



**Air Management Services  
Annual Report for Calendar Year 2023**



**Kassahun Sellassie, Ph.D., PE  
Director**

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## Introduction

Air Management Services (AMS), a division of the Philadelphia Department of Public Health and the air pollution control agency for the City of Philadelphia, has made great strides over the past few years in protecting the people of our city from the adverse effects of air pollution. This report details our unit's goals, a summary of activities and revenues collected, and our progress in Calendar Year 2023 towards meeting our objectives set under the Clean Air Act.

## Mission and Vision

Mission Statement: Air Management Services, a division of the Philadelphia Department of Public Health, is committed to protecting the health, well-being, and quality of life of the people who live, work, and visit Philadelphia from the adverse effects of air pollution.

Vision Statement: To ensure all Philadelphia residents have access to safe, clean air.

## Goals and Achievements

Achieve and maintain the National Ambient Air Quality Standards (NAAQS) in Philadelphia by implementing all relevant federal, state, and local air regulations. These air quality standards may be further reduced based on updated scientific information. Among these are:

- Achieve the 2015 ambient ozone NAAQS of 0.070 parts per million (average over eight hours in a day) by August 3, 2027. This can only be achieved by considering mobile source emission reductions. AMS is working with the US Environmental Protection Agency (EPA), Pennsylvania Department of Environmental Protection (PA DEP), and other stakeholders.
- Reduce Philadelphia's average annual fine particle pollution (PM<sub>2.5</sub>) levels to 9 µg/m<sup>3</sup> for 2023-2026 .
- Minimize risks to all Philadelphia city residents from air toxics to less than one in a million risk of cancer risk (for a particular source).

Other agency goals and achievements include:

- **Philadelphia Air Quality Survey (PAQS) project:** Continue monitoring of air pollution at the neighborhood level at 48 locations and produce at least one report of 12 months of continuous measurements. Make data available online to the public as part of increasing transparency for all city agencies.
- **Community-Scale Air Toxics (CSAT) Monitoring:** AMS was awarded an EPA grant in September 2021 to conduct community-scale air toxics monitoring in Philadelphia. AMS started measuring toxic air pollutants in south Philadelphia at the former refinery and plans to continue monitoring for at least one more year and make data available online.
- **America Rescue Plan (ARP) Grant:** AMS won a competitive ARP grant to measure criteria pollutants and air toxics at overburden EJ communities at three locations: the former Refinery area, Nicetown and the Port Richmond area. Procurement of equipment

and monitoring devices is completed, and data measurement will start as soon as construction of monitoring stations is completed; measurement data will be available online to the public.

- **EPA-IRA grants for air monitoring networks:** AMS has applied for the new 2024 EPA-IRA grants for air monitoring networks. AMS will establish a new multipollutant air monitoring station in environmental justice areas of North Philadelphia.
- **Mobile Monitoring:** AMS purchased a mobile monitoring van equipped with several air monitoring instruments to measure criteria pollutants and air toxics. Data quality management plans and reporting protocols for mobile monitoring were prepared and implemented. The vehicle will be deployed to various parts of the city, especially Environmental Justice (EJ) areas and for special incidents such as fires, to monitor air quality and make data available online.
- **AMR VI:** Air Management Regulation (AMR) VI was initially approved by the Air Pollution Control Board (APCB) on April 28, 2022; Public hearing was held on August 10, 2022. AMR VI was finalized in 2023 for implementation to start on January 1, 2024.
- **The Diesel Emissions Reduction Act (DERA) Program:** Continue working with EPA and MARAMA to reduce/eliminate old diesel trucks that do not meet Tier 4 standards by utilizing EPA's DERA Program funds, grants, and rebates to reduce harmful emissions from diesel engines, protect human health, and improve air quality.
- **Outreach Activities:** AMS will continue to expand its outreach activities to various community groups, universities, high schools, and stakeholders to explain and teach about air quality and AMS' activities to reduce air pollution that affects public health and the environment.
- AMS will continue to work with EPA and other stakeholders to seek alternative funding sources for the air program from the transportation sector, such as emission fees for mobile sources and/or vehicle registration fees.
- Gather the best information available to appropriately address many factors involved in the regulation of air quality, including health, quality of life, equity, and economic impacts.
- Improve AMS' profile and its community services to Philadelphians and operate in accordance with the PA DEP's Environmental Justice Policy and enhance public participation.
- Educate the public about air quality, energy efficiency and sustainability.
- Plan and coordinate with other authorities to reduce the impact of air pollution from the transportation sector.
- Assist businesses to help them comply with environmental regulations while being sensitive to the economic implications of these regulations.
- Coordinate with the Mayor's Office of Sustainability to support their goal of making Philadelphia the greenest city in America.
- Coordinate with the Philadelphia Port Authority to establish a detailed and robust annual emission inventory and establish an air toxics and particulate matter monitor near the Delaware River.
- Work with the Air Pollution Control Board, the regulated community, and other stakeholders to develop or modify regulations to reduce or control emissions of criteria pollutants to help meet the NAAQS.

