TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AGENDA ITEM REQUEST

for Adoption of State Implementation Plan Revision

AGENDA REQUESTED: February 27, 2025

DATE OF REQUEST: February 7, 2025

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

CAPTION: Docket No. 2023-0319-SIP. Consideration for adoption of the Bexar County Moderate Area Attainment Demonstration State Implementation Plan (SIP) Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard (NAAQS).

As a result of the voluntary reclassification of the Bexar County 2015 ozone NAAQS moderate nonattainment area to serious, this SIP revision includes the following SIP elements associated with the prior moderate classification, as determined by EPA: certification statements to confirm that nonattainment new source review and Stage I gasoline vapor recovery program requirements have been met for the Bexar County 2015 ozone NAAQS nonattainment area. (Stephanie Frederick, Terry Salem; Project No. 2022-025-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:** February 7, 2025

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

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

Docket No.: 2023-0319-SIP

Subject: Commission Approval for Adoption of the Bexar County Moderate Area Attainment Demonstration (AD) State Implementation Plan (SIP) Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard (NAAQS)

Bexar County 2015 Ozone NAAQS Moderate AD SIP Revision
Non-Rule Project No. 2022-025-SIP-NR

Background and reason(s) for the SIP revision:
Bexar County was originally designated nonattainment with a marginal classification for the 2015 eight-hour ozone NAAQS of 0.070 parts per million with a September 24, 2021, attainment date. Based on monitoring data from 2018, 2019, and 2020, Bexar County did not attain the standard by the September 24, 2021, attainment date for the area under the marginal classification 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 area from marginal to moderate, effective November 7, 2022 (87 *Federal Register* (FR) 60897). EPA set a January 1, 2023, deadline for states to submit AD and reasonable further progress (RFP) SIP revisions to address the 2015 eight-hour ozone moderate nonattainment area requirements.

Bexar County was subject to the moderate ozone nonattainment area requirements in FCAA, §182(b), and the Texas Commission on Environmental Quality (TCEQ) was required to submit moderate classification AD and RFP SIP revisions to EPA. On October 12, 2023, Texas Governor Greg Abbott signed and submitted a letter to EPA to voluntarily reclassify the Bexar County, Dallas-Fort Worth, and Houston-Galveston-Brazoria 2015 eight-hour ozone NAAQS moderate nonattainment areas to serious. On October 18, 2023, EPA published a finding of failure to submit required SIP revisions for the 2015 eight-hour ozone NAAQS moderate nonattainment areas, effective November 17, 2023 (88 FR 71757), which started sanctions and federal implementation plan (FIP) clocks. Submittals and an EPA completeness determination are required by May 17, 2025, to prevent implementation of the first sanction, increased emission offsets. If submittals are not received and a completeness determination is not made by November 17, 2025, federal highway funding sanctions will apply. If complete submittals are not approved by November 17, 2025, EPA will be obligated to promulgate a FIP.

On June 20, 2024, EPA published the final reclassification of the 2015 eight-hour ozone NAAQS nonattainment areas to serious, effective July 22, 2024 (89 FR 51829). The final reclassification action provided details on moderate classification SIP elements that EPA deems to still be due despite the voluntary reclassification to serious. As a result of this action, TCEQ is no longer required to submit SIP revisions addressing a demonstration of attainment by the prior moderate attainment date, a reasonably available control measures (RACM) analysis, and contingency

[1] An area that fails to attain the 2015 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 (70 parts per billion (ppb)); Bexar County's fourth highest daily maximum eight-hour average for 2020 was 72 ppb. Bexar County's design value for 2021 was 73 ppb.

measures for failure to attain by the moderate attainment date. These formerly proposed, no longer required elements have been removed from this SIP revision and are indicated with strikethrough formatting. The final reclassification determined that TCEQ is still required to submit a reasonably available control technology (RACT) analysis, nonattainment new source review (NNSR) certification statements, an RFP demonstration that includes a 15% reduction in volatile organic compounds (VOC), and contingency measures for failure to meet RFP.

TCEQ adopted and submitted SIP and rule revisions to implement a vehicle inspection and maintenance (I/M) program in Bexar County, as required for moderate ozone nonattainment areas. The 30 Texas Administrative Code (TAC) Chapter 114 rulemaking concerning Expansion of I/M to Bexar County (Project No. 2022-026-114-AI), and the Bexar County I/M SIP Revision (Project No. 2022-027-SIP-NR) were adopted by the commission on November 29, 2023, and submitted to EPA on December 18, 2023.

On April 24, 2024, the commission adopted the Bexar County 2015 Eight-Hour Ozone Standard Moderate Nonattainment Area RACT SIP Revision (Non-rule Project No. 2023-132-SIP-NR), which included the required moderate classification RACT analysis along with the concurrently adopted revisions to 30 TAC Chapter 115, Control of Air Pollution from Volatile Organic Compounds (Rule Project No. 2023-116-115-AI) and 30 TAC Chapter 117, Control of Air Pollution from Nitrogen Compounds (Rule Project No. 2023-117-117-AI) to implement moderate RACT requirements in Bexar County. The RACT SIP and rule revisions were submitted to EPA on May 7, 2024.

This SIP revision includes certification statements to confirm that nonattainment new source review and Stage I gasoline vapor recovery program requirements have been met for the Bexar County 2015 ozone NAAQS nonattainment area. Moderate classification elements relating to RFP are addressed in the concurrent Bexar County 2015 Ozone NAAQS Moderate RFP SIP Revision (Non-Rule Project No. 2022-024-SIP-NR). The commission is currently litigating the issue of whether the remaining ozone nonattainment moderate elements are still required to be submitted to EPA. Since the litigation is not concluded, the executive director is submitting the remaining moderate elements to the commission for consideration for adoption and submittal to the EPA to fulfill those obligations if a court finds those elements must be submitted by the state to avoid the imposition of federal sanctions.

Scope of the SIP revision:

A.) Summary of what the SIP revision will do:
As a result of the voluntary reclassification of the Bexar County 2015 ozone NAAQS nonattainment area from moderate to serious, this SIP revision includes the following SIP elements associated with the prior moderate classification (as determined by EPA): certification statements to confirm that NNSR and Stage I gasoline vapor recovery program requirements have been met for the Bexar County 2015 ozone NAAQS nonattainment area.

B.) Scope required by federal regulations or state statutes:
The elements included in this SIP revision meet certain FCAA SIP requirements for moderate ozone nonattainment areas following voluntary reclassification of the Bexar County 2015 ozone NAAQS nonattainment area from moderate to serious. Specifically, this SIP revision includes certification statements to confirm that NNSR and Stage I gasoline vapor recovery program requirements have been met for the Bexar County 2015 ozone NAAQS nonattainment area under the moderate classification. A moderate classification RACT analysis was already completed and associated control measures required to implement moderate RACT for Bexar County were adopted by the commission on April 24, 2024. This satisfies the requirements of FCAA, §182(b)(2) and EPA's *Implementation of the 2015 National Ambient Air Quality Standards for Ozone: State*

Implementation Plan Requirements; Final Rule. The Bexar County 2015 Eight-Hour Ozone Standard Moderate Nonattainment Area RACT SIP Revision (Project No. 2023-132-SIP-NR) and Chapter 115 and Chapter 117 rule projects (Project No. 2023-116-115-AI and Project No. 2023-117-117-AI) were submitted to EPA on May 7, 2024. Beginning on January 1, 2025, applicable sources in Bexar County must comply with new RACT requirements.

Remaining moderate classification elements relating to RFP are addressed in the concurrent Bexar County 2015 Ozone NAAQS Moderate RFP SIP Revision (Non-Rule Project No. 2022-024-SIP-NR).

As previously mentioned, the commission is currently litigating the issue of whether the remaining ozone nonattainment moderate elements are still required to be submitted to EPA. Since the litigation is not concluded, the executive director is submitting the remaining moderate elements to the commission for consideration for adoption and submittal to the EPA to fulfill those obligations if a court finds those elements must be submitted by the state to avoid the imposition of federal sanctions.

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 is proposed and 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:
None.

B.) Public:
This SIP revision would have no new effect on the public.

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

Stakeholder meetings:
TCEQ hosted a virtual Bexar County Stakeholders Meeting on June 8, 2022, related to the proposed SIP revision. The purpose of the meeting was to discuss what emission reduction strategies (primarily VOC) are being or could be implemented by different source sectors. The meeting was open to the public, but the focus was on stationary sources. In addition, two virtual Technical Information Meetings were hosted by TCEQ. One was held on August 16, 2021, and the other was held on August 22, 2022. The purpose of these meetings was for TCEQ to have an open, consultative forum regarding the technical work associated with the SIP, to include the

development of the photochemical modeling, data analysis, and EI. Both meetings were open to everyone; however, the focus was on the technical aspects on the development of the SIP.

An additional outreach meeting was held on January 19, 2024, to discuss voluntary reclassification, EPA's finding of failure to submit, and SIP planning requirements for serious nonattainment areas. These meetings were open to the public, but the focus was on companies and industry in Bexar County with stationary sources of pollution.

Public Involvement Plan
Yes.

Alternative Language Requirements
Yes. Spanish.

Public comment:
The commission opened a public comment period and held a public hearing concerning the proposed SIP revision, which included elements that are not being considered for adoption. The public comment period opened on June 2, 2023, and closed on July 17, 2023. The commission held a public hearing in San Antonio on July 13, 2023, at 7:00 p.m. Notice of the public hearing was published in the *San Antonio Express-News* newspaper in English and Spanish on June 2, 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 June 16, 2023 (48 TexReg 3339). 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 as well as the concurrently proposed Bexar County 2015 Ozone NAAQS Moderate RFP SIP Revision (Project No. 2022-024-SIP-NR), Bexar County Vehicle Inspection and Maintenance (I/M) SIP Revision (Project No. 2022-027-SIP-NR), and the 30 TAC Chapter 114 Bexar County I/M Expansion, Low-RVP Clean-Up, and Definitions Clean-Up Rulemaking (Project No. 2022-026-114-AI). Spanish language interpreters were available at the hearing, the comments were recorded, and a transcript was prepared.

During the comment period, comments on this SIP revision were received from Alamo Area Council of Governments, EPA, Sierra Club, and 24 individuals. Generally, the comments focused on the adverse health effects of ozone, modeling, lack of RACT, and lack of a RACM analysis. The public comments received are summarized and addressed in this Bexar County AD SIP Revision.

Significant changes from proposal:
As a result of the reclassification of the 2015 eight-hour ozone NAAQS nonattainment areas to serious, effective July 22, 2024, the following elements associated with the prior moderate classification and attainment date are no longer required and have been removed from this SIP revision with strikethrough formatting:

- a demonstration of attainment by the prior moderate attainment date;
- photochemical modeling;
- motor vehicle emissions budget (MVEB);
- a RACM analysis;
- a weight-of-evidence analysis; and
- contingency measures for failure to attain
- emissions inventory.

Potential controversial concerns and legislative interest:
Due to the delayed EPA reclassification to moderate, TCEQ did not submit the required moderate classification SIP revisions for the 2015 ozone NAAQS by the January 1, 2023, deadline. EPA issued

a finding of failure to submit on October 18, 2023 (88 FR 71757). Effective November 17, 2023, this finding started 18-month and 24-month sanctions clocks and a 24-month federal FIP clock for the Bexar County 2015 ozone NAAQS nonattainment area. As a result of the voluntary reclassification of the Bexar County area from moderate to serious nonattainment for the 2015 ozone NAAQS, an emissions inventory, photochemical modeling, MVEBs, a RACM analysis, a weight-of-evidence analysis, and a contingency plan for failure to attain by the moderate attainment date were determined by EPA to be no longer required. Therefore, these elements are not being submitted to EPA as part of this SIP revision. The 18-month and 24-month sanctions clocks would stop only if EPA receives, and deems complete, a submittal with all remaining required elements. The 24-month FIP clock would stop only if EPA receives and approves a submittal with all remaining required elements. The remaining SIP elements determined by EPA to still be required are addressed in this SIP revision and the concurrent Bexar County 2015 Ozone NAAQS Moderate RFP SIP Revision (Project No. 2022-024-SIP-NR).

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 revision?
The commission could choose to not comply with requirements to submit the remaining moderate classification SIP elements determined by EPA to still apply. However, the 18-month and 24-month sanctions clocks would stop only if EPA receives, and deems complete, a submittal with all remaining required elements. Sanctions include transportation funding restrictions, grant withholdings, and 2-to-1 emissions offsets requirements for new construction and major modifications of stationary sources in the Bexar County 2015 ozone NAAQS nonattainment area. EPA would impose such sanctions until the state submitted the remaining moderate classification SIP elements for the area and EPA determined the submittals complete. The 24-month FIP clock would stop only if EPA receives and approves a submittal with all remaining required elements. Submittals and a completeness determination are required by May 17, 2025, to prevent implementation of the first sanction, increased emission offsets. If submittals are not received and a completeness determination is not made by November 17, 2025, federal highway funding sanctions will apply. If complete submittals are not approved by November 17, 2025, EPA will be obligated to promulgate a FIP.

Key points in the adoption SIP revision schedule:
Anticipated agenda date: February 27, 2025

Agency contacts:
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cc: Chief Clerk, 2 copies
Executive Director's Office
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Terry Salem

Re: Docket No. 2023-0319-SIP

Contessa Gay
Jamie Zech

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

BEXAR COUNTY 2015 EIGHT-HOUR OZONE STANDARD
NONATTAINMENT AREA

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087
AUSTIN, TEXAS 78711-3087

BEXAR COUNTY MODERATE AREA ATTAINMENT DEMONSTRATION STATE IMPLEMENTATION PLAN REVISION FOR THE 2015 EIGHT-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD

PROJECT NUMBER 2022-025-SIP-NR
SFR-122/2022-025-SIP-NR

Adoption
February 27, 2025

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EXECUTIVE SUMMARY

Bexar County was originally designated nonattainment with a marginal classification for the 2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS) of 0.070 parts per million (ppm) with a September 24, 2021, attainment date.[1] Based on monitoring data from 2018, 2019, and 2020, Bexar County did not attain the standard by the September 24, 2021, attainment date for the area under the marginal classification and did not qualify for a one-year attainment date extension in accordance with federal Clean Air Act (FCAA), §181(a)(5).[2] On October 7, 2022, the U.S. Environmental Protection Agency (EPA) published a final notice reclassifying Bexar County from marginal to moderate effective November 7, 2022 (87 *Federal Register* (FR) 60897).

Bexar County was then subject to the moderate ozone nonattainment area requirements in FCAA, §182(b), and the Texas Commission on Environmental Quality (TCEQ) was required to submit moderate ozone classification attainment demonstration (AD) and reasonable further progress (RFP) state implementation plan (SIP) revisions to EPA. ~~The attainment date for the Bexar County 2015 ozone NAAQS nonattainment area is September 24, 2024, with a 2023 attainment year (87 FR 60897).~~[3] The EPA set a January 1, 2023, deadline for states to submit AD and RFP SIP revisions to address the 2015 eight-hour ozone NAAQS moderate nonattainment area requirements.

On October 12, 2023, Texas Governor Greg Abbott signed and submitted a letter to EPA to voluntarily reclassify the Bexar County, Dallas-Fort Worth, and Houston-Galveston-Brazoria 2015 eight-hour ozone NAAQS moderate nonattainment areas to serious. On October 18, 2023, EPA published a finding of failure to submit required SIP revisions for the 2015 eight-hour ozone NAAQS moderate nonattainment areas, effective November 17, 2023 (88 FR 71757), which started sanctions and federal implementation plan (FIP) clocks. Submittals and a completeness determination are required by May 17, 2025, to prevent implementation of the first sanction, increased emission offsets. If submittals are not received and a completeness determination is not made by November 17, 2025, federal highway funding sanctions will apply. If complete submittals are not approved by November 17, 2025, EPA will be obligated to promulgate a FIP. On June 20, 2024, EPA published the final reclassification of the 2015 eight-hour ozone NAAQS nonattainment areas to serious, effective July 22, 2024 (89 FR 51829).

As specified in the final serious reclassification rule, TCEQ is no longer required to submit SIP revisions addressing a demonstration of attainment by the prior moderate attainment date, a reasonably available control measures (RACM) analysis, and

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[1] Bexar County was designated nonattainment for the 2015 ozone NAAQS effective September 24, 2018, after most of the rest of the country (83 FR 35136, July 25, 2018).

[2] An area that fails to attain the 2015 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 (70 parts per billion (ppb)); Bexar County's fourth-highest daily maximum eight-hour average for 2020 was 72 ppb.

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

contingency measures for failure to attain (as determined by EPA). These formerly proposed, no longer required elements have been removed from this SIP revision with strikethrough formatting. The remaining SIP requirements for the prior moderate classification are addressed in this SIP revision and in the concurrent Bexar County 2015 Ozone NAAQS Moderate RFP SIP Revision (Non-Rule Project No. 2022-024-SIP-NR). The commission has filed a legal challenge in the Fifth Circuit Court of Appeals challenging EPA's position that these remaining ozone nonattainment moderate elements are still required to be submitted after EPA granted the commission's request that the areas be reclassified to serious. Since the litigation is not concluded, the commission is adopting and submitting the moderate elements to EPA to fulfill the obligations only if a court deems those elements must be submitted by the state to avoid the imposition of federal sanctions.

~~This Bexar County AD SIP revision includes the following required SIP elements for ozone nonattainment areas classified as moderate: photochemical modeling, 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, and certification statements to confirm that nonattainment new source review and Stage I gasoline vapor recovery program requirements have been met for the Bexar County 2015 ozone NAAQS nonattainment area. This SIP revision also describes existing ozone control measures for Bexar County; however, it does not include a reasonably available control technology (RACT) analysis. This SIP revision includes a commitment from the Executive Director to propose a RACT analysis and associated control measures required to implement RACT for Bexar County, if any are needed, at a future Commission Agenda. The Bexar County RACT analysis and any associated rules are anticipated to be proposed later in 2023. The RACT analysis and any regulations, if adopted by the commission, would be submitted to EPA by May 7, 2024.~~ This Bexar County AD SIP revision includes the following required SIP elements for ozone nonattainment areas classified as moderate (as determined by EPA): certification statements to confirm that nonattainment new source review and Stage I gasoline vapor recovery program requirements have been met for the Bexar County 2015 ozone NAAQS nonattainment area. On April 4, 2024, the commission adopted the Bexar County 2015 Eight-Hour Ozone Standard Moderate Nonattainment Area RACT SIP Revision (Non-rule Project No. 2023-132-SIP-NR), which included the required RACT analysis along with the concurrently adopted revisions to 30 Texas Administrative Code (TAC) Chapter 115, Control of Air Pollution from Volatile Organic Compounds (Rule Project No. 2023-116-115-AI) and 30 TAC Chapter 117, Control of Air Pollution from Nitrogen Compounds (Rule Project No. 2023-117-117-AI) to implement moderate RACT requirements in Bexar County. The RACT SIP and rule revisions were submitted to EPA on May 7, 2024.

Effective July 22, 2024, Texas is no longer required to submit failure-to-attain contingency measures due to the voluntary reclassification of the Bexar County area from moderate to serious nonattainment for the 2015 ozone standard. ~~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 measure requirement. At the time the 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 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.

Since EPA had not issued final guidance to states regarding contingency measures at the time this SIP revision was developed, this SIP revision relies on the historically approved approach of using surplus emissions reductions to fulfill the contingency measure requirements.

The 30 TAC Chapter 114 rulemaking concerning Expansion of Vehicle I/M to Bexar County (Project No. 2022-026-114-AI), and the concurrent Bexar County I/M SIP Revision (Project No. 2022-027-SIP-NR) that contains the required I/M performance standard modeling for Bexar County were adopted on November 29, 2023. The I/M SIP and rule revisions were submitted to EPA on December 18, 2023.

This Bexar County AD SIP revision is adopted concurrent with the Bexar County 2015 Ozone NAAQS RFP SIP Revision (Project No. 2022-024-SIP-NR). the 30 Texas Administrative Code (TAC) Chapter 114 rulemaking concerning Expansion of Vehicle I/M to Bexar County and Removal of Six Dallas-Fort Worth Counties from the Regional Low Reid Vapor Pressure Gasoline Program (Project No. 2022-026-114-AI), and the Bexar County I/M SIP Revision (Project No. 2022-027-SIP-NR).

This Bexar County 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 by a WoE analysis. The peak ozone design value for the Bexar County nonattainment area is estimated to be 71 ppb in 2023. The quantitative and qualitative analyses in Chapter 5: *Weight of Evidence* supplement the photochemical modeling analysis presented in Chapter 3: *Photochemical Modeling* to characterize future ozone conditions.

For the photochemical modeling analysis, this Bexar County AD 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 70 ppb have historically been monitored within the Bexar County 2015 ozone NAAQS 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 2023 future case modeling results to estimate 2023 eight-hour ozone design values.

Table ES-1: *Summary of 2019 Base and 2023 Future Case Anthropogenic Modeling Emissions in Bexar County 2015 Ozone NAAQS Nonattainment Area for the June 12 Episode Day* lists anthropogenic 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 2023 future case ozone modeling. The differences in modeling emissions between the 2019 base and the 2023 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.

Table ES-1: Summary of 2019 Base and 2023 Future Case Anthropogenic Modeling Emissions in Bexar County 2015 Ozone NAAQS Nonattainment Area for the June 12 Episode Day

Emissions Source Category	2019 NO_x (tpd)	2023 NO_x (tpd)	2019 VOC (tpd)	2023 VOC (tpd)
On-Road	28.26	20.61	14.95	12.37
Non-Road	7.82	6.99	11.36	11.92
Off-Road - Airports	1.89	1.72	0.62	0.59
Off-Road - Locomotives	1.98	1.48	0.09	0.07
Area Sources	5.34	5.53	77.41	81.14
Oil and Gas - Drilling	0.00	0.00	0.00	0.00
Oil and Gas - Production	1.71	1.71	6.38	6.38
Point - EGU	8.34	10.08	0.33	0.33
Point - Non-EGU	8.73	9.33	4.33	4.91
Bexar County Total	**64.07**	**57.45**	**115.47**	**117.71**

The future year on-road mobile source emission inventories for this SIP revision were developed using EPA Motor Vehicle Emission Simulator version 3 (MOVES3). These 2023 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 2023 on-road mobile source emissions that have been modeled for the attainment demonstration and include all of the on-road control measures. The MVEBs are provided in Table 4-2: *2023 Attainment Demonstration MVEB for the Bexar County 2015 Ozone NAAQS Nonattainment Area*.

The 2019 base case design value (DVB) and 2023 future case design value (DVF) for the regulatory ozone monitors in the Bexar County 2015 ozone NAAQS nonattainment area are shown in Table ES-2: *Summary of 2019 DVB and Modeled 2023 DVF for Bexar County 2015 Ozone NAAQS Nonattainment Area Regulatory Monitors*. In accordance with EPA's November 2018 *Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze*,[4] the 2023 DVFs presented have been rounded to one decimal place and then truncated. Based on TCEQ's modeling and available data, the Bexar County area is not expected to attain the 2015 ozone NAAQS by the September 24, 2024 attainment date.

Table ES-2: Summary of 2019 DVB and Modeled 2023 DVF for Bexar County 2015 Ozone NAAQS Nonattainment Area Regulatory Monitors

Monitor Name	CAMS Number	2019 DVB (ppb)	Relative Response Factor	2023 DVF (ppb)
Camp Bullis	0058	72.00	0.995	71
Calaveras Lake	0059	65.67	0.998	65
San Antonio Northwest	0023	72.00	0.996	71

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

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

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 TCEQ), the 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), (e)(11)(B) - (F), (e)(13) and (e)(15), (e)(16), (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

Chapter 115: Control of Air Pollution from Volatile Organic Compounds — December 12, 2024

Chapter 116: Control of Air Pollution by Permits for New Construction or Modification — July 1, 2021

Chapter 117: Control of Air Pollution from Nitrogen Compounds — May 16, 2024

Chapter 118: Control of Air Pollution Episodes — March 5, 2000

Chapter 122: Federal Operating Permits Program
§122.122: Potential to Emit — February 23, 2017

SECTION VI: CONTROL STRATEGY

A. Introduction (No change)
B. Ozone (Revised)
    1. Dallas-Fort Worth (No change)
    2. Houston-Galveston-Brazoria (No change)
    3. Beaumont-Port Arthur (No change)
    4. El Paso (No change)
    5. Regional Strategies (No change)
    6. Northeast Texas (No change)
    7. Austin Area (No change)
    8. San Antonio Area (Revised)
    9. Victoria Area (No change)
C. Particulate Matter (No change)
D. Carbon Monoxide (No change)
E. Lead (No change)
F. Oxides of Nitrogen (No change)
G. Sulfur Dioxide (No change)
H. Conformity with the National Ambient Air Quality Standards (No change)
I. Site Specific (No change)
J. Mobile Sources Strategies (No change)
K. Clean Air Interstate Rule (No change)
L. Transport (No change)
M. Regional Haze (No change)

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LIST OF ACRONYMS

ACT	alternative control techniques
AD	attainment demonstration
~~AEDT~~	~~Aviation Environmental Design Tool~~
~~AGL~~	~~above ground level~~
~~APU~~	~~auxiliary power unit~~
AQRP	Air Quality Research Program
~~AQS~~	~~Air Quality System~~
auto-GC	automated gas chromatograph
~~BEIS~~	~~Biogenic Emission Inventory System~~
~~BELD5~~	~~Biogenic Emissions Land-use Database~~
~~CAMS~~	~~continuous ambient monitoring station~~
~~CAMx~~	~~Comprehensive Air Quality Model with Extensions~~
~~CEDS~~	~~Community Emission Data System~~
CFR	Code of Federal Regulations
~~CMV~~	~~commercial marine vessel~~
~~CO~~	~~carbon monoxide~~
~~CSAPR~~	~~Cross-State Air Pollution Rule~~
CTG	control techniques guidelines
~~D.C.~~	~~District of Columbia~~
~~DERI~~	~~Diesel Emissions Reduction Incentive program~~
~~DFW~~	~~Dallas-Fort Worth~~
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	U.S. Environmental Protection Agency
~~ESL~~	~~Energy Systems Laboratory~~
~~FAA~~	~~Federal Aviation Administration~~
FCAA	Federal Clean Air Act

~~FIP~~	~~federal implementation plan~~
~~FINN~~	~~Fire Inventory of National Center for Atmospheric Research~~
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~~
~~km~~	~~kilometer~~
~~m~~	~~meter~~
~~MERRA~~	~~Modern-Era Retrospective analysis for Research and Applications~~
~~MDA8~~	~~maximum daily average eight-hour ozone~~
~~MODIS~~	~~Moderate-Resolution Imaging Spectroradiometer~~
~~MOVES3~~	~~Motor Vehicle Emission Simulator version 3~~
~~MPE~~	~~model performance evaluation~~
~~MVEB~~	~~motor vehicle emissions budget~~
~~MW~~	~~megawatt~~
~~MWh~~	~~megawatt-hours~~
NAAQS	National Ambient Air Quality Standard
~~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~~
PAMS	Photochemical Assessment Monitoring Stations
~~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
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~~
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
TCAA	Texas Clean Air Act
TCEQ	Texas Commission on Environmental Quality (commission)
~~TCFP~~	~~Texas Clean Fleet Program~~
~~TDM~~	~~travel demand model~~
TERP	Texas Emissions Reduction Plan
~~TexN~~	~~Texas NONROAD~~
~~TexN2~~	~~Texas NONROAD version 2 utility~~
~~TNGVGP~~	~~Texas Natural Gas Vehicle Grant Program~~
~~TNMHC~~	~~total non-methane hydrocarbon~~
TNRCC	Texas Natural Resource Conservation Commission
~~tpd~~	~~tons per day~~
TSD	technical support document
~~TTI~~	~~Texas Transportation Institute~~
TWC	Texas Water Code
~~TX~~	~~Texas~~
~~TxDOT~~	~~Texas Department of Transportation~~
~~TxLED~~	~~Texas Low Emissions Diesel~~
U.S.	United States
~~VIIRS~~	~~Visible Infrared Imaging Radiometer Suite~~
~~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 U.S. 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/airquality/sip/sipplans.html).

2023 Bexar County Inspection and Maintenance (I/M) SIP Revision (TCEQ Non-Rule Project No. 2022-027-SIP-NR, adopted November 29, 2023) Bexar County Inspection and Maintenance (I/M) State Implementation Plan (SIP) Revision

2024 Bexar County 2015 Eight-Hour Ozone Moderate Classification Reasonably Available Control Technology (RACT) SIP Revision (TCEQ Non-Rule Project No. 2023-132-SIP-NR, adopted April 24, 2024) Bexar County 2015 Eight-Hour Ozone Moderate Classification Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) Revision

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Appendix A	Modeling Technical Support Document (TSD)
~~Appendix B~~	~~Conceptual Model for the Bexar County Nonattainment Area for the 2015 Eight-Hour Ozone National Ambient Air Quality Standards~~
~~Appendix C~~	~~Local Initiatives~~

Note: Appendices indicated with strikethrough formatting are no longer required and are not being submitted to EPA as part of this SIP revision.

