Lower Rio Grande Valley Area Evaluation
(Laredo and Harlingen Regions)
**Lower Rio Grande Valley Area Characteristics**

**Terrain**

The Lower Rio Grande Valley area terrain consists of the Southern Texas Plains to the northwest and the Western Gulf Coast Plains near the cities of McAllen and Brownsville. The Southern Texas Plains form a transition zone from the semi-arid area near Del Rio, to the alluvial plains south of the Edwards Plateau area, and the Rio Grande River basin to the south. The landscape decreases in elevation from approximately 2,000 feet near Del Rio in the west to approximately 400 feet near Rio Grande City in the east with periodic topographic variations due to the presence of numerous streams. The Western Gulf Coast Plains extend along the Gulf Coast to just west of McAllen. The terrain is mostly flat nearest the coastline and highly vegetated. (Griffith et al. 2004)

Figure 85 is a topographic map of the area and wind roses from meteorological sensors from ambient air monitoring stations show the pronounced terrain effects of the Rio Grande River basin. Annual wind patterns are dominated by southeast to northwest wind flows from the Gulf of Mexico.

**Climate**

The Lower Rio Grande Valley area has a similar sub-tropical climate to the other areas near the coastline. Annual average temperatures have ranged from 71°F to 77°F from 2000 to 2014. Annual precipitation averages between 15 and 30 inches with irregular rainfall patterns often coming in the form of torrential rains from tropical storms. Rainfall has ranged from a low of just over 11 inches per year in 2011 to a high of over 30 inches in 2003 and 2007. (NCDC 2015)
Figure 85: Lower Rio Grande Valley Area Counties, Population Density, and Wind Data from Ambient Air Quality Monitors
Population

As of 2010, there are three MSAs in the Lower Rio Grande Valley area: Brownsville-Harlingen (population 406,000 in Cameron County), McAllen-Edinburg-Mission (population 775,000 in Hidalgo County), and Laredo (population 250,000 in Webb County). Figures 86 and 87 map the population densities across the Lower Rio Grande Valley area based on 2010 United States Census Bureau data. According to 2014 estimates, the McAllen-Edinburg-Mission MSA is the largest population center with over 831,000 people. The Brownsville-Harlingen MSA had approximately 420,000 people and the Laredo MSA had approximately 267,000 people.

Based on these 2014 population estimates and 2014 design values, a minimum of one ozone, one NO2, two PM2.5, and between two and four PM10 monitors are required in the McAllen-Edinburg-Mission MSA to comply with monitoring network design criteria requirements in 40 CFR Part 58, Appendix D, Section 4. In addition, one ozone monitor and up to one PM10 monitor are required in the Brownsville-Harlingen MSA, and one ozone monitor and up to one PM10 monitors are required in the Laredo MSA.

According to the Texas State Data Center, the McAllen-Edinburg-Mission MSA will experience the state’s second highest population growth (23%) by 2020. Populations in this MSA are projected to reach over 1 million by 2020, which would impact the numbers and types of federally required air quality monitors in the area. If these population projections are accurate, the minimum monitoring requirements for the McAllen-Edinburg-Mission MSA would increase to include one near-road CO, one area wide NO2, two to three PM2.5, and between four and eight PM10 monitors by 2020. The Laredo MSA population is projected to reach 317,000 people by 2020, a growth rate of approximately 21%. The Brownsville-Harlingen MSA is projected to have a slightly slower growth rate (18%), but the population is not expected to exceed 500,000 people by 2020. No additional monitors would be required in the Brownsville-Harlingen or Laredo MSAs.
Figure 86: Lower Rio Grande Valley Area Population Density
Figure 87: Lower Rio Grande Valley Metropolitan Statistical Area Population Density
Pollutant Sources

Anthropogenic Sources
Mobile sources (on-road and non-road) are the dominant contributor of CO (88%) in the Lower Rio Grande Valley area. NOx is primarily emitted by area (38%) and on-road mobile (37%) sources. Area sources contribute the most PM10 (97%), PM2.5 (85%), and VOCs (85%). Area sources emitted the majority (55%) of SO2, followed by point sources (34%). Finally, non-road mobile sources accounted for all Pb emissions in the Lower Rio Grande Valley area.

