for the DFW region to comply with national ozone standards. Specifically, Liveable Arlington stated a meaningful revision must monitor, measure, account for, and require that industry use best available technologies to stop emissions from fracking. Another individual stated TCEQ must emphasize measures to help clean up pollution from fracking. They concluded that this will improve the health and quality of life for millions of residents. Sierra Club, Earthjustice, and one individual stated that we are overdue for real action from our leaders.

Sierra Club, Earthjustice and 12 individuals commented that TCEQ should create a strong ozone plan for the DFW nonattainment area and stated Texas should do more in its SIP submissions to reduce ozone pollution. Further, the 12 individuals encouraged the agency to reduce pollution and protect public health. Greater Fort Worth Sierra Club stated TCEQ is affecting their life quality and asked TCEQ to help by creating more stringent regulations. 350Dallas and one individual asked TCEQ to put more substantial regulations in place, and another individual noted it is critical that improvements to our air quality come from this SIP revision. Club, Earthjustice, and six individuals requested TCEQ make and carry out a strong and meaningful plan so that we can improve our air. Sierra Club, Earthjustice, and one individual advocated for the need to implement strict hazard laws as done in some of the Asian countries. Liveable Arlington requested that SIP revisions take strong action, specifically on emissions from Barnett shale gas extraction operations. Sierra Club, Earthjustice, and one individual insisted TCEQ better regulate large industries throughout the state and work with the Railroad Commission of Texas to get flaring under control. Sierra Club, Earthjustice, and one individual asked why not promote clean air and water, stating all living things need clean water and air. They claimed overpopulation and pollution are greater than ever and asked TCEQ to listen to science.

Sierra Club, Earthjustice, and one individual declared the air quality in the DFW area is bad and asked TCEQ to take action on this issue. They stated we need clean air in North Texas. Sierra Club, Tarrant County Coalition for Environmental Awareness, Earthjustice, and two individuals requested TCEQ improve air quality, stating TCEQ can do better. Sierra Club, Earthjustice, and one individual requested TCEQ create solutions and aid with improving the current air quality. Another individual stated it is time to change what TCEQ does and protect the people. Additionally, two individuals requested TCEQ do something, one of them claiming it would be "business as usual" to

not make an impactful change. One individual requested TCEQ do more and use better data. Sierra Club, Earthjustice and one individual noted, traveling towards Dallas, the smog is very evident, which makes them limit their trips to Dallas as much as possible. Sierra Club, Earthjustice, and one individual claimed living in Denton County over the last 20 years, they have watched the air quality degrade.

Two individuals stated the region needs to be cleaned up for the sake of current residents and future generations. Similarly, Sierra Club, Earthjustice, and one individual asked TCEQ to impose the strongest clean air standards possible for their families and their future. Sierra Club, Earthjustice, and one individual requested a clean, livable Texas for their children and all children. They commented that without proper regulations, polluters will continue to pollute our environment. The Dallas Environmental Commission asked TCEQ to toughen the standards around ozone and around pollution for the health of our children. One individual insisted TCEQ take bold action immediately to support a desirable, livable future and to avoid the economic penalties associated with severe non-compliance.

The commission takes its commitment to protect the environment and public health very seriously. The commission prepares and implements air quality plans in accordance with both state and federal law. Attainment of the ozone NAAQS is an ongoing challenge, particularly as EPA continues to revise the NAAQS to be more stringent. TCEQ remains committed to working with area stakeholders to attain the 2008 eight-hour ozone standard as expeditiously as practicable in accordance with EPA rules and guidance and the federal Clean Air Act (FCAA).

As shown in Figure 1-1: *Ozone Design Values and Population in the Dallas-Fort Worth Area* of this DFW AD SIP revision, both one-hour and eight-hour design values have decreased over the past 31 years. The 2022 one-hour ozone design value of 101 parts per billion (ppb) represents a decrease of 28%, nearly one-third the 1991 one-hour design value of 140 ppb. The 2022 eight-hour ozone design value of 77 ppb represents a 27% decrease from the 1991 eight-hour ozone design value of 105 ppb. The DFW area has been in attainment of the 1979 one-hour ozone NAAQS of 0.12 ppm since 2006 and was determined by EPA to be in attainment in 2020 (85 *Federal Register* (FR) 19096). Further, in 2014, the DFW area attained the 1997 eight-hour ozone NAAQS of 0.08 ppm as well. These decreases in design values occurred despite a 90% increase in area population from 1991 through 2021. The air quality in the DFW area has improved dramatically as a result of state, local, and federal air pollution control measures.

The FCAA requires EPA to set the primary ozone NAAQS at levels that protect the health of the public, including infants, children, the elderly, and those with pre-existing conditions, such as asthma. EPA considered these health impacts when setting the 2008 eight-hour ozone NAAQS.

The purpose of this DFW AD SIP revision is to demonstrate whether the DFW nonattainment area will or will not attain the 2008 eight-hour ozone standard in accordance with EPA's rules and guidance and FCAA requirements. TCEQ followed all relevant federal and state statutes, regulations, and guidance in the development of this SIP revision. Comments relating to attainment of the 2015 eight-hour ozone NAAQS are outside the scope of this SIP revision.

No changes were made to this SIP revision in response to these comments.

NCTCOG requested that TCEQ enhance public engagement for the SIP and partner with NCTCOG and local governments in the region to distribute information on public hearings. NCTCOG also stated they believe there is a need for TCEQ to be more specific in public engagement discussion to identify the number of meetings held, as well as include the attendance across all hearings, as opposed to stating that multiple meetings were held.

Additionally, NCTCOG requested that TCEQ organize more engagement and information meetings for the DFW region closer to the SIP proposal timeline to allow for a clearer understanding of the technical outcomes and for results not to be a surprise to those outside TCEQ.

NCTCOG stated that discussions should cover concluding results and summaries of the anthropogenic modeling emissions, ozone design values of base case, future design values, and scenario-based planning runs (such as zero-out runs on various emissions source categories, time-of-day analysis, etc.) and present these sensitivities at technical information meetings.

TCEQ hosted and attended multiple meetings for the DFW area related to the proposed SIP revision. Agenda topics included the status of DFW photochemical modeling development, emissions inventories and trends, ozone design values, and planning activities for the DFW 2008 Eight-Hour Ozone Severe Area AD SIP Revision. Attendees included representatives from industry, county and city government, environmental groups, and the public.

During 2021 and 2022, TCEQ conducted timely technical information meetings (TIMs) to present details of the 2019 modeling platform at key developmental stages. Information on these meetings is outlined in Section 1.4, *Stakeholder Participation and Public Meetings* of this SIP revision. Details on episode selection, emissions inventories and models used for input development, and preliminary future year design value (DVF) were presented at the meetings. Following these meetings, detailed emissions summaries were provided to stakeholders upon request. In addition to the TIMs, TCEQ also released preliminary modeling files to the public and requested feedback. The meteorological input files were made available publicly on June 7, 2021, and photochemical modeling files on December 29, 2021. TCEQ did not receive any feedback or comments on the preliminary modeling files. More information on DFW Air Quality TIMs is available at https://www.tceq.texas.gov/airquality/airmod/meetings/aqtim-dfw.html. Comments concerning future SIP planning are outside the scope of this AD SIP revision.

No changes were made to this SIP revision in response to these comments.

Public Citizen, Lone Star Chapter of Sierra Club, and two individuals commented EPA rejected TCEQ's previous SIP submittal under the 2015 eight-hour ozone NAAQS, stating the plan failed to effectively address the reclassified moderate nonattainment area. Public Citizen and one individual highlighted that the 2015 eight-hour ozone NAAQS is more protective than the 2008 eight-hour ozone NAAQS. Additionally, 12

individuals commented in support of the determination by EPA to reject TCEQ's previous SIP submittal for the DFW and HGB nonattainment areas under the 2015 eight-hour ozone NAAQS.

These comments are outside the scope of this SIP revision. However, as a point of clarification, TCEQ has submitted one SIP revision to EPA for the DFW nonattainment area concerning the 2015 eight-hour ozone NAAQS. On June 29, 2021, EPA published final approval of the 2015 Eight-Hour Ozone NAAQS Emissions Inventory SIP Revision for the HGB, DFW, and Bexar County Nonattainment Areas (86 FR 34139). While the DFW area failed to attain the 2015 eight-hour ozone NAAQS by the marginal classification attainment date, the EPA proposed an action for voluntary reclassification of the area from moderate to serious on January 26, 2024 (89 FR 5145). TCEQ has not submitted additional SIP revisions regarding the DFW 2015 ozone NAAQS nonattainment area.

No changes were made to this SIP revision in response to these comments.

One individual stated that we all have a responsibility to work together in order to protect and save our wilderness, waterways, and environment from senseless destruction and poisoning in the name of ignorance and greed.

The commission takes its commitment to protect the environment and public health seriously. The air quality in the DFW area has improved dramatically as a result of state, local, and federal air pollution control measures. The commission remains committed to working with area stakeholders and local governments to meet FCAA requirements as expeditiously as practicable.

No changes were made to this SIP revision in response to these comments.

EPA stated table 3-22 contains a typo, where "CMW" should be "CMV".

Table 3-24 of Appendix A: *Modeling Technical Support Document,* previously Table 3-22, has been updated to correct the typographical error.

NCTCOG commented they appreciate the opportunity to provide local initiatives (Appendix E) and continued collaboration between agencies to mitigate health and environmental impacts of pollution in the DFW region.

The commission appreciates NCTCOG's support. No changes were made to this SIP revision in response to these comments.

Greater Fort Worth Sierra Club commented they are concerned about pollution concentrations in East Fort Worth due to zoning allowing truck plants in concentrated areas.

Comments relating to zoning are outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

Sierra Club, Earthjustice, and one individual claimed the negative impact of humans on the planet has become increasingly understood. They stated, regardless of the natural

climate change, they believe with the use of fossil fuels, propellant spray cans, and nuclear run-off into the oceans, we are accelerating our own end along with every other species on the planet we chose not to live in harmony with. The commenters requested TCEQ make the efforts to correct our past mistakes.

This comment is outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

One individual claimed Arlington, Texas has unacceptable air quality directly tied to drilling activities of TOTAL and the company from which TOTAL allegedly acquired drilling rights in the Barnett Shale.

TCEQ implemented rule revisions in 30 TAC Chapter 115, Subchapter B, Division 7 to address requirements for oil and gas equipment in ozone nonattainment areas, including the DFW area, and followed recommendations in EPA guidance such as the 2016 Control Techniques Guidelines (CTG) for the Oil and Gas Industry (EPA-453/B-16-001).

No changes were made to this SIP revision in response to this comment.

One individual commented The American Lung Association asks that you adopt standards that could, with enforcement efforts from TCEQ, reduce future increases in large particulate emissions in the DFW area and statewide.

Comments relating to particulate emissions are outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

Sierra Club, Earthjustice, and 55 individuals stated that a large part of the nonattainment problem in Texas is related to increased temperatures. They commented that summers are getting hotter as the climate crisis is impacted by continued reliance on fossil fuels and failure to appropriately regulate industry. Sierra Club and Earthjustice requested more regulation of emissions from fossil fuels and industry. Sierra Club, Earthjustice, and one individual commented we must keep all fossil fuels in the ground and achieve 100% clean, renewable energy in electrical generation and transportation by 2030.

The purpose of this DFW AD SIP revision is to demonstrate whether the DFW nonattainment area will or will not attain the 2008 eight-hour ozone standard in accordance with EPA's rules and guidance and FCAA requirements. TCEQ does not have authority to eliminate the use of fossil fuel, nor does it have the authority to specify use of a particular fuel. Comments regarding efforts to address global warming are outside the scope of this SIP revision.

No changes were made to this SIP revision in response to these comments.

NCTCOG suggested TCEQ remove the Blue Skyways discussion from the DFW AD's *Chapter 5: Weight of Evidence*, specifically section *5.3.1.1*, as the initiative has not been active in EPA Region 6 in 10 years and is no longer resulting in meaningful impacts.

The commission will take the suggestion under advisement for future SIP development. No changes were made to this SIP revision in response to this comment.

EPA commented that the local initiatives provided by NCTCOG, detailed in Appendix E of the SIP revision, did not mention that Granbury in Hood County has been a member for numerous years of the Ozone Advance program. EPA stated it could be beneficial to encourage other communities (e.g., Ennis, Terrell, Forney, or Cleburne) to join the Ozone Advance program, since reductions in these upwind cities could provide measured benefit to the DFW Area.

The commission acknowledges the comment related to the Ozone Advance program. No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice claimed TCEQ's proposed DFW AD SIP is flawed and must be revised. They stated the DFW AD SIP fails to rationally demonstrate attainment under the 2008 ozone NAAQS, and the proposal will interfere with DFW's attainment of the 2008 standards and thus violate CAA Section 110(l). They commented that as the TCEQ SIP revision does not include sufficient controls on NO_x and VOC emissions, it will interfere with the DFW area's ability to attain the 2008 ozone NAAQs. The individual states that EPA cannot approve a SIP revision that interferes with attainment or progress.

Attainment of the ozone NAAQS is an ongoing challenge, particularly as EPA continues to revise the NAAQS to be more stringent.

As shown in Figure 1-1 of this DFW AD SIP revision, both one-hour and eight-hour design values have decreased over the past 31 years. The 2022 one-hour ozone design value of 101 ppb represents a decrease of 28%, nearly one-third the 1991 one-hour design value of 140 ppb. The 2022 eight-hour ozone design value of 77 ppb represents a 27% decrease from the 1991 eight-hour ozone design value of 105 ppb. The DFW area has attained the 1979 one-hour ozone NAAQS of 0.12 ppm since 2006 and was determined by EPA to be in attainment in 2020 (85 FR 19096). Further, in 2014, the DFW area attained the 1997 eight-hour ozone NAAQS of 0.08 ppm as well. These decreases in design values occurred despite a 90% increase in area population from 1991 through 2021. The air quality in the DFW area has improved dramatically as a result of state, local, and federal air pollution control measures.

The commission does not agree that this SIP revision violates FCAA, §110(l). This SIP revision provides photochemical modeling, reasonably available control technology (RACT) and reasonably available control measures (RACM) analyses, and a contingency plan as required by the FCAA, strengthening the SIP, which would not violate FCAA, §110(l).

NCTCOG expressed disappointment that TCEQ does not do more to support or request receipt of legislative appropriations for air quality emission reductions. NCTCOG stated these funds include approximately $176 million that still exists in Clean Air Account 151 from the now defunct Local Initiatives Project (LIP) and Low-Income Vehicle Repair, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP), which

could be used to fund local emissions enforcement task forces to combat fraudulent vehicle emission inspections, reduce high emitting vehicles on the road, and other transportation initiatives. NCTCOG also stated that the Texas Emissions Reduction Plan (TERP) has over $2 billion in dedicated revenue in Fund 5071, which NCTCOG posited could realize a potential reduction of around 45 tons per day of nitrogen oxides (NO_x) and approximately 1.5 ppb of ozone in the DFW area.

Regarding the appropriation of LIRAP funds, TCEQ remains neutral on appropriation requests to the legislature, as agencies may not legally engage in lobbying activities.

The commission acknowledges NCTCOG's interest in funding for TERP. Fund 5071 is a General Revenue Dedicated account that was established in 2001 by Senate Bill (SB) 5, 77th Texas Legislature, and comprises revenue received from the TERP fees (Texas Health and Safety Code, §386.250). Until September 1, 2021, the Texas Legislature appropriated a portion of the revenue remitted to fund 5071 for TCEQ to administer TERP programs. In 2019, House Bill (HB) 3745, 87th Texas Legislature, established the TERP Trust as a fund outside of the state treasury that would receive all new revenue from the TERP fees beginning September 1, 2021. HB 3745 directed TCEQ to utilize TERP Trust revenue for the TERP programs, in lieu of legislative appropriation from fund 5071. The TERP Trust increased the funding available for TERP programs in the 2022-2023 state fiscal biennium. TERP funding is and has been available in the DFW area. Section 5.3.1.4, *Texas Emissions Reduction Plan (TERP)* of this SIP revision details the amount of funding DFW has received from the various TERP programs as well as the resulting estimated emissions reductions in the area.

No changes were made to this SIP revision in response to this comment.

NCTCOG encouraged TCEQ to include LIP funds in its Legislative Appropriations Request ahead of the 89th Texas Legislative session occurring in 2025.

This comment is outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

Sierra Club, Earthjustice, and one individual commented to please plant more trees.

This comment is outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

Dallas Sierra Club and seven individuals stated they support NCTCOG's recommendations on transportation, solar projects, sustainable development, and other applicable measures to help aid the DFW area into compliance. They urged TCEQ to evaluate and implement as many of the strategies and actions proposed by NCTCOG as practical.

The commission remains committed to working with area stakeholders toward the common goal of attaining the 2008 eight-hour ozone standard as expeditiously as practicable and in accordance with EPA rules and guidance under the FCAA.

No changes were made to this SIP revision in response to this comment.

Twelve individuals commented that Texas recently discontinued safety inspections, which means that vehicles not meeting air pollution standards will go undetected. The commenters said that Texas must maintain emissions testing in counties where required and must ensure that car companies are not cheating on emission testing. The individuals also listed emissions tests, the smoking vehicle program, and remote emissions sensing as strategies to combat vehicle pollution.

Safety inspections for noncommercial vehicles in Texas are no longer required on January 1, 2025, due to the passage of House Bill 3297, 88th Texas Legislature, 2023, Regular Session. Texas will continue to implement the vehicle emissions inspection and maintenance (I/M) program in the counties where it is required. The I/M program in the DFW area includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties.

As a part of the DFW area's enhanced I/M program requirement under 40 Code of Federal Regulations (CFR) §51.351, the Texas Department of Public Safety (DPS) uses remote emissions sensing equipment to collect on-road vehicle emissions measurement data and identify high-emitters among the commuting fleet that are contributing disproportionately to air quality in the core metropolitan areas. The remote sensing program is aimed at identification of commuter polluters, raising public awareness, and deterring vehicle tampering and fraudulent inspections.

DPS is the agency in Texas that is responsible for enforcement of the I/M program, while EPA is responsible for enforcing federal engine standards. Texas law enforcement agencies may issue a citation to a driver of a smoking vehicle under the state's smoking vehicle statute in Texas Transportation Code §547.605.

No changes were made to this SIP revision in response to these comments.

One individual suggested that the state require vehicle emissions inspections in more areas than nonattainment counties because vehicles from elsewhere in the state drive through the DFW area and pollute the air.

State statute does not provide TCEQ with the authority to require vehicle emissions inspections in attainment counties, however Texas Health and Safety Code (THSC) §382.202(c)(2) offers counties in attainment areas the ability to opt into the I/M program. For example, Travis and Williamson Counties are NAAQS attainment counties, and emissions inspections have been required in those counties since September 1, 2005 as a result of voluntarily opting in to the I/M program.

As a part of the DFW area's enhanced I/M program requirement under 40 CFR §51.351, DPS uses remote emissions sensing equipment to collect on-road vehicle emissions measurement data and identify high-emitters among the commuting fleet that are contributing disproportionately to air quality in the core metropolitan areas. The remote sensing program is aimed at identification of commuter polluters.

No changes were made to this SIP revision in response to this comment.

Dallas Sierra Club and four individuals commented on the passage of HB 3297 from the 88th Texas Legislature, Regular Session, stating that it eliminates the state emissions inspection in 2025 except for in the DFW area counties. The commenters expressed concern for DFW's air quality if vehicles from other parts of the state are no longer required to be inspected as a result of this bill pass through the area. One individual encouraged TCEQ to call for the reversal of this legislation in the next session. One individual suggested that TCEQ inform and make clear to local officials and legislators the negative air and health impacts that will result from the passage of HB 3297.

HB 3297 only eliminates safety inspections for noncommercial vehicles. The bill does not affect emissions inspections and is not expected to have an adverse effect on air quality in the DFW area. Additionally, as a part of the DFW area's enhanced I/M program requirement under 40 CFR §51.351, DPS uses remote emissions sensing equipment to collect on-road vehicle emissions measurement data and identify high-emitters among the commuting fleet that are contributing disproportionately to air quality in the core metropolitan areas. The remote sensing program is aimed at identification of commuter polluters. No changes were made to this SIP revision in response to this comment.

The commission remains neutral on legislative matters as state government agencies may not legally engage in lobbying activities. No changes were made to this SIP revision in response to this comment.

NCTCOG commented that research is needed to see what effect fraud is having on air quality and what other initiatives can be done to enhance the I/M program.

As required by 40 CFR §51.366, TCEQ conducts the federally required biennial I/M program evaluation to assess the overall effectiveness of the Texas I/M program. This study has repeatedly concluded that the Texas I/M program is effective and in compliance with EPA's program requirements.

No changes were made to this SIP revision in response to this comment.

TxETRA commented that more incentives should be available in Texas to transition medium-duty and heavy-duty vehicles from internal combustion engines to battery electric. The commenter stated there was a need for funding for videos to educate the public about electric vehicles, including ride and drive events. The commenter also stated TCEQ should focus on vehicles that are truly zero emissions 24 hours per day and have benefits for those vehicle purchases. Another individual commented electric vehicles should be supported and encouraged.

The commission administers TERP in accordance with THSC Chapter 386. The TERP includes programs that provide financial incentives for individuals, businesses, governmental entities, and organizations to transition to medium-duty and heavy-duty vehicles that produce fewer emissions than the vehicles or equipment they currently operate. These TERP programs provide greater financial incentives for the replacement, upgrade, or purchase of vehicles and equipment that result in the greatest emissions reductions, including battery electric vehicles. TCEQ hosts informational webinars for each of the TERP programs and is actively planning and

implementing outreach activities that include billboards in both English and Spanish languages, videos, and participation in events and with organizations promoting the use of cleaner vehicles.

No changes were made to this SIP revision in response to this comment.

Liveable Arlington commented TCEQ should offer rebates for purchase of electric vehicles in nonattainment areas like DFW, expand charging infrastructure, fund removing tolls for electric vehicles, and rebate back the $200 per year fine being imposed by the state on EVs.

The commission administers the TERP in accordance with THSC Chapter 386. THSC §386.153, requires TCEQ to provide incentives for light-duty electric vehicles statewide under the Light-Duty Motor Vehicle Purchase or Lease Incentive Program, and limits those incentives to no more than $2,500 per qualifying electric vehicle purchase. However, many of the TERP grant programs prioritize funding for projects that reduce emissions from vehicles and equipment that operate primarily in the nonattainment areas of Texas. Additionally, TCEQ provides financial incentives for the construction or expansion of alternative fueling facilities, including Level II and Direct Current Fast Charging stations that will be located within the Texas Clean Transportation Zone (https://www.tceq.texas.gov/downloads/air-quality/terp/affp/affp-24-clean-transportation-zone-map.pdf). The Texas Clean Transportation Zone is an area established under THSC §393.001 that includes all of the nonattainment areas in Texas, in addition to the counties along and in-between the transportation corridors that connect those areas.

Regarding the $200 charge related to electric vehicles, the commission remains neutral on legislative matters as state government agencies may not legally engage in lobbying activities.

No changes were made to this SIP revision in response to this comment.

NCTCOG commented several TERP programs not currently listed in the SIP revision may achieve additional reductions, including the Light-Duty Motor Vehicle Purchase or Lease Incentive Program and Alternative Fueling Facility Program, which achieve benefits indirectly by facilitating broader use of cleaner alternative fuel vehicles.

While the commission recognizes that the Light-Duty Motor Vehicle Purchase or Lease Incentive Program and the Alternative Fueling Facilities Program may achieve emissions reductions indirectly by encouraging the use of alternative fuel vehicles in Texas, the programs do not require projected emissions reductions to be calculated in order to receive funding.. However, these programs could be considered for inclusion in the Weight of Evidence discussion in Chapter 5 of a future SIP revision.

No changes were made to this SIP revision in response to this comment.

TxETRA commented TERP incentives should focus on the areas of nonattainment and recommended that future iterations of the program focus in the areas that really need help.

The commission administers the TERP in accordance with THSC Chapter 386. This statutory provision requires TCEQ to provide incentives state-wide under the Light-Duty Motor Vehicle Purchase or Lease Incentive Program, the Texas Clean School Bus Program, and the New Technology Implementation Grant Program. However, the majority of TERP funding is awarded through grant programs that prioritize funding for projects that reduce emissions from vehicles and equipment that operate primarily in the nonattainment areas of Texas, or within the Texas Clean Transportation Zone (https://www.tceq.texas.gov/downloads/air-quality/terp/affp/affp-24-clean-transportation-zone-map.pdf). The Texas Clean Transportation Zone is an area established under THSC, §393.001 that includes all of the nonattainment areas in Texas, in addition to the counties along and in-between the transportation corridors that connect those areas.

No changes were made to this SIP revision in response to this comment.

NCTCOG commented that TCEQ should be proactive so as to attain the 2008 ozone standard, but also to avoid potential FCAA, Section 185 fees that would greatly impact the region.

This adopted SIP revision contains adequate measures to demonstrate attainment by the attainment date. The RACM analysis indicated that there were no potential control measures that would advance attainment.

Comments regarding future rulemaking, such as Section 185 fees, are outside the scope of this AD revision.

No change was made to this SIP revision in response to this comment.

Sierra Club and Earthjustice commented that Texas residents living in urban and environmental justice (EJ) communities with worse air quality have much poorer health outcomes, as reflected in asthma hospitalization rates. They further stated that nonattainment areas in Texas have some of the highest EJ indices for ozone pollution according to EPA. Sierra Club and Earthjustice also stated ozone pollution disproportionately impacts low income and communities of color in the DFW area, and these impacts should be considered and modeled in TCEQ's AD SIP. They stated that while the health impacts of ozone are ubiquitous, certain populations are at an increased risk for ozone-related health effects including people of color. They stated that because asthma disproportionately affects communities of color, TCEQ must reduce ozone pollution and NO_x emissions to address the unequal public health harm in the SIP. Sierra Club and Earthjustice commented that over half of all Texans live in areas that repeatedly experience air that EPA has determined unsafe to breathe and this disproportionality impacts disadvantaged communities. Finally, Sierra Club and Earthjustice stated that TCEQ failed to consider EJ concerns when determining if additional emissions reduction measures were needed for this evaluation period. Sierra Club and Earthjustice further commented that TCEQ's failure to incorporate EJ analyses into the SIP is inexcusable.

EPA requested TCEQ carefully review applicable authorities for opportunities to incorporate EJ considerations and ensure they have been adequately and appropriately incorporated in this SIP. In addition, EPA suggested that TCEQ consider the number of pollution sources, major and minor, in a geographic area as part of evaluating community risk during SIP development.

EPA encouraged TCEQ to use both EJScreen and specific area information in developing its SIP to consider potential issues related to civil rights of the communities potentially impacted. EPA commented that using EJScreen would indicate whether a SIP revision has the potential to contribute to significant public health or environmental impacts, if the community may be particularly vulnerable to impacts from the SIP revision, and whether the community is already disproportionately impacted by public health and/or environmental burdens on the basis of demographic factors.

Sierra Club stated that ozone exposure does not affect all Texans equally and noted that EPA's EJScreen tool shows areas of concern, pointing out specific index values for Dallas, Fort Worth, and San Antonio.

One individual commenter requested that TCEQ do better for minority communities.

The purpose of this DFW AD SIP revision is to demonstrate whether the DFW nonattainment area will or will not attain the 2015 eight-hour ozone standard in accordance with EPA's rules and guidance and FCAA requirements. TCEQ followed all relevant federal and state statutes, regulations, and guidance in the development of this SIP revision and evaluated all relevant information, including emission sources, in reaching its decision regarding the appropriate control strategies for the DFW nonattainment area.

