Quarterly Report of Air Quality Monitoring
January 1 to March 31, 2020
at the Gregory - Portland
Community Air Monitoring Stations

Prepared by

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Executive Summary

The Gregory Fresnos Community Air Monitoring Station began continuous monitoring operations October 1, 2019. Two additional air-monitoring stations in Portland, TX on Buddy Ganem Dr. on the campus of the Gregory-Portland High School and on Broadway on the campus of the old East Cliff Elementary School began operations on January 1, 2020. At the Gregory Fresnos (GF) station, the automated gas chromatograph (auto-GC), the beta-attenuation fine particulate matter instrument (BAMS), and meteorological equipment worked well from the start. Issues were found with the sulfur dioxide (SO_2) and nitrogen oxides (NOx) instruments, and they were both replaced mid-October with better performing monitors. The original SO_2 and NOx instruments were repaired and reinstalled in February 2020, and these instruments are being reviewed for performance.

A new public website to provide information about air quality and monitoring data from the three stations was developed by The University of Texas at Austin with funding from Cheniere and Gulf Coast Growth Ventures (GCGV). A focus group composed of community representatives was appointed in December to assist in the design and development of the public website. The website is in final stages of review and is actively being populated with data and other information. It will be ready for release to the public in the next quarter.

1.0 Introduction

This report is jointly-funded by Cheniere Energy and Gulf Coast Growth Ventures (GCGV) as part of their separate community air-monitoring programs. It includes reviews and analyses of the air monitoring data obtained at the three stations and focuses primarily on the period January 1 to March 31, 2020. Over time as data are accrued, future reports will include assessments over broader time periods. The University of Texas at Austin (UT Austin) established the Gregory Fresnos (GF) station for Cheniere Energy and has managed the station since continuous monitoring operations began on October 1, 2019. AECOM, an engineering company, established the Portland Buddy Ganem (PBG) and Portland Broadway (PBway) stations for GCGV and has managed the stations since continuous monitoring operations began on January 1, 2020.

2.0 Summary of Activities for the Period January 1 through March 31, 2020

Project activities during the reporting period have focused on maintenance and operation of the three community air monitoring stations, analysis of the data from all three stations, and development of the public website for reporting of the data from the three stations. The UT Austin project team solicited nominations from Cheniere Energy and GCGV for the formation of a focus group composed of community representatives to assist with the detailed design and development of the public website to help make it user friendly and helpful for the community. The focus group members are listed in Table 1. Their first meeting was January 8 and a follow-up meeting was on March 4. The website is complete and the focus group and sponsors are currently reviewing the final draft of the website (https://gpair.ceer.utexas.edu) before it is released to the public in the next quarter.

Table 1. Public Website Design & Development Focus Group Members and Affiliation

Name	Position
Troy Bethel	City Council, Portland
Randy Cain	City Council, Ingleside on the Bay
Brandi Dickey	Gregory-Portland ISD
Amelia Flores	Parks & Recreation Board, Gregory
Ron Jorgensen	Portland Resident and Regional Health Awareness Board
Bob Lacy	HOA Officer, Portland
Rudy Rivera	Gregory Resident
Kristina Zambrano	City Council, Gregory

The remainder of this report focuses on the data collected during the period January 1 through March 31, 2020. However, data from October through December 2019 are also used in this report.

3.0 Air Monitoring Station Locations & Information

During the reporting period, there have been three air monitoring stations in the Gregory-Portland area in operation: the Gregory Fresnos (GF) Community Air Monitoring Station at 401 Fresnos Street, Gregory, Texas at the Stephen F. Austin, Elementary School Campus and two sites operated by AECOM, at two Gregory-Portland Independent School District (GPISD) properties in Portland, TX. The two GCGV stations are named Portland Buddy Ganem (located at the Gregory Portland High School campus) and Portland Broadway (located on the Old East Cliff Elementary School property). The parameters measured at the three stations are summarized in Table 2. The locations of the three stations are shown in Figure 1. Also outlined in Figure 1 are the locations of the Cheniere liquefied natural gas facility and the under-construction GCGV ethane-cracker facility.

Table 2. Gregory-Portland Community Air Monitoring Stations and Parameters Measured

Air Monitoring Station Name & Address	Volatile Organic Compounds (VOCs) 46 compounds	Ethylene oxide (EO) 24 hr canister every 6th day	Nitrogen Oxides (NOx, NO, & NO_2)	Sulfur Dioxide (SO_2)	Particulate Matter (PM) Mass, particles < 2. 5 micron diameter	Wind Speed (WS), Wind Direction (WD), Ambient Temperature (T), Relative Humidity (RH), & Barometric Pressure (BP)
Gregory Fresnos 401 Fresnos St., Gregory, TX	Yes	No	Yes	Yes	Yes	Yes
Portland Buddy Ganem GP High School Portland, TX	Yes	Yes	No	No	Yes	Yes. + precipitation
Portland Broadway Old East Cliff Elementary School Portland, TX.	Yes	Yes	No	No	Yes	Only WS, WD

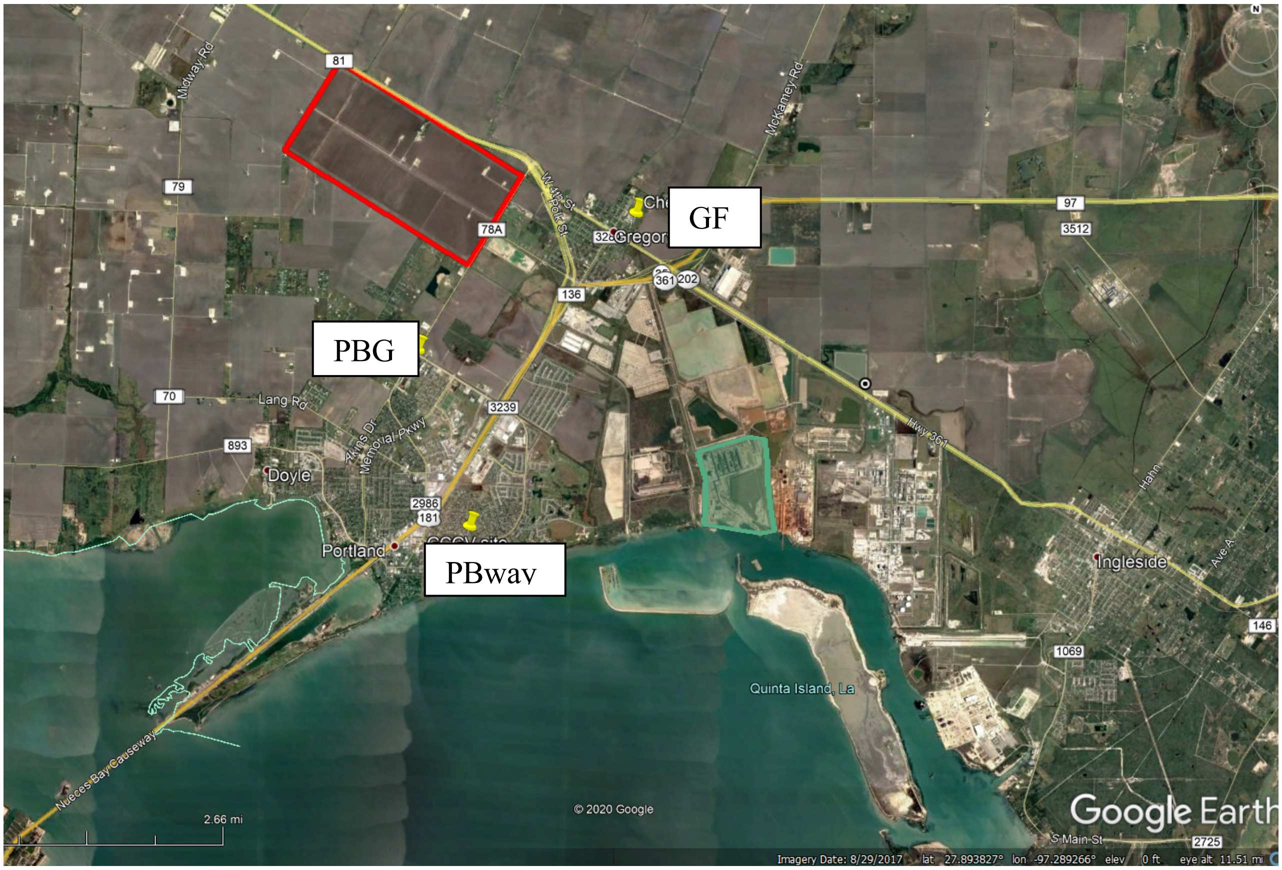

Figure 1. Location of Gregory-Fresnos Community Air Monitoring Station (GF), and two GCGV stations on GPISD sites in Portland on Buddy Ganem (PBG) and on Broadway (PBway)

4.0 Summary of Data

Pollutant concentrations are affected by several factors. One, of course, is the emission of a gas or smoke from a source or the availability of dust to become airborne. Another is the weather. Regarding weather, rain can reduce concentrations of several pollutants, in particular particulate matter. Temperature inversions such as those experienced at night cause air pollutants emitted near the surface to be trapped at lower altitudes, thus allowing concentrations to increase. The converse is midday periods when the "mixing height" of the lower atmosphere rises and air pollutants are diluted in a large volume of air. The wind plays a significant role in moving air pollutants from a source to other locations. For this reason a large majority of air monitoring stations operated by the TCEQ and all three Gregory-Portland stations measure wind speed and direction. Under high wind speeds, many gas pollutants are dispersed and diluted; however under high speed winds, dust on the surface can be picked up and transported, leading to higher particulate concentrations. Winds can be thought of as being local – near the surface – and regional – at higher altitudes. The local wind direction affects pollutant concentrations in terms of whether or not a pollution source is in the upwind direction, or along the local upwind path of the air if wind directions are changing. Similarly, but on a larger scale, the regional wind direction affects pollutant concentrations in terms of whether or not a source such as another major city, a large power plant, a forest fire, etc. are along the regional upwind path of the air. In the graphs that follow, some short-term concentration measurements are significantly higher than the balance of the data. In some cases this is likely the combination of emission and meteorological factors.

