

Texas: San Antonio

Intended Area Designations for the 2015 Ozone National Ambient Air Quality Standards (NAAQS) Technical Support Document (TSD)

1.0 Summary

This technical support document (TSD) describes the EPA's intended designation for the San Antonio area in Texas for the 2015 ozone National Ambient Air Quality Standards (NAAQS). The intended designations for other previously undesignated areas in Texas were announced on December 21, 2017 and are in the docket for this action.

On October 1, 2015, the EPA promulgated revised primary and secondary ozone NAAQS (80 FR 65292; October 26, 2015). The EPA strengthened both standards to a level of 0.070 parts per million (ppm). In accordance with Section 107(d) of the Clean Air Act (CAA), whenever the EPA establishes a new or revised NAAQS, the EPA must promulgate designations for all areas of the country for that NAAQS. The EPA must complete this process within 2 years of promulgating the NAAQS, unless the Administrator has insufficient information to make the initial designations decisions in that time frame. In such circumstances, the EPA may take up to 1 additional year to complete the designations.

Under CAA section 107(d), states were required to submit area designation recommendations to the EPA for the 2015 ozone NAAQS no later than 1 year following promulgation of the standards, i.e., by October 1, 2016. Tribes were also invited to submit area designation recommendations. On September 30, 2016, Texas ("the State") submitted to EPA its recommendations for nonattainment counties. On August 23, 2017, the State submitted updated recommendations.¹ In a letter dated September 27, 2017, the state of Texas urged EPA not move forward with any nonattainment designations for new areas, such as the San Antonio area in Bexar County at this time. On January 19, 2018, EPA Region 6 submitted a letter to Governor Abbott asking whether he intended the September 27, 2017 letter to serve as a revision to the September 30, 2016 recommended designations for the counties in the San Antonio area. On February 28, 2018, the Governor of Texas responded to the EPA, urging the EPA to designate the area as attainment or at most, unclassifiable.²

After considering the State's recommendations and other relevant technical information regarding the designation of the San Antonio area, the EPA intends to designate the San Antonio area counties of Atascosa, Bandera, Comal, Guadalupe, Kendall, Medina, and Wilson as Attainment/Unclassifiable, and intends to modify Texas's recommendation of Attainment for Bexar County.

¹ All the state and tribal recommendations submitted to EPA are available at <https://www.epa.gov/ozone-designations/2015-ozone-standards-state-recommendations>.

² These letters are posted in the docket for this action.

On November 6, 2017 (82 FR 54232; November 16, 2017), the EPA signed a final rule designating most of the areas the State did not recommend for designation as nonattainment as attainment/unclassifiable.³ On December 20, 2017, the EPA announced its intended designations for the remaining areas, except San Antonio (see 83 FR 651, January 5, 2018). EPA explains in section 2.0 the approach it is now taking to designate the remaining areas in the State.

The EPA will designate all tribes in accordance with two guidance documents issued in December 2011 by the EPA Office of Air Quality Planning and Standards titled, “Guidance to Regions for Working with Tribes during the National Ambient Air Quality Standards (NAAQS) Designations Process,”⁴ and “Policy for Establishing Separate Air Quality Designations for Areas of Indian Country.”⁵ There are no tribal lands in the areas addressed in the State’s recommendation for the San Antonio area.

2.0 Nonattainment Area Analyses and Intended Boundary Determination

The EPA evaluates and determines the intended boundaries for each nonattainment area on a case-by-case basis, considering the specific facts and circumstances of the area. In accordance with the CAA section 107(d), the EPA is required to designate as nonattainment the areas with the monitors that are violating the 2015 ozone NAAQS and nearby areas with emissions sources (i.e., stationary, mobile, and/or area sources) that contribute to the violations. As described in the EPA’s designations guidance for the 2015 NAAQS (hereafter referred to as the “ozone designations guidance”⁶ after identifying each monitor indicating a violation of the ozone NAAQS in an area, the EPA analyzed those nearby areas with emissions potentially contributing to the violating area. In guidance issued in February 2016, the EPA provided that using the Core Based Statistical Area (CBSA) or Combined Statistical Area (CSA)⁷ as a starting point for the contribution analysis is a reasonable approach to ensure that the nearby areas most likely to contribute to a violating area are evaluated. The area-specific analyses may support establishing nonattainment area boundaries that are smaller or larger than the CBSA or CSA.

On November 6, 2017, the EPA issued Attainment/Unclassifiable designations for approximately 85% of the United States and one unclassifiable area designation.⁸ At that time, consistent with statements in the designations guidance regarding the scope of the area the EPA would analyze in determining

³ In previous ozone designations and in the designation guidance for the 2015 ozone NAAQS, the EPA used the designation category label Unclassifiable/Attainment to identify both areas that were monitoring attainment and areas that did not have monitors but for which the EPA had reason to believe were likely attainment and were not contributing to a violation in a nearby area. The EPA is now reversing the order of the label to be Attainment/Unclassifiable so the category is more clearly distinguished from the separate Unclassifiable category.

⁴ <https://www.epa.gov/sites/production/files/2016-02/documents/ozone-designation-tribes.pdf>

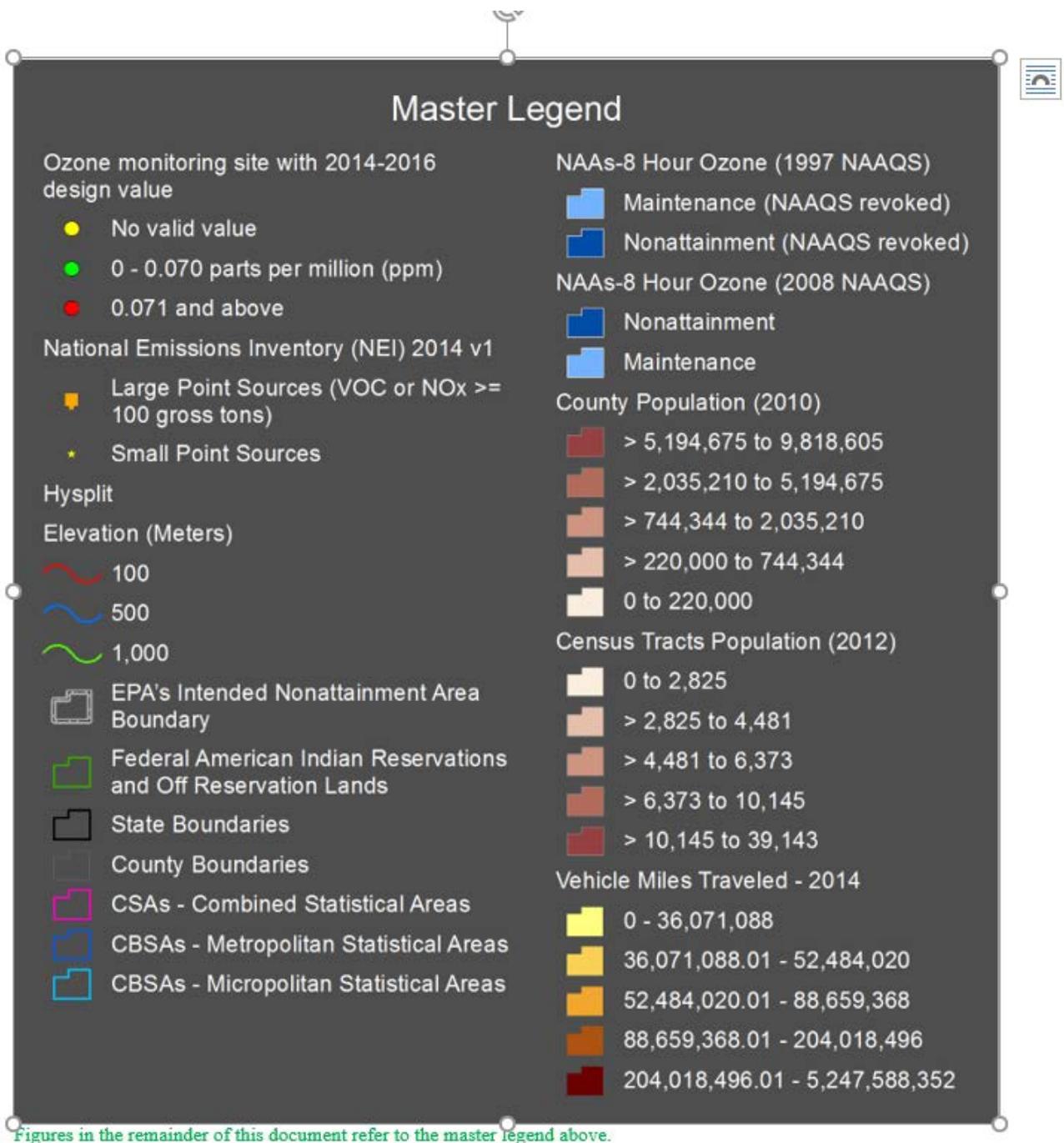
⁵ <https://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf>

⁶ The EPA issued guidance on February 25, 2016 that identified important factors that the EPA intends to evaluate in determining appropriate area designations and nonattainment boundaries for the 2015 ozone NAAQS. Available at <https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs>

⁷ Lists of CBSAs and CSAs and their geographic components are provided at www.census.gov/population/www/metroareas/metrodef.html. The Office of Management and Budget (OMB) adopts standards for defining statistical areas. The statistical areas are delineated based on U.S. Census Bureau data. The lists are periodically updated by the OMB. The EPA used the most recent July 2015 update (OMB Bulletin No. 15-01), which is based on application of the 2010 OMB standards to the 2010 Census, 2006-2010 American Community Survey, as well as 2013 Population Estimates Program data.

