

DEP Air Quality Monitoring Project

Monitoring Air Quality in Southern Delaware County



Quarterly Report
January - May 2026



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Summary

This is the second report to the community as part of a Delaware County Planning Department and Pennsylvania Department of Environmental Protection (DEP) project studying the air quality of southern Delaware County. This report is provided quarterly (i.e. every three months) to update communities in the study area about developing observations from the data collected.

We will be collecting much, much more data from now through the Summer of 2027.

To date, levels of Particulate Matter (PM) measurements of 2.5 micrometers or less (PM_{2.5}) in the study area are usually below the federal 24-Hour (i.e. Daily) AVERAGE standard. There have been some days with higher levels, although these days are uncommon. PM_{2.5} levels have varied across monitoring locations at times, and we are continuing to study how regional factors and local sources contribute to these patterns.

As we collect more data, we will be able to begin other analyses that will aid in describing the nature of pollution in southern Delaware County. As these analyses are added, their results will be shared through this report and public meeting. We welcome community input for types of analyses that the community may find valuable.

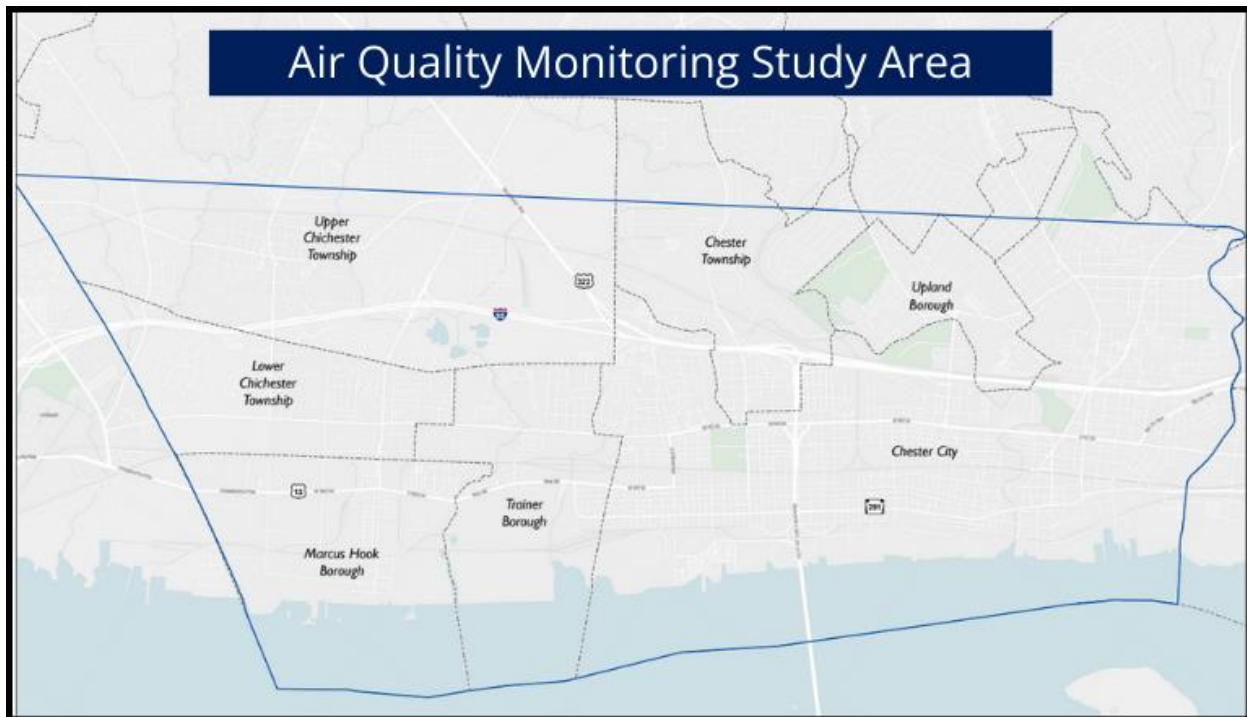
About the Project

This is a two-year project by the Delaware County Planning Department, the Pennsylvania Department of Environmental Protection (DEP), Johns Hopkins University, University of Pennsylvania's (UPenn) Center of Excellence in Environmental Toxicology (CEET), and community partners to study how vehicle emissions from I-95 and other emissions from industries in Southern Delaware County are impacting air quality, and to share this data with the community.

To do this, 32 air quality monitors have been installed at locations throughout the study area.

The study area includes:

- Chester City
- Trainer Borough
- Marcus Hook Borough
- Lower Chichester Township
- Part of Upper Chichester Township
- Part of Chester Township
- Part of Upland Borough



Data may help answer questions like:

- *How is the air in neighborhoods affected by industries and truck routes?*
- *Which neighborhoods are most affected by air pollution?*

Public Meetings will be happening **quarterly** to answer any questions and provide expert support understanding the data. Dates will be posted to the [Project Website](https://tinyurl.com/depairqualitymonitoring) (tinyurl.com/depairqualitymonitoring) and [Project Instagram \(@DEPairqualitymonitoring\)](https://www.instagram.com/DEPairqualitymonitoring) page as meetings are scheduled. Want to be alerted in your email inbox when a public meeting is coming up? Join our mailing list! [Sign up here](#) or at tinyurl.com/DEPairNewsletter.

Air Pollution and Your Health

Outdoor air pollution can be caused by nature and humans. Pollutants come from many sources (e.g. traffic, unplanted fields, industry, wildfires) and have varying health effects. Pregnant women, children, the elderly, and people with lung, heart, and other conditions are more vulnerable to the effects of air pollution. Short-term spikes in pollution (e.g., wildfires, industrial emissions, high traffic days) can result in asthma attacks, ER visits, or heart complications.

Particulate Matter

Particulate matter (PM) is the general term used to describe particles found in the air. What these particles are made of and their size can vary. Their size is very small and is measured in micrometers (also called “microns”). When written, the notation is “ μm ” because the Greek letter *mu* (μ) is used to denote “micro-“. The monitors we are using in this study record particles of different sizes, including those with diameters of 10 μm and smaller (called PM₁₀), those with diameters smaller than 2.5 μm (called PM_{2.5}), and particles less than 1.0 μm in diameter (called PM₁). The following infographic helps to visualize the size differences.

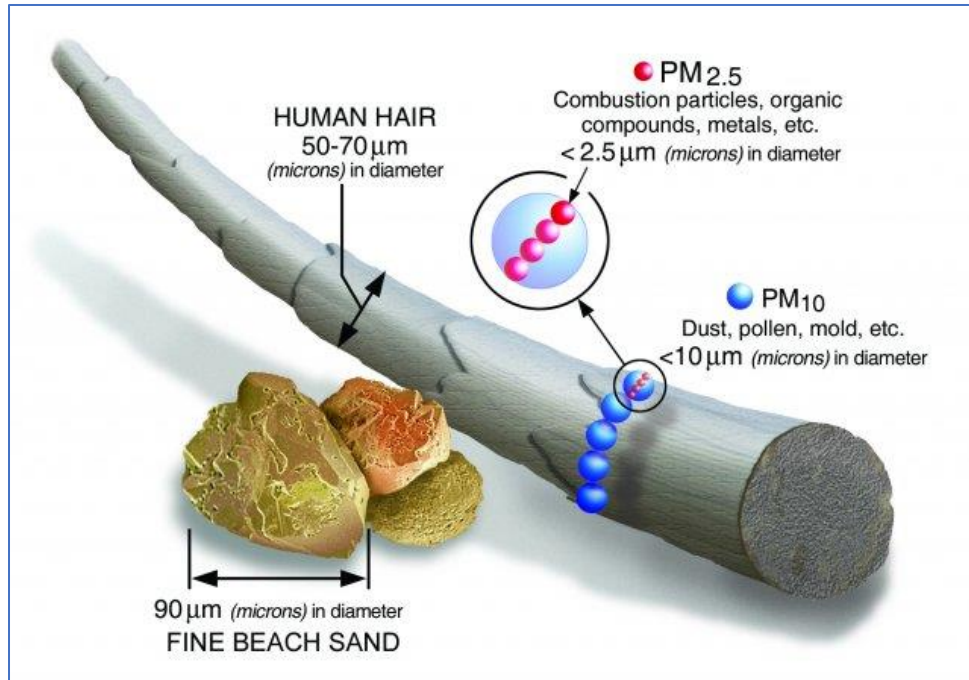


Figure 1: From EPA website <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>

PM_{2.5}, being studied here, includes all particles that are 2.5 μm in diameter or smaller. PM_{2.5} is the particle size that has the most research linking it to health effects. These fine particles are so small they can be inhaled deep into the lungs, impacting heart and lung health.

When measuring PM concentrations, they are measured in micrograms per cubic meter (μg/m³). This unit of measure indicates the mass of particulate per volume of air. Standard scientific practice is for that volume of air to be one cubic meter (imagine a cube of air that is one meter long, by one meter wide, by one meter deep).

The U.S. Environmental Protection Agency (EPA) sets standards for pollutants. These standards are set to protect public health.

- Over a 24-hour period, the average concentration of PM_{2.5} should not exceed 35 micrograms per cubic meter of air (μg/m³).
- Over an entire year, the average concentration of PM_{2.5} should not exceed 9.0 micrograms per cubic meter of air (μg/m³).

AQI Chart

The Air Quality Index is a tool used to communicate air quality to the public. It includes six color-coded categories, each corresponding to a range. The higher the AQI value, the greater the level of air pollution and the greater the health concern.

This report uses AQI colors to communicate about the air quality but uses $\mu\text{g}/\text{m}^3$ to share particulate levels rather than the values of the index.

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups* may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

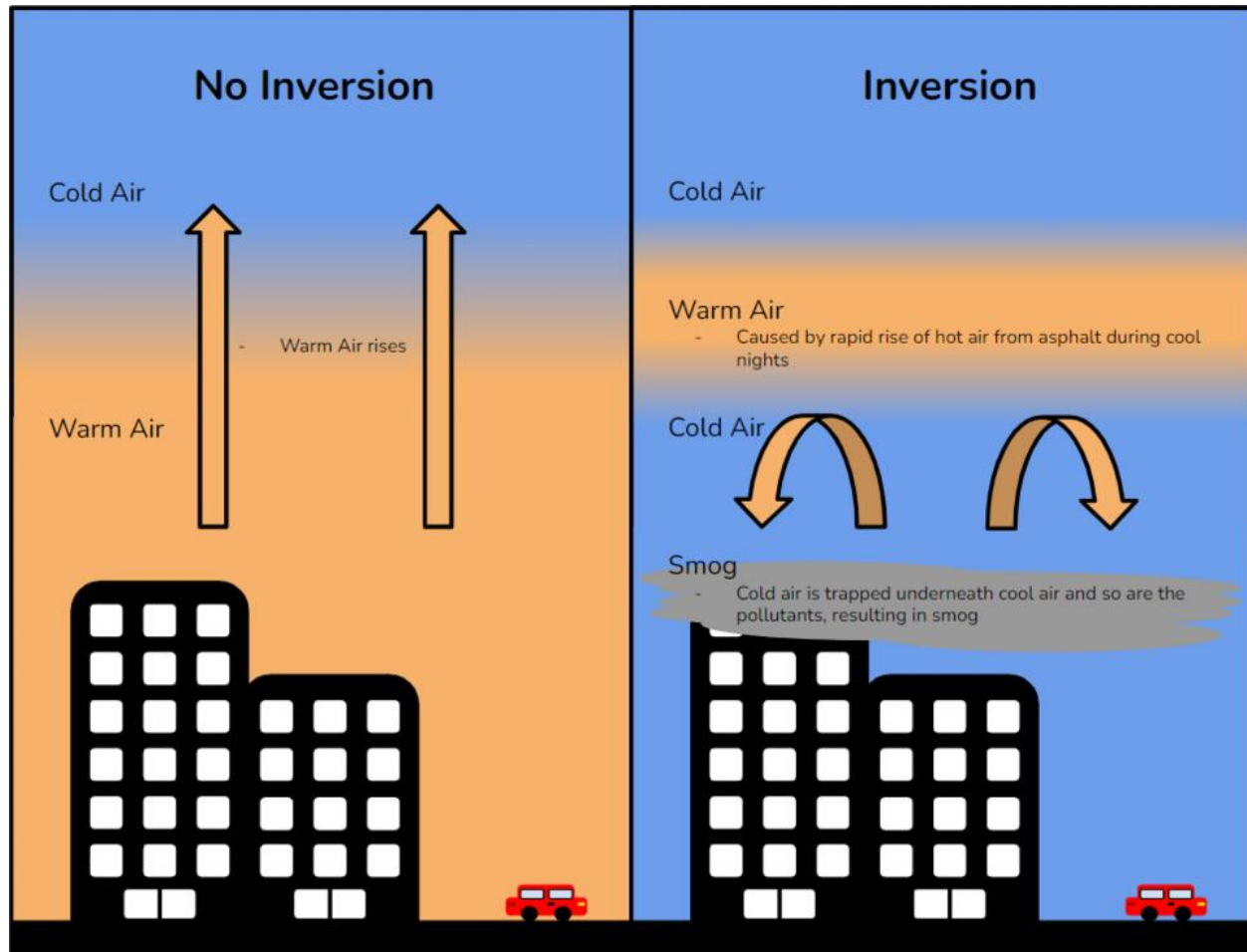
**Sensitive Groups include individuals who are more susceptible to health effects from air pollution. These groups typically consist of children under 18 years old, older adults over 65 years old, people with chronic heart or lung disease, pregnant women, and individuals with diabetes. When AQI is unhealthy for sensitive groups, these individuals may experience more serious health effects compared to the public.*

Map - Average PM for All Locations (JANUARY through MAY 2026)

The following figures show the monthly $\text{PM}_{2.5}$ averages for January, February, March, April, and most of May 2026. The monthly average for January, across all sensor sites, is $7.8 \mu\text{g}/\text{m}^3$. Sensors during January were classed as either “Good” or “Moderate” according to the AQI Chart. Being said, there may have been specific days or hours where the air quality was not as good, this is explored in the next section (“Time Series Analysis”). In February, the average measurement for the month increased to $9.9 \mu\text{g}/\text{m}^3$, marking an interesting increase for the month. Then the monthly average values for March, April, and May dropped to 7.2 , 6.2 , and $7.3 \mu\text{g}/\text{m}^3$, respectively.