Please note that measurement data are quality assured and made available at different frequencies: NOx, NO, & NO_2, SO_2, PM 2.5 & Met measurements – weekly; auto GC VOC measurements - within 90 days of the measurement; and EO canister data – with 60 days of the date the sample was collected. Hence, the data available at the time the analyses were performed for this report will not all have the same date ranges for this quarter.

GF Hydrocarbon Data

Air monitoring hydrocarbon data collection completeness at Gregory Fresnos (GF) has been relatively high (>90%) since the start of the project. Figure 2 shows the time series for the hourly concentrations of benzene at GF. The figure shows benzene hourly average concentrations for each hour from October 1, 2019 through March 21, 2020. **Not all of the data in this and subsequent figures for other hydrocarbons have undergone full data validation and are subject to change.** Figure 3 shows the hourly time series for 1,3-buatadiene, and Figure 4 shows the hourly time series for iso-propylbenzene. Iso-propylbenzene has a relatively low odor threshold and is shown in part because the odor threshold had been crossed at a Corpus Christi monitoring station in the past. Benzene and 1,3-butadiene are considered to be air toxics, but concentrations to date are much lower than TCEQ Air Monitoring Comparison Values (AMCV) or Effects Screening Levels (ESL). Note that a straight line or a gap in a time series graph represents missing data.

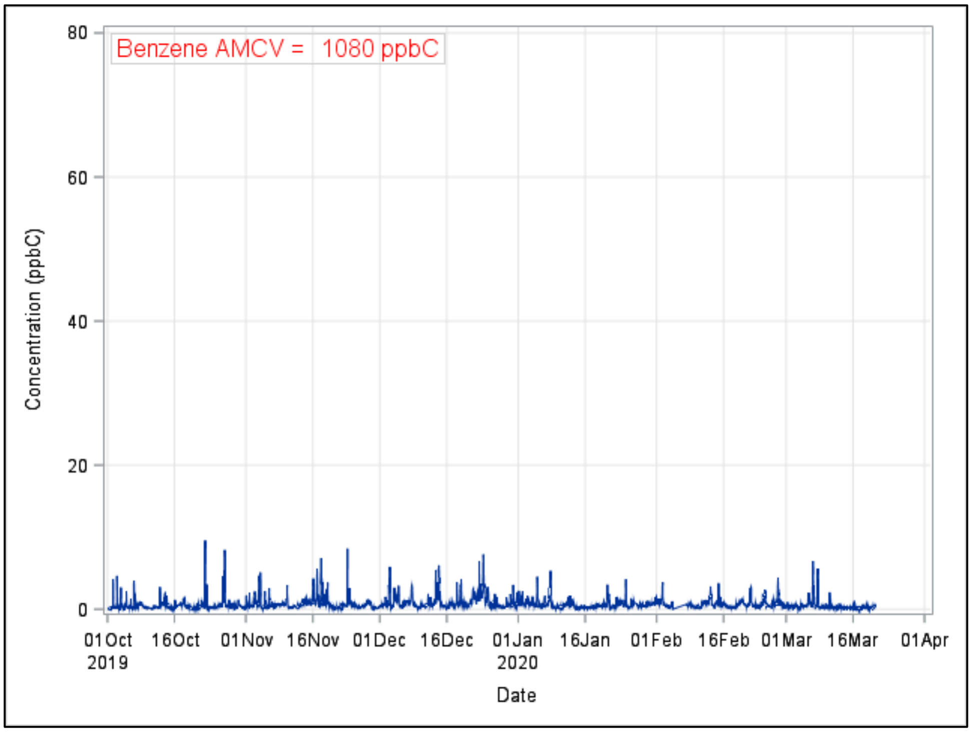

Figure 2. Hourly benzene concentrations at GF station, Oct. 1, 2019 – Mar. 21, 2020, ppbC units

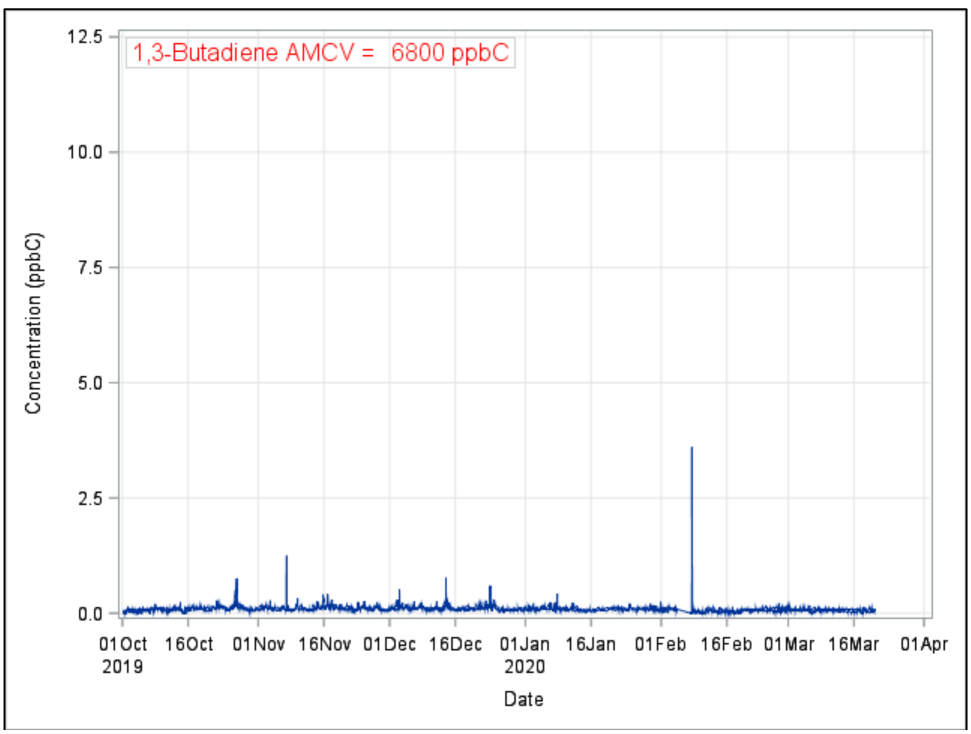

Figure 3. Hourly 1,3-butadiene concentrations at GF station, Oct. 1, 2019 – Mar. 21, 2020, ppbC units

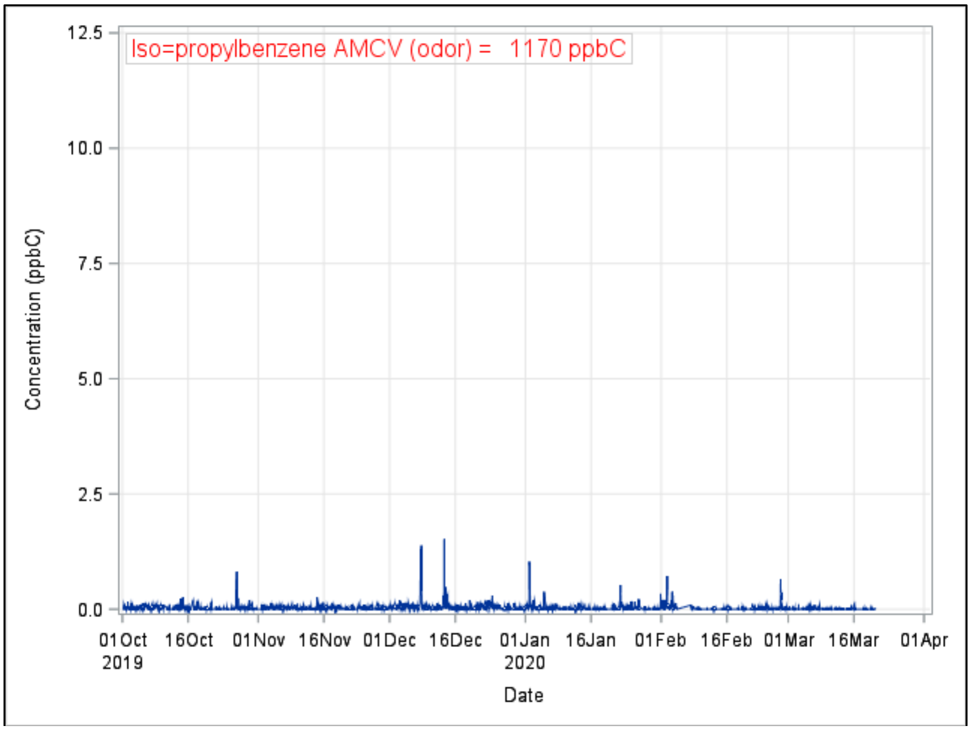

Figure 4. Hourly iso-propylbenzene concentrations at GF station, Oct. 1, 2019 – Mar. 21, 2020, ppbC units

Time series graphs of other hydrocarbon species are also available upon request, and any graphs can be made with time scales (x-axis) or concentration scales (y-axis) adjustments. In addition, concentrations can be averaged by day, or week, or month, upon request.

PBG and PBway Hydrocarbon Data

Only one month of data are available at this point for the two GCGV stations. Figure 5 shows the time series for the hourly concentrations of benzene at the Portland Buddy Ganem (PBG) station. The figure shows benzene hourly average concentrations for each hour from January 1 through January 31, 2020. Some benzene data were invalidated January 1 to 4 and January 9 to 13, and on January 16 due to failed internal QC for the daily blank recoveries. In the benzene graph, a straight line replaces the Jan. 9 – 13 invalidated data. Figure 6 shows the hourly time series for 1,3-buatadiene, and Figure 7 shows the hourly time series for iso-propylbenzene.

Figure 8 shows the time series for the hourly concentrations of benzene at the Portland Broadway (PBway) station. The figure shows benzene hourly average concentrations for each hour from January 1 through January 31, 2020. Figure 9 shows the hourly time series for 1,3-buatadiene, and Figure 10 shows the hourly time series for iso-propylbenzene.

As was the case at the Gregory Fresnos station, concentrations to date are much lower than TCEQ AMCVs or ESLs.