- Reduce and resolve all backlogs (NOVs, conformance checks, and permits), targeting 80% by December 2024, despite staff shortage.
- Continue implementing the plan for enhanced monitoring of air quality at Hilco (Former PES) Redevelopment by issuing asbestos permits, issuing dust permits, and inspect the site.
- PA DEP finalized the Ozone RACT III rule in November 2022. AMS started working on RACT III implementation and 2015 ozone NAAQS State Implementation Plan (SIP) revisions.
- In accordance with Executive Order 1-07, AMS has been inspecting and updating mobile sources from non-road emission reductions from construction equipment.
- Issue installation permits and operating licenses for unpermitted facilities.

### **Air Quality Index**

The U.S. Air Quality Index (AQI) is EPA’s index for reporting daily air quality. The higher the AQI value, the greater the level of air pollution and the greater the health concern. The AQI is divided into six categories: 0 - 50 for Green/Good, 51 - 100 for Yellow/Moderate, 101 - 150 for Orange/Unhealthy for Sensitive Groups, 151 - 200 for Red/Unhealthy, 201 - 300 for Purple/Very Unhealthy, and 300 and higher for Maroon/Hazardous. For more information, see <https://www.airnow.gov/aqi/aqi-basics/>.

Air quality in Philadelphia has steadily improved over the past few decades, as evidenced by the relatively fewer number of unhealthy air quality days (adjusted to the current standard) during the past several years, as shown in the graphic below. It is important to note that air pollution, especially ozone which forms in the presence of heat and sunlight, is weather dependent and varies significantly from year to year depending on meteorological trends. In addition, changes to PM<sub>2.5</sub> (particles less than 2.5 micrometers in diameter) sampling method from a filter-based to a continuous monitor may also have affected the number of good and moderate days.

For all criteria pollutants, currently the Philadelphia region is in nonattainment only for ozone. AMS expects long term trends for ozone to decrease due to regulations that will reduce ozone precursors. Philadelphia is designated as being in attainment for PM<sub>2.5</sub> by the 2015 standards.