The reason for this increase still needs to be analyzed with wind speed and wind direction factored in, but this observed increase in average concentration is not necessarily correlated to an increased generation of pollution. The meteorological phenomenon called **temperature inversion** is commonly observed in the autumn and winter seasons in the Mid-Atlantic region of the United States. This

inversion can, in effect, “trap” pollutants near ground level, preventing their usual diffusion by wind. This “trapping” is a result of cooler air being closer to the Earth’s surface and underneath a body or warmer air (this is the inverse of the usual situation, hence why it’s called an Inversion). The cooler air does not move freely across the ground, which means that the pollutants are not being diluted at their usual rate. Because of this, the average concentration may increase, not because of increased pollution generation but rather due to the pollution not being able to leave the area.



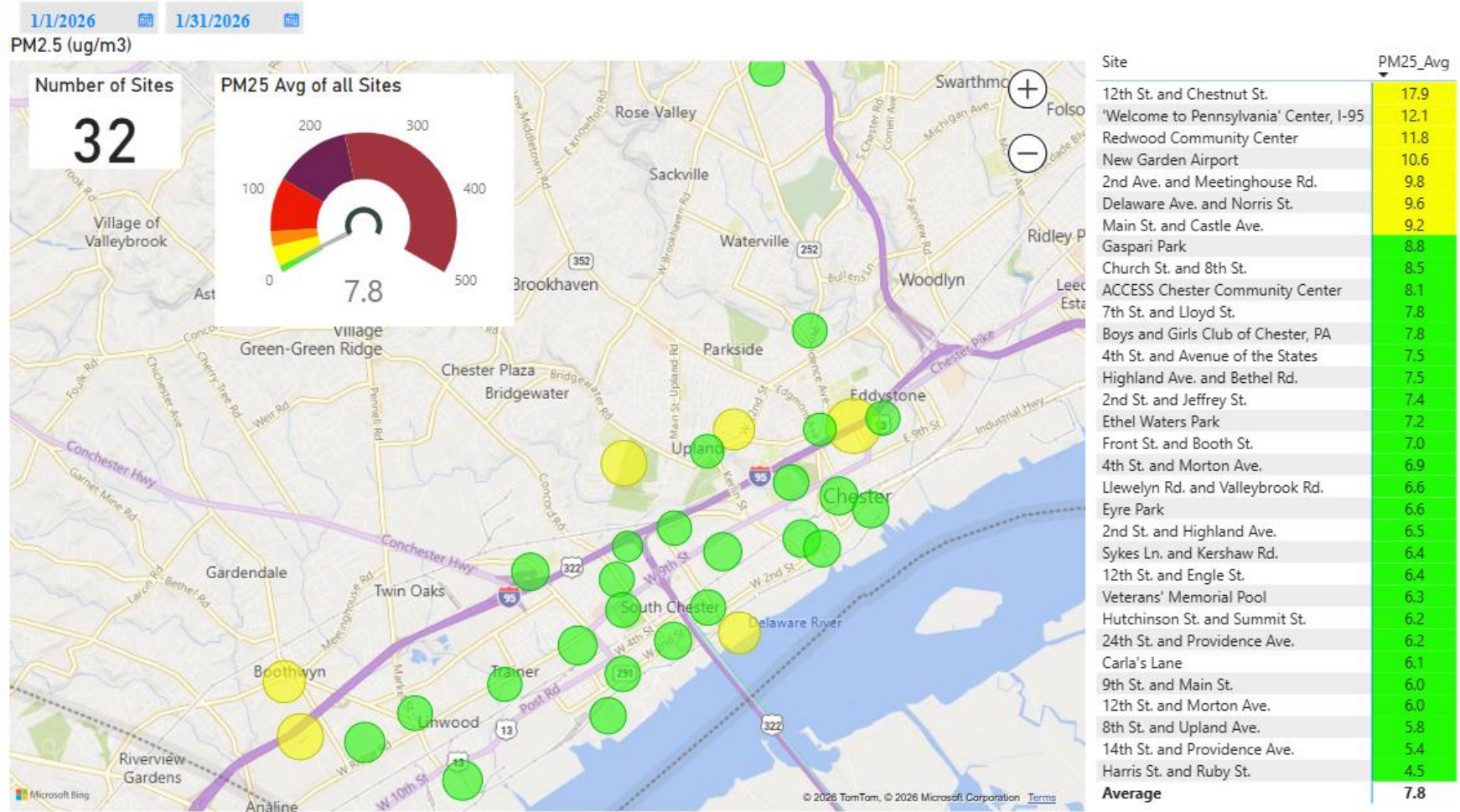
[“Thermal Inversion in Urban Environment”](#) by Tyler Chow is licensed under [CC BY-SA 4.0](#)

With respect to January and February having higher concentrations, the cold winter air, coupled with the snow cover (keeping the air colder for longer) combined to produce multiple temperature inversions, thus causing temporary increases in pollution concentrations.

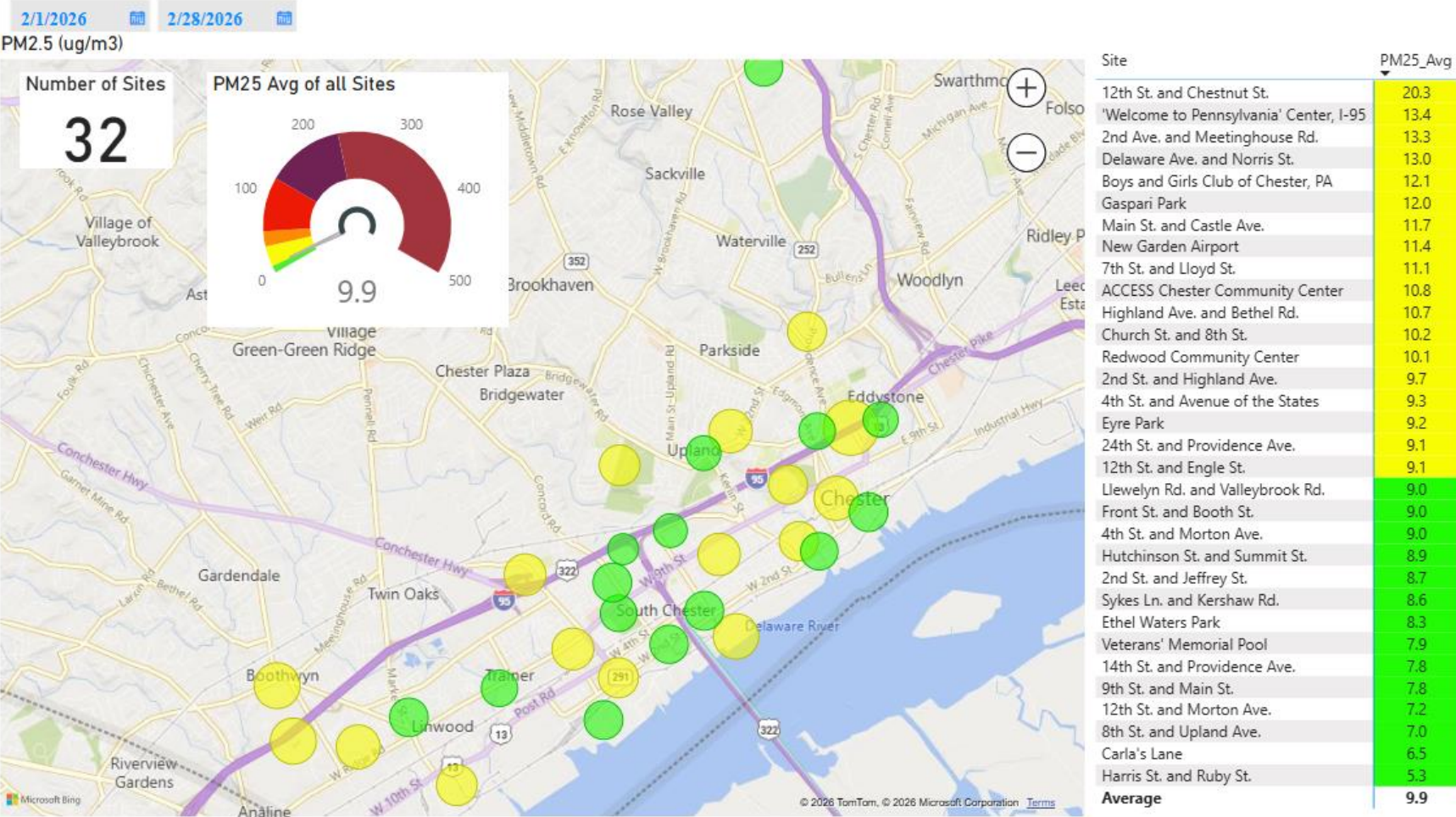
There is also the possibility that pollution generation did increase due to the cold temperatures of January and February. Many homes are heated through the winter with oil or natural gas burning furnaces (as well as those with supplemental wood or coal stoves). These methods use the combustion of fossil fuels as the heat source, and these are known to contribute to pollution generation.

As mentioned, more analysis will be performed as more data is accumulated at the sensor locations.

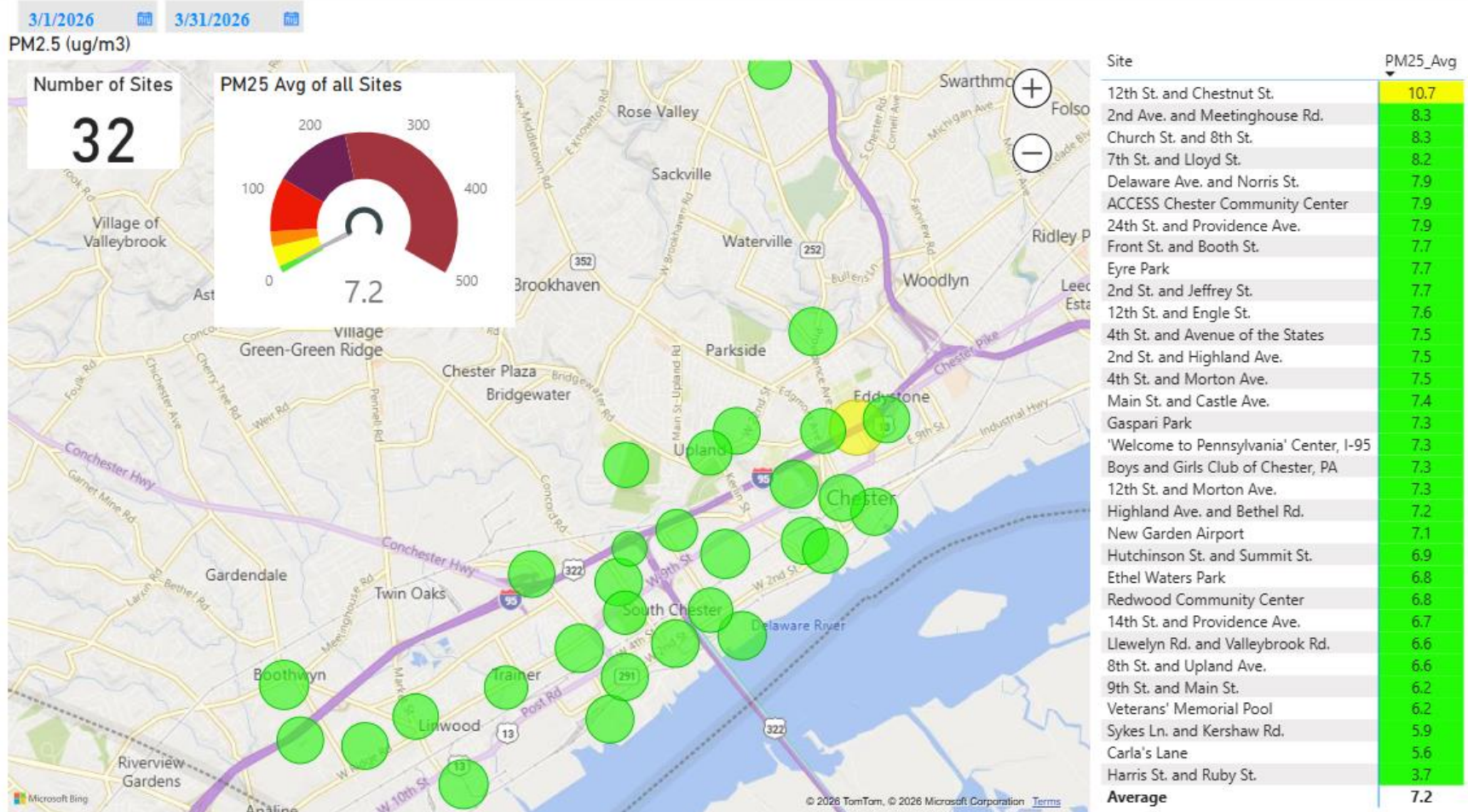
Monthly Average (All Sites) JANUARY 2026