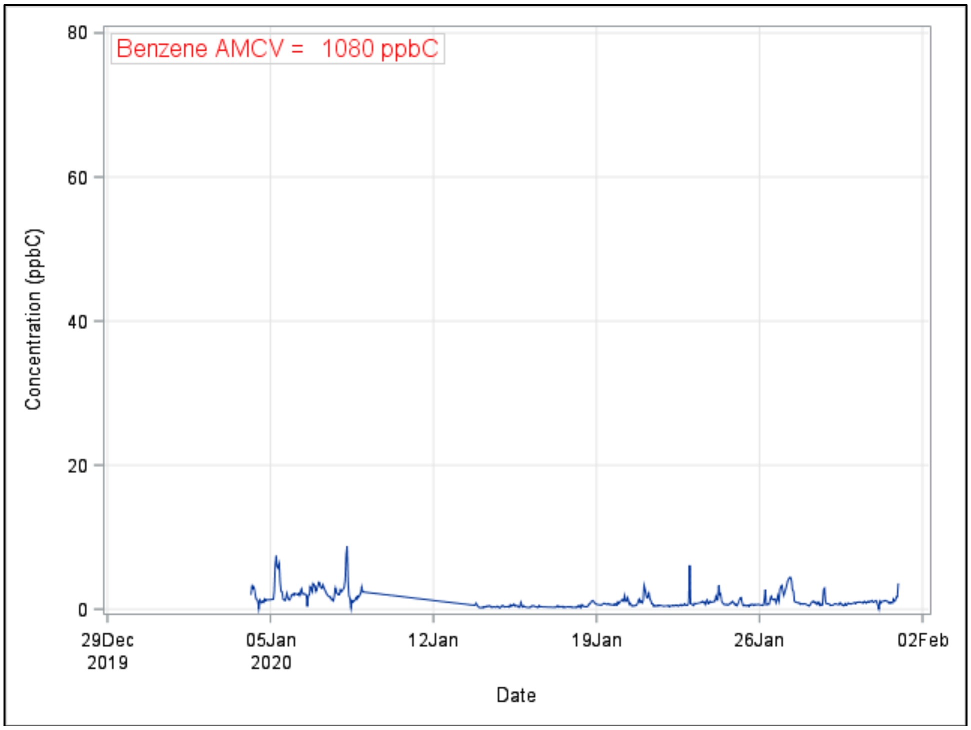

Figure 5. Hourly benzene concentrations at PBG station, Jan. 1 – Jan. 31, 2020, ppbC units

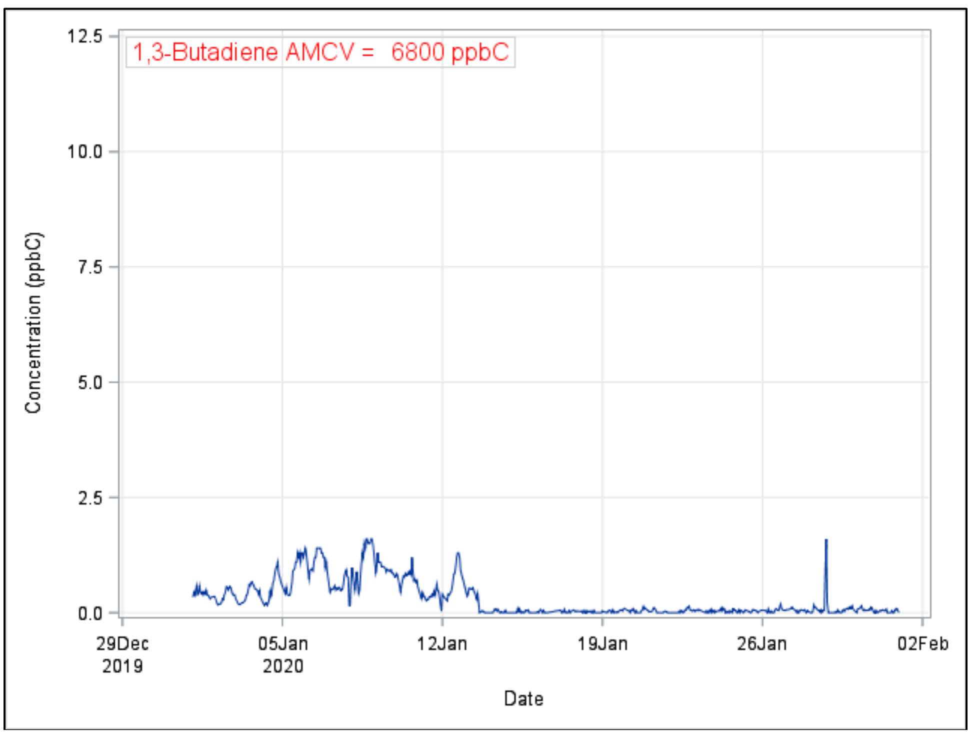

Figure 6. Hourly 1,3-butadiene concentrations at PBG station, Jan. 1 – Jan. 31, 2020, ppbC units

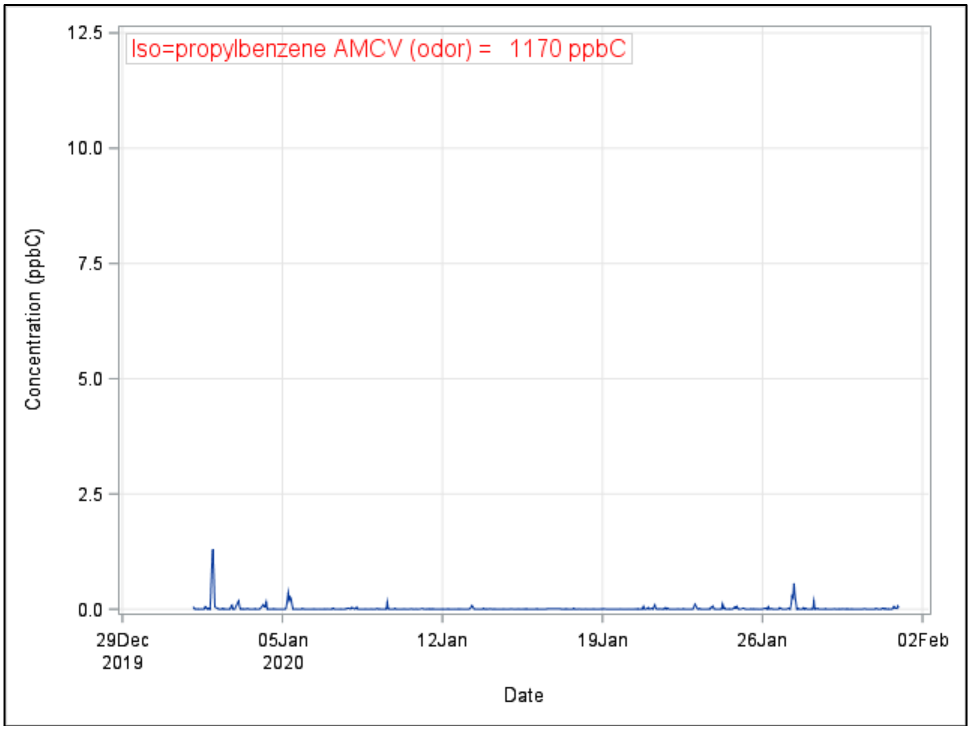

Figure 7. Hourly iso-propylbenzene concentrations at PBG station, Jan. 1 – Jan. 31, 2020, ppbC units

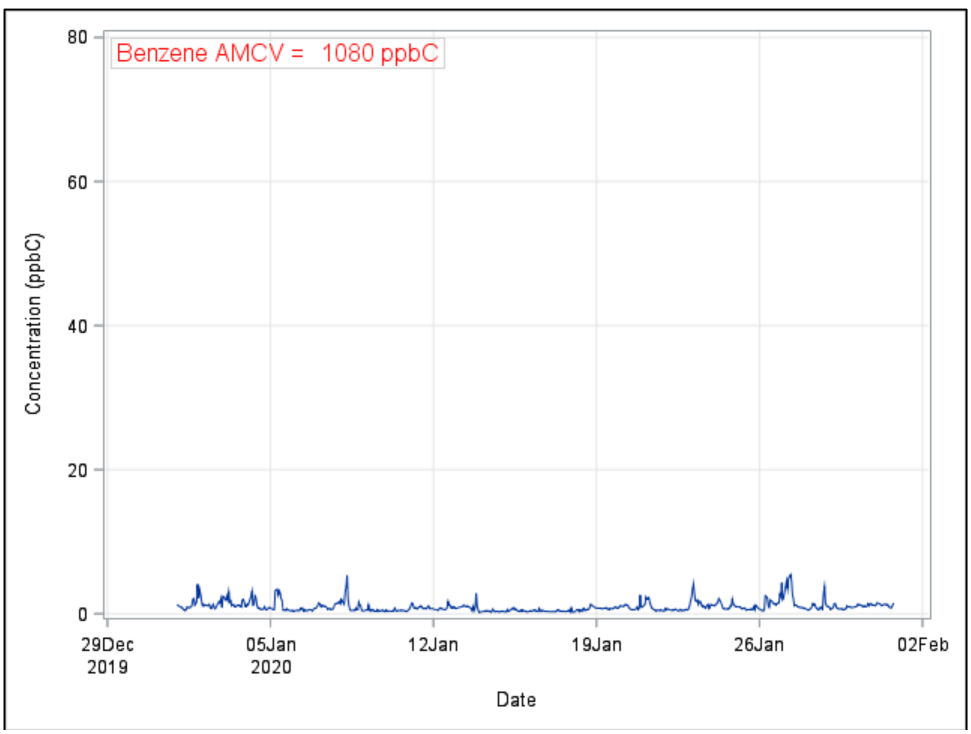

Figure 8. Hourly benzene concentrations at PBway station, Jan. 1 – Jan. 31, 2020, ppbC units