⁸ Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards published on November 16, 2017(82 FR 54232).

nonattainment boundaries, EPA deferred designation for any counties in the larger of a CSA or CBSA where one or more counties in the CSA or CBSA was violating the standard and any counties with a violating monitor not located in a CSA or CBSA. In addition, the EPA deferred designation for any other counties adjacent to a county with a violating monitor. The EPA also deferred designation for any county that had incomplete monitoring data, any county in the larger of the CSA or CBSA where such a county was located, and any county located adjacent to a county with incomplete monitoring data. In the San Antonio area, Atascosa, Bandera, Bexar, Guadalupe, Comal, Kendall, Medina and Wilson Counties were deferred.



3.0 Technical Analyses

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides EPA's evaluation of the area and any nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone

designations guidance and any other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).⁹ In addition, the EPA considered any additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

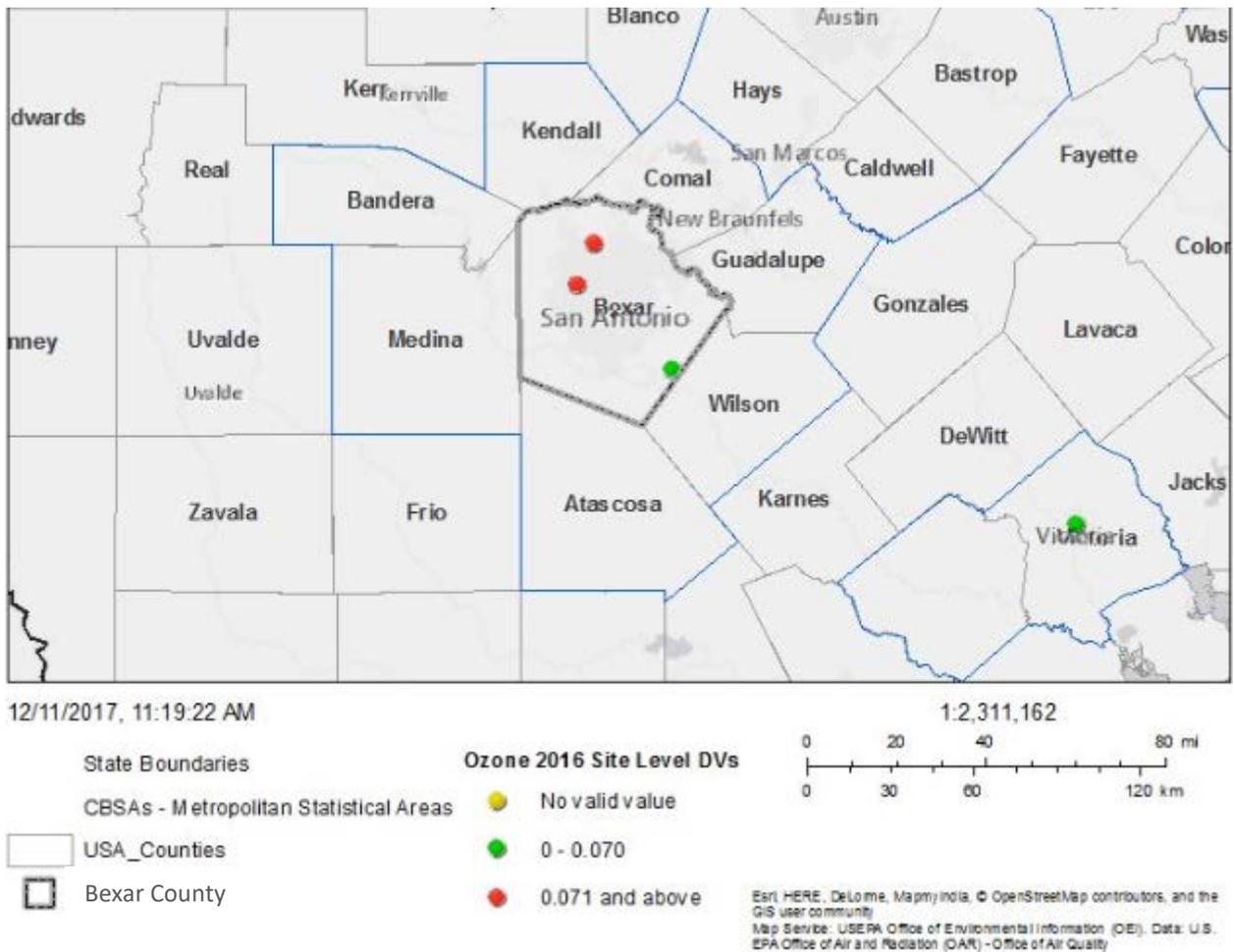
1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

The Core Based Statistical Area (CBSA) is known as San Antonio-New Braunfels and includes eight counties: Atascosa, Bandera, Bexar, Comal, Guadalupe, Kendall, Medina, and Wilson. There is not a CSA that includes any of the counties in the San Antonio-New Braunfels CBSA. The CBSA is shown in Figure 1 below and we refer to these eight counties as the area of analysis. Figure 1 also shows the EPA's intended nonattainment boundary, the ambient air quality monitors, county and other jurisdictional boundaries. For purposes of the 1997 ozone NAAQS, three counties within the area of analysis were designated nonattainment/deferred: Bexar, Comal, and Guadalupe.¹⁰ For purposes of the 2008 ozone NAAQS, all the counties within the area of analysis were designated as unclassifiable/attainment.

⁹ The EPA's Ozone Designations Guidance and Data web page can be found at <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data>.

¹⁰ To receive the deferred effective date, these counties and the State participated in the EPA's Early Action Compact, within which they agreed to reduce ground-level ozone pollution earlier than the CAA would require (see 69 FR 23858, April 30, 2004). These counties successfully attained and were designated as attainment for the 1997 ozone standard on April 2, 2008 (73 FR 17897).

Figure 1. EPA's Intended Nonattainment Boundaries for the Area of Analysis



The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Bexar County has two monitors in violation of the 2015 ozone NAAQS. The following sections describe the weight-of-evidence five factor analysis. While the factors are presented individually, they are not independent. The five-factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the area of analysis based on data for the 2014-2016 period (i.e., the 2016 design value). This is the most recent three-year period with fully-certified air quality data. The DV is the 3-year average of the annual 4th highest daily

maximum 8-hour average ozone concentration.¹¹ The 2015 NAAQS are met when the DV is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.¹² The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone DVs. Individual violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule¹³ are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the DV for the county or area is determined by the monitor with the highest valid DV. The presence of one or more violating monitors (i.e. monitors with DV greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent DVs violate the NAAQS, and examined historical ozone air quality measurement data (including previous DVs) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing DV data generally include State and Local Air Monitoring Stations that are operated in accordance with 40 CFR part 58, appendix A, C, D and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes.¹⁴

The 2014-2016 DVs for counties in the area of analysis are shown in Table 1 below.

¹¹ See 40 CFR part 50, appendix U.

¹² The QA requirements for ozone monitoring data are specified in 40 CFR part 58, appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53, subpart B.

¹³ The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see <https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance>.

¹⁴ All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248). There are 8 SPMs in the area of analysis, 6 of which are owned and operated by the Alamo Area Council of Governments and the remainder owned and operated by San Antonio City Public Services. However, these 8 monitors are not eligible for comparison to the NAAQS because they do not meet the quality assurance and quality control requirements at 40 CFR part 58.