The SIP is not the appropriate mechanism to address EJ issues. No federal or state statute, regulation, or guidance provides a process for evaluating or considering the socioeconomic or racial status of communities within an ozone nonattainment area. In a recent proposed approval of a TCEQ submittal for El Paso County, which did not include an EJ evaluation, EPA stated that the FCAA "and applicable implementing regulations neither prohibit nor require such an evaluation" (88 FR 14103). Further, TCEQ's jurisdiction for air quality permits is limited by statute; for example, TCEQ may not consider location, land use, or zoning when permitting facilities. TCEQ continues to be committed to protecting Texas' environment and the health of its citizens regardless of location. Specific health-related concerns are further addressed elsewhere in this response to comments.

While EPA may encourage states to utilize EJScreen in SIP actions, it is not necessary, because the NAAQS are protective of all populations. If the NAAQS are not sufficient to protect public health, it is incumbent upon EPA to revise the NAAQS.

TCEQ provided the public equal access in accordance with Title VI of the Civil Rights Act. This SIP revision was developed in compliance with the policies and guidance delineated in TCEQ's Language Access Plan (LAP) (https://www.tceq.texas.gov/downloads/agency/decisions/participation/language-access-plan-gi-608.pdf) and TCEQ's Public Participation Plan (PPP)

(https://www.tceq.texas.gov/downloads/agency/decisions/participation/public-participation-plan-gi-607.pdf). The LAP helps ensure individuals with limited English proficiency may meaningfully access TCEQ programs, activities, and services in a timely and effective manner; and the PPP identifies the methods by which TCEQ interacts with the public, provides guidance and best practices for ensuring meaningful public participation in TCEQ activities, and highlights opportunities for enhancing public involvement in TCEQ activities and programs.

In accordance with the PPP, EJScreen was used to conduct a preliminary analysis of the population in the DFW nonattainment area, which was then used to plan public engagement efforts for this SIP revision. Specifically, TCEQ developed plain language summaries, GovDelivery notices, public hearing notices, and SIP Hot Topics notices that were provided in English and Spanish for all projects. The newspaper hearing notice for this SIP revision was also translated and published in a Spanish language newspaper, and it included a statement that Spanish interpretation would be available at the hearing. Additionally, two Spanish language interpreters were available at the hearing.

No changes were made to this SIP revision in response to these comments.

Sierra Club and Earthjustice stated that the Sonoma Report shows Texas' coal fired electric generating units (EGU) are having outsized impacts on environmental justice communities in nonattainment areas and that these communities are not well reflected in the AQS monitoring network.

Federal monitoring network design criteria used to determine the number and placement of monitors reporting to the Air Quality System (AQS) require agencies to site monitors in populated areas that represent regional air quality where people live, work, and play, and are not generally sited to assess impacts from specific industrial sources. TCEQ is federally required to operate a minimum of three ozone monitors in the DFW-Arlington metropolitan statistical area (MSA), based on the most recent population estimates and the three-year ozone design value. Texas exceeds these requirements with 18 ozone monitors in the MSA, 16 of which are located in the DFW area and include communities located near heavily industrialized areas. TCEQ currently meets federal requirements. The TCEQ annually evaluates the number and location of air monitors within its network to assess compliance with federal monitoring requirements and the adequacy of monitoring coverage for identified monitoring objectives as a part of the Annual Monitoring Network Plan provided to EPA on July 1 of each year. Details regarding the annual review of the air monitoring network are located on TCEQ's website (https://www.tceq.texas.gov/airquality/monops/past_network_reviews).

No changes were made to this SIP revisions in response to this comment.

One commenter stated that many gas wells are approved in areas where most people are renters and may be low income or speak English as a second language.

Air quality permits are not the subject of this SIP revision and, therefore, are outside the scope of this review. When TCEQ is required to review air quality permits, it does so without reference to the socioeconomic or racial status of the

surrounding community. TCEQ is committed to protecting the health of the people of Texas and the environment regardless of location. Therefore, control measures implemented for a polluting source are protective of all populations at any location.

TCEQ's jurisdiction is established by the Texas Legislature and is limited to the issues set forth in statute. Accordingly, TCEQ does not have jurisdiction to consider plant location, zoning, or land use when determining whether to approve or deny an air quality permit application, unless a statute or rule imposes specific limitations. The issuance of an air quality authorization does not override any local zoning or land use requirements.

No changes were made to this SIP revision in response to these comments.

EMISSIONS INVENTORY

EPA commented that there was a large decrease in Oil and Gas emissions between 2019 and 2026 shown in Table ES-1: *Summary of 2019 Base and 2026 Future Case Anthropogenic Modeling Emissions for DFW 2008 Ozone NAAQS Nonattainment Area for the June 12 Episode Day* of the proposed SIP revision from a sector that has shown decreases in previous SIP submittals as well. EPA also commented that they are skeptical of the large reductions in volatile organic compound (VOC) emissions from oil and gas production sources in the Barnett Shale and asked to confirm that these reductions are possible using Texas Railroad Commission (RRC) data.

As explained in Appendix A of this SIP revision, the 2019 RRC activity data was used to develop the base 2019 emissions estimates for oil and gas sources and emissions estimates for 2026 were developed using projection factors developed for TCEQ by Eastern Research Group (ERG). Further, as explained in Appendix A, additional controls were applied to 2026 VOC emissions for some oil and gas production sources based on current regulations that will take effect on January 1, 2026. More information on the ERG projection factors and these regulations can be found in Section 3.8.1 on pages A-72 and A-73 in Appendix A of this SIP revision.

Emissions modeling files including RRC inputs and files used to apply ERG projection factors and additional VOC reductions to determine the oil and gas emissions estimates can be found on TCEQ's file transfer protocol (FTP) site and Section 6: *Modeling Data Archive* of Appendix A provides details on how to access these files.

Recent RRC data on oil and gas production it has decreased from 2019 to 2022, which correlates with a decrease in emissions. The RRC production data for 2019 through 2022 for the 25 counties in the Barnett Shale was queried from the RRC Oil and Gas Production Data Query website on January 30, 2024. The query results show that crude oil production decreased by 16%, condensate production decreased by 21%, and natural gas production decreased by 19%.

No changes were made to this SIP revision in response to this comment.

EPA suggested that TCEQ provide a summary discussion of the expected difference between MOVES4 and TCEQ's MOVES3 on-road emissions inventory for the DFW and HGB areas. EPA noted the MOVES4 model was released on September 12, 2023, and TCEQ could have included reported improvements to the on-road emissions inventory from the MOVES4 model as weight of evidence.

The commission develops highly resolved, link-based on-road emissions inventories for its ozone SIP revisions. These emissions inventories contain Texas-specific vehicle registration, fuel survey, and vehicle inspection and maintenance data, as well as data developed from transportation travel demand models, such as vehicle miles traveled, trip starts and ends, speed, and other activity data.

The commission does not have the resources to perform the necessary travel demand modeling and must work with a grant partner, Texas A&M Transportation Institute, to develop its on-road mobile emissions inventories. The process to develop these emissions inventories typically takes a minimum of 12 months and can take longer if inputs need to be developed or the MOVES model changes. With the release of MOVES4 two months before TCEQ proposed these SIP revisions, TCEQ had no time to assess preliminary impacts of MOVES4. As EPA stated in its notice of availability published in the *Federal Register* on September 12, 2023, "[….] state and local agencies that have already completed significant work on a SIP with a version of MOVES3 (e.g., attainment modeling has already been completed with MOVES3) may continue to rely on this earlier version of MOVES" (88 FR 62567, 62569). Additionally, a cursory assessment of MOVES4 improvements would not necessarily accurately predict the direction of resulting on-road emissions changes due to the complexity of on-road model inputs and would likely not be robust enough to include as weight-of-evidence.

No changes were made to this SIP revision in response to this comment.

An individual and Liveable Arlington commented that there were 7,500 gas wells in Tarrant County.

A February 2024 well count report from the RRC shows an active well count for Tarrant County of 3,989 gas wells.[1]

No changes were made to this SIP revision in response to this comment.

Liveable Arlington stated that ozone numbers have continued to rise in the Barnett shale counties in the western half of the DFW nonattainment area due to continued fracking and increasing well counts. One individual stated the western end of DFW metroplex is overrun by fracking.

The commission disagrees with these comments. From 2012 through 2022, decreases in ozone design values were recorded at all monitors located in the north and northwest of the DFW area, notably those near or within the Barnett Shale oil and gas formation (Denton Airport South -8%, Frisco -11%, Grapevine Fairway -12%,

[1] https://www.rrc.texas.gov/oil-and-gas/research-and-statistics/well-information/well-distribution-by-county/

Keller -17%, and Pilot Point -1%). Only one did not record a decrease (Eagle Mountain Lake +9%). Ozone monitors located in the eastern portion of the DFW area uniformly recorded decreases over the period (Cleburne Airport -6%, Corsicana Airport -7%, Greenville -13%, Kaufman -7%, and Rockwall Heath -11%). Most urban ozone monitors also recorded decreases (Dallas Hinton -18%, Dallas North #2 -12%, Dallas Executive Airport -12%, Arlington Municipal Airport -13%) with only one recording an increase (Ft. Worth Northwest +12%).

The commission does not have analysis that correlates ambient levels of both NO_x and VOC sources specifically with drilling and fracking. While new oil and gas wells continue to be drilled and hydraulically fractured in the Barnett Shale area, the numbers are very low historically. The Baker Hughes counts of active drilling rigs in the Barnett Shale from 2011 through 2023 indicates that the average number of active drilling rigs each week has dropped by over 90% (from 72 in 2011 to only one in 2020).[2] While there was a small uptick in the drilling rig count in 2022 (going from one in both 2020 and 2021 to three in 2022), it has fallen back to 2020 levels (one in 2023 and the first month of 2024).

Also, the DFW area total well count has decreased in the past 10 years, not increased. The total number of active oil and gas wells in the DFW 10-county nonattainment area peaked at 17,225 in 2014 and has steadily decreased to 15,574 in 2022. The total number of active wells in the 25 county Barnett Shale area has followed a similar pattern, peaking at 42,093 in 2014 and steadily decreasing to 35,470 in 2022.

No changes were made to this SIP revision in response to this comment.

Liveable Arlington commented that the Barnett Shale inventory completed in 2009 showed 8,600 compressors and equipment authorized under Permit by Rule and asserted that the numbers have only gone up.

The total number of active wells in the Barnett Shale area peaked at 42,093 in 2014 and has steadily decreased to 35,470 in 2022. Over the same period, oil production has decreased by 47%, gas production has decreased by 52%, and condensate production has decreased by 79%. As production declines at older wells, those wells are shut down, and the equipment at those sites is either idled or moved to different sites. It is unlikely that the number of active Barnett compressors and equipment is greater now than in 2009, regardless of authorization type.

No changes were made to this SIP revision in response to this comment.

Nineteen individuals commented that TCEQ used drilling rig counts from 2014 or 2015 in the DFW SIP, which is unacceptable when more recent rig counts are readily available.

The drilling rig emissions contained in the DFW AD SIP revision and concurrent DFW-HGB 2008 Ozone NAAQS Severe Reasonable Further Progress (RFP) SIP revision (Project No. 2023-108-SIP-NR) are not based on drilling rig counts from

[2] https://rigcount.bakerhughes.com/na-rig-count, accessed on January 30, 2024.

2014 or 2015. TCEQ obtains the amount of feet drilled in a given calendar year from the RRC, which provides a more accurate emissions estimate than the drilling rig count. TCEQ developed 2023 and 2026 emissions based on actual 2020 county-level amounts of feet drilled from the RRC since this was the most recent set of data available at the time of SIP development.

No changes were made to this SIP revision in response to this comment.

Seven individuals commented that TCEQ incorrectly indicated that drilling rig activity was expected to decline by 2020. The individuals stated that the Arlington area has increased drilling activity.

While new oil and gas wells continue to be drilled and hydraulically fractured in the Barnett Shale area, which includes the Arlington area, the number of drilling permits issued in this area in 2023 amounts to its lowest levels in the past 24 years based on RRC data.[3] The Baker Hughes counts of active drilling rigs in the Barnett Shale from 2011 through 2023 also reflect this trend, indicating that the average number of active drilling rigs each week has dropped by over 90% (from 72 in 2011 to only one in 2020).[4] While there was a small uptick in drilling rigs in 2022 (going from one in both 2020 and 2021 to three in 2022), it has fallen back to 2020 levels (one in 2023 and the first month of 2024).

No changes were made to this SIP revision in response to this comment.

HEALTH EFFECTS AND ENVIRONMENTAL IMPACTS

Liveable Arlington and four individuals supported the notion that the state should tighten its rules on cancer risks to be more protective of human health. Liveable Arlington and one individual stated that EPA has set its upper cancer risk to 1 in 10,000 and has set a target level of 1 in 1 million. Liveable Arlington and two individuals commented that TCEQ should reverse its new policy that loosened the threat risk from toxic pollution to 1 in 100,000, stating that this proposal was made by the agency without any public hearing.

The commission's target cancer risk level of 1 in 100,000 does not apply to EPA's NAAQS for the criteria pollutants, including ozone. Therefore, comments about the target cancer risk level are outside of the scope of this SIP revision.

No changes were made to this SIP revision in response to these comments.

Liveable Arlington stated that TCEQ raised the amount of the VOC benzene it considers an acceptable level of exposure for permitting purposes in 2007, doubling it to 54 parts per billion for brief periods, and to 1.4 ppb for longer durations. Liveable Arlington further stated that the agency's brief-exposure guideline for benzene is even higher at 180 parts per billion for air-monitoring purposes. They added that the World Health Organization's guidelines for benzene emphasized that no safe level of

[3] https://www.rrc.texas.gov/media/srpkgz4w/drilling-permits.pdf

[4] https://rigcount.bakerhughes.com/na-rig-count

exposure can be recommended and that research separately produced for the American Petroleum Institute and Shell as far back as the 1940s, which was later introduced in court proceedings, also concluded that no amount of benzene was safe. Liveable Arlington also stated that even after TCEQ increased its benzene guidelines, it found the carcinogen at levels that exceeded them. They commented that during a Barnett monitoring project in 2009, agency employees discovered benzene above that yardstick in nearly a third of the 64 sites where they tested. And that most of the problem samples exceeded the guideline for exposure over an extended time, with tests at two of the sites coming back so high and above the 180-parts-per-billion level deemed safe for brief exposure — including a 15,000 parts-per-billion measurement at a well pad and thirty-four other chemicals exceeding TCEQ's short-term guidelines, too.

Benzene concentrations and associated comparison values do not apply to EPA's NAAQS for the criteria pollutants, including ozone. Therefore, comments about benzene are outside of the scope of this SIP revision.

No changes were made to this SIP revision in response to these comments.

An individual asked that TCEQ take extreme action to meet citizen health and wellness needs to ensure a stable economy. One individual requested TCEQ protect public health. Three individuals requested the SIP be the most stringent plan possible as they are concerned for their health and that of the community. They claimed the agency was placing more families and children at risk for their health. Similarly, Liveable Arlington and Justice Network of Tarrant County requested meaningful action by TCEQ to clean up the air and help improve the health and quality of life of millions of residents impacted in the region. Sierra Club, Earthjustice, and one individual requested clean air to breathe for those in the DFW area with existing health conditions.

Sierra Club, Earthjustice and one individual commented that the literal air we breathe is negatively affecting Texans on a daily basis, hurting people's collective health and putting an economic burden on citizens and public health sectors. Another individual indicated that they were born prematurely and expressed concern about premature birth and advised that premature birth statistics should not be dismissed, claiming that though many babies appear normally healthy at birth, untold serious health issues may develop subsequently. Sierra Club, Earthjustice, and one individual expressed concern about thousands of deaths and countless health issues caused by bad air quality. Sierra Club, Earthjustice, and two individuals highlighted the need to protect children and people with compromised lungs. Sierra Club, Earthjustice, and one individual stated that air quality has gotten out of control and is costing children and adults their health and advised that Texas be made better by looking after children's health while saving healthcare costs and lost opportunities due to respiratory health complications. The Dallas Environmental Commission requested that TCEQ toughen the standards around ozone and around pollution for the health of our children. Two individuals commented the emissions of volatile organic compounds like benzene, xylene, toluene, and other hazardous air pollutants that harm human health are also the building blocks of ozone that the agency needs to reduce to bring the region into compliance with national standards.

Sierra Club, Earthjustice, and one individual commented that the air is so polluted with toxics from commercial facilities and vehicles with terrible exhaust systems, which add more problems to citizens health. An individual was concerned about pollution sources diminishing the health of citizens in the area.

The commission takes its commitment to protect the environment and public health very seriously. The commission does review ambient pollutant concentrations, which are impacted by emissions from all sources, including those that are not regulated by TCEQ.

The FCAA requires EPA to set NAAQS for criteria pollutants (particulate matter, ground-level ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead), which are known to affect human health and the environment, at levels that protect the health of the public, including infants, children, the elderly, and those with pre-existing conditions, such as asthma. Many different health effects have been investigated to determine whether they are caused by ozone exposure. However, because data from minimal or inconsistent studies do not provide the weight of evidence necessary to demonstrate that a pollutant exposure causes a health outcome, only those health outcomes with consistent, robust data are determined to be causally associated with exposure to ozone in EPA's science assessments. The 2006 Air Quality Criteria for Ozone and Related Photochemical Oxidants document stated that the overall evidence supported a causal relationship between acute ambient ozone exposures and increased respiratory effects (increased respiratory morbidity outcomes resulting in increased emergency visits and hospitalizations during the warm season) but was inconclusive for long-term ambient ozone exposures. No other causal determinations were made.[5]

In addition to meeting federal requirements for ambient air quality monitoring, the commission also conducts additional ambient air quality monitoring across the state for about 84 VOCs. TCEQ toxicologists and data analysts continually evaluate ambient concentrations from approximately 500 pollutant monitors statewide, of which currently 87 pollutant monitors are in the DFW area, to ensure that pollutant concentrations remain below a level of potential health concern, according to TCEQ-derived air monitoring comparison values and EPA's NAAQS. TCEQ provides public access to its monitoring data and evaluations on the Air Quality Data and Evaluations webpage (https://www.tceq.texas.gov/agency/data/lookup-data/aq-data.html) and provides an ozone alert system so that members of the public are aware of elevated ozone concentrations.

Data from monitoring air toxics can be used for finding pollution sources, evaluating air permit applications, and identifying potential health concerns. Additionally, TCEQ, through its air permitting program, ensures the use of best available emission control technology at industrial sites and conducts a protectiveness review of impacts from pollutants, considering surrounding land use and predicted concentrations from air dispersion modeling using set guidelines. The Air Pollutant Watch List (APWL) program is designed to address areas in Texas where data show persistent, elevated concentrations of air toxics by developing a

[5] EPA. Air Quality Criteria For Ozone and Related Photochemical Oxidants (Final Report, 2006). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-05/004aF-cF, 2006.

strategic action plan, forming a work group, increasing monitoring and inspections, ensuring stricter air permit reviews for industrial sites, and negotiating with companies to make additional emission reductions.

Overall, the commission remains committed to ensuring the protection of public health and the environment in the state by basing decisions on the law, common sense, sound science, and fiscal responsibility; ensuring that regulations are necessary, effective, and current; applying regulations clearly and consistently; ensuring consistent, just, and timely enforcement when environmental laws are violated; ensuring meaningful public participation in the decision-making process; and promoting and fostering voluntary compliance with environmental laws.

No changes were made to this SIP revision in response to these comments.

Two individuals commented that Tarrant County has been out of compliance with the Clean Air Act for decades and stated that this is unacceptable since damage to health from air pollution can be permanent. The commenter emphasized dependence on the agency to protect collective health of citizens from the effects of ozone and air pollution. Another individual stated that Dallas County has the highest rate of asthma in children in the country and that the primary reason children are admitted to the emergency room in Dallas County is asthma. This commenter also stated that asthma is the primary reason children miss school in Dallas County and that no one in the commenter's Baby Boomer generation had childhood asthma. This commenter stated that asthma and other severe respiratory illnesses are now occurring more because of reliance on sick air for life and, thus, death among the citizens. The commenter stated even the pets in Dallas County are afflicted with this horrible respiratory illness, given an environment that makes one unable to breathe. One individual emphasized the need to remember children who cannot get to school or miss school because of asthma, and wondered if people know what it is like to have asthma. One individual stated that the agency should consider asthma patients and all who suffer from poor air quality in the DFW area and implement rules that will help meet the FCAA standards. A comment provided by one individual, which was submitted by Sierra Club and Earthjustice, mentioned they take medication to protect them from breathing problems as the air quality is very poor. Two individuals stated TCEQ must have a comprehensive plan to improve air quality, or asthmatics will continue to suffer.

A comment provided by one individual, submitted by Sierra Club and Earthjustice, stated that her husband never smoked but suffers from chronic obstructive pulmonary disease in part due to living for years in the DFW area. Sierra Club, Earthjustice and 59 individuals stated that the DFW area has been rated the 18th most polluted urban area in the country. It was mentioned that this could be especially maddening for an adult-onset asthma sufferer since more could be done for the inhabitants of the area. Sierra Club, Earthjustice, and six individuals also stated that the American Lung Association ranked DFW as the 18th most polluted city for ozone pollution in the U.S. and that Dallas County received an "F" grade for ozone pollution.

The commission takes it responsibilities very seriously and endeavors to protect public health and the environment in every action it takes, including those intended to reduce air pollution. TCEQ prepares and implements air quality plans in accordance with both state and federal law. TCEQ reviews and considers ambient

pollutant concentrations that are impacted by emissions from all sources including those that are not regulated by TCEQ through the assessment of data from the ambient air monitoring network.

In addition to meeting federal requirements for ambient air quality monitoring, TCEQ toxicologists and data analysts continually evaluate ambient concentrations from approximately 500 pollutant monitors statewide to ensure that pollutant concentrations remain below a level of potential health concern, according to TCEQ-derived air monitoring comparison values and EPA's NAAQS. TCEQ provides public access to its monitoring data and evaluations on the Air Quality Data and Evaluations webpage (https://www.tceq.texas.gov/agency/data/lookup-data/aq-data.html) and provides an ozone alert system so that members of the public are aware of elevated ozone concentrations.

The commission is committed to maintaining healthy air quality across the state and continues to work toward this goal. Texas is investing resources into technological research and development for advancing pollution control technology, refining quantification of emissions, and improving the science for ozone modeling and analysis. Refining emissions quantification helps improve understanding of ozone formation, which benefits the SIP. Additionally, TCEQ is working with EPA, local area leaders, and the scientific community to evaluate new measures for addressing ozone precursors. The State of Texas Air Quality Research Program (AQRP) supports scientific research related to Texas air quality in the areas of emissions inventory development, atmospheric chemistry, meteorology, and air quality modeling Reports detailing TCEQ emission inventory improvement projects can be found at TCEQ's Air Quality Research and Contract Projects webpage (https://www.tceq.texas.gov/airquality/airmod/project/pj.html). TCEQ remains committed to working with area stakeholders to attain both the 2008 and 2015 eight-hour ozone NAAQS across the entire area as expeditiously as practicable and in accordance with EPA rules and guidance under the FCAA.

The FCAA requires EPA to set the primary ozone NAAQS at levels that protect the health of the public, including infants, children, the elderly, and those with pre-existing conditions, such as asthma. Current scientific literature does not provide a definitive link between ambient ozone levels and asthma development. The trends in asthma prevalence and the lack of a definitive link between ambient ozone concentrations and asthma rates are consistent on the national scale. Large, multi-city studies, which have included Dallas, have not indicated a correlation between ambient concentrations of ozone and increased incidence of asthma symptoms.[6,7] Also, EPA's analysis completed as part of the 2015 eight-hour ozone NAAQS, does not anticipate a statistically significant reduction in asthma exacerbations as a

[6] O'Connor GT, Neas L, Vaughn B, Kattan M, Mitchell H, Crain EF. et al. 2008. Acute respiratory health effects of air pollution on children with asthma in US inner cities. J Allergy Clin Immunol. 121(5):1133-1139.

[7] Schildcrout JS, Sheppard L, Lumley T, Slaughter JC, Koenig JQ, and Shapiro GG. 2006. Ambient air pollution and asthma exacerbations in children: An eight-city analysis. American Journal of Epidemiology, 164:505-517

result of a lower standard.[8] Therefore, because asthma rates have remained steady while ambient levels of both ozone and ozone precursors have been steadily decreasing and because asthma rates can be higher in areas with lower ozone, it does not appear that ambient ozone concentrations are a significant contributing factor to asthma rates.

Although the causes of asthma are not fully understood, there are many factors that influence the development and exacerbation of asthma. According to the World Health Organization, asthma is more likely if other family members also have asthma and in people who have other allergic conditions. Asthma is associated with urbanization and is increased in people who have damaging early life events (such as prematurity and low birth weight), and environmental allergens, irritants, and obesity are also thought to increase the risk of asthma. It is also more prevalent among some racial and ethnic groups.[9]

Additionally, data from the Texas Department of State Health Services, Texas Health Care Information Collection (THCIC), Inpatient Hospital Discharge Public Use Data File, 2009-2021, shows that from 2009-2020, the DFW MSA (Dallas, Hunt, Parker, Kaufman, Johnson, Tarrant, Ellis, Hood, Denton, Rockwall, Collin, and Wise Counties) age-adjusted asthma hospitalization rates per 10,000 were lower than overall Texas rates.[10] Also, data from U.S. Centers for Disease Control and Prevention (CDC), shows that the crude (nonage-adjusted) asthma hospitalization rate for the DFW MSA is lower than the Texas and U.S. (nonage-adjusted, 2010-2019) rates for children under 18 years of age.[11]

As shown below in Figure 1: *Age-Adjusted Child Asthma Hospital Discharge Rates (per 10,000) by Year, 2009-2021*, in 2021 the age-adjusted asthma hospitalization discharge rate among those 17 years and younger in the DFW MSA was 3.7 per 10,000. This was a statistically significant decrease from the age-adjusted hospitalization rate of 17.1 per 10,000 in 2009.

[8] EPA. 2015. The National Ambient Air Quality Standards. Overview of EPA's updates to the air quality standards for ground-level ozone. https://www.epa.gov/sites/default/files/2015-10/documents/overview_of_2015_rule.pdf.

[9] World Health Organization. Asthma. https://www.who.int/news-room/fact-sheets/detail/asthma

[10] Texas Department of State Health Services (TDSHS), Childhood Asthma Hospitalizations, Texas And Select Regions (2009-2021), and Overall Asthma Mortality, Texas (2009-2020). Prepared by Chronic Disease Epidemiology Branch, Health Promotion and Chronic Disease Prevention Section, Texas Department of State Health Services.