The TCEQ reviewed pending and issued air permits within the Lower Rio Grande Valley area (detailed in Appendix D). Three new facilities were located to the northwest and northeast of the Eagle Pass monitor, but the other eight new facilities were located near Mission and along Interstate 69E between Harlingen and Brownsville. Existing monitoring locations in the Mission, Harlingen, and Brownsville areas and the upcoming Edinburg monitor are near these new facilities and are sufficient to evaluate air quality in this area. No additional monitors are considered necessary.

Natural Sources
Monitors near the coastline, particularly Isla Blanca Park, have historically been impacted by elevated incoming PM2.5 concentrations as a result of long-range transport, as evidenced by speciation data, satellite imagery, wind flow patterns, and back trajectories. African dust from the Saharan Desert typically impacts the coastal area three to six times each summer. Daily average PM2.5 concentrations can reach as high as 23 µg/m³ or more during these transported dust events. Smoke is generally associated with abnormally high organic carbon concentrations. Smoke from agricultural burning in Mexico and Central America typically affects the Lower Rio Grande Valley area from April to early June each year when the winds bring in air from eastern Mexico and Central America. More detailed information about these natural events is available in the TCEQ’s Houston PM2.5 exceptional events demonstration packages for 2010, 2011, and 2012.
Regional Air Quality

Criteria Pollutants

As of January 2015, all Lower Rio Grande Valley geographical areas were classified as attainment/unclassifiable for the current NAAQS. In addition, there are no current or historical APWL areas based on air toxics monitoring.

In June 2010, the primary SO₂ NAAQS was revised to a one-hour standard of 75 ppb. The Governor has recommended designating all Texas areas as attainment for the one-hour SO₂ NAAQS, but a final action has not been taken by the EPA. Prior to making final determinations on area designations for the revised SO₂ standard, the EPA proposed the SO₂ Data Requirements Rule. This rule, proposed in April 2014, could result in additional source-oriented SO₂ monitoring to characterize ambient air quality around larger area SO₂ sources and inform area designations.
Monitoring Network Evaluation

Ozone

Network History

As of January 1, 2015, four ozone monitors were operating in the Lower Rio Grande Valley area. Ozone monitoring in the area began in the 1990s with deployment of the Brownsville monitor. In the late 1990s, the ozone monitoring network expanded in other urban areas to include ozone monitoring in the Laredo and Mission areas to evaluate ozone concentrations in populated areas. Appendix A provides a full list of both active and recently decommissioned ozone monitors, as well as their locations, monitoring objectives, and associated spatial scales.

Since the last five-year assessment period, two ozone network changes occurred in the Lower Rio Grande Valley area. In 2011, the Brownsville ozone design value resulted in the need for an additional ozone monitor in the Brownsville-Harlingen MSA. To meet this requirement, the Mercedes ozone monitor in the McAllen-Edinburg-Mission MSA was moved to the Harlingen Teege site in 2012. Figure 88 provides a map illustrating the active and inactive ozone monitors across the Brownsville-Harlingen and McAllen-Edinburg-Mission MSA. In addition, in 2011, construction in the vicinity of the Laredo Vidaurri site prompted a relocation of the site, including the ozone monitor. The new Laredo Vidaurri site, deployed in 2012, is within one kilometer of the old site, and the AQS number did not change. Figure 89 provides a map illustrating the active ozone monitors across the Laredo MSA.
Figure 88: McAllen-Edinburg-Mission and Brownsville-Harlingen Area Ozone \((O_3)\) Monitors
Figure 89: Laredo Area Ozone (O₃) Monitors

Lower Rio Grande Valley Area Evaluation
Design Values and Trends

Eight-hour ozone design value trends have exhibited an overall decline in the Lower Rio Grande Valley area since 2000 and remain below the 2008 eight-hour ozone NAAQS as shown in Figure 90.

The fourth highest daily maximum ozone value for Laredo Vidaurri, 0.057 ppm, was evaluated since ozone design values are not available for this monitor from 2012 to 2014 due to the site relocation during that period. Laredo Vidaurri had the second lowest 2014 fourth highest daily maximum ozone concentration in the state; the lowest occurred at Mission.