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 (http://www.tceq.texas.gov/airquality/sip) on the Texas Commission on Environmental Quality's (TCEQ) website (http://www.tceq.texas.gov/).

1.2 INTRODUCTION

The following history of the 2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS) for Bexar County is provided to give context and greater understanding of the complex issues involved in the area's ozone challenge.

1.2.1 2015 Eight-Hour Ozone NAAQS History

On October 1, 2015, the U.S. Environmental Protection Agency (EPA) lowered the primary and secondary eight-hour ozone standards to 0.070 parts per million (ppm), effective December 28, 2015 (80 *Federal Register* (FR) 65291). On June 4, 2018, EPA published final designations for areas under the 2015 eight-hour ozone NAAQS (83 FR 25766), effective August 3, 2018; however, EPA did not designate Bexar County as part that action. The EPA designated Bexar County as nonattainment for the 2015 ozone NAAQS with a marginal classification on July 25, 2018, effective September 24, 2018 (83 FR 35136).

1.2.1.1 Marginal Classification for the 2015 Eight-Hour Ozone NAAQS

Under a marginal classification, Bexar County was required to attain the 2015 ozone NAAQS by the end of 2020, the attainment year, to meet a September 24, 2021 attainment date.[5] On January 15, 2020, the commission approved proposal of a federal Clean Air Act (FCAA), §179B Demonstration SIP revision that demonstrated that the Bexar County marginal ozone nonattainment area would attain the 2015 eight-hour ozone standard by its attainment deadline "but for" anthropogenic emissions emanating from outside the United States. On January 9, 2020, EPA issued draft guidance for the development of §179B demonstrations. On July 1, 2020, the commission adopted the Bexar County §179B Demonstration SIP revision. It was submitted to EPA on July 13, 2020. On December 21, 2020, EPA issued final guidance for the development of §179B demonstrations.

On June 10, 2020, the commission adopted an emissions inventory (EI) SIP revision for the 2015 eight-hour ozone NAAQS marginal nonattainment areas, including Bexar County (Non-Rule Project No. 2019-111-SIP-NR). It was submitted to EPA on June 24, 2020. The revision satisfied FCAA EI reporting requirements for areas designated nonattainment for the 2015 eight-hour ozone NAAQS and also included certification statements to confirm that emissions statement and nonattainment new source review (NSR) SIP requirements had been met for the 2015 eight-hour ozone marginal nonattainment areas. On June 29, 2021, EPA published final approval of the EI for the Bexar County 2015 ozone NAAQS nonattainment area (86 FR 34139). On September 9,

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

2021, EPA published final approval of the emissions statement and nonattainment NSR certification statements (86 FR 50456).

1.2.1.2 Reclassification to Moderate for the 2015 Eight-Hour Ozone NAAQS

Based on monitoring data from 2018, 2019, and 2020, Bexar County did not attain the 2015 eight-hour ozone NAAQS in the 2020 attainment year under the marginal classification 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 Bexar County 2015 ozone NAAQS nonattainment area from marginal to moderate, effective November 7, 2022 (87 FR 60897). The attainment date for the Bexar County moderate nonattainment area is September 24, 2024, with a 2023 attainment year. In this same action, EPA also disapproved the Bexar County §179B Demonstration SIP Revision.

1.2.1.3 Reclassification to Serious for the 2015 Eight-Hour Ozone NAAQS

On October 12, 2023, Texas Governor Greg Abbott signed and submitted a letter to EPA to voluntarily reclassify the Bexar County, Dallas-Fort Worth, and Houston-Galveston-Brazoria 2015 eight-hour ozone NAAQS moderate nonattainment areas to serious. 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). On June 20, 2024, EPA published the final reclassification of the 2015 eight-hour ozone NAAQS nonattainment areas to serious, effective July 22, 2024 (89 FR 51829). With the final reclassification of the Bexar County area to serious nonattainment for the 2015 ozone NAAQS, TCEQ is no longer required to submit SIP revisions addressing the following requirements for the moderate classification:

- A demonstration of attainment by the prior moderate attainment date;
- A reasonably available control measures (RACM) analysis tied to the prior moderate attainment date; and
- contingency measures specifically related to the area's failure to attain by the prior moderate attainment date.

EPA's October 18, 2023, finding of failure to submit no longer applies to these specific SIP elements (88 FR 71757).

1.2.2 Ozone Design Value Trends

The eight-hour ozone design values for the San Antonio area from 2000 through 2022 are illustrated in Figure 1-1: *Eight-Hour Ozone Design Values and Population in the San Antonio Area*. The design value has decreased over the past 22 years. The 2022 eight-hour ozone design value of 75 parts per billion (ppb) represents a 13% decrease from the 2000 value of 86 ppb. This decrease in design values occurred despite an 45% increase in area population from 2000 through 2021.

[6] An area that fails to attain the 2015 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 (70 parts per billion (ppb)); Bexar County's fourth-highest daily maximum eight-hour average for 2020 was 72 ppb.

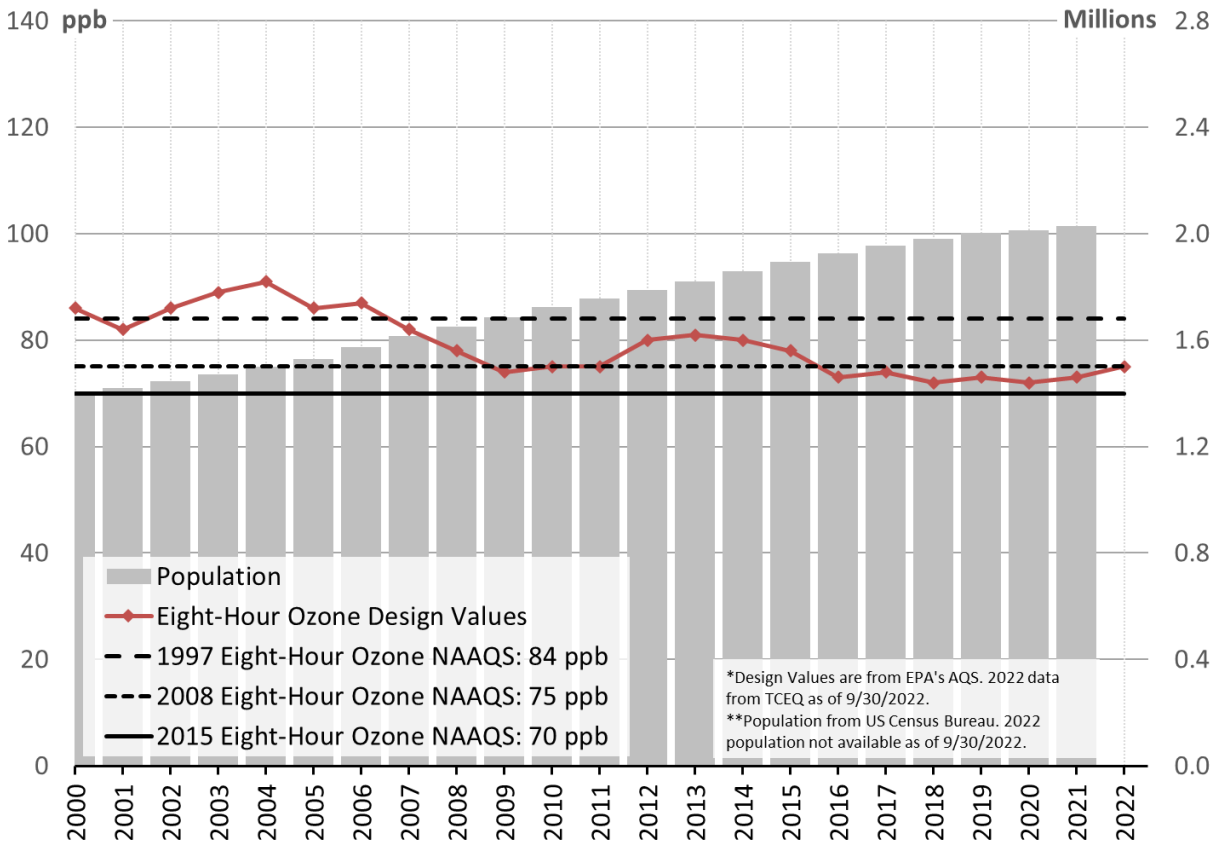

Figure 1-1: Eight-Hour Ozone Design Values and Population in the San Antonio Area

1.3 HEALTH EFFECTS

In 2015, EPA revised the primary eight-hour ozone NAAQS to 0.070 ppm (70 ppb). To support the 2015 eight-hour primary ozone standard, EPA provided information that suggested that health effects may potentially occur at levels lower than the previous 0.075 ppm (75 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 Bexar County Virtual Technical Information Meeting (TIM)

The Bexar County Air Quality TIMs are provided to present technical and scientific information related to air quality modeling and analysis in the Bexar County

nonattainment area. The TCEQ hosted two virtual TIMs, one on August 16, 2021, and the other was held on August 22, 2022. These TIMs included presentations on ozone planning, ozone design values, modeling platform updates, emissions inventory development, and updates from EPA. More information is available on the San Antonio Air Quality TIM webpage (https://www.tceq.texas.gov/airquality/airmod/meetings/aqtim-sa.html).

1.4.2 Bexar County Stakeholders Meetings

The TCEQ hosted a virtual Bexar County Stakeholder Meeting on June 8, 2022, related to SIP planning for the Bexar County area. The purpose of the meeting was to discuss what emission reduction strategies (primarily VOC) are being or could be implemented by different source sectors. An additional outreach meeting was held on January 19, 2024, to discuss voluntary reclassification, EPA's finding of failure to submit, and SIP planning requirements for serious nonattainment areas. These meetings were open to the public, but the focus was on companies and industry in Bexar County with stationary sources of pollution.

1.5 PUBLIC HEARING AND COMMENT INFORMATION

The commission opened a public comment period and held a public hearing concerning the proposed SIP revision, which included elements that are not being considered for adoption. The public comment period opened on June 2, 2023, and closed on July 17, 2023. The commission held a public hearing in San Antonio on July 13, 2023, at 7:00 p.m. Notice of the public hearing was published in the *San Antonio Express-News* newspaper in English and Spanish on June 2, 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 June 16, 2023 (48 TexReg 3339). 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 as well as the concurrently proposed Bexar County 2015 Ozone NAAQS Moderate Reasonable Further Progress SIP Revision (Project No. 2022-024-SIP-NR), Bexar County I/M SIP Revision (Project No. 2022-027-SIP-NR), and the 30 Texas Administrative Code Chapter 114 Bexar County I/M Expansion, Low-RVP Clean-Up, and Definitions Clean-Up Rulemaking (Project No. 2022-026-114-AI). Spanish language interpreters were available at the hearing, the comments were recorded, and a transcript was prepared.

Written comments were accepted via mail, fax, or through TCEQ's Public Comment system (https://tceq.commentinput.com/). During the comment period, comments on this SIP revision were received from Alamo Area Council of Governments, EPA, the Sierra Club, and 24 individuals. Generally, the comments focused on the adverse health effects of ozone, as well as modeling, lack of reasonably available control technology analysis, and lack of a RACM analysis. The public comments received are summarized and addressed in this Bexar County AD SIP Revision.

1.6 SOCIAL AND ECONOMIC CONSIDERATIONS

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

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 (NO CHANGE)

2.1 ~~INTRODUCTION~~

~~The federal Clean Air Act (FCAA) requires that attainment demonstration (AD) emissions inventories (EI) be prepared for ozone nonattainment areas (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 emissions 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 Bexar County 2015 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 Bexar County 2015 ozone NAAQS nonattainment area. Therefore, some minor sources in 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 generate emissions credits. SIP emissions are site- or facility-specific values based on the calendar year emissions inventory 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 emissions inventory 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) Air Markets Program Data and 2019 for all other stationary point sources (non-EGUs) with emissions recorded in TCEQ's STARS database. For more detail on the projection-base year for point sources, see Chapter 3, Section 3.4.2: *Emissions Inputs* and Appendix B: *Conceptual Model for the Bexar County Nonattainment Area for the 2015 Eight-Hour Ozone National Ambient Air Quality Standards.*

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

2.3 AREA SOURCES

Stationary 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 industrial, commercial, and residential sources that use materials or perform processes that generate emissions of air pollutants. Examples of area sources of VOC emissions include the following: oil and gas production facilities, printing processes, industrial coating and degreasing operations, gasoline service station underground tank filling, and vehicle refueling operations. Examples of typical fuel combustion area sources that emit NO_x include the following: oil and gas production facilities, stationary source fossil fuel combustion at residences and businesses, outdoor 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 an 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 are 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. The area source periodic emissions inventory (PEI) is reported every third year (triennially) to EPA for inclusion in the National Emissions Inventory. The TCEQ submitted the most recent PEI for calendar year 2020.

2.4 NON-ROAD MOBILE SOURCES

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

For this AD SIP revision, EIs for non-road sources were developed for the following subcategories: NONROAD model categories (as described further below), airports, locomotives, and drilling rigs used in upstream oil and gas exploration activities. Since no commercial marine activities occur in the Bexar County 2015 ozone nonattainment area, CMV EIs were not developed. The airport subcategory includes estimates for emissions from the aircraft, auxiliary power units (APUs), and ground support equipment (GSE) subcategories relevant for airports. The following sections describe the emissions estimate methodologies used for the non-road mobile source subcategories discussed below.

2.4.1 NONROAD Model Categories Emissions Estimation Methodology

The Motor Vehicle Emission Simulator version 3 (MOVES3) is EPA's latest mobile source emissions model for estimating non-road source category emissions. The TCEQ has invested significant time and resources to develop a Texas-specific version of the non-road sources called Texas NONROAD utility version 2 (TexN2) that replaces EPA defaults used to determine emissions with county-specific activity data.[8] The TCEQ uses TexN2 to estimate 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 the 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.

2.4.2 Drilling Rig Diesel Engines 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

[8] https://www.tceq.texas.gov/downloads/air-quality/research/reports/emissions-inventory/582211300fy2021-20210423-erg-texn2-update.pdf

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 Texas Railroad Commission 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 preliminary on-road EIs developed using MOVES3. 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 Bexar County 2015 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 emission 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,

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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/582211102 7-20211015-tti-texas-locomotive-railyard-2020-aerr-trend-ei.pdf

[11] https://www.tceq.texas.gov/downloads/air-quality/research/reports/emissions-inventory/582211119 6-20211015-tti-texas-airport-2020-aerr-trend-ei.pdf

temperature, humidity, vehicle age distributions for each vehicle type, percentage of miles traveled for each vehicle type, fuel control programs, and gasoline vapor pressure controls.

To estimate on-road mobile source emissions, emission factors estimate by the MOVES3 model must be multiplied by the level of vehicle activity. On-road mobile source emission 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 (TDMs) run by the Texas Department of Transportation and/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 inventories, 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 estimated 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 are located on TCEQ's Air Quality Research and Contract Projects webpage (https://www.tceq.texas.gov/airquality/airmod/project/pj.html).

CHAPTER 3: PHOTOCHEMICAL MODELING (PLACEHOLDER)

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, PM2.5, and Regional Haze* EPA, 2018; (referred to as EPA modeling guidance).

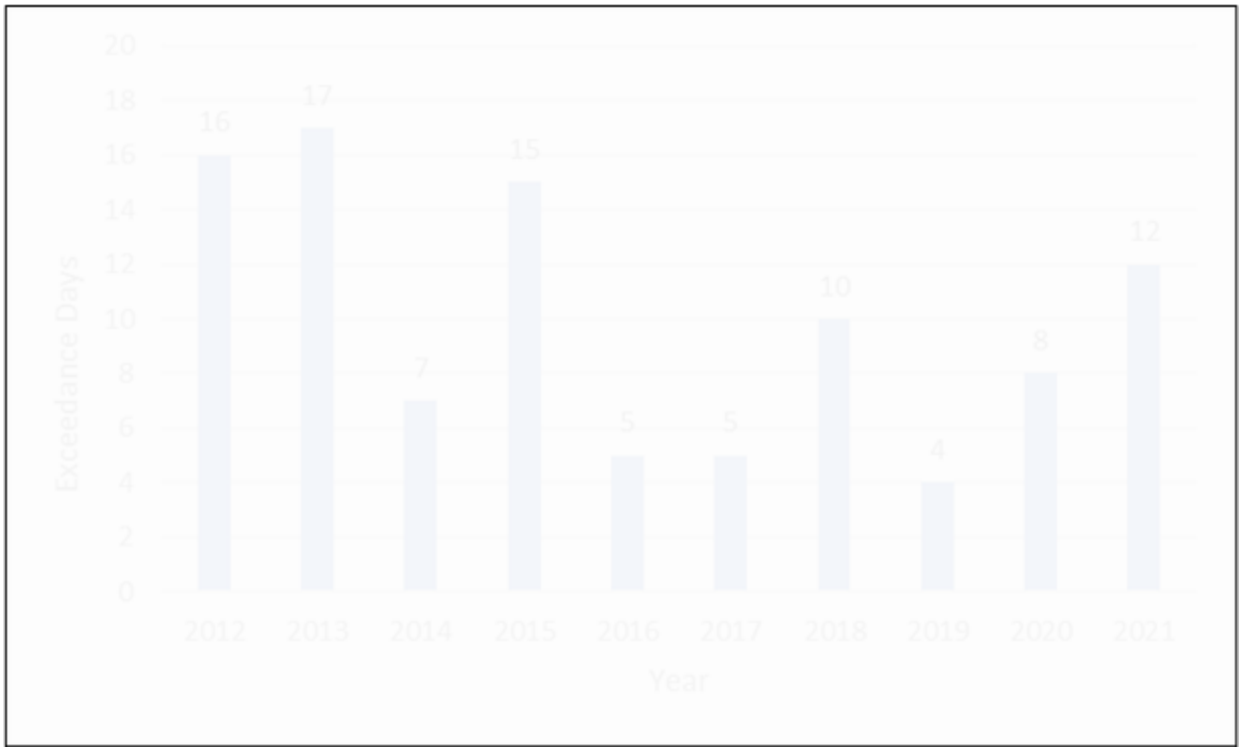
Results of the 2019 base case and the 2023 future case photochemical modeling runs are presented, which were used to estimate the 2023 attainment year design value. Base case modeling was used to evaluate the photochemical model's ability to replicate measured ozone and precursor concentrations for a past timeframe with monitored high-ozone concentrations. Future case modeling estimates the change in ozone concentrations due to changes in anthropogenic emissions in a future year 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 ozone concentrations be in the future if the same meteorological conditions (that resulted in a high ozone episode in the past) were to repeat?

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 from April 1 through October 31, 2019. 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 ozone season in the Bexar County 2015 eight-hour ozone NAAQS moderate nonattainment area (Bexar County 2015 ozone NAAQS nonattainment area).

One of the recommended criteria for selecting a modeling episode is that the episode be in the recent past and that it contains 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 2015 ozone NAAQS of 70 parts per billion (ppb). Figure 3-1: *Exceedance Days in the Bexar County 2015 Ozone NAAQS Nonattainment Area by Year from 2012 through 2021* shows the number of exceedance days across Bexar County by year over a 10-year period. While there were a higher number of ozone exceedance days earlier in the decade shown, 2019 had 4 exceedance days, which is similar to the number of exceedance days as 2014, 2016, and 2017, but lower than the years 2018, 2020, and 2021.



~~Figure 3-1: Exceedance Days in the Bexar County 2015 Ozone NAAQS Nonattainment Area by Year from 2012 through 2021~~

~~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 2021 in the Bexar County 2015 Ozone NAAQS Nonattainment Area* shows the frequency of exceedance days for the three eight-hour ozone standards from 2012 through 2021. This analysis shows that, similar to the Houston-Galveston-Brazoria (HGB) and Dallas-Fort Worth (DFW) nonattainment areas, the ozone season in Bexar County area exhibits two peaks with the mid-summer minimum usually occurring in July. Exceedances in the Bexar County 2015 Ozone NAAQS nonattainment area during March are quite rare, only one has occurred in this 10-year period. Most exceedance days typically occur in the latter half of the ozone season, August through October.~~

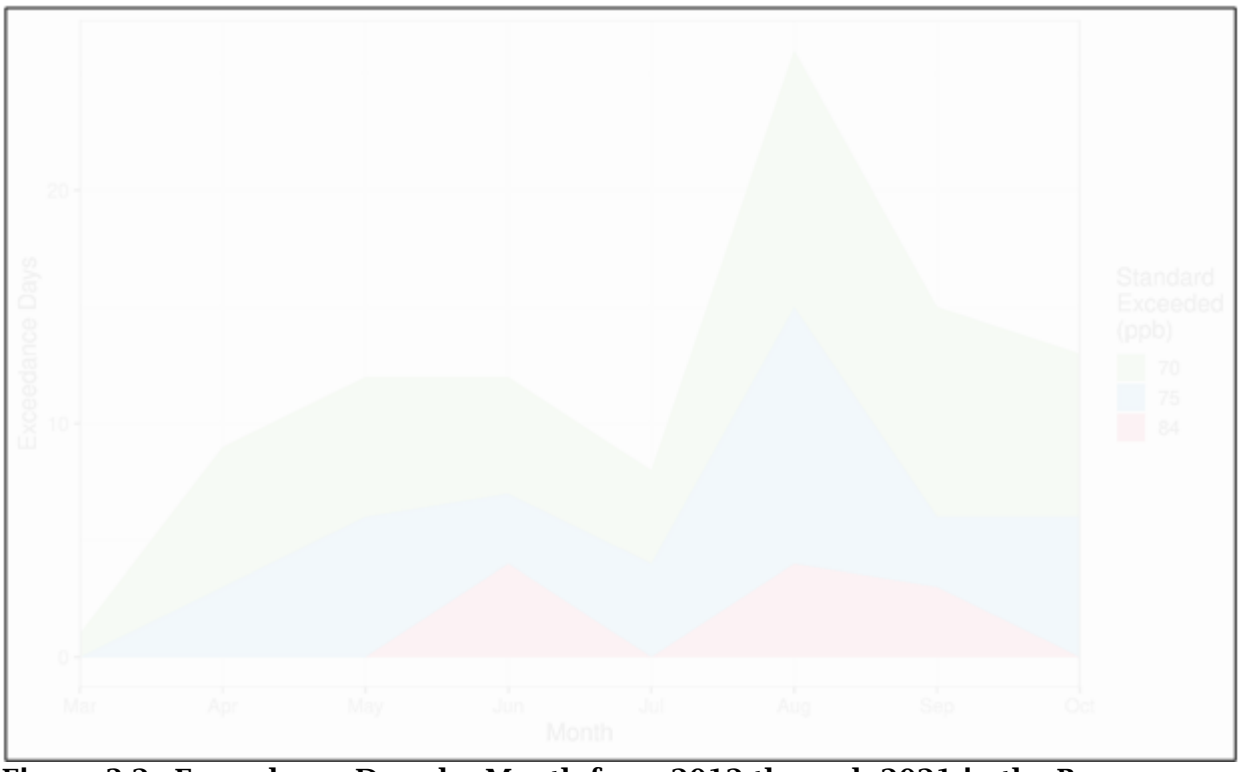


Figure 3-2: Exceedance Days by Month from 2012 through 2021 in the Bexar County 2015 Ozone NAAQS Nonattainment Area

Figure 3-3: *Map of Regulatory Ozone Monitors in Bexar County 2015 Ozone NAAQS Nonattainment Area* shows the locations of the three regulatory ozone monitors in Bexar.[12]

[12]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.

Figure 3-3: Map of Regulatory Monitors in Bexar County 2015 Ozone NAAQS Nonattainment Area

The MDA8 ozone values observed at the three regulatory monitors in Bexar County included four days with exceedances of the 70 ppb 2015 NAAQS in 2019. The observations summarized in Table 3-1: *Exceedance Days and Ozone Conditions from April through October 2019 Modeling Episode at Regulatory Monitors* indicate 10 days above 60 ppb for two regulatory monitors, and only six days above 60 ppb for the remaining regulatory monitor. All three regulatory monitors in Bexar County have at least the five days over 60 ppb recommended in EPA modeling guidance, one of the criteria used by TCEQ for selecting the April 1 through October 31, 2019, modeling episode.

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

Monitor Name	CAMS Number	Episode Maximum Eight-Hour Ozone (ppb)	Number of Days Over 60 ppb	Number of Days Over 70 ppb
Camp Bullis	0058	76	10	1
Calaveras Lake	0059	64	6	0
San Antonio Northwest	0023	78	10	4

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 Bexar County 2015 ozone NAAQS nonattainment area in 2019 showed that the year was not atypical, and therefore was reasonable for modeling ozone. Details of this assessment and of the episode selection used by TCEQ are provided in Section 1.2: *Modeling Episode* of Appendix A.

3.3 PHOTOCHEMICAL MODELING

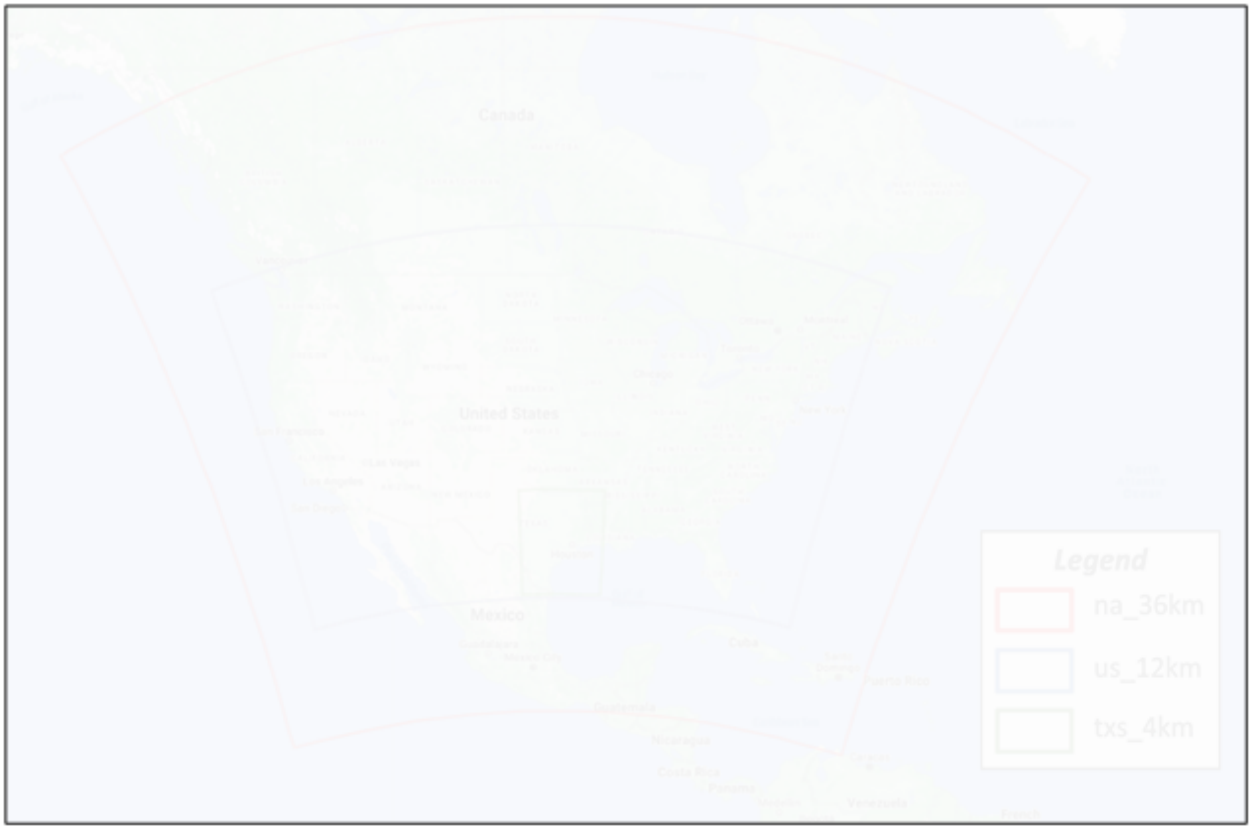
The TCEQ used the Comprehensive Air Quality Model with Extension (CAMx), version 7.20, for this AD modeling. The model software and the CAMx user's guide are publicly available (Ramboll, 2018). The TCEQ's choice of CAMx is in line with the criteria specified in EPA modeling guidance for model selection.