- 2023 Exceptional Events

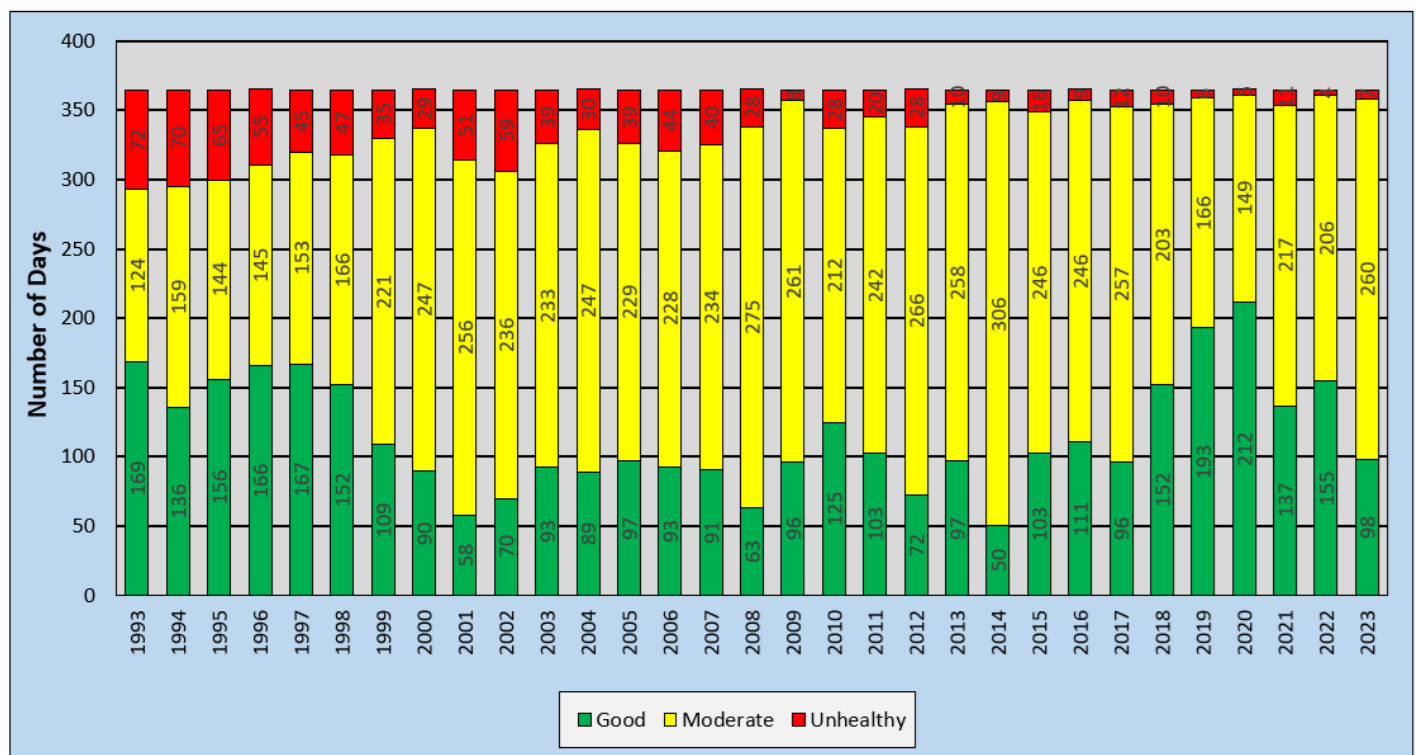
In Summer 2023, smokes from large-scale wildfires, mostly in Canada, significantly impacted air quality in Philadelphia Region and other part of the US, and increased the number bad air quality days for particulate matter and ozone. The impacted days can be identified by air monitoring data, wildfire and weather records, PA DEP’s air quality modeling, and other evidence. Under the EPA Exceptional Events Rule (<https://www.epa.gov/air-quality-analysis/treatment-air-quality-monitoring-data-influenced-exceptional-events>), state and local air agencies may propose to exclude the wildfire-impacted air quality data from being used in determination of NAAQS attainment. These proposals are subject to EPA approval.

Without excluding data impacted by the wildfires, in 2023 Philadelphia experienced a total of 83 Good days by AQI values, 268 Moderate days, 9 Unhealthy for Sensitive Groups (Code Orange) days, 3 Unhealthy days, 1 Very Unhealthy day, and 1 Hazardous day.

Based on the EPA Exceptional Events Rule described above, PA DEP and AMS are considering to exclude air quality data for days significantly impacted by the 2023 wildfire smokes. This would remove ozone data on June 1, June 2, June 29 and June 30; PM<sub>2.5</sub> data on June 6, June 7, June 8, June 29, and June 30; and PM<sub>10</sub> data on June 6, June 7, and June 8. If these data were excluded, Philadelphia would have experienced 98 Good days, 260 Moderate days, and 7 Unhealthy for Sensitive Groups days (Code Orange, 5 from PM<sub>2.5</sub> and 2 from ozone) in 2023. The AQI chart below shows an annual summary of AQI values since 1993. Note that in this chart: 1) The 2023 AQI data doesn't reflect the tentative treatment of exceptional events data as described above. 2) The AQI's reflect the recent EPA update of PM<sub>2.5</sub> FEM data; and 3) All historic AQI values have been standardized with the current EPA AQI breakpoints and are consistent with the EPA 2015 ozone standards and the 2024 PM<sub>2.5</sub> standards.