[11] U.S. Centers for Disease Control and Prevention (CDC). Asthma Data, Statistics, and Surveillance: Asthma-related Healthcare Use. https://www.cdc.gov/asthma/national-surveillance-data/healthcare-use.htm

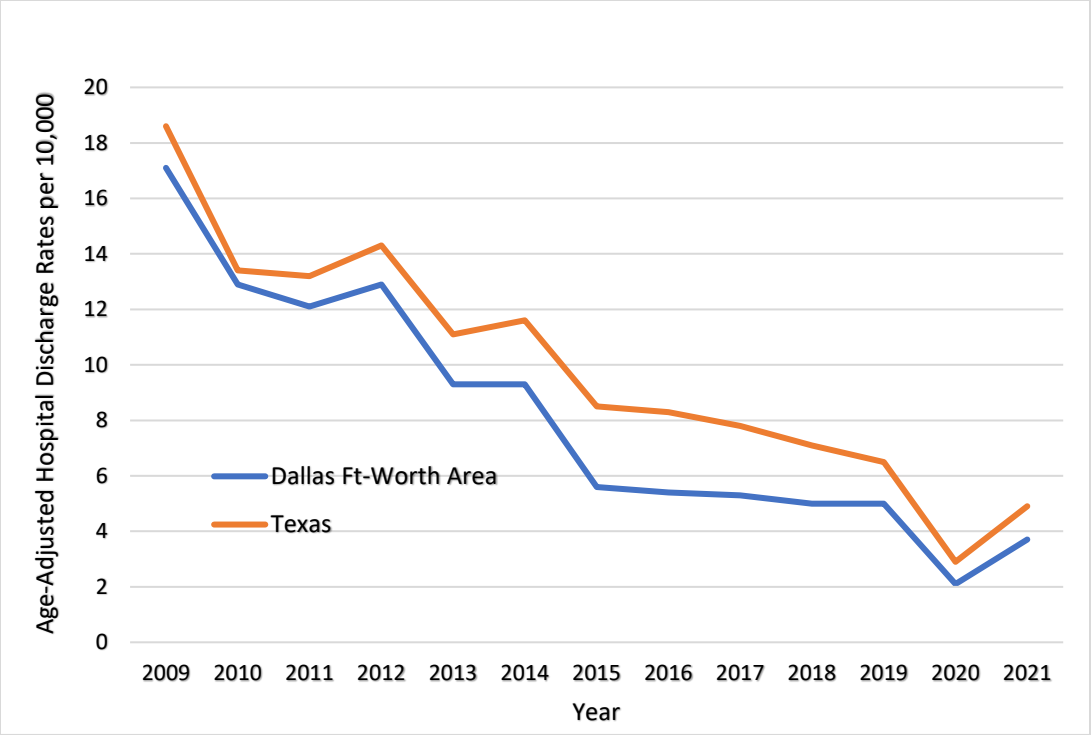

Figure 1: Age-Adjusted Child Asthma Hospital Discharge Rates (per 10,000) by Year, 2009-2021As shown below in Figure 2: *Crude Child Asthma Hospital Discharge Rates (per 10,000) by Year, 2010-2020*, **in 2020 the crude asthma hospitalization discharge rate among those 17 years and younger in the DFW MSA was 2.1 per 10,000. This was a statistically significant decrease from the crude hospitalization rate of 13.1 per 10,000 in 2009.**

No changes were made to this SIP revision in response to these comments.

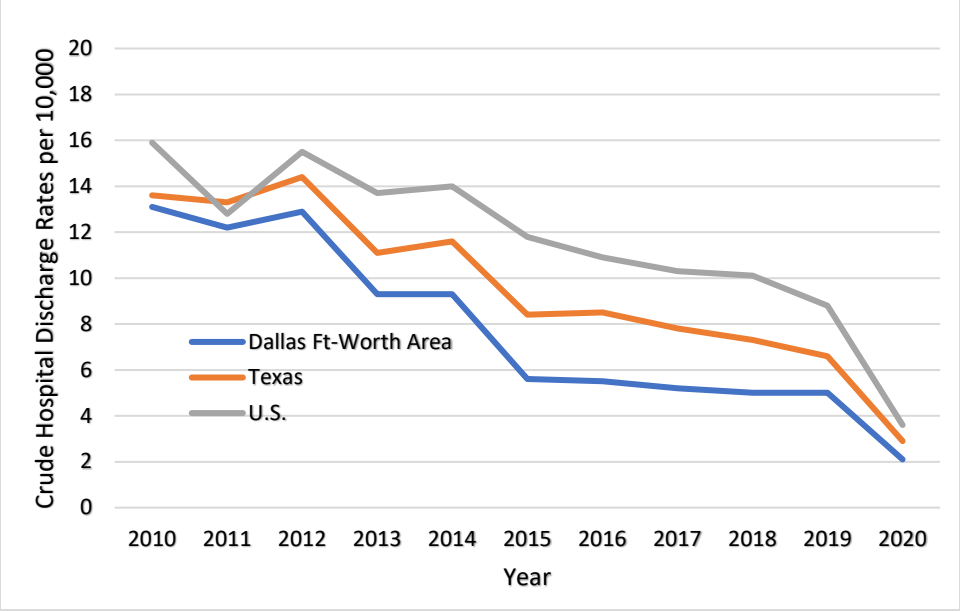

Figure 2: Crude Child Asthma Hospital Discharge Rates (per 10,000) by Year, 2010-2020

Sierra Club, Earthjustice, and 55 individuals stated that a recent story from the Sierra Club identified that nearly half of the Texas population is consistently exposed to unsafe levels of ozone pollution. They highlighted that this as a public health crisis that TCEQ must address before it worsens since nearly 15 million people could be at risk. Sierra Club and Earthjustice discussed ground-level ozone as being dangerous to human health. Sierra Club and Earthjustice stated exposure to ozone, the main component of smog, has detrimental effects on human health. Ozone exposure, even short-term exposure, is linked to chronic conditions affecting the respiratory, cardiovascular, reproductive, and central nervous systems, as well as mortality. Respiratory symptoms of ozone exposure include coughing, wheezing, and shortness of breath. Notably, ozone exacerbates asthma and can contribute to new onset asthma. Accordingly, ozone exposure is associated with increased asthma attacks, emergency room visits, hospitalization, and medication for asthma.

Sierra Club and Earthjustice further stated that the health effects of ozone exposure are cumulative, increasing with higher ozone concentrations and increased exposure time. And adverse health impacts can occur at concentration levels below the 2008 eight-hour ozone NAAQS of 75 ppb. Sierra Club and Earthjustice commented that ozone concentrations as low as 60 ppb can cause inflammation and decreased lung function in healthy, exercising adults after 6.6 hours of exposure, that studies have observed an association between short-term ozone exposure and hospital admission or emergency department visits at concentrations as low as 31 ppb, with ozone concentrations being highest outdoors, though exposure can occur indoors as well. One commenter stated the level of ozone and other pollutants is unacceptable.

Sierra Club and Earthjustice stated that while the health impacts of ozone are ubiquitous, certain populations are at an increased risk for ozone-related health effects. Those populations include people with asthma and/or lung disease, children, people over the age of 65, pregnant people, people of color, and outdoor workers. Sierra Club and Earthjustice additionally stated that factors contributing to an individual's risk of ozone-induced health burdens include exposure, susceptibility, access to healthcare, and psychosocial stress and that these factors can intersect to place certain individuals at even greater risk. For example, children experience increased exposure to ozone because they are more likely to spend time being active outdoors, and increased susceptibility to health impacts due to their developing lungs and higher occurrences of respiratory infections than adults.

TCEQ takes the health and concerns of Texans seriously. The ozone NAAQS has been determined by EPA as requisite to protect public health, including sensitive members of the population such as children, the elderly, and those with pre-existing conditions, such as asthma. EPA considered these health impacts when setting the 2008 eight-hour ozone NAAQS. The commission remains committed to working with area stakeholders to attain both the 2008 and 2015 eight-hour ozone NAAQS across the entire area as expeditiously as practicable and in accordance with EPA rules and guidance under the FCAA.

Many different health effects have been investigated to determine whether they are caused by ozone exposure. However, because data from minimal or inconsistent studies do not provide the weight of evidence necessary to demonstrate that a pollutant exposure causes a health outcome, only those health outcomes with

consistent, robust data are determined to be causally associated with exposure to ozone in EPA's science assessments. The 2006 Air Quality Criteria for Ozone and Related Photochemical Oxidants document stated that the overall evidence supported a causal relationship between acute ambient ozone exposures and increased respiratory effects (increased respiratory morbidity outcomes resulting in increased emergency visits and hospitalizations during the warm season) but was inconclusive for long-term ambient ozone exposures. No other causal determinations were made.[12]

Current scientific literature does not provide a definitive link between ambient ozone levels and asthma development. The trends in asthma prevalence and the lack of a definitive link between ambient ozone concentrations and asthma rates are consistent on the national scale. Large, multi-city studies have not indicated a correlation between ambient concentrations of ozone and increased incidence of asthma symptoms.[13, 14] **EPA's analysis completed as part of the 2015 ozone NAAQS does not anticipate a statistically significant reduction in asthma exacerbations as a result of a lower standard.**[15] **Therefore, because asthma rates have remained steady while ambient levels of both ozone and ozone precursors have periods of steady decrease and because asthma rates can be higher in areas with lower ozone, it does not appear that ambient ozone concentrations are a significant contributing factor to asthma rates. The 2010 Texas Asthma Burden Report noted that lifetime or current asthma prevalence in either Texas adults or children did not change significantly from 2005 to 2009, and the 2014 Texas Asthma Burden Report noted a similar plateau effect for the 2011 to 2013 period.**[16, 17]

Although the causes of asthma are not fully understood, there are many factors that influence the development and exacerbation of asthma. According to the World Health Organization (WHO), asthma is more likely if other family members also have asthma and in people who have other allergic conditions. Asthma is associated with urbanization and is increased in people who have damaging early life events (such as prematurity and low birth weight), and environmental allergens, irritants, and obesity are also thought to increase the risk of asthma. It is also more prevalent among some racial and ethnic groups.[18]

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[12] EPA. Air Quality Criteria For Ozone and Related Photochemical Oxidants (Final Report, 2006). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-05/004aF-cF, 2006.

[13] O'Connor GT, Neas L, Vaughn B, Kattan M, Mitchell H, Crain EF. et al. 2008. Acute respiratory health effects of air pollution on children with asthma in US inner cities. J Allergy Clin Immunol. 121(5):1133-1139.

[14] Schildcrout JS, Sheppard L, Lumley T, Slaughter JC, Koenig JQ, and Shapiro GG. 2006. Ambient air pollution and asthma exacerbations in children: An eight-city analysis. American Journal of Epidemiology, 164:505-517.

[15] EPA. 2015. The National Ambient Air Quality Standards. Overview of EPA's updates to the air quality standards for ground-level ozone. https://www.epa.gov/sites/default/files/2015-10/documents/overview_of_2015_rule.pdf

[16] Texas Department of State Health Services (TDSHS). 2010 Texas Asthma Burden Report. December 2010.

[17] TDSHS. 2014 Texas Asthma Burden Report. December 2014.

[18] World Health Organization (WHO). 2023. Asthma. https://www.who.int/news-room/fact-sheets/detail/asthma

The commission does not agree with the assertion that acute exposure to ambient concentrations of ozone is causing death, because the scientific data do not support it. Clinical studies on hundreds of human subjects have shown only a range of mild, reversible respiratory effects in people who were exposed to between 60 ppb and 120 ppb ozone (representative of ambient concentrations) for up to eight hours while exercising vigorously.[19, 20] Ethical standards preclude scientists from giving human subjects potentially lethal doses of chemicals, and none of the human subjects in these studies were injured or died as a result of their exposure to ozone. Basic toxicological principles indicate that concentrations of ozone (or any other chemical) that only cause a mild, reversible effect cannot also increase the incidence of all causes of death, even in a very sensitive individual. The dose of ozone that is lethal to experimental animals is orders of magnitude higher than ambient levels of ozone[21] and the National Institute for Occupational Safety and Health (NIOSH) Immediately Dangerous to Life or Health value for ozone is 5,000 ppb.[22] Therefore, the available information does not support assertions that there is a mechanism for acute exposure to ambient ozone to contribute to mortality. Finally, EPA's 2019 Integrated Science Assessment downgraded the relationship between short-term exposure to ozone and mortality from a likely causal relationship to suggestive of a causal relationship.[23]

No changes were made to this SIP revision in response to these comments.

Two residents of the Glenn Springs neighborhood in Arlington asked TCEQ to take immediate, meaningful action to protect citizens living on the Barnett Shale from the dangers of fracking and natural gas drilling in our neighborhoods. They pleaded that there is immediate need to enact changes to policies and procedures that will better protect the people of Arlington and Fort Worth from the effects of fracking, including health damages (cancer, asthma, and heart disease) and pollution to our atmosphere. One individual stated that emissions from fracking are linked to higher rates of asthma, birth defects, poor birth outcomes, leukemia, and many other health issues, emphasizing that air quality and health benefits from meaningful action by TCEQ will improve health and quality of life for millions of residents. Two individuals asked TCEQ to help protect people and help families live their lives without the immense burden that the related health problems from fracking can cause. One individual commented the air is severely polluted from fracking operations and further deteriorating our air quality.

Another individual wondered what the city council justification could be for not holding a public hearing on this matter stating that it was unacceptable, especially

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[19] Adams, WC. 2006. Comparison of chamber 6.6-h exposures to 0.04-0.08 ppm ozone via square-wave and triangular profiles on pulmonary responses. Inhal Toxicol 18(2):127-136.

[20] Schelegle, ES; Morales, CA; Walby, WF; Marion, S; Allen, RP. 2009. 6.6-Hour inhalation of ozone concentrations from 60 to 87 parts per billion in healthy humans. Am J Respir Crit Care Med 180(3):265-272.

[21] Stokinger, HE. 1957. Evaluation of the hazards of ozone and oxides of nitrogen. Arch Ind Health 15:181-190.

[22] NIOSH Pocket Guide to Chemical Hazards (NPG). 2005. Pub No. 2005-149. http://www.cdc.gov/niosh/npg/

[23] EPA. 2020b. Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards. https://www.epa.gov/sites/default/files/2020-05/documents/o3-final_pa-05-29-20compressed.pdf

considering the threat of nosebleeds, respiratory distress, and dizziness for those living close to this gas well sites, which leads to an increase in ozone levels and poisoning of air and water in the metroplex. One individual also stated that fracking is a relatively new technology (late 80s) and that there are not enough studies showing the danger to water and air from the byproducts.

Furthermore, the individual stated that diesel-powered drilling rigs, diesel-powered engines, compressors and flowback all emit VOC and NO_X that interact with sunlight to create ground-level ozone and harm human health by increasing rates of asthma, leukemia, heart disease, birth defects, preterm births, with young children and the elderly especially vulnerable to the effects of ozone pollution.

One individual asked that natural gas drilling pollution in Arlington and the DFW area be stopped because the health and lives of people in the area depend on cleaning up the air there. Two individuals stated that the chances of getting leukemia when one lives near a fracking rig is four times greater because the drilling operations produce benzene, a commonly known carcinogen. They commented public schools are downwind from the operations of drilling sites and stated this is unacceptable.

Two other individuals added that the risks and incidences of cancer and heart disease are higher, especially if one lives within 1,000 feet of a drill site. Liveable Arlington commented that emissions from fracking are linked to higher rates of asthma, birth defects, poor birth outcomes, congenital heart disease, low birth weight, leukemia, lymphomas, cardiac and respiratory disease, and many other health issues.

The commission takes the health and concerns of Texans seriously. Starting around 2008, there was rapid expansion of oil and natural gas production into more heavily populated areas within the DFW metroplex in the Barnett Shale region of Texas. This raised concerns regarding the effect of oil and natural gas activities on chemical levels in the air. For decades, TCEQ has evaluated ambient air quality data collected from across the State of Texas for the potential to cause adverse effects on human health and vegetation. TCEQ's evaluations of human health risks from air monitoring data from 2003 to 2021 are on the agency's website (https://www.tceq.texas.gov/toxicology/regmemo) and they include evaluations of ambient air data collected in the Barnett Shale area, which is in TCEQ's Region 4.

The commission reviews and evaluates ambient pollutant concentrations in air, which are impacted by emissions from all sources, including those that are not regulated by TCEQ, through the assessment of data from the ambient air monitoring network. In addition to meeting federal requirements for ambient air quality monitoring, TCEQ toxicologists and data analysts continually evaluate ambient concentrations from approximately 500 pollutant monitors statewide to ensure that pollutant concentrations remain below a level of potential health concern, according to TCEQ-derived air monitoring comparison values and EPA's NAAQS. TCEQ provides public access to its monitoring data and evaluations on its Air Quality Data and Evaluations webpage.[24] Overall, TCEQ has concluded that the monitored concentrations of VOCs in the Barnett Shale area do not pose additional

[24] TCEQ Air Quality Data and Evaluations. https://www.tceq.texas.gov/agency/data/lookup-data/aq-data.html

risks to human health or welfare (e.g., damage to vegetation or production of nuisance odors). Similarly, several studies have been carried out to evaluate VOC air concentrations in the Barnett Shale area and these studies have not found targeted chemicals at levels that could cause increased risk to human health in the Barnett Shale area.[25,26,27,28,29,30] For example, Bunch and colleagues demonstrated that shale gas operations have not resulted in community-wide exposures to VOCs at levels that would pose a health concern. Other studies have been conducted in the Barnett Shale region and found that measured concentrations of VOCs and other chemicals did not exceed short-term, health-based comparison values.[31,32]

Despite the overall weight of evidence demonstrating that oil and natural gas activities in the Barnett Shale area are not associated with concentrations of chemicals in air that would pose a health threat, many uncertainties remain to be addressed regarding the impact of oil and natural gas activities on other aspects of air quality. Consequently, scientists at both TCEQ and other research communities have been examining the potential impacts of oil and natural gas activity on the types and concentrations of chemicals in ambient air in the Barnett Shale as well as the potential for adverse health effects. In one of such study conducted by toxicologists at TCEQ, VOC concentrations from 6–12 years (2008–2019) of hourly ambient air monitoring data from 15 monitors (4 monitors had ≥ 10 years of data) were compared to several metrics of oil and natural gas activity (number of active wells, natural gas production, condensate production) within a 2-mile radius of each monitor.[33] Monitoring sites were also classified into urban, suburban, and rural areas as a surrogate for nearby vehicular emission sources. Analyses of this huge dataset showed that both peak and mean chemical concentrations of lighter alkane hydrocarbons (e.g., ethane) were most impacted by the number of gas wells. Levels of heavier alkanes (e.g., pentane) were increased by condensate production and at

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[25] Bunch, A.G., Perry, C.S., Abraham, L., Wikoff, D.S., Tachovsky, J.A., Hixon, J.G., et al., 2014. Evaluation of impact of shale gas operations in the Barnett Shale region on volatile organic compounds in air and potential human health risks. Sci. Total Environ. 468–469, 832–842. https://doi.org/10.1016/j.scitotenv.2013.08.080

[26] Lim, G.Q., Matin, M., John, K., 2019. Spatial and temporal characteristics of ambient atmospheric hydrocarbons in an active shale gas region in North Texas. Sci. Total Environ. 656, 347–363. https://doi.org/10.1016/j.scitotenv.2018.11.313

[27] Lim, G.Q., John, K., 2020. Impact of energy production in the Barnett Shale gas region on the measured ambient hydrocarbon concentrations in Denton. Texas. Atmos Pollut Res 11, 409–418. https://doi.org/10.1016/j.apr.2019.11.013.

[28] Rich, A., Grover, J.P., Sattler, M.L., 2014. An exploratory study of air emissions associated with shale gas development and production in the Barnett Shale. J. Air Waste Manag. Assoc. 64, 61–72. https://doi.org/10.1080/10962247.2013.832713

[29] Zielinska, B., Fujita, E., Campbell, D., 2010. Monitoring of Emissions from Barnett Shale Natural Gas Production Facilities for Population Exposure Assessment. Desert Research Institute.

[30] Zielinska, B., Campbell, D., Samburova, V., 2014. Impact of emissions from natural gas production facilities on ambient air quality in the Barnett Shale area: a pilot study. J. Air Waste Manag. Assoc. 64, 1369–1383. https://doi.org/10.1080/ 10962247.2014.954735.

[31] Barnett Shale Energy Education Council, 2010. Ambient air quality study- natural gas sites, cities of Fort Worth & Arlington. Prepared by TITAN Engineering, Inc, Texas

[32] City of Fort Worth, 2011. City of Fort Worth natural gas air quality study, final report.

[33] Lange SS. Shrestha L., Nnoli N., Aniagu S., Rawat S. & McCant D. Do shale oil and gas production activities impact ambient air quality? A comprehensive study of 12 years of chemical concentrations and well production data from the Barnett Shale region of Texas. Environment International 175 (2023) 107930

monitors located in areas with greater urbanicity, and therefore higher vehicular emissions. The levels of unsaturated alkynes (e.g., ethylene) were entirely driven by urbanicity and were unaffected by nearby oil and natural as activity. Aromatic hydrocarbons (e.g., benzene, xylenes) were impacted by multiple emissions sources and did not show the same patterns as non-aromatic VOCs. No VOC concentrations were at levels of concern for human health or odor based on comparison to Texas air monitoring comparison values.

Finally, as earlier discussed, data from the Texas Department of State Health Services, Texas Health Care Information Collection, Inpatient Hospital Discharge Public Use Data File, 2009-2021, shows that from 2009-2020, DFW MSA age-adjusted asthma hospitalization rates per 10,000 were lower than the overall Texas rates.[34] Also, data from the CDC, shows that the crude (nonage-adjusted) asthma hospitalization rate for DFW MSA is lower than the Texas and U.S. (nonage-adjusted, 2010-2019) rates for children under 18 years of age.[35] In addition, from 2016 to 2020, the age-adjusted average cancer incidence rates for all types of cancers per 100,000 people of all ages in Tarrant County, Texas (430 per 100,000 people) was lower than the national average (442 per 100,000).[36,37] TCEQ remains committed to working with area stakeholders to protect our state's public health and natural resources, and to attain the 2008 ozone NAAQS.

Comments regarding the city council not holding a public hearing are outside the scope of this SIP revision. Additionally, comments relating to the effects of fracking on water quality are outside the scope of this SIP revision.

The TCEQ acknowledges the commenters suggestions of strategies to reduce ozone precursor emissions. The commission expects to meet AD milestones in 2026 in the DFW area as described in Chapter 3: *Photochemical Modeling* of this SIP revision. No additional control measures are required for this purpose. Additional control measures for other purposes are outside the scope of this SIP revision.

No changes were made to this SIP revision in response to these comments.

TECHNICAL ANALYSIS

City of Dallas suggested TCEQ consider a more accurate modeling analysis than the photochemical analysis used by TCEQ in this SIP revision. Further, the commenter

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[34] Texas Department of State Health Services (TDSHS), Childhood Asthma Hospitalizations, Texas And Select Regions (2009-2021), and Overall Asthma Mortality, Texas (2009-2020). Prepared by Chronic Disease Epidemiology Branch, Health Promotion and Chronic Disease Prevention Section.

35 CDC Asthma Data, Statistics, and Surveillance: Asthma-related Healthcare Use. https://www.cdc.gov/asthma/national-surveillance-data/healthcare-use.htm

[36] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2022 submission data (1999-2020): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; https://www.cdc.gov/cancer/dataviz, released in November 2023

[37] Texas Department of State Health Services (TDSHS). 2024 Department of State Health Services, Texas Cancer Registry web query tool: https://www.cancer-rates.info/tx/

requested that TCEQ consider impacts of COVID-19 on ozone trends, including in 2020, 2021, and 2022, and requested that this analysis be made public.

As part of this SIP revision, TCEQ conducted photochemical modeling in accordance with EPA "*Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze*"[38] (hereafter referred to as EPA modeling guidance), as well as used the latest data, models, and scientific research available at the time of the SIP revision. TCEQ further conducted a robust model performance evaluation that met the performance benchmarks for air quality modeling applications referenced in EPA modeling guidance. For these reasons, TCEQ believes that the photochemical modeling used in this SIP revision is accurate. In addition to modeling, the SIP revision included other elements of evaluating the future attainment status of the DFW area, including weight-of-evidence analyses. Since the commenter did not provide details on what would be a more accurate modeling analysis or why TCEQ's photochemical modeling is not accurate, TCEQ has no basis to make any substantive changes.

In the proposed DFW SIP under consideration, both Appendix B: *Conceptual Model* and Chapter 5: *Weight of Evidence* evaluated ozone in years 2020, 2021, and 2022 at both annual and monthly time scales and did not identify any impacts attributable specifically to COVID-19. A thorough evaluation of impacts of COVID-19 is beyond the scope of this SIP revision.

No changes were made to this SIP revision in response to this comment.

An individual commented that we don't have complete understanding of air pollution issues in Texas, and providing a research grant to research institutions and universities in Texas may help for a better understanding of air pollution problem.

The commission is committed to continually investing in scientific research for better understanding of air quality in Texas. As discussed in Chapter 6: *Ongoing and Future Initiatives* of this SIP narrative, TCEQ directly sponsors applied research projects to support SIP development and other agency requirements. The projects are for better understanding of ozone and particulate matter formation, developing advanced modeling techniques, and air quality monitoring. In addition to applied research, TCEQ has funded the Texas AQRP, administered by the University of Texas at Austin to support scientific research related to Texas air quality, including field measurement campaigns, ambient air quality and meteorological data analyses, emission inventory development and assessment, and air quality modeling studies. Further information on TCEQ funded and AQRP funded research projects can be accessed at TCEQ's Air Quality Research and Contract Projects webpage (https://www.tceq.texas.gov/airquality/airmod/project/pj.html) and the University of Texas at Austin's AQRP webpage (https://aqrp.ceer.utexas.edu).

No changes were made to this SIP revision in response to this comment.

EPA and NCTCOG commented that there are concerns that the modeling projections of the 2026 future ozone design value (2026 DVF) for the DFW area in this SIP revision is

[38] https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf

underestimated. EPA commented that their concern was based on modeled 2026 DVF for the DFW area being greater than the 2015 eight-hour ozone NAAQS of 70 ppb at four of the 17 monitors and that the historically observed rate of decrease of monitored design value in the DFW area is 1 to 1.2 ppb/year whereas a decrease of 2 ppb/year is needed in the next three years to attain 75 ppb from the 2023 monitored design value of 81 ppb. NCTCOG also commented that the preliminary 2023 design value for the DFW area is 81 ppb and requested that TCEQ provide analyses and assumptions used to determine the 3 ppb per year reduction in ozone between now and 2026. EPA and NCTCOG stated that the 2022 and 2023 monitored design values were higher than the modeled 2023 design value in the previously proposed DFW 2015 Ozone NAAQS Moderate AD SIP Revision, and the modeled 2026 DVF in this SIP revision are underestimated. EPA further commented that the proposed SIP revision did not include a discussion of why the modeled 2026 DVF is realistic considering the monitored 2023 design value for the DFW area is 81 ppb.

The preliminary monitored 2023 design value in the DFW area, comparison of those values to the 2015 eight-hour ozone NAAQS, and modeling conducted for the DFW 2015 Ozone NAAQS Moderate AD SIP Revision are not appropriate measures of whether modeled 2026 DVF values contained in this SIP revision are underestimated. The SIP revision is for the severe classification for the 2008 ozone NAAQS of 75 ppb for the DFW area, which has an attainment date of July 20, 2027, and an attainment year of 2026. Attainment of the 2008 ozone NAAQS by the severe classification attainment date will be based on monitored ambient ozone data from 2024 through 2026. Monitored ozone data from 2023 will not be used to determine compliance for the DFW area and are, therefore, by themselves inappropriate for assessing projections of future attainment. Details of AD modeling from the previously proposed DFW 2015 Ozone NAAQS Moderate AD SIP Revision are irrelevant to evaluation of the AD modeling for a different standard with a later attainment date than documented in that SIP revision.

EPA and NCTCOG inappropriately estimated a per year decrease of two ppb and three ppb, respectively, needed in three years from a 2023 monitored design value of 81 ppb to reach 75 ppb when, as explained above, attainment of the 2008 ozone standard by the attainment year of 2026 does not depend on the 2023 monitored design value at all.

In addition, meteorology in 2023 was markedly different from most other years in the DFW area. Data of 2023 DFW meteorology from National Weather Service monitoring stations in context with other recent years confirms that 2023 recorded abnormally high temperatures and abnormally dry conditions throughout the critical late ozone season period of time in DFW area.[39] For this reason, too, it is inappropriate to use 2023 as a year of comparison for compliance determinations.