Table 1. Air Quality Data (all values in ppm)^a

County	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4 th highest daily max value	2015 4 th highest daily max value	2016 4 th highest daily max value
Atascosa	No	No monitor	N/A			
Bandera	No	No monitor	N/A			
Bexar	No	480290052 “Camp Bullis”	0.073	0.072	0.080	0.069
		480290032 “Northwest”	0.073	0.069	0.079	0.071
		480290059 “Calaveras Lake”	0.064	0.063	0.068	0.062
Guadalupe	No	No monitor	N/A			
Comal	No	No monitor	N/A			
Kendall	No	No monitor	N/A			
Medina	No	No monitor	N/A			
Wilson	No	No monitor	N/A			

^aThe highest design value in each county is indicated in bold type.

N/A means that no data exists for the county.

Two of the regulatory monitors in Bexar County show a violation of the 2015 ozone NAAQS.

An area must also be designated nonattainment if it contributes to a violation in a nearby area. Each county without a violating monitor that is located near a county with a violating monitor has been evaluated based on the weight-of-evidence of the five factors and other relevant information to determine whether it contributes to the nearby violation. EPA also notes that, in addition to the violating monitors in Bexar County, the County has one ambient monitor that is meeting the ozone NAAQS. Within the area of analysis, Atascosa, Bandera, Comal, Guadalupe, Kendall, Medina, and Wilson counties do not have regulatory ozone monitoring sites.

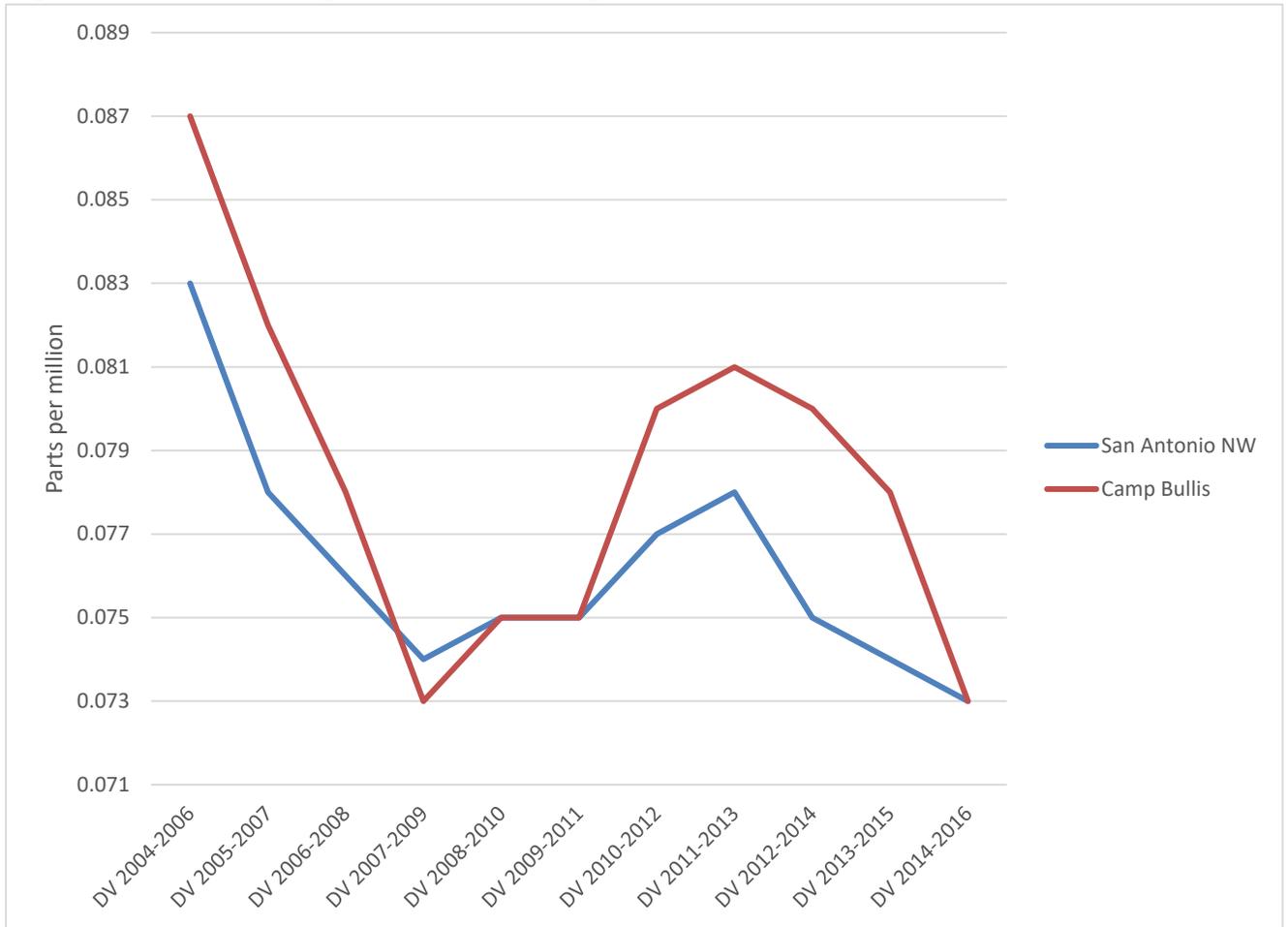
Figure 1, shown previously, identifies the intended nonattainment area, the CBSA boundary and the violating monitors. Table 1 identifies the DVs for all monitors in the area of analysis and Figure 2 below shows the historical trend of DVs for the violating monitors. As indicated in Figure 1, there are three regulatory monitors in the area of analysis, two of which are violating the 2015 ozone NAAQS. The two violating monitors are located in the northwest quadrant of Bexar County: the “Northwest” monitor and the “Camp Bullis” monitor. The Northwest monitor has a DV of 73 ppb and is located approximately 10 miles northwest¹⁵ of the center of Bexar County (roughly where the downtown San Antonio area is located), in a residential area and on the campus of John Marshall High School. The Camp Bullis monitor also has a DV of 73 ppb and is located approximately 15 miles north northwest of the center of Bexar County, on the grounds of the Camp Bullis military training reservation and near the southern border of such reservation. The monitor meeting the 2015 ozone NAAQS is known as Calaveras Lake – it has a DV

¹⁵ This distance is “as the crow flies.”

of 64 ppb and is approximately 15 miles southeast of the center of Bexar County, at the southern end of Calaveras Lake.

Figure 2 below illustrates the trend in ozone design values since 2006 at the monitors in the area of analysis currently violating the 2015 ozone NAAQS. We note the initial downward trend of decreasing ozone levels through 2009, after which time ozone levels increased by a maximum of 8 ppb at the Camp Bullis monitor in 2013 and thereafter have rapidly decreased to the lowest levels recorded in the area of analysis.

Figure 2. Three-Year Design Values for Violating Monitors (2006-2016)



Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI).¹⁶ For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year (tpy)) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 2 below provides a county-level emissions summary of NO_x and VOC emissions for the area of analysis considered for inclusion in the intended nonattainment area.

Table 2. Total County-Level NO_x and VOC Emissions

County	State Recommended Nonattainment?	Total NO _x (tpy)	Total VOC (tpy)
Bexar	No	38,094	35,111
Atascosa	No	8,097	8,960
Comal	No	7,282	3,863
Guadalupe	No	4,704	6,565
Medina	No	2,379	3,047
Wilson	No	1,889	2,885
Kendall	No	983	1,097
Bandera	No	593	1,122
Area wide:		64,021	62,750

Counties with monitors violating the NAAQS are indicated in bold.

Our review of emissions of NO_x and VOC in the area of analysis includes emissions from large and small point sources. The location of these sources, together with the other factors, can help define the nonattainment boundaries. The locations of the large and small point sources are shown in Figure 3 below.

¹⁶ The NEI numbers do not include biogenic emissions.