### Good, Moderate and Unhealthy Air Quality Days <sup>1</sup>

(Days shown in red indicate Code Orange, Code Red, and worse air quality days combined;  
Exclusion of 2023 Exceptional Events data is tentative and subject to EPA approval)



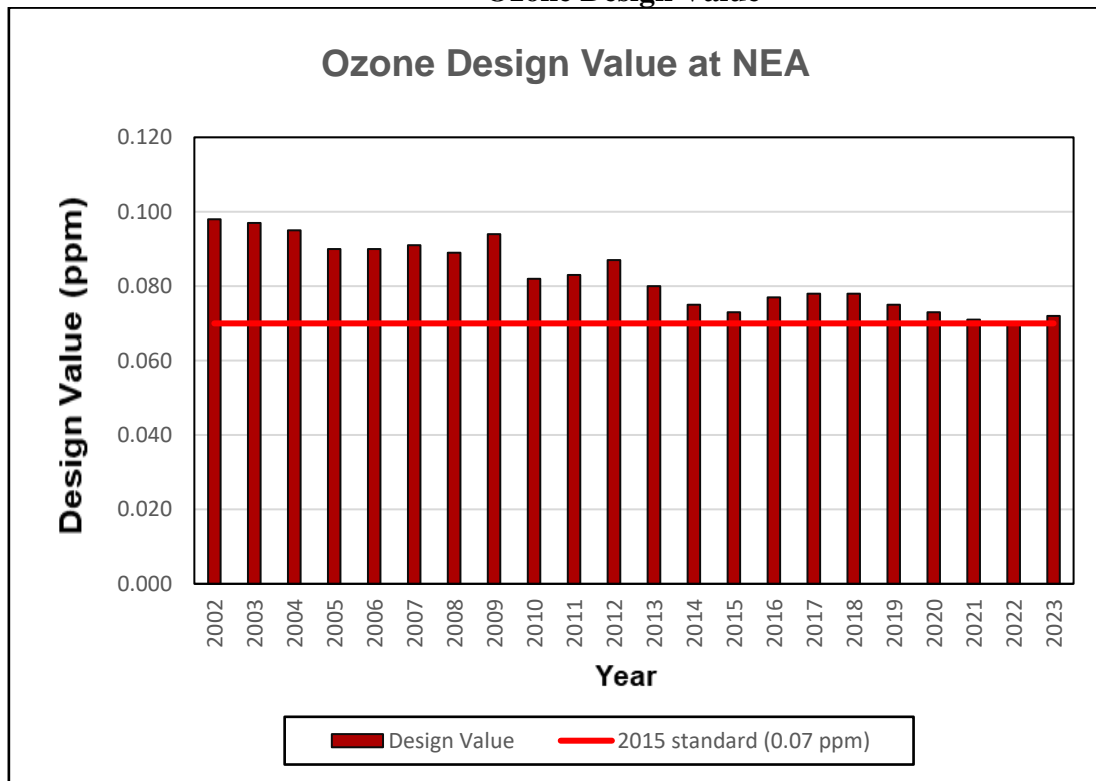
<sup>1</sup> Data for 2023 obtained from EPA's Air Data website on 6/7/2024, after EPA PM<sub>2.5</sub> FEM data updates.

Although Philadelphia is currently in nonattainment for the 2015 8-hour ozone NAAQS, the trend shows that attainment can be achieved in the coming few years. Ozone is a pollutant that is not emitted directly by pollution sources, but forms in the atmosphere in the presence of heat and sunlight as part of chemical reactions between other pollutants – specifically, oxides of nitrogen and volatile organic compounds. Ozone is very irritating to the lungs and contributes to heart and lung diseases such as asthma.

As discussed in the “2023 Exceptional Events” section on Page 11 of the 2023 Air Quality Report (2023 AQR), large-scale wildfires significantly increased the number of bad air quality days for particulate matter and ozone. Without excluding air quality data impacted by the wildfires, the 4th highest daily maximum 8-hour ozone in Philadelphia was 0.072 ppm at the Northeast Airport (NEA) site, with a corresponding design value of 0.071 for year 2023.

If the exceptional events data were to be excluded, the 4th highest daily maximum 8-hour ozone in Philadelphia would be 0.068 ppm in 2023, and the 2021-2023 three-year ozone design value would be 0.07 ppm. The following figure shows Ozone trends for all sites and Ozone design values at NEA including the effect of EE. The NEA monitoring site usually has the highest ozone design value in Philadelphia.