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*. A map showing the geographic extent of each domain is shown in Figure 3-4: *CAMx Domains*. The Bexar County 2015 ozone NAAQS nonattainment area is contained within txs_4km, the finest resolution domain, as shown in Figure 3-5*: The Bexar County 2015 Ozone NAAQS Nonattainment Area and the txs_4km CAMx 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: The Bexar County 2015 Ozone NAAQS Nonattainment Area and the txs_4km CAMx Domain

3.3.2 CAMx Options

The 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 5.1.4: *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 MODEL 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, emission 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 CAMx.

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 2015 ozone NAAQS nonattainment areas of Bexar County, DFW, and HGB, 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.

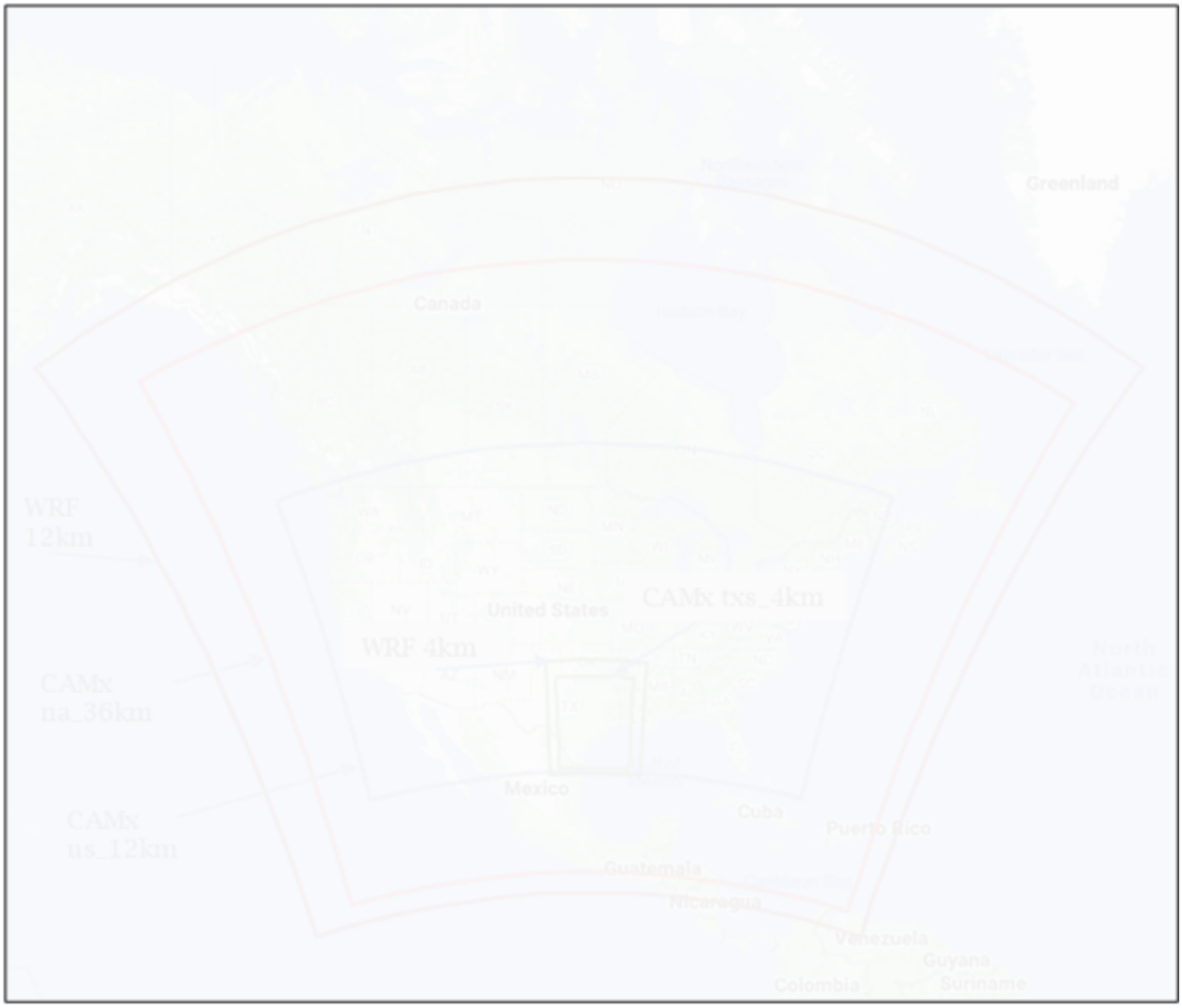


Figure 3-6: WRF and CAMx Domains

The WRF domains have 42 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. The lowest CAMx layer corresponds to the first two WRF layers. CAMx layers 2 through 21 align with the WRF domain. Layers 22 through 30 of the CAMx domain encompass multiple WRF layers as displayed in Figure 3-7: *WRF and CAMx Vertical Layers for txs_4km Domain*.

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

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

3.4.2 Emissions Inputs

Model-ready hourly emissions were developed for the April through October episode for the 2019 base case and the 2023 future case. The sections below provide an overview of the emission inputs used in this AD SIP modeling; more details about emissions inventory development are provided in Section 3: *Emissions Modeling* of Appendix A.

Emission inputs, or modeling emission inventories (EI), include emission 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 emission sources (e.g., fires). EI for each sector was developed using various datasets, models, and estimation techniques. The data sources and models used to develop the 2019 base case are listed in Table 3-4: *EI Data Sources for TCEQ 2019 Base Case*. A variety of datasets and interpolation techniques were used to develop the EI for the 2023 future case, which are described in Appendix A.

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

EI Source Category	Sector/Geographic Area	Datasets and/or Models used for 2019 EI
Point	EGU	2019 Clean Air Market Program Data[13]
Point	Non-EGU Texas (TX)	2019 State of Texas Air Reporting System[14]
Point	Non-EGU Non-TX	EPA 2016v1 Modeling Platform[15]
Non-Point	Oil & Gas TX	2019 Railroad Commission of Texas
Non-Point	Oil & Gas Non-TX	EPA 2017 Modeling Platform[16]
Non-Point	Off-Shore	2017 Bureau of Ocean Energy Management[17]
Mobile	On-Road, TX nonattainment areas	MOVES3[18] - link-based
Mobile	On-Road, other	MOVES3 - county based
Mobile	Non-Road, TX	TX: TexN2.2
Mobile	Non-Road, non-TX	MOVES3
Mobile	Off-Road Shipping, txs_4km domain	2019 Automatic Identification System (AIS) and vessel characteristic IHS 2020; MARINER v1
Mobile	Off-Road Shipping, us_12km domain	EPA 2016v1 modeling platform
Mobile	Off-Road Airports, TX nonattainment areas	Texas Trasportation Institute (TTI) 2020 data
Mobile	Off-Road Airports, other	EPA 2016v1 modeling platform
Mobile	Off-Road Locomotives, TX nonattainment areas	TTI 2019 data; Other: EPA 2016v1 modeling platform
Mobile	Off-Road Locomotives, other	EPA 2016v1 modeling platform

[13] https://campd.epa.gov/
[14] https://www.tceq.texas.gov/airquality/point-source-ei/psei.html
[15] https://www.epa.gov/air-emissions-modeling/2016v1-platform
[16] https://www.epa.gov/air-emissions-modeling/2017-emissions-modeling-platform
[17] https://www.boem.gov/environment/environmental-studies/ocs-emissions-inventory-2017
[18] https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves

EI Source Category	Sector/Geographic Area	Datasets and/or Models used for 2019 EI
Area	Area TX	2020 Air Emissions Reporting Requirements (AERR)
Area	Area Non-TX	EPA 2017 Modeling Platform
Natural	Biogenic	Biogenic Emissions Land-use Database (BELD5); BEIS v3.7[19] and SMOKEv4.8
Natural	Fires	2019 MODIS and VIIRS; FINN v2.2
Other	International EI	2019 Community Emission Data System (CEDS)[20]; SMOKEv4.7_CEDS

Total anthropogenic emissions for a model episode day of June 12 in the 2019 base case and 2023 future case from within the Bexar County 2015 ozone NAAQS nonattainment area listed in tons per day (tpd) in Table 3-5: *June 12 Episode Day 2019 Base Case Anthropogenic EI in the Bexar County 2015 Ozone NAAQS Nonattainment Area* and Table 3-6: *June 12 Episode Day 2023 Future Case Anthropogenic EI in the Bexar County 2015 Ozone NAAQS Nonattainment Area.* The June 12 was sample episode day chosen because it had high monitored ozone in the nonattainment area. Mobile sources contributed the greatest amount of NO_x and CO emissions in the area. Area sources contributed the greatest amount of VOC emissions.

Table 3-5: June 12 Episode Day 2019 Base Case Anthropogenic EI in the Bexar County 2015 Ozone NAAQS Nonattainment Area

Source Category	NO_x (tpd)	VOC (tpd)	CO (tpd)
On-Road	28.26	14.95	281.22
Non-Road	7.82	11.36	222.92
Off-Road - Airports	1.89	0.62	5.63
Off-Road - Locomotives	1.98	0.09	0.50
Area Sources	5.34	77.41	9.66
Oil and Gas - Drilling	0.00	0.00	0.00
Oil and Gas - Production	1.71	6.38	2.59
Point - EGU	8.34	0.33	8.13
Point - Non-EGU	8.73	4.33	3.41
Bexar County Total	**64.07**	**115.47**	**531.75**

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

Table 3-6: June 12 Episode Day 2023 Future Case Anthropogenic EI in the Bexar County 2015 Ozone NAAQS Nonattainment Area

Source Category	NO_x (tpd)	VOC (tpd)	CO (tpd)
On-Road	20.61	12.37	257.76
Non-Road	6.99	11.92	241.36
Off-Road - Airports	1.72	0.59	5.38
Off-Road - Locomotives	1.48	0.07	0.45
Area Sources	5.53	81.14	10.10
Oil and Gas - Drilling	0.00	0.00	0.00
Oil and Gas - Production	1.71	6.38	2.59
Point - EGU	10.08	0.33	3.41
Point - Non-EGU	9.33	4.91	6.05
Bexar County Total	57.45	117.71	527.10
Difference between 2023 and 2019	**-6.62**	**2.24**	**-4.65**

While emissions for categories described in Table 3-4 are projected to 2023, the anthropogenic emissions from other categories are held constant with the 2019 values used for 2023 future case. The emissions from non-US, non-Canada, and non-Mexico countries within the modeling domain and from natural source categories, including fire and biogenic categories, are held constant. While individual sectors in Table 3-6 increase in emissions between 2019 and 2023, there is an overall decrease in NO_x and CO emissions but an increase in VOC emissions.

Figure 3-8: *Difference in Anthropogenic NO_x between 2023 Future and 2019 Base Case on June 12 Modeled Episode Day*, shows how the difference in total anthropogenic NO_x emissions between future and base case are distributed spatially within the Bexar County area. Figure 3-9: *Difference in Anthropogenic VOC between 2023 Future and 2019 Base Case on June 12 Modeled Episode Day* shows how the difference in total anthropogenic VOC emissions between future and base case are distributed spatially within the Bexar County area.

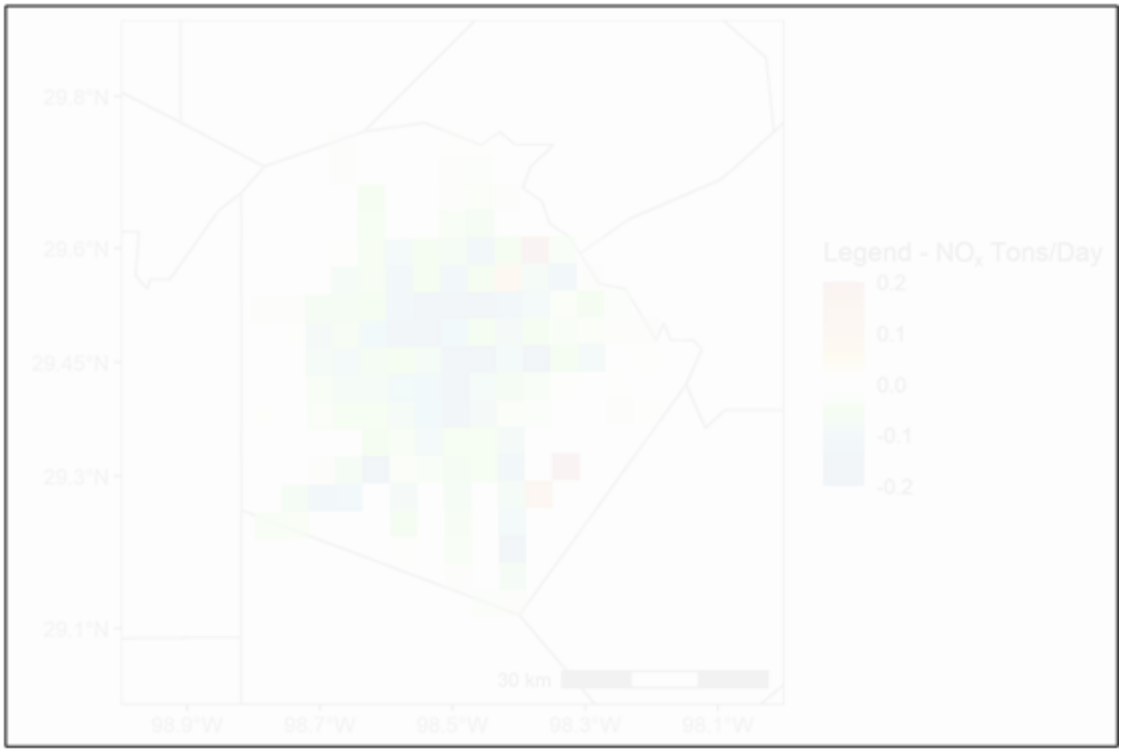


Figure 3-8: Difference in Anthropogenic NO_x between 2023 Future and 2019 Base Case on June 12 Modeled Episode Day

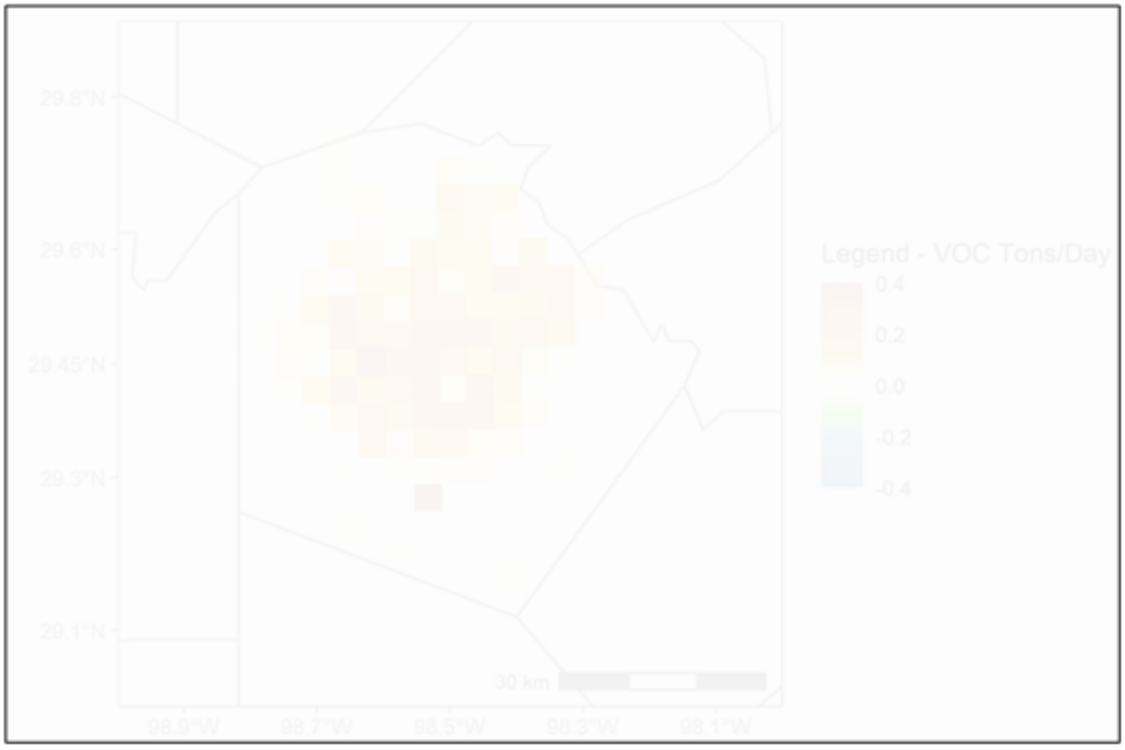


Figure 3-9: Difference in Anthropogenic VOC between 2023 Future and 2019 Base Case on June 12 Modeled Episode Day

While Figure 3-8 shows decreases in NO_x emissions between the 2023 future case and 2019 base case for almost all grid cells in the Bexar County area for the June 12 modeled episode day, there are a few grid cells in the northeast and southeast that show increases. The largest reductions are concentrated in the grid cells near the center of the county where major roadways in San Antonio are located, in line with the largest NO_x emissions decreases (7.65 tpd) coming from the on-road sector as shown in Table 3-5 and Table 3-6.

In line with the overall increase in VOC emissions between the 2023 future case and the 2019 base case, Figure 3-9 shows increases in most grid cells in the Bexar County area with the increases spread evenly over the urban geographic area and indicating the VOC emissions increases come mostly from the area source sector.

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 five edges (North, South, East, West, and 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 2023. Lateral boundary conditions were developed for each grid cell along all four lateral boundaries of the outer 36 km modeling. Top boundary conditions were also developed to represent pollutant concentrations from atmospheric layers above the highest CAMx vertical layer.

The 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 spin-up time (Jan and Feb). A spin-up period is the period of days that precede the actual time period of interest for modeling. The spin-up period is used to ensure that the atmospheric conditions in the model are balanced. For both modeled years, (2019 and 2023) GEOS-Chem version 12.7.1 was run at $2^{\circ} \times 2.5^{\circ}$ horizontal resolution with 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 2023 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 EIs from EPA's 2016v1 modeling platform were used to develop scaling factors at the county-level for the US 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

Model performance evaluation (MPE) of the base case modeling is necessary to demonstrate the ability of the model to replicate the formation and transport of ozone

given the meteorological and emissions inputs. The model's ability to suitably replicate real-life conditions is necessary to have confidence in the model's simulation of the future case ozone and the response to various control measures. The MPE is performed by comparing 2019 base case CAMx modeling results to measured ozone concentrations at all regulatory and non-regulatory ozone monitoring sites in Bexar County and adjacent counties. Regulatory ozone monitors in the Bexar County 2015 Ozone NAAQS nonattainment area are shown in Figure 3-3 and the name and location of non-regulatory ozone monitors in Bexar and adjacent counties are listed in Table 3-7: Non-Regulatory Monitors in Bexar and Adjacent Counties. Due to the small number of regulatory ozone monitors in Bexar, including the five non-regulatory ozone monitors in Bexar County and the four non-regulatory ozone monitors in adjacent counties produces more robust statistics, especially for statistics with minimum ozone cutoffs.

Table 3-7: Non-Regulatory Monitors in Bexar and Adjacent Counties

Monitor Name	County	CAMS Number	Longitude (degree)	Latitude (degree)
Bulverde Elementary	Comal	0503	-98.463	29.761
City of Garden Ridge	Comal	0505	-98.299	29.639
Elm Creek Elementary	Bexar	0501	-98.724	29.277
Fair Oaks Ranch	Bexar	0502	-98.626	29.730
Government Canyon	Bexar	1610	-98.765	29.549
Heritage Middle School	Bexar	0622	-98.333	29.353
New Braunfels Airport	Guadalupe	0504	-98.029	29.704
CPS Pecan Valley	Bexar	0678	-98.431	29.407
Seguin Outdoor Learning Center	Guadalupe	0506	-97.932	29.589

As recommended in EPA modeling guidance, TCEQ evaluations include eight-hour and one-hour performance measures calculated by comparing monitored and four-cell bi-linearly interpolated modeled ozone concentrations for all episode days and monitors. Statistical evaluations were compared to benchmarks set by Emery et al. (2017) which were based on a meta-analysis of the model performance statistics reported in peer-reviewed photochemical modeling studies. Normalized Mean Bias (NMB) values between -5 and 5% are within the 'goal' range indicate the best performance that a model can be expected to achieve. NMB values within -15 to 15% are within the 'criteria' range and indicate acceptable model performance. For Normalized Mean Error (NME), values less than 15% are within the goal range and values within 25% are within the criteria range.

The NMB and NME for high-ozone days with observed MDA8 ozone concentrations at or above 60 ppb for each ozone monitoring site in Bexar and adjacent counties for the whole modeling episode is presented in Figure 3-10: *NMB for MDA8 Ozone of at least 60 ppb in April through October 2019* and Figure 3-11: *NME for MDA8 Ozone of at least 60 ppb in April through October 2019*. Figure 3-10 shows that all ozone monitors in Bexar and adjacent counties have NMB within the criteria range and all but three show NMB values within the goal range. The Bulverde Elementary monitor had a NMB value

~~of 0.0 which does not show on Figure 3-10. Two of the three regulatory monitors, Camp Bullis and San Antonio Northwest, are within the goal range. This indicates acceptable model performance for all sites and good model performance for Camp Bullis and San Antonio Northwest.~~

~~Figure 3-10: NMB for MDA8 Ozone of at least 60 ppb in April through October 2019~~

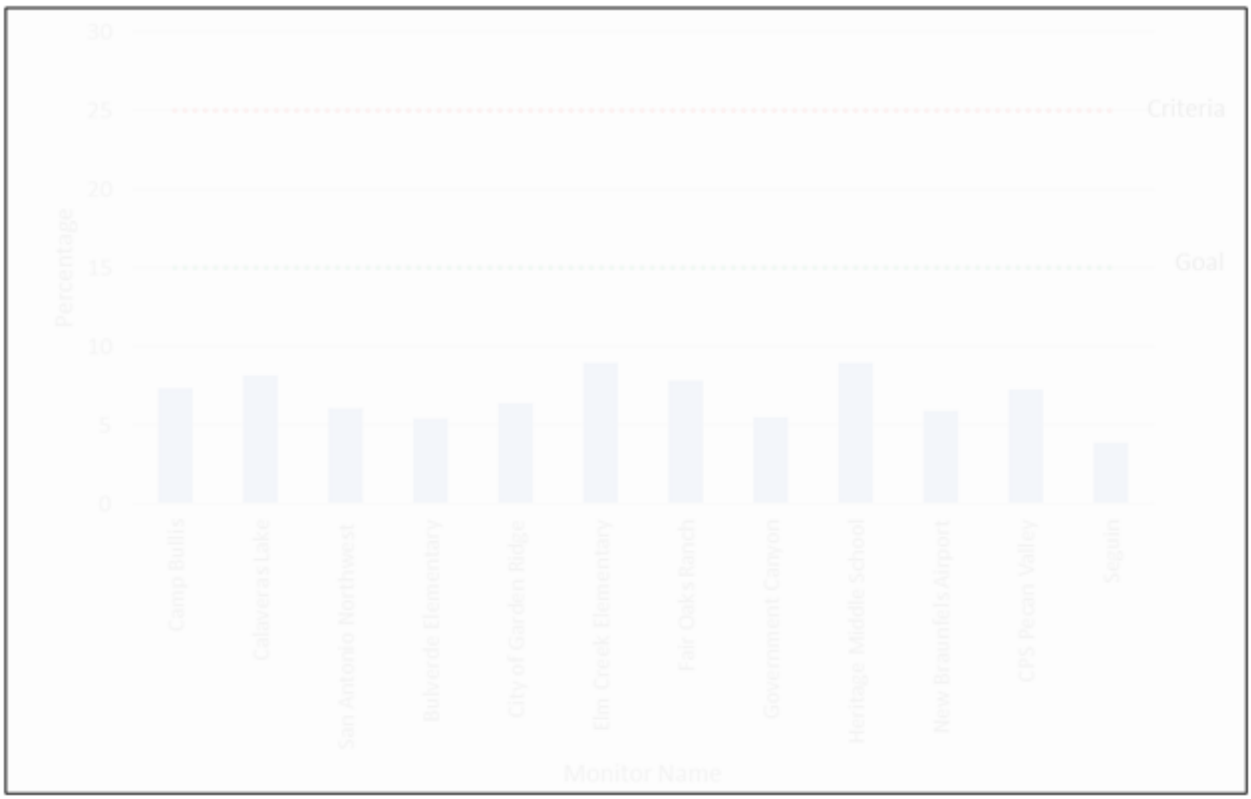


Figure 3-11: NME for MDA8 Ozone of at least 60 ppb in April through October 2019

Figure 3-11 shows that all monitors in Bexar and adjacent counties have NME within the goal range and all less than 10 percent NME. This indicates good model performance for regulatory and non-regulatory monitors in the Bexar County and adjacent counties. In addition to the episode-wide evaluation of model performance shown in Figure 3-10 and Figure 3-11, an evaluation of modeled eight-hour ozone concentrations for Bexar County and nearby counties for each month is presented in Table 3-8: *NMB and NME of Eight-hour Ozone in Bexar and Adjacent Counties.* The values represent monthly and seven-month averages from the 12 monitors in Bexar and adjacent counties shown in Figure 3-3. When evaluated for eight-hour observations (obs) over 40 ppb typical of daytime values, the NMB is positive in all months and within the criteria range in all months except May. The NMB values for MDA8 are within the criteria range except for April through June and always positive, with May and April showing the most positive bias. NMB values when the MDA8 observations are over 60 ppb are within the criteria range for each month and for the entire episode and exhibit positive and negative bias. The NME values for MDA8 are within the criteria value of 25% for each month except May, all months when observed ozone is over 40 ppb, and all months when the observed MDA8 is over 60 ppb. The NME values for the highest observed ozone days are within the 15% goal range and like for individual monitors, all under 10 percent. Model performance is acceptable for each month and the entire episode, with May and April showing the poorest performance.

Table 3-8: NMB and NME of Eight-hour Ozone in Bexar and Adjacent Counties

Month	NMB All Obs ≥ 40 ppb (%)	NME All Obs ≥ 40 ppb (%)	NMB Daily Max (%)	NME Daily Max (%)	NMB Daily Max Obs ≥ 60 ppb (%)	NME Daily Max Obs ≥ 60 ppb (%)
Apr	1.04	10.18	16.58	21.60	-5.51	6.04
May	18.5	20.19	39.52	40.22	(no obs ≥ 60 ppb)	(no obs ≥ 60 ppb)
Jun	3.55	11.59	15.24	21.76	-4.83	8.61
Jul	9.49	11.76	13.70	16.08	3.95	7.25
Aug	1.36	9.03	7.13	11.58	-6.24	9.77
Sep	9.27	12.35	10.16	14.19	-2.90	6.50
Oct	2.18	9.19	7.76	12.66	0.29	5.09
Apr through Oct	5.59	11.60	15.53	19.55	-2.13	7.11

Additional detailed evaluations are included in Section 5: *Photochemical Model Performance Evaluation* of Appendix A.

3.6 ATTAINMENT TEST

In accordance with EPA modeling guidance, the top-10 base case episode days with modeled MDA8 above 60 ppb, per monitor, were used for the modeled attainment test. The relative response factor (RRF) that is used in the attainment test was calculated based on EPA modeling guidance as follow:

- from the 2019 base case modeling, the maximum concentrations of the three-by-three grid cell array surrounding each monitor were averaged over top-10 modeled days to produce the top-10 day average base case MDA8 values;
- from the 2023 future case modeling, the concentrations from the corresponding base case top-10 modeled days and maximum grid cells were averaged to calculate the future case top-10 day average future MDA8 values; and
- the RRF was calculated for each monitor as a ratio of the top-10 day average future MDA8 values to the top-10 day average base case MDA8 values.

All regulatory ozone monitors in the Bexar County area had 10 modeled base case days above 60 ppb as well as over five days of observed MDA8 over 60 ppb in 2019. Since these monitors all meet EPA modeling guidance recommendations, they were included in the attainment test. The RRF for each monitor is shown in Table 3-8: *Monitor-Specific Relative Response Factors for Attainment Test.*

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

Monitor Name	CAMS Number	2019 Top 10 Days Modeled MDA8 Mean (ppb)	2023 Top 10 Days Modeled MDA8 Mean (ppb)	Relative Response Factor
Camp Bullis	0058	70.45	70.09	0.995
Calaveras Lake	0059	67.74	67.74	0.998
San Antonio Northwest	0023	73.06	72.76	0.996

The RRF is then multiplied by the 2019 base case design value (DVB) to obtain the 2023 future design value (DVF) for each ozone monitor. The base case design value (DVB is calculated as the average of the 2019, 2020 and 2021 regulatory design values. This is shown for 2019 in Figure 3-12: *Example Calculation of 2019 DVB*.