Figure 3. Large and Small Point Sources in the Area of Analysis

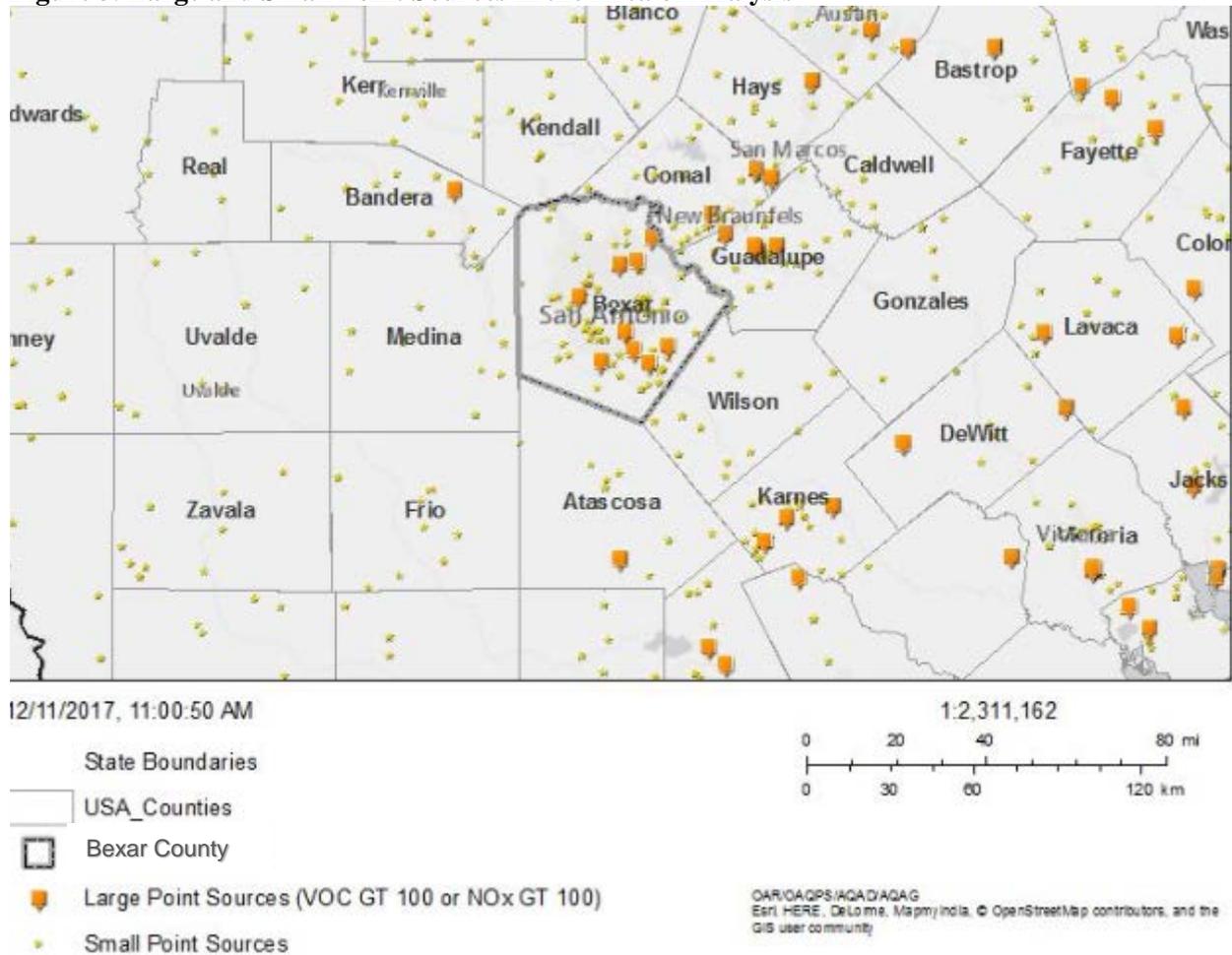


Figure 3 shows that the heaviest concentration of large point sources is in Bexar County, where the violating monitors are also located. Bexar County has the highest NO_x emissions in the area of analysis, exceeding 38,000 tpy, which accounts for nearly 60 percent of the NO_x emissions in the area of analysis. Atascosa and Comal counties emit the next highest levels of NO_x, with approximately 8,000 and 7,000 tpy, respectively. Guadalupe County emits about 4700 tpy, Medina emits about 2400 tpy, Wilson emits about 1900 tpy and the remaining counties emit less than 1,000 tpy. Bexar County also has the highest VOC emissions in the area of analysis, exceeding 35,000 tpy, which accounts for nearly 56 percent of the VOC emissions in the area of analysis. Atascosa and Guadalupe counties emit the next highest levels of VOC, with approximately 9,000 and 6500 tpy, respectively Comal County emits approximately 3900 tpy, Medina County emits about 3,000 tpy and Wilson County emits about 2,900 tpy. The remaining counties, each emit approximately 1,000 tpy.

Population density and degree of urbanization

The EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NOx and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NOx and VOC emissions that may contribute to violations of the NAAQS.

Table 3 shows the population, population density, and population growth information for each county in the area of analysis. Figure 4 contains a county-level density map of the area of analysis.

Table 3. Population and Growth

County	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute change in population (2010-2015)	Population % change (2010-2015)
Bexar	No	1,714,773	1,897,753	1,531	182,980	11
Guadalupe	No	131,533	151,249	213	19,716	15
Comal	No	108,472	129,048	231	20,576	19
Atascosa	No	44,911	48,435	40	3,524	8
Medina	No	46,006	48,417	37	2,411	5
Wilson	No	42,918	47,520	59	4,602	11
Kendall	No	33,410	40,384	61	6,974	21
Bandera	No	20,485	21,269	27	784	4
Area wide:		2,142,508	2,384,075	326	241,567	11

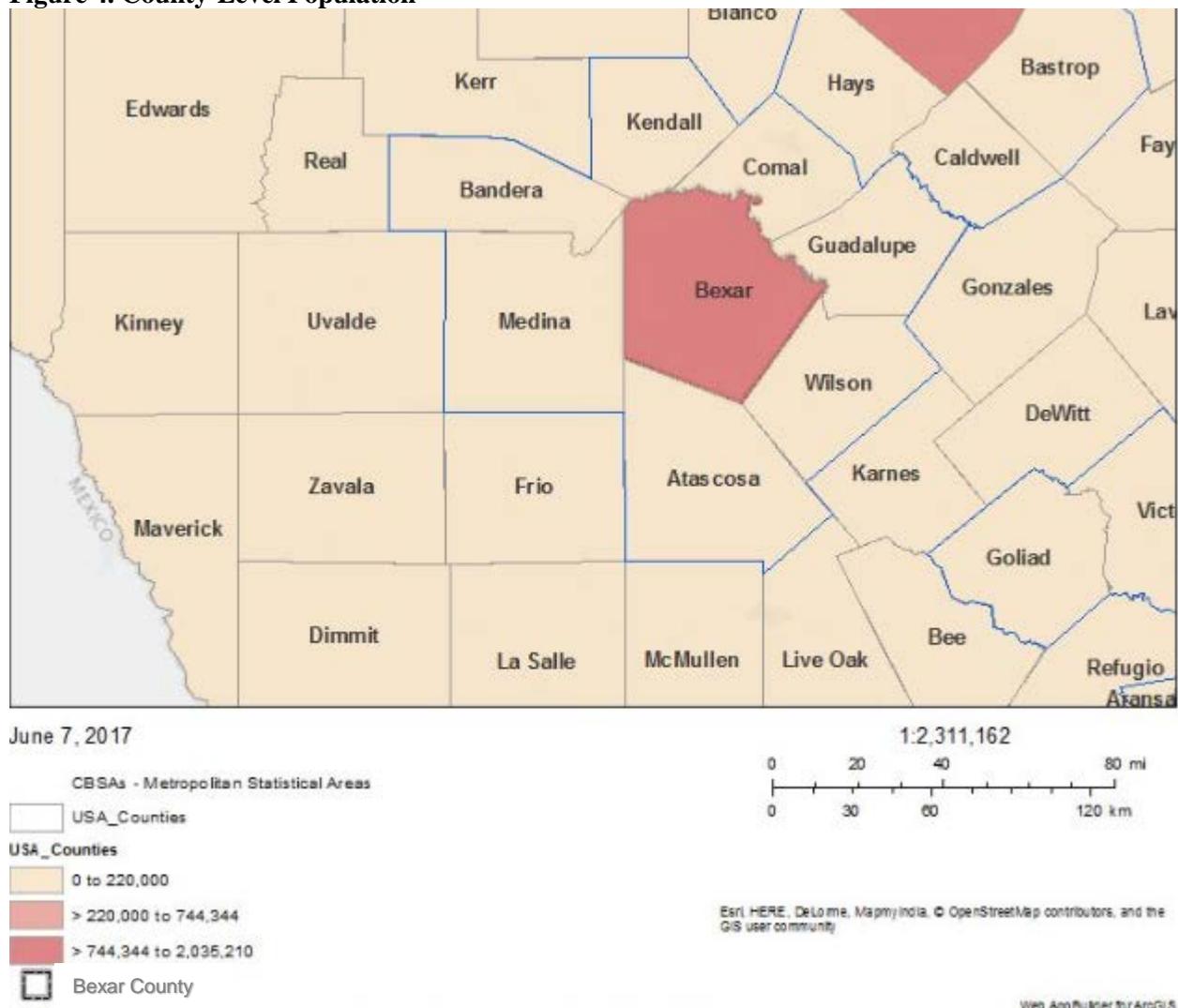
Source: U.S. Census Bureau population estimates for 2010 and 2015. www.census.gov/data.html

The 2015 Census data indicate that the majority of the population in the area of analysis (nearly 80 percent) reside in Bexar County, making it the most densely populated, with 1530 people per square mile. The next most populated counties are Comal and Guadalupe, with approximately 130,000 to 150,000, respectively (less than 10% of the population of Bexar). These two counties are less densely populated than Bexar, with over 200 people per square mile. Kendall, Wilson, Medina and Atascosa counties range in population from 40,000 to 48,000. Bandera is the least populated with over 21,000. These five less populated counties are also less densely populated, with 60 people per square mile or less.