Further, complete validated monitored data for 2023 were unavailable at the time the proposed SIP revision was developed and will still not yet be available for a

[39] https://weatherspark.com/h/y/8813/2023/Historical-Weather-during-2023-in-Dallas-Texas-United-States

thorough assessment by the time this SIP revision has to be adopted to meet EPA imposed deadlines.

No changes were made to this SIP revision in response to these comments.

EPA commented that the model demonstrates significant underprediction and that there was "overwhelming negative bias" documented in Section 3.5, *Photochemical Model Performance Evaluation (MPE)*, of the DFW attainment SIP revision. EPA noted that three of the 17 monitors were positively biased and that eight did not meet performance goals. EPA commented that TCEQ's model exhibited "decent performance" for the DFW nonattainment area but noted that 14 of 16 regulatory monitors were underpredicting ozone and 9 of 16 monitors had a normalized mean bias (NMB) outside the goal range; EPA acknowledged that all monitors were within the normalized mean error (NME) goal. EPA further commented that TCEQ simply concluded that the model performance is good without discussion and that TCEQ did not address the likelihood of systematic error.

The commission disagrees with the characterization of "significant underprediction" and "overwhelming negative bias" stated by EPA and EPA's speculation that TCEQ's MPE statistics might indicate the presence of systematic errors that needs to be investigated. Section 3.5: *Photochemical Model Performance Evaluation* clearly states that the benchmark criteria for NMB is 15%, and Figure 3-10 *NMB of MDA8 Ozone ≥ 60 ppb by Monitor* clearly shows that all 17 DFW area monitors fall well within this 15% range. Section 3.5 cites research that shows the goal of 5% for NMB is typically achieved by the top third of modeling applications, while the criteria of 15% is achieved by the top two-thirds of modeling applications. Figure 3-10 shows that nine of the 17 monitors meet the 5% goal, while only one of the remaining eight monitors has a NMB of more than 10%, which is Cleburne Airport at roughly 12%. These metrics show that in most instances, TCEQ's model performance is in the top one-third of modeling applications.

In its comment, EPA also fails to acknowledge that the NMB is very low for some of the monitors that have historically measured the highest ozone levels in DFW, such as Denton Airport South (-2%), Fort Worth Northwest (+2%), Grapevine Fairway (+2%), and Keller (-2%). TCEQ also includes a more extensive discussion in Section 5.2: *DFW Model Performance Evaluation* of Appendix A with similar performance metrics. This overall pattern of MPE included in this SIP revision constitutes good model performance, and therefore there is no need to address the likelihood of systematic error.

No changes were made to this SIP revision in response to this comment.

EPA commented that TCEQ did not provide MPE data with sufficient time for EPA and the general public to review and that the MPE material was "lacking" and does not comport with EPA modeling guidance.

The commission disagrees with EPA's assertion that the MPE does not comport with EPA modeling guidance. TCEQ used EPA-recommended methodology, statistics, graphs, and documentation in preparation of this SIP revision. Table 3-7: *Benchmarks for Photochemical Model Performance Evaluation Statistics,* located in

the DFW SIP narrative, shows the benchmarks that were used to evaluate the performance of the photochemical model. These benchmarks were reported in the Emery et al., 2017 paper, cited in Chapter 3 of the SIP revision. Pages 3-16 through 3-17 of the DFW SIP revision discussed temporal and spatial scales used to conduct the operational performance evaluation in accordance with EPA modeling guidance.

Performance statistics recommended by EPA are displayed graphically in Figures 3-10 and 3-11 *NME of MDA8 Ozone ≥ 60 ppb by Monitor*, of the DFW SIP narrative for each regulatory monitor in the DFW nonattainment area and are also shown for each month of the episode in Table 3-8: *NMB and NME of Eight-Hour Average Ozone in the DFW 2008 Ozone NAAQS Nonattainment Area*, located in the DFW SIP narrative. A spatial plot (Figure 3-12: *Monthly NMB (for observed MDA8 ≥ 60 ppb) in the DFW 2008 Ozone NAAQS Nonattainment Area*, located in the DFW SIP narrative) recommended by EPA modeling guidance displays the NMB percentage at each monitor for each month of the episode. Appendix A: *Modeling Technical Support Document (TSD)* contains additional performance statistics recommended by EPA, such as mean observed ozone, mean modeled ozone, mean bias, mean error, and correlation coefficient for each month of the episode, as well as monitor-specific soccer plots (Figure 5-8: *Soccer Plots of NMB and NME of MDA8 Ozone at DFW Monitors*, located in the DFW SIP Appendix A).

The commission notes that modeling files were made available to EPA, stakeholders, and the general public in November 2023. The files are available to download from TCEQ's Air Modeling FTP site. Details on how to access the files are provided in Chapter 6: *Modeling Data Archive* of Appendix A as well as at Texas Air Quality Modeling (2019 Platform) webpage (https://www.tceq.texas.gov/airquality/airmod/data/tx2019).

Further, EPA did not specify how TCEQ's MPE was "lacking" and did not reference specific areas that needed improvement. Therefore, given the information in the SIP revision adheres to EPA modeling guidance, TCEQ has no basis to make any substantive changes.

No changes were made to this SIP revision in response to this comment.

EPA commented that the meteorological modeling MPE was "limited" and suggested that a more robust analysis is needed to help determine why the photochemical modeling may not be replicating high monitored ozone values.

To evaluate the Weather Research and Forecasting (WRF) model performance, TCEQ used EPA-recommended methodology, statistics, graphs, and documentation in preparation of this SIP revision. As stated on page A-13 of Appendix A, TCEQ compared model results to observed data during periods within the 2019 modeling episode months that had overlapping exceedance days for DFW and HGB to account for the long ozone season and evaluate WRF model performance for high ozone days. TCEQ used benchmarks reported in Emery et al., 2001 as recommended in EPA modeling guidance to evaluate "simple" conditions, while benchmarks reported in McNally, 2009 and Kemball-Cook et al., 2005 were used to evaluate "complex" conditions.

Pages A-18 through A-20 of Appendix A explain the monthly performance of the model for wind speed, wind direction, temperature, and humidity. As stated on pages A-18 through A-19 of Appendix A, all performance statistics were within the "simple" and/or "complex" benchmarks except for humidity, which exhibited greater error likely due to the limited number of monitors that record humidity in the DFW area. TCEQ presented these data in soccer plots recommended in EPA modeling guidance. Given the ability of the model to replicate ozone exceedance days within acceptable error, TCEQ considers the model reasonably robust.

TCEQ devoted significant time and effort to develop appropriate modeling inputs and configurations. Meteorological files for the platform were made publicly available on June 7, 2021, and were open for comment until July 23, 2021. TCEQ also presented the meteorological MPE for 2019 at the HGB Air Quality Technical Information Meeting (AQ TIM) on June 23, 2021. Various components of the WRF MPE were discussed as well as additional information, such as the choice of a vertical coordinate system, alternative WRF configurations, and use of observational nudging. This information is publicly available on TCEQ's website at Meteorological Model Performance Evaluation for 2019 (https://www.tceq.texas.gov/downloads/air-quality/modeling/meetings/hgb/2021/20210623-meteorologicalmodelperformance-tceq-dornblaser.pdf). WRF modeling files are available to EPA and/or stakeholders upon request.

Further, EPA did not specify how TCEQ's WRF MPE was "limited" and did not reference areas that needed improvement. Therefore, given the data and information in the SIP revision adheres to EPA modeling guidance, TCEQ has no basis to make any substantive changes. Appendix A, however, was updated to include references used for the complex benchmarks.

EPA commented that some of the episode days used in the attainment test calculations had low observed ozone in the 2019 base case while having relatively high modeled ozone. EPA cited examples of this for the DFW monitors of Grapevine Fairway, Frisco, and Denton Airport South. EPA stated that future design value calculations could be impacted by inclusion of these days with significant differences between observed and modeled ozone.

In performing the attainment test for each monitor, TCEQ followed EPA modeling guidance, as outlined in Section 4.2, *Modeled Attainment Test for the Primary Ozone Standard*. This approach required including the top 10 days in the episode that had the highest modeled ozone in the base case simulation in the Relative Response Factor (RRF) calculation, which resulted in inclusion of some episode days where modeled ozone in the 2019 base case was higher than observed ozone.

TCEQ performed a sensitivity analysis where any of the top 10 days that had NMB beyond +/- 15% were removed from the attainment test calculation and replaced with episode days that had the next highest modeled ozone. For example, the ten-episode days included in the initial Grapevine Fairway attainment test were June 1, June 2, July 26, August 2, August 5, August 15, August 28, September 3, September 5, and September 6. After applying the 15% NMB filter criteria, the episode days of June 1, June 2, July 26, and August 28 were removed and replaced with July 25,

July 31, September 14, and September 15. Under both approaches, the RRF for the Grapevine Fairway monitor remained unchanged at 0.956, as reported in both Table ES-2 and Table 3-9 of the SIP revision narrative, so there was no net change in the calculated future design value of 71 ppb for 2026 at Grapevine Fairway.

TCEQ also did a test of filtering days based on observed MDA8. In the base case, only days with observed MDA8 greater than 60 ppb were included in the top 10 days and used in the RRF calculation. Table 1: *Impact of Filtering Out Episode Days on 2026 Future Design Values in DFW*, below, summarizes the impacts that these filtering approaches have on 2026 DVF values at DFW area regulatory ozone monitors.

Table 1: Impact of Filtering Out Episode Days on 2026 Future Design Values in DFW

DFW Area Monitor Name	2026 DVF: No Filter	2026 DVF: 15% NMB Filter	Impacts on 2026 DVF due to NMB Filter	2026 DVF: Observed MDA8 >= 60 Filter	Impacts on 2026 DVF due to Observed MDA8 Filter
Frisco	72	72	0	72	0
Grapevine Fairway	71	71	0	71	0
Eagle Mountain Lake	71	71	0	71	0
Cleburne Airport	71	71	0	71	0
Dallas North #2	70	71	+1	71	+1
Pilot Point	70	70	0	70	0
Keller	70	70	0	70	0
Fort Worth Northwest	69	69	0	69	0
Denton Airport South	69	69	0	69	0
Arlington Municipal Airport	68	67	-1	67	-1
Dallas Executive Airport	66	65	-1	65	-1
Dallas Hinton Street	66	67	+1	67	+1
Parker County	66	66	0	65	-1
Kaufman	63	62	-1	62	-1
Midlothian OFW	62	63	+1	63	+1
Rockwall Heath	61	62	+1	62	+1

Further, though Section 4.2.1, *Model Values to Use in the RRF Calculation* of the EPA modeling guidance does say that some episode days with poor performance can be removed from the attainment test and then replaced with the next highest modeled day(s) to ensure that at least 10 days are included in the test for each monitor, EPA modeling guidance does not specify criteria that should be used when selecting episode days for removal from the attainment test.

Since there are no changes to the conclusions in the proposed SIP revision that the DFW area will attain the 2008 ozone NAAQS by the severe classification attainment date and there is no specific guidance in EPA modeling guidance on which criteria should be used to filter the top 10 days included in the RRF used in the attainment test, no changes were made to the SIP revision in response to this comment.

EPA commented that the weight-of-evidence analyses did not provide evidence that the modeling is a "fully reliable predictor of future ozone levels," that modeling is overestimating anticipated reductions in design values, and that the DFW area does not seem likely to reach attainment of the 2008 ozone standard by 2026.

It is impossible for any computer-based model to be a "fully reliable predictor of future ozone levels," and the purpose of weight-of-analysis is to supplement the AD modeling and is not required to provide evidence that modeling is a "fully reliable predictor of future ozone levels." EPA clearly states this in its modeling guidance when discussing the need for analyses that supplement the modeling.

Section 6.0: *How Can Additional Analyses Be Used to Support an Ozone or PM2.5 Attainment Demonstration?* of the EPA modeling guidance begins with the following excerpt: "By definition, models are simplistic approximations of complex phenomena. The modeling analyses used to assess whether emission reduction measures will bring an individual area into attainment for the NAAQS contain many elements that are uncertain (e.g., emission projections, meteorological inputs, science formulations, etc.). These uncertain aspects of the analyses prevent definitive assessments of future attainment status." In the same section of EPA modeling guidance, EPA goes on to say that "all attainment demonstrations will be strengthened by additional analyses that can *supplement* [emphasis added] the modeling to enhance the assessment of whether the planned emissions reductions are likely to result in attainment." In accordance with EPA guidance, additional analyses that constitute the weight-of-evidence in this SIP revision supplement attainment modeling rather than prove that the modeling is a "fully reliable predictor of future ozone levels."

No changes were made to this SIP revision in response to this comment.

EPA commented that the proposed DFW AD SIP revision for the 2008 eight-hour ozone NAAQS used "basically all the same modeling files, etc." as for the previously proposed DFW 2015 ozone NAAQS Moderate SIP revision. EPA noted that the peak 2023 future design value modeled for DFW was 73 ppb in the DFW 2015 ozone NAAQS moderate SIP revision, which is 8 ppb lower than the peak 2023 monitored design value of 81 ppb for DFW. Based on these differences between the monitored and modeled design values for 2023, EPA believes the modeling projections for 2026 will likely underestimate future design values that will actually occur in 2026. EPA further stated that TCEQ should investigate what seems to be a systematic problem and offer potential solutions to improve future model projections.

The commission disagrees with the statement that "basically all the same modeling files" were used for the AD modeling in the previously proposed DFW 2015 ozone NAAQS moderate AD SIP revision. While the same meteorological files for the 2019 base case episode were used, updates were made to some emissions inventory files,

as time permitted. Further, different emissions inventory input files were required to be modeled for the 2023 and 2026 future years for modeling attainment of the 2015 and 2008 eight-hour ozone NAAQS, respectively.

While peak monitored and modeled future design values for 2023 cited by EPA are correct for the DFW area, it is inappropriate to use modeling from a previously proposed SIP revision for a lower standard with an earlier attainment date as an evaluation criterion for this SIP revision solely based on the incorrect assumption that "basically all the same modeling files" were used. It should be noted that in the previously proposed DFW 2015 ozone NAAQS moderate AD SIP revision, TCEQ did not model attainment of the 2015 ozone NAAQS. However, on October 12, 2023, Texas Governor Greg Abbott signed and submitted a letter to EPA to reclassify the DFW 2015 ozone NAAQS moderate nonattainment area to serious. In both cases, TCEQ appropriately used the AD modeling results.

Further, EPA did not provide any specific details or information on why it believes there is a systematic problem with the proposed AD modeling other than the difference between the monitored and modeled design values for 2023. As explained above, the monitored design values were heavily influenced by outlier meteorology and are not an appropriate metric for determining if the modeling in this SIP revision is reasonable.

No changes were made to the SIP revision in response to this comment.

EPA, Sierra Club, and Earthjustice commented that TCEQ did not use the most up-to-date data from EPA in developing emissions inventories for non-Texas areas. The commenters noted that version 1 of EPA's 2016 modeling platform was available in March 2021, but was updated by version 2 in February 2022 and version 3 in January 2023. EPA stated that use of these updated versions of the 2016 modeling platform may improve model performance and resolve emission inventory issues.

When conducting AD modeling, TCEQ always strives to incorporate the complete sets of the most recent modeling files available from EPA or any other sources. Publication dates for EPA technical support documents for versions 1, 2, and 3 of their 2016 modeling platform are March 2021, February 2022, and January 2023, respectively. However, these dates typically reflect the initial release of some but not all modeling files associated with that version of the modeling platform. For example, a review of various directories with modeling files will show that EPA was updating version 2 through April of 2023 and was updating version 3 through June of 2023, when EPA also provided the modeled design values for this version of the modeling platform as part of the Good Neighbor Federal Implementation Plan (FIP).

Table 2: *Comparison of 2026 Future Design Values for DFW between TCEQ and EPA*, below, shows a comparison of the 2026 future design values for version 3 of EPA's modeling with TCEQ's current modeling. When averaged across all monitors, the 2026 future design values from EPA were 7 ppb lower in DFW when compared with TCEQ's efforts, making it unclear that inclusion of version 3 of the 2016 modeling platform would necessarily improve model performance and/or resolve emission inventory issues, as EPA suggests.

Table 2: Comparison of 2026 Future Design Values for DFW between TCEQ and EPA

DFW Site ID	DFW Ozone Monitor Name	TCEQ 2026 DVF (ppb)	EPA 2026 DVF (ppb)	TCEQ - EPA DVF (ppb)
480850005	Frisco	72	63	+9
482510003	Cleburne Airport	71	64	+7
484390075	Eagle Mountain Lake	71	62	+9
484393009	Grapevine Fairway	71	65	+6
481130075	Dallas North #2	70	63	+7
484392003	Keller	70	63	+7
481211032	Pilot Point	70	64	+6
481210034	Denton Airport South	69	68	+1
484391002	Fort Worth Northwest	69	62	+7
484393011	Arlington Municipal Airport	68	57	+11
481130069	Dallas Hinton	66	62	+4
481130087	Dallas Executive Airport	66	56	+10
481390016	Midlothian OFW	62	55	+7
483970001	Rockwall Heath	61	56	+5
483670081	Parker County	66	61	+5
482570005	Kaufman	63	52	+11

Further, other than speculating that using data from the latest version of EPA's 2016 modeling platform might improve model performance, EPA did not provide any justification or reasoning for its assertion that inclusion of a slightly updated emissions inventory for non-Texas areas in the modeling domain will improve model performance.

TCEQ used the most up-to-date data available at the time of SIP development, and based on TCEQ's comparison in Table 2, above, it appears that EPA's latest version of its 2016 modeling platform would not have addressed the concern that the modeled 2026 DVF in TCEQ's modeling is underestimated. Regardless, incorporating major changes such as emissions inputs for all non-Texas areas in the

modeling domain is not feasible during late stages of attainment SIP development. No changes were made to this SIP revision in response to this comment.

EPA commented that it is unclear how DFW area cement kiln modeled NO_X emissions incurred a significant increase from the 2019 base case to the 2026 future case.

TCEQ modeled DFW area cement kilns in the base case using their actual reported NO_X emissions of 9.78 tons per day (tpd). As explained in Appendix A for this SIP revision as well as previous AD SIP revisions, future case NO_X emissions for cement kilns are conservatively modeled using the entire Holcim account specific NO_X cap specified in 30 TAC §117.3123 and per ton clinker limits specified in agreed orders and permitted production limits for TXI and Ash Grove. TCEQ did notice a typographical error in Table ES-1 of the SIP revision as the collective modeled NO_X emissions for DFW area cement kilns for the 2026 future case is 15.12 tpd. Table ES-1 was corrected to reflect the modeled emissions.

EPA commented that 2021 should have been evaluated as a suitable base case episode year for DFW, rather than relying on a 2019 base case episode. EPA stated that the discussion associated with Figure 3-1 in Chapter 3 of this SIP revision is not adequate to justify relying on 2019 for the base case episode because more exceedance days occurred in both 2021 and 2022 compared with 2019. EPA stated that using a 2022 episode would be unlikely because of proximity to the 2023 proposal date for the attainment SIP revision. EPA also stated that the information in Figure 3-1 could be expanded to include additional years.

The commission disagrees with EPA's suggestion that considering a 2021 base case episode would be a practical option for an attainment SIP revision proposed during 2023; nor is it required by EPA rules or guidance. By advancing such a suggestion, EPA is significantly underestimating the extensive time, resources, and efforts needed for states to complete the modeling and technical analysis components of an AD SIP revision required by EPA's rules and guidance. For comparison, the latest complete modeling platform, one that includes base case and future case emissions inventories, available from EPA is for a 2016 base case episode, and version 1 of this platform was not released until 2021 - almost five years after the conclusion of 2016. After version 1 was released, EPA did not opt to advance this base case episode year (e.g., to 2021), and instead chose to revise the 2016 platform with versions 2 and 3 being released in 2022 and 2023, respectively. To date, the latest complete modeling platform available from EPA, and relied upon for a major regulatory effort such as the Good Neighbor FIP, is this 2016 base case episode from eight years ago. By arbitrarily suggesting that TCEQ advance base years, EPA is placing excessive and unnecessary expectations on states that EPA itself is not following.

It should be noted that EPA modeling guidance relied upon by states does not require advancing base years frequently. Further, EPA implies in its comments that the number of exceedance days alone is a suitable metric for choosing one base case episode versus another. EPA's comment is not in accordance with Section 2.3.1: *Choosing Time Periods to Model*, of EPA modeling guidance that recommends choosing "time periods which reflect a variety of meteorological conditions that frequently correspond with observed eight-hour daily maxima concentrations

greater than the level of the NAAQS at monitoring sites in the nonattainment area." For episode selection, the total number of exceedance days in a given year is less important than how representative those exceedance days are at capturing the historical pattern of high ozone levels throughout the area. The year 2021 is not an appropriate choice for a base case episode since there was only one exceedance of the 75-ppb standard in DFW during all of August 2021 (80 ppb measurement at the Cleburne Airport monitor on Tuesday August 3). August has historically been the month with the largest number of ozone exceedance days in DFW, HGB, and other Texas areas. Another reason 2021 is not an appropriate choice for a base case episode is that impacts of the COVID-19 shutdown were still occurring throughout much of 2021. Whenever possible, years with significant reductions in economic activity (e.g., 2008, 2020, 2021) should be avoided in base case episode selection because modeling them would require use of atypical emissions for important source categories such as on-road, non-road construction, generation of electricity, etc.

The commission disagrees with EPA's statement that the discussion associated with Figure 3-1 is not adequate. Section 3.2: *Modeling Episode* of this SIP revision provides a sufficient overview of the episode selection process and ends with a reference to Section 1.2: *Modeling Episode Selection* of Appendix A for more detail.

Figure 3-1 on page 3-2 of this DFW attainment SIP revision was included to provide historical context concerning the number of ozone exceedance days per year from 2012 through 2022. EPA suggests that this information could be expanded to include additional years but does not state which year(s) should be added or why. TCEQ disagrees that continuing to report on ozone exceedance days that occurred prior to 2012 would be useful at this time because that information is already included in older attainment SIP revisions.

No changes were made to this SIP revision in response to this comment.

EPA commented on a concern TCEQ is not advancing to a more recent year ('future base') to project EGU emissions to the future case year.

TCEQ does not use the term *future base*, instead using *projection base* when referring to a year from which future case modeling emissions are derived. Using an advanced year for the projection base is not a requirement in EPA modeling guidance, and EPA did not identify any benefits that would be obtained from taking such an approach. For the EGU sector, it is beneficial to preserve the relation of meteorological conditions with hourly EGU emissions. Thus, to develop the future case EGU emissions, TCEQ uses the base year hourly EGU emissions and augments them with the most recent information regarding units that may shutdown in the future, and new units planned to come online prior to 2026. Additionally, TCEQ conservatively included the fixed Cross-State Air Pollution Rule (CSAPR) cap while developing future case EGU emissions, which makes any benefit gained from advancing the projection year less impactful and unnecessary.

No changes were made to this SIP revision based on this comment.

EPA commented that TCEQ is not advancing to a more recent year ('future base') to project non-EGU emissions to the future case year.

As previously stated, using an advanced year for the projection base is not a requirement in EPA modeling guidance, and EPA did not provide reasons why such an advancement is required. Further, State of Texas Air Reporting System (STARS) data available subsequent to the 2019 base year, such as 2020 and 2021, would have been potentially affected by changes due to COVID-19, thus introducing inaccurate data for future case projection.

EPA commented on the maximum and minimum values depicted in the legend in Figure 3-8 located in Chapter 3 of this SIP revision and wanted to make sure that emissions values in each grid cell are contained within the legend values.

The maximum and minimum legend values in Figure 3-8 indicate concentrations greater than or equal to +0.2 tpd and less than or equal to -0.2 tpd respectively. For example, dark blue depicts grid cells that experience a negative change of at least 0.2 tpd between 2019 and 2026, and dark red depicts grid cells that experience a positive change of at least 0.2 tpd between 2019 and 2026. So, it is likely that grid cells shown in either color have values much greater than the 0.2 tpd or much less than the -0.2 tpd which would then explain the total change for all anthropogenic emissions in DFW being -55.94 tpd between 2019 and 2026.

A footnote was added to Figure 3-6 in Appendix A and to Figure 3-8 in the DFW AD SIP Revision to clarify information about the figure legends.

EPA commented that Chapter 5: *Weight of Evidence* lacks documentation of the methodology and monitors used. EPA further commented that the technique generates biased estimates, claiming that it biases estimates of local ozone production low and estimates of background ozone values high.

TCEQ disagrees with EPA's comment that Chapter 5: *Weight of Evidence* of this SIP narrative contains "no documentation on methodology and monitors used." On the contrary, on page 5-8, the chapter states: "The technique for estimating background ozone concentrations is detailed in Appendix B." The referenced Appendix B also includes a list of monitors specifically selected for this analysis and references two studies, Nielsen-Gammon et al. (2005)[40] and Berlin et al. (2013),[41] which have guided TCEQ background ozone computations in this and several previous SIP revisions.

TCEQ disagrees that the selected technique for computing background ozone biases local ozone production low and biases background ozone values high, and EPA presents no evidence or sources supporting this assertion. In fact, as noted in Appendix B, and following the cited methodology, "perimeter monitors were selected to avoid low biased ozone concentrations found in the urban core."

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[40] Nielsen-Gammon, J. W., J. Tobin, A. McNeel, and G. Li (2005), A Conceptual Model for Eight-Hour Ozone Exceedances in Houston, Texas, Part I: Background Ozone Levels in Eastern Texas, Texas A&M University, January 29, 2005.

[41] Berlin, S. R., A. O. Langford, M. Estes, M. Dong, and D. D. Parrish (2013), Magnitude, Decadal Changes, and Impact of Regional Background Ozone Transported into the Greater Houston, Texas, Area. dx.doi.org/10.1021/es4037644, Environ. Sci. Technol. 2013, 47, 13985−13992.

Nielsen-Gammon et al. (2005)[1] specifically discusses the importance of site selection in the DFW area to inhibit low bias of background ozone estimates. Further, TCEQ estimates of background ozone are in-line with, or indeed lower than, estimates by other studies, that used different techniques, including chemical transport models (CTMs), such as Parrish and Ennis (2019),[42] which found background ozone levels of 54 to 63 ppb in rural western states and 43 to 49 ppb in northeastern states, as well as McDonald-Buller et al. (2011)[43] and Jaffe et al. (2018).[44]

No changes were made to the SIP revision in response to this comment.

EPA commented that TCEQ seemed to conclude that 33% to 40% of total ozone comes from local production and that local reductions would be helpful in attaining the standard. EPA suggested that TCEQ analyze CAMx Anthropogenic Precursor Culpability Assessment (APCA) results for high monitored ozone exceedance days to see how the base case and future case compare.

TCEQ stated on page 2-10 of Appendix B: *Conceptual Model for the Dallas-Fort Worth Nonattainment Area for the 2008 Eight-Hour Ozone National Ambient Air Quality Standard*: "Locally produced ozone accounted for approximately 27% to 32% of MDA8 ozone, regardless of whether the day was a high ozone day or not." TCEQ agrees that local reductions would be helpful in attaining the standard, and this SIP revision accounts for anticipated local reductions to demonstrate attainment. Although APCA results would be interesting to analyze, it is not a requirement for AD and is not recommended in EPA modeling guidance; thus, the commission did not include APCA results in this SIP revision.

No changes were made to this SIP revision in response to this comment.

EPA commented that recent 95th percentile NO_X is the same as or higher than 2016 levels, which does not support projected reductions in ozone.