Brownsville-Harlingen area eight-hour ozone design values have declined overall since the early 2000s and are also among the lowest in the state. The 2014 ozone design value for the Brownsville monitor is 0.058 ppm. The Harlingen Teege monitor design values will be available in 2015 when the monitor has three complete years of data however, the 2014 fourth highest daily maximum ozone concentration was 0.059 ppm.

Consistent with the rest of the Lower Rio Grande Valley area, eight-hour ozone design values show an overall decline in Mission. Ozone levels in Mission have decreased from levels of 0.075 ppm in 2000 to 0.057 ppm in 2014. The Mission eight-hour ozone design value and the 2014 fourth highest daily maximum ozone concentration are both the lowest in the state.
ppm – parts per million
NAAQS – National Ambient Air Quality Standards
Laredo Vidaurri monitor design values for 2011-2014 are unavailable due to incomplete data.

**Figure 90: Eight-Hour Ozone Design Value Trends in the Lower Rio Grande Valley Area, 2000-2014**

**Network Evaluation**

The Brownsville, Harlingen Teege, and Mission ozone monitors fulfill federal monitoring requirements based on each area’s population and design values, and continue to meet established monitoring objectives. The Brownsville ozone monitor provides data on ozone transport into the populated Brownsville area downwind of Matamoros, Mexico. Ozone data from the Harlingen Teege monitor supports understanding of ambient ozone concentrations in a growing, populated area, air quality mapping, and air quality forecasting. Each Lower Rio Grande Valley area ozone monitor is located to be representative of an urban core environment and densely populated areas and can be impacted from international emissions. All three monitors are considered of high value.

Based on population and monitoring data, there are no requirements for ozone monitoring in Laredo. However, the Laredo Vidaurri ozone data supports evaluation of ambient ozone trends in a growing area and provides meaningful data about international transport of ozone into South Texas and is thus considered high value.

Figure 91 shows the correlation analysis to assess redundancy between the Lower Rio Grande Valley area ozone sites. Monitors are identified by AQS numbers, which can be
referenced in Appendix A. The Brownsville (AQS 48-061-0006) and Harlingen Teege (AQS 48-061-1023) monitors appear to be highly correlated (Pearson’s coefficient=0.949, relative difference=0.145). However, the distance between the monitors is too great for the monitors to be considered redundant, and each site is independently valuable.

Given the historical ozone concentrations, prevailing winds, and increased population in these areas, the ozone monitor placement along and near the international border continues to be appropriate. The four active ozone monitors in the Lower Rio Grande Valley area are considered of high value. These monitors cover multiple monitoring objectives including measuring maximum concentrations and upwind/downwind concentrations in populated locations. Appendix C provides a detailed description of the value of each active ozone monitor.
Figure 91: Eight-Hour Daily Maximum Ozone Correlation Matrix in the Lower Rio Grande Valley Area, 2011-2013

Carbon Monoxide

Network History

Three CO monitors are operating across the Lower Rio Grande Valley area at the Brownsville, Laredo Vidaurri, and Laredo Bridge sites. Each of these three monitors provide more than 10 years of data history. The CO monitors were deployed in populated areas likely to have maximum concentrations and near areas of concentrated mobile source activities. Currently there are no federal minimum CO monitoring requirements applicable to the Lower Rio Grande Valley areas.

In 2011, construction near the Laredo Vidaurri site prompted a relocation of the site, including the CO monitor. The new Laredo Vidaurri site, deployed in 2012, is within one kilometer of the old site and the AQS number remained the same.
Appendix A provides a full list of active CO monitors, as well as their location, monitoring objectives, and associated special scales. Monitoring locations and CO point sources for the Lower Rio Grande Valley area are shown in Figure 92.
Figure 92: Lower Rio Grande Valley Area Carbon Monoxide (CO) Point Sources and Monitors
Design Values and Trends

Since 2000, CO design values in the Lower Rio Grande Valley area have remained well below the one-hour CO NAAQS of 35 ppm and the eight-hour CO NAAQS of 9 ppm. Based on 2014 data, CO one-hour design values ranged from 1.3 to 2.9 ppm, and CO eight-hour design values ranged from 0.7 to 1.4 ppm for the Brownsville, Laredo Vidaurri, and Laredo Bridge sites.