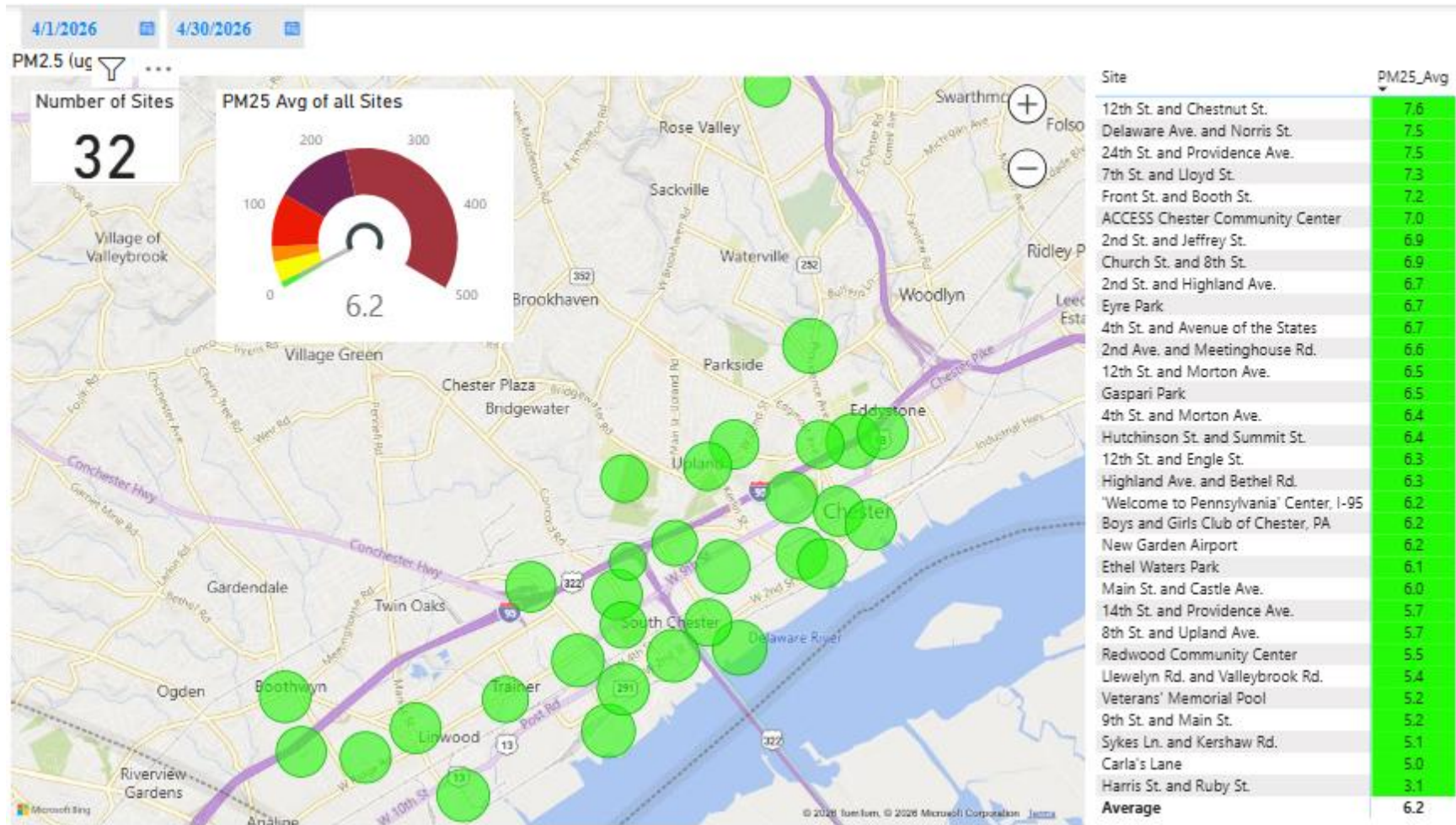
Monthly Average (All Sites) FEBRUARY 2026



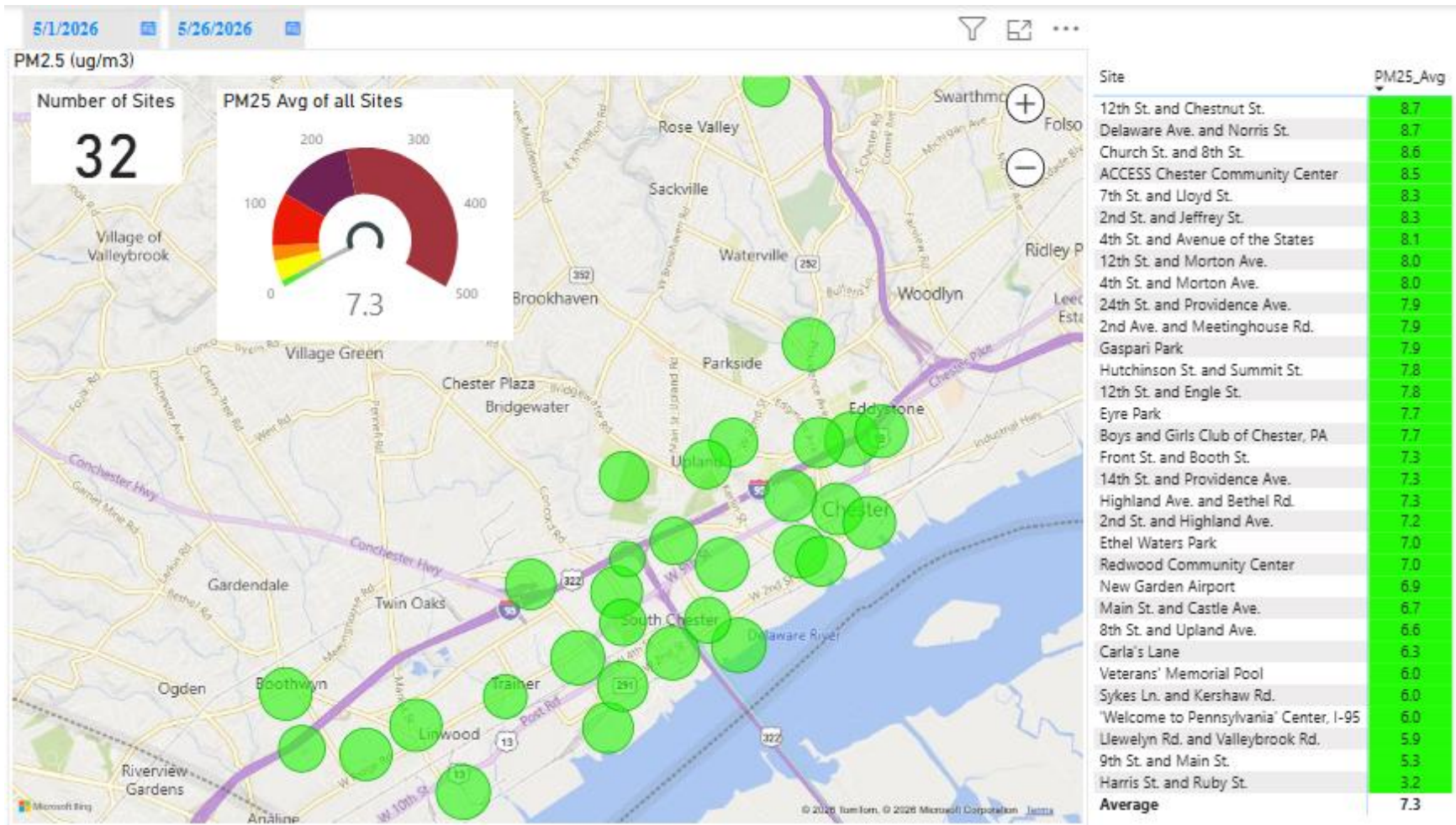
Monthly Average (All Sites) MARCH 2026



Monthly Average (All Sites) APRIL 2026



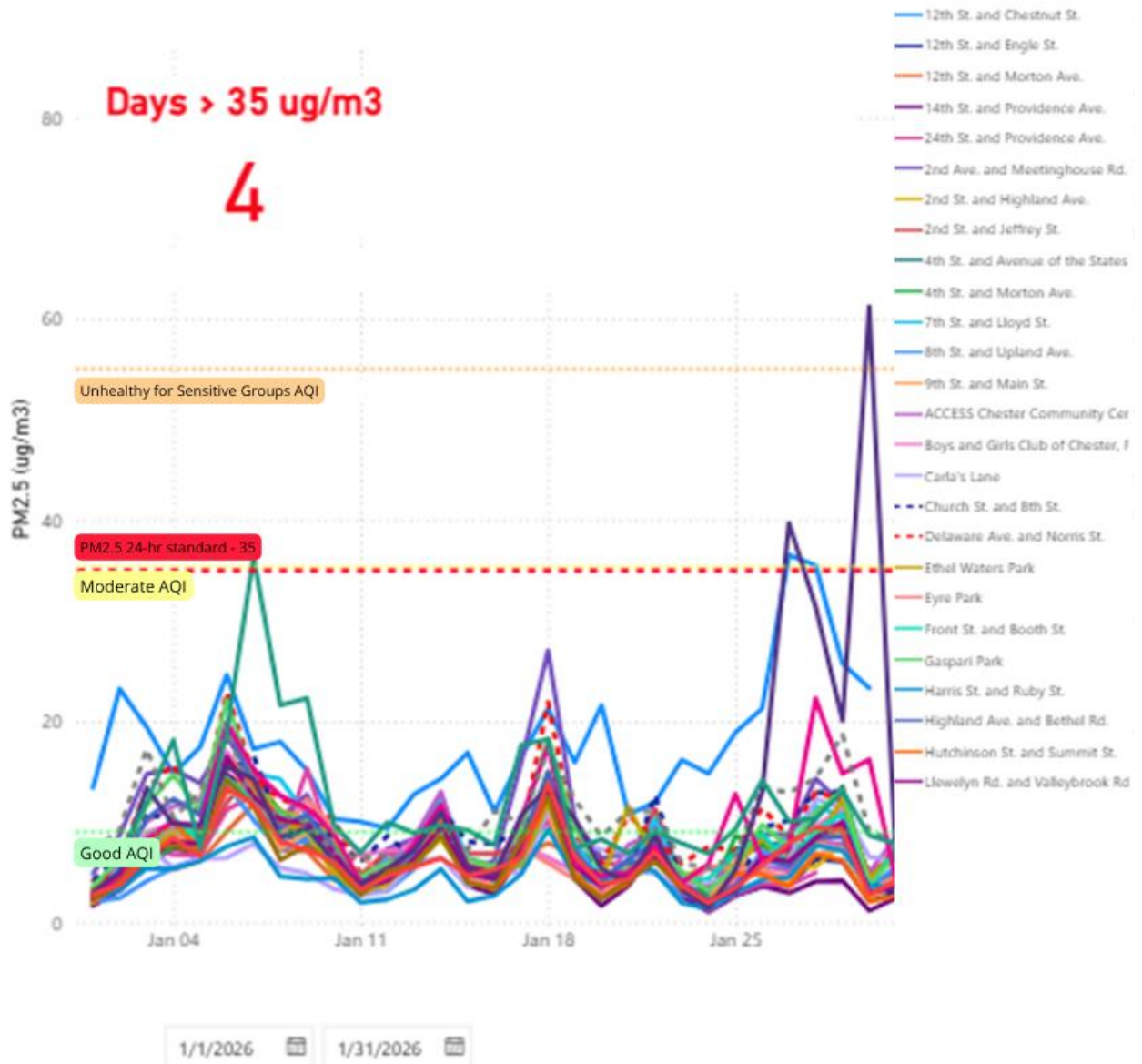
Monthly Average (All Sites) MAY 2026



Time Series Analysis

The following three time-series graphs display the changes in PM_{2.5} concentrations from January to May 2026. Graphs for individual sites (January – May) can be found in Appendix A of this report.

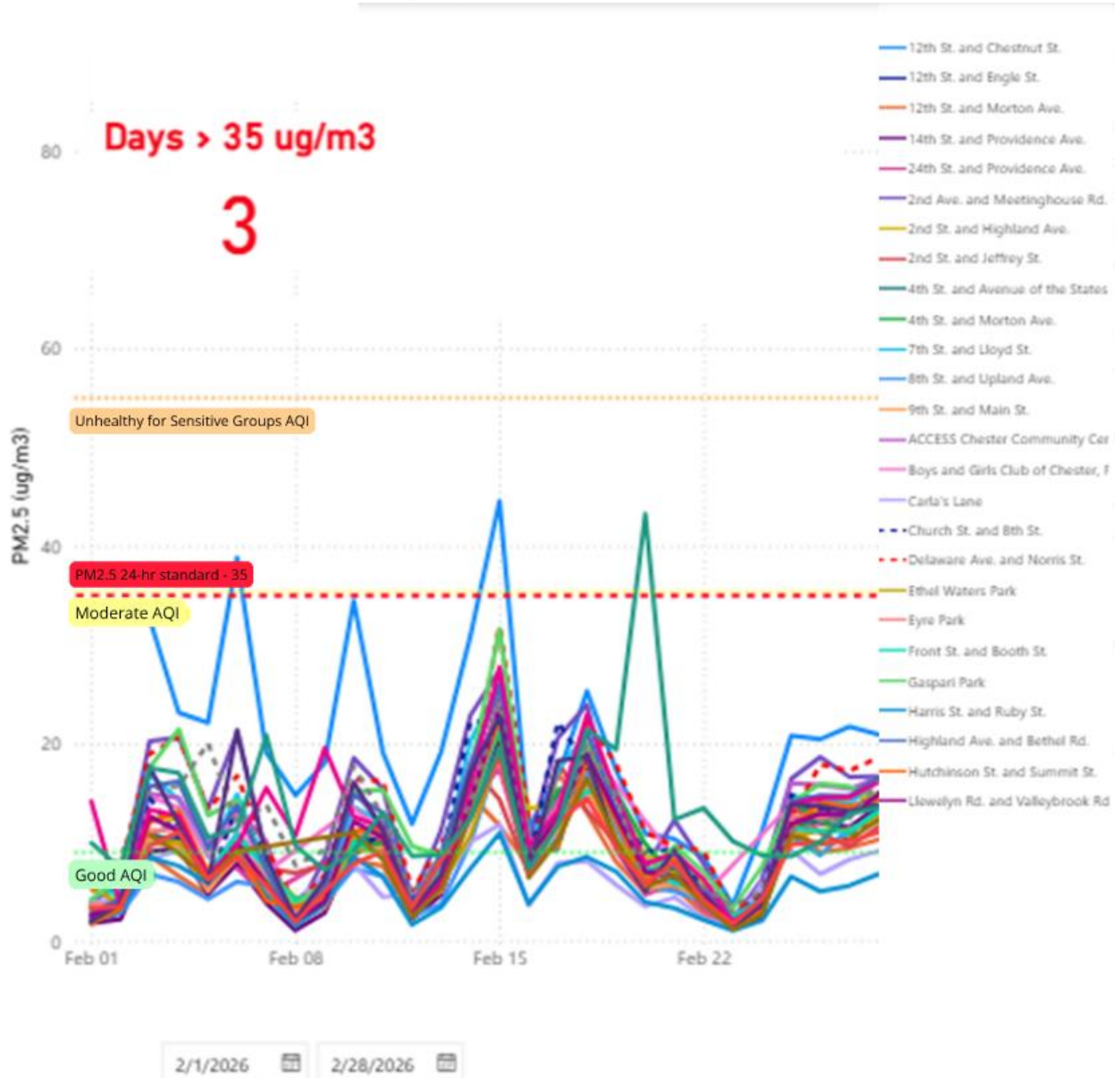
Daily Averages (All Sites) JANUARY 2026



In January, the hourly average concentration frequently surpassed the ANNUAL standard of 9.0 µg/m³ the hourly average concentrations stayed under the DAILY (24-Hr) standard of 35 µg/m³ except on four days. The first time the concentration exceeded the 24-Hr standard was on January 7th, at the 'Welcome to Pennsylvania' visitors' center along I-95. The remainder of the events were near the end of the month: January 27th, 28th, and the 30th. These latter events occurred at two locations, at the Redwood Community Center and near the intersection of 12th St. and Chestnut St. The 12th and Chestnut location is situated directly over I-95, which is likely the explanation for its high readings; either abnormally high