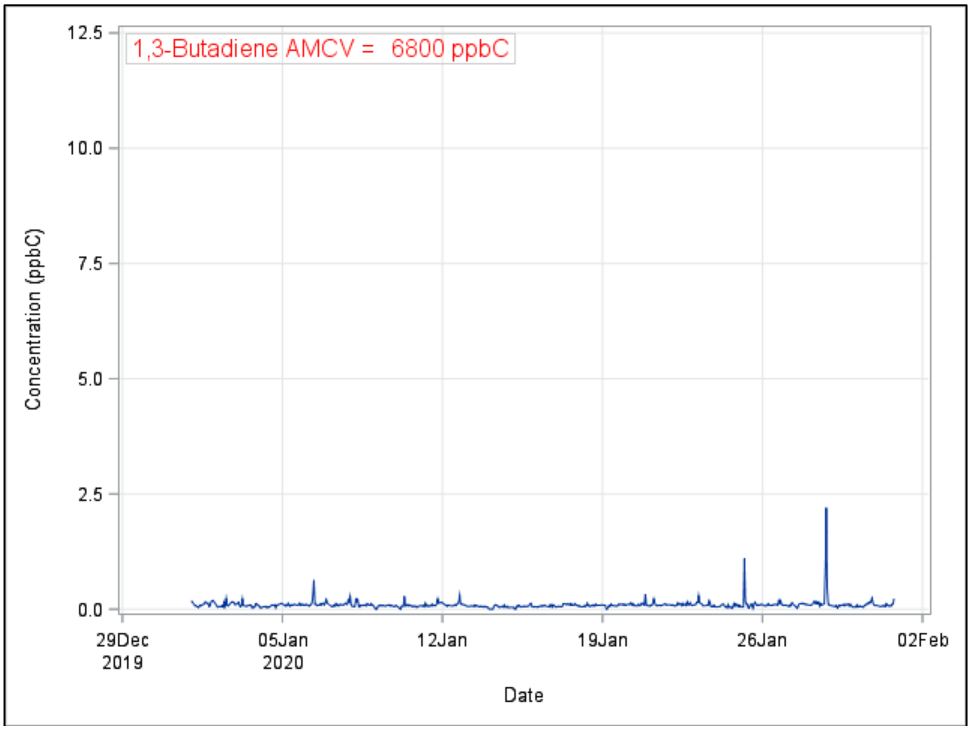

Figure 9. Hourly 1,3-butadiene concentrations at PBway station, Jan. 1 – Jan. 31, 2020, ppbC units

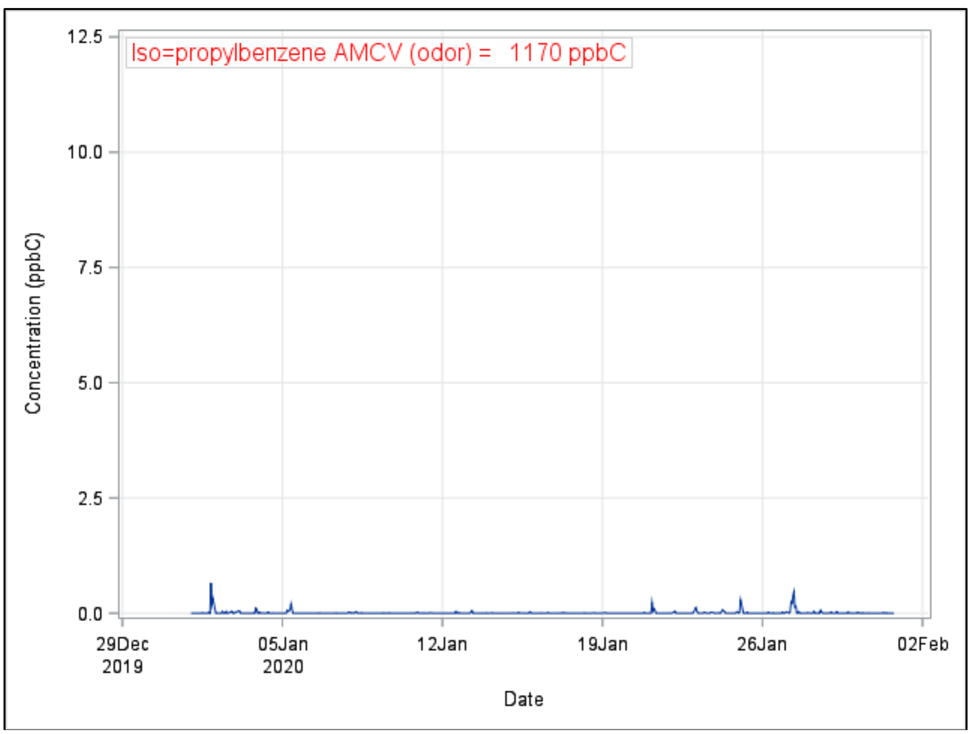

Figure 10. Hourly iso-propylbenzene concentrations at PBway station, Jan. 1 – Jan. 31, 2020, ppbC units

GF Criteria Pollutant Data

Sulfur dioxide (SO_2), fine particulate matter ($PM_{2.5}$), and nitrogen dioxide (NO_2) are three pollutants measured at the GF site that are regulated by the U.S. Environmental Protection Agency (EPA). No concentrations near the National Ambient Air Quality Standards (NAAQS) have been seen at the GF station, with the exception of one short period of elevated $PM_{2.5}$ likely associated with parking lot maintenance in early December. This was not enough to cause concern for violating the NAAQS, however.

Figure 11 shows the hourly time series for $PM_{2.5}$ at the GF station. The average concentration since October is 4.1 micrograms per cubic meter ($\mu g/m^3$) compared with a NAAQS of 12 $\mu g/m^3$. The instrument underwent maintenance in mid-February, resulting in two weeks of data loss.

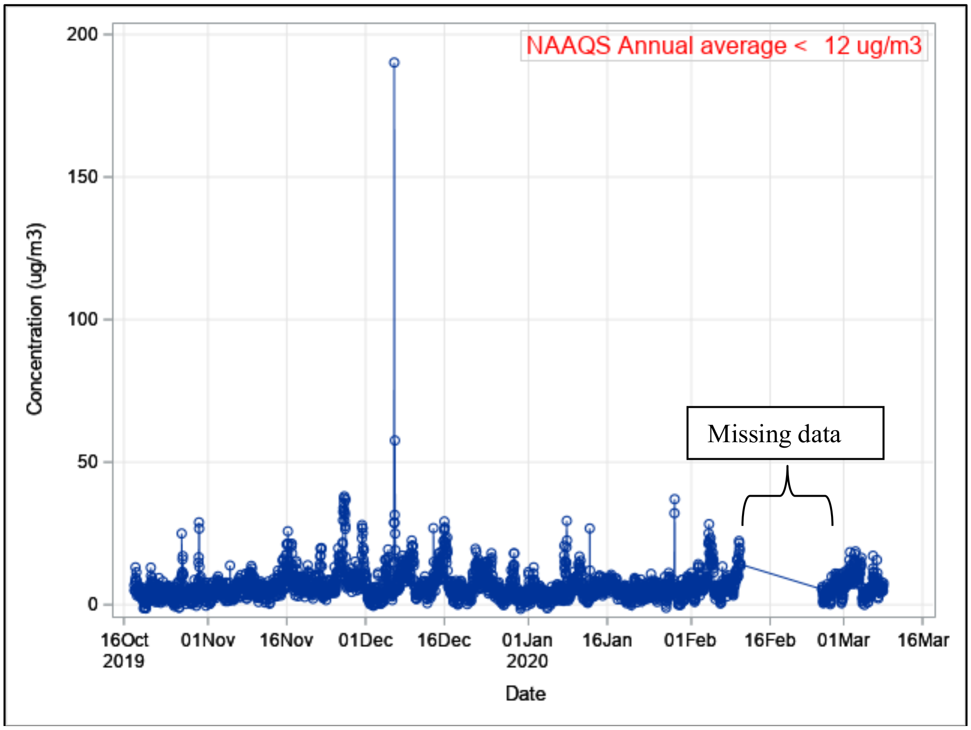

Figure 11. Hourly average $PM_{2.5}$ at GF, micro-grams/cubic meter units, Oct. 17, 2019 – Mar. 8, 2020

Figure 12 shows the hourly time series for NO_2. The average concentration of NO_2 measured to date is 6.6 parts per billion (ppb) compared to the NAAQS of 53 ppb. There was a change out of equipment in mid-February that caused a few days data loss.

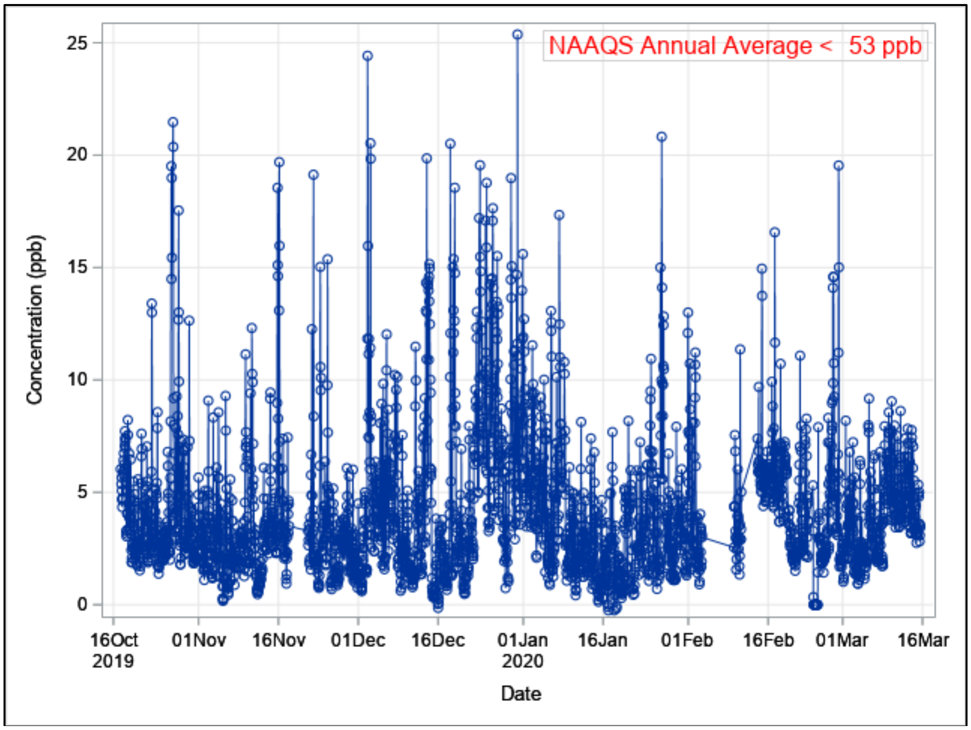

Figure 12. Hourly NO_2 at GF, ppb units, Oct. 17, 2019 – Mar. 15, 2020

Figure 13 shows the hourly time series for SO_2. The average concentration of SO_2 measured to date is less than 1 part per billion (ppb) and the maximum one-hour concentration has been 3 ppb compared to the NAAQS of 75 ppb. There was a change out of equipment in mid-February that caused a few days data loss.