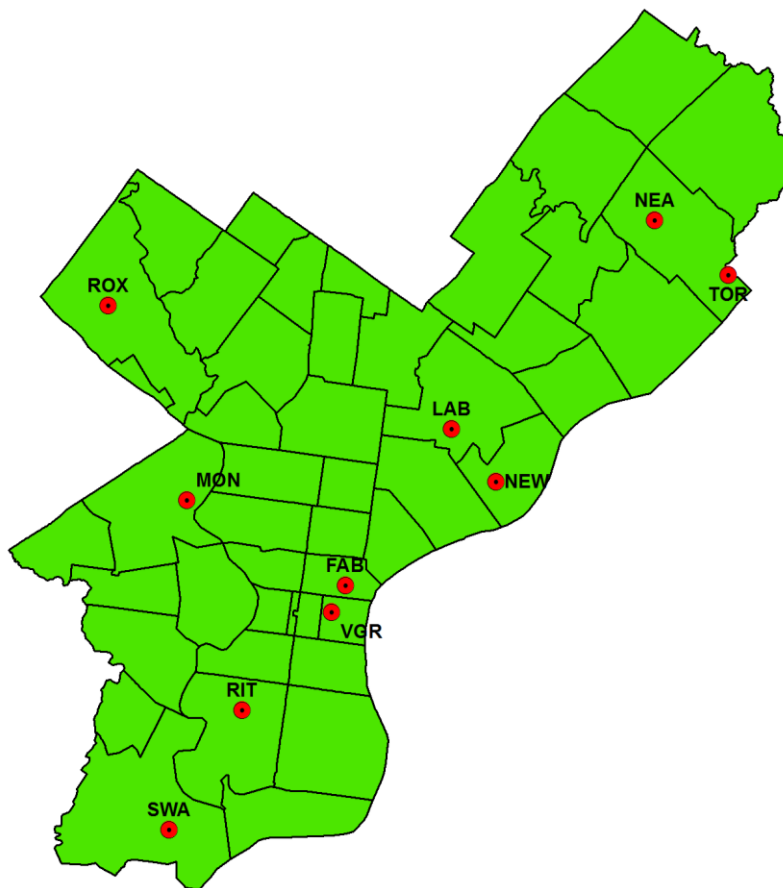
**Ozone Design Value**



## Air Monitoring Programs

In 2023, AMS operated a network of ten air monitoring sites located throughout the City. Eight sites (LAB, NEA, NEW, RIT, FAB, TOR, MON, and VGR) measured criteria pollutants: ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). These measurements are made in "real time", meaning measurements show pollution levels as they occur, instead of after the fact. Four sites (ROX, RIT, SWA, and NEW) also measure air toxics through canisters, such as 1,3-butadiene, benzene, carbon tetrachloride, and formaldehyde. One site, VGR, measures O<sub>3</sub> and PM<sub>2.5</sub> as part of a pilot study for research and development, utilizing solar and wind turbine power.

### 2023 Philadelphia Air Monitoring Network



AMS measures air quality for several reasons:

- To ensure that long-term goals and targets to reduce levels of air pollution are being met,
- To provide information to the public as to how good or bad the air quality is in Philadelphia,

To ensure attainment with standards set forth by the United States Environmental Protection Agency.

AMS strives to achieve a 75% or greater data quality capture rate at each quarter for each criteria pollutant monitor, per federal requirements in each Appendix of 40 CFR Part 50.

The 2023-2024 Air Monitoring Network Plan for Philadelphia is available at:  
[https://www.phila.gov/media/20230808153125/2023-2024AMNP\\_final\\_July17-2023.pdf](https://www.phila.gov/media/20230808153125/2023-2024AMNP_final_July17-2023.pdf) .

AMS completed its seven years of monitoring with the Village Green Park Bench Air Pollution Monitoring System at 6th and Arch Streets across from the Constitution Center, measuring PM<sub>2.5</sub> and ozone, as well as local wind speed, wind direction, temperature, and humidity, utilizing solar and wind turbine power, to increase community awareness of environmental conditions. Additional information about Village Green can be found here:  
<https://villagegreen.airnowtech.org/welcome?siteID=24292>.