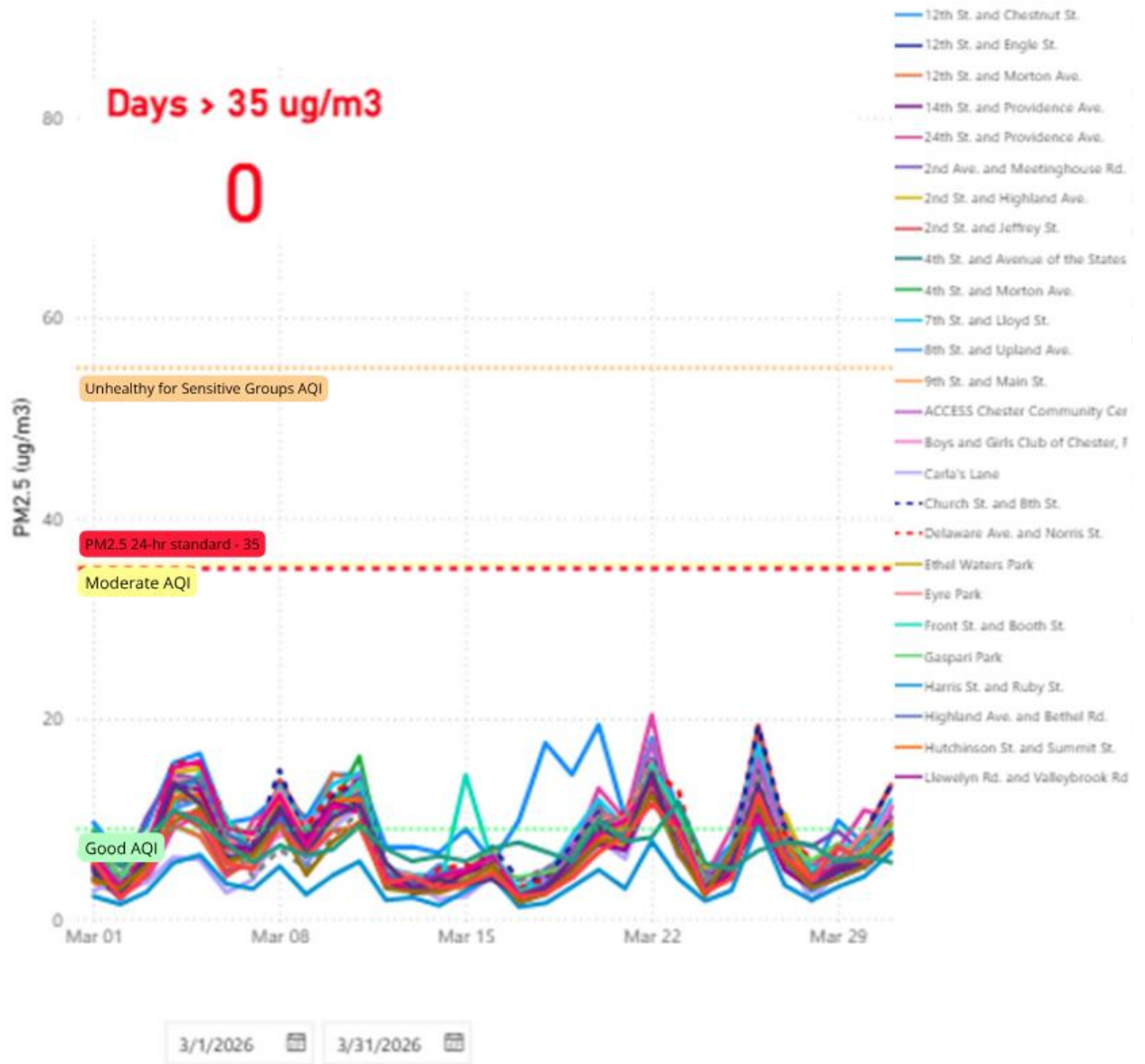
traffic volumes, a temperature inversion, or a blend of these two explanations. The high readings at the Redwood Community Center do not have a clear explanation yet. If anyone in the community has information that may help, please contact us at PetersonS@co.delaware.pa.us.

Daily Averages (All Sites) FEBRUARY 2026



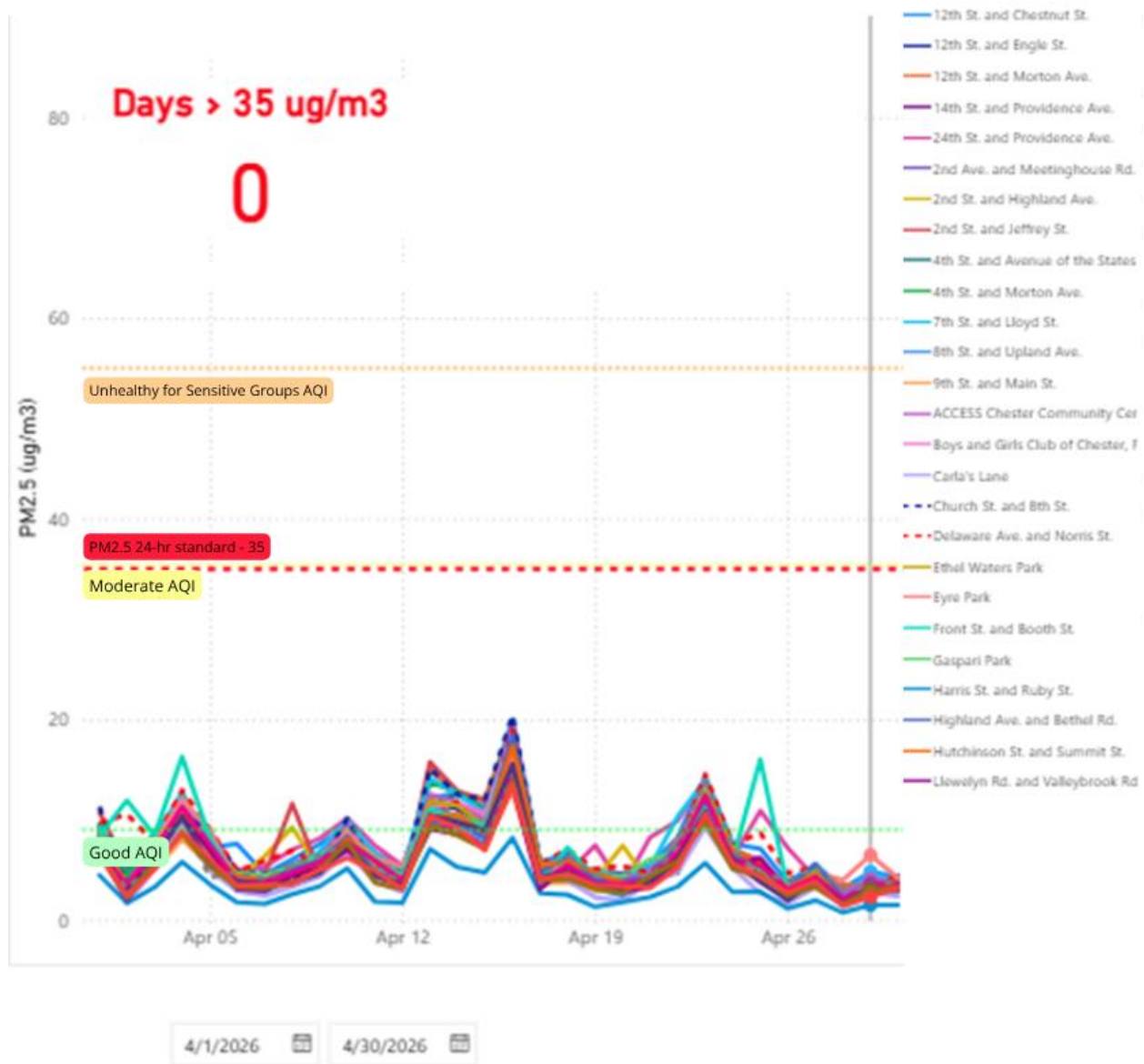
In February, some high hourly concentration readings again which exceeded the DAILY average (35 $\mu\text{g}/\text{m}^3$) at 12th St. and Chestnut St. and the 'Welcome to Pennsylvania' center. The first two exceedances (Feb 6th and 15th) were again at 12th and Chestnut, and likely for the same reasons as in January. The third event (Feb 20th) was at the Visitors' Center and since the nearby sensors at Gaspari Park and the (former) Boothwyn Fire Department did not register elevated concentrations, it's fair to conclude that this was likely the result of an idling truck(s).

Daily Averages (All Sites) MARCH 2026



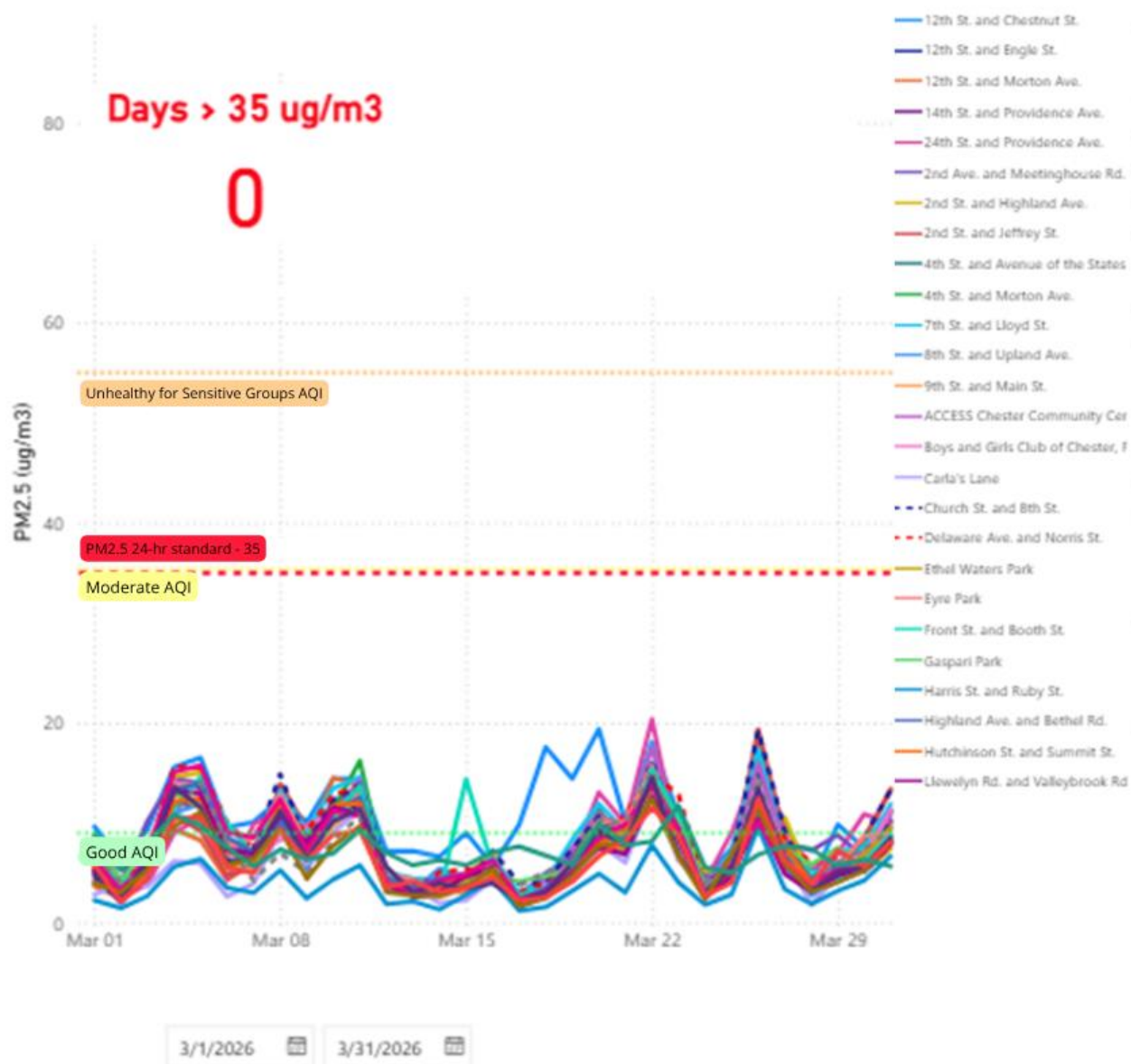
In March, the 24-Hr averages returned to being well below the standard, with the highest recorded concentration being $20 \mu\text{g}/\text{m}^3$ on March 22. With the seasonal change of the weather, and March's historically increased wind speeds, the pollution that was generated was diluted much more quickly than during the autumn and winter seasons. The measurements that were recorded, however, were evenly split between over and under the ANNUAL standard of $9 \mu\text{g}/\text{m}^3$. It is possible that, once we have one year's worth of data, the measurements may exceed the annual standard.

Daily Averages (All Sites) APRIL 2026



April's measurements are largely reduced from those observed in the preceding months. Measurements were consistently below the annual standard (except for a few exceedances in the middle of the month). From April 12th through the 17th, most sites recorded measurements from 9 $\mu\text{g}/\text{m}^3$ to 20 $\mu\text{g}/\text{m}^3$. Though these remained below the 24-Hr standard, it is interesting that nearly all sensor sites had some kind of elevated reading. Again, if anyone in the Community has any insight, we're happy to discuss potential explanations.