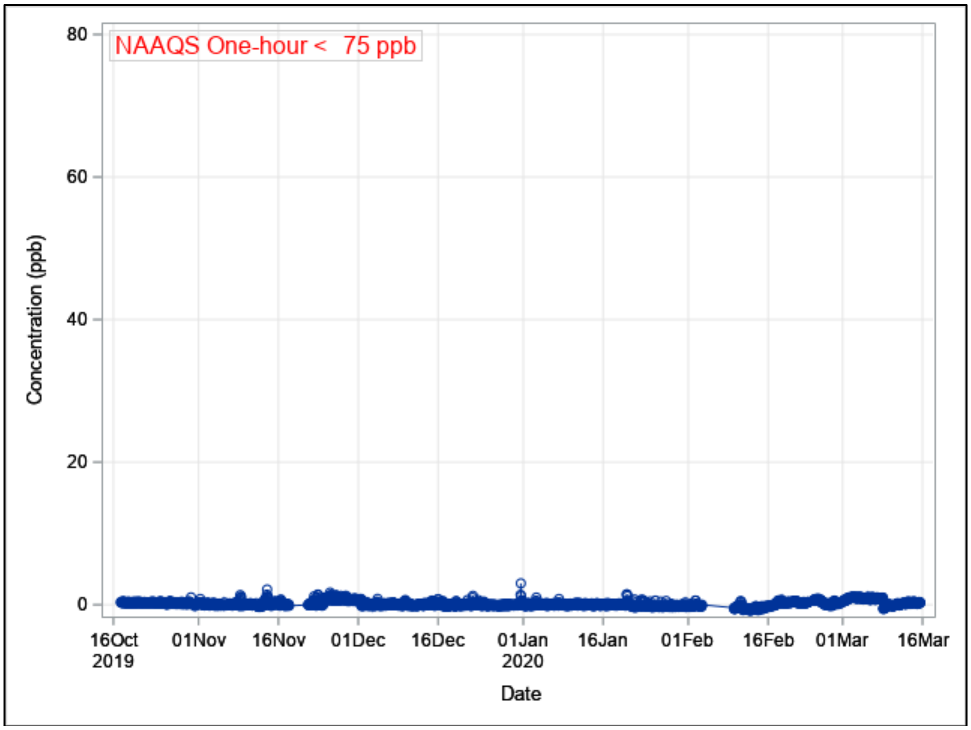

Figure 13. Hourly average SO_2 at GF, ppb units, Oct. 17, 2019 – March. 15, 2020

PBG and PBway Criteria Pollutant Data

Fine particulate matter ($PM_{2.5}$) is the only NAAQS-regulated pollutant measured at the PBG and PBway sites. No concentrations near the NAAQS have been seen at the two stations. Figure 14 shows the hourly concentrations of $PM_{2.5}$ at the PBG site and Figure 15 shows the same for the PBway site. The average concentration to date at PBG is 4.7 $\mu g/m^3$ and is 6.5 $\mu g/m^3$ at PBway, as compared to the NAAQS Annual Average of 12 $\mu g/m^3$.

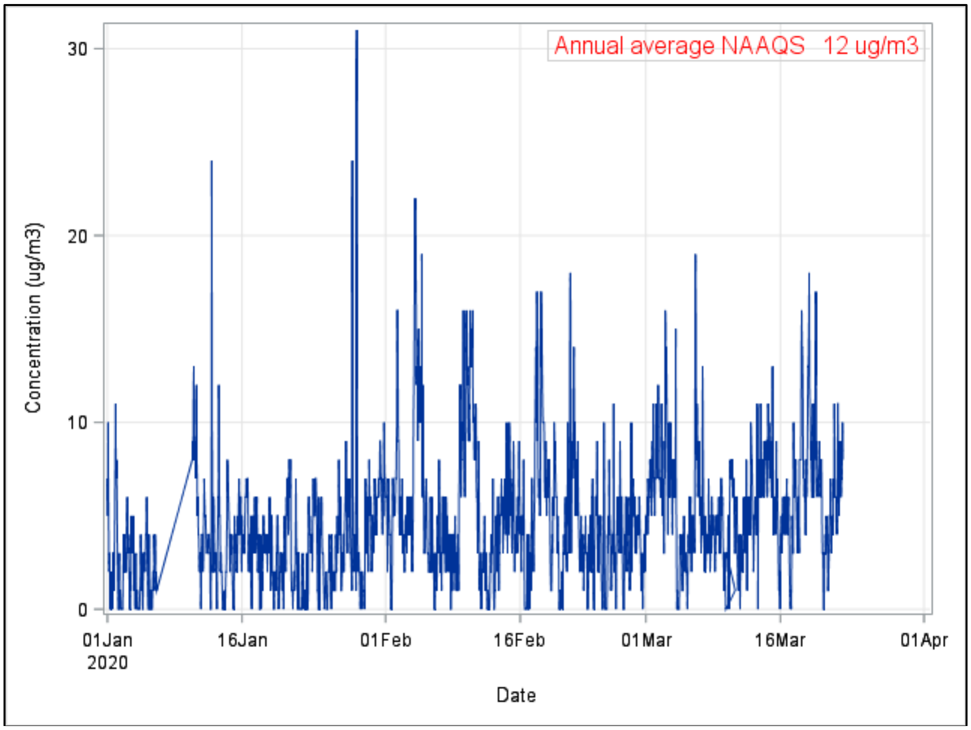

Figure 14. Hourly average $PM_{2.5}$ at PBG, micro-grams/cubic meter units, Jan. 1 – Mar. 22, 2020

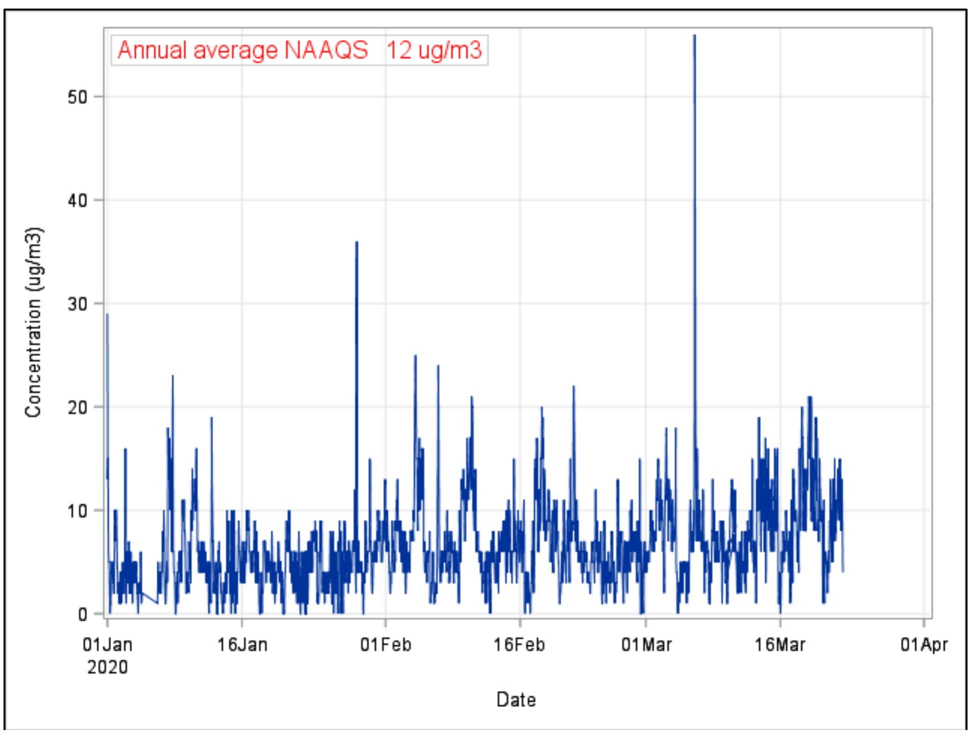

Figure 15. Hourly average $PM_{2.5}$ at PBway, micro-grams/cubic meter units, Jan. 1 – Mar. 22, 2020

5.0 Analysis of Data

Temporal Effects

In many cases, air pollutant concentrations respond to the time of day, day of week, and season of the year, as well as to meteorological factors. Figure 16 shows the mean concentrations at GF for NOx by hour of the day with data combined for weekdays (Monday through Friday = WD) and weekends (Saturday and Sunday = WE). Excluded from this analysis are a handful of the holiday dates. Concentrations tend to be higher in the morning under commuter traffic and overnight with the nighttime inversions (lower mixing height), and concentrations tend to be lower midday under higher speed daytime winds. Concentrations tend to be higher on weekdays, in part because of larger use of motor vehicles by commuters and businesses, as well as the adjacent school facilities. Approximately 22 weeks' worth of data from mid-October 2019 to mid-March 2020 were used for this analysis.