Network Evaluation

The existing Lower Rio Grande Valley area CO monitoring network meets all current federal monitoring requirements and is adequate to evaluate existing monitoring objectives and the minimal impact CO has on regional air quality. Each of the three monitors is considered of medium value. Except for mobile sources that account for 88% of CO emissions in the region, there are no other significant CO sources in the area. Given the historical CO design values in both the Brownsville and Laredo areas, no additional network changes are recommended at this time.

Oxides of Nitrogen

As of January 2015, the Lower Rio Grande Valley geographical area was designated attainment/unclassifiable with the current ozone standard and does not trigger ozone precursor monitoring associated with PAMS requirements. Area populations are not large enough to trigger current near-road monitoring requirements. Therefore, no NO\textsubscript{x} monitors are currently being operated under federal obligation in the Lower Rio Grande Valley area.

NO\textsubscript{2} concentrations have generally been on a downward trend across the state, and concentrations in heavily populated areas - those likely to have the highest traffic congestion and, therefore, higher mobile source contributions and elevated ambient concentrations - have remained well below the NAAQS. Further, there are no significant NO\textsubscript{2} point sources in the Lower Rio Grande Valley area. No new NO\textsubscript{x} monitors are considered necessary at this time. The TCEQ will reevaluate the network once the EPA finalizes its proposed ozone rule, as PAMS requirements and ozone nonattainment areas are likely to change.

The McAllen-Edinburg-Mission area will be required to have one near-road NO\textsubscript{x} monitor by January 1, 2017. The analysis and selection process for this site will be detailed in the 2016 Annual Monitoring Network Plan released for public comment.

Sulfur Dioxide

Federal requirements for SO\textsubscript{2} monitoring are determined by the area’s PWEI. Because of smaller MSA populations and lack of major SO\textsubscript{2} point sources in the Lower Rio Grande Valley area, SO\textsubscript{2} monitors are not required or operated by the TCEQ. Even with thresholds in the EPA’s proposed Data Requirements Rule, monitors would not be considered necessary in this area. The TCEQ will continue to evaluate population and point source emission trends to determine future monitoring needs.
Lead

Network History
As of January 1, 2015, Pb monitoring was conducted at two locations within the Lower Rio Grande Valley area, as shown in Figure 93. The Brownsville Pb monitor was deployed in 1995, and the Laredo Vidaurri Pb monitor was deployed in 1996, but was temporarily shut down for relocation in 2011. Pb monitors are not federally required in the Lower Rio Grande Valley area due to the lack of major Pb sources. However, both Pb monitors were sited to evaluate ambient Pb concentrations in populated areas downwind of a grouping of industrial sources in Mexico.

Design Values and Trends
No valid 2014 design values are available for the Laredo Vidaurri and Brownsville Pb monitors due to incomplete data. Unofficial highest combined site summaries for Laredo Vidaurri (0.01 μg/m³ in 2012, 0.01 μg/m³ in 2013, and 0.00 μg/m³ in 2014) and for Brownsville (0.01 μg/m³ in 2012, 0.00 μg/m³ in 2013, and 0.01 μg/m³ in 2014) indicate consistently low ambient levels. Furthermore, three-month rolling average Pb values at both sites collected since 2012 have remained well below the NAAQS level of 0.15 μg/m³.

Network Evaluation
The existing Pb monitoring network in the Lower Rio Grande Valley area exceeds all current federal monitoring requirements and continues to meet existing monitoring objectives. However, the ambient Pb data from these two locations is considered of medium value as it continues to provide valuable data regarding international Pb transport into border areas. No additional Pb network changes are recommended for the Lower Rio Grande Valley area at this time. Appendix C provides a detailed description of the assessed values for the Brownsville and Laredo Vidaurri Pb monitors.
Figure 93: Lower Rio Grande Valley Area Lead (Pb) Point Sources and Monitors

TPY – tons per year
Particulate Matter of 2.5 Micrometers or Less

Network History

PM$_{2.5}$ is measured at five sites in the Lower Rio Grande Valley area providing data relevant to the evaluation of concentrations in areas frequented by the public and impacted by PM$_{2.5}$ transport. PM$_{2.5}$ monitoring began in 1999 with the deployment of a PM$_{2.5}$ FRM monitor at the Mission site. In the early 2000s, PM$_{2.5}$ monitoring expanded in other urban areas to include continuous PM$_{2.5}$ monitoring in the Mission, Brownsville, Laredo, and Eagle Pass areas. Figure 94 provides a map of the active PM$_{2.5}$ monitors in the Lower Rio Grande Valley area.