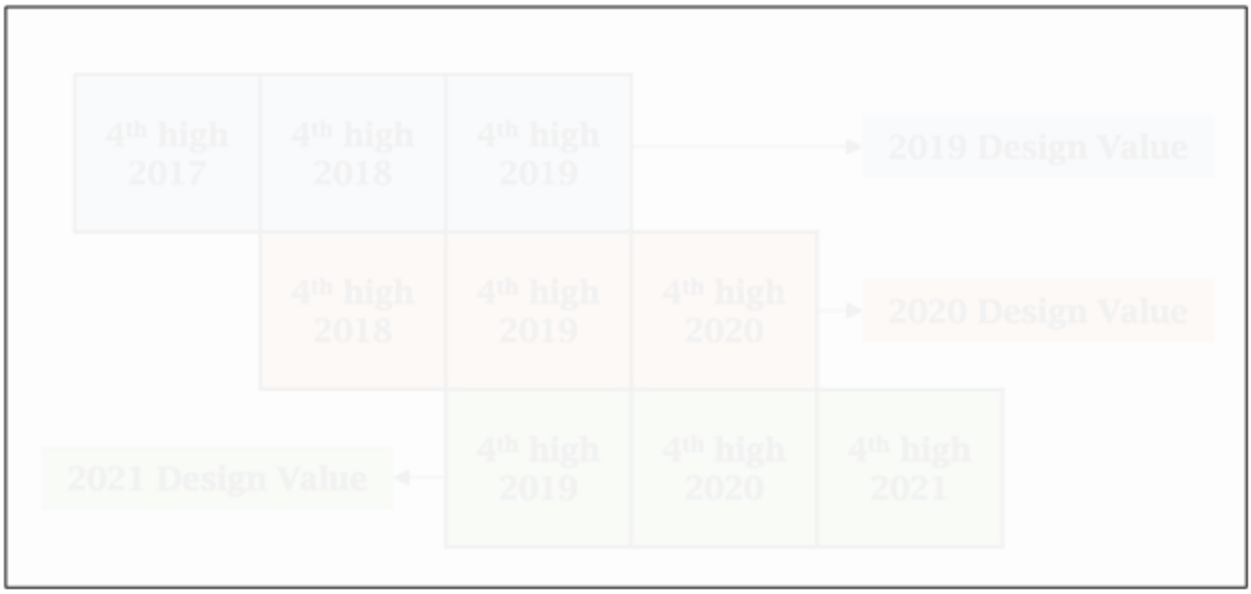


Figure 3-12: Example Calculation of 2019 DVB

In accordance with EPA modeling guidance, the final DVF is obtained by rounding to the tenths digit and truncating to zero decimal places. The 2023 DVFs are presented in Table 3-10: *Summary of the 2023 DVF for the Attainment Test* and Figure 3-14: *2023 DVF in the Bexar County 2015 Ozone NAAQS Nonattainment Area*. Application of the attainment test results in two monitors above the 2015 eight-hour ozone standard of 70 ppb in 2023, with both Camp Bullis and San Antonio Northwest at 71 ppb.

Table 3-10: Summary of the 2023 DVF for the Attainment Test

Monitor Name	CAMS Number	2019 Base Case DVB (ppb)	2023 Pre-rounded DVF (ppb)	2023 Truncated DVF (ppb)
Camp Bullis	0058	72.00	71.63	71
Calaveras Lake	0059	65.67	65.51	65
San Antonio Northwest	0023	72.00	71.70	71

Figure 3-13: 2023 DVF in the Bexar County 2015 Ozone NAAQS Nonattainment Area

3.7 MODELING REFERENCES

Emery, Christopher, Zhen Liu, Armistead G. Russell, M. Talat Odman, Greg Yarwood, and Naresh Kumar. "Recommendations on statistics and benchmarks to assess photochemical model performance." Journal of the Air & Waste Management Association 67, no. 5 (2017): 582-598. DOI: 10.1080/10962247.2016.1265027

Ramboll. "User's Guide, Comprehensive Air Quality Model with Extensions, Version 7.20." (2022). https://camx-wp.azurewebsites.net/Files/CAMxUsersGuide_v7.20.pdf, last accessed on Jan. 20, 2023.

Stohl, A., Aamaas, B., Amann, M., Baker, L.H., Bellouin, N., Berntsen, T.K., Boucher, O., Cherian, R., Collins, W., Daskalakis, N. and Dusinska, M., 2015. Evaluating the climate

and air quality impacts of short-lived pollutants. Atmospheric Chemistry and Physics, 15(18), pp.10529-10566. DOI: 10.5194/acp-15-10529-2015

U.S. Environmental Protection Agency. "Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze" (2018). https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf, last accessed on Jan. 20, 2023.

Wiedinmyer, C., Kimura, Y., McDonald-Buller, E., Seto, K., Emmons, L., Tang, W., Buccholz, R., Orlando, J. The Fire Inventory from NCAR version 2 (FINNv2): updates to a high resolution global fire emissions model. In preparation for submission to the Journal of Advances in Modeling Earth Systems.

CHAPTER 4: CONTROL STRATEGIES AND REQUIRED ELEMENTS

4.1 INTRODUCTION

The Bexar County 2015 ozone National Ambient Air Quality Standard (NAAQS) nonattainment area, which consists of Bexar County, includes a 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 many of these sources. This chapter describes existing ozone control measures for Bexar County ~~and establishes a commitment from TCEQ Executive Director to submit for the Commission's consideration, a proposed reasonably available control technology (RACT) analysis as well as proposed regulations to implement RACT requirements, if any are needed. The RACT analysis and any regulations is anticipated to be submitted to the United States Environmental Protection Agency (EPA) by May 7, 2024~~.

4.2 EXISTING CONTROL MEASURES

Bexar County has existing VOC and NO_X regulations that were promulgated during the 1970s when the county was not attaining the photochemical oxidants air quality standard, the predecessor to the 1979 one-hour ozone NAAQS. Additional VOC regulations were added in response to requests described in the Austin, San Antonio and Northeast Texas Early Action Compact SIP revisions for the 1997 eight-hour ozone standard, submitted to EPA in 2004. Bexar County has also been included in NO_X regulations affecting East and Central Texas and various statewide and regional rules designed to address ozone affecting other Texas ozone nonattainment areas. Statewide requirements such as those for windshield washer fluid also apply to Bexar County. Table 4-1: *Existing Ozone Control and Voluntary Measures Applicable to Bexar County* lists the existing ozone control strategies that have been implemented for the 1979 one-hour ozone NAAQS and the 1997, 2008, and 2015 eight-hour ozone NAAQS and are applicable in Bexar County.

A reasonably available control technology (RACT) analysis was completed, and regulations were adopted by the commission on April 24, 2024, as part of Rule Project No. 2023-116-115-AI and Rule Project No. 2023-117-117-AI, along with the concurrently adopted Bexar County RACT State Implementation Plan (SIP) Revision (Non-rule Project No. 2023-132-SIP-NR) to implement moderate RACT requirements in Bexar County. These measures have been added to Table 4-1. The RACT SIP and rule revisions were submitted to the U.S. Environmental Protection Agency (EPA) on May 7, 2024.

Table 4-1: Existing Ozone Control and Voluntary Measures Applicable to Bexar County

Measure	Description	Start Date(s)
VOC Storage Rules 30 Texas Administrative Code (TAC) Chapter 115, Subchapter B, Division 1	VOC control requirements applicable to storage tanks to satisfy FCAA requirements for the Metropolitan San Antonio Intrastate Air Quality Control Region.	December 31, 1973

Measure	Description	Start Date(s)
VOC Vent Gas Rules 30 TAC Chapter 115, Subchapter B, Division 2	VOC control requirements applicable to stack emissions to satisfy FCAA requirements for the Metropolitan San Antonio Intrastate Air Quality Control Region.	December 31, 1973
VOC Water Separation 30 TAC Chapter 115 Subchapter B, Division 3	VOC control amendments satisfy RACT requirements for the Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds control techniques guidelines category (EPA-450/2-77-025)	December 31, 1973
VOC Loading and Unloading Rules 30 TAC Chapter 115, Subchapter C, Division 1	VOC control consistent with EPA's 1977 Control of Volatile Organic Emissions from Bulk Gasoline Plants control techniques guidelines (EPA-450/2-77-035).	December 31, 1973
VOC Transport Rules 30 TAC Chapter 115, Subchapter C, Division 3	VOC control requirements for VOC transport vessels in covered attainment counties, including Bexar.	April 30, 2000
VOC Degreasing Rules 30 TAC Chapter 115, Subchapter E, Division 1	VOC controls to implement RACT requirements for degreasing processes based on EPA's 1977 Control of Volatile Organic Emissions from Solvent Metal Cleaning control techniques guidelines document (EPA-450/2-77-022)	May 7, 1979
VOC Windshield Washer Fluid Rules 30 TAC Chapter 115, Subchapter G, Division 1	VOC content controls for consumer windshield washer fluid sold in Texas. Enacted to generate VOC reductions required for FCAA 15% Rate of Progress requirements. Rules made applicable statewide.	May 27, 1994
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 December 31, 2005
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 Bexar County	May 1, 2003 through May 1, 2005
Cement Kiln Rule 30 TAC Chapter 117, Subchapter E, Division 2	NO_x emission limits for all Portland cement kilns located in Bexar County	May 1, 2005

Measure	Description	Start Date(s)
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
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 Bexar County)	November 15, 1999
~~Texas Emissions Reduction Plan (TERP)~~ ~~30 TAC Chapter 114, Subchapter K~~	~~Voluntary TERP programs provide 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)*~~
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
California Gasoline Engines	California standards for non-road gasoline engines 25 horsepower and larger	May 1, 2004
~~Voluntary Energy Efficiency/Renewable Energy (EE/RE)~~	~~See Section 5.3.1.2: *Energy Efficiency and Renewable Energy (EE/RE) Measures*~~	~~See Section 5.3.1.2~~
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	Phase 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	Phase in through 2018
VOC Storage Rules 30 TAC Chapter 115, Subchapter B, Division 1	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025

Measure	Description	Start Date(s)
VOC Storage Rules 30 TAC Chapter 115, Subchapter B, Division 2 Vent Gas Control	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
VOC Storage Rules 30 TAC Chapter 115, Subchapter B, Division 3 Water Separation	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
VOC Storage Rules 30 TAC Chapter 115, Subchapter B, Division 4 Industrial Wastewater	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
VOC Storage Rules 30 Texas Administrative Code (TAC) Chapter 115, Subchapter B, Division 6 Batch Processes	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
VOC Storage Rules 30 TAC Chapter 115, Subchapter B, Division 7 Oil and Natural Gas Service in Ozone Nonattainment Areas	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
VOC Transfer Operations Rules 30 TAC Chapter 115, Subchapter C, Division 1 Loading and Unloading of Volatile Organic Compounds	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
VOC Transfer Operations Rules 30 TAC Chapter 115, Subchapter C, Division 2 Filling of Gasoline Storage Vessels (Stage I) for Motor Vehicle Fuel Dispensing Facilities	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025

Measure	Description	Start Date(s)
VOC Transfer Operations Rules 30 TAC Chapter 115, Subchapter C, Division 3 Control of Volatile Organic Compound Leaks from Transport Vessels	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Petroleum Refining, Natural Gas Processing, and Petrochemical Processes Rules 30 TAC Chapter 115, Subchapter D, Division 1 Process Unit Turnaround and Vacuum-Producing Systems in Petroleum Refineries	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Petroleum Refining, Natural Gas Processing, and Petrochemical Processes Rules 30 TAC Chapter 115, Subchapter D, Division 3 Fugitive Emission Control in Petroleum Refining, Natural Gas/Gasoline Processing, and Petrochemical Processes in Ozone Nonattainment Areas	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Solvent-Using Processes Rules 30 TAC Chapter 115, Subchapter E Division 2 Surface Coating Processes	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Solvent-Using Processes Rules 30 TAC Chapter 115, Subchapter E Division 3 Flexographic and Rotogravure Printing	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025

Measure	Description	Start Date(s)
Solvent-Using Processes Rules 30 TAC Chapter 115, Subchapter E Division 4 Offset Lithographic Printing	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Solvent-Using Processes Rules 30 TAC Chapter 115, Subchapter E Division 5 Control Requirements for Surface Coating Processes	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Solvent-Using Processes Rules 30 TAC Chapter 115, Subchapter E Division 6 Industrial Cleaning Solvents, and Division	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Solvent-Using Processes Rules 30 TAC Chapter 115, Subchapter E Division 7 Miscellaneous Industrial Adhesives	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Miscellaneous Industrial Source Rules 30 TAC Chapter 115, Subchapter F Division 1 Cutback Asphalt	Implements VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
Miscellaneous Industrial Source Rules 30 TAC Chapter 115, Subchapter F Division 2 Pharmaceutical Manufacturing Facilities	Implements moderate VOC RACT to reflect reclassification change for the 2015 eight-hour ozone NAAQS; applicability and compliance provisions for existing RACT rules were amended to add provisions for Bexar County	January 1, 2025
NO_X Industrial Rules 30 TAC Chapter 117, Subchapter B, Division 2 Combustion Control at Major Industrial, Commercial, and Institutional Sources in Ozone Nonattainment Areas	Implements moderate NO_X RACT requirements for major sources of NO_X in Bexar County. The adopted provisions include emission standards, exemptions, monitoring, recordkeeping, reporting, and testing requirements that will apply to gas-fired lean burn engines, turbines, and duct burners used in turbine exhaust ducts major sources of NO_X emissions in Bexar County	January 1, 2025

Measure	Description	Start Date(s)
Cement Kiln Rule 30 TAC Chapter 117, Subchapter E, Division 2 Combustion Control at Cement Kilns in Bexar County	Implements moderate NO_X RACT requirements for major sources of NO_X in Bexar County. The adopted provisions include emission standards, exemptions, monitoring, recordkeeping, reporting, and testing requirements that will apply to cement kilns at major sources of NO_X emissions in Bexar County	January 1, 2025
NO_X Utility Rules 30 TAC Chapter 117, Subchapter C, Division 2 Combustion Control at Major Utility Electric Generation Sources in Ozone Nonattainment Areas	Implements moderate NO_X RACT requirements for major sources of NO_X in Bexar County. The adopted provisions include emission standards, exemptions, monitoring, recordkeeping, reporting, and testing requirements that will apply to utility boilers, auxiliary boilers, gas turbines, and duct burners used in turbine exhaust ducts in Bexar County	January 1, 2025
Vehicle Inspection and Maintenance (I/M) 30 TAC Chapter 114, Subchapter C	Emissions tests for model year 2-24 gasoline-powered vehicles Implements an I/M program in accordance with 40 Code of Federal Regulations (CFR) §51.350(b)(2) in Bexar County.	November 1, 2026

4.3 NEW CONTROL MEASURES

~~In addition to the required moderate attainment demonstration (AD) and reasonable further progress (RFP) SIP revisions, the state is also required to implement a vehicle emissions inspection and maintenance (I/M) program in Bexar County.~~ The state is required to implement a vehicle emissions inspection and maintenance (I/M) program in Bexar County. The FCAA and 40 CFR Part 51, as amended, require a basic vehicle emissions I/M program in ozone nonattainment areas classified as moderate. On November 29, 2023, the commission adopted a rulemaking to implement I/M and set the testing fee applicable in Bexar County and adopted a SIP revision to incorporate a Bexar County I/M program into the SIP. The rulemaking (Project No. 2022-026-114-AI) and SIP revision (Project No. 2022-027-SIP-NR) satisfy the moderate classification I/M requirements for Bexar County and were submitted to EPA on December 18, 2023.

4.4 RACT ANALYSIS

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). According to EPA's *Implementation of the 2015 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements: Final Rule* (2015 eight-hour ozone standard SIP requirements rule) published on December 6, 2018, states containing areas classified as moderate ozone nonattainment or higher must submit a SIP revision to fulfill RACT requirements for all source categories addressed by control techniques guidelines (CTG) or alternative control techniques (ACT) as well as any non-ACT/CTG category sources that are classified as major stationary sources of nitrogen oxides or VOC (83 *Federal Register* (FR) 62998). On October 7, 2022, EPA published a final notice reclassifying Bexar County from marginal to moderate nonattainment for the 2015 eight-hour ozone NAAQS, effective November 7, 2022 (87 FR 60897).

Regulations were adopted by the commission on April 24, 2024, as part of Rule Project No. 2023-116-115-AI and Rule Project No. 2023-117-117-AI, along with the concurrently adopted Bexar County RACT SIP Revision (Non-rule Project No. 2023-132-SIP-NR) to implement moderate RACT requirements in Bexar County. The RACT SIP and rule revisions were submitted to EPA on May 7, 2024.

4.5 ~~RACM ANALYSIS~~

~~4.5.1 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* (57 FR 13498), EPA explains that it interprets FCAA, §172(c)(1) as a requirement that states incorporate into their SIP 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.~~

~~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).~~

~~RACM is defined by EPA as any potential control measure for application to point, area, on-road and 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." A control measure would have to be implemented by March 1, 2023, the beginning of the attainment year, to be considered as advancing attainment. Given the attainment date, advancing attainment is the only criteria of relevance for the purposes of this SIP revision.~~

~~4.5.2 Results of the RACM Analysis~~

~~The TCEQ determined that no potential control measures met the criteria to be considered RACM. Because it is not possible to implement any control measures before March 2023, no control measures can meet the criteria of advancing attainment of the NAAQS.~~

4.6 ~~MOTOR VEHICLE EMISSIONS BUDGETS~~

~~The motor vehicle emissions budget (MVEB) refers to the maximum allowable emissions from on-road mobile sources for each 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. Areas must demonstrate that the~~

estimated emissions from transportation plans, programs, and projects do not exceed applicable MVEBs. An MVEB represents the summer weekday on-road mobile source emissions that have been modeled for the attainment demonstration and include the on-road control measures reflected in Chapter 4: *Control Strategies and Required Elements* of the SIP revision. The on-road NO_x and VOC emissions inventories (EI) establishing these MVEBs were developed with the version 3 of the Motor Vehicle Emission Simulator (MOVES3) model. The resulting MVEBs are shown in Table 4-2: *2023 Attainment Demonstration MVEBs for the Bexar County 2015Ozone NAAQS Nonattainment Area*.

Table 4-2: 2023 Attainment Demonstration MVEB for the Bexar County 2015 Ozone NAAQS Nonattainment Area (tons per day)

Description	NO_x (tpd)	VOC (tpd)
2023 On-Road MVEBs based on MOVES3	20.61	12.37

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

4.7 MONITORING NETWORK

The ambient air quality monitoring network provides data to verify the attainment status of the 2015 eight-hour ozone NAAQS. The TCEQ monitoring network in the San Antonio area consists of three regulatory ambient air ozone monitors in Bexar County. The TCEQ operates ozone monitors at the following air monitoring sites:

- Calaveras Lake (480290059);
- Camp Bullis (480290052); and
- San Antonio Northwest (480290032).

The monitors are managed in accordance with EPA requirements prescribed by 40 CFR Part 58 to verify the area attainment status. The TCEQ commits to maintaining an air monitoring network to meet EPA regulatory requirements in the San Antonio 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/airquality/monops/past_network_reviews). Air monitoring data from these monitors continue to be quality assured, reported, and certified according to 40 CFR Part 58.

4.8 CONTINGENCY PLAN

AD SIP revisions for nonattainment areas are required by FCAA, §172(c)(9) to provide for specific contingency measures that 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. 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 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 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.

Since EPA had not issued final guidance to states regarding contingency measures at the time this SIP revision was developed, this SIP revision relies on the historically approved approach of using surplus emissions reductions to fulfill the contingency measure requirements.

Under the historical approach, in the General Preamble for implementation of the FCAA Amendments of 1990 published in the April 16, 1992 *Federal Register*, EPA interpreted the contingency requirement to mean additional emissions reductions that are sufficient to equal up to 3% of the emissions in the base year inventory (57 FR 13498). Similarly, EPA's 2015 eight-hour ozone standard SIP requirements rule (December 6, 2018, 83 FR 62998) states that contingency measures "should provide 1 year's worth of emissions reductions, or approximately 3 percent of the baseline emissions inventory." These emissions reductions should be realized in the year following the year in which the failure is identified.

This AD SIP revision uses the 2017 RFP base year inventory from the concurrent Bexar County Moderate Area RFP SIP Revision for the 2015 Eight-Hour Ozone NAAQS (Project Number 2022-024-SIP-NR) as the inventory from which to calculate the required 3% contingency reductions. The 3% contingency analysis for 2024 is based on a 1.5% reduction in NO_x and a 1.5% reduction in VOC, to be achieved during the one-year period from January 1, 2024 through December 31, 2024. Analyses were performed to assess emissions reductions for the 2024 contingency year from the federal emissions certification programs and for fuel control programs for both on-road and non-road vehicles.

A summary of the 2024 contingency analysis is provided in Table 4-3: *2024* Bexar *County 2015 Ozone NAAQS Nonattainment Area Attainment Contingency Demonstration (tons per day).* The analysis demonstrates that the 2024 contingency reductions exceed the 3% reduction requirement; therefore, the AD contingency requirement is met based on the historical approach. Additional documentation for the attainment contingency demonstration calculations is available in the concurrent Bexar County Moderate Area RFP SIP Revision for the 2015 Eight-Hour Ozone NAAQS (Project no. 2022-025-SIP-NR).

Table 4-3: 2024 Bexar County 2015 Ozone NAAQS Nonattainment Area Attainment Contingency Plan (tons per day)

Contingency Plan Description	NO_x	VOC
Bexar County 2017 RFP base year (BY) EI	82.27	110.28
Percent for contingency calculation (total of 3%)	1.50	1.50
2023 to 2024 AD required contingency reductions (RFP BY EI x [contingency percent])	1.23	1.65
Control reductions to meet contingency requirements		

~~Contingency Plan Description~~	~~NO_x~~	~~VOC~~
~~2023 to 2024 emission reductions due to Post-1990 Federal Motor Vehicle Control Program (FMVCP), East Texas Regional Low Reid vapor pressure (RVP), 2017 Low Sulfur Gasoline Standard, ultra-low sulfur diesel, and on-road Texas Low Emissions Diesel (TxLED)~~	~~10.41~~	~~6.96~~
~~2023 to 2024 emission reductions due to federal non-road mobile new vehicle certification standards and non-road TxLED~~	~~0.25~~	~~0.83~~
~~Total AD contingency reductions~~	~~10.66~~	~~7.79~~
~~**Contingency Excess (+) or Shortfall (-)**~~	~~**9.43**~~	~~**6.14**~~

4.9 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). 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 Bexar County 2015 ozone NAAQS nonattainment area for the moderate classification, including nonattainment new source review (NSR) program requirements and Stage I vapor recovery requirements.

Bexar County meets the FCAA, §182(b)(4) requirements to implement an I/M program, according to 40 CFR §51.350(b)(2). The adopted I/M rulemaking (Project No. 2022-026-114-AI) and SIP revision (Project No. 2022-027-SIP-NR) will satisfy the I/M requirements for Bexar County, to be implemented by no later than November 1, 2026. The I/M SIP revision contains EPA-required performance standard modeling and analysis demonstrating how the Bexar County I/M program will meet the applicable performance standard defined within the federal I/M regulations (40 CFR Part 51, subpart S) and the FCAA.

4.9.1 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 moderate ozone nonattainment areas are those sources emitting at least 100 tons per year 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 emissions 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 moderate ozone nonattainment areas is 1.15:1.

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 Areas), the nonattainment NSR SIP requirements are met for Texas for the Bexar County 2015 ozone NAAQS nonattainment area under the moderate classification.

Further, TCEQ already certified that Texas has EPA-approved rules that cover nonattainment NSR requirements for the Bexar County 2015 ozone NAAQS nonattainment area in the 2015 Eight-Hour Ozone NAAQS EI SIP Revision for the Houston-Galveston-Brazoria, Dallas-Fort Worth, and Bexar County nonattainment areas. On September 9, 2021, EPA published final approval of the emissions statement and nonattainment new source review NSR certification statement portions of the EI SIP revision (86 FR 50456).

4.9.2 Stage I Vapor Recovery

Stage I vapor recovery is a control strategy to capture gasoline vapors that are released when gasoline is delivered to a storage tank. The vapors are returned to the tank truck as the storage tank is being filled with fuel, rather than released to the ambient air. The EPA took a direct final action on April 30, 2015 (80 FR 24213) to approve revisions to the Texas SIP related to Stage I regulations. The TCEQ has determined that the Stage I vapor recovery SIP requirements are met for Texas for the Bexar County 2015 ozone NAAQS nonattainment area.

4.10 EMISSION CREDIT GENERATION

Because TCEQ is not submitting a photochemical modeling demonstration and related emissions inventory (EI) with this SIP revision, 2017 will remain the SIP emissions year used for Bexar County emission credit generation, set by the 2015 Eight-Hour Ozone NAAQS EI SIP Revision for the Houston-Galveston-Brazoria, Dallas-Fort Worth, and Bexar County Nonattainment Areas (Non-Rule Project No. 2019-111-SIP-NR).

~~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 Database, 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.~~

~~On April 9, 2021, TCEQ sent notice to point sources through agency email system and posted notice on TCEQ's website that 2019 point source emissions 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 revisions were incorporated into this SIP revision.~~

CHAPTER 5: WEIGHT OF EVIDENCE

5.1 INTRODUCTION

The corroborative analyses presented in this chapter demonstrate, using photochemical modeling and monitoring data, that while there is benefit from reductions of both nitrogen oxides (NO_x) and volatile organic compounds (VOC) emissions, ozone decreases in larger amounts with the reductions in NO_x in support of the concurrent Bexar County 2015 Ozone NAAQS RFP SIP Revision (Project No. 2022-024-SIP-NR). The 2019 base case from the Texas Commission on Environmental Quality (TCEQ) 2019 modeling platform was used for the photochemical modeling. A detailed description of the various modeling elements, such as episode selection, modeling domain, and model inputs, can be found in *Appendix A: Modeling Technical Support Document (TSD).*

~~The corroborative analyses presented in this chapter demonstrate the progress that the Bexar County 2015 ozone National Ambient Air Quality Standard (NAAQS) nonattainment area is making towards attainment of the 70 parts per billion (ppb) standard. This chapter describes analyses that, in conjunction with the modeling results presented in Chapter 3: *Photochemical Modeling*, indicate that the Bexar County 2015 ozone NAAQS nonattainment area could reach attainment by September 24, 2024. 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; referred to as the modeling guidance) states that all modeled attainment demonstrations (AD) should include supplemental evidence that the conclusions derived from the basic attainment modeling are supported by other independent sources of information. This chapter details the supplemental evidence, i.e., the corroborative analyses, for this Bexar County AD State Implementation Plan (SIP) revision.~~

~~This chapter describes analyses that corroborate the conclusions in Chapter 3. First, information regarding trends in ozone and ozone precursors in the Bexar County 2015 ozone NAAQS nonattainment area are presented. This chapter also provides an overview of trends in background ozone levels transported into the nonattainment area, in ozone chemistry, and in meteorological influences on ozone. More detail on ozone and emissions in the Bexar County 2015 ozone NAAQS nonattainment area is provided in Appendix B: *Conceptual Model for the Bexar County Nonattainment Area for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard*.~~

5.2 ~~ANALYSIS OF AMBIENT TRENDS AND EMISSIONS TRENDS~~

~~The EPA's 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 and its precursors and in emissions (past and projected) are consistent with progress toward attainment.~~

~~The Bexar County 2015 ozone NAAQS nonattainment area's monitoring network currently has three regulatory and five non-regulatory ozone monitors, four oxides of nitrogen (NO_x) monitors, one automated gas chromatograph (auto-GC) for volatile organic compounds (VOC), and one canister sampler for VOC. There are additional monitors inside the San Antonio area but outside of the ozone nonattainment area that~~

contribute to a more extensive network. Data from these monitors are discussed in Appendix B.

Details about the monitors in the Bexar County 2015 ozone NAAQS nonattainment area that measure regulatory ozone, NO_x, or VOC are listed below in Table 5-1: *Monitor Information for the Bexar County 2015 Ozone NAAQS Nonattainment Area*. Monitors that measure ozone are marked with an asterisk. More detail on nonregulatory monitors, monitor locations, and other parameters measured per monitor can be found on the Texas Commission on Environmental Quality (TCEQ) Air Monitoring Sites webpage (https://www.tceq.texas.gov/airquality/monops/sites/air-mon-sites). Ozone data used in this chapter are only from regulatory monitors that reports to EPA's Air Quality System (AQS).

Table 5-1: Monitor Information for the Bexar County 2015 Ozone NAAQS Nonattainment Area

Site Name	AQS Number	CAMS Number	Compounds or Parameters Measured
San Antonio Northwest*	480290032	0023	Ozone, NO_x
Camp Bullis*	480290052	0058	Ozone, VOC, NO_x
Calaveras Lake*	480290059	0059	Ozone, NO_x
Old Hwy 90	480290677	0677	VOC
San Antonio Interstate 35	480291069	1069	NO_x

Note: Monitors that measure ozone are marked with an asterisk.