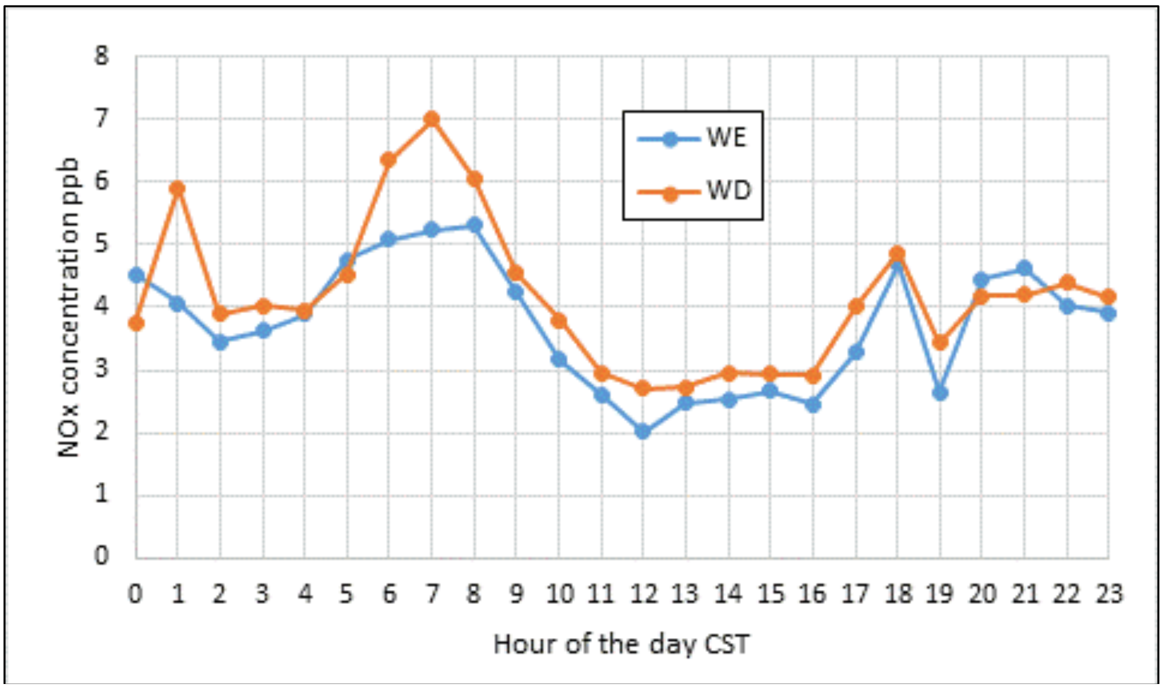

Figure 16. Hourly average NOx concentrations over the course of the day for Monday through Friday (WD) and Saturday and Sunday (WE) at the GF station, ppb units, Oct. 17, 2019 to Mar. 20, 2020

Similarly, Figure 17 shows the mean concentrations for $PM_{2.5}$ at GF by hour of the day with data combined for weekdays (Monday through Friday = WD) and weekends (Saturday and Sunday = WE). As with NOx, a few of the holiday dates are not included in this analysis. In this case, the concentrations are closer together with relatively little "weekday/weekend" effect, and relatively little variation over the 24-hour period, compared with NOx.

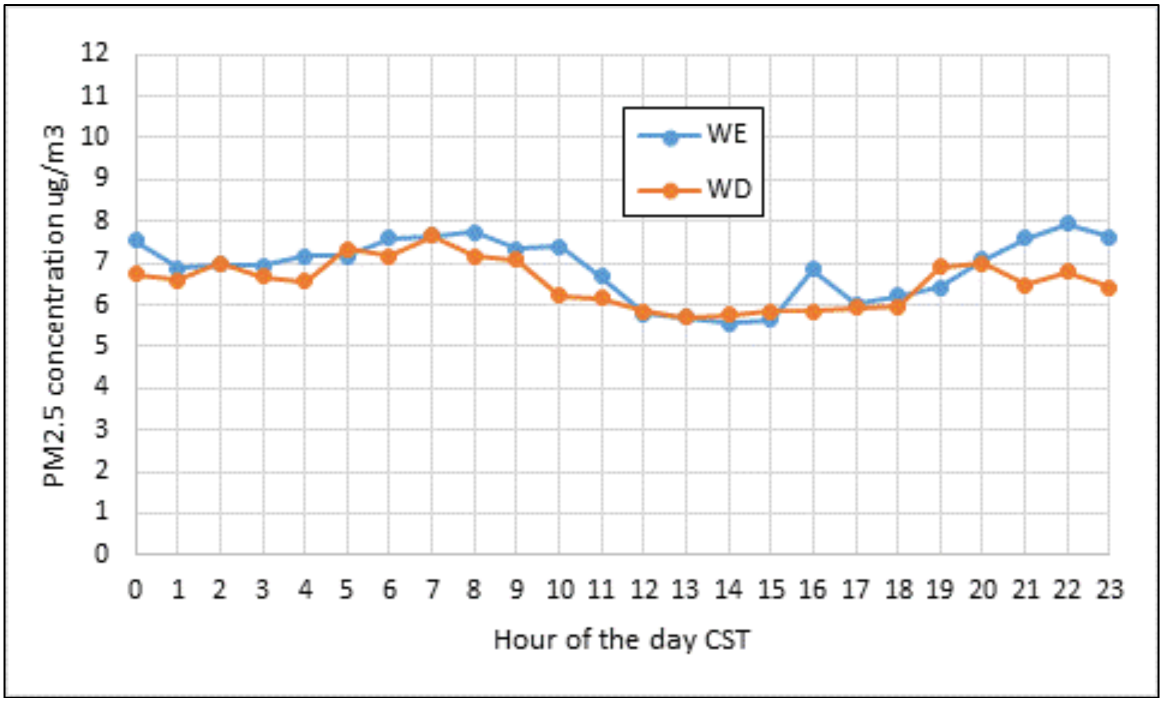

Figure 17. Hourly average $PM_{2.5}$ concentrations over the course of the day for Monday through Friday (WD) and Saturday and Sunday (WE) at the GF station, µg/m^3 units, Oct. 17, 2019 to Mar. 20, 2020

Comparison between Stations

One aspect of quality assuring data is to do inter-comparisons among monitoring stations. UT has been comparing meteorological data between the Gregory-Fresnos station and the two Portland stations, shown later in this report. Figure 18 shows a comparison of recent $PM_{2.5}$ concentrations between the TCEQ Corpus Christi Dona Park and the GF stations. There is a weak correlation between the two stations, as to some extent $PM_{2.5}$ concentrations are driven by regional factors, such as transported smoke from distant fires, transported ammonium sulfate from distant coal-burning power-plants, sea spray from the nearby Gulf of Mexico, or transported dust from distant deserts. Local factors such as road dust, local traffic, construction, chimneys and flues from homes and businesses, local fires, or industrial releases, may cause one site to have higher concentrations than a relatively nearby site.

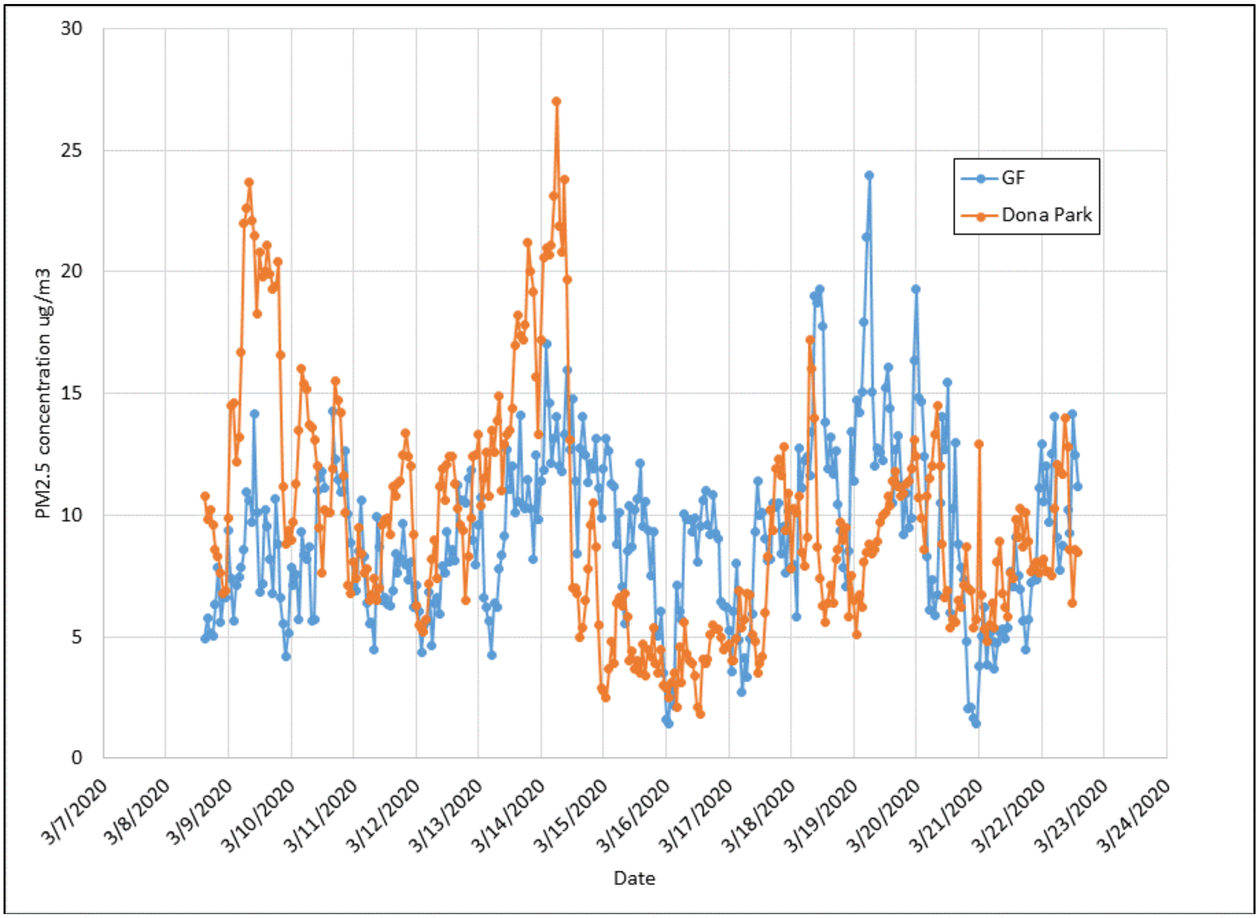

Figure 18. Hourly $PM_{2.5}$ concentrations at the GF site and the TCEQ's Dona Park site in Corpus Christi, March 8 – Mar. 22, 2020

As was mentioned above, UT has been comparing meteorological data between the GF station and the two Portland stations. The PBG station measures a wide suite of meteorological parameters similar to GF but it includes rainfall. The PBway station only records wind data. Figure 19 shows a comparison of hourly meteorological measurements for barometric pressure, relative humidity, and outdoor temperature from the Portland BG station versus the same parameters from the GF site for Jan. 1 – Feb. 9, 2020. The agreement is very good. Figure 20 shows the agreement between wind speed at the PBG and PBway stations versus the GF site. This agreement is poorer, but wind speeds are affected more by local conditions. Finally, Figure 21 shows the comparison of wind directions. For wind direction, only the hours for which all three sites were less than 360 degrees wind direction or more than 0 degrees wind direction were used in this analysis. Much of the scatter in the figures is associated with light and variable winds, but the overall agreement is very good.