Based on area population and design values, the Brownsville-Harlingen MSA is required to have one FRM and one continuous PM$_{2.5}$ monitor. A PM$_{2.5}$ continuous monitor is currently operated at the Brownsville and Isla Blanca Park sites. The only significant PM$_{2.5}$ network change since the last five-year network assessment was the relocation of the FRM and supplemental speciation monitors from Isla Blanca Park to the Galveston 99th Street site. This change was implemented to evaluate regional transport of PM$_{2.5}$ in support of exceptional event analyses. A continuous PM$_{2.5}$ monitor was added to Isla Blanca Park to continue the support of regional and international transport of PM$_{2.5}$ into the area. The TCEQ plans to deploy an FRM at the Brownsville site in 2015.

PM$_{2.5}$ is measured at one site in the McAllen-Edinburg-Mission MSA and provides data relevant to the evaluation of concentrations in areas frequented by the public and impacted by PM$_{2.5}$ transport. Based on area population and design values, the McAllen-Edinburg-Mission MSA is required to have two PM$_{2.5}$ FRM monitors and one continuous PM$_{2.5}$ monitor. One PM$_{2.5}$ FRM and one continuous monitor are operated at the Mission site, and the TCEQ plans to deploy an FRM monitor at the new Edinburg East Freddy Gonzalez Drive site in Edinburg by summer 2015 in fulfillment of these requirements.

Continuous PM$_{2.5}$ monitoring is conducted at one site in the Laredo area and one site in the Eagle Pass area. Based on each area’s population, no federal PM$_{2.5}$ monitoring requirements apply to Laredo or Eagle Pass; however, these two monitors provide valuable data related to internationally transported PM$_{2.5}$ concentrations and concentrations in areas frequented by the public. Additionally, the World Trade Bridge monitor in Laredo is located at one of two main international border crossing locations and is considered a source-oriented monitor because of the large volume of heavy-duty vehicle traffic at this location. Since the 2010 five-year network assessment, no changes in the Laredo and Eagle Pass area PM$_{2.5}$ network have been made.

Appendix A provides a full site list of both active and decommissioned PM$_{2.5}$ monitors, as well as their location, monitoring objectives, and associated spatial scales.
Figure 94: Lower Rio Grande Valley Area Particulate Matter of 2.5 Micrometers or Less in Diameter (PM$_{2.5}$) Point Sources and Monitors
**Design Values and Trends**

*Brownsville-Harlingen Area*

Although no regulatory monitors are currently operated in the Brownsville-Harlingen area to calculate a valid design value, the TCEQ calculated an annual average over three years and a 98th percentile of 24-hour averages over 3 years concentrations for comparison across the network. As shown in Figure 95, the Brownsville monitor has an annual average concentration hovering around 85% of the NAAQS, although concentrations have been declining since 2009. Figure 95 also shows the 98th percentile of the 24-hour average concentrations have followed this same downward trend and have remained below 70% of the NAAQS since 2008. The PM$_{2.5}$ continuous monitor at Isla Blanca Park does not have enough data to be included in this analysis.

\[ \mu g/m^3 - \text{microgram per cubic meter} \]

*Figure 95: Trends in 98th Percentile of 24-Hour Averages and Annual Averages Over Three Years from the Brownsville Continuous Particulate Matter of 2.5 Micrometers or Less in Diameter (PM$_{2.5}$) Monitor, 2007-2014*

*McAllen-Edinburg-Mission Area*

Design values in the McAllen-Edinburg-Mission MSA have consistently remained below both the 24-hour and annual PM$_{2.5}$ NAAQS, as shown in Figure 96. The annual PM$_{2.5}$ design value concentrations from Mission have shown a gradual decreasing trend since 2007 and have consistently remained below 12 $\mu g/m^3$, the level of the annual NAAQS.
PM$_{2.5}$ 24-hour concentrations at Mission have shown a slight increase since 2010, but are still well below the 24-hour NAAQS of 35 µg/m$^3$.