From 2010 to 2015, Bexar County experienced the highest absolute population change with an increase in population of over 182,000, which is approximately an 11% change. Kendall and Comal Counties experienced the highest percentage population growth of 21% (nearly 7,000) and 19% (over 20,000), respectively. Over the same period, Guadalupe County grew by more than 19,000, which is approximately 15 percent, and Wilson County grew by more than 4,500, which is approximately 11 percent. Medina and Bandera Counties had relatively small changes in population, increasing by 5% and 4%, respectively, over the same period.

The presence of large populations and high population density is an indicator of high area and mobile source emissions of ozone precursors that may contribute to observed violations of the 2015 ozone NAAQS in this area.

Figure 4. County-Level Population



Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis.¹⁷ In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may

¹⁷ The VMT data are available from the NEI (see <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>). See also <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data>.

signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the CBSA.¹⁸ Table 4 below shows the traffic and commuting pattern data, including total VMT for each county, the number of residents who work in each county and number of residents commuting to Bexar County (which has the violating monitors), and the percent of residents commuting to Bexar County. The data in Table 4 are 2014 data.

Table 4. Traffic and Commuting Patterns

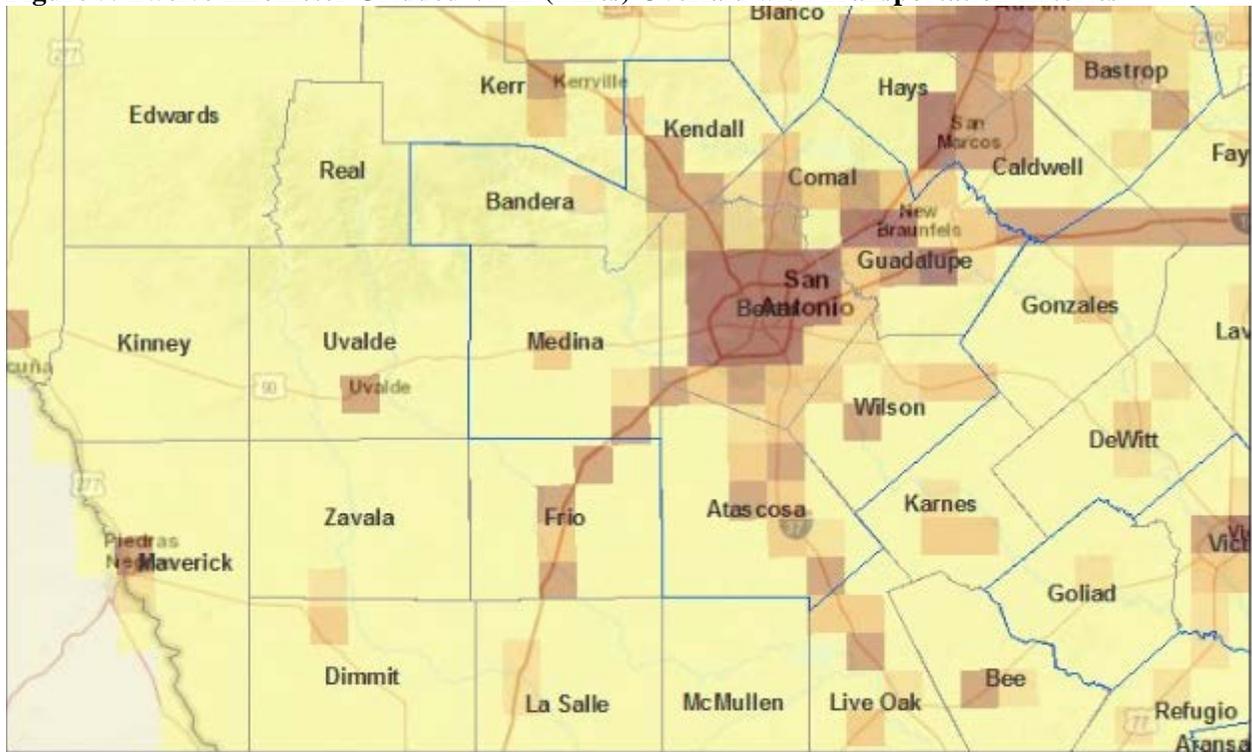
County	State Recommended Nonattainment?	2008 Total VMT (Million Miles)	2014 Total VMT (Million Miles)	VMT Growth 2008 to 2014 (percent)	Number of County Residents Who Work	Number Commuting to or Within County with Violating Monitors	Percentage Commuting to or Within County with Violating Monitors
Bexar	No	14,497	15,515	7%	745,493	579,420	77.7%
Comal	No	1,421	1,642	15.5%	52,488	16,981	32.4%
Guadalupe	No	1,230	1,391	13.1%	64,271	23,079	35.9%
Atascosa	No	610	832	36.4%	18,781	6,874	36.6%
Medina	No	526	572	8.7%	18,512	7,929	42.8%
Bandera	No	167	165	-0.9%	8,088	2,998	37.1%
Kendall	No	392	405	3.3%	15,139	6,625	43.8%
Wilson	No	358	472	31.6%	21,030	8,936	42.5%
Totals:		19,201	20,994	9.3%	943,802	652,842	69.2%

Counties with monitors violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 5 (below) overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

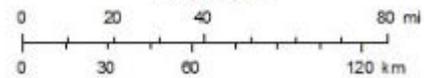
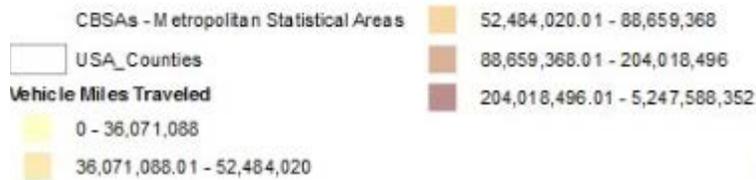
¹⁸ The worker data can be accessed at: <http://onthemap.ces.census.gov/>.

Figure 5. Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries



June 7, 2017

1:2,311,162



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), Mapbox, Swatch, Bing, OpenStreetMap contributors, and the GIS User Community
 U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning

Commuters in the area of analysis traveled a total of approximately 21 billion miles during calendar year 2014. Three counties in the area of analysis (Bexar, Comal and Guadalupe) each have total VMT for calendar year 2014 in excess of 1 billion. Bexar County has the highest total VMT with approximately 15.5 billion which is ten times higher than the VMT in Comal and Guadalupe with about 1.6 and 1.4 billion miles, respectively. Atascosa County has over 800 million VMT, Medina County has nearly 600 million, Wilson County has nearly 500 million, Kendall County has about 400 million, and Bandera County has less than 200 million miles.

Seven of the eight counties in the area of analysis experienced an increase in VMT for the period from 2008 – 2014.¹⁹ In two of those counties, the growth rate was over 30 percent: Atascosa (36%) and Wilson (32%). Two more counties experienced VMT growth over 10 percent: Comal (16%) and Guadalupe (13%). Medina County had approximately 9 percent growth in VMT, Bexar County had approximately 7

¹⁹ To calculate VMT growth we compared VMT from the 2008 and 2014 NEIs.

percent growth in VMT, and Kendall County had about 3 percent growth in VMT. Bandera County declined in VMT growth by approximately (-1%).

Within the area of analysis, Bexar County has the highest percentage of commuters and has the violating monitors – over 77 percent of workers living in Bexar County (nearly 580,000) commute within the county. The absolute number of workers living in Bexar County who commute within the county is about 88% of all commuters in the area of analysis that commute to the county with the violating monitor.