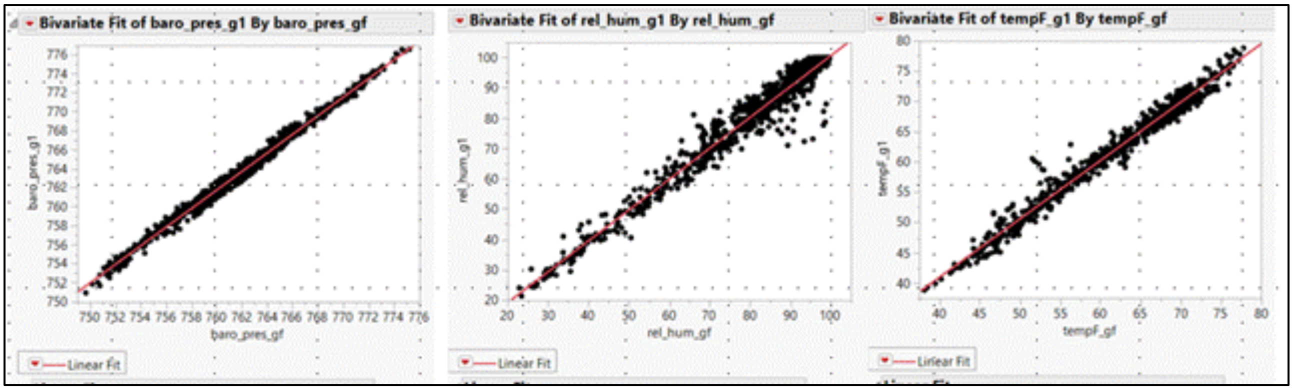

Figure 19. Hourly meteorological measurements for barometric pressure, relative humidity, and outdoor temperature from the GP-High School on Buddy Ganem (y-axis) versus the GF site (x-axis), Jan. 1 – Feb. 9, 2020

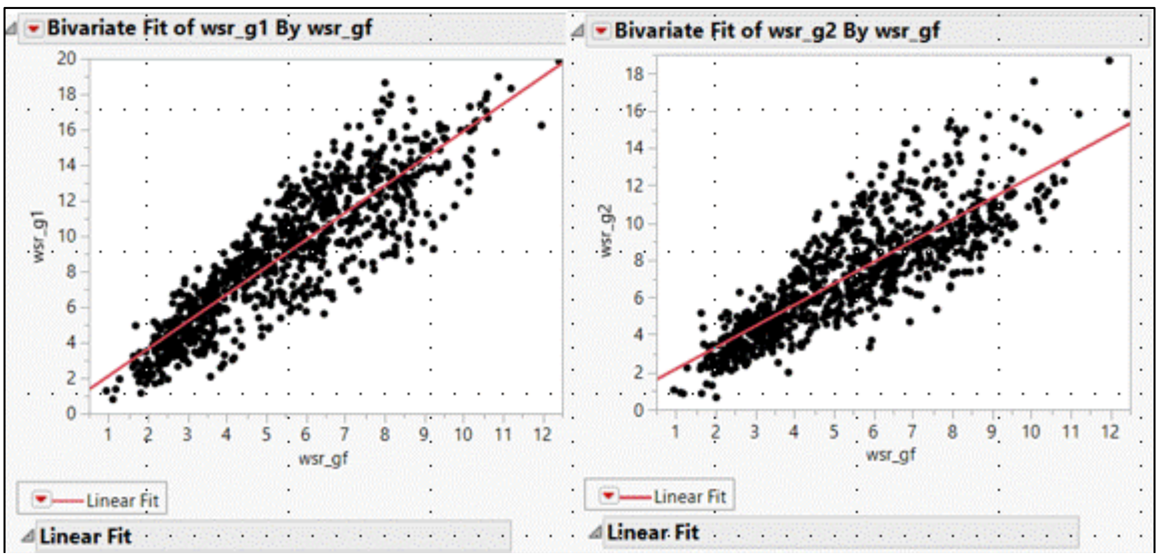

Figure 20. Hourly meteorological measurements for wind speed from Portland Buddy Ganem (y-axis) on the left and Portland Broadway on the right versus the GF site (x-axis), Jan. 1 – Feb. 9, 2020

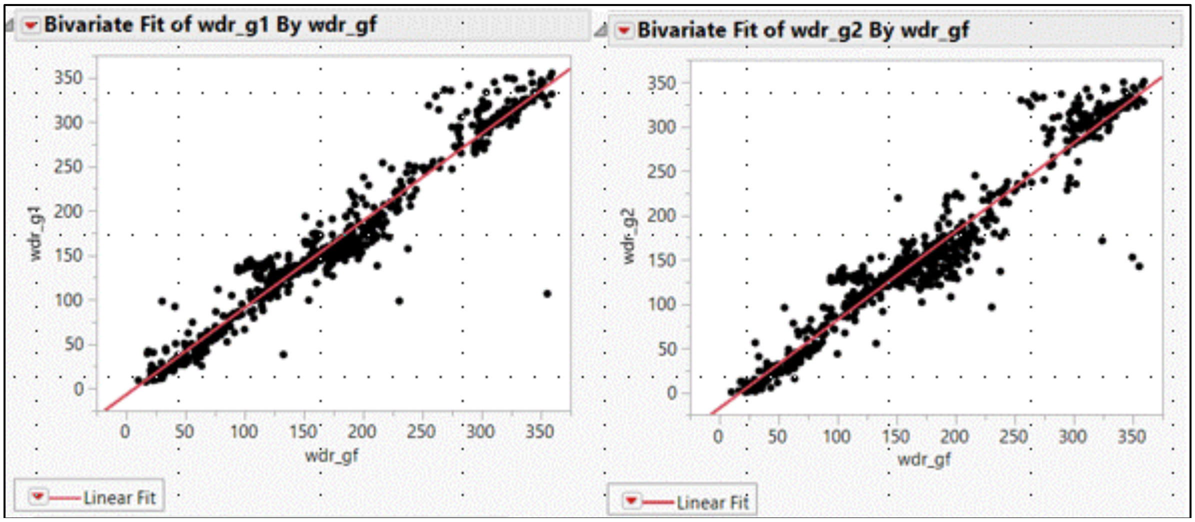

Figure 21. Hourly meteorological measurements for wind direction from the Portland Buddy Ganem (y-axis) on the left and Portland Broadway on the right versus the GF site (x-axis), Jan. 1 – Feb. 9, 2020

6.0 Conclusions

The air monitoring to date has been very successful. No concentrations have violated any NAAQS or exceeded any TCEQ AMCVs. UT Austin would be happy to answer any questions or conduct additional analysis at the community's or sponsors' requests.

Appendices

A.1 Air Monitoring Station Locations & Information

Table A-1. Gregory-Portland Community Air Monitoring Stations and Parameters Measured

Air Monitoring Station Name & Address	Volatile Organic Compounds (VOCs) 46 compounds	Ethylene oxide (EO) 24 hr canister every 6th day	Nitrogen Oxides (NOx, NO, & NO_2)	Sulfur Dioxide (SO_2)	Particulate Matter (PM) Mass, particles < 2. 5 micron diameter	Wind Speed (WS), Wind Direction (WD), Ambient Temperature (T), Relative Humidity (RH), & Barometric Pressure (BP)
Gregory Fresnos 401 Fresnos St., Gregory, TX	Yes	No	Yes	Yes	Yes	Yes
Portland Buddy Ganem GP High School Portland, TX	Yes	Yes	No	No	Yes	Yes. + precipitation
Portland Broadway Old East Cliff Elementary School Portland, TX.	Yes	Yes	No	No	Yes	Only WS, WD