![Graph showing PM$_{2.5}$ concentrations from 2007 to 2014](image)

**Figure 96: 24-Hour and Annual Particulate Matter of 2.5 Micrometers or Less in Diameter (PM$_{2.5}$) Design Values for the Mission Monitor, 2007-2014**

**Laredo and Eagle Pass Areas**

Although no regulatory monitors are operated in the Laredo and Eagle Pass areas to calculate a valid design value, the TCEQ calculated an annual average over three years and a 98th percentile of 24-hour averages over three years for comparison. This data suggests that PM$_{2.5}$ design values would be less than 76% of the annual NAAQS at the Eagle Pass monitor and 90% of the annual NAAQS at the World Trade Bridge monitor. Concentrations show annual PM$_{2.5}$ trends at Eagle Pass are stable while showing a downward trend at the World Trade Bridge monitor.

The 24-hour average concentrations of the non-FRM continuous measurements at the Eagle Pass and World Trade Bridge monitors have been slightly variable since 2007. Eagle Pass data has ranged from 21 to 23 µg/m$^3$, while World Trade Bridge data has ranged from 25 to 27 µg/m$^3$. Figure 97 shows annual averages and the 98th percentile of 24-hour averages that were averaged over the three-year period ending with the noted year.
Network Evaluation

Area sources are the primary contributor to inventoried PM\(_{2.5}\) emissions in the Lower Rio Grande Valley area. Only one point source contributor in this area exceeds 33 tpy according to the 2013 point source emissions data. Therefore, it is appropriate that the Lower Rio Grande Valley area PM\(_{2.5}\) monitoring network continues to be designed to monitor concentrations of incoming transported PM\(_{2.5}\). The TCEQ has deemed each PM\(_{2.5}\) monitor valuable and does not plan to decommission any of the current PM\(_{2.5}\) monitors.

**Brownsville-Harlingen Area**

The Brownsville-Harlingen area is required to have at least one FRM monitor and one continuous PM\(_{2.5}\) monitor based on population and measured design values. The TCEQ plans to deploy an FRM monitor at the existing Brownsville site in 2015 to meet this requirement. The existing Brownsville continuous monitor is considered of high value because it meets federal requirements and provides useful data for evaluating ambient levels in populated areas along the international border. The Isla Blanca Park

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**Figure 97: Trends in 98th Percentile of 24-Hour Averages and Annual Averages Over Three Years from Lower Rio Grande Valley area Continuous Particulate Matter of 2.5 Micrometers or Less in Diameter (PM\(_{2.5}\)) Monitors, 2007-2014**

µg/m\(^3\) - microgram per cubic meter
NAAQS – National Ambient Air Quality Standards

- **Brownsville-Harlingen Area**
  - The Brownsville-Harlingen area is required to have at least one FRM monitor and one continuous PM\(_{2.5}\) monitor based on population and measured design values. The TCEQ plans to deploy an FRM monitor at the existing Brownsville site in 2015 to meet this requirement. The existing Brownsville continuous monitor is considered of high value because it meets federal requirements and provides useful data for evaluating ambient levels in populated areas along the international border. The Isla Blanca Park

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**Lower Rio Grande Valley Area Evaluation**
continuous monitor, located on the south side of South Padre Island, provides valuable
data on internationally transported PM$_{2.5}$ concentrations into the border and coastal
areas. Analysis of data from the Brownsville and Isla Blanca Park continuous PM$_{2.5}$
monitors indicates the monitors are moderately correlated (Pearson’s coefficient=0.931,
relative difference=0.17) based on data from 2011-2013. Even with this moderate
correlation, both monitors provide valuable spatial coverage for the area.

**McAllen-Edinburg-Mission Area**

The McAllen-Edinburg-Mission MSA is required to have at least two FRM monitors and
one continuous PM$_{2.5}$ monitor. The Mission PM$_{2.5}$ FRM monitor and continuous
monitor meet part of this requirement and are, therefore, considered of high value. The
TCEQ is deploying a new site in the Edinburg area to meet the remaining federal
requirement. This new site at East Freddy Gonzalez Drive in Edinburg, Texas, will have
one FRM PM$_{2.5}$ monitor, operated on a one in three day schedule. The monitor is
scheduled to be deployed in summer 2015.