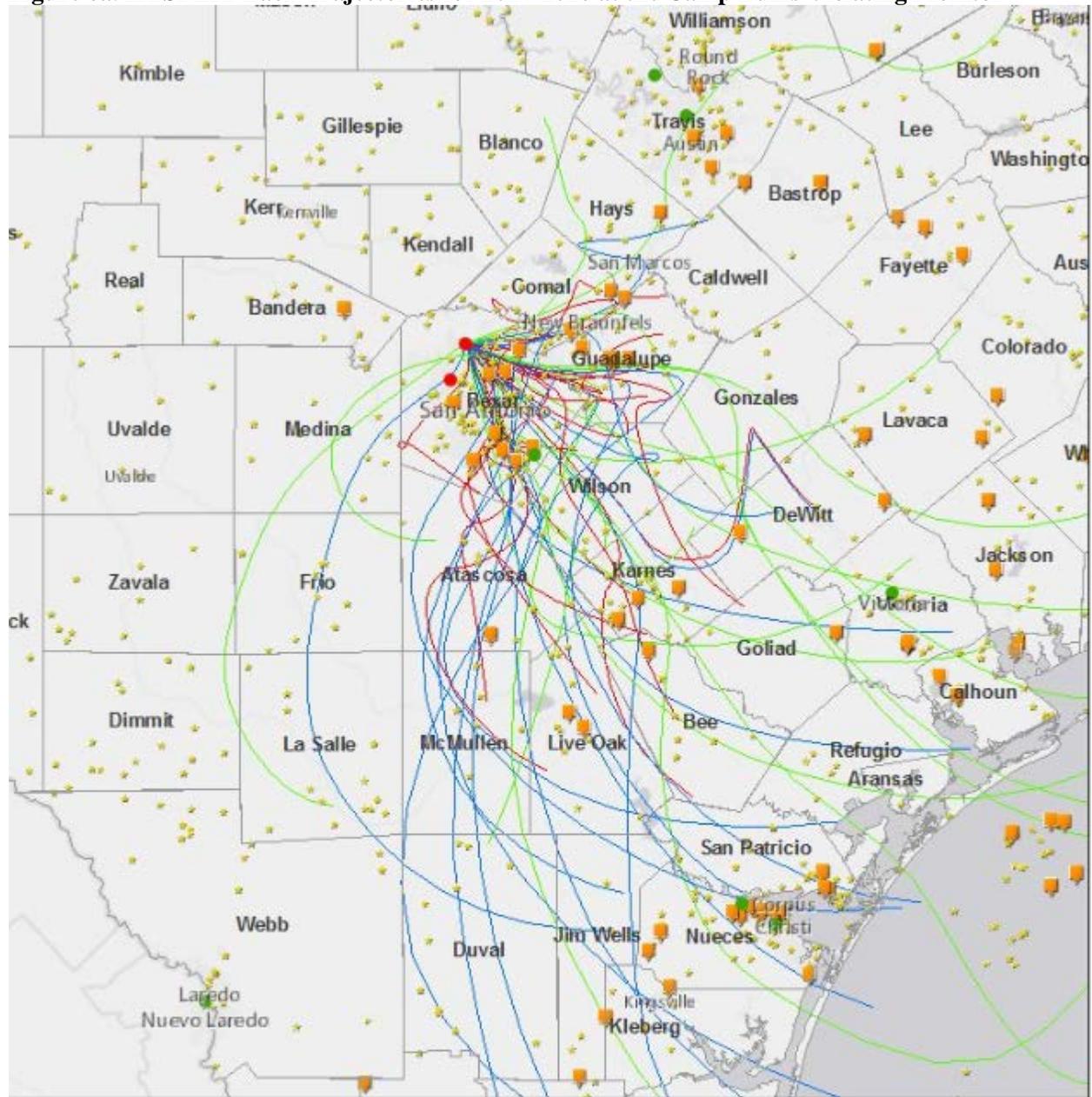
Approximately 40 percent of workers living in each of Medina, Kendall and Wilson Counties commute to Bexar County (the county with the violating monitor). However, the absolute number of workers living in each of these three counties who commute to Bexar County is less than 1.5 percent of all commuters in the area of analysis that commute to the violating monitor.

Approximately 32 to 37 percent of workers living in each of Comal, Guadalupe, Atascosa and Bandera Counties commute to Bexar County. However, the absolute number of workers living in Comal County who commute to Bexar County is less than 2.6 percent of all commuters in the area of analysis that commute to the violating monitor; the absolute number of workers living in Guadalupe County who commute to Bexar County is less than 3.5 percent of all commuters in the area of analysis that commute to the violating monitor; the absolute number of workers living in Atascosa County who commute to Bexar County is 1 percent of all commuters in the area of analysis that commute to the violating monitor; and the absolute number of workers living in Bandera County who commute to Bexar County is less than 1 percent of all commuters in the area of analysis that commute to the violating monitor.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area. EPA conducted analyses to better understand the area's meteorological transport conditions using the National Oceanic and Atmospheric Administration Hybrid Single Particle Lagrangian Integrated Trajectory Model (NOAA HYSPLIT or HYSPLIT). The HYSPLIT model yields an estimate of the path an air mass has traveled before reaching a monitor at a specific location and time. Specifically, the model provides the centerline of the probable path. By evaluating these estimates of where an air mass has traveled before reaching a monitor where an exceedance has occurred, one can consider what potential areas and emission sources could have contributed to the exceedance. The EPA evaluated 2014-2016 HYSPLIT trajectories at 100, 500, and 1000 meters AGL that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figures 6a and 6b show the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating monitors.

Figure 6a. HYSPLIT Back Trajectories for 2014-2016 at the Camp Bullis Violating Monitor



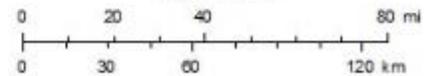
June 7, 2017

1:2,311,162

USA_Counties

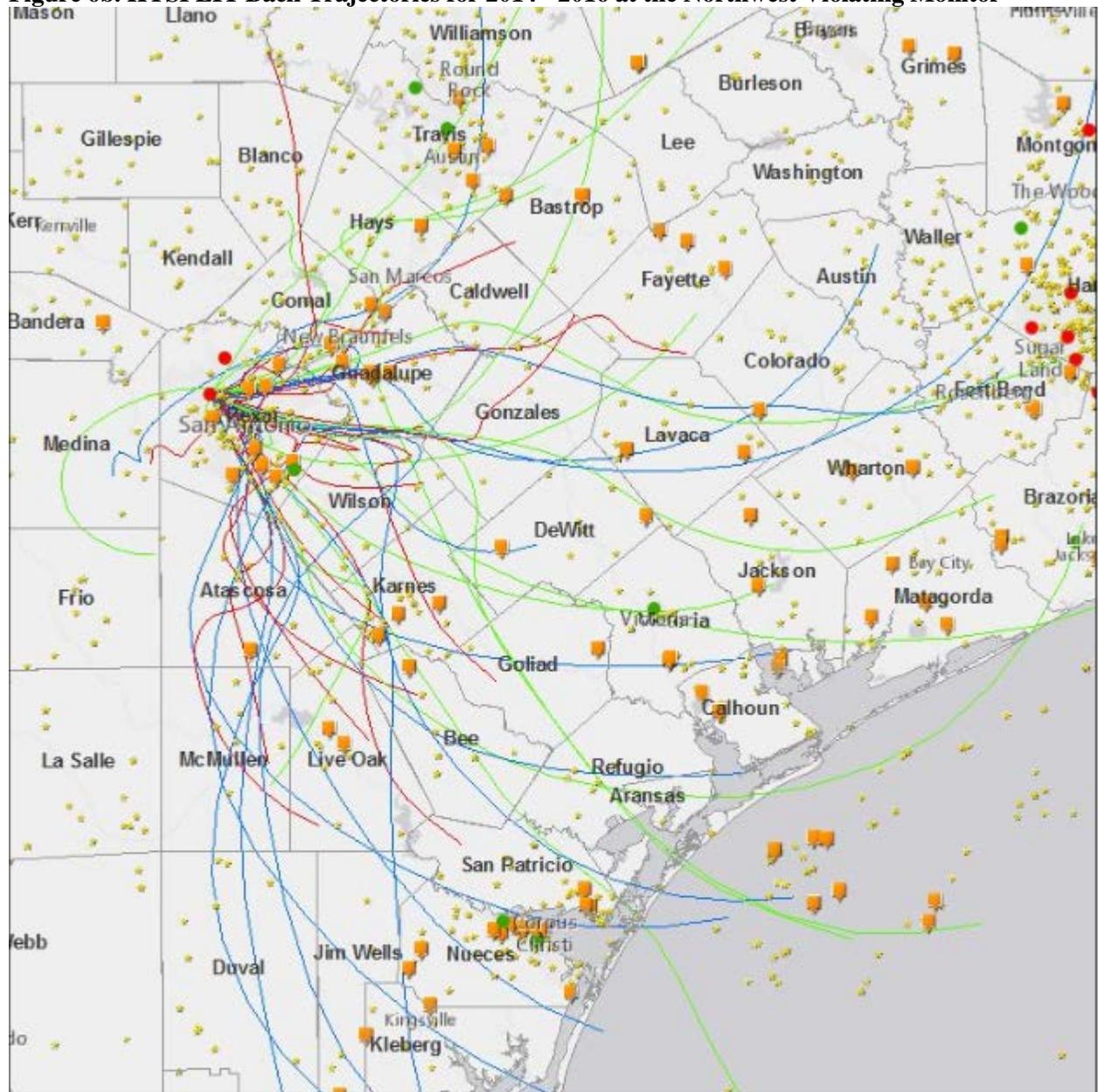
Site level DVs

- Violating
- Attaining
- Incomplete
- Large Point Sources (VOC GT 100 or NOx GT 100)
- Small Point Sources