Daily Averages (All Sites) MAY 2026



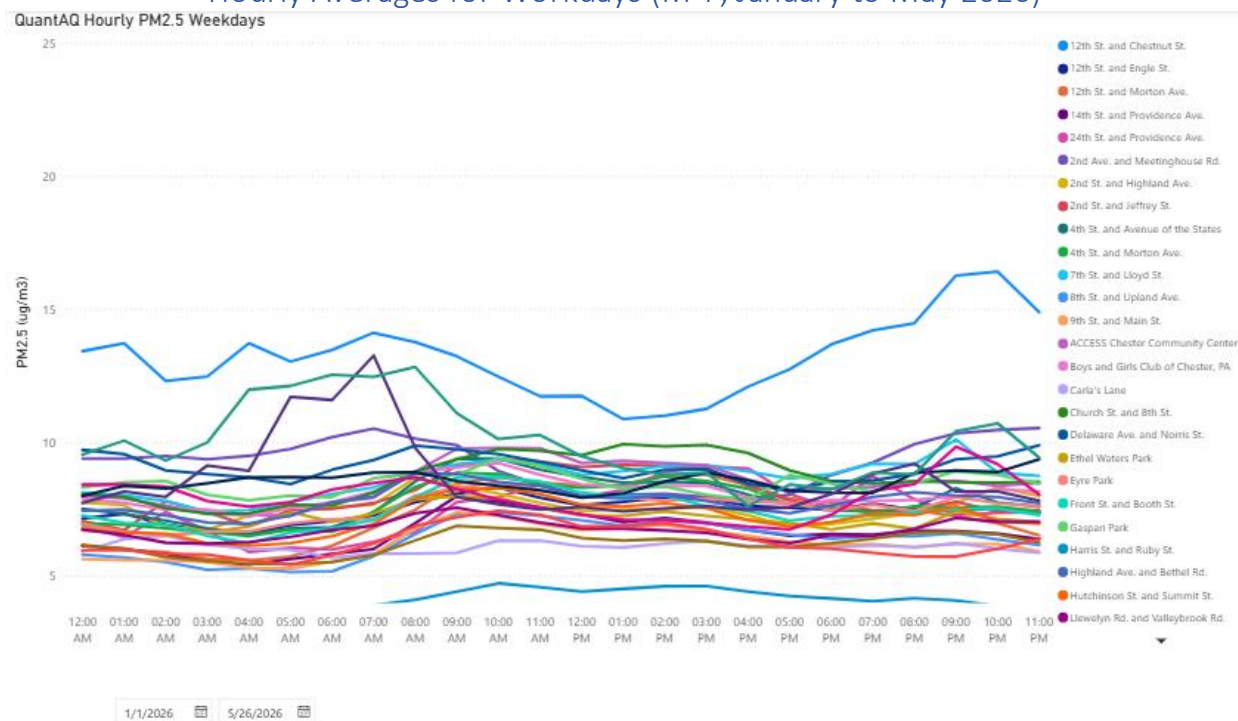
In May, the readings again mostly stayed below the annual standard except for three obvious events. May 5th to May 6th, May 9th to May 10th, and a multi-day event from May 16th to May 20th. Just as in April, these measurements do not exceed the 24-Hr standard, but they do indicate some kind of event(s) that affected the study area. The wind speed and wind direction data is being gathered at the time of writing, and may be helpful in identifying potential causes. Temperature inversions are not common (but not impossible) in the warmer months, so it remains to be seen what the reason(s) for these events could be. We will provide information to the community as we have it.

Written Summary of Trends

On any given weekday (Monday through Friday) of any given week, most sites recorded concentrations of about $6.0 \mu\text{g}/\text{m}^3$ to $9.0 \mu\text{g}/\text{m}^3$, with some consistently in the $9.0 \mu\text{g}/\text{m}^3$ to $12.0 \mu\text{g}/\text{m}^3$ range. As should be expected, the 12th and Chestnut location produced the highest readings, but recall that this is situated directly above I-95, so its readings should be considered through that lens. The nearby major highway interchange of I-95 and I-476 further increases the traffic volume affecting the region.

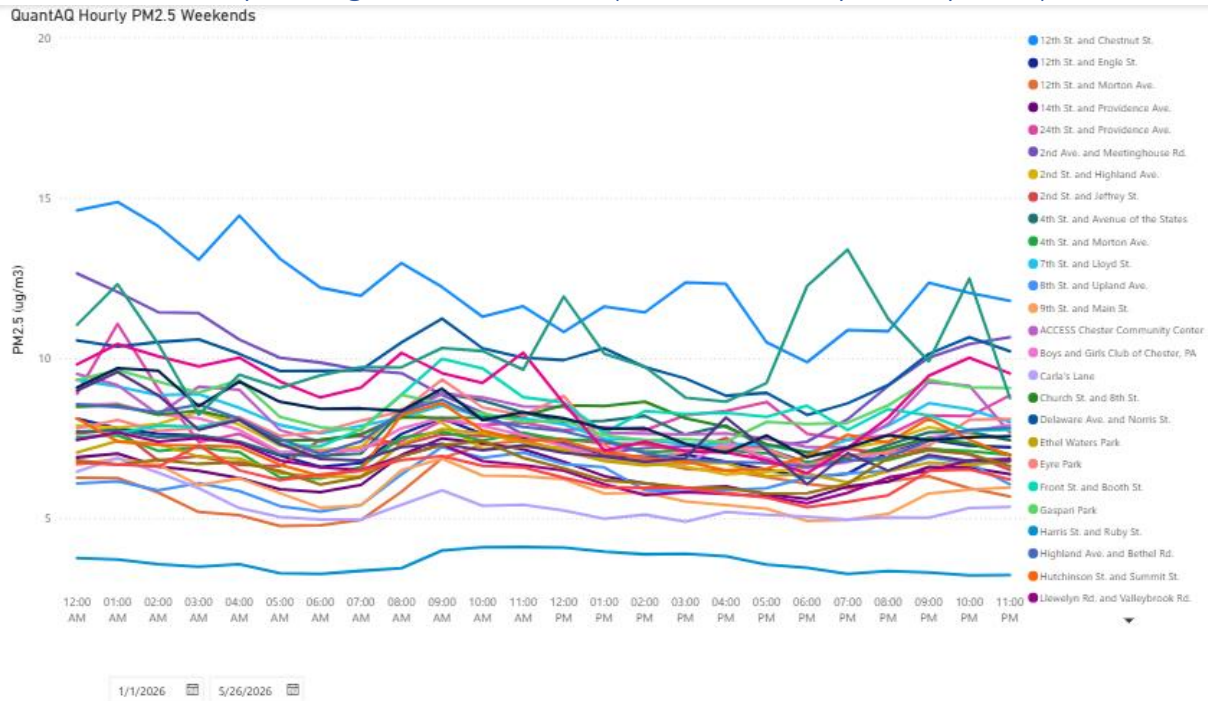
Although some days are above the $9.0 \mu\text{g}/\text{m}^3$ annual average standard, particulate concentrations stayed well below the 24-hr standard of $35 \mu\text{g}/\text{m}^3$. However, being above the annual standard does indicate that the dedicated monitoring of these sites should continue to determine if these sites will exceed the annual average standard ($9.0 \mu\text{g}/\text{m}^3$).

Hourly Averages for Workdays (M-F, January to May 2026)



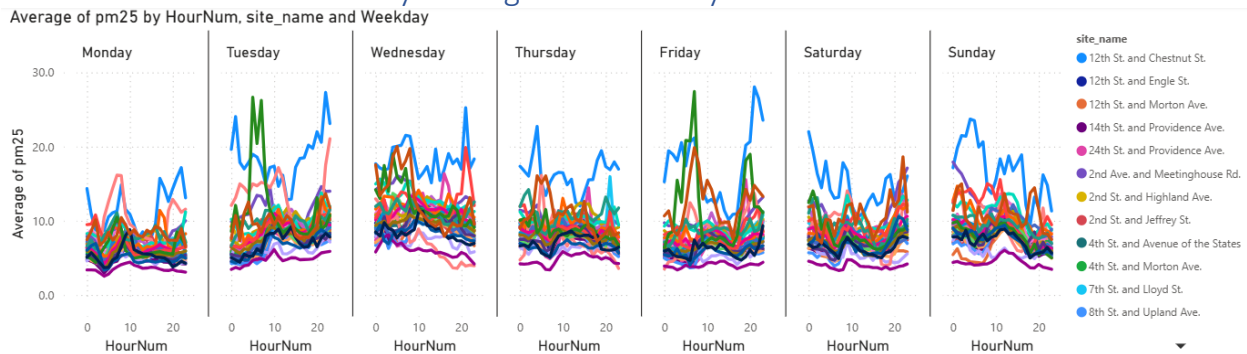
In contrast to the previous edition of this report (where the evening hours noted a sharp increase in measured concentrations), the days of the weekend (Saturday and Sunday) are seeing more even measurements throughout the day, with variations being based more on sensor location rather than the time of day. Being said, there are some hours of the day that have elevated measurements, but none approach the 24-Hr standard and most are below the annual standard.

Hourly Averages for Weekends (Sat-Sun, January to May 2026)



Day-of-the-Week analysis demonstrates roughly what we expected to observe. The average readings are a bit higher during the week (excepting Monday for reasons not yet understood) and tend to be lower on the weekends. This is in keeping with what we'd expect from traffic patterns and industrial operations. The three locations that we've already discussed above (12th and Chestnut Streets, the Welcome to Pennsylvania Center, and the Redwood Community Center) are routinely the highest readings observed.

Daily Average for Each Day of the Week



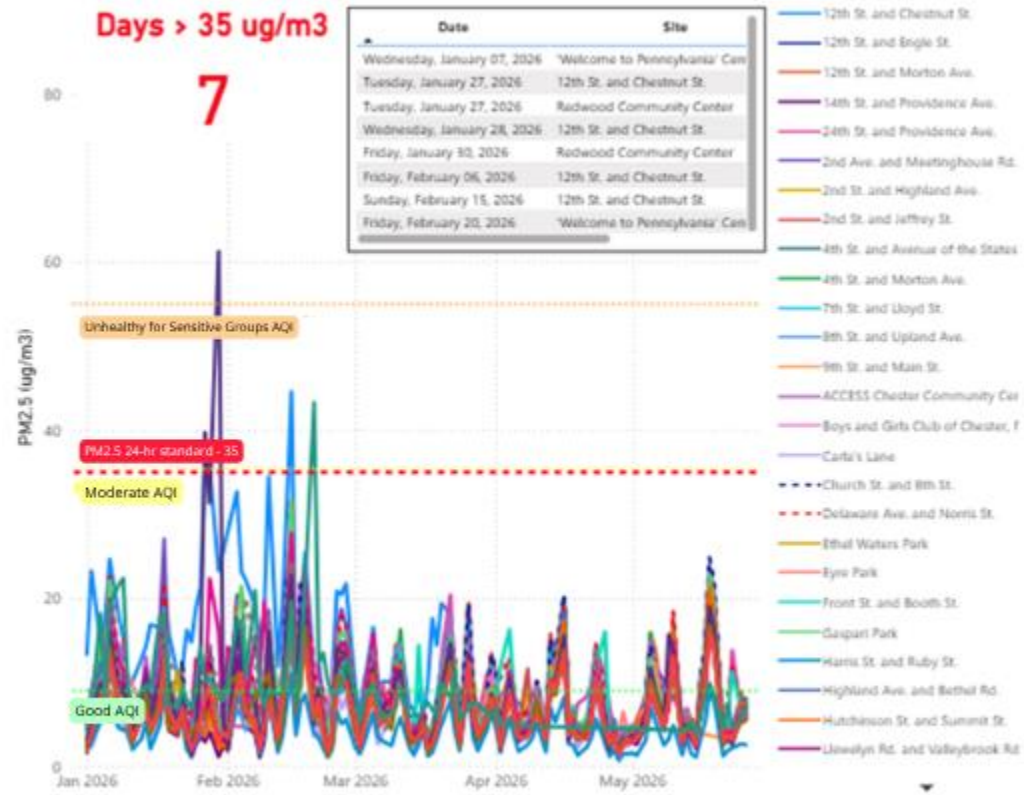
An overview of the first five months of this year is below. Comparing the left-side chart (the sensor readings) with the right-side chart (DEP calibrated instrumentation) indicates that the sensors are measuring data consistent with the official network managed by the Bureau of Air Quality. The exceedances in the left graph have already been discussed and may reflect local conditions not picked up by the DEP calibrated instrumentation (the right graph).

Full Project Time-Series (Jan 2026 – May 2026)

QuantaQ Daily PM2.5

Days > 35 ug/m3

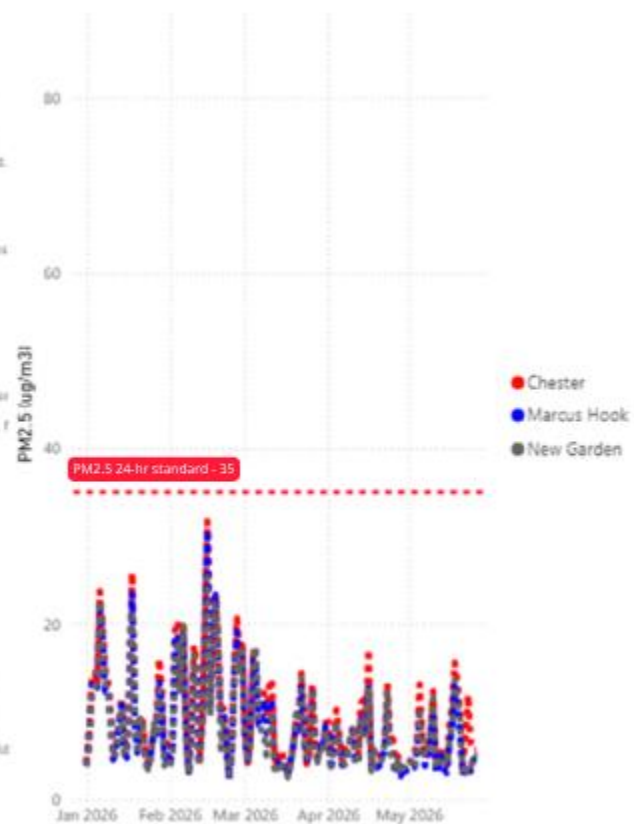
7



1/1/2026

5/26/2026

AirVision Daily PM2.5



1/1/2026

5/26/2026

Takeaways and Recommendations

Takeaways

- The study sensors, when compared to the rigorously calibrated COPAMS monitors, have shown acceptable consistency.
- The monthly averages of PM_{2.5} were 7.8 µg/m³ in January, 9.9 µg/m³ in February, 7.2 µg/m³ in March, 6.2 µg/m³ in April, and 7.3 µg/m³ in May all under the DAILY (24-Hr) standard of 35 µg/m³.
- In all months there were episodes when the hourly average concentration surpassed the ANNUAL standard of 9 µg/m³.