This section examines emissions and ambient trends from the regulatory ozone and ozone-precursor monitoring network in the Bexar County 2015 ozone NAAQS nonattainment area. Appendix B provides additional graphics and analyses that detail ozone formation in the region, primarily from 2012 through 2021. Results from these analyses show that ozone has declined over the past decade, despite a continuous increase in the population of the area, a strong economic development pattern, growth in vehicle miles traveled, and steady to increasing trends in NO_x and VOC emissions. Some of the ozone declines may be due to meteorological effects.

5.2.1 Ozone Trends

Because ozone varies both temporally and spatially, there are several ways that trends in ozone concentrations are analyzed. This section discusses trends in design values, the fourth-highest eight-hour concentrations, and background ozone. Ozone data used in this section are only from regulatory monitors that report to EPA's AQS unless otherwise noted.

5.2.1.1 Ozone Design Value Trends

A design value is the statistic used to determine compliance with the NAAQS. For the 2015 eight-hour ozone NAAQS, design values are calculated by averaging fourth-highest daily maximum eight-hour average (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 71 ppb and greater exceed the 2015 eight-hour ozone NAAQS.

Design values have decreased in the Bexar County 2015 ozone NAAQS nonattainment area since 2012, as shown in Figure 5-1: *Eight-Hour Ozone Design Values in Bexar County 2015 Ozone NAAQS Nonattainment Area*. The 2022 eight-hour ozone design value for the nonattainment area was 75 ppb, which represents a 6% decrease from the 2012 design value of 80 ppb.

The largest decreases in design values occurred from 2013 through 2016, when it dropped by 8 ppb. After 2016, the design value has remained consistently between 72 ppb and 75 ppb. These fluctuations may be due to changes in meteorology and/or background ozone; both will be examined in later sections.

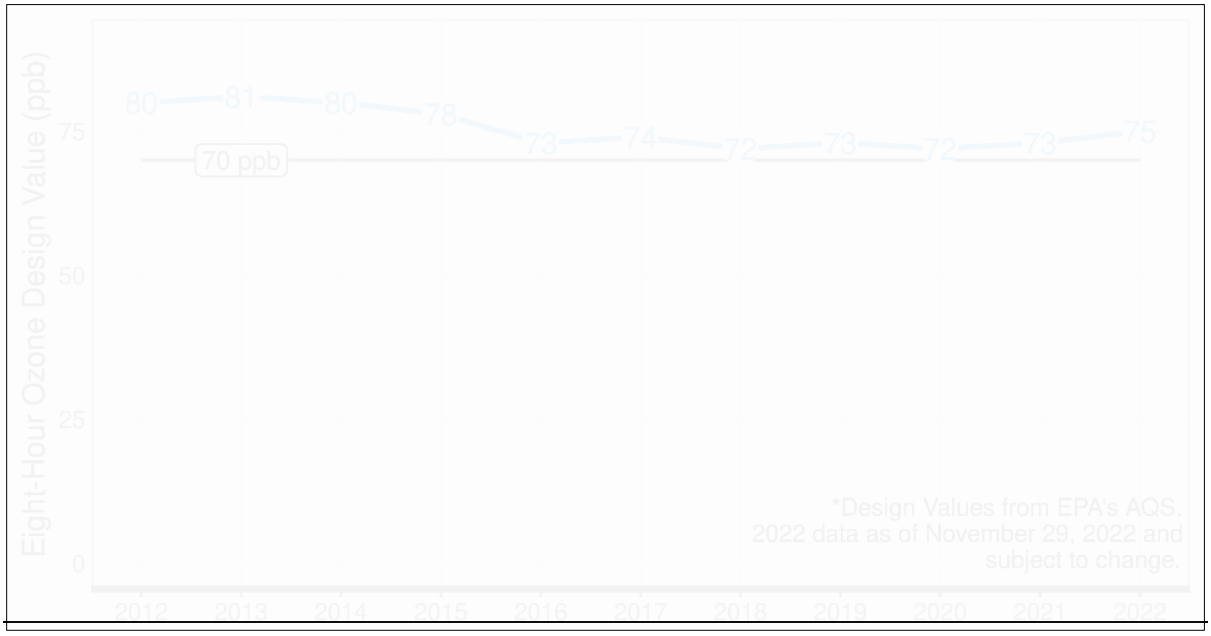


Figure 5-1: Eight-Hour Ozone Design Values in Bexar County 2015 Ozone NAAQS Nonattainment Area

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 Bexar County 2015 Ozone NAAQS Nonattainment Area* displays the 2012 through 2022 design values at the three regulatory ozone monitors and demonstrates that the design values have decreased across the area.

Figure 5-2 also shows how the monitor with the highest eight-hour ozone design value in the Bexar County 2015 ozone NAAQS nonattainment area has changed over time. From 2012 through 2016, Camp Bullis consistently measured a design value multiple ppb higher than San Antonio Northwest. However, from 2016 on, there has been much less variation between the two monitors' design values and there have even been years that San Antonio Northwest was the design value setting monitor.

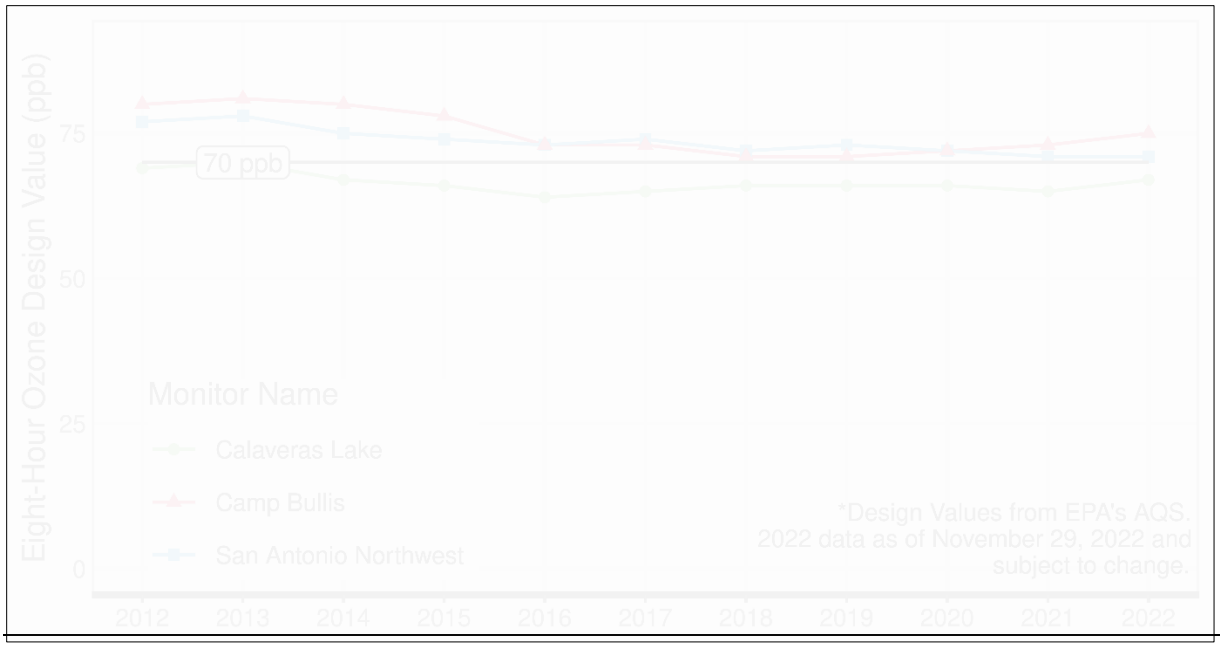


Figure 5-2: Eight-Hour Ozone Design Values by Monitor in Bexar County 2015 Ozone NAAQS Nonattainment Area

5.2.1.2 Fourth-Highest Eight-Hour Ozone Trends

Because eight-hour ozone design values are three-year averages, trends tend to be smoother, making year-to-year variations in ozone concentrations due to factors such as meteorology are less apparent. Trends in the yearly fourth-highest MDA8 ozone concentrations provide more insight into each individual year. Fourth-highest MDA8 ozone trends can also help determine what levels of ozone are required in order for the area to monitor attainment. Area-wide fourth-highest MDA8 ozone trends are not very instructive because design values are calculated on a per monitor basis. Instead, fourth-highest MDA8 ozone trends are investigated at each monitor in the Bexar County 2015 ozone NAAQS nonattainment area in Figure 5-3: *Fourth-Highest MDA8 Ozone Concentration by Monitor in Bexar County 2015 Ozone NAAQS Nonattainment Area*. The fourth-highest MDA8 ozone trends span from 2010 though 2022 in order to examine all years used in the design value trends.

Trends show that there is more variability present in fourth-highest MDA8 ozone values when compared to design values. Fourth-highest MDA8 ozone values trended downwards from 2011 through 2016, and then stagnated from 2016 through 2022. Except for 2018, Calaveras Lake is consistently lower than the other two monitors. From 2014 through 2018, Camp Bullis and San Antonio Northwest had fourth-highest values within a few ppb of each other. However, from 2019 through 2021, their fourth-highest values diverge.

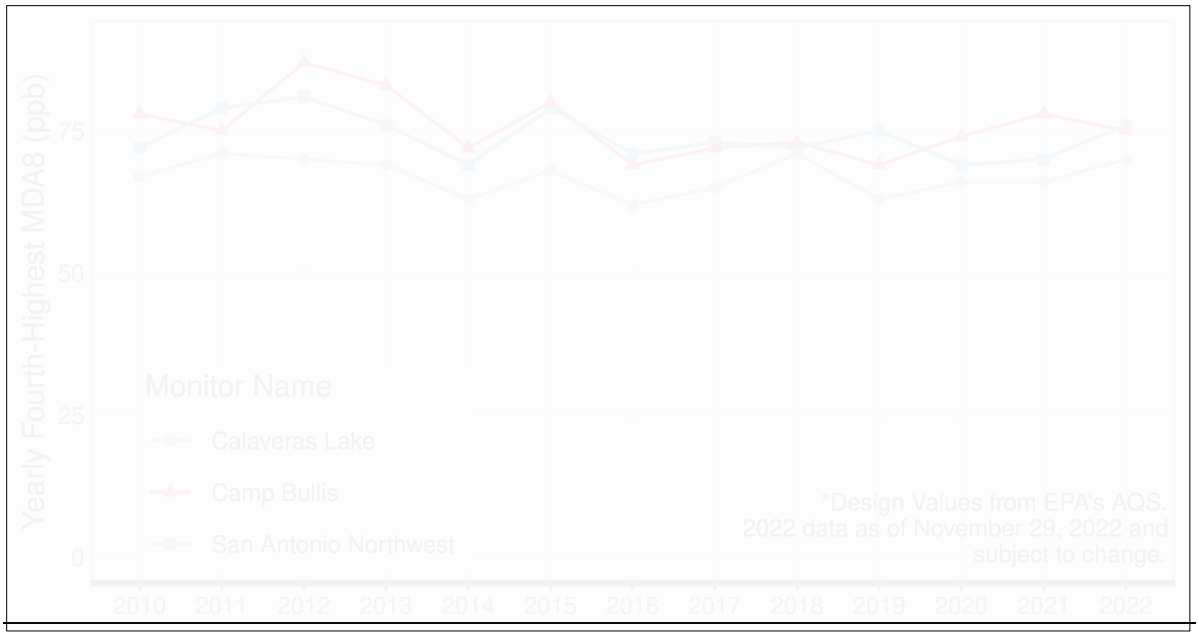


Figure 5-3: Fourth-Highest MDA8 Ozone Concentration by Monitor in Bexar County 2015 Ozone NAAQS Nonattainment Area

5.2.1.3 Background Ozone Trends

Background ozone reflects the ozone produced from all sources outside of the Bexar County 2015 ozone NAAQS nonattainment area. Determining background ozone concentrations for the Bexar County 2015 ozone NAAQS nonattainment area provides insight into how much ozone the area produces from local emissions and how much ozone is received from outside the local area. The local component of ozone formation is the amount that the area could potentially control to meet the 2015 eight-hour ozone NAAQS. The technique for estimating background ozone concentrations, which uses the lowest MDA8 ozone value from selected sites to determine the background ozone concentrations, is detailed in Appendix B.

Locally produced ozone was calculated by subtracting the 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 are any day with a MDA8 ozone value greater than 70 ppb. Low ozone days are any day with a MDA8 ozone value less than or equal to 70 ppb.

San Antonio's ozone season runs from March through November; however, several of the non-regulatory monitors used for this analysis do not monitor in March and none of the high ozone days were observed in November. To avoid artificial skewing of the data due to in-operational monitors in March, this analysis focuses on the months of April through October, which will be referred to as the modified ozone season. This will not affect the results significantly because there has only been one exceedance day in March over the period of 2012 through 2021.

In ozone data analysis, the median is a better summary statistic to investigate the central tendency of the background ozone data. The median MDA8 ozone, background

ozone, and locally produced ozone was calculated each year and results are displayed in Figure 5-4: *Modified Ozone Season Trends in MDA8 Ozone, Background Ozone, and Locally Produced Ozone for High versus Low Ozone Days in San Antonio Area*. Because the median for each statistic was chosen, there may be years where the background ozone and locally produced ozone do not exactly add to the area wide MDA8, but this is not an error in calculations. Overall, the median background ozone is 27 to 36 ppb on low ozone days and increases to 49 to 60 ppb on high ozone days. Although background ozone is higher on high ozone days, local ozone production also increases at a proportional rate on these days. For both high and low ozone days, background ozone accounts for approximately 70% of the MDA8 ozone and locally produced ozone accounts for approximately 30% of the MDA8 ozone.

Background ozone declines on both low and high ozone days from 2012 through 2021, decreasing 6 ppb for low ozone days and 7 ppb for high ozone days. On high ozone days, locally produced ozone increased 2 ppb from 2012 to 2021. However, this trend is not seen on low ozone days. These trends offset one another to create the flat trend in design values.

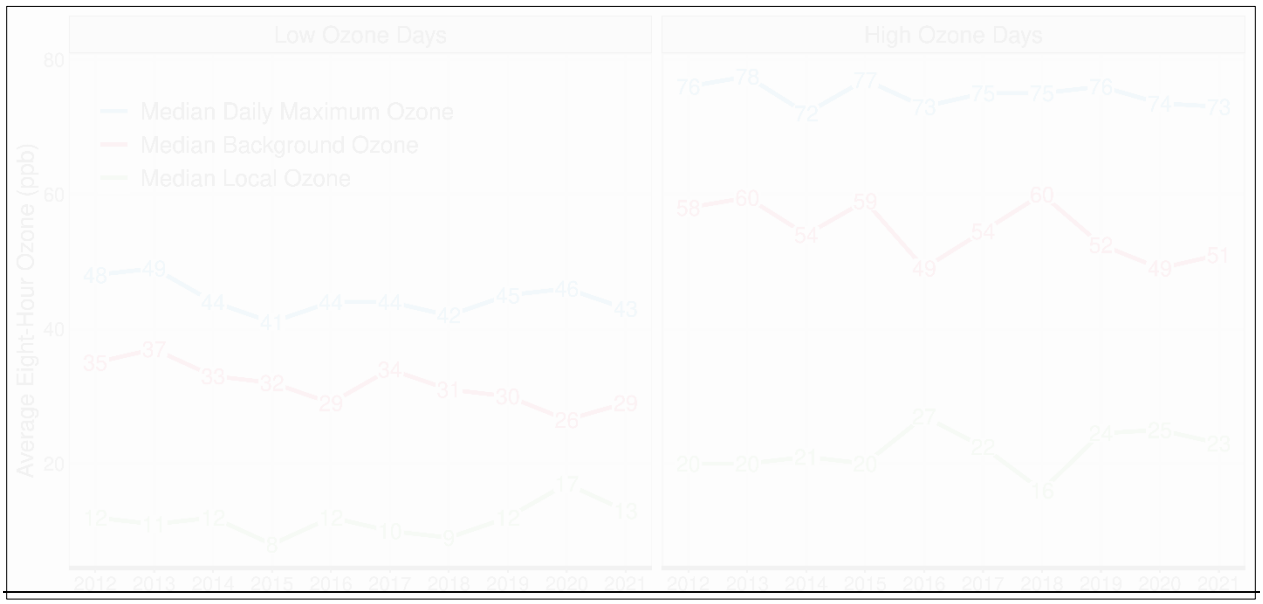


Figure 5-4: Modified Ozone Season Trends in MDA8 Ozone, Background Ozone, and Locally Produced Ozone for High versus Low Ozone Days in San Antonio Area

5.2.2 NO_x Trends

NO_x, a precursor to ozone formation, is a mixture of nitric 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 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 the NO_x values that lead to ozone formation, this analysis uses only NO_x concentrations that occur during March through October, or the ozone season.

The Bexar County 2015 ozone NAAQS nonattainment area has four NO_x monitors, including one near-road monitor, as of 2021. Two additional NO_x monitors (CPS Pecan Valley (CAMS 0678) and Heritage Middle School (CAMS 0622)) ceased operations prior to 2021. All six NO_x monitors in operation at some point from 2012 through 2021 were used to calculate area-wide NO_x trends.

All valid hours and years of NO_x data were used to calculate yearly median and 95th percentile NO_x trends. The 95th percentile shows trends at the highest NO_x levels while the median shows the central tendency of NO_x concentrations. Figure 5-5: *Ozone Season NO_x Trends in Bexar County 2015 Ozone NAAQS Nonattainment Area* shows that 95th percentile NO_x increased from 2012 through 2021 while median NO_x showed little change.

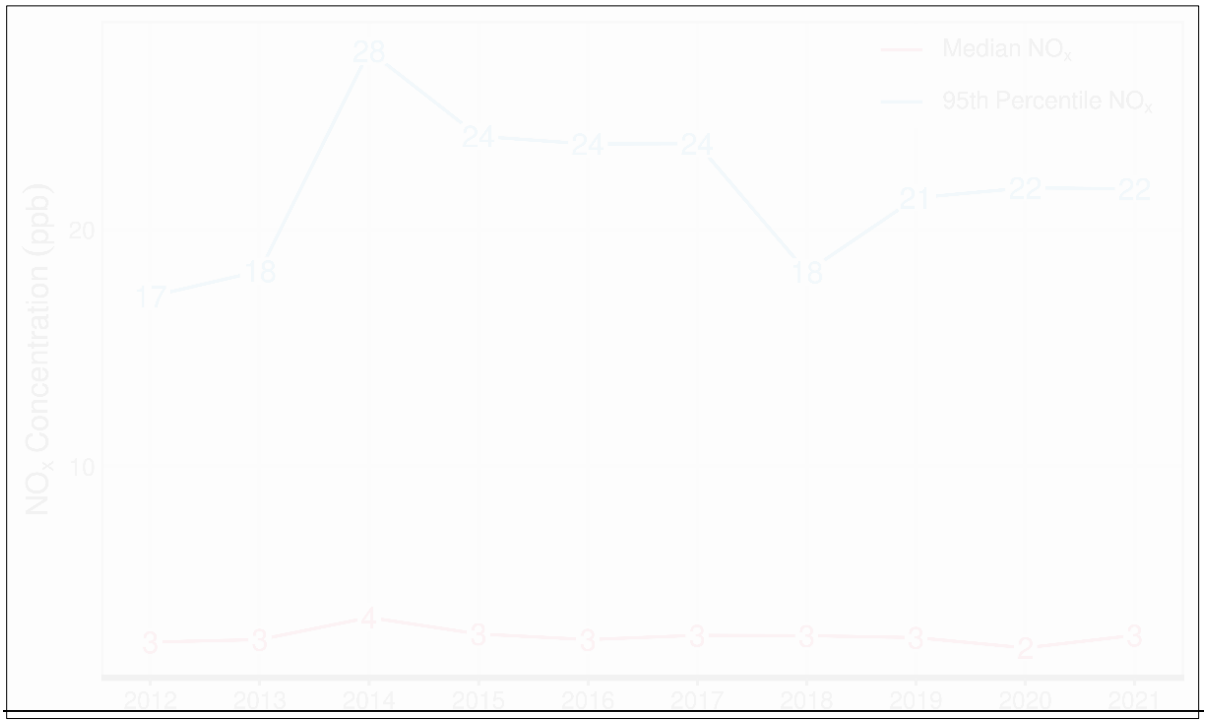


Figure 5-5: Ozone Season NO_x Trends in Bexar County 2015 Ozone NAAQS Nonattainment Area

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, NO_x trends were examined at the six NO_x monitors. Only ozone season NO_x data for days and years with at least 75% completeness were used in this analysis.

Figure 5-6: *Median Ozone Season NO_x Concentrations by Monitor in Bexar County 2015 Ozone NAAQS Nonattainment Area* shows there is variability in median NO_x values by monitor. San Antonio Interstate 35 is a near-road NO_x monitor, and thus it is not

surprising that it sees higher readings. Generally, the trend across the years is flat, though San Antonio Northwest shows a notable increase over the years, especially in 2021. The Camp Bullis monitor, a design value setting monitor for 2020 and 2021, showed a decrease in median NO_x concentrations after 2019. This could explain the NO_x-limited ozone chemistry seen in the VOC to NO_x ratio analysis for this monitor.

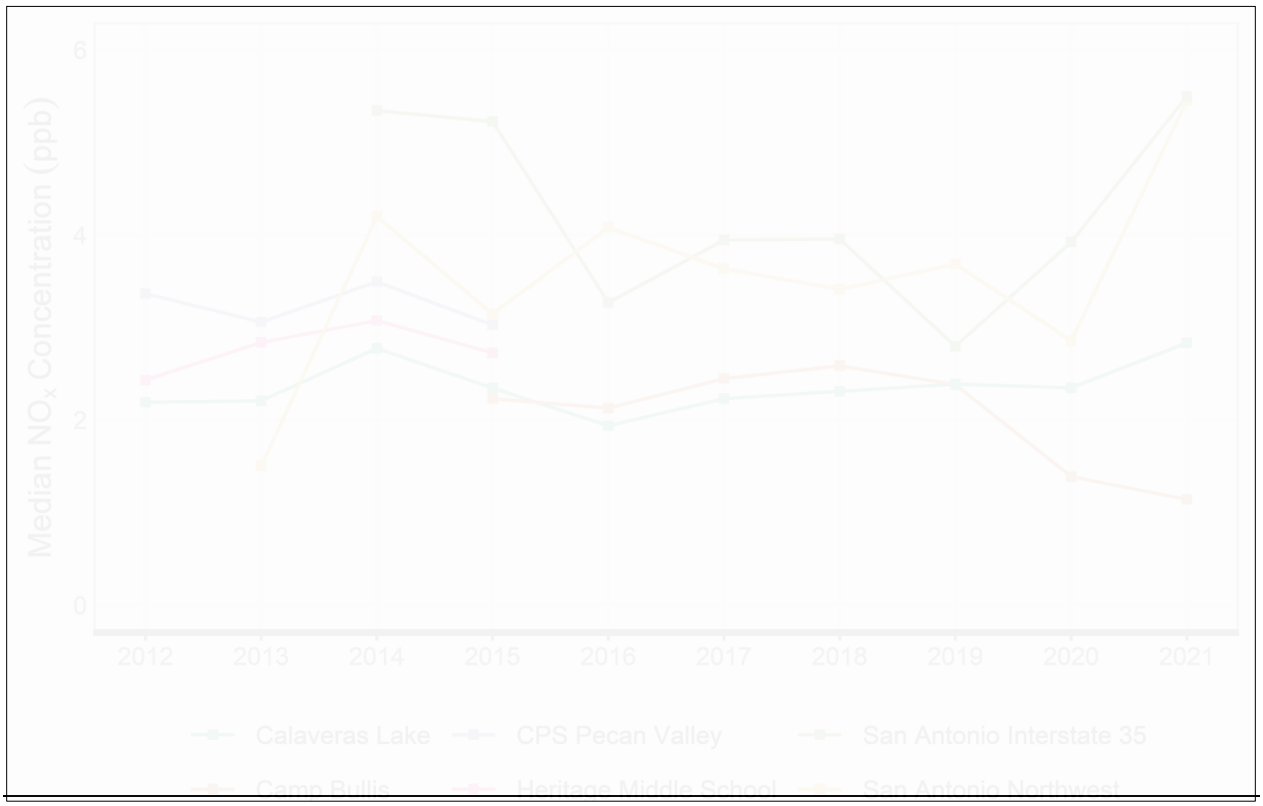


Figure 5-6: Median Ozone Season NO_x Concentrations by Monitor in Bexar County 2015 Ozone NAAQS Nonattainment Area

From the late 1990s to the present, federal, state, and local measures have resulted in significant NO_x reductions within the Bexar County 2015 ozone NAAQS nonattainment area. The TCEQ funded a study by the Texas Transportation Institute (TTI) to estimate on-road emissions trends throughout Texas from 1999 through 2050 using the 2014a version of the Motor Vehicle Emission Simulator (MOVES2014a) model (TTI, 2015). On-road NO_x emissions in the San Antonio (SAN) area decreased from the early 2000's through 2021 and beyond. These reductions are projected to continue as older, higher-emitting vehicles are removed from the fleet and are replaced with newer, lower-emitting ones. Details can be found in the previous Bexar County nonattainment area conceptual model (TCEQ, 2020).

A similar pattern is reflected in a TCEQ non-road emissions trends analysis using the Texas NONROAD (TexN) model. Non-road emissions decreased from 1999 through 2021 and beyond, even as the number of non-road engines (equipment population) has increased. 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. Details can be

found in the previous Bexar County nonattainment area conceptual model (TCEQ, 2020).

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 TAC §101.10). Emissions from 2022 were not available in time to be included in this analysis. The emissions trends analysis uses data in tons per year from 2012 through 2021.

Figure 5-7: *Bexar County 2015 Ozone NAAQS Nonattainment Area Point Source NO_x Emissions by Site* shows the top NO_x emitters in the area. All other point source emissions are displayed as the Sum of All Others. The top six reporting sites accounted for 96% of the total point source NO_x emissions. Each of these sites reported total NO_x emissions exceeding 100 tons in 2021, with the largest emitter, Calaveras Plant, reporting about 4,000 tons of NO_x in 2021. Overall, NO_x emissions decreased 17% from 2012 to 2021.

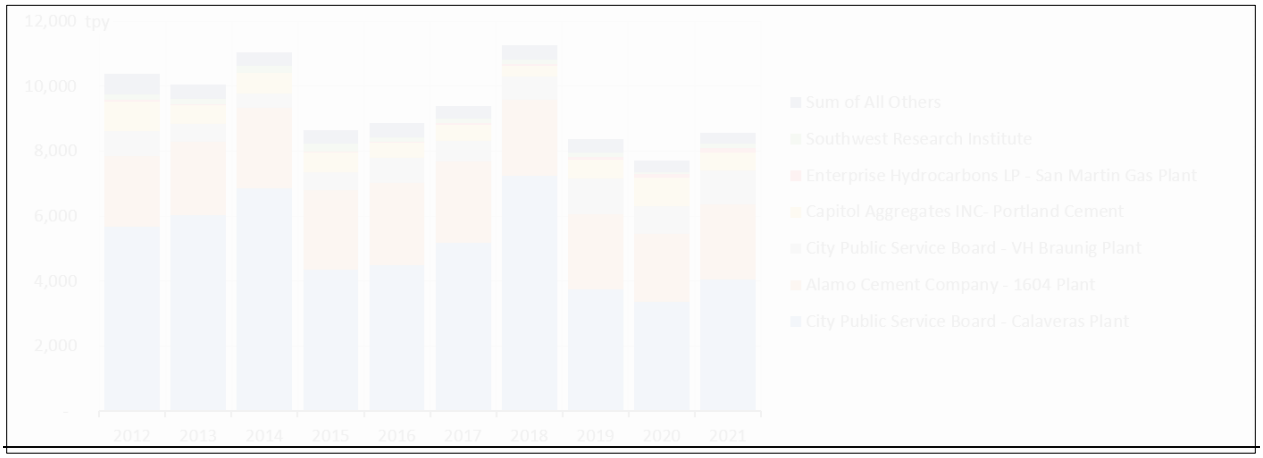


Figure 5-7: Bexar County 2015 Ozone NAAQS Nonattainment Area Point Source NO_x Emissions by Site

5.2.3 VOC Trends

Total non-methane hydrocarbons (TNMHC) are used to represent total VOC concentrations. VOC are emitted from numerous sources including large industrial processes, automobiles, solvents, paints, dry-cleaning, fuels, and even natural sources such as trees.

Two types of monitors record VOC data in the Bexar County 2015 ozone NAAQS nonattainment area: auto-GC, which record hourly data; and canisters, which record 24-hour data. Due to the reactive nature of VOCs, the hourly auto-GC measurements are preferred for assessing trends. The nonattainment area currently has one auto-GC monitor (Camp Bullis) and one canister monitor (Old Highway 90). Unfortunately, Camp Bullis only has data from 2016 through 2021 and data from 2016 and 2019 did not meet data completeness criteria.