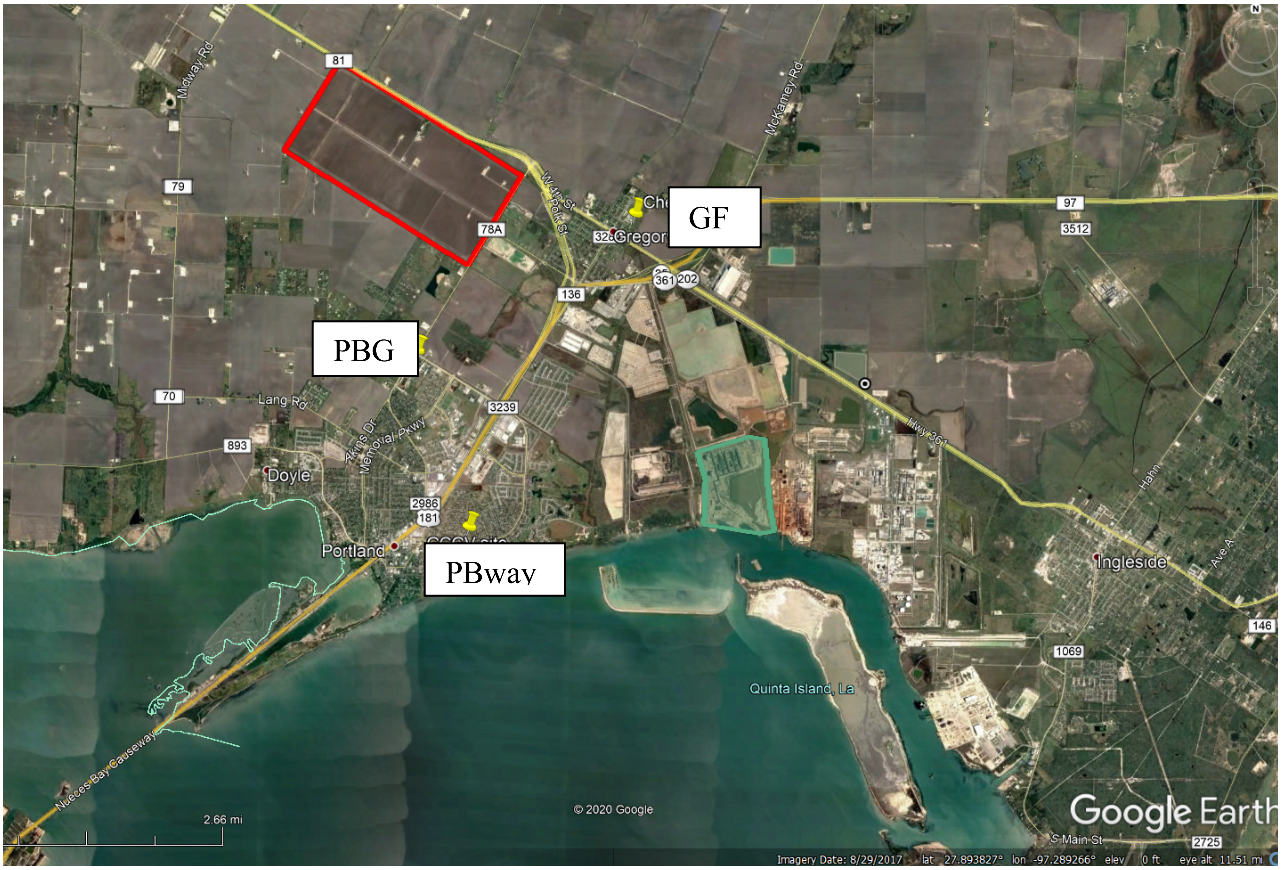

Figure 22. Location of Gregory-Fresnos Community Air Monitoring Station (GF), and two GCGV stations on GPISD sites in Portland on Buddy Ganem (PBG) and on Broadway (PBway)

A.2 Glossary of Terms and Terminology

Pollutant concentrations – Concentrations of most gaseous pollutants are expressed in units denoting their "mixing ratio" in air; i.e., the ratio of the number molecules of the pollutant to the total number of molecules per unit volume of air. Because concentrations for all gases other than molecular oxygen, nitrogen, and argon are very low, the mixing ratios are usually scaled to express a concentration in terms of "parts per million" (ppm) or "parts per billion" (ppb). Sometimes the units are explicitly expressed as ppm-volume (ppmV) or ppb-volume (ppbV) where 1 ppmV indicates that one molecule in one million molecules of ambient air is the compound of interest and 1 ppbV indicates that one molecule in one billion molecules of ambient air is the compound of interest. In general, air pollution standards and health effects screening levels are expressed in ppmV or ppbV units. Because hydrocarbon species may have a chemical reactivity related to the number of carbon atoms in the molecule, mixing ratios for these species are often expressed in ppb-carbon (ppbV times the number of carbon atoms in the molecule), to reflect the ratio of carbon atoms in that species to the total number of molecules in the volume. This is relevant to our measurement of auto-GC species and TNMHC, which are reported in ppbC units. For the purpose of relating hydrocarbons to health effects, this report notes hydrocarbon concentrations in converted ppbV units. However, because TNMHC is a composite of all species with different numbers of carbons, it cannot be converted to ppbV. Pollutant concentration measurements are time-stamped based on the start time of the sample, in Central Standard Time (CST), with sample duration noted.

Auto-GC – The automated gas chromatograph collects a sample for 40 minutes, and then automatically analyzes the sample for a target list of 46 hydrocarbon species. These include benzene and 1,3-butadiene, which are air toxics, various species that have relatively low odor thresholds, and a range of gasoline and vehicle exhaust components.

Total non-methane hydrocarbons (TNMHC) – TNMHC represent a large fraction of the total volatile organic compounds released into the air by human and natural processes. TNMHC is an unspeciated total of all hydrocarbons, and individual species must be resolved by other means, such as with canisters or auto-GCs.

Canister – Electro-polished stainless steel canisters are filled with air samples when an independent sensor detects that *elevated* (see below) levels of hydrocarbons (TNMHC) are present. Samples are taken for a set time period to capture the chemical make-up of the air.

Air Monitoring Comparison Values (AMCV) – The TCEQ uses AMCVs in assessing ambient data. Two valuable online documents ("Fact Sheet" and "Uses of ESLs and AMCVs Document") that explain AMCVs are at http://www.tceq.texas.gov/toxicology/AirToxics.html (accessed July 2015). The following text is an excerpt from the TCEQ "Fact Sheet" document:

Effects Screening Levels are chemical-specific air concentrations set to protect human health and welfare. Short-term ESLs are based on data concerning acute health effects, the potential for odors to be a nuisance, and effects on vegetation, while long-term ESLs are based on data concerning chronic health and vegetation effects. Health-based ESLs are set below levels where health effects would occur whereas welfare-based ESLs (odor and vegetation) are set based on effect threshold concentrations. The ESLs are screening levels, **not ambient air standards.** Originally, the same long- and short-term ESLs were used for both air permitting and air monitoring.

There are significant differences between performing health effect reviews of air permits using ESLs, and the various forms of ambient air monitoring data. The Toxicology Division is using the term "air monitoring comparison values" (AMCVs) in evaluations of air monitoring data in order to make more meaningful comparisons. "AMCVs" is a collective term and refers to all odor-, vegetative-, and health-based values used in reviewing air monitoring data. Similar to ESLs, AMCVs are chemical-specific air concentrations set to protect human health and welfare. Different terminology is appropriate because air *permitting* and air *monitoring* programs are different.

Rationale for Differences between ESLs and AMCVs – A very specific difference between the permitting program and monitoring program is that permits are applied to one company or facility at a time, whereas monitors may collect data on emissions from several companies or facilities or other source types (e.g., motor vehicles). Thus, the protective ESL for permitting is set lower than the AMCV in anticipation that more than one permitted emission source may contribute to monitored concentrations.

National Ambient Air Quality Standards (NAAQS) – U.S. Environmental Protection Agency (EPA) has established a set of standards for several air pollutions described in the Federal Clean Air Act. NAAQS are defined in terms of *levels* of concentrations and particular *forms*. For example, the NAAQS for particulate matter with size at or less than microns ($PM_{2.5}$) has a *level* of 12 micrograms per cubic meter averaged over 24- hours, and a *form* of the annual average based on four quarterly averages, averaged over three years. Individual concentrations measured above the level of the NAAQS are called *exceedances*. The number calculated from a monitoring site's data to compare to the level of the standard is called the site's *design value*, and the highest design value in the area for a year is the regional design value used to assess overall NAAQS compliance. A monitor or a region that does not comply with a NAAQS is said to be *noncompliant*. At some point after a monitor or region has been in noncompliance, the U.S. EPA may choose to label the region as *nonattainment*. A nonattainment designation triggers requirements under the Federal Clean Air Act for the development of a plan to bring the region back into compliance. A more detailed description of NAAQS can be found on the EPA's Website at http://www.epa.gov/air/criteria.html (accessed July 2015).

One species measured by this project and regulated by a NAAQS is sulfur dioxide (SO_2). EPA set the SO_2 NAAQS to include a level of 75 ppb averaged over one hour, with a form of the three-year average of the annual 99th percentiles of the daily maximum one- hour averages. If measurements are taken for a full year at a monitor, then the 99th percentile would be the fourth highest daily one hour maximum. There is also a secondary SO_2 standard of 500 ppb over three hours, not to be exceeded more than once in any one year.

Elevated Concentrations – In the event that measured pollutant concentrations are above a set threshold they are referred to as "elevated concentrations." The values for these thresholds are summarized by pollutant below. As a precursor to reviewing the data, the reader should understand the term "*statistical significance*." In the event that a concentration is higher than one would typically measure over, say, the course of a week, then one might conclude that a specific transient assignable cause may have been a single upwind pollution source, because experience shows the probability of such a measurement occurring under normal operating conditions is small. Such an event may be labeled "statistically significant" at level 0.01, meaning the observed event is rare enough that it is not expected to happen more often than once in 100 trials. This does not necessarily imply the occurrence of a violation of a health-based standard. A discussion of "elevated concentrations" and "statistical significance" by pollutant type follows:

- For SO2, any measured concentration greater than the level of the NAAQS, which is 75 ppb over one hour, is considered "elevated." Note that the concentrations of SO2 need not persist long enough to constitute an exceedance of the standard to be regarded as elevated. In addition, any closely spaced values that are statistically significantly (at 0.01 level) greater than the long-run average concentration for a period of one hour or more will be considered "elevated" because of their unusual appearance, as opposed to possible health consequence. The rationale for doing so is that unusually high concentrations at a monitor may suggest the existence of unmonitored concentrations closer to the source area that are potentially above the state's standards.
- For TNMHC, any measured concentration greater than the threshold of 2000 ppbC is considered "elevated."
- For benzene and other air toxics in canister samples or auto-GC measurements, any concentration above the AMCV is considered "elevated." Note that 40-minute auto-GC measurements are compared with the short-term AMCV.
- Some hydrocarbon species measured by the auto-GC generally appear in the air in very low concentrations close to the method detection level. Similar to the case above with SO2, any values that are statistically significant (at 0.01 level) greater than the long-run average concentration at a given time or annual quarter will be considered "elevated" because of their unusual appearance, as opposed to possible health consequence. The rationale for doing so is that unusually high concentrations at a monitor may suggest an unusual emission event in the area upwind of the monitoring site.