We expect to perform additional analyses, including wind direction and speed analyses, to determine potential sources of pollution worthy of further investigation.

Seven sites are also measuring gaseous compounds, such as ozone (O₃), carbon monoxide (CO), Nitrogen Oxide (NO), and Nitrogen Dioxide (NO₂). Data has been collected but not yet processed to analyze those results. An initial evaluation will be included in the next Quarterly Report of this project.

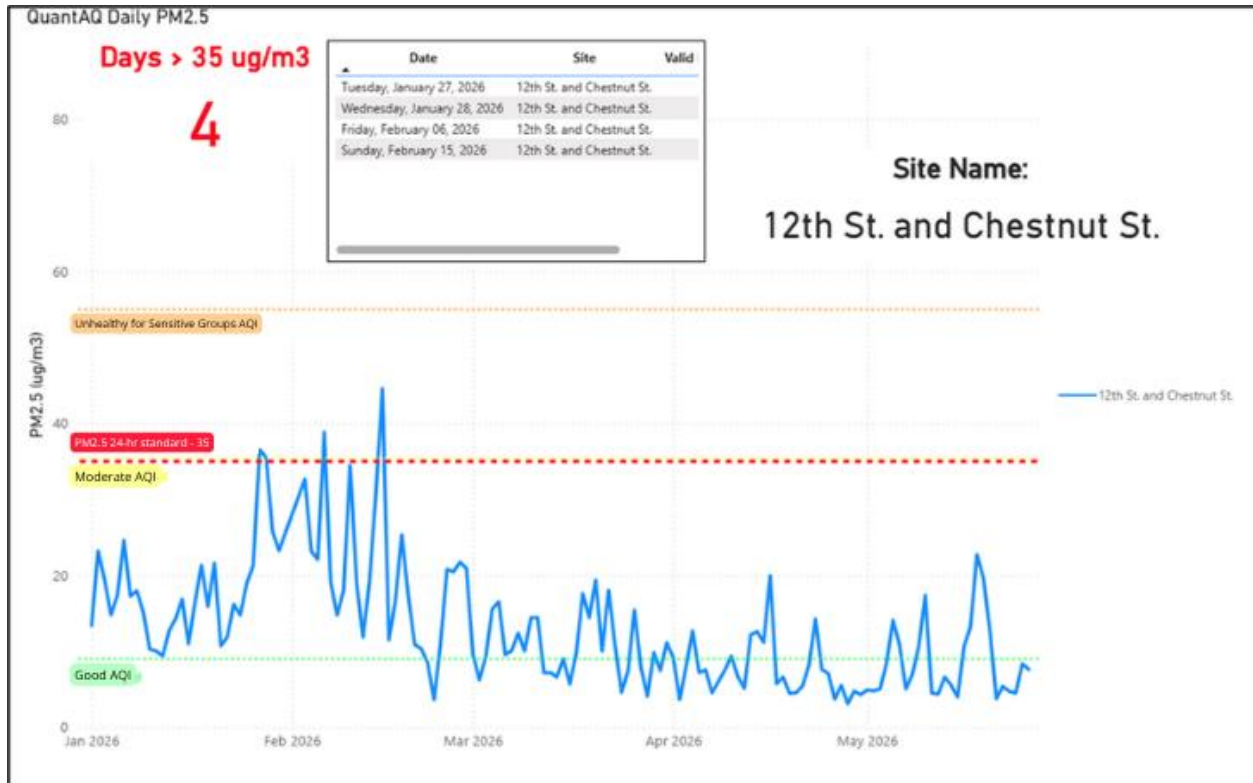
If you have ideas about sources of air pollution in your neighborhood or recommendations for how the data should be presented or analyzed, please contact us at: PetersonS@co.delaware.pa.us.

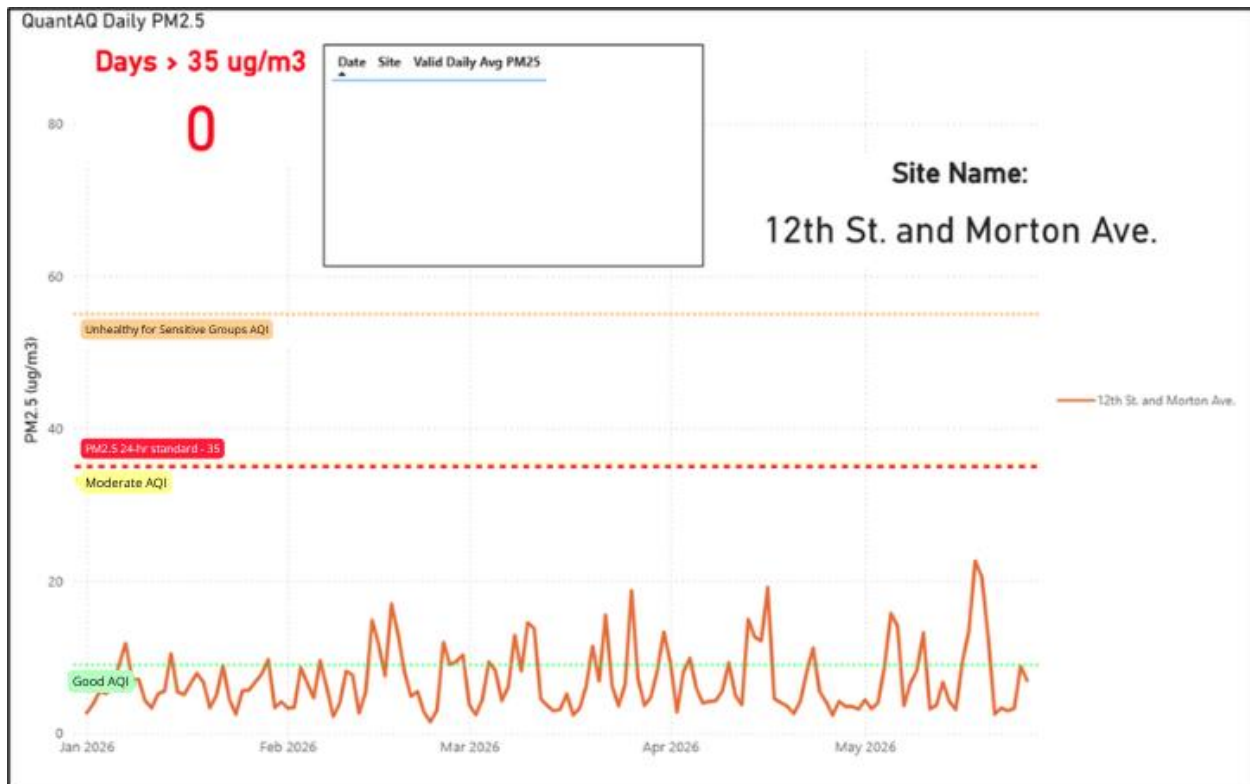
Recommendations:

- Residents may locate the sensor that is closest to their home or place of work on the project website at tinyurl.com/depairqualitymonitoring.
- Attend quarterly project meetings to hear more and have questions answered. The meeting schedule will be available on the [Project Website](#).
- Sign up for air quality notifications at: <https://www.enviroflash.info/signup.cfm>
- Precautions to take for Air Quality Action Days:
 - Orange: Children, the elderly, pregnant women, and those with heart and lung diseases should avoid exercising or spending time outdoors.
 - Red/Purple/Maroon: Everyone should limit all outdoor activity. Using air purifiers should improve indoor air quality. [View EPA's guide to air purifiers in the home](#).

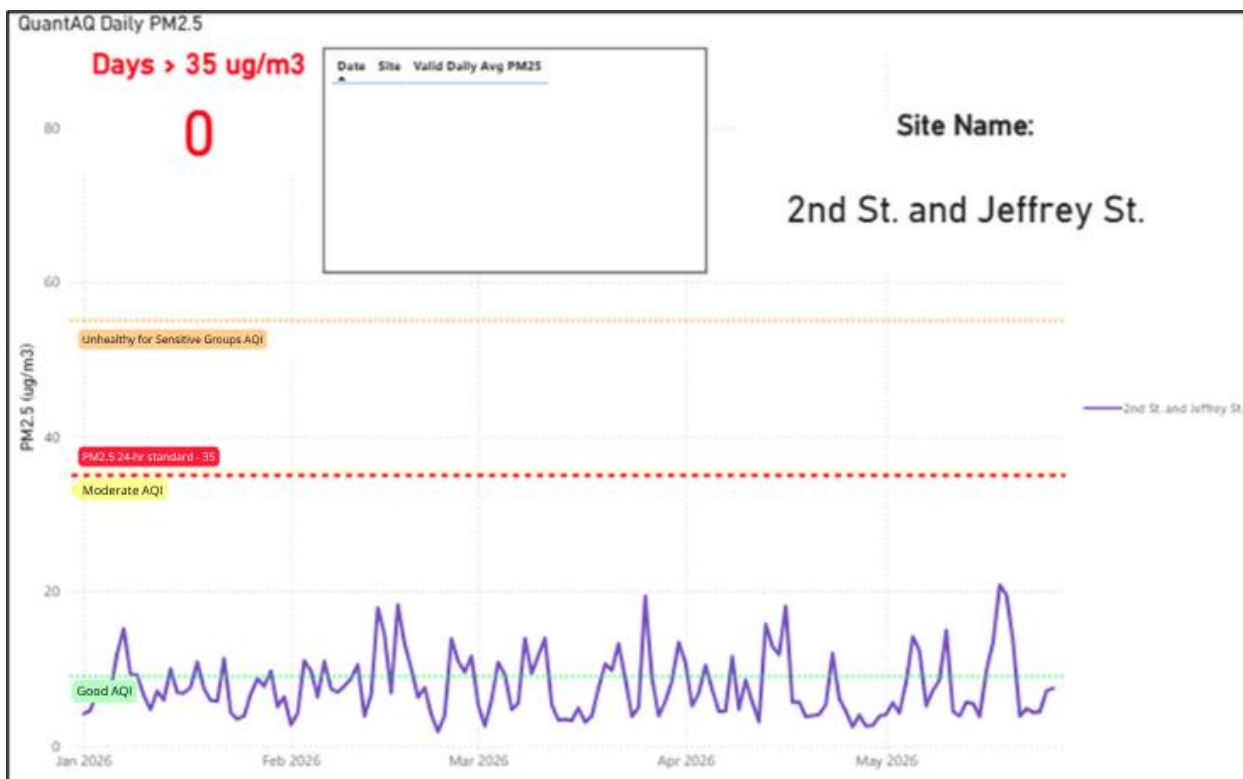
APPENDIX A

Time series by site (January through May 2026)