The commission disagrees with the implied conclusion of this comment that trends in annual 95th percentile NO_X concentrations are a primary determinant of annual ozone design values. It is well known that ozone is highly variable and is formed in a complex system with many interconnected factors, as discussed in the conceptual model. The annual 95th percentile NO_X in 2022 was higher than its value in 2016, but the 2022 design value in DFW was lower than 2016. This SIP revision clearly demonstrates that NO_X is only one factor in ozone design values and cannot be considered in isolation.

No changes were made to this SIP revision in response to this comment.

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[42] Parrish, D. D. and Ennis, C. A. Estimating background contributions and US anthropogenic enhancements to maximum ozone concentrations in the northern US, Atmos. Chem. Phys., 19, 12587–12605, doi.org/10.5194/acp-19-12587-2019, 2019.

[43] McDonald-Buller, E., et al. Establishing Policy Relevant Background (PRB) Ozone Concentrations in the United States. Environ. Sci. Technol. 2011, 45, 9484–9497. dx.doi.org/10.1021/es2022818.

[44] Jaffe, DA, et al. 2018. Scientific assessment of background ozone over the U.S.: Implications for air quality management. Elem Sci Anth, 6: 56. doi.org/10.1525/elementa.309.

EPA commented that no information was provided regarding the hours of the day that were used in the calculation of VOC/NO_x ratios used in Section 5.2.4: *VOC and NO_x Limitation* from Chapter 5: *Weight of Evidence* of this SIP narrative.

The VOC/NO_x ratios calculation used all hours of the day. TCEQ added a sentence on page 5-16 of this SIP revision noting the hours of the day that were included in the calculation of the VOC/NO_x ratios.

EPA commented that the "soccer plots" included with the meteorological performance evaluation were very helpful. EPA compared the meteorological modeling output between the DFW and HGB areas and made the following observations: (1) HGB had better wind speed bias; (2) DFW had better wind direction bias and error; (3) DFW had less temperature error, but a bit more bias; (4) HGB had a tight temperature bias of +0.5 Kelvin; and (5) DFW humidity was slightly more negatively biased. EPA further commented that it would have been more helpful in the written discussion to compare the meteorological modeling results between DFW and HGB, and to meteorological modeling for past episodes.

The commission disagrees with EPA that the written narrative would be enhanced by comparing these results with meteorological modeling for past ozone episodes used by TCEQ, such as for a 2006 base case, 2012 base case, etc. The meteorological modeling for those episodes relied on the latest versions of the meteorological models (e.g., WRF, MM5, etc.) available at the time that work was done, and the latest versions of meteorological models used in this SIP revision include significant scientific improvements. Also, the meteorological modeling for those previous episodes is appropriately documented in previous AD SIP revisions for the DFW and HGB areas. Discussion of older work would be neither valuable nor is required in this current SIP revision.

Similarly, comparing meteorological modeling results between the DFW and HGB areas is neither required nor illuminating. The performance differences noted by EPA between the DFW and HGB areas exist, but such differences are trivial. For example, the wind speed accuracy for the DFW and HGB areas are provided in Tables 2-6 and 2-4 of Appendix A, respectively. For wind speeds less than two meters per second (m/s), Table 3: *Modeled Wind Speed Accuracy at 2 m/s for DFW and HGB by Month in 2016*, below, compares the results between the DFW and HGB areas by month. For the four months of April through July, the results for the HGB area are slightly better, but the results for the DFW area are slightly better for the three months of August through October. Across all seven months of the 2016 episode, the average performance difference between the DFW area and HGB area is a mere 0.3%.

Table 3: Modeled Wind Speed Accuracy at 2 m/s for DFW and HGB by Month in

2016

Month	DFW	HGB	Difference
April	82.2%	83.8%	1.6%
May	82.8%	86.4%	3.6%
June	87.2%	88.3%	1.1%
July	90.0%	90.1%	0.1%
August	94.0%	92.3%	-1.7%
September	91.3%	89.0%	-2.3%
October	86.0%	85.6%	-0.4%
Average	87.6%	87.9%	0.3%

In all its modeling efforts, TCEQ strives for optimal performance and chooses the WRF modeling that provides robust performance across multiple areas. As EPA clearly stated in its modeling guidance when discussing uncertainty in modeling analyses, perfection is an impossible goal to achieve. Expectations of documentation of such unnecessary details, comparisons, and analysis does not enhance the SIP revision and only places undue burden on the state to expend limited resources on these unnecessary tasks.

No changes were made to this SIP revision in response to this comment.

EPA commented on point source growth factors and emission reduction credits (ERCs) in Section 3.3.1.3 of Appendix A. In discussion of the ERC sensitivity figures in Table 3-5 *Comparison of the 2026 Modelable Bank and Predicted Growth for Emission Reduction Credit Modeling Sensitivity*, EPA suggested that it should be explained that higher NO_X and VOC emission figures from Table 3-4 *Comparison of the 2026 Modelable Bank and Predicted Growth* were used.

The commission acknowledges that EPA would present and discuss these ERC sensitivity results in a slightly different manner, but pertinent information regarding ERC is clearly and succinctly presented as is. It is evident that the NO_X and VOC values in the third and fourth columns of Table 3-4 of Appendix A match those from the third and sixth columns of Table 3-3, respectively. In addition, the last column of each table has the heading "Future Year Characterized By" to indicate whether growth, ERCs, etc., are driving the final values modeled. There is no need to overly explain what is evident from a simple comparison of two tables close to each other in Appendix A.

No changes were made to this SIP revision in response to this comment.

EPA is skeptical of the 40% reduction in June on-road NO_X emissions between 2019 and 2026 in the DFW area because of population growth during that period. The 30% reduction in VOC emissions and 25% reduction in CO emissions from June 2019 to June 2026 in DFW were also highlighted. EPA commented that though the new MOVES4 model was only released in September 2023, two months prior to this SIP revision proposal, TCEQ should have discussed potential impacts of MOVES4 in weight-of-evidence and encouraged TCEQ to run MOVES4 sensitivities prior to potential adoption of this SIP revision.

The commission utilized the latest MOVES3 model and the latest activity data available at the time of SIP development. Further, the on-road emissions presented in this SIP revision are comparable to on-road emissions developed and made available in EPA's 2016v3 modeling platform, which EPA encouraged TCEQ to use in another comment.

TCEQ compared the 2026 on-road emissions of NO_x, VOC and carbon monoxide (CO) to EPA's latest 2016v3 on-road NO_x, VOC, and CO emissions for the DFW and HGB areas. Table 4: *Comparison of June 2026 On-road Emissions Estimates between TCEQ's Modeling Platform and EPA's Modeling Platform*, below, provides a comparison of 2026 on-road emissions values for the month of June between TCEQ and EPA. While TCEQ June 2026 NO_x values for the DFW area were marginally less than EPA's corresponding June 2026 total (8% less), TCEQ's June 2026 VOC and CO emissions for the DFW area were notably larger than EPA's 2016v3 corresponding totals (18% and 11% greater respectively), suggesting TCEQ's 2026 on-road emissions are likely not underestimated. Additionally, the change in TCEQ on-road emissions from June 2019 to June 2026 (41% NO_x decrease, 31% VOC decrease, 22% CO decrease for the DFW area) appears proportional to the change in EPA on-road emissions from June 2016 to June 2026 (62% NO_x decrease, 47% VOC decrease, 36% CO decrease for the DFW area). This conclusion is also supported when comparing other summer months covering the height of ozone season.

Table 4: Comparison of June 2026 On-road Emissions Estimates between TCEQ's Modeling Platform and EPA's Modeling Platform

Area Pollutants	TCEQ 2026 June (tons per month)	EPA 2026 June (tons per month)	TCEQ-EPA Difference (tons)	Percent Difference to EPA	Percent Change from 2019 to 2026 in TCEQ Modeling	Percent Change from 2016 to 2026 in EPA Modeling
DFW NO_x	1,626.53	1,760.49	-133.96	-8%	41%	62%
DFW VOC	968.40	821.02	147.38	18%	31%	47%
DFW CO	20,788.09	18,672.53	2,115.56	11%	22%	36%
HGB NO_x	1,303.48	1,434.66	-131.19	-9%	41%	63%
HGB VOC	813.36	827.42	-14.06	-2%	29%	46%
HGB CO	17,878.41	17,778.28	100.13	1%	21%	36%

It should be noted that the EPA 2016v3 modeling platform also utilized the MOVES3 model. Some differences in future year emissions should be expected since TCEQ used link-based inventories for these areas, while EPA used county-based inventories.

EPA's expectation that TCEQ should have discussed the potential impacts of the new MOVES4 model—released two months prior to proposal of this SIP revision—in this SIP revision, as well as the expectation that TCEQ perform MOVES4 sensitivities prior to adoption of this SIP revision, are both unnecessary and unreasonable due to the time and resources needed to develop emissions inventories and conduct sensitivity model runs. EPA policy guidance on use of MOVES4 for SIP purposes outlines that state agencies should use the latest version of MOVES available at the time of SIP development. The guidance also further states that "state and local agencies that have already completed significant work on a SIP

with MOVES3 (e.g., attainment modeling has already been completed with MOVES3) may continue to rely on MOVES3" (see page 8 of Policy Guidance on the Use of MOVES4 for State Implementation Plan Development, Transportation Conformity, General Conformity, and Other Purposes).[45] Therefore, it is reasonable for this SIP revision to rely on MOVES3 for its on-road emissions inventory, and investigating whether MOVES4 makes a difference in the on-road emissions is not plausible or required.

No changes were made to this SIP revision in response to this comment.

EPA commented that TCEQ did not use negative values to denote the difference between 2026 and 2019 in Table 3-8 for DFW in the HGB Technical Support Document (TSD), but TCEQ used negative values in Table 3-10 for HGB.

The commission agrees with EPA's suggestion to make the tables in Appendix A consistent and made the corresponding updates in Appendix A.

EPA recommended that TCEQ provide a reference to where the RACM sensitivity is discussed in detail in Section 3.7.1.1 of the TSD (Appendix A).

A reference has been added to Appendix A.

EPA pointed out that Gulf of Mexico emissions used for base and future years for this SIP revision were from a 2017 gulf-wide emissions inventory (GWEI). EPA inquired whether TCEQ determined if these emissions were expected to change in the future and if any discussions had occurred with the Federal Bureau of Ocean Energy Management (BOEM), which developed the inventory. EPA also asked if any trends were analyzed.

The 2017 GWEI emissions dataset was the most up-to-date emissions dataset available at the time of SIP development. Gulf-wide 2017 emissions were kept as is for the base year 2019 and future year 2026 because no projection factors are available for these sources. TCEQ did not have discussions with BOEM, and a trend analysis was not done as it is not required.

No changes were made to this SIP revision in response to this comment.

EPA commented on the DFW "soccer plots" included in Section 5.2.2: *Monitor-Specific Statistics* of Appendix A and emphasized that almost all marks are within the acceptable NMB and NME boundaries for the four highest DFW area monitors. EPA stated that the highest error occurred during the first three months of the episode. EPA stated that performance data for the Dallas North #2 monitor shows negative bias in Figure 5-6: *NMB of MDA8 Ozone ≥ 60 ppb for DFW Monitors,* but only positive bias for all months in Figure 5-8: *Soccer Plots of NMB and NME of MDA8 Ozone at DFW Monitors*. EPA made a similar comment for the Grapevine Fairway monitor also showing negative bias in Figure 5-6 but only positive bias for all months in Figure 5-8. EPA stated that the differences are likely due to MDA8 greater than 60 ppb (MDA8>60)

[45] https://www.epa.gov/system/files/documents/2023-08/420b23009.pdf

data being included in Figure 5-6 but not in Figure 5-8. EPA commented that this difference should be made clearer to the reader.

The commission does not agree that the first three months of the episode had the highest error. Table 5-6: *Performance Statistics for Observed MDA8 ≥ 60 ppb at All DFW Monitors* on page A-99 of Appendix A shows that June and July had the highest errors, and these are the third and fourth months of the episode, respectively.

The commission does not agree that negative bias is presented for the Grapevine Fairway monitor in Figure 5-6. On the contrary, Figure 5-6 demonstrates that positive bias of roughly 2% is reported for both the Grapevine Fairway and Fort Worth Northwest monitors.

The commission agrees that MDA8>60 ppb data were used for the NMB data by monitor presented in Figure 5-6 but not for the NMB/NME data presented in Figure 5-8 soccer plots. This is made clear since the captions for Figures 5-6 and 5-7 reference use of data above 60 ppb, while Figure 5-8 does not. TCEQ understands that EPA would present and discuss these results in a slightly different manner but believes pertinent information regarding model performance statistics are clearly and succinctly presented as is.

No changes were made to this SIP revision in response to this comment.

EPA requested that TCEQ explain why the months of June, August, and September were chosen as test months for the CAMx options (at the top of page A-102 of Appendix A).

June, August, and September were chosen as the three test months for the CAMx options based on the higher number of ozone exceedances (compared with other months) of the 2008 ozone NAAQS of 75 ppb at monitors in the three Texas ozone nonattainment areas and WRF model performance evaluation.

An explanation has been added to Appendix A.

EPA stated that TCEQ should provide additional detail concerning the emission tileplots. EPA observed that no difference plots were provided for the area source category in Appendix A and stated that since the differences [in area source emissions] presented in Tables 3-36 and 3-38 are small, readers might be confused or not catch that sources are grown in place and that there will be no spatial differences between base and future case emissions.

The commission acknowledges that EPA would choose to include different figures if it was preparing similar documentation. As observed by EPA, the differences are minimal between base and future case emissions and this is documented by TCEQ using tables as well as figures in Appendix A. Further details on how the 2026 future case emissions were derived are also provided in Appendix A.

No changes were made to this SIP revision in response to this comment.

EPA commented that use of the word “stagnated” should be replaced with “leveled off” in Section 2.3 on page 2-6 of Appendix B. EPA also commented that use of the word “sunlight” in Section 3.1 on page 3-2 of Appendix B should be replaced with “solar insolation”.

The commission acknowledges that EPA would make different word choices if it was preparing similar documentation. Wherever possible when presenting highly complex technical information, the commission prefers to use “plain English” language for ease of understanding for non-technical readers. For example, simply saying “these cooler months have less sunlight” on page 3-2 is just as clear and is more readable than saying “these cooler months have less solar insolation.” If anything stated in the SIP documentation is either unclear or incorrect, the commission appreciates having it noted.

Since these editorial comments by EPA do not bring more clarity to the reader, no changes were made to this SIP revision in response to these comments.

EPA commented that it was unclear if there was a cut-off used to identify the “low ozone days” in Section 2.5 of Appendix B.

The commission did not use a low-end cutoff to define *low ozone days*, and all non-exceedance days are considered low ozone days. A clarifying sentence was added to Appendix B, Section 2.5.

An individual commented that they were curious about why TCEQ picked a “cleaner” base year of 2019, which had 29 high ozone days and 59 exceedances while 2023 had 53 high ozone days and 213 exceedances. The commenter requested that TCEQ explain why this base year was chosen.

The purpose of this SIP revision is to demonstrate whether the DFW nonattainment area will or will not attain the 2008 eight-hour ozone NAAQS in accordance with EPA’s rules and guidance and FCAA requirements. As part of this SIP revision, TCEQ conducted photochemical modeling in accordance with EPA modeling guidance that included different components such as episode selection, modeling domain, and development of necessary model inputs such as meteorological parameters, emission inputs, initial and boundary conditions, and model performance evaluation. Development and documentation of an AD involves extensive work spanning several years. To accommodate SIP due dates imposed by EPA, simply shifting to a newer year was infeasible because of the time and resources required to incorporate changes in emission inputs for all Texas and non-Texas areas as well as unavailability of several key datasets. For example, using 2023 as a base year would require crucial datasets such as a certified 2023 design value data and a quality assured 2023 point source emissions inventory data, which will not be available until May 2024 and November 2024, respectively.

The commission followed EPA modeling guidance in choosing the 2019 base year (episode year) that is recent and has a sufficient number of high ozone days that follow historically observed patterns in a timely manner such that the commission will be able to meet EPA imposed deadlines for this SIP revision in a timely manner.

No changes were made to this SIP revision in response to these comments.

One commenter asserted that "the NAAQS for ozone has never been achieved for the Dallas-Fort Worth region."

On October 16, 2008, EPA issued a determination that the DFW area had attained the one-hour NAAQS of 0.12 parts per million (73 FR 61357). Subsequently, on September 1, 2015, EPA finalized the determination of attainment by the DFW area for the 1997 eight-hour ozone NAAQS of 0.08 ppm (80 FR 52630). On March 27, 2008, EPA once again revised the ozone NAAQS to 0.075 ppm (73 FR 16436). As this SIP revision demonstrates, the DFW area has made substantial progress toward attainment of this 2008 ozone NAAQS, with the DFW eight-hour ozone design value declining 11% from 2012 (87 ppb) through 2022 (77 ppb). As EPA has continued to tighten the ozone NAAQS, the DFW area has continued extensive efforts to reduce emissions and make progress towards attainment of the latest ozone NAAQS.

No changes were made to this SIP revision in response to this comment.

One commenter referenced a 50% reduction in traffic in Spring 2020 and a 17% reduction in traffic in December 2020 in the DFW area that did not see a corresponding decrease in ozone levels. The commenter suggested TCEQ perform a comprehensive evaluation of 2020 to identify impacts of the COVID-19 pandemic on emissions of ozone precursors, especially relating to reduced mobile source emissions due to curtailed commuting.

In the SIP revision, both in Appendix B and Chapter 5: *Weight of Evidence* of the SIP narrative, TCEQ evaluated ozone in 2020 at both annual and monthly time scales, but neither scale identified any impacts specifically attributable to COVID-19. Section 5-5 of Appendix B identified 2020 as a year with meteorology that was less conducive to ozone formation than a typical year. This meteorology was likely a greater influence on ozone that year than any changes during the response to COVID-19 that curtailed commuting.

A thorough evaluation of COVID-19 is beyond the scope of this SIP.

No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club commented that the episode year should include more days with high ozone and notes that 2018, 2021, 2022, and 2023 had a greater number of exceedances than 2019. The Lone Star Chapter of Sierra Club asserted that 2019-episode selection is "pale" in comparison to ozone exceedances in these suggested years and suspects that 2019 base year selection may lead to underpredicting ozone in the photochemical model.

The commission followed EPA modeling guidance in choosing the base year (episode year) that is both in the recent past and has a sufficient number of high ozone days that follow historically observed patterns. In choosing a base year, TCEQ focuses on both exceedance days per episode as shown in Figure 3-1 of the SIP revision, as well as total exceedances that the commenter refers to and are shown in Figure 1-1 of Appendix A. The HGB nonattainment area had 22

exceedance days in 2019, which is the most since 2015 (29). The DFW area had 13 in 2019, and while 2018 had a higher number of exceedance days (21), TCEQ must choose a base year that satisfies criteria specified in EPA modeling guidance for all areas (HGB, DFW, and Bexar County) for ozone AD purposes.

In accordance with EPA modeling guidance, a base year must reflect "a variety of meteorological conditions that *frequently* [emphasis added] correspond with observed eight-hour daily maxima concentrations greater than the level of the NAAQS at monitoring sites." Although 2018 was considered, during its summer the polar jet stream trajectory took an atypical, strong southerly path towards the Gulf of Mexico in late July, leading to stagnant winds and high ozone. Typically, July experiences relatively low ozone compared with June and August because impact of the Bermuda High on Texas is at its peak during this time, resulting in steady offshore winds from the Gulf of Mexico that tend to bring low background ozone concentrations. Therefore, the summer of 2018 did not follow historically observed temporal patterns for ozone formation. TCEQ found that the 2019 temporal distribution of exceedances for all areas was more representative of the 10-year average. TCEQ presented this information on July 21, 2021, at an Air Quality Technical Information Meeting for the DFW area. More information about episode selection is available at Modeling Base Year Selection (chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.tceq.texas.gov/downloads/air-quality/modeling/meetings/dfw/2021/20210701-modelingepisode-tceq-scalpone.pdf) and in Section 1.2 of Appendix A.

More recent years such as 2020 and 2021 cannot be selected because emission inputs might be atypical due to the COVID-19 pandemic. In addition, development and documentation of an AD involves extensive work spanning several years. To accommodate SIP due dates imposed by EPA, newer years such as 2021, 2022, and 2023 cannot be selected because of the time and resources required to incorporate changes in emission inputs for all Texas and non-Texas areas as well as unavailability of key datasets in a timely manner.

Regarding photochemical model performance, TCEQ used EPA-recommended methodology, statistics, and documentation. As discussed in Section 5 of Appendix A, TCEQ compared model results to observed data during periods where maximum daily 8-hour average (MDA8) ozone was at or above 60 ppb. Using benchmarks reported in the Emery et al., 2017 paper recommended in EPA modeling guidance, TCEQ found that all monitors in the HGB and DFW areas had a normalized mean bias (NMB) and NME within either the criteria or goal range. TCEQ finds that the choice of base year and model performance in replicating high ozone in the chosen base year are in line with EPA modeling guidance.

No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club used different ozone metrics such as the number of monitors exceeding the 2008 ozone NAAQS in 2023, preliminary 2023 eight-hour ozone design values, and maximum annual daily fourth highest eight-hour ozone concentrations in the DFW area to suggest that 2023 was the "worst" year for ozone "violations" over the 2014 through 2023 period in the DFW area. The commenter then

stated that monitored ozone values in 2023 do not support the forecast of attainment of the 2008 ozone NAAQS by the attainment date of July 20, 2027.

The commission disagrees that the preliminary 2023 design value and number of monitors that exceeded the 2008 ozone NAAQS in 2023 are appropriate measures of whether 2026 DVF values contained in this SIP are realistic. The attainment date for the 2008 eight-hour ozone NAAQS for the severe classification for the DFW area is July 20, 2027, which will require incorporation of monitored ambient ozone data from 2024 through 2026 to compute design values. Monitored ozone data from 2023 will not be used to determine compliance for the DFW area and is, therefore, by itself inappropriate for assessing future attainment status of the nonattainment area.

Regarding efforts to project future ozone design values, it is well known that ozone is highly variable across many time scales and is formed in a complex system with many interconnected factors. One of the most, if not the most, important factors is meteorology. Meteorology is highly variable, like ozone. Meteorology in 2023 was markedly different from most other years in the DFW area. DFW meteorological data from 2023[46] from National Weather Service monitoring stations in context with other recent years confirms that 2023 recorded abnormally high temperatures and abnormally dry conditions throughout the critical late ozone season period of time in the DFW area. For this reason, too, it is inappropriate to use 2023 as a year of comparison for compliance determinations.

The commenter incorrectly referred to exceedances the 2008 ozone NAAQS of 75 ppb as violations. Compliance or violation with the eight-hour ozone NAAQS is determined with the design value, which averages three years of annual fourth highest daily maximum eight-hour ozone concentrations at the same monitor. This multi-year averaging is intended to account for some of the year-to-year variability in meteorology and its effect on ozone formation. Further, the commenter used the term "peak at" in reference to the maximum among areawide annual fourth highest daily maximum eight-hour ozone concentrations in the DFW area. These values may or may not occur at the areawide design value setting monitor, which is the monitor of interest for compliance determinations.

Design values show that eight-hour ozone design values in the DFW area have declined 11% from 2012 through 2022, from 87 ppb to 77 ppb suggesting the DFW area is making steady progress towards attainment by the 2027 attainment date.

No changes were made to this SIP revision in response to these comments.

NCTCOG requested TCEQ to have a thorough, peer-reviewed photochemical model validation assessment to explain the model's NO_x emissions underprediction, resulting in future year results inconsistent with observed monitoring readings.

As part of this SIP revision, TCEQ conducted photochemical modeling in accordance with EPA modeling guidance, used the latest data, models, and scientific research

[46] https://weatherspark.com/h/y/8813/2023/Historical-Weather-during-2023-in-Dallas-Texas-United-States

available at the time of the SIP revision, and conducted a robust model performance evaluation that met the performance benchmarks for air quality modeling applications. In addition to modeling, the SIP revision includes other elements for evaluating the future attainment status of an ozone nonattainment area, including weight-of-evidence analyses.

TCEQ continually performs state-of-the-science studies to improve the emissions inventory used in the AD modeling. These studies result in refined emissions factors, activity data, or emissions determination methods that are incorporated directly into development of appropriate inventory source categories. These efforts ensure the best possible inventory data are used for this SIP modeling. TCEQ's Air Quality Research and Contract Reports: Photochemical Modeling webpage can be reviewed for more information (https://www.tceq.texas.gov/airquality/airmod/project/pj_report_pm.html).

NCTCOG did not provide details on how it determined that NO_x emissions were underpredicted, nor did it point to specific emission sectors that might need improvements. TCEQ continues to evaluate its modeling to reduce uncertainties of the modeling inputs based on availability of data and resources.

No changes were made to this SIP revision in response to these comments.

NCTCOG stated that TCEQ's photochemical model performance is within EPA's modeling guidance but is significantly off from real-world observance. NCTCOG suggested that further evaluation is needed. Further, NCTCOG stated that TCEQ [should be] "applauded for a <15 percent normalized mean bias for all the monitors except the Cleburne Airport monitor" but asserted that this still does not achieve desirable results. Further, NCTCOG recommended establishing more stringent Texas-level or region-specific criteria rather than relying on generous EPA/national guidance parameters. NCTCOG commented that results in the photochemical modeling contain a systematic underprediction of ozone values. NCTCOG requested further assessment of the established modeling platform, with any necessary updates/revisions to be done for future work.

The commission disagrees with NCTCOG that the results contain a systematic underprediction of the values in the photochemical model. According to Emery et al. (2017), cited in Chapter 3 of the SIP, the 15% normalized bias for ozone is based on a review of historical modeling applications and provides a measure of what the top third of models have achieved in terms of performance. TCEQ performed the MPE by comparing 2019 base case CAMx modeling results to measured ozone concentrations at all ozone monitors in the DFW 2008 ozone NAAQS nonattainment area. Figure 3-10 in Chapter 3 of this SIP revision shows that all monitors in the DFW area have NMB for this data aggregation within the criteria range, with seven monitors meeting the goal range. Figure 3-11 in Chapter 3 of this SIP revision shows all monitors in the nonattainment area had NME within the goal range for this data aggregation. By these metrics, 2019 base case CAMx modeling has overall good to acceptable performance when replicating MDA8 ozone concentrations greater than or equal to 60 ppb in the DFW area. More information on MPE is described in Section 3.5 of the SIP revision and Section 5 of Appendix A.

Therefore, given information in the SIP that adheres to EPA modeling guidance, there is no further evaluation needed. TCEQ has no basis to make any substantive changes to the modeling platform and MPE.

MPE criteria/standard are establishing performance standards for modeling when compared to other modeling applications. Since EPA is the authority that reviews and approves TCEQ's modeling, setting of MPE criteria for acceptable performance is EPA's prerogative. TCEQ cannot review all modeling applications and decide what is acceptable for AD modeling performance.

Further, these metrics are not only based on the geographic scope of modeling applications but rather on the ability of all models to replicate as many air quality episodes as possible. TCEQ here did not rely on national metrics but rather on metrics set for air quality modeling.

Comments concerning future SIP planning are outside the scope of this AD SIP revision.

No changes were made to this SIP revision in response to these comments.

NCTCOG recommended that TCEQ establish necessary resources and reinstate photochemical model sensitivity analysis. NCTCOG also commented that TCEQ should conduct modeling to evaluate scenarios such as: zero-out runs for specific source categories, time of day and day of week analysis, and any other programs that generate unnecessary emissions. NCTCOG commented that TCEQ must publish the findings from this analysis.

Sensitivity analyses are performed when new control measures are developed as a part of the RACM analysis. As discussed in Chapter 3: *Photochemical Modeling* of this SIP revision, current modeling results indicate that the DFW area will demonstrate attainment by its attainment date of July 20, 2027. Therefore, no additional measures were determined to be necessary to meet or advance attainment of the 2008 eight-hour ozone NAAQS, and sensitivity analyses were not conducted. More RACM analysis information is described in Section 4.6: *RACM Analysis* of this SIP revision.