This analysis uses valid ozone season data from March through October. A year was considered valid if there were at least 60% valid days of data during the ozone season and a day was considered valid if there were at least 75% valid hours of data recorded.

Figure 5-8: *Ozone Season Median and 95th Percentile TNMHC in Bexar County 2015 Ozone NAAQS Nonattainment Area* shows results from Camp Bullis. Both metrics declined from 2017 through 2021, with the 95th percentile TNMHC and median TNMHC decreasing by 8% and 13%, respectively.

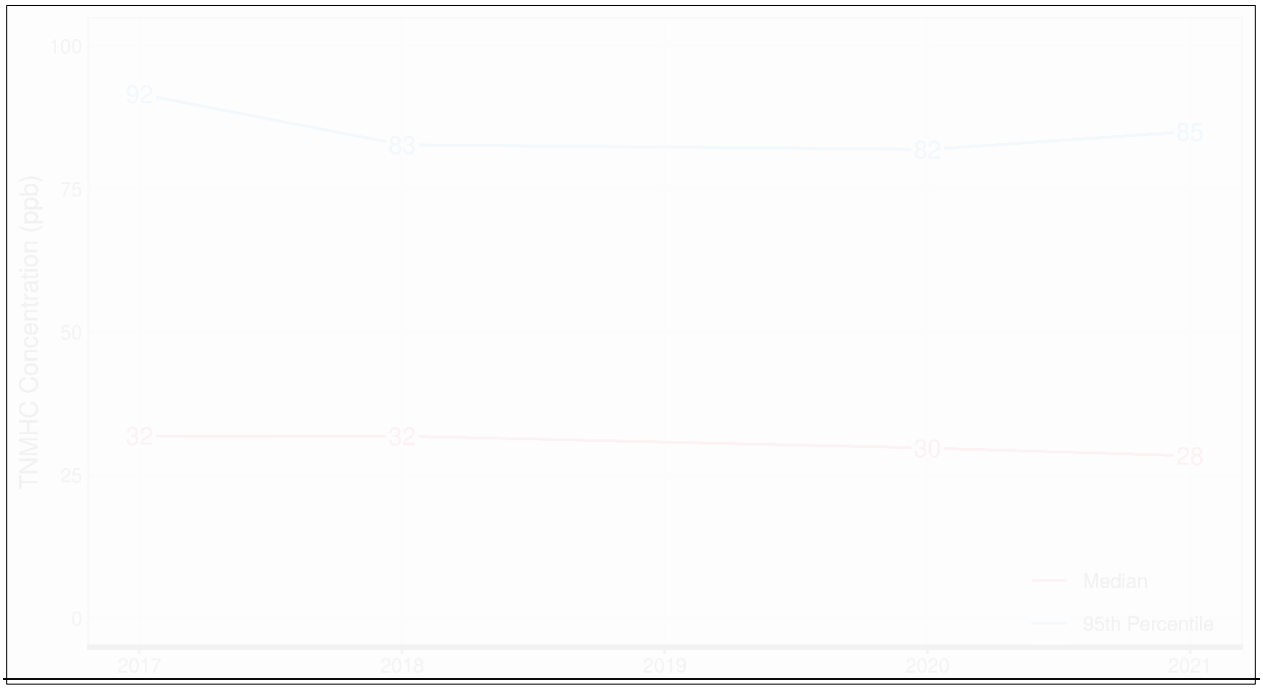
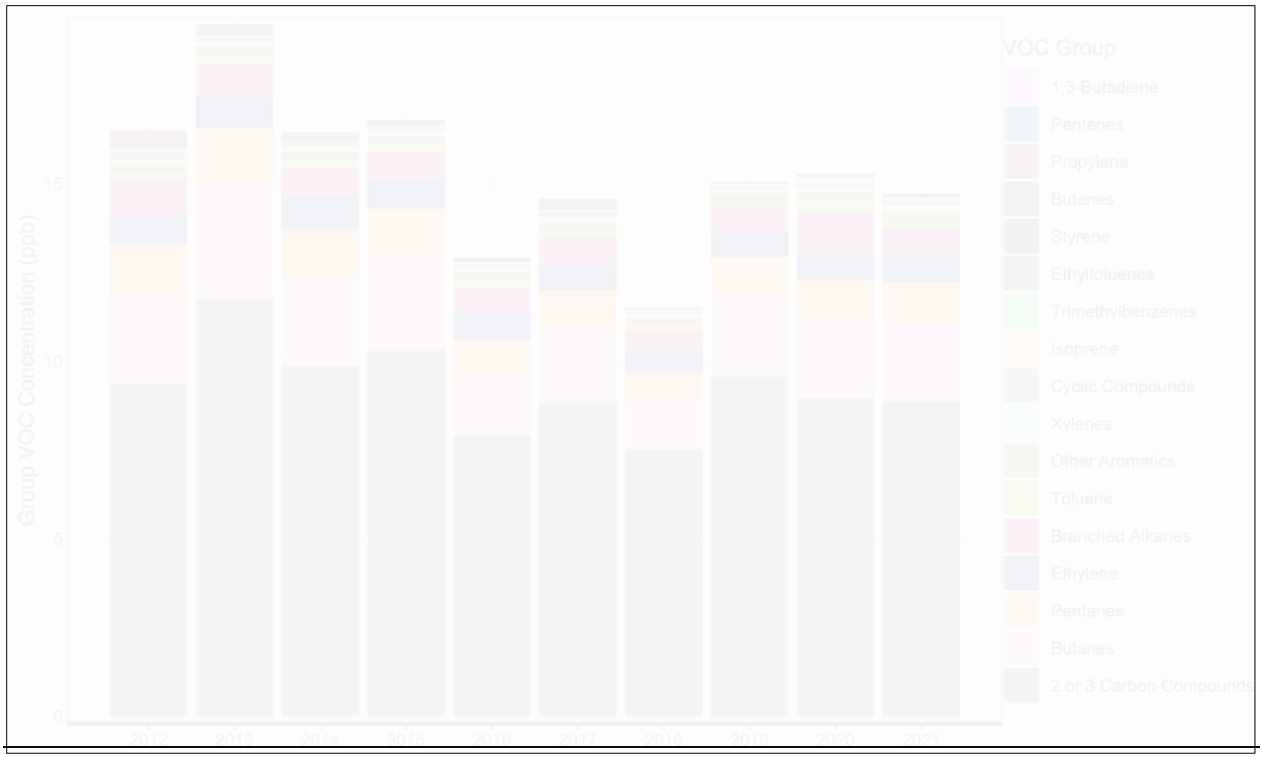


Figure 5-8: Ozone Season Median and 95th Percentile TNMHC in Bexar County 2015 Ozone NAAQS Nonattainment Area

Like ozone and NO_x, VOC concentrations can vary widely based on location. VOC concentrations tend to be higher nearer to VOC emission sources. TNMHC trends at Camp Bullis may not be representative of other sections of the Bexar County 2015 ozone NAAQS nonattainment area.

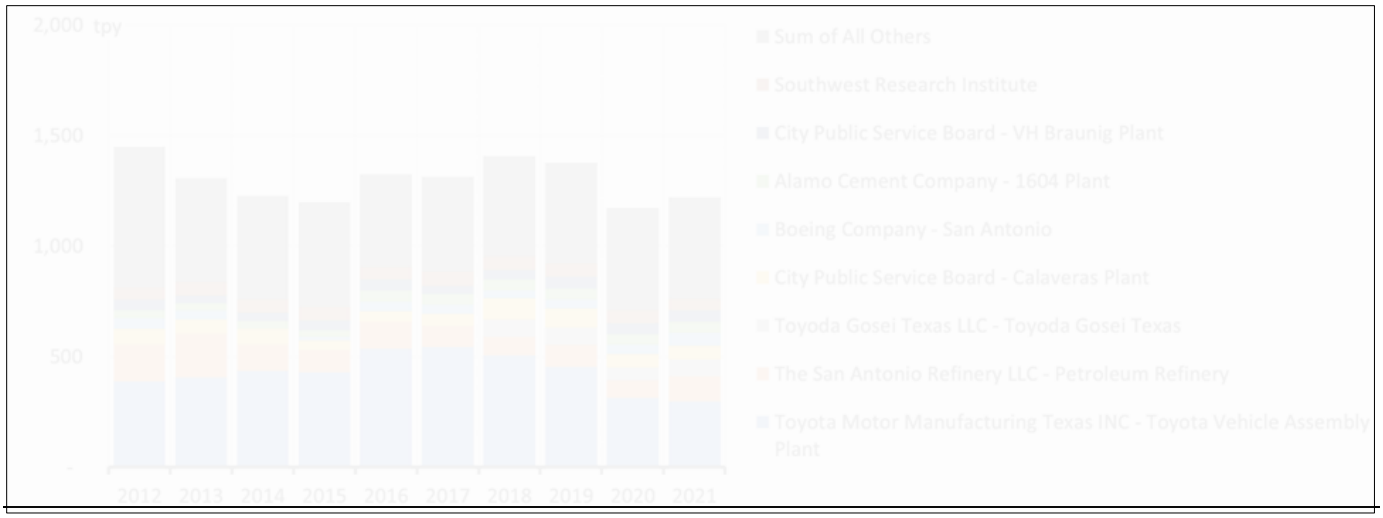
Using Old Highway 90 canister VOC data, 17 distinct groups of VOC were analyzed to investigate the long term VOC trend in the Bexar County 2015 eight-hour ozone nonattainment area. Figure 5-9: *Total Concentrations of VOC Groups at Old Highway 90 Canister Site in Bexar County 2015 Ozone NAAQS Nonattainment Area* shows a flat trend from 2012 through 2021. To avoid seasonal skewing of the data, hours with less than 80% of species measured in a particular group and years with less than 60% valid hours were removed.



~~Figure 5-9: Total Concentrations of VOC Groups at Old Highway 90 Canister Site in Bexar County 2015 Ozone NAAQS Nonattainment Area~~

~~Point source VOC emission trends from STARS were also investigated. Figure 5-10: *Bexar County 2015 Ozone NAAQS Nonattainment Area Point Source VOC Emissions by Site* shows the top VOC emitters in the area. All other point source emissions are displayed as the Sum of All Others.~~

~~Figure 5-10 shows the top eight reporting sites accounted for 62% of the total point source VOC emissions in the nonattainment area in 2021. Each of these sites reported total VOC emissions exceeding 50 tons in 2021, with the largest emitter, Toyota Vehicle Assembly Plant, reporting almost 300 tons of VOC in 2021. Overall VOC emissions decreased 16% from 2012 to 2021.~~



~~Figure 5-10: Bexar County 2015 Ozone NAAQS Nonattainment Area Point Source VOC Emissions by Site~~

5.2.4 VOC and NO_x Limitation

The VOC or NO_x limitation of an air mass can help determine how reductions in VOC and NO_x concentrations might affect ozone concentrations. A NO_x limited regime occurs where the radicals from VOC oxidation are abundant, and therefore the ozone formation is more sensitive to the amount of NO_x present in the atmosphere. In these regimes, controlling NO_x would be more effective for reducing ozone. In VOC limited regimes, NO_x is abundant, and therefore ozone formation is more sensitive to the VOC oxidation. In VOC limited regimes, controlling VOC emissions would be more effective for reducing ozone. 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 could reduce ozone concentrations.

VOC-to-NO_x ratios are one way to determine the chemical composition of an air mass and are calculated by dividing hourly total non-methane hydrocarbon concentrations in parts per billion by carbon (ppbC) by hourly NO_x concentrations in parts per billion by volume (ppbV). The value of the ratio then determines the limitation of the air mass. While ratio definitions for VOC limited, NO_x limited, or transitional atmospheric conditions vary, this analysis uses the cut points described in the U.S. Environmental Protection Agency's Photochemical Assessment Monitoring Stations (PAMS) training workshop (Hafner and Penfold, 2018). 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. Calculation of VOC-to-NO_x ratios are limited by the number of collocated automated gas chromatograph (auto-GC) and NO_x monitors available in the area. In addition, auto-GC monitors are often source-oriented, and therefore they will only provide information on the air masses located near the source and not throughout the whole area.

Camp Bullis has data from collocated VOC and NO_x samplers from 2016 through 2021. Figure 5-11: *Median VOC-to-NO_x Ratios During Ozone Season in the Bexar County 2015 Ozone National Ambient Air Quality Standard (NAAQS) Nonattainment Area* shows transitional to NO_x limited conditions in recent years. This monitor is not located near the San Antonio urban core and sees lower NO_x emissions.

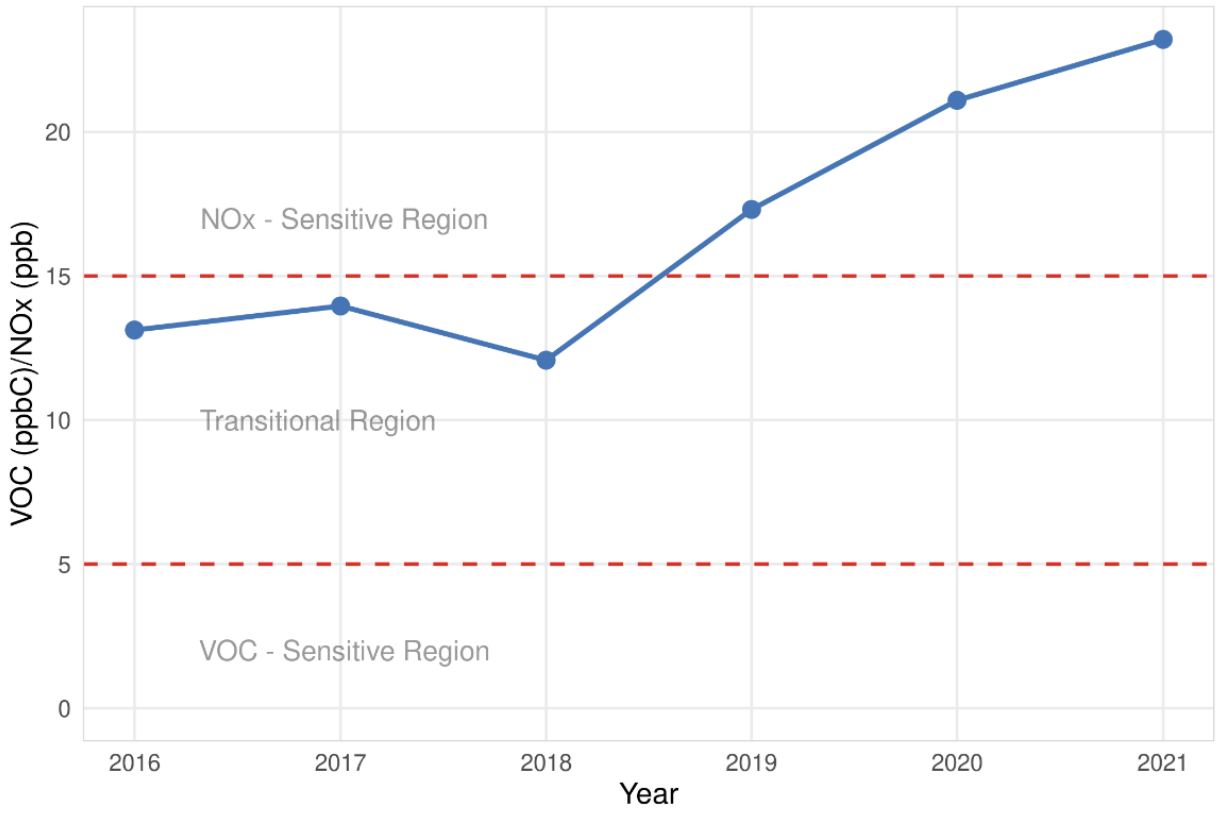


Figure 5-11: Median VOC-to-NO_x Ratios During Ozone Season in the Bexar County Ozone NAAQS Nonattainment Area

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 Bexar County, and the impact of these reduced emission on the 2019 ozone Base Case Design Value (DVB) was obtained. The DVB calculation and its use in an attainment test is described in Chapter 3. Figure 5-12: *Modeling Domain and Monitors for Bexar County VOC and NO_x Sensitivity Analysis* shows a map with a purple outline surrounding Bexar County and parts of adjacent counties that comprise the modeling domain.[21] Circles show the monitors location used for this analysis. Anthropogenic emissions of VOC and NO_x across this modeling domain were reduced by 20% relative to emissions in each grid cell for the sensitivity analysis.

[21] 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.

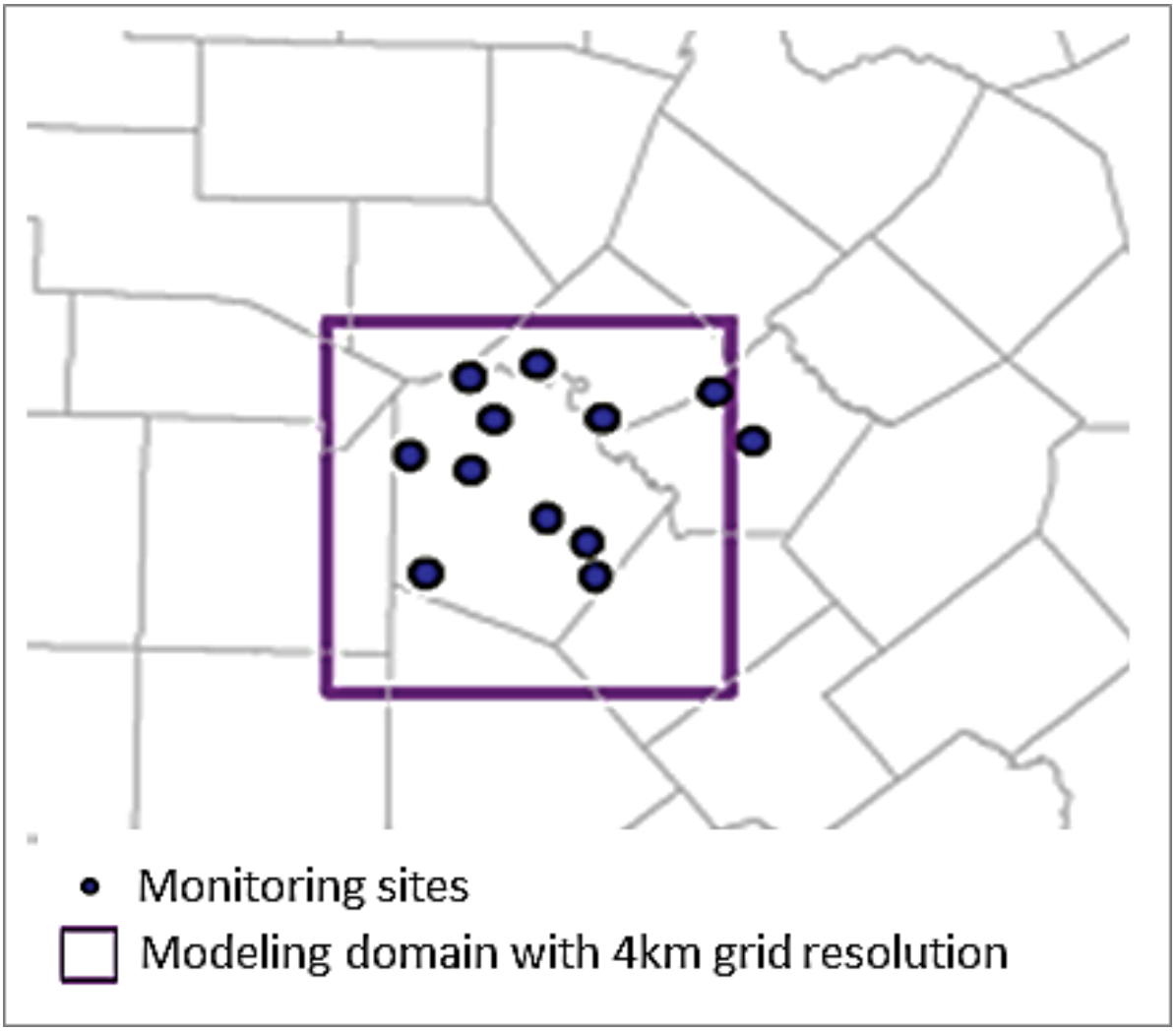


Figure 5-12: Modeling Domain and Monitors for Bexar County VOC and NO_X Sensitivity Analysis

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 – 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 of the MDA8 ozone from the top 10 days from the 20% anthropogenic emissions reduction emission scenario to the average of the MDA8 ozone from the top 10 days from the base case scenario for each monitor and adjusting the 2019 DVB with the ratio. The results showed that, though ozone decreased when VOC or NO_X was decreased, reductions in NO_X were more impactful. Figure 5-13: *Modeled Impact of NO_X and VOC 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 Bexar County. The maximum estimated decrease in the ozone base case design value from a 20% NO_X reduction is 1.2 ppb, a factor of 6 greater than the decrease of 0.2 ppb from a 20% VOC reductions scenario.

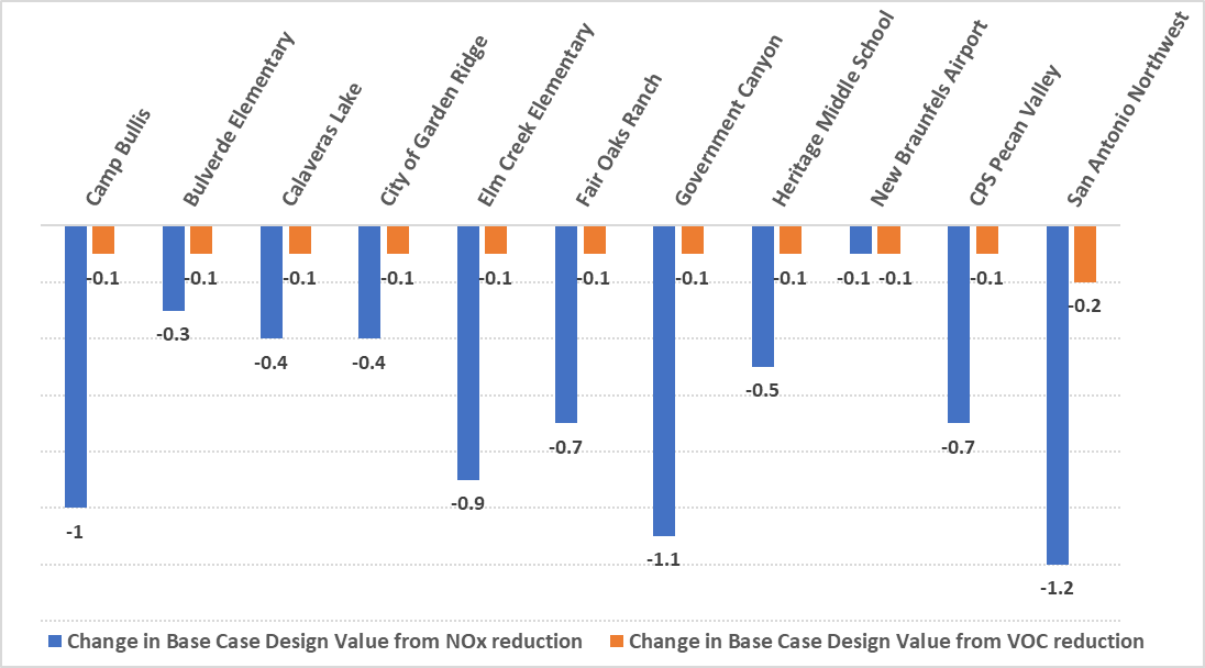


Figure 5-13:**Modeled Impact of NO_x and VOC Reductions on 2019 Ozone DVB**

The modeling results support the conclusion, from the analysis of measured data, that the ozone formation in Bexar County is primarily NO_x-limited.

~~5.2.5 Meteorological Influences on Ozone Trends~~

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

~~Meteorologically adjusted MDA8 ozone values represent what the ozone would be if meteorological effects on ozone concentrations are removed. Without the influence of meteorology, changes in ozone concentrations are more likely due to emission changes. The EPA developed a statistical model that uses local weather data to adjust the ozone trends according to the meteorology for that year (Wells et al., 2021). These trends compare the observed average, 90th percentile, and 98th percentile MDA8 ozone to the meteorologically adjusted average, 90th percentile, and 98th percentile MDA8 ozone from May through September. The EPA calculated these trends for each of the regulatory ozone monitors in the Bexar County 2015 ozone NAAQS nonattainment area from 2012 through 2021 (EPA, 2022). Although results for all statistics were examined, only the 98th percentile trends will be discussed since it most closely relates to the ozone values used in design value calculations. To aggregate the data further, the maximum, median, and minimum 98th percentile MDA8 value was calculated from regulatory monitors within the nonattainment area~~

for each year. This allows for easier examination of the results across all three regulatory monitors.

Figure 5-14: *Observed and Meteorologically Adjusted 98th Percentile Ozone Trends for May through September in the Bexar County 2015 Ozone NAAQS Nonattainment Area* confirms that the low ozone in 2014 and 2019 and the high ozone in 2012 were largely influenced by meteorology. In 2018 and 2021, meteorology pushed observed ozone slightly higher. The effect of meteorology was most notable at Camp Bullis. Comparing 2012 with 2021, both measured and meteorologically adjusted 98th percentile ozone decreased, by 15% and 7%, respectively.

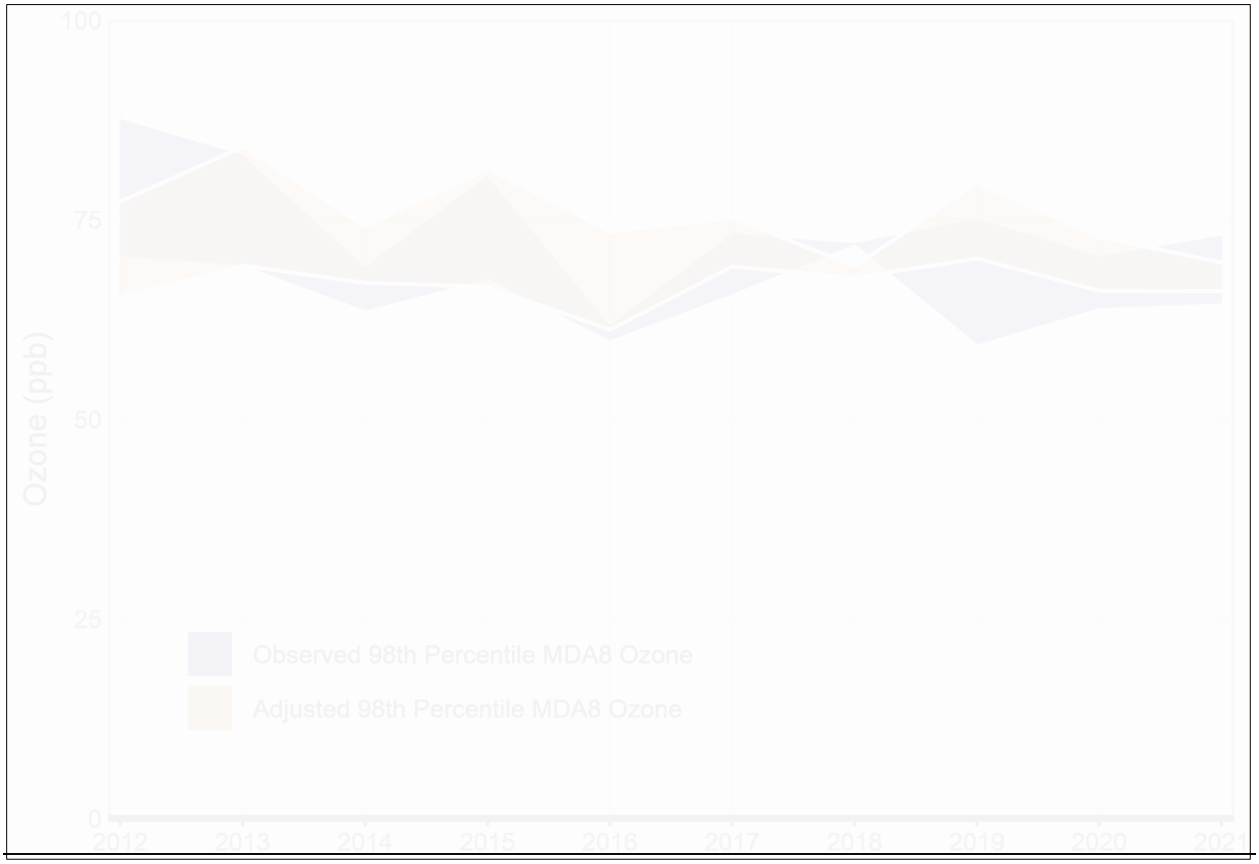


Figure 5-14: Observed and Meteorologically Adjusted 98th Percentile Ozone Trends for May through September in the Bexar County 2015 Ozone NAAQS Nonattainment Area

5.2.6 Fire Influence

The base case month of May was shown in Chapter 3, Section 3.5, Table 3-7 to have the poorest model performance, followed by April. At each of the three Bexar County regulatory monitors, four or five of the top-10 modeled base case days showed high influence from fire emissions. Five days (April 23 and May 9, 19, 21, and 22) have high influence from fire emissions across the three regulatory monitors. On these days, emissions from fires reached Bexar County, mostly from one or two days prior in the Yucatan region of Mexico. Figure 5-1: *Back Trajectories Ending on May 22 at Camp Bullis (top left) and San Antonio Northwest (top right), and May 21 Fire Emissions of NO_x*

(bottom left) and VOC (bottom right) shows data for one example. The other days exhibit similar characteristics. The wind back trajectories shown end at the Camp Bullis and San Antonio Northwest monitors at 10, 50, 100, 500 and 1,000 meters above ground level (AGL). The wind trajectories indicate that air parcels arriving at these monitors on May 22 passed over the Yucatan Peninsula on May 21. The bottom panels of Figure 5-1 show estimated NO_x and VOC emissions from fires on May 21 including multiple 36-kilometer (km) grid cells with over 1,000 tons per day (tpd) of VOC emissions. The back trajectory with the highest altitude traversed over areas with large VOC emissions while lower altitude trajectories traversed over areas with less emissions.