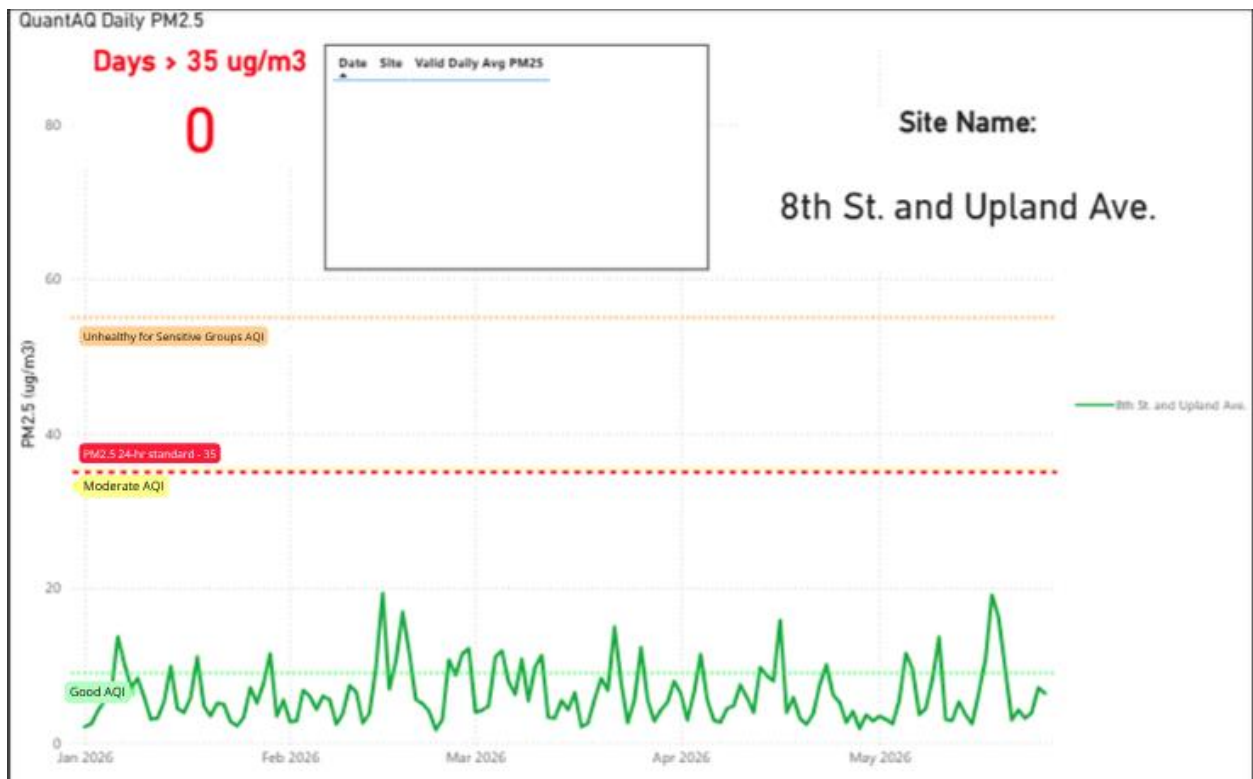




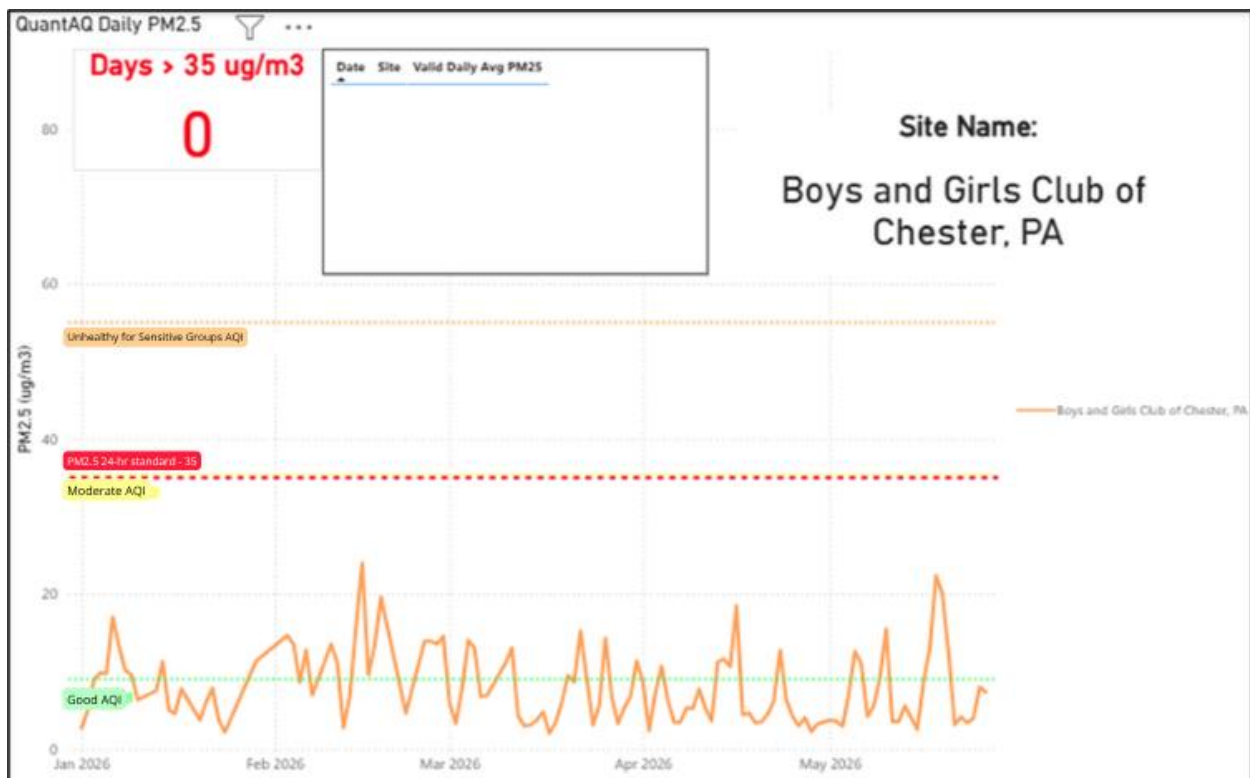












QuantaQ Daily PM2.5

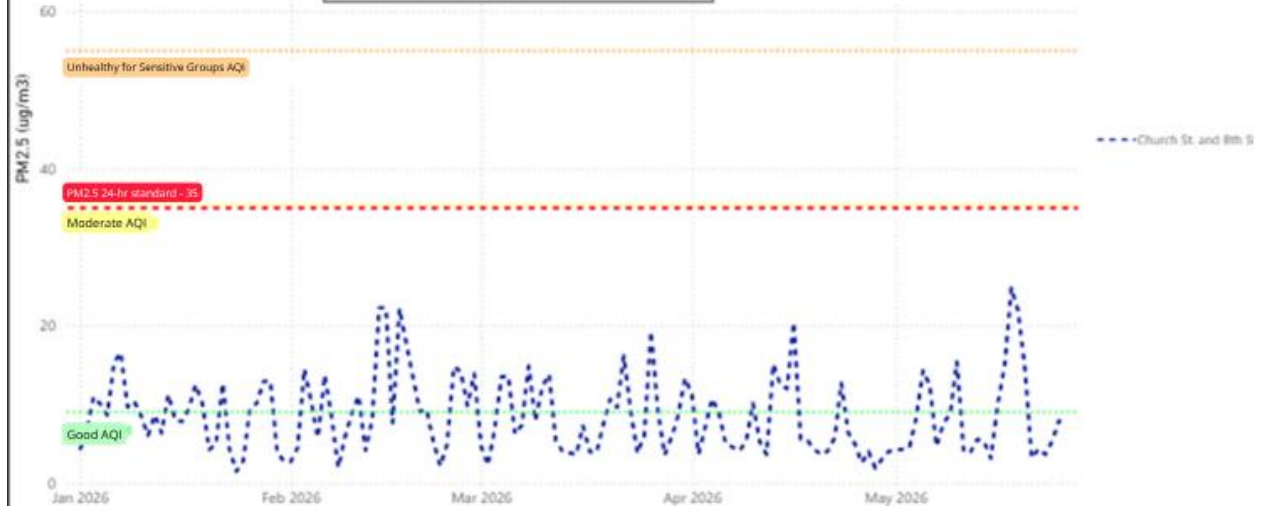
Days > 35 ug/m3

0

Date	Site	Valid Daily Avg PM25

Site Name:

Church St. and 8th St.



QuantaQ Daily PM2.5

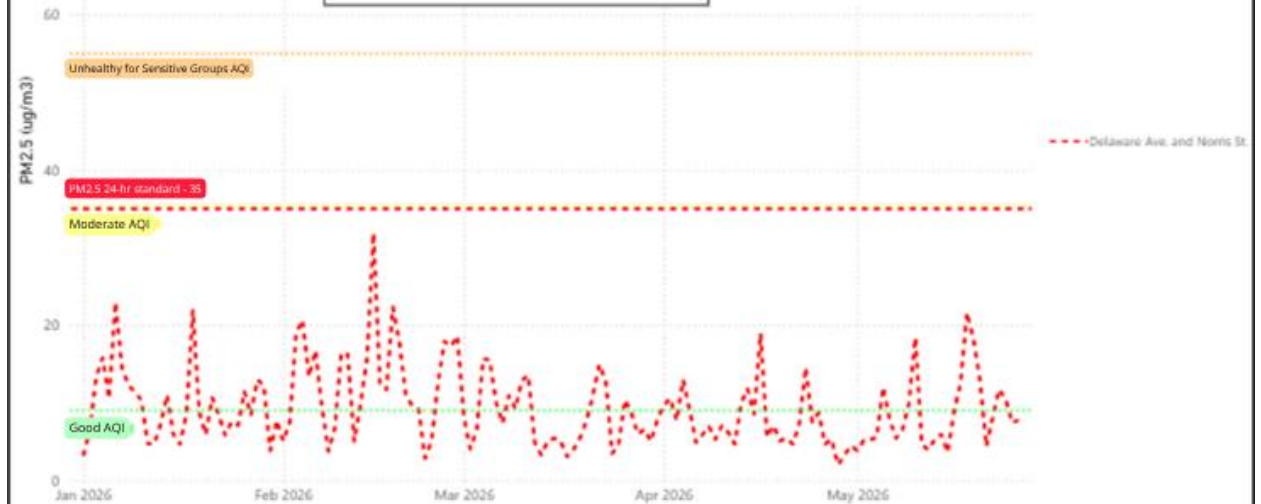
Days > 35 ug/m3

0

Date	Site	Valid Daily Avg PM25

Site Name:

Delaware Ave. and Norris St.



QuantAQ Daily PM2.5

Days > 35 ug/m3

0

Date	Site	Valid Daily Avg PM25

Site Name:

Ethel Waters Park



QuantAQ Daily PM2.5

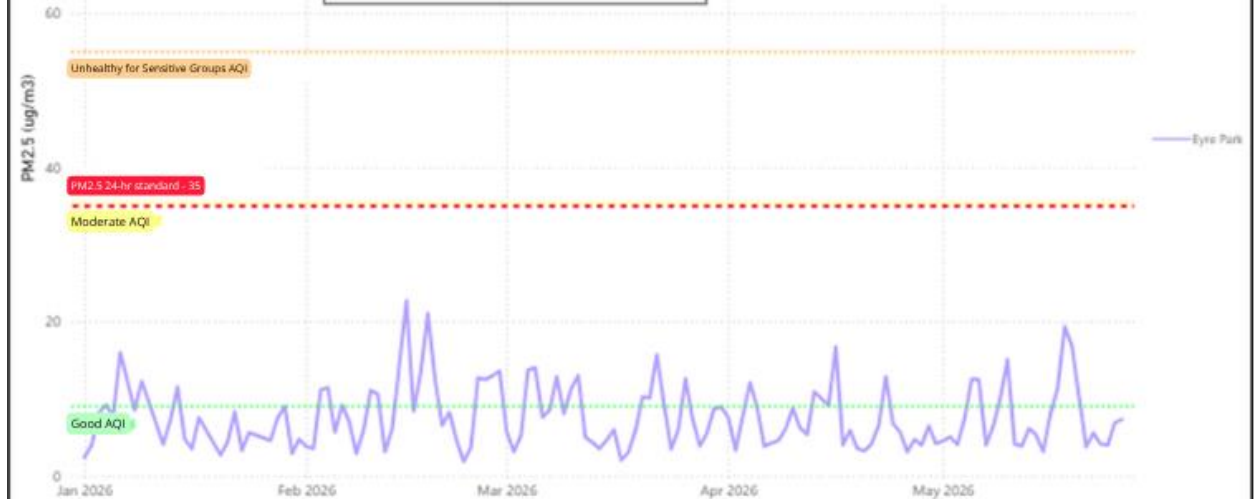
Days > 35 ug/m3

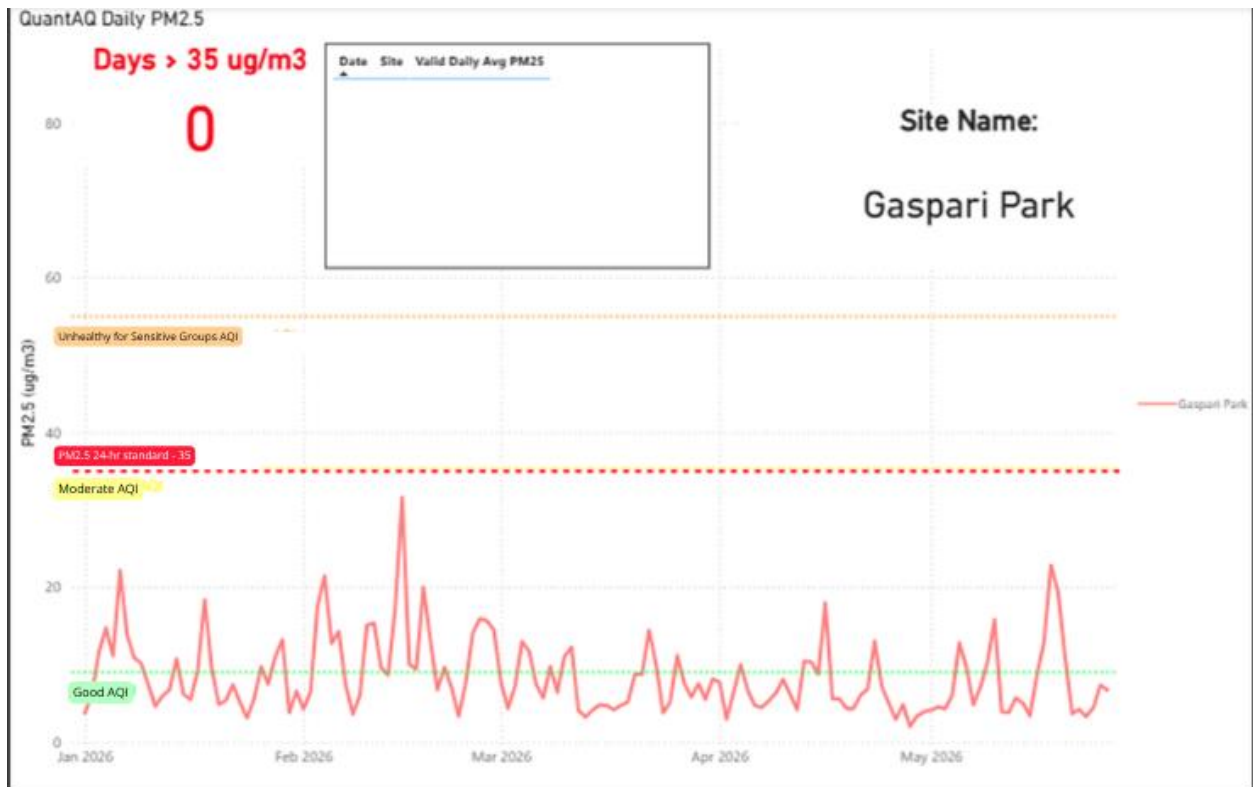
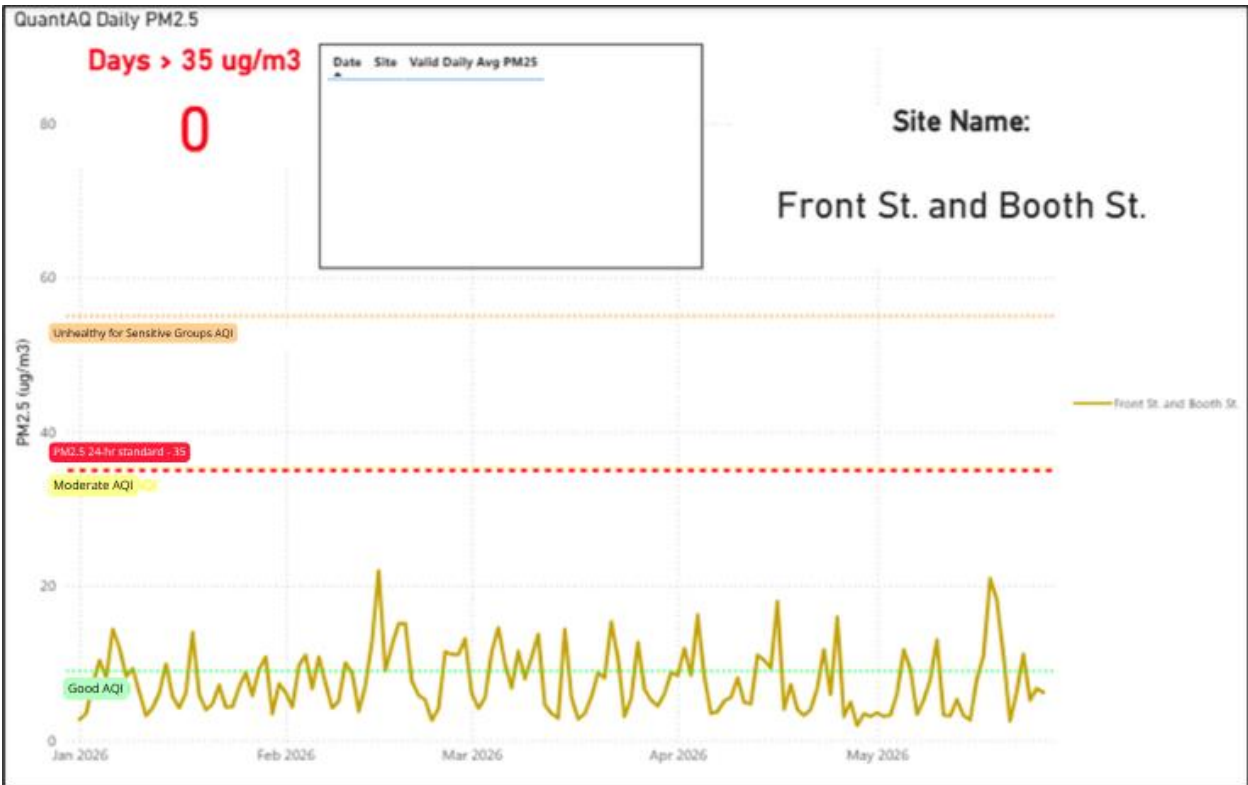
0