Comments concerning future SIP planning are outside the scope of this AD SIP revision.

No changes were made to this SIP revision in response to these comments.

NCTCOG commented that they observed slight differences, 0.07 and 0.04 tons per day (tpd), respectively, in on-road NO_x and VOC emissions values between data provided by NCTCOG to TCEQ and the values shown in the proposed SIP revision. NCTCOG provided a table with these differences in on-road emissions numbers, and requested an explanation from TCEQ on why a slight discrepancy was found.

In March 2023, TCEQ implemented emission factor adjustments to apply Reformulated Gasoline (RFG) benefits in Ellis, Johnson, Kaufman, Parker, Rockwall, and Wise Counties in the DFW area. This benefit has already been in effect in Collin,

Dallas, Denton, and Tarrant Counties since January 1, 1995, and took effect in the remaining six counties of the DFW 10-county area on November 7, 2023. Emission factor adjustments are based on relative differences between Low Reid Vapor Pressure (RVP) and RFG scenarios simulated with MOVES3 for a July 2026 weekday in each of the 6 counties. These adjustment factors were applied to the emissions inventory provided by a contract project with NCTCOG. This updated inventory was included as an emissions input in the latest CAMx runs done for the Appendix A of this SIP revision. Table 5: *Comparison of June 2026 On-Road emissions between two versions of TCEQ emissions modeling and NCTCOG inventory totals*, below, shows the numbers in question.

Table 5: Comparison of June 2026 On-Road emissions between two versions of TCEQ emissions modeling and NCTCOG inventory totals

Source Type	Source	Processing Date	NO_X (tpd)	VOC (tpd)
NCTCOG On-Road	MOVES3 Link	n/a	60.19	33.27
TCEQ On-Road	MOVES3 Link	8/24/2021	60.19	33.27
TCEQ On-Road	MOVES3 Link w/RFG for 6 remaining DFW counties	3/29/2023	60.12	33.31

An explanation of the RFG benefit applied to the on-road emissions of the six counties in DFW has been added to section 3.4.1 of Appendix A to add more context to the emissions values presented in the technical support document.

NCTCOG commented that Figure 5-8 in Chapter 5: *Weight of Evidence* illustrates a decreasing trend in NO_X emissions and that the data in the graph illustrates a variable or flat trend.

The commission agrees that Figure 5-8 in Chapter 5: *Weight of Evidence* illustrates a decreasing trend in NO_X emissions from 2012 through 2021, a decline of 26% from 13,984.56 tons per year (tpy) in 2012 to 10,359.37 tpy in 2021. The commenter appears to be referring to more recent years, specifically 2017 through 2021, when reported NO_X emissions were variable and did not follow a clear upward or downward trend. Such short-term changes in emissions are expected and conclusions on trends from such limited data is inappropriate, which is why this SIP revision examined a decade of data.

No changes were made to this SIP revision in response to this comment.

NCTCOG recommended that TCEQ expand the map of NO_X sources shown in Figure 5-9: *Map of Stationary NO_X Emissions Sources in the DFW 2008 Ozone NAAQS Nonattainment Area* of Chapter 5: *Weight of Evidence* to include sources farther south and east of the DFW area.

The intent of Figure 5-9 is to highlight sources entirely within the DFW severe ozone nonattainment area. While a conceptual model can provide information on prevailing wind directions associated with high ozone conditions, it is unable to attribute impacts to specific source locations.

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice commented that TCEQ's conclusion of area attainment "is not credible" because the modeling underestimates ozone and measured ozone is not decreasing. Sierra Club commented that it is irrational for TCEQ to attempt to demonstrate attainment using modeling for the following reasons: TCEQ's own MPE, which is discussed elsewhere in this RTC, casts doubt on the accuracy of the modeling, model underpredicts ozone levels at most regulatory monitors in DFW, the NMB falls outside the range that indicates good performance including at monitors that have historically captured the highest ozone levels such as Dallas North #2 and Arlington Municipal Airport, and since modeling for the DFW monitor has been shown to underestimate ozone levels on average 5% or 3.75 ppb. Sierra Club and Earth Justice also notes that monitoring methods would change next year but this was not accounted for in the AD.

TCEQ used EPA modeling guidance as well as the latest data, models, and scientific research available at the time of the SIP revision and conducted a robust model performance evaluation that met performance benchmarks for air quality modeling applications. TCEQ evaluated model performance and compared statistical parameters to benchmarks reported in the Emery et al., 2017 paper recommended in EPA modeling guidance. The commission disagrees that NMB falls outside the range that indicates good performance. Figure 3-10 in the SIP Narrative and Figure 5-6 in Section 5.2 of Appendix A show that all regulatory monitors in the DFW area have NMB within the criteria range (< ±15%), with nine monitors within the goal range (< ±5%). Five percent for NMB is typically achieved by the top third of modeling applications. This indicates acceptable to good model performance at all monitors. In addition, all monitors in the DFW area have NME within the goal range, which indicates good model performance too. Further, Sierra Club and Earthjustice also fail to acknowledge that the NMB is very low for some of the monitors that have historically measured the highest ozone levels in DFW such as Denton Airport South (-2%), Fort Worth Northwest (+2%), Grapevine Fairway (+2%), and Keller (-2%) in the past few years.

TCEQ attainment modeling that shows attainment of the ozone standard of 75 ppb in 2026 is supported by analysis of measured ozone trends as presented in Chapter 2 of Appendix B of this SIP revision. That chapter states that "the range of design values has been decreasing across the entire DFW area. While in 2012, 16 monitors failed to attain the 2008 ozone NAAQS of 75 ppb, by 2022, only five monitors did not attain the 2008 ozone NAAQS." Details of the trends are shown in Figure 2-2 of Appendix B and ozone design values for 2012, 2017, and 2022 are presented on maps.

The change in monitoring methods is not expected to impact design values. As EPA stated in the October 12, 2023, excerpt in the final rule summary: "The adoption of this updated ozone absorption cross-section could result in increases in measured ozone concentrations but given the existing sources of potential variability in monitoring data, it is unlikely that there will be any consistent measurable and predictable effect on reported data" (88 FR 70595). Further, changes in monitoring methods are outside the scope of this SIP revision.

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice stated that TCEQ's proposal relies solely on existing controls to bring the DFW area into attainment and that is arbitrary and unlawful. They further stated that TCEQ's own modeling does not predict decreases in point source NO_X emissions since the proposal predicts a 55% increase in cement-kiln emissions and a 22% increase in EGU emissions. They further stated that the overall decrease in 2020 emissions is temporary and due to changes in commuting patterns from the COVID-19 pandemic in the U.S. in March and April of 2020. Sierra Club and Earthjustice also stated that TCEQ relies on unusually low pollution levels in 2020 to support its AD, and reliance on low 2020 pollution levels is arbitrary because there is no reasonable basis to expect those pollution reductions to be permanent. They further stated that increasing trends in ambient ozone, NO_X, and VOC is consistent with increasing trends in point source NO_X and VOC emissions. Sierra Club and Earthjustice commented that TCEQ cannot rationally conclude the DFW area will attain the ozone standard without taking steps to ensure additional emissions reductions. They further commented that TCEQ's 2020 Serious AD SIP Revision failed to bring the DFW area into attainment and stated that TCEQ provides no reason to believe that emissions reductions from existing controls and fleet turnover will achieve attainment.

The commission disagrees with Sierra Club that the SIP proposal relies solely on existing controls to bring the DFW area into attainment and that the proposal is arbitrary and unlawful. Photochemical modeling indicated that no additional control measures were needed for attainment, and RACM analysis indicated that no control measures would advance attainment, so none were proposed for either purpose. TCEQ's modeling incorporates anticipated emissions reductions in all anthropogenic emissions between the 2019 base case and 2026 future case.

The emissions increases from cement kilns and EGUs that Sierra Club cited are due to TCEQ conservatively modeling regulatory emissions caps. In the future case, NO_X emissions for cement kilns are conservatively modeled using the entire Holcim account specific NO_X cap specified in 30 TAC §117.3123, and per ton clinker limits specified in agreed orders and permitted production limits for TXI and Ash Grove. In developing future case NO_X emissions for EGU, TCEQ chose to conservatively include the entire CSAPR cap. Utilization of this cap typically increases EGU NO_X emissions for the future year. More information on Point Source EI selection is available in Section 3.3 of Appendix A.

The commission disagrees with Sierra Club that TCEQ relies on unusually low pollution levels in 2020 to support its AD. TCEQ followed EPA modeling guidance in choosing a base case modeling episode of April through October 2019 (not 2020) and estimated 2026 future case emissions based on 2019 emissions and economic projection factors. These projection factors were developed prior to 2020 and therefore did not take any COVID-19 impacts into account. Specifics of the projection factors, also called growth factors, differ by sector, and are described in detail throughout Appendix A.

TCEQ acknowledges that modeled design values for the 2020 future year in a previous SIP revision were not precise predictions of actual monitored design values, as photochemical models are approximations of complex phenomena. All

modeling analyses used for AD modeling contain many elements that are uncertain (e.g., emissions projections, meteorological inputs, chemical mechanisms, etc.). Per EPA modeling guidance, these uncertain aspects of modeling prevent definitive assessments of future attainment status. As stated above, a key variable factor is meteorology, which is not forecasted but kept the same as the base year, which was 2012 for TCEQ's 2020 serious AD SIP revision.

TCEQ spent considerable resources in developing the more recent base year of 2019 and also using the latest models, data, and methodology to reduce uncertainty associated with model inputs. Further, TCEQ supplemented its modeling results with weight-of-evidence analyses that included trends analysis of monitored design values that showed as recently as 2022, the DFW area design value was 77 ppb when only five of 20 monitors exceeded 75 ppb, and in 2021 it was 76 ppb when only one monitor exceeded the standard. This evidence indicates that trends in design values in the DFW area suggest slow yet steady progress toward attainment by the 2027 attainment date.

No changes were made to this SIP revision in response to this comment.

EPA commented that the method used to incorporate emission events (EE) and scheduled maintenance, start-up, and shutdown (SMSS) emissions into ozone season emissions does not provide the resolution required for daily or hourly model input, and TCEQ should consider procedural changes for point source EE/SMSS emissions inventory reporting. EPA stated the EE and SMSS should be calculated based on the timeframe of the events instead of adding the EE and SMSS annual tons per year and converting to an ozone season tons per day.

According to 40 CFR Part 51, Subpart A, the Air Emissions Reporting Requirements (AERR) rule, EPA does not require reporting of EE and SMSS emissions. Additionally, the commission disagrees that changing TCEQ's current emissions inventory reporting to hourly or event-based EE/SMSS reporting would constitute a simple "procedural" change to the current database. Instead, these changes would be a complicated undertaking involving significant funds, time, and staff resources.

No changes were made to this SIP revision in response to this comment.

CONTROL STRATEGIES

EPA commended TCEQ's inclusion of contingency measures that fall in line with the January 2021 U.S. Court of Appeals for the District of Columbia Circuit vacatur of EPA's interpretation of the CAA.

The commission appreciates the support. No changes were made to this SIP revision in response to this comment.

EPA commented that TCEQ should clarify if it intends to rely upon all of the contingency measures TCEQ identified in its RFP SIP revision proposal for the ozone nonattainment area if the area failed to attain the 2008 ozone standard or if the DFW area failed to satisfy RFP requirements for the 2008 ozone standard. If the intent of

TCEQ was not to rely on all the contingency measures that it identified at proposal, EPA requested further clarification of not only which contingency measures TCEQ would choose to implement upon a triggering event, but also how a selection process would comply with FCAA requirements and EPA guidance.

As stated in Section 4.9: *Contingency Plan* of the DFW AD SIP revision, each contingency measure can be triggered independently for the DFW 2008 ozone NAAQS nonattainment area, as needed. TCEQ would implement enough contingency measures in the area to meet or exceed the required contingency reductions for whichever purpose may arise first. Table 4-3: *10-County DFW 2008 Ozone NAAQS Nonattainment Area VOC Contingency Measure Reductions* of the DFW AD SIP revision contains a list of the contingency measures and the VOC reduction amount associated with each measure for the DFW area.

Staff inadvertently omitted some source categories and incorrectly stated multiple VOC content limits for other source categories in the industrial adhesives contingency measure of the concurrent Chapter 115 rulemaking proposal (Rule Project No. 2023-116-115-AI). This resulted in less emissions reductions available to fulfill contingency requirements in the DFW area. The Executive Director intends to immediately initiate an Industrial Adhesives Contingency Measure Corrections rulemaking (corrections rulemaking) to restore the missing and incorrect VOC content limits to achieve the reductions originally intended.

Table 4-4: *DFW 2008 Ozone NAAQS Nonattainment Area Severe Attainment Contingency Plan as Adopted* and Table 4-5: *DFW 2008 Ozone NAAQS Nonattainment Area Severe RFP Contingency Plan Adopted and Industrial Adhesives Contingency Measure Corrections Rule* of the DFW AD SIP revision show how the VOC reduction amounts from Table 4-3 satisfy the required contingency measure reductions for the DFW area with or without the additional reductions from the corrections rulemaking.

The FCAA requirement and EPA's 2008 eight-hour ozone standard SIP requirements rule (80 FR 12264) state that contingency measures sufficient to reach the contingency reduction target must be implemented, which is expressed in Line 3 of Table 4-4 and Table 4-5 as 3% of the VOC emissions in the baseline year inventory. Therefore, contingency measures are selected and implemented in agreement with the 2008 eight-hour ozone standard SIP requirements rule, which EPA claims is consistent with the FCAA.

The triggering language in the concurrent 30 TAC Chapter 115 rulemaking (Project No. 2023-116-115-AI) states that the *Texas Register* notice would specify which contingency measures are triggered in which nonattainment areas and the purpose for triggering. For example, the triggering language for the industrial cleaning solvents contingency measure in the DFW area states "The owner or operator of a solvent cleaning operation in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties shall be in compliance with the requirements of §115.463(e) of this title (relating to Control Requirements) no later than 270 days after the commission publishes notification in the *Texas Register* of its determination that the industrial cleaning solvent contingency requirements are necessary as a result of EPA publication of a notice in the *Federal Register* that the

specified area failed to attain the applicable NAAQS for ozone by the attainment deadline or failed to demonstrate reasonable further progress as set forth in the 1990 Amendments to the FCAA, §172(c)(9)."

TCEQ added clarifying language to Section 4.9 of this SIP revision in response to this comment.

EPA, Sierra Club and Earthjustice commented that this SIP revision relies on previous RACT analyses and is based exclusively on existing rules and old CTG and alternative control technique (ACT) guidance documents published by EPA. EPA cited its implementation rules for the 2008 and 2015 ozone NAAQs, noting that for RACT analysis, states should refer not only to the latest CTGs and ACTs but also recent technical information available at the time of SIP development and information received in the public comment period. EPA commented that TCEQ should provide adequate documentation showing analysis of current and relevant economic and technological feasibility data for emission controls that were considered and examined. The Sierra Club and Earthjustice also commented that TCEQ RACT analysis did not follow EPA guidance.

TCEQ evaluated RACT for this DFW 2008 ozone NAAQS severe AD SIP revision based on the EPA's 2008 eight-hour ozone standard SIP requirements rule (80 FR 12264).

The SIP requirements rule does not require states to perform exhaustive research of recent technical information when evaluating RACT, as claimed by the commenters. Section 51.112(a) of the 2008 eight-hour ozone standard SIP requirements rule requires states to "submit a SIP revision that meets the VOC and NO_x RACT requirements in CAA sections 182(b)(2) and 182(f)." The remainder of §51.112 only speaks to deadlines for RACT SIP submittal and RACT implementation and the determination of major stationary sources for RACT.

The language referenced by the commenters is from the preamble of the 2008 eight-hour ozone standard SIP requirements rule and, not the rule itself. Additionally, the language provided in EPA's 2015 eight-hour ozone standard SIP requirements rule (83 FR 62998) referred to the same prior language from the preamble of the 2008 eight-hour ozone standard SIP requirements rule. However, EPA omits other language from the same preamble of the 2008 eight-hour ozone standard SIP requirements rule that states sources already addressed by RACT determinations for the 1-hour and/or 1997 ozone NAAQS do not need to implement additional controls to meet the 2008 ozone NAAQS RACT requirement because the cost of the incremental benefit from additional control may not be reasonable.

Nothing in the 2015 eight-hour ozone standard SIP requirements rule preamble or rule negates this prior preamble language that states might determine that sources addressed by prior RACT determinations do not need to implement additional controls.

Furthermore, when developing attainment demonstrations for ozone NAAQS, state resources would be better spent developing effective control strategies when they are necessary to reach attainment. Resources spent searching for and evaluating

technical information on each and every emission source covered by a previous CTG or ACT document are not available for more productive pursuits.

No changes were made to this SIP revision in response to this comment.

EPA requested TCEQ review and incorporate the controls on EGUs and non-EGUs in EPA's Good Neighbor FIP into the SIP for nonattainment areas. EPA commented that NO_x and VOC controls in nonattainment areas should be at least as stringent as the Good Neighbor rule. EPA also commented that because the 2015 ozone NAAQS poses a greater need for emission reductions than the 2008 ozone NAAQS, TCEQ should conduct a robust analysis of emission controls and include documentation and analyses for CTG RACT, major source non-CTG VOC RACT and major source NO_x RACT.

The commission notes that EPA's Good Neighbor FIP rules are under judicial stay. If the Good Neighbor FIP rules come into force, their effect in the nonattainment areas may be analyzed like other applicable rules in future AD SIP revisions. Additionally, for all applicable units in the DFW area during the ozone season, current TCEQ emission limits are as low or lower than the corresponding limits in the Good Neighbor FIP. A RACT analysis for the 2015 ozone NAAQS would be required for AD SIP revisions developed to address the 2015 ozone NAAQS and is outside the scope of this SIP revision.

No changes were made to this SIP revision in response to this comment.

NCTCOG asked whether TCEQ has included the future cost of FCAA, Section 185 fees in an economic assessment of RACT and evaluated how many years' worth of fees would be needed to fund RACT implementation and the impact of spending the same amount now on strategy implementation.

The potential future cost of fees associated with the Section 185 rule was not assessed in TCEQ's RACT analysis for this AD SIP revision. These fees are independent of any control option evaluated for RACT and have not been assessed. Thus, they would not be relevant to the cost of controls evaluated in a RACT analysis. TCEQ's RACT analysis can be found in Section 4.5: *RACT Analysis,* of this SIP revision. A SIP revision to address FCAA, §185 rule requirements is due to EPA by November 7, 2025 and is not addressed in this DFW AD SIP revision.

No changes were made to this SIP revision in response to this comment.

NCTCOG commented that TCEQ should explain in this SIP revision what effect on emissions reductions is expected from decreasing the major source threshold to 25 tpy.

The reduced major source threshold is stipulated by the FCAA and affects permitted emission limits at some facilities in the DFW area; however, the major source threshold change is not a control strategy that TCEQ evaluated independently. Reduced emissions in the 2026 future year take into account additional controls on sources between 25 and 50 tpy and other factors. Table 3-5: *June 12 Episode Day 2019 Base Case Anthropogenic EI in the DFW 2008 Ozone*

NAAQS Nonattainment Area and Table: 3-6: *June 12 Episode Day 2026 Future Case Anthropogenic EI in the DFW 2008 Ozone NAAQS Nonattainment Area* show the difference in emissions between the 2019 base year and the 2026 future year, including the effect of additional regulations.

No changes were made to this SIP revision in response to these comments.

The City of Dallas requested that TCEQ confirm which negative declarations have been made for Wise County in the VOC RACT analysis.

TCEQ proposed to remove negative declarations previously made for Wise County: Wood Furniture Manufacturing, Flexible Package Printing, and Graphic Arts Rotogravure and Flexographic Printing. TCEQ was unable to confirm that these sources do not exist in Wise County because sources may exist that are small enough to not require registered air permits or emission inventory reporting but are above the CTG applicability threshold. Existing negative declarations for the DFW nonattainment area (including Wise County) under the 2008 ozone NAAQS consist of the following:

- **Fiberglass Boat Manufacturing Materials;**
- **Refinery Vacuum Producing Systems and Process Unit Turnarounds (Wise County only);**
- **Manufacture of Pneumatic Rubber Tires;**
- **Shipbuilding and Ship Repair Surface Coating Operations;**
- **Flat Wood Paneling Coatings, Group II issued in 2006;**
- **Letterpress Printing;**
- **Manufacture of Synthesized Pharmaceutical Products (Wise County only);**
- **Wood Furniture Manufacturing (Wise County only);**
- **Flexible Package Printing; and**
- **Graphic Arts Rotogravure and Flexographic Printing.**

The Sierra Club and Earthjustice commented that TCEQ should evaluate emission limits from other states and set RACT limits for source categories at the lowest level found in other states. The Sierra Club and Earthjustice noted the following source categories: gas-fired stationary engines, stationary gas turbines, gas-fired boilers and process heaters, utility boilers, and various electric generating units.

The Sierra Club and Earthjustice noted lower emission limits for some of these source categories in the New York State and the South Coast Air Quality Management District and several other unnamed areas.

TCEQ evaluated RACT for this 2008 DFW severe AD SIP revision based on the 2008 eight-hour ozone NAAQS implementation rule in 40 CFR, Part 51, Subpart CC, §51.1112. The SIP requirements rule does not require the commission to choose the lowest RACT limits in other states. TCEQ may continue to evaluate limits from

other states for technical feasibility and economic reasonableness, but will focus on considerations specific to affected sources located in Texas.

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice commented that TCEQ has not established RACT for pesticide applications and should include RACT analysis for pesticide applications, as pesticides are precursors to VOCs under CTG guidance in the CAA. Sierra Club noted that pesticide use is regulated by Texas Department of Agriculture (TDA), which is tasked with identifying sources producing more than 25 tons of VOC/year from pesticide applications and required to adopt rules implementing RACT for those sources. Sierra Club and Earthjustice stated that TCEQ and TDA, alongside all state agencies, have a duty under the CAA to regulate pesticides, pointing to nonattainment areas in California that regulate pesticides as part of their VOC attainment plans. Sierra Club and Earthjustice suggested that, as there is no assessment in the SIP revision showing lack of viability in pesticide regulation, that the SIP revision should be amended to include pesticide controls or be amended with a negative declaration.

The comment refers to a March 1993 EPA Alternative Control Technology (ACT) Document for Control of VOC Emissions from the Application of Agricultural Pesticides (EPA-453/R-92-011). FCAA, §182(b)(2) requires states to implement RACT that addresses each category of VOC sources covered by a CTG and all other major stationary sources of VOC located in the ozone nonattainment area. As stated in Appendix D: *Reasonably Available Control Technology Analysis*, no RACT determination is required for this source category because the ACT document does not give presumptive controls.

No changes were made to this SIP revision in response to this comment.

The City of Dallas requested that TCEQ conduct an analysis of RACM that includes modeled-future design values and observed data and sets a goal of reaching attainment by July 20, 2026.

TCEQ's RACM analysis can be found in *Chapter 4: Control Strategies and Required Elements* of this AD SIP revision. Specifically, Section 4.6.2 *Results of the RACM Analysis* concludes that no potential control measures met the criteria to be considered RACM and that no additional RACM measures are necessary to advance attainment of the 2008 eight-hour ozone NAAQS by one year.

No changes were made to this SIP revision in response to this comment.

Sierra Club, Earthjustice, and the Lone Star Chapter of Sierra Club commented that there are no new control requirements proposed and that TCEQ must strengthen the proposed SIP revision to require new control requirements and more effective contingency measures to generate emissions reductions to achieve attainment in the DFW area. The Sierra Club and Earthjustice also requested that TCEQ implement all technologically and economically feasible control measures on all sources in the DFW area regardless of whether or not the controls advanced attainment.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures on sources inside or outside the DFW area, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to these comments.

Liveable Arlington, Sierra Club, Earthjustice, and 59 individuals commented that facilities outside of the DFW region are consistent contributors to VOC and NO_x emissions within DFW. The commenters stated that such facilities should either utilize cleaner methods for operation or shut down altogether. Further, the commenters mentioned that the Martin Lake power plant does not have the selective catalytic reduction (SCR) technology necessary to reduce nitrogen oxide emissions.

In rulemaking actions, the commission can specify emission limits or performance levels but cannot mandate that certain pieces of equipment or control techniques be used.

EPA recently stated its interpretation of the FCAA relating to evaluation of potential controls on sources outside the DFW area:

> **"The EPA believes our interpretation of [F]CAA section 172(c)(6), under certain circumstances, establishes a mandatory requirement for states to consider and implement emission controls for sources inside the state but outside of a designated nonattainment area.**
>
> **. . .**
>
> **only in circumstances where that is necessary or appropriate to provide for attainment by the attainment date, because the emission controls required on sources within the nonattainment area are not sufficient to provide for attainment by that date." (83 FR 63015)**

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, including SCR control on the Martin lake coal-fired power plant, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to this comment.

The Sierra Club and Earthjustice commented that TCEQ must implement more stringent SCR-equivalent controls for significant ozone contributors to the DFW area, specifically, the Fayette, Limestone, Martin Lake, and Welsh coal-fired power plants in order to come into attainment, citing information from a Sonoma Report and data from AQS monitors near environmental justice communities. The Sierra Club and Earthjustice also commented that SCR technology has been demonstrated to be economically and technologically feasible because the percentage of coal-fired power plants operating without SCR in Texas (65%) far exceeds the national average (35%),

and Texas lags behind other states. Sierra Club also commented, providing several examples of actions by which EPA has confirmed that SCR is RACT or RACM including EPA's Good Neighbor Plan, CSAPR, and other states that impose SCR-level emissions. The Sierra Club and Earthjustice commented that coal-fired power plants in Texas contribute more than 0.5% to modeled ozone values at certain DFW monitors. The Sierra Club also requested that TCEQ perform sensitivity modeling runs to assess emission reduction strategies for East Texas coal-fired power plants.

Because no coal-fired EGUs exist in the DFW nonattainment area and because RACT only applies within the nonattainment area, TCEQ set no RACT levels for coal-fired boilers in the DFW area in this SIP revision. TCEQ's RACT analysis can be found in Section 4.5, and Appendix D of this SIP revision.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, including NO_x reductions from East Texas coal-fired power plants, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club commented that TCEQ must propose more measures to further reduce VOC and NO_x emissions from both major and minor industrial sources.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures from either major or minor industrial sources, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club commented that TCEQ provisions within 30 TAC Chapter 115 authorize more emissions than are allowed under the FCAA. The commenter also stated that elevated surface ozone levels are partly due to weak enforcement by TCEQ and weak compliance by regulated entities.

The commission agrees that proper implementation of VOC rules is an important element in assisting in the attainment and maintenance of the NAAQS. TCEQ enforces its rules as specified by rule. The commission does not agree that 30 TAC Chapter 115 authorizes more emissions than are allowed under the FCAA or that enforcement is weak, and the commenter did not provide specific information relevant to this SIP revision to support their assertion.

No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club commented that TCEQ provides "loophole" provisions in 30 TAC Chapter 115 that allow highly reactive volatile organic compounds (HRVOC) emissions to exceed acceptable limits and allow sites to combine

emissions from multiple sources to circumvent additional HRVOC reductions. The commenters requested rules to reduce HRVOC emissions that start in Houston and migrate north and westward toward the DFW area.

The commission does not agree that 30 TAC Chapter 115 provides loophole provisions allowing HRVOC emissions to exceed acceptable limits, and the commenter did not provide specific information relevant to this SIP revision to support their assertion.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to this comment.