OAR/OACPS/DAQ/DAQAG
 Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 6b. HYSPLIT Back Trajectories for 2014 - 2016 at the Northwest Violating Monitor



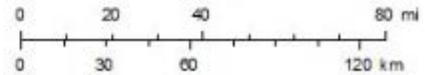
June 7, 2017

USA_Countries

Site level DVs

- Violating
- Attaining
- Incomplete
- Large Point Sources (VOC GT 100 or NOx GT 100)
- ★ Small Point Sources

1:2,311,162



QAR/QGPS/QCAD/QAG
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

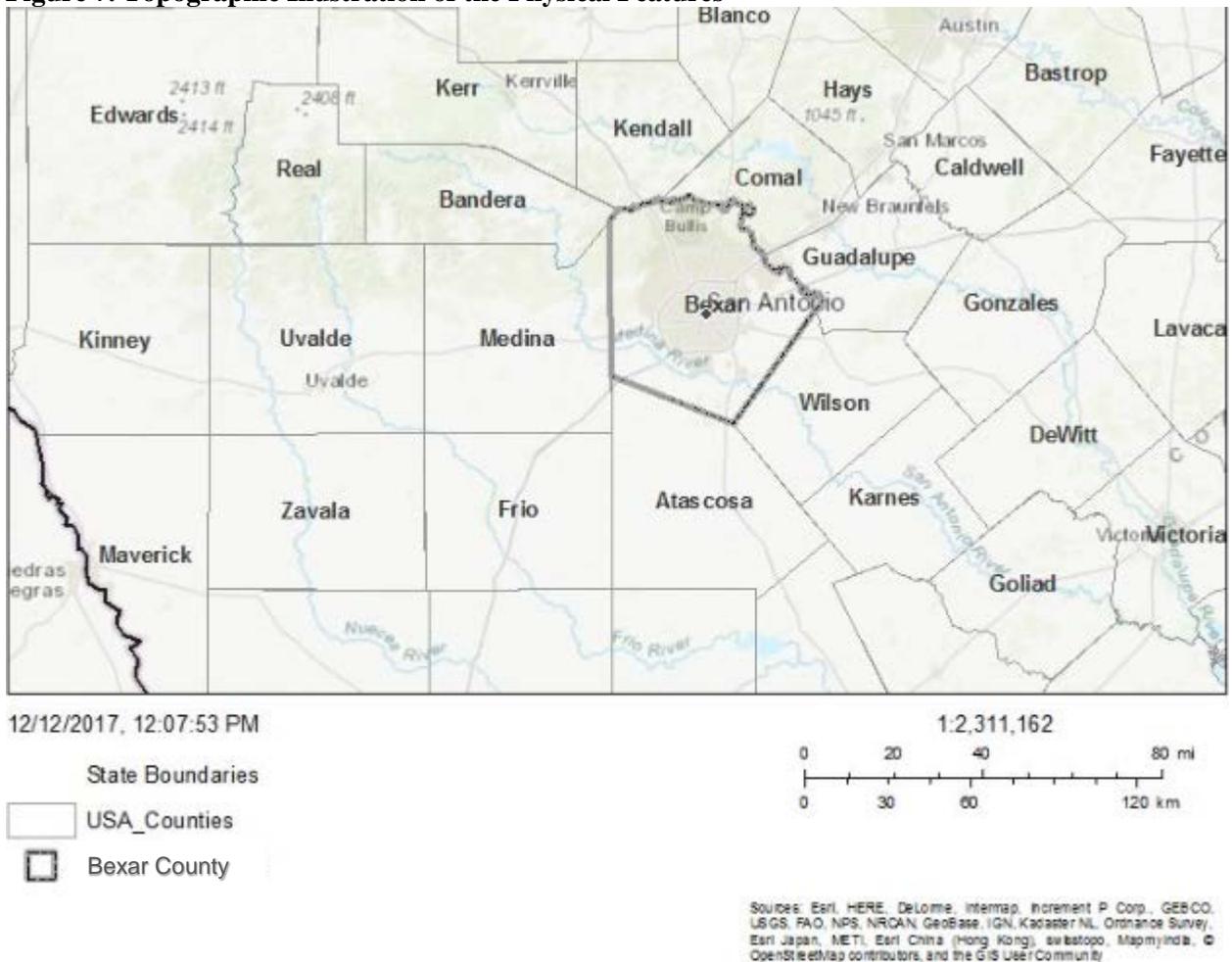
The HYSPLIT data show that the back trajectories are predominantly from the east, southeast, and south, with no trajectories directly from the north and few from the northwest and west. We also note these HYSPLIT maps show an absence of back trajectories from Bandera or Kendall Counties to the monitors in nearby Bexar County on days when those two monitors exceeded the 2015 ozone NAAQS.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA evaluated the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. The area of analysis does not have any geographical or topographical features significantly limiting air pollution transport within its air shed (see Figure 7 below). Therefore, this factor did not provide data relevant for determining designations for this area.

Figure 7. Topographic Illustration of the Physical Features



Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the intended nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the intended designated areas.

The area of analysis has a previously established nonattainment boundary associated with the 1997 ozone NAAQS which included Bexar, Comal, and Guadalupe Counties.²⁰ The previous nonattainment boundary for the area falls within the boundary of the metropolitan planning organization (MPO) known as the Alamo Area Council of Governments (AACOG). Among other services, the AACOG provides program specific technical assistance for regional planning in the areas of economic development, air quality, and transportation. The State does not have jurisdiction in Indian country and the area of analysis does not include Indian country.

February 28, 2018 Letter: On February 28, 2018, the Governor of Texas provided a letter, urging the EPA to designate the area as attainment or at most, unclassifiable. Relative to the five factors, the letter provided information and a modeling analysis that may help inform an evaluation of Factor 1 (Air Quality), Factor 2 (Emissions), and Factor 3 (Meteorology).

Overview of Additional Air Quality Data

Additional monitoring data from non-regulatory monitors in the San Antonio Metropolitan Area show “calculated design values” below the 2015 NAAQS, as shown in Table 5 below.

Table 5. Non-regulatory Monitors in the San Antonio Area

San Antonio Area	Parts Per Billion Ozone			
	<u>Calculated 2015-2017 DV</u>	<u>2017 4th High</u>	<u>2016 4th High</u>	<u>2015 4th High</u>
<u>Non-Regulatory Site*</u>				
Elm Creek Elementary C501	65.7	68	61	68
Fair Oaks Ranch C502	66.7	67	66	67
Bulverde Elementary C503	65.7	67	63	67
New Braunfels Airport C504	61.3	63	58	63
City of Garden Ridge C505	65.7	66	65	66

²⁰ See 69 FR 23858, April 30, 2014. The effective date of designation for nonattainment was deferred because the State and 3-county area participated in the Early Action Compact. The area was ultimately designated as attainment on April 2, 2008 (73 FR 17897).

Seguin Outdoor Learning Center C506	60.3	62	57	62
Heritage Middle School C622	64.0	67	58	67
CPS Pecan Valley C678	60.3	61	59	61
Government Canyon C1610	incomplete	60	incomplete	60
*Data from the monitors at these sites do not meet EPA quality assurance criteria and cannot be used for regulatory purposes.				
Source: https://www.tceq.texas.gov/cgi-bin/compliance/monops/8hr_4highest.pl , accessed 3/16/2018.				

Overview of Texas Modeling Results

Texas used a photochemical model known as the Comprehensive Air Quality Model with Extensions (CAMx) to relate source emissions to their quantitative impact on ambient air pollution, termed “source apportionment modeling.” Texas used CAMx with 36 km resolution over the US, 12 km resolution over the southern US, and 4 km resolution over East Texas. Base year emissions from 2012 were projected to 3 future years: 2017, 2020, and 2023. The analysis used the modeling to project future design values using two different methodologies. The first method took ambient data from 2010-2014 and the 2012 base modeling year to project DVs to 2017, 2020, and 2023. The second method used ambient data from 2015-2017 and the 2017 future year modeling to project further out to 2020 and 2023. Using the first method, monitors in Bexar County are projected to violate the 2015 NAAQS in 2020 but to meet the 2015 NAAQS in 2023. Using the second method the modeling projects that the three Bexar County monitors will meet the 2015 NAAQS by 2020, with design values all lower than 71 ppb, and will all be well below the 2015 NAAQS by 2023.