Date	Site	Valid Daily Avg PM25

Site Name:

Eyre Park





QuantAQ Daily PM2.5

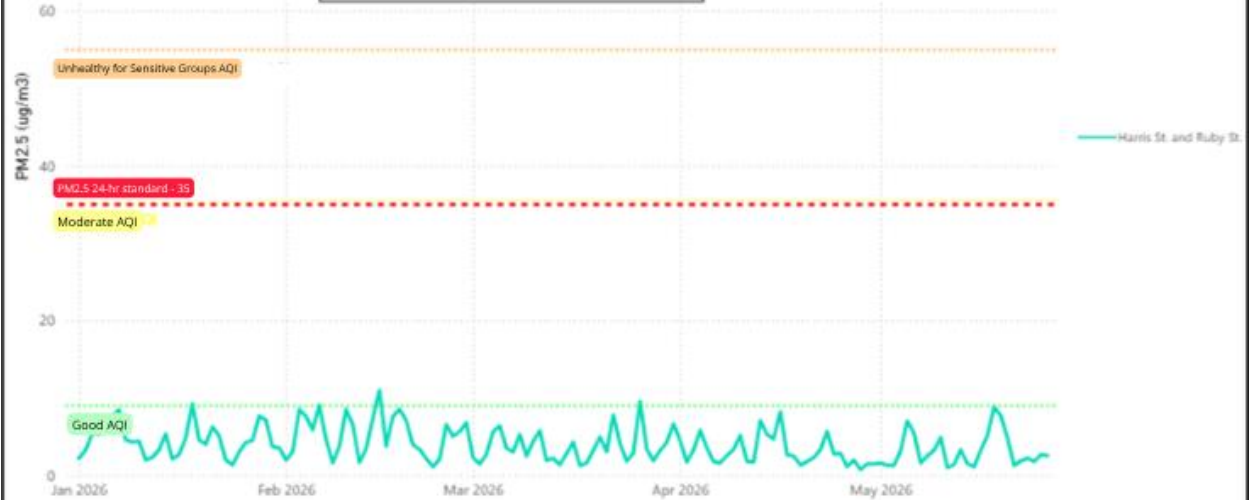
Days > 35 ug/m3

0

Date	Site	Valid Daily Avg PM25

Site Name:

Harris St. and Ruby St.



QuantAQ Daily PM2.5

Days > 35 ug/m3

0

Date	Site	Valid Daily Avg PM25

Site Name:

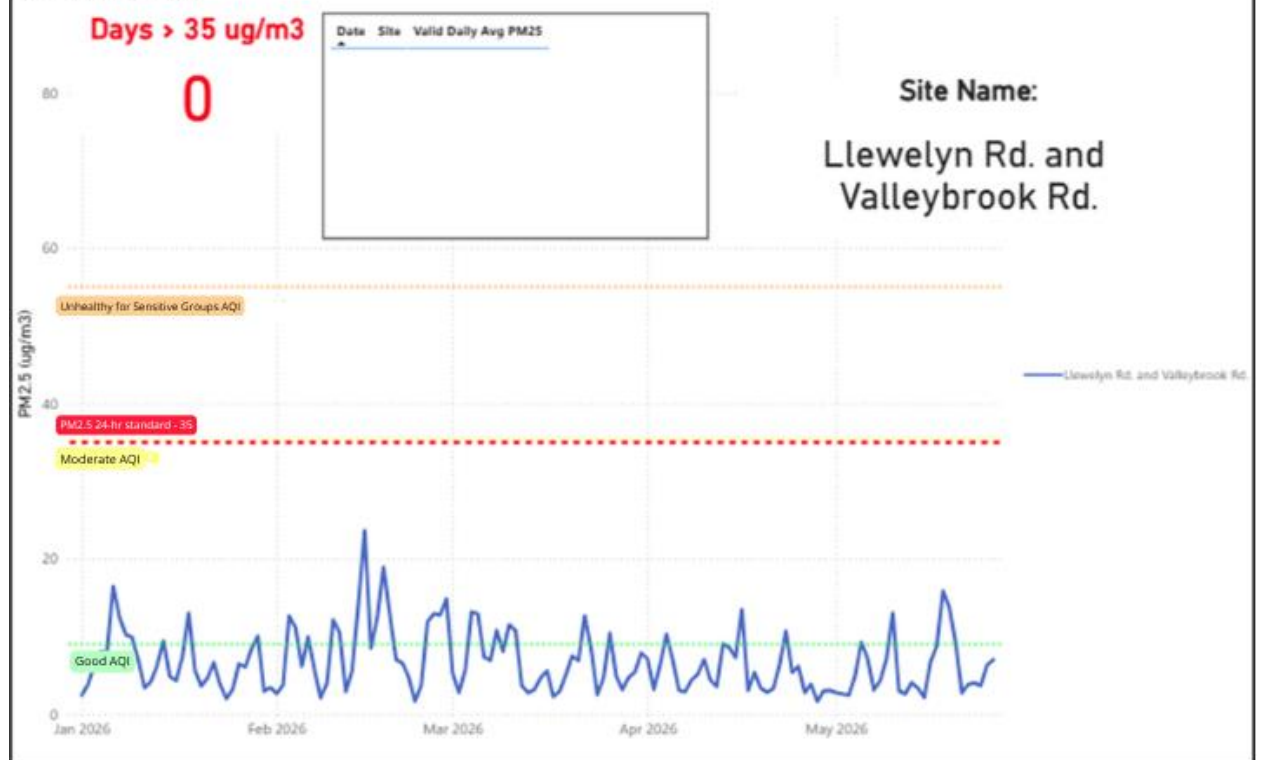
Highland Ave. and Bethel Rd.



QuantAQ Daily PM2.5



QuantAQ Daily PM2.5

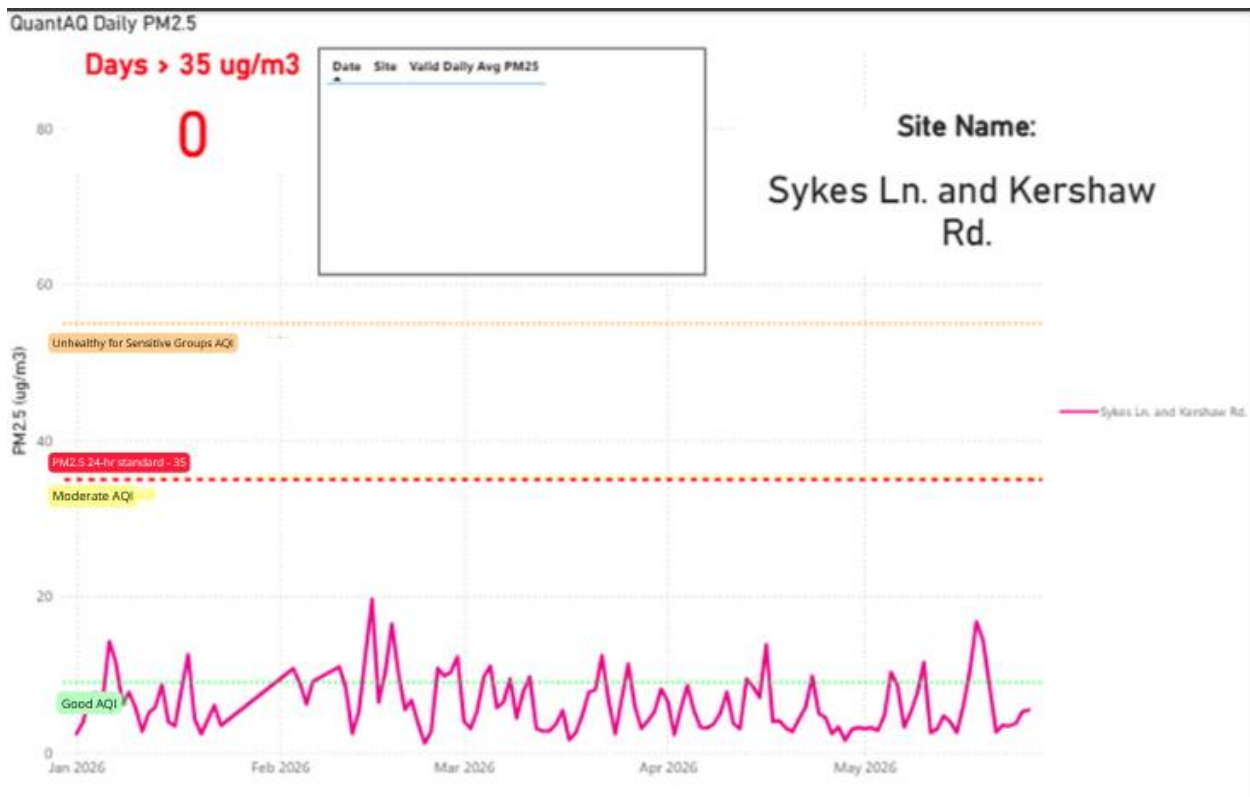
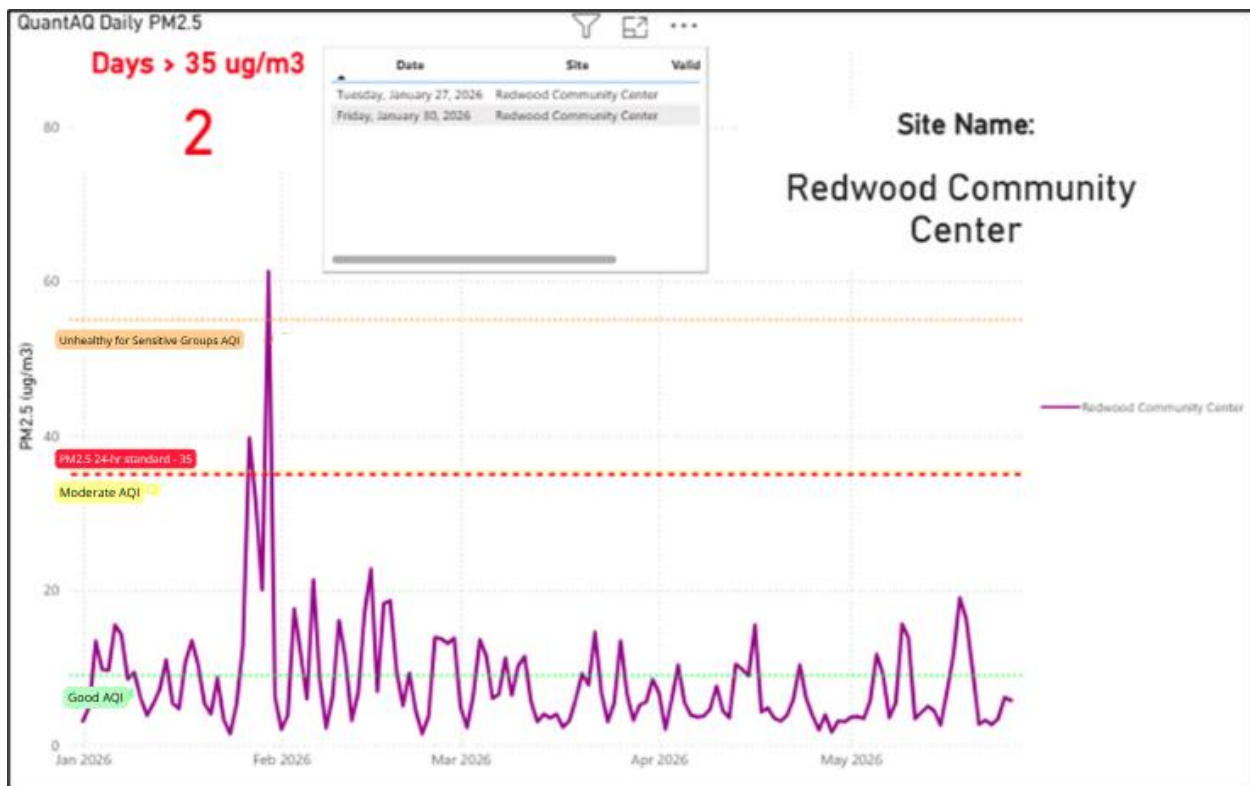


QuantAQ Daily PM2.5



QuantAQ Daily PM2.5





QuantAQ Daily PM2.5

Days > 35 ug/m3

0

Date	Site	Valid Daily Avg PM25

Site Name:

Veterans' Memorial Pool



QuantAQ Daily PM2.5

Days > 35 ug/m3

2

Date	Site
Wednesday, January 07, 2026	'Welcome to Pennsylvania' Center
Friday, February 20, 2026	'Welcome to Pennsylvania' Center

Site Name:

'Welcome to Pennsylvania' Center, I-95