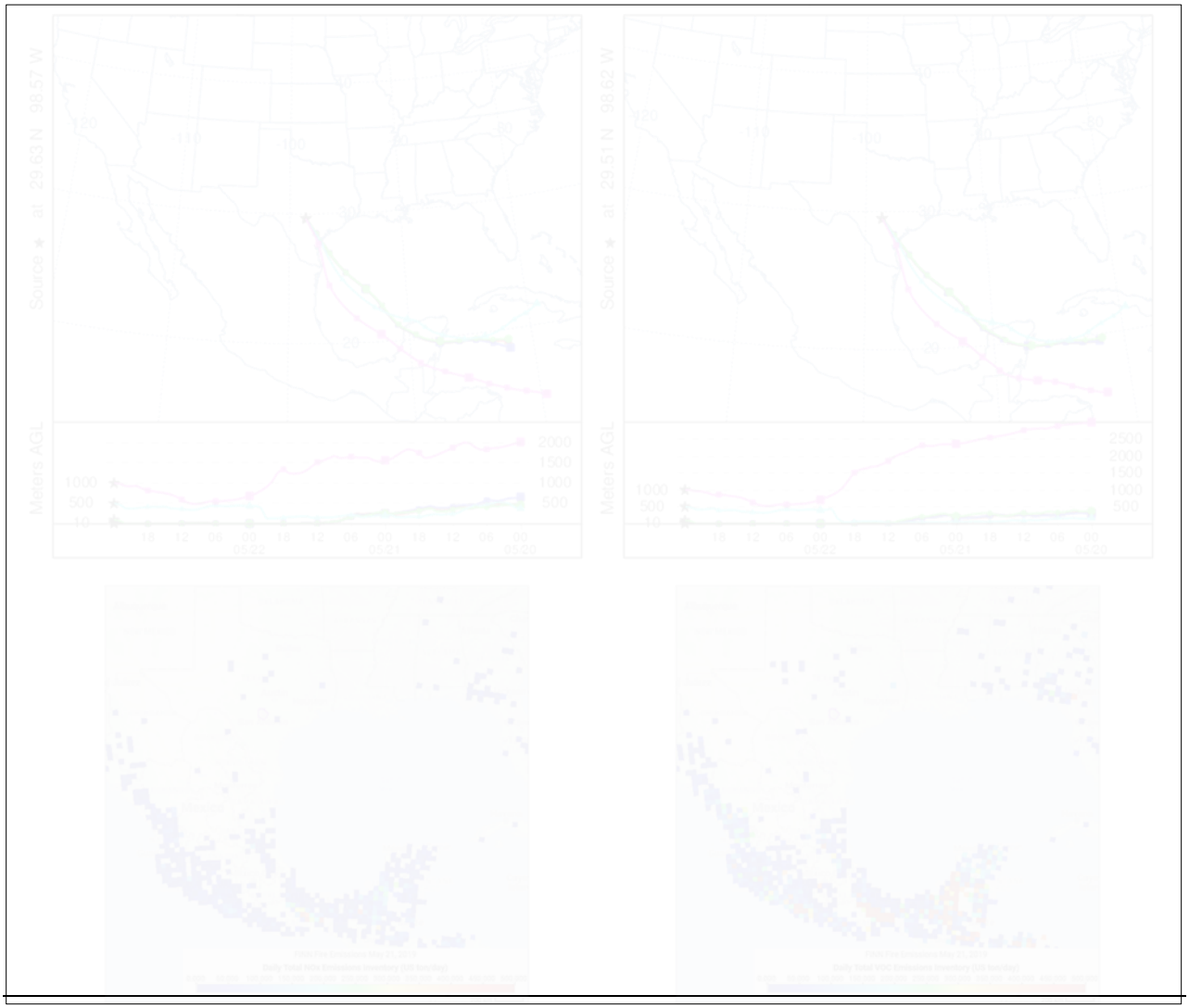


Figure 5-15: Back Trajectories Ending on May 22 at Camp Bullis (top left) and San Antonio Northwest (top right), and May 21 Fire Emissions of NO_x (bottom left) and VOC (bottom right)

Emission plumes from large fires are assumed to extend above the 1000 mAGL back trajectory pictured in Figure 5-1. The FINN fire emission estimation used in this modeling carries the fire plume up over 3,000 meters AGL for class 3 and larger fires,

which burn over 100 acres as seen in Figure 5-2: *FINN Fire Plume Height for Different Size Fires*.[22]

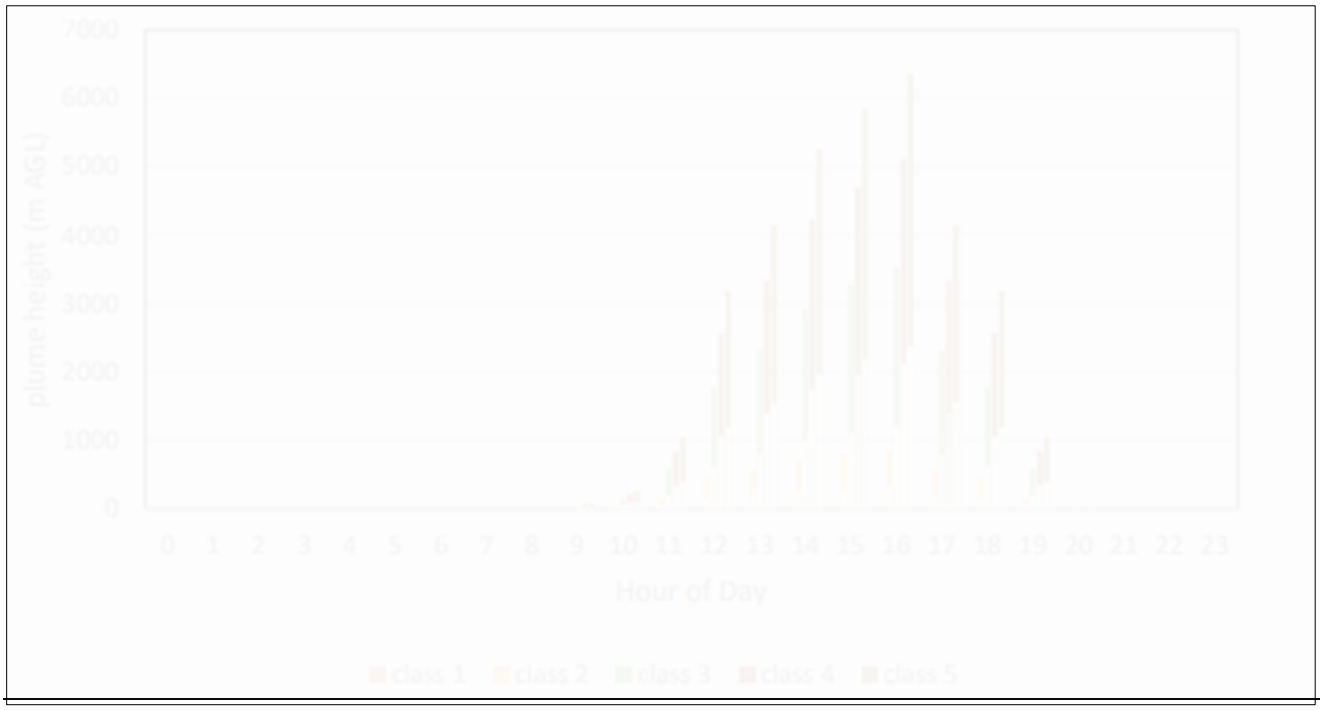


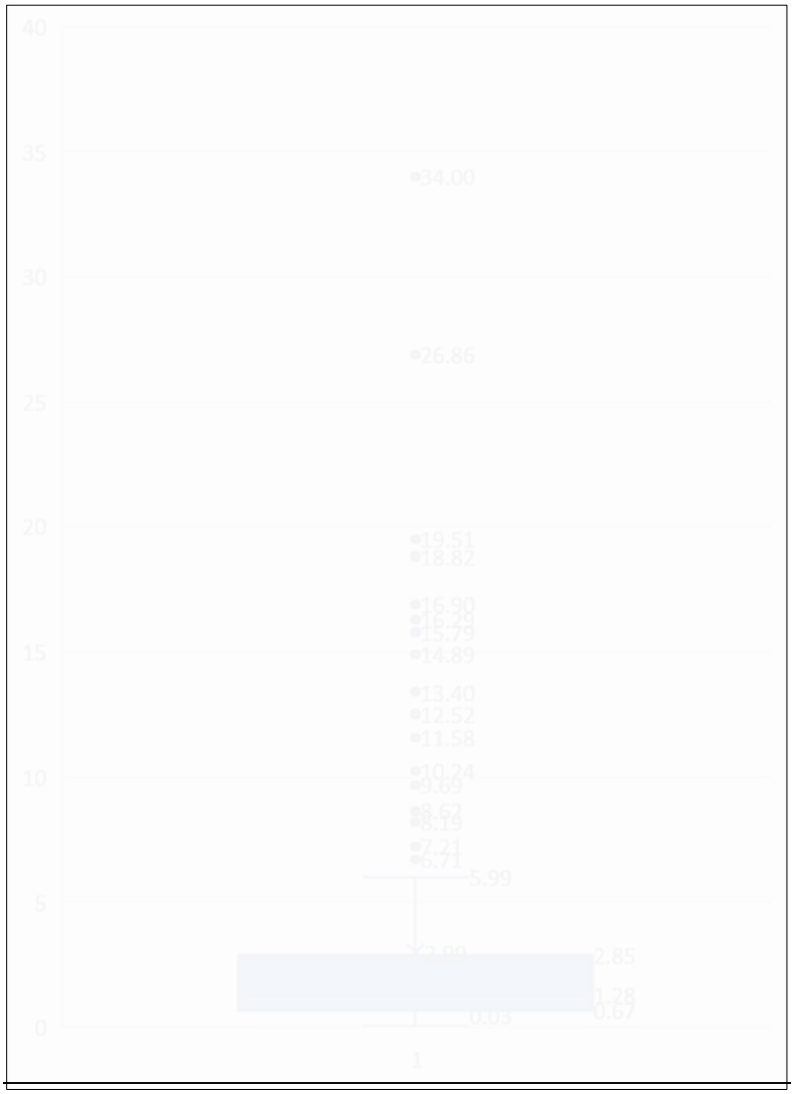
Figure 5-16: FINN Fire Plume Height for Different Size Fires

To analyze the influence of fire emissions, Comprehensive Air Quality Model with Extensions (CAMx) was run with and without fire emissions for the entire episode. For each day and regulatory monitor in Bexar County, the difference in hourly average modeled ozone concentration between the with-fire and without-fire runs was calculated and the maximum value and observation time recorded. The back trajectories in Figure 5-1 end at the time of the maximum difference on May 22. Maps of the maximum difference in hourly ozone concentration for May 21, when the trajectories are over the Yucatan Peninsula, and May 22, when the ozone plume reaches Texas, are shown in Figure 5-3: *Maximum Difference in Hourly Ozone Concentration Modeled With and Without Fire Emissions, May 21 (left) and May 22 (right).* In this figure, the ozone produced by fire emissions can be seen following a path similar to the trajectories in Figure 5-1, with the maximum fire influence decreasing as it traverses Texas.

[22] FINN fire emission plume height from *Development and Evaluation of the FINNv.2.2 Global Model Application and Fire Emissions Estimates for the Expanded Texas Air Quality Modeling Domain*, AQRP Project 18-022., https://aqrp.ceer.utexas.edu/projectinfoFY18_19/18-022/18-022%20Final%20Report.pdf.

Figure 5-17: Maximum Difference in Hourly Ozone Concentration Modeled With and Without Fire Emissions, May 21 (left) and May 22 (right)

For each regulatory monitor in Bexar County, the 95th percentile of the distribution of the maximum daily hourly ozone differences for the episode was calculated. Modeled ozone differences above the 95th percentile value for that monitor were considered to be potentially highly influenced by fire emissions. The 95th percentile of with-fire minus without-fire modeled hourly ozone concentration is 10.47 ppb at Camp Bullis, 11.42 ppb at Calaveras Lake, and 11.04 ppb at San Antonio Northwest. The highest hourly with-fire minus without-fire modeled hourly ozone concentration is 34.00 ppb at Camp Bullis, 31.36 ppb at Calaveras Lake, and 34.10 ppb at San Antonio Northwest. Figure 5-4: *Box and Whisker Plot of the Maximum Difference in Hourly Ozone With and Without Fire Emissions at Camp Bullis* shows the distribution of the maximum hourly ozone differences, with only difference values outside the shaded interquartile range box plotted for readability.



~~Figure 5-18: Box and Whisker Plot of the Maximum Difference in Hourly Ozone With and Without Fire Emissions at Camp Bullis~~

~~The fire emission inventory used in this modeling relies on satellite detection of fire activity and a chemical speciation profile grouping fires within five km of each other into a single event. The Yucatan region experiences burning for agricultural purposes during the months of April and May. Numerous detected small fires may get aggregated in such a way that the combined effect in the na_36km grid may not be representative of actual conditions. In Figure 5-1, many of the estimated 36-km grid cell VOC emissions in the Yucatan Peninsula area are over 1,000 tpd. This estimate may be excessive but actual measurements of VOC emissions from these fires are not available for comparison. It is also possible that CAMx produces excessive amounts of ozone in this situation. The TCEQ continues to investigate alternative CAMx options to better handle fire emissions.~~

Because the future case emission inventory replicates the base case fire emissions, the same effect is expected on these days in the future case. If the days potentially highly influenced by fire are removed from the top-10 modeled days for the regulatory monitors, the future design value calculation is not likely to be affected since these potentially excessive emissions are removed from both the base and future case modeling but estimated future year design value could be more reflective of changes in anthropogenic emissions.

5.3 QUALITATIVE CORROBORATIVE ANALYSIS

5.3.1 Additional Measures

5.3.1.1 SmartWay Transport Partnership and the Blue Skyway 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 also 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 336 million barrels.[23] 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.[24] Approximately 247 Texas companies are SmartWay partners, 12 of which are in Bexar County.[25] The SmartWay Transport Partnership will continue to benefit Bexar County 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 sources.[26] 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

[23] https://www.epa.gov/smartway/smartway-program-successes
[24] https://www.epa.gov/smartway/smartway-trends-indicators-and-partner-statistics-tips
[25] https://www.epa.gov/smartway/smartway-partner-list
[26] https://blueskyways.org/

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 energy and solar 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[27] 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), approximately 26.3% of the 378.2[28] million MWh total wind net electrical generation for the U.S. In 2021, total net electrical generation from renewable wind generators in Texas was 11.9% more than in 2020.

Texas non-residential solar electricity generation in 2021 totaled 17.2 million MWh, a 69.5% increase from 2020.[29] The 2021 total installed solar electricity generation capacity in Texas was 10,374 MW, a 73% increase from 2020.[30]

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.

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/). The Texas Emissions Reduction Plan (TERP) reports submitted to TCEQ regarding EE/RE measures are available on the ESL website on the TERP Reports webpage (http://esl.tamu.edu/terp/documents/terp-reports/).

5.3.1.3 Cross-State Air Pollution Rule (CSAPR)

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

[27] https://www.eia.gov/electricity/annual/html/epa_04_07_b.html
[28] https://www.eia.gov/electricity/annual/xls/epa_03_01_b.xlsx
[29] https://www.eia.gov/electricity/annual/xls/epa_03_21.xlsx
[30] https://www.eia.gov/electricity/annual/html/epa_04_07_b.html

~~obligations under the 2008 eight-hour ozone standard and EPA's transport FIP for the 2015 eight-hour ozone standard.~~

~~On September 7, 2016, EPA signed the final CSAPR Update Rule for the 2008 eight-hour ozone standard. The EPA's modeling showed that emissions from within Texas no longer significantly contribute to downwind nonattainment or interfere with maintenance for the 1997 eight-hour ozone NAAQS, even without implementation of the original CSAPR ozone season NO_x emissions budget. Accordingly, sources in Texas are no longer subject to the emissions budget calculated to address the 1997 eight-hour ozone NAAQS. However, this rule finalized a new ozone season NO_x emissions budget for Texas, effective for the 2017 ozone season, to address interstate transport with respect to the 2008 eight-hour ozone NAAQS. On July 10, 2018, EPA published a proposed close-out of CSAPR, proposing to determine that the CSAPR Update Rule fully addresses interstate pollution transport obligations for the 2008 eight-hour ozone NAAQS in 20 covered states, including Texas. The EPA's modeling analysis projects that by 2023 there will be no remaining nonattainment or maintenance areas for the 2008 eight-hour ozone NAAQS in the CSAPR Update region, and therefore EPA would have no obligation to establish additional control requirements for sources in these states. As a result, these states would not need to submit SIP revisions establishing additional control requirements beyond the CSAPR Update. The final rule was published on December 21, 2018 with an effective date of February 19, 2019 (83 FR 65878). On September 13, 2019, the D.C. Circuit Court remanded the CSAPR Update back to EPA after finding that the rule is inconsistent with the FCAA and allows upwind states to continue their significant contributions to downwind air quality problems beyond the attainment dates for those downwind areas. On October 1, 2019, the D.C. Circuit Court vacated the CSAPR close-out rule.~~

~~On April 30, 2021, EPA published the final Revised CSAPR Update for the 2008 ozone NAAQS, effective June 29, 2021 (86 FR 23054). For nine out of the 21 states, including Texas, for which the CSAPR Update was previously found to be only a partial remedy, projected 2021 emissions do not significantly contribute to nonattainment or maintenance problems for the 2008 ozone NAAQS in downwind states. Therefore, no further emission reductions beyond those under the CSAPR Update are required for Texas to address interstate air pollution under the 2008 ozone NAAQS.~~

~~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 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).~~

~~The EPA signed a final FIP on March 15, 2023 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. As part of the final FIP to~~

address interstate transport obligations for the 2015 ozone NAAQS, EPA including 22 states, including Texas, in a revised and strengthened CSAPR NO_x Ozone Season Group 3 Trading Program for EGUs beginning in the 2023 ozone season. The 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.

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 August 2022, $1,192,434,745 in DERI grants were awarded for projects projected to help reduce an estimated 189,151 tons of NO_x in the period over which emissions reductions are reported for each project under the program. This includes $96,637,493 going to activities in the San Antonio Area, which includes Bexar County, with an estimated 11,977 tons of NO_x reduced in the San Antonio 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 San Antonio Area.

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 August 2022, the program awarded $28,702,701, with an estimated 1,303 tons of NO_x reduced in the period over which emissions reductions are reported for each project under the program. In the San Antonio Area $403,479 was awarded to projects with an estimated 16 tons of NO_x reduced in the period over which emissions reductions are reported for each project under the program.

The Texas Clean Fleet Program (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 August 2022, $69,363,635 in TCFP grants were awarded for projects to help reduce an estimated 671 tons of NO_x in the period over which emissions reductions are reported for each project under the

program. In the San Antonio Area, $10,559,210 in TCFP grants were awarded with an estimated 77 tons of NO_x reduced in the period over which emissions reductions are reported for each project under the program.

The Texas Natural Gas Vehicle Grant Program (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 August 2022, $54,012,006 in TNGVGP grants were awarded for projects to help reduce an estimated 1,668 tons of NO_x in the period over which emissions reductions are reported for each project under the program. In the San Antonio Area, $3,840,886 in TNGVGP grants were awarded to projects with an estimated 131 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

HB 3469, 79th Texas Legislature, 2005, Regular Session, established the Clean School Bus Program, which provides monetary incentives for 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 August 2022, TCEQ's Clean School Bus Program has awarded $53,053,626 in grants for 7,860 retrofit and replacement activities across the state. This amount includes $4,694,101 in federal funds. Of the total amount, approximately $2,972,332 has been awarded for 740 school bus retrofit and replacement projects in the San Antonio Area, resulting in a projected 12 tons of NO_x reduced in the period over which emissions reductions are reported for each project under the program.

5.3.1.6 87th Texas Legislature, 2021

A summary of the bills passed during the 87th Texas Legislature, 2021, Regular and Special Sessions, that have the potential to impact Bexar County are discussed in this section. For legislative updates regarding EE/RE measures and programs, see Section 5.3.1.2: Energy Efficiency and Renewable (EE/RE) Energy Measures.

HB 4472, Relating to the TERP

HB 4472 directed TCEQ to remit not less than 35% of TERP Trust Fund to the Texas Department of Transportation for congestion mitigation and air quality improvement projects in nonattainment areas and affected counties. The Texas Department of Transportation (TxDOT) is required to report to TCEQ by October 1 of each year a description, estimated emission reductions, and costs of the related projects. TxDOT could fund additional projects to reduce emissions within Texas nonattainment areas.

HB 4772 set 55 percent as the minimum amount of time a marine vessel or engine must operate in the Texas intercoastal waters adjacent to a nonattainment area or affected county to be eligible for a TERP Diesel Emissions Reduction Incentive grant. This may increase the number of eligible marine vessels or engines that could be replaced or retrofitted with cleaner engines, thus reducing NO_x emissions along the Texas coast.

HB 4772 added New Technology Implementation Grant (NTIG) projects that reduce flaring emissions and other site emissions to the list of projects that TCEQ must give preference to when awarding grants. The requirement that flaring and other oil and gas site emissions reduction projects capture waste heat to generate electricity solely for on-site service was removed under the NTIG program. These changes may yield more grant awards to reduce flaring and other emissions under the NTIG program.

5.3.1.7 Local Initiatives

Local entities submitted an assortment of locally implemented strategies in the Bexar County 2015 ozone NAAQS nonattainment area, including projects, programs, partnerships, and policies. Due to the continued progress of these measures, additional air quality benefits will be gained that will further reduce precursors to ground-level ozone formation. A summary of each strategy is included in Appendix C: *Local Initiatives.*

5.4 CONCLUSIONS

TCEQ used monitoring and modeling analysis to show that reductions in NO_X emissions result in greater ozone benefits. This conclusion supports the use of NO_X emissions reductions to fulfill RFP requirements in the concurrent Bexar County 2015 Ozone NAAQS RFP SIP Revision (Project No. 2022-024-SIP-NR). TCEQ used several sophisticated technical tools to evaluate causes of high ozone in the Bexar County 2015 ozone NAAQS nonattainment area to predict future air quality, as discussed in this chapter. The assessment of historical trends in ozone and ozone precursor concentrations and their causes supports the following conclusions.

The eight-hour ozone design values decreased from 2012 through 2022, but after 2016 remained flat. The 2022 eight-hour design value for the nonattainment area was 75 ppb, a 6% decrease from 2012.

On average, background ozone contributed about 73% to maximum daily ozone concentrations on low ozone days, and locally produced ozone contributes roughly 27%. The contribution averages are nearly identical for high ozone days, 72% and 28%, respectively. Overall, background ozone is decreasing, and local production is increasing slightly on both high and low ozone days.

Point source NO_x and VOC emissions decreased 17% and 16%, respectively, in the Bexar County 2015 ozone NAAQS nonattainment area according to emissions data from 2012 through 2021. Camp Bullis shows NO_x limited chemistry in recent years, which may be due to decreases in NO_x emissions. Further ozone reductions could be achieved with further reductions in NO_x emissions. While photochemical modeling shows benefit from both NO_x and VOC reductions, ozone decreases in larger amounts with the reductions in NO_x. This Bexar County AD SIP revision documents a fully evaluated

photochemical modeling analysis and a thorough weight-of-evidence assessment. The weight-of-evidence analysis presented in this chapter corroborates TCEQ's modeling result, that the Bexar County area is not expected to attain the 2015 ozone NAAQS by the September 24, 2024 attainment date.

5.5 REFERENCES

Berlin, Shaena R., Andrew O. Langford, Mark Estes, Melody Dong, and David D. Parrish. 2013. "Magnitude, decadal changes, and impact of regional background ozone transported into the greater Houston, Texas area." *Environ. Sci. Technol.* 47 (24): 13985-13992

EPA. 2018. "Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze." November 2018. https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf.

EPA. 2022. "Trends in Ozone Adjusted for Weather Conditions." Last modified June 1, 2022. https://www.epa.gov/air-trends/trends-ozone-adjusted-weather-conditions.

Hafner, Hilary R. and Bryan M. Penfold. 2018. "PAMS Data Validation and Analysis Training Material, Sonoma Technology, Inc." Prepared for EPA. January 4, 2018. https://www.epa.gov/sites/default/files/2020-03/documents/pams_data_analysis_workbook.pdf.

TTI. 2015. "Development of 2014 On-Road Mobile Source Annual, Summer, Weekday, and Winter Work Weekday Emissions Inventories for Specified Areas: Houston-Galveston-Brazoria Area." PGA Number: 582-15-52083-17.

Wells, Benjamin, Pat Dolwick, Brian Eder, Mark Evangelista, Kristen Foley, Elizabeth Mannshardt, Chris Misenis, and Anthony Weishampel. 2021. "Improved estimation of trends in U.S. ozone concentrations adjusted for interannual variability in meteorological conditions." *Atmospheric Environment.* 248 (March): 118234. https://doi.org/10.1016/j.atmosenv.2021.118234.

CHAPTER 6: ONGOING AND FUTURE INITIATIVES (NO CHANGE)

6.1 ~~INTRODUCTION~~

~~The Texas Commission on Environmental Quality (TCEQ) is committed to maintaining healthy air quality in the Bexar County area and continues to work toward this goal. Texas continues to invest resources in air quality scientific research for better understanding of atmospheric chemical processes and the advancement of pollution control technology, refining quantification of emissions, and improving the science for ozone modeling and state implementation plan (SIP) analysis. Additionally, TCEQ is working with the U.S. Environmental Protection Agency (EPA), local 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 and management in Texas and the Bexar County ozone nonattainment area.~~

6.2 ~~ONGOING WORK~~

~~6.2.1 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 can be found at the 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 Projects~~

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

~~6.2.2.2 Texas Air Quality Research Programs~~

~~The goals of the State of Texas Air Quality Research Program (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;~~
- ~~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. Three projects that could have findings relevant to the San Antonio 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 Black and Brown Carbon ($BC)^2$ Monitoring Network (project number 22-006)
- 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)

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 webpage (https://aqrp.ceer.utexas.edu).

6.2.3 Wildfire and Smoke Impact

The TCEQ is reviewing ambient air monitoring data from monitors in the San Antonio area and has determined that there were ozone episodes that appear to have been influenced by smoke from fires outside the United States in 2020, 2021, and 2022.

Each spring, agricultural fires are set in Mexico and Central America to prepare fields for planting. The smoke from these fires often reaches Texas, carrying ozone precursors and particulate matter (Andrae, 2019; Coggan et al., 2019). Wang et al. (2018) shows that the Mexican and Central American agricultural fires can affect Texas air quality.

In 2022, the San Antonio area had high ozone episodes in June, September, and October. High ozone episodes on September 13 and October 6 were likely influenced by fires. On September 13, 2022, smoke plumes covered large portions of Texas and satellites detected moderate, possibly dense, aerosols over San Antonio on this day so precursors in the smoke could have contributed to the ozone formation. On October 6, 2022, smoke plumes covered the southern Great Plains including Texas, and the Hazard Mapping System (HMS) showed numerous fires in Arkansas and Mississippi that could have contributed to the high ozone observed at three San Antonio area monitors.