The analysis also included source apportionment modeling for the 2023 projected year which included: a national simulation that broke out contributions on a state-by-state level and into international sources (36 km resolution), a Texas simulation that broke out contributions by source regions within Texas (12 km resolution), and a San Antonio simulation that broke out contributions by county within the San Antonio MSA (4 km resolution). While the source apportionment modeling is for a future year, it provides a relative indication of the impact of emission from various sources in the area.

Texas’s source apportionment modeling for 2023 shows that on high ozone days Bexar County contributes 8-9 ppb (83% of the San Antonio area contribution to predicted peak ozone values), while the other counties in the area of analysis with remaining highest emissions contribute less than 1 ppb, as follows: Atascosa 0.6-0.7 ppb (8%), Guadalupe 0.6-0.8 ppb (7%), and Comal <0.1 ppb (1%).

The February 28 letter also raises concerns regarding the impact of international emissions on San Antonio. EPA’s evaluation of Texas’s source apportionment modeling does not find that the impact of manmade emissions from Mexico are such to impact EPA’s decision making regarding the designation of the area. It appears that the letter incorrectly includes in its conclusions regarding international emissions a contribution labeled “Boundary conditions/International.” By doing this, it conflates naturally occurring ozone from outside the modeling domain with man-made emissions from outside the modeling domain. Not only will this category include naturally occurring ozone but it will include ozone that is generated by portions of the US that are outside the modeling domain and ozone that is generated from emissions within the US and recirculated into the domain. From the same modeling results a more reasonable estimate of the impacts from manmade emissions from Mexico is on the order of less than 1 ppb (1-2%) of the ozone projected for 2023 in San Antonio.

Conclusion for the San Antonio-New Braunfels Area

Based on the assessment of the factors described above, EPA intends to designate the San Antonio area counties of Atascosa, Bandera, Comal, Guadalupe, Kendall, Medina, and Wilson as attainment/unclassifiable, and intends to modify Texas's recommendation of attainment for Bexar County. Bexar County has air quality monitors whose latest available data (2014-2016) indicate a violation of the 2015 ozone NAAQS. Bexar County also has NO_x and VOC emissions that are approximately a factor of 4 times higher than any other county in the area of analysis and population and VMT that are approximately an order of magnitude higher than any other county in the area of analysis, supporting a conclusion that emissions within the county contribute to the violations.

The EPA does not intend to modify the State's recommendation to designate the counties in the area of analysis outside Bexar County as attainment/unclassifiable. Within the area of analysis, outlying Bandera and Kendall Counties are ranked among the lowest for most of the evaluated factors: they have the lowest levels of NO_x and VOC emissions; Kendall had the highest percentage population growth, but these two counties have the lowest absolute population numbers; they have the lowest VMT and workers living in these counties comprise 1 percent or less of commuters in the area of analysis commuting to the county with the violating monitor. Analysis of HYSPLIT data show there are no back trajectories from Bandera or Kendall Counties to the violating monitors on days when those monitors exceeded the 2015 ozone NAAQS.

Within the area of analysis, Medina County has the 4th lowest NO_x and VOC emissions, the 4th lowest population and VMT, and workers living in Medina County comprise 1 percent of commuters in the area of analysis commuting to the county with the violating monitor. Examination of the HYSPLIT data shows three back trajectories flowed through Medina County to the violating Northwest monitor (Figure 6b). However, these three trajectories first flowed past the violating Northwest monitor and further into Bexar County before reaching the violating monitor. The HYSPLIT data also show three back trajectories flow through Medina County to the violating Camp Bullis monitor (see Figure 6a). However, one trajectory first flowed through the center of Bexar County and south of the violating monitor. The other two trajectories originate further south, in the distant Jim Wells and La Salle Counties, and flow in a sweeping arch through several counties and unknown sources before flowing through Medina County and on to the violating monitor. Medina County has no large point sources to potentially contribute emissions to the violating monitor. Furthermore, in comparison, Bexar County emits almost 12 times more VOC and 16 times more NO_x, has 27 times more VMT, and 39 times more population than Medina County.

Within the area of analysis, Wilson County has the 3rd lowest NO_x and VOC emissions, the 3rd lowest population and VMT, and workers living in Wilson County comprise less than 2 percent of commuters in the area of analysis commuting to the county with the violating monitor. Examination of HYSPLIT data show back trajectories shows that air flowed through Wilson County prior to reaching the nearby violating monitors (Figures 6a and 6b). However, many of these trajectories begin or pass through Karnes County, which emits approximately 14,618 tpy NO_x and 54,664 tpy VOC, which, in comparison, is 8 times more NO_x and 19 times more VOC than Wilson County. In addition, several of the trajectories flow into Bexar County before flowing to the violating monitor (Figures 6a and 6b). Furthermore, the trajectories through Wilson County flow over large and small point sources in Bexar County before reaching the violating monitors. Wilson County has no large point sources to contribute emissions to the

violating monitors. In comparison, Bexar County emits 12 times more VOC and 20 times more NOx, has 33 times more VMT and 40 times more population than Wilson County. Thus, Bexar County greatly outweighs Wilson County in terms of all emissions sources. We note that the Calaveras Lake monitor, which is south of the violating monitors and approximately 2 miles from the border between Bexar and Wilson Counties, is meeting the 2015 ozone NAAQS.

Within the area of analysis, Atascosa County has the second highest emissions of NOx and VOC, the 4th highest population and VMT, however, workers living in Atascosa County comprise only 1 percent of commuters in the area of analysis commuting to the county with the violating monitor. Examination of HYSPLIT data show back trajectories flowed through Atascosa County prior to reaching the nearby violating monitors. However, all of these trajectories also flow through Bexar County, passing over numerous large and small point sources in Bexar County before reaching the violating monitors. In comparison, Bexar County has 4 to 5 times more VOC and NOx emissions, 18 times more VMT and 39 times the population of Atascosa County. Atascosa County has one large point source, located about 56 miles south of the Northwest violating monitor and about 64 miles south of the Camp Bullis violating monitor.

Within the area of analysis, Comal County has the 3rd highest NOx emissions, the 4th highest VOC emissions, the 3rd highest population and the 2nd highest VMT. However, Comal County contributes the smallest percentage of commuters to the county with the violating monitor and workers living in Comal County comprise less than 3 percent of commuters in the area of analysis commuting to the county with the violating monitor.

Examination of HYSPLIT data show back trajectories flowed through Comal County to the nearby violating monitors (Figures 6a and 6b above). These trajectories flow through Comal, then over numerous large and small point sources in Bexar County before reaching the violating monitors. In comparison, Bexar County emits 5 times more NOx and 9 times more VOC, has 9 times the VMT and 15 times more population than Comal County. Thus, Bexar County greatly outweighs Comal County in terms of all emissions sources. We note that in addition, two of the three large point sources in Comal County are cement plants. These plants have installed Selective Non-Catalytic Reduction (SNCR) to reduce NOx emissions. These facilities have the modern “dry” kilns, which are cleaner in terms of emissions compared to older “wet” kilns. These facilities also use low-NOx firing systems (burners), which further reduce NOx emissions.²¹

Within the area of analysis, Guadalupe County has the 4th highest NOx emissions, the 3rd highest VOC emissions, the 2nd highest population, and the 3rd highest VMT. However, Guadalupe County contributes the 2nd smallest percentage of commuters to the county with the violating monitor and workers living in Guadalupe County comprise less than 4 percent of commuters in the area of analysis commuting to the county with the violating monitor. Analysis of HYSPLIT maps show back trajectories flow through Guadalupe County to the nearby violating monitors (see Figures 6a and 6b above). These trajectories flow through Guadalupe, then over numerous large and small point sources in Bexar County before reaching

²¹ Should Bexar County be designated as nonattainment, the area would be classified as Marginal, meaning major sources in the county would not be required to further address emissions unless such sources were undergoing major modification, consistent with requirements of the NSR permitting program. Currently, major new or modified sources in the county are addressed through the State’s PSD program.

the violating monitors. Bexar County emits 8 times more NO_x and 5 times more VOC, has 11 times more VMT and 13 times more population than Guadalupe County. Thus, Bexar County greatly outweighs Guadalupe County in terms of all emissions sources.

Therefore, in conclusion of our review and analyses of the five factors for the counties in the area of analysis, we intend to modify Texas's recommendation to designate Bexar County in the San Antonio-New Braunfels CBSA as attainment for the 2015 ozone standard. We intend to designate the other seven counties in the CBSA as attainment/unclassifiable. We will further evaluate any information supplied during the 120-day notification process to support a designation other than attainment for all or portions of Bexar County.