The Mission site and the new Edinburg East Freddy Gonzalez Drive site will provide
spatial coverage to monitor contributions from local sources and transported particulate
matter from the neighboring Mexico area. Both monitors are also located in populated
residential areas. No other changes are planned for the PM$_{2.5}$ monitoring network in the
McAllen-Edinburg-Mission area.

**Laredo and Eagle Pass Areas**

The Laredo and Eagle Pass areas are not currently required to have PM$_{2.5}$ monitors due
to population size. Continuous PM$_{2.5}$ monitors are located at the Eagle Pass site and at
the World Trade Bridge site. These two monitors are considered of medium value for
evaluating regional and international transport of PM$_{2.5}$ emissions. Analysis of data
from the Eagle Pass and the World Trade Bridge continuous PM$_{2.5}$ monitors indicates
the monitors have low correlation (Pearson’s coefficient=0.863, relative
difference=0.252). These two monitors are located 152 kilometers apart and the weak
correlation suggests that the provided data is unique and important to providing spatial
coverage to evaluate international and regional transport along the border. The TCEQ is
not recommending any changes for the PM$_{2.5}$ network in the Laredo area.

**Particulate Matter of 10 Micrometers or Less**

**Network History**

As of January 1, 2015, PM$_{10}$ concentrations in the Lower Rio Grande Valley area are
monitored at three sites to evaluate regional air quality trends in populated areas. PM$_{10}$
monitoring in the Lower Rio Grande Valley area began in the late 1990s at the Laredo
Bridge site. A map illustrating the current monitor locations and point sources is shown
in Figure 98.

The Laredo Bridge PM$_{10}$ monitor, activated in 1999, and the Laredo Vidaurri PM$_{10}$
monitor, activated in 2004, are located within about 1.3 miles of each other. The Laredo
Bridge monitor was deployed to monitor ambient air in populated areas and to
understand microscale air quality in proximity to a large international border crossing
between the United States and Mexico. A microscale defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters. The Mission PM$_{10}$ monitor was activated in 2008 to monitor ambient concentrations in populated areas. The Laredo Bridge and Mission PM$_{10}$ monitors are also useful in assessing pollutant transport across the international border.

Current federal minimum requirements specify PM$_{10}$ monitoring in metropolitan areas based on population and measured concentrations, if available. Based on the latest concentration and population data, the Laredo and Brownsville-Harlingen areas are required to have between zero and one PM$_{10}$ monitors, and the McAllen-Edinburg-Mission area is required to have between two and four PM$_{10}$ monitors. Currently, those requirements are met, except for the requirement of one additional PM$_{10}$ monitor in the McAllen-Edinburg-Mission area, discussed further below. Appendix A provides a full list of PM$_{10}$ monitors, as well as their locations, monitoring objectives, and associated spatial scales.
Figure 98: Lower Rio Grande Valley Area Particulate Matter of 10 Micrometers or Less (PM$_{10}$) Point Sources and Monitors
**Design Values and Trends**

Compliance with the 24-hour PM$_{10}$ NAAQS is based on the number of measured exceedances of the 150 µg/m$^3$ standard on average over a three year period. The Lower Rio Grande Valley area PM$_{10}$ monitoring sites had zero estimated number of exceedances per year from 2011 to 2014.

Maximum PM$_{10}$ monitor concentrations at the Laredo Bridge site have remained below one third of the NAAQS level of 150 µg/m$^3$ since 2011. The maximum concentration at the Laredo Vidaurri PM$_{10}$ monitor has remained below 53% of the NAAQS since 2012. The Mission PM$_{10}$ monitor has measured maximum concentrations of 94 µg/m$^3$ in 2012, 138 µg/m$^3$ in 2013, and 64 µg/m$^3$ in 2014. Satellite imagery verifies that on March 5, 2013, a regional dust storm carrying particulate matter from Far West Texas and Mexico heavily impacted the McAllen-Edinburg-Mission area contributing to the 138 µg/m$^3$ level. The next highest concentration in 2013 was 88 µg/m$^3$ and was collected on a day impacted by transported African dust. The maximum concentration for 2014 was 64 µg/m$^3$ suggesting that the concentration collected on March 5, 2013, was due to an exceptional event. Maximum concentrations have remained below the NAAQS level of 150 µg/m$^3$ from 2011 through 2014 and are heavily affected by regional transport of PM$_{10}$.