Five individuals commented requesting closure of the Martin Lake and/or W.A. Parish power plants and other major point sources in order to improve air quality in the DFW area, claiming that emissions from these plants affect ozone levels in the DFW area.

In rulemaking actions, the commission can specify emission limits or performance levels but cannot mandate that certain pieces of equipment or control techniques, including shutdowns, be used. As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice commented that TCEQ should not weaken monitoring requirements for visual, audio, and olfactory (OVA) inspections for heavy liquids, especially because TCEQ modeling trends show increasing emissions from 2019 to 2026, and instrument monitoring is already in place and can accurately assess and record the quantity of VOC emitted from leaks. Sierra Club and Earthjustice further argued that weakened monitoring of these VOC emissions would make it impossible to demonstrate that future attainment of the ozone NAAQS resulted from enforceable emission reductions.

In the concurrent 30 TAC Chapter 115 rulemaking (Project No. 2023-116-115-AI), the commission adopts an exemption for fugitive components in heavy liquid service from routine instrument monitoring requirements provided they are monitored weekly by a visual, audio, and olfactory (OVA) survey, as EPA's 2016 CTG for the oil and gas industry recommends. Rather than weaken monitoring, the OVA monitoring surveys will identify heavy liquid service leaks quicker than instrument monitoring because the inspections occur more frequently and typically document leak evidence before an instrument reading above the 10,000 ppm leak definition is observed. The rule provisions also require that the operator "shall eliminate the visual, audible, olfactory, or other indication of a potential leak within five calendar days of detection." Therefore, the adopted §115.172(a)(9) exemption will enable heavy liquid service fugitive component leaks to be identified and

repaired sooner to reduce natural gas processing plant VOC emissions. Contrary to what the commenters assert, faster required leak repair will make attainment of the ozone NAAQS more likely.

No changes were made to this SIP revision in response to these comments.

Sierra Club and Earthjustice commented that TCEQ's proposal, consisting of unenforceable reductions from fleet turnover and no additional controls, will not bring DFW into attainment by the attainment date, as previous SIPs have not. They argued that, to reach attainment under the CAA, TCEQ must add permanent and enforceable controls of ozone precursors, especially from industrial sources.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to these comments.

NCTCOG requested for TCEQ to broaden existing control measures to reduce emissions and implement more stringent controls to be adopted in the SIP revision beyond the 10-county nonattainment area because the region continually fails to attain the ozone standard. NCTCOG noted that it solicits ideas for emission reduction and requested that TCEQ work with EPA to reduce transported ozone and ozone precursors into the DFW area. NCTCOG commented that it is more "agreeable" to implement unpopular control measures now so that FCAA, Section 185 fees can be avoided.

Investigations to address transport influences on ozone are ongoing at TCEQ and throughout the air quality research community. Transport is known to be a large, regular contributor to not only the DFW airshed but also other airsheds in Texas (e.g., Bexar County, El Paso, Houston-Galveston-Brazoria). Background ozone generally accounts for approximately two-thirds to three-fourths of the total ozone concentration. Locally attributable ozone generally accounts for the remaining one-fourth to one-third of ozone concentrations, regardless of whether the day saw high ozone readings. Although they vary from year-to-year, the estimates of local ozone production in the DFW area have not changed substantially from 2012 through 2022. TCEQ continues to investigate to further understand the culpability for air quality impacts among identified sources within and outside the airshed.

Nonattainment area boundaries are established by EPA as part of the designations process under FCAA §107(d). This process already accounts for emissions from sources outside a nonattainment area—if nearby and affecting a nonattainment area's ability to timely attain—in setting nonattainment area boundaries.

EPA recently stated its interpretation of the FCAA relating to evaluation of potential controls outside of nonattainment areas: "Further, the EPA emphasizes that we do not interpret section 172(c)(6) [of the FCAA] to automatically require states to conduct an evaluation of all sources and all potential controls throughout the entire state regardless of attainment needs" (83 FR 63016). TCEQ implemented regional

strategies in the past and may consider such strategies again in the future, as appropriate.

Comments regarding future rulemaking, such as Section 185 fees, are outside the scope of this SIP revision.

No changes were made to this SIP revision in response to these comments.

Three individuals requested a variety of emission reduction strategies, including stronger rules against idling vehicles and smoking vehicles. Three individuals requested that TCEQ adopt both NCTCOG's surface traffic strategies and targeted industrial source pollution reduction requirements. Commenters noted that during the COVID-19 pandemic, monitoring defied predictions and ozone did not decrease as expected in the absence of decreased surface traffic.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to these comments.

NCTCOG commented that the 30 TAC Chapter 114, Subchapter I, Division 3 rules applicable to engines rated 25 bhp and greater should be revised because these rules are based on California standards from 1999, which California updated most recently in 2008.

TCEQ used the 1999 California standards to develop emission standards for the State of Texas, however, the commission is not required to update its standards to match the latest standards in other states. As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to these comments.

Twenty individuals commented that TCEQ should require electric motors on oil and gas drilling rigs and compressors and other equipment associated with oil and gas production.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to this comment.

Four individuals commented encouraging TCEQ to consider fenceline monitoring for VOC, methane, and other toxins at all drill sites, monitoring fracking infrastructure

located within 600 feet of homes, schools, and daycares in the nonattainment region; and that TCEQ accept registered third-party monitoring evidence of emissions.

The commenters' suggestions for additional targeted emission monitoring and acceptance of emission evidence are not emission control measures.

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice asked TCEQ to make the RACM analysis, especially decision steps for specific measures that TCEQ considered and rejected, more available for public review. Sierra Club asked TCEQ to impose SCR as RACM like other states have done and urged TCEQ to impose mass-based tons per hour NO_X emission limits on five coal-fired power plants in east Texas, specifically identifying Limestone and Martin Lake, or to create caps for those units.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year. Section 4.6.2: *Results of the RACM Analysis* of this DFW AD SIP revision is available for public review and states that TCEQ determined that no potential control measures met the criteria to be considered RACM. Because no RACM measures were required, no potential RACM measures were considered or rejected, and the need for documenting the analysis of potential RACM measures is moot.

No changes were made to this SIP revision in response to these comments.

Sierra Club and Earthjustice recommended that TCEQ impose NO_X emission limits on five coal-fired plants in East Texas and stated that doing so would help drive TCEQ's compliance with numerous other obligations such as complying with 2015 ozone NAAQS Good Neighbor provisions, complying with 42 U.S.C. §7410(l) noninterference, and satisfying RFP requirements for the second compliance period of the Regional Haze program.

As discussed elsewhere in this response to comments, this SIP revision provides photochemical modeling, RACT and RACM analyses, and a contingency plan, as required by the FCAA. Addressing Good Neighbor FIP provisions, 2015 ozone NAAQS attainment, and requirements of the Regional Haze program are outside the scope of this DFW AD SIP revision.

No changes were made to this SIP revision in response to these comments.

An individual commented that each SIP revision provides control strategies meant to bring areas into attainment for ozone, but these strategies have been modest and have failed to reduce ozone to the NAAQS. The individual acknowledged that there has been some success in reducing ozone, but not enough to ever achieve attainment with the ozone NAAQS in the DFW area.

Attainment of the ozone NAAQS is an ongoing challenge, particularly as EPA continues to revise the NAAQS to be more stringent. The 2022 one-hour ozone

design value of 101 parts per billion (ppb) represents a decrease of 28%, nearly one-third the 1991 one-hour design value of 140 ppb. The 2022 eight-hour ozone design value of 77 ppb represents a 27% decrease from the 1991 eight-hour ozone design value of 105 ppb. The DFW area has attained the 1979 one-hour ozone NAAQS of 0.12 ppm since 2006 and was determined by EPA to be in attainment in 2020 (85 FR 19096). Further, in 2014, the DFW area attained the 1997 eight-hour ozone NAAQS of 0.08 ppm as well. These decreases in design values occurred despite a 90% increase in area population from 1991 through 2021. The air quality in the DFW area has improved dramatically as a result of state, local, and federal air pollution control measures. The commission remains committed to working with area stakeholders and local government to attain the 2015 eight-hour ozone standard as expeditiously as practicable in accordance with EPA rules and guidance under the FCAA.

As discussed elsewhere in this response to comments, this SIP revision demonstrates that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

No changes were made to this SIP revision in response to these comments.

Liveable Arlington and 11 individuals requested TCEQ reduce methane emissions from all sources, implement leak detection and repair, implement continuous monitoring from the oil and gas industry operations at every stage, and recommended that TCEQ concurrently develop a SIP revision for EPA's methane rule to implement rules and urgently begin its implementation and enforcement. Additionally, it was commented that TCEQ should require electric drilling rigs and motors, implement a new zero-emissions standard for all pneumatic controllers, implement up-to-date technology for fracking operations, emphasize monitoring of drill sites, require fenceline monitoring of VOC, methane, and toxics near sensitive areas, accept third-party evidence for enforcement actions, and hire more inspectors to address issues associated with fracking activities. Sierra Club, Earthjustice and one individual asserted we must act now to curb methane emissions in order to reduce ozone pollution. One individual also requested comprehensive monitoring of methane as well as VOC and NO_x for both active and inactive sites. One individual advocated that methane emissions from oil rigs should be addressed.

EPA had not finalized the Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review ("methane rule") when this SIP revision was proposed, so the commission was not able to consider its potential impact on ozone in the DFW area. The methane rule establishes specific timelines for compliance with new source performance standards (NSPS) and emission guidelines for existing facilities in the oil and natural gas sector. States may choose to implement emission guidelines in state plans as specified in FCAA, §111(d), which are similar to but not the same as SIPs required under FCAA, §110 for the control of criteria pollutants such as ozone. TCEQ may implement the NSPS according to the timelines established by the final rule upon its promulgation; the commission may consider the proposal and adoption of a state plan to implement the emission guideline in the future. If interested in future commission actions, the commission encourages

the public to sign up for informational notices on the commission's website at: Texas Commission on Environmental Quality (https://public.govdelivery.com/accounts/TXTCEQ/subscriber/new) and review upcoming commission agendas at: Agenda Meetings and Work Sessions (https://www.tceq.texas.gov/agency/decisions/agendas).

No changes were made to this SIP revision in response to these comments.

Four individuals requested TCEQ place a moratorium on, or stop, gas drilling in Arlington until measures to stop drilling and fracking pollution are implemented. One individual further commented that a moratorium would incentivize operators to comply with more stringent requirements expeditiously since they would be losing money until they were compliant.

Drilling and wellhead activities are not regulated by TCEQ under the TCAA. The RRC has regulatory responsibility for drilling and natural resource extraction, including drilling and hydraulic fracturing operations. TCEQ does not have authority to regulate these operations and only has authority over stationary facilities after drilling has completed. Comments regarding the effect of a moratorium on gas drilling are beyond the scope of this SIP revision.

No changes were made to this SIP revision in response to these comments.

NCTCOG commented that TCEQ should implement the VOC contingency measures listed in Tables 4-1 and 4-3 of the proposed SIP revision and include those measures as weight-of-evidence measures in the adopted SIP revision.

As discussed in the SIP revision, the VOC contingency measures are included because they are intended to fulfill the FCAA, §§179(c)(9) and 182(c)(9) contingency measure requirements.

No changes were made to this SIP revision in response to this comment.

Two individuals commented that the SIP should require diesel powered vehicles to undergo yearly emissions inspections because diesel engines are a major source of NO_X compounds, which are a precursor to ground level ozone.

The commission does not have the authority to implement emissions inspections for diesel vehicles because THSC 382.203(a) limits the Texas I/M program to gasoline-powered vehicles. Additionally, MOVES calculates I/M program benefits only for gasoline-fueled vehicles.[47]

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice stated that the emissions reductions relied on fleet turnover or already-applicable federal actions and failed to include enforceable

[47] Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model, EPA-420-B-22-034, October 2022

controls. They commented that whether these reductions occur is outside TCEQ's control and therefore cannot be enforced.

The commission disagrees that the mobile source emissions reductions from fleet turnover are not enforceable. FCAA, Title II directs EPA to establish emissions standards to control pollution from engines and vehicles and requires manufacturers to demonstrate that their vehicles and engines comply with these standards by obtaining certificates from EPA. These newer vehicles that must meet stricter and federally enforceable emissions standards will replace older vehicles. EPA certification specifications require compliance with emissions standards throughout the useful life of the engine.

The commission's rules in 30 TAC Chapter 114, Control of Air Pollution from Motor Vehicles, regarding anti-tampering provisions and vehicle inspection and maintenance programs also assist with ensuring on-road vehicles are complying with EPA requirements. Remote sensing elements of the vehicle inspection and maintenance program randomly inspect vehicle emissions.

As part of regulatory analyses, EPA studies the impacts of fleet turnover and the implications for the age and size of the vehicle fleet. EPA incorporates the impacts of fleet turnover into its mobile source emissions model, MOVES, which TCEQ is required to use for SIP emissions inventory development.

TCEQ conducted AD photochemical modeling in accordance with EPA modeling guidance, as well as used the latest data, models, and scientific research available at the time of the SIP development for this as well as for past SIP revisions. TCEQ relied upon latest projections and models to determine the 2026 future case emissions which showed emissions decreases for several anthropogenic sectors and not just mobile sources. Further, TCEQ conducted a robust model performance evaluation that met the performance benchmarks for air quality modeling applications referenced in EPA modeling guidance. In addition to modeling, the SIP revision included other elements of evaluating the future attainment status of the DFW area, including weight-of-evidence analyses. For these reasons, TCEQ contends that this conclusion that the DFW area will reach attainment by the attainment date is reasonable.

No changes were made to this SIP revision in response to this comment.

EPA commented that TCEQ must provide and implement additional contingency measures to address the DFW and HGB areas' failure to attain by the 2008 ozone NAAQS serious attainment date in addition to the proposed new contingency measures that would be implemented in the event of failure to attain or make RFP by the severe attainment date. EPA requested clarification on which contingency measures will be triggered in the event of a failure to attain by the serious date. EPA was also seeking a clear identification of the specific measures that will be implemented under each scenario.

Details of the contingency plan, including triggering and available measures for the finding of failure to attain for the serious and severe classifications, can be found in Section 4.9 of this DFW AD SIP revision. TCEQ would implement enough

contingency measures in the area to meet or exceed the required contingency reductions for whichever purpose may arise first. Table 4-3 of this DFW AD SIP revision contains a list of the contingency measures and the VOC reduction amount associated with each measure for the DFW area.

Staff inadvertently omitted some source categories and incorrectly stated multiple VOC content limits for other source categories in the industrial adhesives contingency measure of the concurrent Chapter 115 rulemaking proposal (Rule Project No. 2023-116-115-AI). This resulted in less emissions reductions available to fulfill contingency requirements in the DFW area. The Executive Director intends to immediately initiate an Industrial Adhesives Contingency Measure Corrections rulemaking (corrections rulemaking) for commission consideration to restore the missing and incorrect VOC content limits to achieve the reductions originally intended.

Table 4-4of this DFW AD SIP revision shows how the VOC reduction amounts from Table 4-3 satisfies the required contingency measure reductions for the DFW area.

The FCAA requirement and EPA's 2008 eight-hour ozone standard SIP requirements rule (80 FR 12264) state that contingency measures sufficient to reach the contingency reduction target must be implemented, which is expressed in Line 3 of Table 4-4 as 3% of the VOC emissions in the baseline year inventory. Therefore, TCEQ contingency measures are selected and implemented in agreement with the 2008 eight-hour ozone standard SIP requirements rule, which EPA claims is consistent with the FCAA.

TCEQ added Table 4-6: *DFW 2008 Ozone NAAQS Nonattainment Area Serious Attainment Contingency Plan as Adopted (tons per day unless otherwise noted)* to this DFW AD SIP revision in response to this comment to show the amount of contingency measure reductions required for the serious classification and how the reductions shown in Table 4-3 can meet them.

Tables 4-5 and 4-7 of this DFW AD SIP revision show how additional emission reductions generated as a result of the corrections rule would increase the margin by which TCEQ contingency measures can meet the contingency reduction target for the severe and serious classifications, respectively.

The triggering language in the concurrent 30 TAC Chapter 115 rulemaking (Project No. 2023-116-115-AI) states that the *Texas Register* notice would specify which contingency measures, NAAQS, classification, and purpose (failure to attain or failure to achieve an RFP milestone) for which contingency measures will be triggered. For example, the triggering language for the industrial cleaning solvents contingency measure in the DFW area states

> "The owner or operator of a solvent cleaning operation in Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties shall be in compliance with the requirements of §115.463(e) of this title (relating to Control Requirements) no later than 270 days after the commission publishes notification in the *Texas Register* of its determination that the industrial cleaning solvent contingency requirements are necessary

as a result of EPA publication of a notice in the *Federal Register* that the specified area failed to attain the applicable National Ambient Air Quality Standard for ozone by the attainment deadline or failed to demonstrate reasonable further progress as set forth in the 1990 Amendments to the FCAA, §172(c)(9).”

EPA recommended adopting additional controls for industrial solvents and adhesives in the DFW area to achieve more emissions reductions. They also urged Texas to implement any measures that result in extra emission reductions promptly to ensure progress towards attainment continues.

As stated in each of the triggering rule provisions in the concurrent Chapter 115 rulemaking (Project No. 2023-116-115-AI), the contingency measures are triggered “after the commission publishes notification in the *Texas Register* of its determination that this contingency rule is necessary as a result of EPA publication of a notice in the *Federal Register* that the specified area failed to attain the applicable National Ambient Air Quality Standard for ozone by the attainment deadline or failed to demonstrate reasonable further progress”.

The commission chooses to adopt the industrial adhesives and industrial cleaning solvents as contingency measures in the DFW area as a change from proposal in response to this comment. Because the triggering statements for these contingency measures are not tied to a particular attainment date, the commission can apply emission reductions from the concurrent Chapter 115 rulemaking that are not necessary for a potential failure of the DFW area to attain by the 2008 ozone NAAQS severe classification attainment date to a failure to meet a different contingency requirement for the DFW area.

Staff inadvertently omitted some source categories and incorrectly stated multiple VOC content limits for other source categories in the industrial adhesives contingency measure of the concurrent Chapter 115 rulemaking proposal (Rule Project No. 2023-116-115-AI). This resulted in less emissions reductions available to fulfill contingency requirements in the DFW area. The Executive Director intends to immediately initiate an Industrial Adhesives Contingency Measure Corrections rulemaking (corrections rulemaking) for commission consideration to restore the missing and incorrect VOC content limits to achieve the reductions originally intended.

As discussed elsewhere in this response to comments, the commission contends that the DFW area will attain the 2008 ozone NAAQS by the attainment date without additional control measures, and no additional control measures were determined to advance attainment by one year.

EPA commented that TCEQ’s process for full implementation of contingency measures within the required 60 days was unclear and requested clarification. Specifically, EPA has concern about the nine-month timeframe mentioned, which suggests that not all actions needed to affect full implementation will occur within the required 60 days of EPA’s notification.

EPA draft contingency guidance dated March 16, 2023 states "As discussed in Section 2, in the 1992 General Preamble, EPA did address the question of how soon the contingency measures for ozone should take effect, and acknowledged that certain actions, such as notification of sources, modification of permits, etc., would probably be needed before a measure could be implemented effectively. There, EPA concluded that in general, actions needed to affect full implementation of the measures should occur within 60 days after EPA notifies the State of its failure (to attain or meet RFP)."[48]

The commission agrees in this situation that "actions needed to affect full implementation of the measures" can occur within 60 days of EPA notice. For these contingency measures, the required actions would be notification in the *Texas Register*. Permit modifications are not anticipated to be required to reduce emissions by using materials with lower VOC content materials such as coatings, degreasing and cleaning solvents, adhesives, and emulsified asphalt because, if mentioned at all, the permit would set a maximum VOC content, not a minimum.

The draft contingency guidance also states, "EPA continues to believe that 1 year is generally the appropriate timeframe for [contingency measures] to achieve reductions because of the intended purpose of [contingency measures] to provide emissions reductions to bridge the gap between the failure and the subsequent corrective action." The commission is adopting a compliance date requiring compliance with the contingency measures no later than 270 days after notice in the *Texas Register*. TCEQ chose to require compliance no later than 270 days rather than a year to allow time between EPA notification and TCEQ notification.

The commission is not requiring compliance within 60 days of EPA notice for three reasons. First, EPA notice would be of EPA's determination of failure to attain or failure to meet an RFP milestone, but a separate notice is required from TCEQ to notify affected sources which contingency measures will be triggered in which nonattainment areas. TCEQ notice requires additional time, potentially using up a substantial portion of a 60-day period. Second, once notified, affected sources may need additional time to procure the lower VOC materials prior to being required to use them. Third, EPA draft contingency guidance recommends that contingency measure reductions occur within one year of EPA notification. The 270 days after *Texas Register* publication compliance date will allow sources sufficient time to adjust their operations while assuring that sources are achieving reductions within one year.

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice commented that TCEQ needed to add appropriate contingency measures in this SIP revision. Sierra Club noted that, according to EPA, if a state demonstrates RFP using both VOC and NO_X reductions, then the state must submit contingencies for both VOC and NO_X. Sierra Club then stated that the new SIP revision includes attainment demonstration using both NO_X and VOC reductions, and therefore must include NO_X and VOC control measures.

[48] https://www.regulations.gov/document/EPA-HQ-OAR-2023-0063-0002

TCEQ contingency measures are contained in *Chapter 4: Control Strategies and Required Elements* of this DFW AD SIP Revision and conform to EPA contingency measure requirements, as specified in EPA's 2008 eight-hour ozone standard SIP requirements rule (80 FR 12264). EPA's rule requires measures to achieve sufficient reductions to meet the calculated target amount. The SIP requirements rule allows VOC or NO_x contingency measures and sets the emission reduction amount at a level EPA claims is sufficient to assist progress toward attainment, which fulfills the FCAA requirement for contingency measures. The SIP requirements rule does not require both VOC and NO_x contingency measures or control measures.

No changes were made to this SIP revision in response to these comments.

Sierra Club and Earthjustice commented that TCEQ's contingency measure controls on industrial cleaning solvents are invalid because these controls must be implemented as RACT because they are addressed in an EPA CTG document.

In the concurrent 30 TAC Chapter 115 rulemaking (Project No. 2023-116-115-AI), the commission adopts contingency measure emission limits for industrial cleaning solvents that are consistent with limits in South Coast Air Quality Management District (SCAQMD) Rule 1171, as amended in 2009. This rule has a general limit of 25 grams of VOC per liter (g/l) of cleaner. In its 2006 CTG for Industrial Cleaning Solvents, EPA evaluated the SCAQMD limit and set the recommended VOC content limit at 50 g/l, which defined RACT for this source category. TCEQ has adopted the beyond-RACT limit of 25 g/l to generate VOC emission reductions for contingency purposes.

No changes were made to this SIP revision in response to these comments.

The City of Dallas requested the addition of a contingency measure to reduce VOC emissions from industrial chemical blending operations.

TCEQ acknowledges the suggestion to reduce VOC emissions from the industrial chemical blending operations. However, as described in Section 4.9 of this SIP revision, TCEQ has adopted sufficient contingency measures in the DFW area to meet FCAA requirements.

No changes were made to this SIP revision in response to this comment.

WEIGHT OF EVIDENCE

NCTCOG recommended several additional programs that could be added to the Weight of Evidence discussion: The Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) implemented key programs, comprising the new EPA Clean School Bus Program and implementation of the National Electric Vehicle Infrastructure (NEVI) Formula Program through the Texas EV Charging Plan which may result in additional tailpipe emissions reductions in the urban core.

The commission may consider these additional programs for future SIP planning.

No changes were made to this SIP revision in response to this comment.

COMPLIANCE AND ENFORCEMENT

(FL1-12) Twelve commenters stated TCEQ can strictly enforce the Clean Air Act and the permits it issues under the act. The commenters noted air pollution violations in Texas occur with no corrective action at all and that TCEQ has a crucial role to play in using enforcement to give companies an economic incentive to obey the law.

Proper implementation of the New Source Review (NSR) program is an important element in attaining and maintaining the NAAQS, and TCEQ enforces this program as specified in the Texas Water Code (TWC), THSC, and commission rules. The commission does not agree that most air pollution violations in Texas occur with no corrective action, nor has the commenter provided specific information for this allegation that is relevant to this SIP revision.

No changes were made to this SIP revision in response to these comments.

Sierra Club, Earthjustice, and one individual stated concern about the air quality in Texas, claiming there is a lack of enforcement by TCEQ to implement and oversee effective programs and solutions. The Lone Star Chapter of Sierra Club commented that it is impossible for TCEQ to thoroughly inspect large facilities even with well-trained staff conducting Comprehensive Compliance Investigations. Three individuals requested TCEQ hire more inspectors to conduct inspections of fracking sites and infrastructure. One individual stated TCEQ needs to hire more staff to ensure the inspections are done, completed, and reported promptly and stated a second inspection should be done to ensure the repairs have been completed. Another individual requested TCEQ have staff sufficient to enforce rules for smoking vehicles and idling.

Comments regarding enforcement generally, and inspector training and hiring are outside the scope of this SIP revision. However, the commission agrees that enforcement is an important element in assisting in the attainment and maintenance of the NAAQS and enforces all air quality requirements as specified in the TWC, THSC, and commission rules.

No changes were made to this SIP revision in response to this comment.

Liveable Arlington requested TCEQ deploy mobile monitoring labs in the Barnett Shale. Liveable Arlington and two individuals requested TCEQ to install and acquire more fence line monitors across the Barnett Shale including at the fence line of drill sites and associated infrastructure. Two individuals stated that the commission should accept registered third-party monitoring evidence of emissions for enforcement actions. One individual commented that Texas had inadequate standards and monitoring that benefit the oil and gas companies. Another individual commented it was essential that TCEQ hire an independent air monitoring company to constantly monitor drill sites.