In 2021, the San Antonio area had high ozone episodes in April, May, June, July, September, and October. High ozone episodes on April 11, June 18, and September 23, 2021, were most likely influenced by fires. On April 11, fires in Mexico, North Texas, and Oklahoma possibly influenced San Antonio's high ozone. On June 18, the HMS showed smoke plumes over most of the San Antonio area, so fires may have influenced the ozone. On September 23, satellite images showed the presence of aerosols over the San Antonio area so wildfires in the Pacific northwest and Rocky Mountains could have contributed to the high ozone.

In 2020, the San Antonio area had high ozone episodes in April, August, and October. On August 19 and 20, 2020, HMS showed smoke plumes over most of Texas and satellites detected the presence of aerosols. This indicates that California wildfires may have caused the high ozone values in San Antonio on August 19 and 20, 2020. On October 6 and 7, 2020, satellite images showed fires along the gulf coast and smoke from these fires could have influenced San Antonio ozone on these days. On September 13, 2020, satellite images showed fires along the gulf coast, and HYSPLIT

trajectories passed through the smoke plume suggesting wildfires could have influenced San Antonio ozone on this day.

6.3 REFERENCES

Andrae, Meinrat O., 2019, Emission of trace gases and aerosols from biomass burning—an updated assessment, Atmos. Chem. Phys., 19: 8523-8546, https://doi.org/10.5194/acp-19-8523-2019.

Coggon, M. M., Lim, C. Y., Koss, A. R., Sekimoto, K., Yuan, B., Gilman, J. B., Hagan, D. H., Selimovic, V., Zarzana, K., Brown, S. S., Roberts, J. M., Müller, M., Yokelson, R., Wisthaler, A., Krechmer, J. E., Jimenez, J. L., Cappa, C., Kroll, J., de Gouw, J., and Warneke, C, 2019, OH-chemistry of non-methane organic gases (NMOG) emitted from laboratory and ambient biomass burning smoke: evaluating the influence of furans and oxygenated aromatics on ozone and secondary NMOG formation, Atmos. Chem. Phys., 19:14875-14899.

Flynn, James, R. Griffin, R. Sheesley, S. Usenko (2018), Additional Mobile Laboratory Monitoring in San Antonio during the Air Quality Research Program Field Study in 2017, Final Report to the Texas Commission on Environmental Quality, PGA Number 582-17-71581-12, https://www.tceq.texas.gov/airquality/airmod/project/pj_report_oth.html, January 2018.

Griffin, Robert, J. Flynn, R. Sheesley, S. Usenko, Y. Wang (2021), Characterization of Corpus Christi and San Antonio Air Quality During the 2021 Ozone Season, Final Report to the Texas Air Quality Research Program, Project 20-003, https://aqrp.ceer.utexas.edu/projectinfoFY20_21/20-003/20-003%20Final%20Report.pdf, August 2021.

Wang, Sing-Chun, Yuxuan Wang, Mark Estes, Ruixue Lei, Robert Talbot, Liye Zhu, Pei Hou, 2018, Transport of Central American fire emissions to the U.S. Gulf Coast: Climatological pathways and impacts on ozone and PM2.5, J. Geophys. Res., https://doi.org/10.1012/2018JD028684.

Yacovitch, Tara, S. Herndon (2017), Identifying and Apportioning Ozone Producing Volatile Organic Compounds in Central Texas, Aerodyne Research, Inc., Final Report to the Texas Air Quality Research Program, Project 17-053, , November 2017.

Appendices Available Upon Request

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RESPONSE TO COMMENTS RECEIVED CONCERNING THE BEXAR COUNTY MODERATE AREA ATTAINMENT DEMONSTRATION (AD) STATE IMPLEMENTATION PLAN (SIP) REVISION FOR THE 2015 EIGHT-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

The Texas Commission on Environmental Quality (commission or TCEQ) offered a public hearing in San Antonio on July 13, 2023, at 7:00 p.m. During the comment period, which closed on July 17, 2023, the commission received comments from Alamo Area Council of Governments (AACOG), the Sierra Club, the U.S. Environmental Protection Agency (EPA), and 24 individuals.

In this response to comments, unless otherwise specified, the commission uses "Bexar County area" to refer to the Bexar County 2015 eight-hour ozone NAAQS nonattainment area. With the final reclassification of Bexar County to serious nonattainment for the 2015 ozone NAAQS, EPA determined that a demonstration of attainment, an emissions inventory, reasonably available control measures (RACM), and contingency measures for failure to attain are no longer required. These elements may be referenced and summarized in comments received but are no longer included in this SIP revision and are not being submitted to EPA.

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GENERAL COMMENTS

AACOG expressed support for the multiple meetings between TCEQ staff and Bexar County area elected officials. AACOG generally supported the proposed SIP revision.

The commission appreciates the support.

EPA suggested TCEQ consider a voluntary reclassification to serious nonattainment to maximize time for assessing, adopting, and implementing emission reduction measures.

The commission acknowledges the federal Clean Air Act (FCAA) provides for voluntary reclassification. On October 12, 2023, Texas Governor Greg Abbott signed and submitted a letter to EPA to voluntarily reclassify the Bexar County, Dallas-Fort Worth (DFW), and Houston-Galveston-Brazoria (HGB) 2015 eight-hour ozone NAAQS moderate nonattainment areas to serious. 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). On June 20, 2024, EPA published the

final reclassification of the 2015 eight-hour ozone NAAQS nonattainment areas to serious, effective July 22, 2024 (89 FR 51829).

As a result of the voluntary reclassification of the 2015 eight-hour ozone NAAQS nonattainment areas to serious, effective July 22, 2024, EPA determined that certain elements associated with the prior moderate classification and attainment date are no longer required. These elements have been removed from the SIP revision with strikethrough formatting.

Sierra Club commented that TCEQ has failed to perform its duty to protect the public from the effects of ozone pollution for more than 45 years. Sierra Club and 24 individuals also urged TCEQ to implement the most stringent plan possible to get Bexar County into attainment. Sierra Club and one individual asked the commission to set very high standards to control ozone pollution. Sierra Club and one individual noted that we need to change the way we live for the planet before it is too late. Sierra Club and one individual commented that future generations would be thankful.

As shown in Figure 1-1: *Ozone Design Values and Population in the San Antonio Area* of this Bexar County AD SIP revision, the eight-hour ozone design value has decreased over the past 22 years. The 2022 eight-hour ozone design value was 75 ppb, representing a 13% decrease from the 2000 value of 86 ppb. These decreases occurred despite a 45% increase in population from 2000 through 2022.

Attainment of the ozone NAAQS is an ongoing challenge, particularly as EPA continues to revise the NAAQS to be more stringent. The commission remains committed to working with area stakeholders and the 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 document and in the revised SIP, the governor submitted a letter to EPA to voluntarily reclassify the state's 2015 eight-hour ozone NAAQS nonattainment areas from moderate to serious. On June 20, 2024, EPA published the final reclassification of the 2015 eight-hour ozone NAAQS nonattainment areas to serious, effective July 22, 2024 (89 FR 51829), which will require additional planning obligations for the Bexar County area.

No changes were made in response to these comments.

Sierra Club and 24 individuals asked the commission to enforce the strictest plan to ensure that the City of Houston returns to an attainment status and greatly reduces its ozone pollution.

This comment refers to the City of Houston which is part of the HGB nonattainment area and is outside the scope of this Bexar County SIP revision.

Sierra Club and 24 individuals expressed concerns regarding TCEQ's vehicle emissions inspection and maintenance (I/M) program and recent reports of testing fraud in the program resulting in cars renewing registration without actually passing the required emissions test. They also expressed concern that the reports indicated the state's computer system was not programmed to catch and immediately stop fake

inspections. The same commenters expressed concern that such oversights have a detrimental impact on air quality.

The Texas Department of Public Safety (DPS) is responsible for 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 in response to this comment.

Sierra Club expressed concern that the Air Quality System (AQS) network monitors were not well located to record the impacts of coal fired electric generating units (EGU) in environmental justice communities in nonattainment areas.

Federal network design criteria, those used to determine the number and placement of monitors reporting to the 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 two ozone monitors in the San Antonio-New Braunfels metropolitan statistical area (MSA), based on the most recent population estimates and the three-year ozone design value. Texas exceeds these requirements with three ozone monitors in the MSA, which also encompasses the Bexar County area and includes communities located near heavily industrialized areas. TCEQ currently meets federal requirements to ensure that the network provides the information necessary to properly monitor and regulate all communities within Texas. 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/airquality/monops/past_network_reviews).

No changes were made in response to this comment.

Sierra Club and one individual commented that ozone pollution should be curbed and climate change needed to be mitigated for the environment and future generations.

As previously stated in this response to comments document, while ozone design values in Bexar County have decreased over the last 22 years, attainment of the ozone NAAQS remains an ongoing challenge. Comments regarding efforts to address global warming/climate change are outside the scope of this SIP revision.

No changes were made in response to these comments.

Sierra Club commented that TCEQ should consider urban planning in its proposal to meet emission limits. They stated that increasing greenspaces and walkable areas could lead to health benefits, energy savings, benefits for overburdened communities,

and air quality improvement. Sierra Club and one individual commented that there should be less cement and more trees.

Emission reduction benefits from regional planning efforts, which are not regulated by TCEQ, are not quantified for this SIP revision and are outside the scope of the SIP elements considered for adoption. No changes were made in response to this comment.

EPA requested TCEQ carefully review applicable authorities for opportunities to incorporate environmental justice (EJ) considerations and ensure they have been adequately and appropriately incorporated in this State Implementation Plan (SIP), as well as incorporating EJ considerations in developing contingency measures. 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.

Sierra Club stated coal-fired electricity generating units (EGUs) have led to high ozone levels in EJ communities. Further, Sierra Club stated that communities of color and economically marginalized communities carry a disproportionate burden of ozone exposure.

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 (1) whether a SIP revision has the potential to contribute to significant public health or environmental impacts, (2) whether the community may be particularly vulnerable to impacts from the SIP revision, and (3) 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 San Antonio.

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 *Federal Register* (FR) 14103). Further, TCEQ's jurisdiction is limited by statute; for example, it 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.

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.

This SIP revision was developed in compliance with the policies and guidance delineated in TCEQ's Language Access Plan (LAP) and TCEQ's Public Participation

Plan (PPP).[1,2] 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 Bexar County area, which was then used to plan public engagement efforts for this SIP revision. Specifically, TCEQ translated the Plain Language Summaries, GovDelivery notices, Public Hearing notices, and SIP Hot Topics notices into Spanish for all projects. Newspaper publications were also in Spanish. Additionally, two Spanish translators were available at all hearings, and the notices included a statement that Spanish translation would be available at each hearing.

Specific health-related concerns are further addressed elsewhere in this response to comments.

No changes were made in response to these comments.

EMISSIONS INVENTORY

The EPA requested clarification on whether the updated February 2023 guidance for cetane improvement projects was considered for the Bexar County AD SIP revision.

With the final reclassification of Bexar County area to serious nonattainment for the 2015 ozone NAAQS, EPA determined that a demonstration of attainment is no longer required. Therefore, assessment and quantification of emissions reductions from cetane improvement projects (i.e., the Texas Low Emission Diesel program) by the applicable moderate attainment date is not being adopted and submitted to EPA as part of this SIP revision.

No changes were made in response to this comment.

HEALTH EFFECTS AND ENVIRONMENTAL IMPACTS

Sierra Club and 24 individuals, in Sierra Club's form letter, highlighted that the 2022 "State of the Air" report by the American Lung Association ranked San Antonio as the 25th most ozone polluted city in the nation and that these emissions can cause premature death and other serious health effects such as asthma attacks, cardiovascular damage and developmental and reproductive harm.[3] The form letter also mentioned that an analysis by researchers at New York University and the American Thoracic Society showed that elevated ozone levels in the San Antonio-New Braunfels area cause about 30 premature deaths annually.[4]

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[1] https://www.tceq.texas.gov/downloads/agency/decisions/participation/language-access-plan-gi-608.pdf
[2] https://www.tceq.texas.gov/downloads/agency/decisions/participation/public-participation-plan-gi-607.pdf
[3] https://www.lung.org/media/press-releases/sota-dallas-fy22
[4] https://healthoftheair.org/rankings

Sierra Club commented that ozone, a main component of smog, is detrimental to health and that short-exposure to ozone can cause chronic conditions including respiratory, cardiovascular, reproductive, and central nervous system effects, as well as mortality. They stated that ozone exposure causes exacerbation and contributes to new onset asthma and that EPA, in its policy assessment for ozone NAAQS, showed that there is an association between ozone exposure and increased asthma attacks, emergency room visits, hospitalization, and medication use for asthma. They further highlighted that the effects of ozone exposure are cumulative and increase with higher ozone concentrations and increased exposure time. Notably, they mentioned that the impacts of ozone exposure on the respiratory system can occur at levels below the 2015 eight-hour ozone NAAQS of 70 ppb.

Sierra Club and two individuals commented about the importance of clean air or wanting clean air to breathe. Sierra Club and one individual commented on the need to protect future generations. Sierra Club and one individual commented that pollution from coal plants is harming the environment and is harmful to the elderly and children. Sierra Club and one individual expressed concern about ozone pollution and its effects on the environment and human health. Sierra Club and one individual commented that morning haze formation from the cement plants in the area makes breathing unhealthy. Sierra Club and two individuals addressed the need for urgent attention and action from the authorities and government. Sierra Club and two individuals commented regarding the need for newer technologies that will ensure cleaner air for the future generations. Sierra Club and one individual expressed frustration regarding the failure to implement better controls, given their respiratory issues. Sierra Club and one individual commented that they do not want to go out on ozone action days and that due their asthma condition, ozone affects them seriously. Sierra Club and 24 individuals commented that according to Sierra Club's 2023 Out of Control Report, the Spruce and San Miguel coal plants cause an estimated 36 deaths every year; Sierra Club and one individual further commented that ozone pollution from the Spruce coal plant directly harms the health of San Antonians and TCEQ has an obligation to fix it.

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. The ozone NAAQS has been determined by EPA as adequate to protect public health, including sensitive members of the population. EPA considered these health impacts when setting the 2015 eight-hour ozone NAAQS of 70 ppb.

The commission takes the health and concerns of Texans seriously. Current scientific literature does not provide a definitive link between ambient ozone levels and asthma development. Many different health effects have been investigated after 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. Those that do not have robust datasets in the *Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants* include:

mortality, cancer, reproductive, cardiovascular, and central nervous system impacts.[5]

The trend in asthma prevalence and the lack of a definitive link between ambient ozone concentrations and asthma rates is 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.[6, 7] **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.**[8] **Therefore, because asthma rates have remained steady while ambient levels of both ozone and ozone precursors have periods of steady decrease and 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 (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 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. Some scientists have also suggested that changes in exposure to microorganisms or the rise in sedentary lifestyle (affecting lung health) may also contribute.[9]

The commission does not support the assertion that ambient concentrations of ozone are 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.[10, 11] **Ethical standards preclude scientists from giving human subjects potentially lethal doses of chemicals, and none of the human subjects in these studies died as a result of their exposure to ozone. Basic toxicological principles indicate that concentrations of ozone (or any other chemical) that only**

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[5] U.S. Environmental Protection Agency (EPA).2020a. *Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants* (Final Report, April 2020). https://ordspub.epa.gov/ords/eims/eimscomm.getfile?p_download_id=540022

[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.

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

[10] 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.

[11] 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.

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[12] and the National Institute for Occupational Safety and Health (NIOSH) Immediately Dangerous to Life or Health value for ozone is 5,000 ppb.[13] Therefore, the available information does not support assertions that there is a mechanism for ambient ozone to contribute to mortality. Finally, EPA's 2019 Policy Assessment downgraded the relationship between short-term exposure to ozone and mortality from a likely causal relationship to suggestive of a causal relationship.[14]

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. The commission is aware that black children in Texas have higher asthma prevalence compared to other racial and ethnic groups and are more likely to visit the emergency department or be admitted to the hospital due to asthma.[15] The causes of asthma are very complex and not fully understood. There are many factors that have been linked to an increasing risk of developing asthma, and it is often difficult to find a single, direct cause.[16] According to 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 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. Some scientists have also suggested that changes in exposure to microorganisms or the rise in sedentary lifestyle (affecting lung health) may also contribute.[17]

Sierra Club commented that the adverse health impacts of ozone exposure do not affect all Texans equally and that the EPA's EJScreen tool shows that populations in Texas nonattainment areas have high environmental justice index values for ozone considering both exposure to pollution and socioeconomic indicators. Sierra Club stated that asthma affects Black communities at disproportionate rates in Texas, measured by emergency department visits, hospitalizations, and death rates. Sierra Club also stated that reducing ozone pollution and NO_x emissions is essential to reduce the unequal public health harms unjustly borne by low-income populations and people of color in Texas.

The commission takes its commitment to protect the environment and public health of all Texans very seriously. The ozone NAAQS has been determined by the EPA as requisite to protect public health, including sensitive members of the

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[12] Stokinger, HE. 1957. Evaluation of the hazards of ozone and oxides of nitrogen. *Arch Ind Health* 15:181-190.
[13] *NIOSH Pocket Guide to Chemical Hazards* (NPG). 2005. Pub No. 2005-149. http://www.cdc.gov/niosh/npg/
[14] 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
[15] Texas Department of State Health Services (TDSHS) 2020. *Strategic Plan for Asthma Control in Texas, 2021-2024*. https://www.dshs.texas.gov/sites/default/files/asthma/Documents/Asthma-Control-Strategic-Plan-2021-2024.pdf
[16] World Health Organization (WHO). 2023. Asthma. https://www.who.int/news-room/fact-sheets/detail/asthma
[17] Id.

population such as children, the elderly, and those with pre-existing conditions, such as asthma. TCEQ is aware that Black children in Texas have higher asthma prevalence compared to other racial and ethnic groups and are more likely to visit the emergency department or be admitted to the hospital due to asthma.[18] The causes of asthma are very complex and not fully understood. There are many factors that have been linked to an increasing risk of developing asthma, and it is often difficult to find a single, direct cause.[19] 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 early life events (such as prematurity and low birth weight); and environmental allergens and irritants as well as obesity are also thought to increase the risk of asthma. Some scientists have also suggested that changes in exposure to microorganisms or the rise in sedentary lifestyle (affecting lung health) may also contribute.

No changes were made in response to these comments.

TECHNICAL ANALYSIS

EPA requested that TCEQ provide the tons of NO_x reductions predicted by the model for the Bexar County nonattainment area to attain the ozone NAAQS.

With the final reclassification of Bexar County to serious nonattainment for the 2015 ozone NAAQS, EPA determined that a demonstration of attainment by the applicable moderate attainment date is no longer required. Therefore, photochemical modeling, including a prediction of tons of NO_x reduced, is not being adopted and submitted to EPA as part of this SIP revision.

No changes were made in response to this comment.

EPA suggested that TCEQ consider field studies about the potential impacts of the Eagle Ford Shale area on Bexar County monitors.

TCEQ has ongoing work and future initiatives to gain a better understanding of ozone formation in Bexar County and the impact of various upwind sources on air quality in the nonattainment area.

No changes were made in response to this comment.

CONTROL STRATEGIES

EPA commented that TCEQ should adopt the same Stage I requirements in Bexar County as they are implemented in the DFW and HGB areas, lowering the Stage I exemption threshold from the current 25,000 gallons of gasoline per month to 10,000 gallons per month.

As stated in Section 4.9.2, *Stage I Vapor Recovery* of this SIP revision, Bexar County meets the Stage I vapor recovery requirements for the moderate nonattainment

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[18] Strategic Control for Asthma Control in Texas, 2021-2024. https://www.dshs.texas.gov/sites/default/files/asthma/Documents/Asthma-Control-Strategic-Plan-2021-2024.pdf.

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

areas. EPA approved Texas' SIP submittal regarding Stage I regulations in 30 Texas Administrative Code (TAC) Chapter 115 on April 30, 2015, effective June 29, 2015, which apply in Bexar County (80 FR 24215).

TCEQ adopted rules (Project No. 2023-116-115-AI) lowering the Stage I exemption threshold for gasoline dispensing facilities in Bexar County from 25,000 gallons per month to 10,000 gallons per month in 30 TAC §115.227(1). As required by 30 TAC §115.229(f), *Counties and Compliance Schedules*, the owner or operator of each affected source in the Bexar County area shall comply with all the applicable requirements of the division as soon as practicable, but no later than January 1, 2025.

No changes were made in response to this comment.

Sierra Club recommended TCEQ apply reasonably available control technology (RACT) regulations to sources outside nonattainment areas since it has the authority.

EPA's *Implementation of the 2015 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements; Final Rule* (2015 eight-hour ozone standard SIP requirements rule) does require states to consider and implement emissions controls on sources located outside of a nonattainment area but within the state's jurisdiction, but "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."

No changes were made in response to this comment.

Sierra Club commented that TCEQ's definition of reasonably available control measures (RACM) as "only measures that could be fully implemented by the attainment deadline" is based on a flawed assumption that Bexar County will attain by the 2023 attainment year.

With the final reclassification of Bexar County to serious nonattainment for the 2015 ozone NAAQS, EPA determined that a moderate classification RACM analysis is no longer required; therefore, it is not being adopted and submitted to EPA as part of this SIP revision.

No changes were made in response to this comment.

EPA disagreed with the use of the already implemented measures to satisfy the contingency measure requirements and cited a recent court decision (*Sierra Club, et al. v. EPA*, 985 F.3d 1055 (D.C. Cir. 2021) that invalidated the use of already implemented control measures and required prospective measures (i.e., undertaken in the future) to meet the federal Clean Air Act (CAA) contingency measure statutory requirements.

With the final reclassification of Bexar County area to serious nonattainment for the 2015 ozone NAAQS, EPA determined that contingency measures for failure to attain are no longer required; therefore, they are not being adopted and submitted to EPA as part of this SIP revision.

No changes were made in response to this comment.

Sierra Club commented that the each of the three nonattainment areas for the 2015 NAAQS—DFW, HGB, and Bexar County—have failed to reach attainment by the previously assigned 2021 attainment deadline (September 24, 2021 for Bexar County) while current monitoring data indicates that none of these nonattainment areas is likely to reach attainment by the 2024 deadline (September 24, 2024 for Bexar County). Sierra Club further commented that the proposed attainment demonstration SIP revision for the 2015 NAAQS in the Bexar County nonattainment area fails to provide RACT updates needed to achieve attainment as expeditiously as practicable. Sierra Club commented that RACT must be implemented all major sources within the state that affect air quality in nonattainment areas, in particular, oil and gas sources. Sierra Club commented that TCEQ has previously implemented VOC and NO_x controls outside the Bexar County area to assist ozone attainment and could therefore do so again as RACT for all nonattainment areas. Sierra Club and 24 individuals commented that a large part of the nonattainment problem in San Antonio is from coal power plant emissions, like from the Spruce and San Miguel plants, urging that those plants be required to utilize already-available control technologies.

The EPA acknowledged that this SIP revision did not include a RACT analysis and expressed interest in reviewing a completed RACT analysis at a future date. The Sierra Club commented that this SIP revision is incomplete due to the lack of RACT and that this deficiency will start the sanction and federal implementation plan clock.

A moderate classification RACT analysis was completed, and associated control measures required to implement moderate RACT for Bexar County were adopted by the commission on April 24, 2024. The Bexar County RACT SIP Revision and associated rule revisions were submitted to EPA on May 7, 2024. This satisfies the requirements of FCAA, §182(b)(2) and EPA's 2015 eight-hour ozone standard SIP requirements rule. Beginning on January 1, 2025, applicable sources in Bexar County must comply with new RACT requirements.

No changes were made in response to this comment.

Sierra Club commented that TCEQ must revisit the availability of RACT for the oil and gas industry. Sierra Club specifically recommended that TCEQ strengthen the 30 TAC Chapter 115, Subchapter B, Division 7 rules by lowering the applicability threshold for leak detection and repair (LDAR) requirements and eliminating provisions allowing well operators to reduce the frequency of LDAR inspections when the percentage of leaking components at the well site is less than two percent.

EPA's reclassification schedule did not allow time to complete updated RACT evaluations and incorporate them into the Bexar County 2015 ozone NAAQS attainment demonstration before the SIP proposal date. Since the proposal, a moderate classification RACT analysis was completed, and associated control measures required to implement moderate RACT for Bexar County, including updates to the Chapter 115, Subchapter B, Division 7 rules, were adopted by the commission on April 24, 2024. The Bexar County RACT SIP Revision and associated rule revisions were submitted to EPA on May 7, 2024. This satisfies the requirements of FCAA, §182(b)(2) and EPA's 2015 eight-hour ozone standard SIP

requirements rule. Beginning on January 1, 2025, applicable sources in Bexar County must comply with new RACT requirements.

No changes were made in response to this comment.

Sierra Club commented that TCEQ's analysis of the Bexar County nonattainment area for the 2015 Ozone NAAQS indicates that the area will not reach attainment by the deadline and that TCEQ must require RACM at all major sources within Texas that have an impact on the nonattainment area and that would allow the area to reach attainment as expeditiously as practical or will advance the attainment date. Sierra Club and one individual commented that technology that can have an impact on pollution should be greenlighted. Sierra Club and another individual commented that TCEQ should implement newer technology upgrades to ensure a cleaner future environment.

With the final reclassification of Bexar County to serious nonattainment for the 2015 ozone NAAQS, EPA determined that a moderate classification RACM analysis is no longer required; therefore, it is not being adopted and submitted to EPA as part of this SIP revision.

No changes were made in response to this comment.

Sierra Club commented that coal plants contribute significantly to ozone nonattainment. Sierra Club commented that EPA has based its Good Neighbor Plan on emissions from coal-fired and natural gas-fired EGUs over 100 megawatts commensurate with newly-installed selective catalytic reduction (SCR) systems operating at 0.05 pound (lb) NO_X/million British thermal units (MMBBtu) and optimized existing SCR systems operating at 0.08 lb/MMBtu. Sierra Club considered these levels as implementation of SCR technology to its fullest potential and asked TCEQ to set RACT or RACM for fossil-fired EGUs throughout Texas at these levels. Sierra Club argued that TCEQ must set RACT at a level at least as stringent as the Good Neighbor Plan. Alternatively, Sierra Club also commented that Georgia and other states have required RACM EGU NO_X reductions based on SCR operation. Sierra Club further commented that the implementation rate of SCR at coal-fired EGUs in Texas lags significantly behind the national average. Sierra Club claimed that coal-fired EGUs were responsible for 55,349 tons of NO_X in Texas during 2021 and that only 35% of the coal-fired EGU capacity in Texas has implemented SCR technology while the national average for SCR implementation at coal-fired EGUs is 62%.

Sierra Club also commented on one source, W.A. Parish, which has SCR technology installed but does not run the control technology at full capacity. Sierra Club provided supporting information citing four determinations EPA has made regarding SCR installation at coal-fired EGUs: First, EPA has acknowledged that states allowing some power plants to operate without SCR incentivizes stakeholders to produce higher emissions in order to lower operating costs. Second, Sierra Club claimed that EPA has found that economic feasibility of a particular technology is determined by the incidence of that technology at other sources more than by a particular source's ability to afford the technology. Third, most coal-fired EGUs across the nation have SCR technology implemented. Finally, Sierra Club estimated the cost per ton of NO_X reductions through SCR installation to be $11,000. Sierra Club further commented that

Texas coal-fired EGUs could install and implement SCR technology in 11 to 36 months, which would allow enough installation time to meet the RACT implementation deadline for severe areas under the 2008 ozone NAAQS, November 7, 2025.

With the final reclassification of Bexar County to serious nonattainment for the 2015 ozone NAAQS, EPA determined that a moderate classification RACM analysis is no longer required; therefore, it is not being adopted and submitted to EPA as part of this SIP revision.

A moderate classification RACT analysis was completed, and associated control measures required to implement moderate RACT for Bexar County were adopted by the commission on April 24, 2024. The Bexar County RACT SIP Revision and associated rule revisions were submitted to EPA on May 7, 2024. This satisfies the requirements of FCAA, §182(b)(2) and EPA's 2015 eight-hour ozone standard SIP requirements rule. Beginning on January 1, 2025, applicable sources in Bexar County must comply with new RACT requirements.

No changes were made in response to this comment.

WEIGHT OF EVIDENCE

EPA expressed support for this SIP revision's inclusion of the SmartWay Transport Partnership program, energy efficiency/renewable energy measures, and the continued implementation of Texas Emissions Reduction Plan (TERP) in the Bexar County nonattainment area.

The commission thanks EPA for the support. However, with the final reclassification of Bexar County to serious nonattainment for the 2015 ozone NAAQS, EPA determined that a moderate classification weight of evidence analysis is no longer required. Therefore, Section 5.3.1, which discussed the SmartWay Transport Partnership program, energy efficiency/renewable energy measures, and the implementation of Texas Emissions Reduction Plan (TERP) in Bexar County, is not being adopted and submitted to EPA as part of this SIP revision.