**Network Evaluation**

PM$_{10}$ monitoring requirements in MSAs are based on population and monitored design values, if available. The current locations of Lower Rio Grande Valley area PM$_{10}$ monitors continue to be sufficient to meet established monitoring objectives.

The McAllen-Mission-Edinburg MSA is required to have between two and four PM$_{10}$ monitors. The Mission PM$_{10}$ monitor meets part of this requirement and is located in an area of high population density, making it of high value. The TCEQ is deploying a new PM$_{10}$ monitor at the Edinburg East Freddy Gonzalez Drive site to meet the remaining federal requirement. Information regarding site selection is located in the TCEQ 2014 Annual Monitoring Network Plan. The PM$_{10}$ monitor is scheduled to be deployed in summer 2015.

The Mission site and the new Edinburg East Freddy Gonzalez Drive site will provide spatial coverage to monitor local source and transported contributions from the neighboring Mexico area. Both monitors are also located in populated residential areas and provide ambient air quality data that is representative of concentrations to which the population could be exposed.

The Laredo Vidaurri PM$_{10}$ monitor is located to monitor maximum concentrations in the area, making it of high value. The Laredo Bridge PM$_{10}$ monitor is located to monitor ambient air in populated areas and to understand microscale air quality in proximity to a large international border crossing; however, it is not federally required and has historically low averages, making it of medium value.

More than 95% of inventoried PM$_{10}$ emissions in the Lower Rio Grande Valley were from area sources, including road construction, unpaved roads, and regional and international transport including African dust and dust originating from the...
Chihuahuan Desert during high wind events. Based on the prevalence of area sources, the concentration of point and area sources in the urban and suburban areas, prevailing wind conditions, and the planned deployment of an additional PM$_{10}$ monitor in the McAllen-Edinburg-Mission MSA, no further changes to the PM$_{10}$ monitoring network in this area are recommended at this.

**Air Toxics**

**Network History**

As of January 2015, federal funding supports the operation of one VOC canister sampler in the Lower Rio Grande Valley area. VOC monitoring in the Laredo area began in the early 2000s at the Laredo Bridge site. Locations of the VOC sampler and point sources are shown in Figure 99.

Federal funding also supports the operation of SVOC samplers at the Brownsville and Mission sites. Due to low ambient concentrations and the low value of the samplers, the Laredo Vidaurri SVOC and Mercedes SVOC samplers were decommissioned in 2011 and 2012, respectively.
Figure 99: Lower Rio Grande Valley Area Volatile Organic Compound (VOC) Point Sources and Monitor
**Trends**

VOC and SVOC concentrations have remained below levels of health and welfare concern throughout the five-year assessment period. Benzene, an ambient air risk driver for most urban settings, has remained well below the AMCV over the last seven years, as shown in Figure 100.

![Figure 100: Annual Average Benzene Concentrations at the Laredo Bridge Canister Monitor, 2008-2014](image)

**Network Evaluation**

There are no current federal requirements for air toxics monitoring in the Lower Rio Grande Valley area. Federal funds are used to operate the Laredo Bridge VOC, Brownsville SVOC, and Mission SVOC samplers as special purpose. All of these samplers are well-placed to evaluate international transport of these pollutants into populated areas in the Lower Rio Grande Valley area. Given the long-term historical value of these samplers and the value of the data, the samplers are considered of medium value.

Other mechanisms fund the Brownsville and Mission VOC sampler operations. More information about these samplers is available online at [http://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome](http://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome).
Concentrations from all available ambient air monitors and samplers are reviewed by TCEQ toxicologists and results are available online at https://www.tceq.texas.gov/toxicology/regmemo/AirMain.html. As indicated in these annual evaluations, available monitoring data indicate that VOC and SVOC concentrations have consistently remained below a level of health and welfare concern.