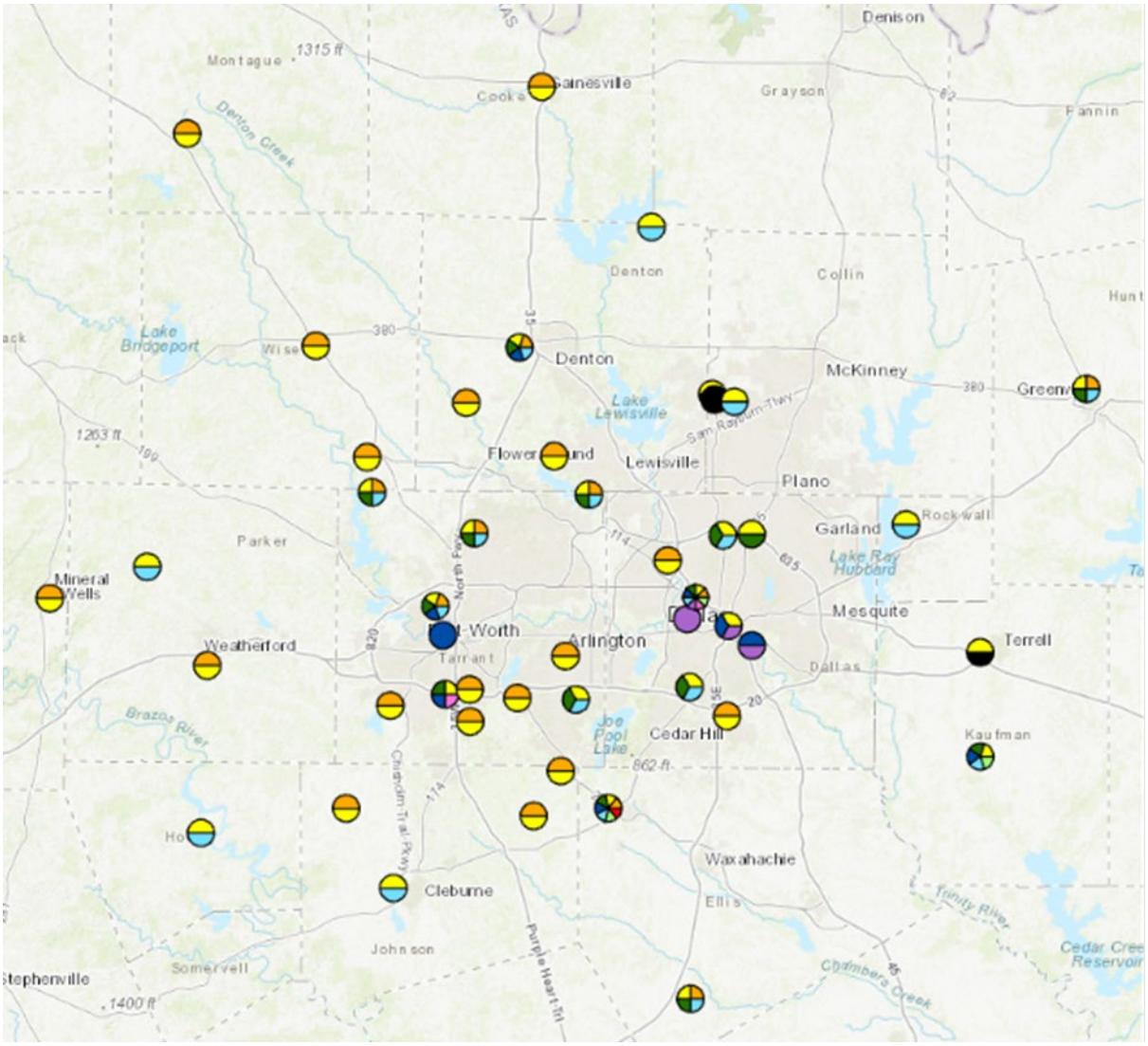
TCEQ clarifies that mobile monitoring is not used to support federal air monitoring requirements and is outside the scope of this SIP revision.

Federal network design criteria, those used to determine the number and placement of ambient air monitors reporting to EPA, require agencies to site monitors in populated areas that represent regional air quality where people live, work, and play, and are not generally sited to assess impacts from specific industrial sources. TCEQ is federally required to operate between 28-32 federal ambient air monitors in the DFW MSA, based on the most recent population estimates and design values. Texas exceeds these requirements with 61 monitors in the MSA at 28 sites, which also encompasses portions of the Barnett Shale area. TCEQ strives to strategically balance meeting federal monitoring requirements and state and local needs with available funding and staffing resources.

TCEQ annually evaluates the number and location of air monitors within its network to assess compliance with federal monitoring requirements and the adequacy of monitoring coverage for identified monitoring objectives as a part of the Annual Monitoring Network Plan provided to EPA on July 1 of each year. This plan is made available on TCEQ's website (https://service.govdelivery.com/accounts/TXTCEQ/subscriber/new) for public review and comment for 30 days beginning in mid-April. Requests for additional monitoring or the identification of additional monitoring needs may be made during this public comment period and will be considered along with other monitoring priorities across the state.

The commission acknowledges the importance of monitoring beyond federal requirements as demonstrated by extensive state-funded monitoring conducted throughout Texas as non-regulatory state initiatives. TCEQ funds 18 additional state-initiative air monitoring sites specifically located to monitor in the Barnett Shale area. Information about TCEQ's Barnett Shale area air monitoring network are available on TCEQ's website at Barnett Shale Monitoring Network (https://www.tceq.texas.gov/airquality/monops/agc/agc_barnett.html).

A map identifying all TCEQ air monitoring sites in the DFW MSA and Barnett Shale area is provided below.



In addition, as part of the NSR permitting process for stationary facilities, fence-line monitoring is generally not a requirement. The permit will specify appropriate monitoring and stack testing requirements consistent with regulatory requirements that are effective at assuring the emitting sources are compliant with operating requirements and emission limits. The specified monitoring and stack testing is consistent with EPA and Texas regulations for monitoring these sources.

TCEQ is authorized by statute to initiate an enforcement action based on information provided by a private individual (TWC §7.0025; 30 TAC §70.4). Data must be collected or gathered in accordance with relevant agency protocol. Additional information is available on TCEQ's website: Gathering and Preserving Information and Evidence Showing a Violation (https://www.tceq.texas.gov/compliance/complaints/protocols/evi_proto.html). Under the citizen-collected evidence program, individuals are providing information on possible violations of environmental law and the information can be

used by TCEQ to pursue enforcement. In this program, citizens can become involved and may eventually testify at a hearing or trial concerning the violation.[49]

No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club commented that 17 of 19 DFW ozone stations had eight-hour exceedances in 2023 and that 15 monitors measured violation with four or more exceedances. The Lone Star Chapter of Sierra Club also noted that Tarrant, Dallas, Denton, Collin, Ellis, Hunt, Hood, Parker, Kaufman, and Johnson Counties had at least one monitor measuring high ozone.

An exceedance day is any day when a regulatory monitor in an area records a daily-maximum eight-hour average ozone concentration that exceeds the level of the ozone standard. For the 2015 NAAQS of 70 parts per billion (ppb), TCEQ confirms that in 2023, 17 of 19 DFW regulatory ozone monitors measured eight-hour ozone exceedances and that 15 DFW monitors measured four or more eight-hour ozone exceedances. TCEQ confirms that Tarrant, Dallas, Denton, Collin, Ellis, Hunt, Hood, Parker, Kaufman, and Johnson Counties all had at least one monitor that measured eight-hour ozone exceedances in 2023 that could qualify as high ozone. TCEQ notes that compliance with the eight-hour ozone NAAQS is determined by a design value, which averages three years of data, rather than the number of exceedance days.

No changes were made to this SIP revision in response to this comment.

One individual commented the drilling, fracking, extraction and transporting process is seriously flawed.

This comment is outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

One individual requested TCEQ increase the funding from the air quality grant program to allow local municipalities to hire additional staff to inspect local polluters. Public Citizen and another individual requested TCEQ increase the funding in its air quality grant program to further local municipalities' ability to ensure compliance with state and federal air laws. The individual stated funding would allow for the hiring of more staff to inspect local polluting facilities within the DFW region. The individual claimed there is not enough inspection and enforcement in DFW to ensure industry feels compelled to follow the law to reduce harmful emissions.

These comments are considered to be outside the scope of this SIP revision. However, the commission agrees that enforcement is an important element in the attainment and maintenance of the NAAQS and enforces air quality requirements as specified in the TWC, THSC, and commission rules.

No changes were made to this SIP revision in response to these comments.

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[49] For additional information, see TCEQ publication, "Do You Want to Make an Environmental Complaint? Do You Have Information or Evidence?" This booklet is available in English and Spanish from TCEQ Publications office at 512-239-0028 and may be downloaded from the agency website at http://www.tceq.texas.gov (under Publications, search for Publication Number 278).

Public Citizen, Liveable Arlington and four individuals stated that the passage of SB 471 allows for TCEQ to ignore certain complaints, though TCEQ should continue to investigate each complaint and strive to remedy every environmental upset or violation regardless of the number of complaints. Justice Network of Tarrant County commented citizens who have complaints should be free to do so.

Citizens may file complaints with TCEQ. TCEQ is authorized by statute to initiate an enforcement action based on information provided by a private individual (TWC §7.0025; 30 TAC §70.4). Data must be collected or gathered in accordance with relevant agency protocol. Additional information is available on TCEQ's website: Gathering and Preserving Information and Evidence Showing a Violation (https://www.tceq.texas.gov/compliance/complaints/protocols/evi_proto.html). Under the citizen-collected evidence program, individuals are providing information on possible violations of environmental law and the information can be used by TCEQ to pursue enforcement. In this program, citizens can become involved and may eventually testify at a hearing or trial concerning the violation.[50]

Comments regarding the content and scope of enforcement programs are beyond the scope of this SIP revision. However, the commission agrees that enforcement is an important element in the attainment and maintenance of the NAAQS and enforces air quality requirements as specified in the TWC, THSC, and commission rules.

No changes were made to this SIP revision in response to these comments.

One individual commented the public is having to incur the expense of monitoring air quality. Additionally, the individual stated that a person or entity qualified to monitor can report a leak only to have an inspector show up day(s) later and file an official report of acceptable air quality and compliance.

Comments regarding the content and scope of enforcement programs are beyond the scope of this SIP revision. However, the commission agrees that enforcement is an important element in the attainment and maintenance of the NAAQS, and enforces air quality requirements as specified in the Texas Water Code, Texas Health & Safety Code, and commission rules.

No changes were made to this SIP revision in response to this comment.

Public Citizen, Liveable Arlington and three individuals commented the criteria to initiate a fine for major violators are too narrow and need to be expanded. Liveable Arlington and two individuals stated though expanding applicability of fines does not directly affect reducing ozone pollution, violations of consequence can inspire industry to pay attention to state rules on VOCs, NO_x and other toxic pollutants.

Comments regarding the content and scope of enforcement programs are beyond the scope of this SIP revision. However, the commission agrees that enforcement is

[50] For additional information, see TCEQ publication, "Do You Want to Make an Environmental Complaint? Do You Have Information or Evidence?" This booklet is available in English and Spanish from TCEQ Publications office at 512-239-0028 and may be downloaded from the agency website at http://www.tceq.texas.gov (under Publications, search for Publication Number 278).

an important element in the attainment and maintenance of the NAAQS, and enforces air quality requirements as specified in the TWC, THSC, and commission rules.

No changes were made to this SIP revision in response to these comments.

The Sierra Club, Earthjustice, Lone Star Chapter of Sierra Club, NCTCOG, and 55 individuals expressed concern regarding reports of fraud in TCEQ's vehicle emissions I/M program. NCTCOG commented that inspections have been allowed to occur within the TCEQ maintained database with little to no enforcement actions being taken until very recently with DPS assistance. The Sierra Club, Earthjustice and the Lone Star Chapter of Sierra Club noted the use of devices that can simulate a car's onboard diagnostic system and can guarantee a passing test result. Additionally, the commenters noted that Texas investigators believe millions of cars never pass the state-required safety or emissions tests and expressed concern that the state's inspection computer system is not programmed to immediately stop fake inspections. NCTCOG suggested that emissions analyzers should be programmed to stop an inspection from proceeding when a vehicle identification number (VIN) mismatch is identified. The commenters urged TCEQ to work more closely with local law enforcement and DPS to stop fraudulent tailpipe inspections.

The DPS is responsible for the enforcement of the I/M program, and TCEQ's role is to support DPS in its administration and enforcement of the program. TCEQ routinely audits the program's effectiveness, including providing data to DPS to assist in its efforts to identify or confirm fraud. Additionally, TCEQ and DPS are working together to evaluate legal, technical, and procedural considerations with stopping potential fraud. TCEQ also conducts the federally required biennial I/M program evaluation to assess the overall effectiveness of the Texas I/M program. This study has repeatedly concluded that the Texas I/M program is effective and in compliance with EPA's program requirements. No changes were made to this SIP revision in response to this comment.

NCTCOG suggested that TCEQ use the TCEQ-maintained database to obtain "clean scanning" trends and share that information with DPS for prompt enforcement action.

The commission already shares data and information with DPS for program enforcement and will continue to do so. No changes were made to this SIP revision in response to this comment.

NCTCOG commented that the revenue from fraudulent inspections has enabled criminals to profit at the expense of the general public and state.

This comment is outside the scope of this SIP revision.

NCTCOG encouraged Texas to implement a "clean screen" program by which drivers pass through a predetermined roadside monitor location and have the entire emissions inspection taken care of through the mail if emissions are at an acceptable level.

THSC §382.202 prescribes a program "to be performed at inspection facilities consistent with the requirements of the FCAA (42 U.S.C. Section 7401 et seq.) and

its subsequent amendments." Changing the program to include testing at roadside locations would require legislative action to allow testing to occur outside of inspection facilities. No changes were made to this SIP revision in response to this comment.

NCTCOG requested TCEQ conduct research on the magnitude and emission impacts associated with diesel engine emission component tampering. The comment claimed that according to EPA, a tampered diesel truck has an increase of over 300 times the NO_x emissions of a compliant diesel truck. The comment further stated that since diesel emissions inspections are not performed in Texas, the extent of the diesel tampering requires more study and research opportunities. NCTCOG also requested TCEQ conduct a photochemical model sensitivity analysis using real-world studies on both vehicle inspection fraud and diesel vehicle tampering. The comment said that the analysis can indicate possible reasons for the disconnect between air quality photochemical modeling results and observed monitor readings.

The commission acknowledges the suggestion. No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club stated that TCEQ's I/M vehicle emissions reductions are likely not being achieved due to potential fraud in the I/M program.

The commission disagrees with the claim that emissions reductions are likely not being achieved due to potential fraud in the program. As required by 40 CFR §51.366, TCEQ conducts a biennial I/M program evaluation to assess the overall effectiveness of the Texas I/M program. The evaluation includes an analysis of potential inspection fraud and an analysis of emissions reductions for vehicles inspected under program requirements. The analysis pairs remote sensing data with I/M program data to calculate the annual I/M benefit using guidance from EPA. This study has repeatedly concluded that the Texas I/M program is effective and in compliance with EPA's program requirements. No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club quoted a TV report by the Dallas NBC News affiliate in which DPS stated that TCEQ database must be manually analyzed and that there are no automatic triggers, red flags, or thresholds. They further quoted TCEQ, stating that TCEQ does not have a trigger that flags stations producing a large volume of inspections.

The commission's vehicle inspection database cannot confirm whether a vehicle was fraudulently inspected or clean scanned. The data must be analyzed by DPS. The triggers referenced in the quote do not run automatically but are available to DPS for enforcement research. TCEQ's vehicle inspection database does not have a trigger that flags inspection stations producing a high volume of inspections. No changes were made to this SIP revision in response to this comment.

The Lone Star Chapter of Sierra Club referenced a television report that stated an estimate of 4 to 5 million cars may have been fraudulently inspected.

The commission disagrees with the estimate that 4 to 5 million cars may have been fraudulently inspected. There are legitimate reasons for some discrepancies in vehicle inspection data that could appear to law enforcement to be fraudulent inspections. No changes were made to this SIP revision in response to this comment.

Dallas Sierra Club and three individuals urged TCEQ to work with law enforcement to create a dedicated emissions task force to combat fraudulent air inspections and engine tampering. Additionally, one commenter urged TCEQ to provide more support to cities to combat fraudulent inspections and engine tampering.

The Texas legislature provided DPS with enforcement authority for the I/M program that includes taking action against inspection stations suspected of fraud. TCEQ will continue to work cooperatively with DPS to assist them in enforcing the program. No changes were made to this SIP revision in response to this comment.

Dallas Sierra Club and three individuals urged TCEQ to provide more support to cities and to adopt and implement idling restrictions in metropolitan areas.

TCEQ staff are available to assist local governments with the process of implementing the state's idling regulations. The state's idling regulations are applicable only within the jurisdiction of a local government that has signed a Memorandum of Agreement (MOA) with TCEQ to delegate enforcement to that local government. Any local government can contact TCEQ for assistance and submit a signed MOA to implement the regulations in 30 TAC §§114.510 - 114.512 and §114.517. No changes were made to this SIP revision in response to this comment.

Five individuals encouraged TCEQ to support idling restrictions. One of those individuals stated that the agency needs to require the adoption and implementation of idling restrictions in the DFW area. That commenter also said that the agency needs to fund local enforcement of idling restrictions.

TCEQ staff are available to assist local governments with the process of implementing the state's idling restrictions. TCEQ does not have the authority to require local governments to adopt and implement idling restrictions. The state's idling regulations are applicable only within the jurisdiction of a local government that has signed a MOA with TCEQ to delegate enforcement to that local government. Enforcement of idling regulations is funded and implemented locally. No changes were made to this SIP revision in response to this comment.

Two individuals commented that the SIP needs to ensure there is enough staff to enforce idling restrictions.

Enforcement of idling regulations is implemented locally. No changes were made to this SIP revision in response to this comment.

One individual urged enforcement of anti-idling rules.

TCEQ staff are available to assist local governments with the process of implementing the state's idling regulations. Any local government can contact

TCEQ for assistance and submit a signed MOA to implement the regulations in 30 TAC §§114.510 - 114.512 and §114.517. Enforcement of idling regulations is implemented locally. No changes were made to this SIP revision in response to this comment.

Dallas Sierra Club and six individuals urged TCEQ to increase the identification, enforcement, and citation of smoking vehicles with visible tailpipe violations.

One individual asked TCEQ to assist with stopping smoking vehicles to get them repaired or replaced. One individual commented that smoking vehicles should be cited. One individual urged increased enforcement of rules against smoking vehicles.

Texas law enforcement agencies have the authority to stop smoking vehicles. Driving a vehicle with excessive smoke in Texas is a violation of the state's smoking vehicle statute under Texas Transportation Code §547.605. Texas law enforcement agencies may issue citations, punishable by fines up to $1,000, to drivers operating a smoking vehicle on any roadway. TCEQ does not have a program to assist with repair or replacement of smoking vehicles. No changes were made to this SIP revision in response to this comment.

One individual urged TCEQ to stop engine tampering and fraudulent inspections.

The Texas Legislature provided DPS with enforcement authority for the I/M program that includes taking action against inspection stations suspected of tampering and fraud. TCEQ will continue to work cooperatively with DPS to assist them in enforcing the program. No changes were made to this SIP revision in response to this comment.

PERMITTING

The City of Dallas commented in support of the proposed revisions for the Nonattainment New Source Review (NNSR) program to lower the major stationary source thresholds, but also requested TCEQ to require minor source facilities to obtain a construction or operation permit for those that emit at least 24.99 tpy or less of a regulated pollutant.

The commission acknowledges the support for lowered major stationary source thresholds as required by the FCAA for areas reclassified as severe. Regarding minor sources, any person who plans to construct any new facility or to engage in the modification of any existing facility which may emit air contaminants into the air of this state must satisfy the requirements of 30 TAC Chapter 116.110(a), which specifies the types of authorizations available for sources. Further, minor source permitting requirements are outside the scope of this SIP revision.

No changes were made to this SIP revision in response to this comment.

Liveable Arlington, Sierra Club, Earthjustice, Public Citizen, the Lone Star Chapter of Sierra Club, and 14 individuals provided comments regarding concerns about major sources circumventing major NSR through various means, such as undercounting

emissions and the improper aggregation of projects, as well as TCEQ allowing such circumvention.

Ensuring circumvention of requirements does not occur is an important element of the air permitting program. Permit applicants are required to represent the maximum hourly and annual emission rates for new or modified facilities, including emission rates for planned maintenance, startup and shutdown (MSS) and related activities. All supporting calculations based on established methods and the technical basis for the emission rates are required to be included. Emissions are calculated based on the maximum hourly operations and annual average operations being authorized for the facility. The submitted application information must enable the permit reviewer to duplicate all emission calculations to verify and confirm emissions data and rates represented in the application. An applicant is bound by its representations in the application and those representations become an enforceable part of the permit, including production rates, authorized emission rates, and equipment. If the applicant deviates from the representations made in the application, the applicant may be subject to enforcement action.

For every application that is received, TCEQ performs an applicability analysis for new major sources and modifications to existing major sources to determine if major new source review is triggered. As required by commission rules in 30 TAC Chapter 116, when undergoing a physical or operational change (project), an existing major source must determine major NSR applicability through a two-step process that first considers whether the increased emissions alone are significant, followed by a calculation of the particular project's net emissions increase considering all contemporaneous increases and decreases at the source to determine if a major modification has occurred.

The process to determine whether a proposed project is subject to major NSR is determined based on a case-by-case evaluation based on available information. TCEQ relies on, and applies, EPA rules and guidance to determine when nominally separate activities should be combined into a single project for purposes of major NSR applicability.

Comments regarding specific new source review permits are outside the scope of the SIP revision. No changes were made to this SIP revision in response to these comments.

Liveable Arlington, Public Citizen, and three individuals commented that TCEQ should not allow major stationary sources to use permits by rule and that GAF Roofing was allowed to utilize a permit by rule instead of being required to obtain an NSR permit.

Comments regarding the content and scope of Texas' NSR program, as well as comments regarding specific new source review permits are outside the scope of the SIP revision and rules; however, the commission notes that new major stationary sources and major modifications of existing major sources are not allowed to authorize emissions under permits by rule, 30 TAC §106.4(a)(2).

No changes were made to this SIP revision in response to this comment.

The Sierra Club and Earthjustice commented that TCEQ must ensure that the NSR program is implemented as required by law. One individual commented that they live around several roofing companies who are all violating TCEQ rules and that TCEQ permit rules need to be tightened, not loosened.

The commission agrees that lawful implementation of the NSR program is an important element in assisting in the attainment and maintenance of the NAAQS. The State of Texas' NSR program is SIP approved pursuant to 40 CFR Part 52, Subpart SS to implement all major NSR permitting programs (Prevention of Significant Deterioration, Nonattainment, and Plantwide Applicability Limit permits) as well as minor new source review permits. The Texas nonattainment permitting program contained in 30 TAC §116.150 is based on the requirements contained in 40 CFR §61.165. The commission ensures compliance with the requirements of the SIP approved NSR program through its review of NSR permitting applications and its enforcement program.

No changes were made to this SIP revision in response to this comment.

Liveable Arlington and four individuals commented that citizens are often excluded from the NSR permitting process due to overly restrictive distance requirements. Two of those individuals and Liveable Arlington commented that the determination of an "affected party" should be based on a distance of at least 2 miles from the facility.

Comments regarding the public participation process for the NSR permitting program are outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

One individual commented that the commission should look at the cumulative effect of pollution, instead of only reviewing pollution from individual sources when permitted.

Comments regarding the content and scope of Texas' NSR program are outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

NCTCOG commented that TCEQ should modify the statewide permitting process to require each permit be evaluated through the appropriate SIP photochemical model to determine how that permit would impact nonattainment areas. NCTCOG also encouraged TCEQ to identify an amount of emissions that would be allocated for each nonattainment area.

Comments regarding the content and scope of Texas' NSR program are outside the scope of this proposal; however, the commission notes that TCEQ addresses regional ozone formation through the SIP development process rather than through individual permitting actions . Emissions growth is addressed in the SIP development process. SIP attainment demonstration modeling of the DFW nonattainment area based on projected future conditions and include both applicable reductions as well as projected emissions from known sources. Individual permit applicants are not required under TCEQ rules to model impacts

using these techniques. No changes were made to this SIP revision in response to these comments.

One individual commented that the commission needed to not be lenient on issuing air permits; instead, the commission needed to regulate companies that apply for, and receive, air permits.

Comments regarding the content and scope of TCEQ's SIP approved NSR permitting program are outside the scope of this SIP revision. However, any person who plans to construct any new facility or to engage in the modification of any existing facility which may emit air contaminants into the air of this state must satisfy the requirements of 30 TAC §116.110(a). TCEQ reviews the permit application in accordance with the applicable law, policy, and procedures, and in accordance with the agency's mission to protect our state's human and natural resources consistent with sustainable economic development. If an applicant meets the requirements for an air quality permit, TCEQ must grant the permit.

No changes were made to this SIP revision in response to this comment.

One individual expressed concerns about the increase in permits for new gas wells near homes of Arlington residents without holding any public hearings. The individual was also concerned how a city council can justify no public hearing on this matter.

Drilling and wellhead activities are not regulated by TCEQ under the TCAA. The RRC has regulatory responsibility for drilling and natural resource extraction, including drilling and hydraulic fracturing operations. TCEQ does not have authority to regulate these operations and only has authority over stationary facilities after drilling has completed.

Comments regarding public participation with respect to NSR permitting are outside the scope of this SIP revision. No changes were made to this SIP revision in response to this comment.

One individual commented that TCEQ needs to increase engagement with communities that are surrounded by companies like batch plants and companies that make roofing shingles.

The commission acknowledges the importance of community involvement in the permitting process. Comments regarding community engagement in the permitting process are outside the scope of this proposal. Information about community engagement and public participation are available on TCEQ's website (https://www.tceq.texas.gov/agency/decisions/participation/participation).

No changes were made to this SIP revision in response to this comment.

One individual commented that TCEQ should investigate permit applicants before they give companies their permits.

Comments regarding the content and scope of Texas' NSR program are outside the scope of this SIP revision; however, the commission notes that site reviews are

requested from the applicable regional office for applications for case-by-case initial permits, amendments, and renewals as well as some permits by rule. These reviews provide information related to the site and may include a site visit. Compliance history information is also reviewed as part of the application review process.

No changes were made to this SIP revision in response to this comment.

Sierra Club and Earthjustice commented that TCEQ must clarify that sources cannot use interprecursor trading to meet new source review ("NSR") requirements, as interprecursor trading is unlawful under the D.C. Circuit's decision in *Sierra Club v. EPA*, 21 F.4th 815 (2021). The commentors indicated that existing regulations under 30 Texas Administrative Code §116.12 and §116.150 could be read to authorize interprecursor trading and commented that TCEQ must make clear that any state implementation plan it will submit for EPA's approval does not authorize sources to meet NSR requirements by relying on interprecursor trading.

TCEQ's Emission Credit Program and Discrete Emission Credit Program regulations require approval from the TCEQ executive director and EPA prior to interprecursor (interpollutant) use of credits.

As noted in the comment, the decision in *Sierra Club v. EPA*, 21 F.4th 815 (D.C. Circuit 2021), vacated certain provisions of EPA's "Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area State Implementation Plan Requirements" at 83 FR 62998 (December 6, 2018). As a result of this court decision, EPA no longer supports approval of [interprecursor trading] IPT requests under TCEQ's previously approved IPT SIP revisions; therefore, since IPT provisions cannot function without approval from both TCEQ and EPA, no IPT requests will be approved.

No changes were made to this SIP revision in response to this comment.

Liveable Arlington and 19 individuals encouraged implementation of EPA's proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review ("methane rule") and additional requirements specific to the Petroleum and Natural Gas sector.

EPA had not finalized the methane rule when this SIP revision was proposed, so the commission was not able to consider its potential impact on ozone in the DFW area. The methane rule establishes specific timelines for compliance with new source performance standards (NSPS) and emission guidelines for existing facilities in the oil and natural gas sector. States may choose to implement emission guidelines in state plans as specified in FCAA, §111(d), which are similar to, but not the same as SIPs required under FCAA, §110 for the control of criteria pollutants such as ozone. TCEQ may implement the NSPS according to the timelines established by the final rule upon its promulgation; the commission may consider the proposal and adoption of a state plan to implement the emission guideline in the future. If interested in future commission actions, the commission encourages the public to sign up for informational notices on the commission's website at: Texas

Commission on Environmental Quality (https://public.govdelivery.com/accounts/TXTCEQ/subscriber/new) and review upcoming commission agendas at: Agenda Meetings and Work Sessions (https://www.tceq.texas.gov/agency/decisions/agendas).

No changes were made to this SIP revision in response to these comments.

Liveable Arlington and four individuals provided comments concerning the need for controls for emissions occurring from drilling activities, including requesting increased monitoring, reduced flaring or capturing of emissions, fixing leaking equipment, requiring zero emissions from pneumatic devices, encouraging the use of electric drilling rigs and electric equipment for pumps and compressors to reduce emissions.

Comments regarding compliance with EPA's methane rule requirements for drilling activities are outside the scope of this SIP revision. However, the commission notes that the Barnett Shale permit by rule and standard permit authorizations contain leak detection and repair requirements for equipment leak fugitives. These requirements include construction requirements, instrument monitoring, and stipulates repair schedules for leaking components.

No changes were made to this SIP revision in response to these comments.