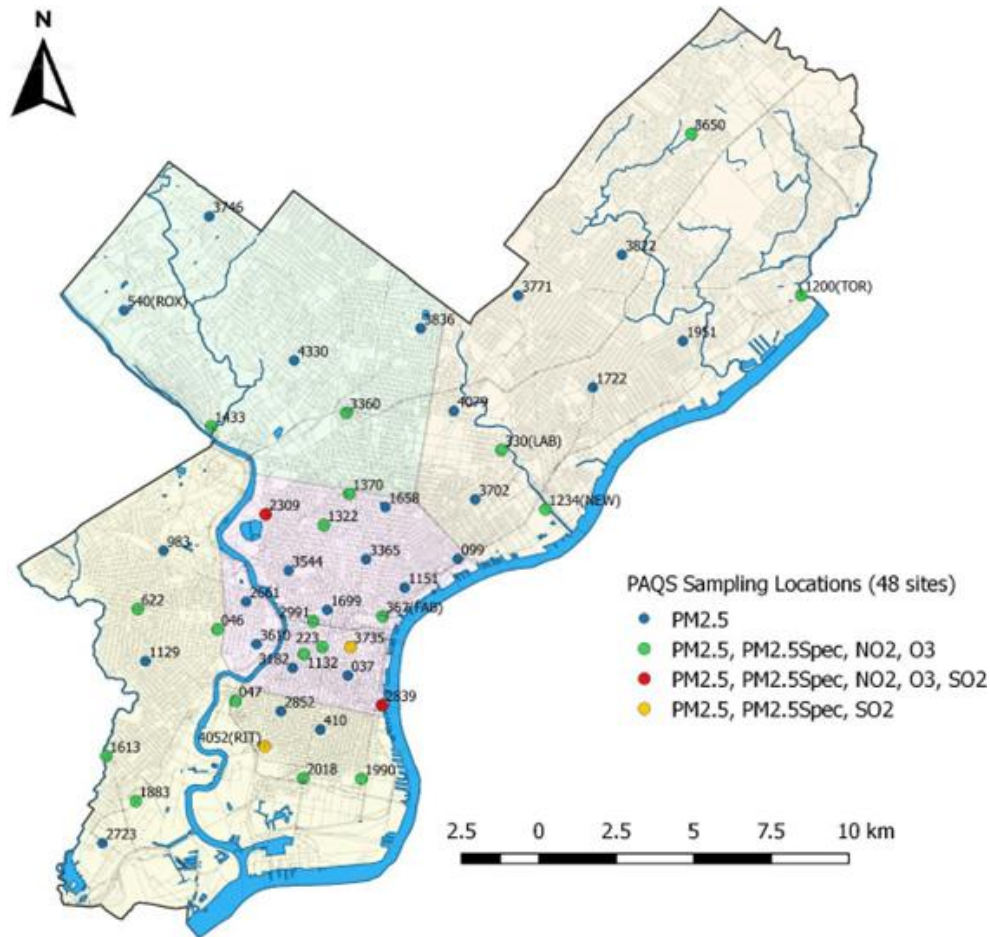
In 2023, AMS operated its Photochemical Assessment Monitoring Station (PAMS) for the enhanced monitoring of ozone, oxides of nitrogen (NO<sub>x</sub>), and volatile organic compounds (VOC) to obtain more comprehensive and representative data on ozone air pollution. AMS LAB successfully finalized the set up and calibration. This system also measures True NO<sub>2</sub>, NO<sub>y</sub>, carbonyls, temperature, relative humidity, barometric pressure, UV radiation, solar radiation, precipitation, wind speed, and wind direction.

In 2020, the EPA announced its air toxics monitoring plans to receive funding under the Agency's Community-Scale Air Toxics (CSAT) Ambient Monitoring grants. AMS was one of the winners and one of two selected in EPA Region 3. AMS continued operation for CSAT in 2023. Similarly, AMS has won the Enhanced Air Monitoring for Communities (EAMC) Competitive grant from EPA in 2022. In 2023, AMS worked on acquiring instruments, preparing the monitoring site, and submitting the QAPP and QMP for EAMC to EPA. More information can be found here: <https://www.epa.gov/amtic/2020-community-scale-air-toxics-ambient-monitoring-csatam-grant-information> .

In 2018, AMS began a new project called the Philadelphia Air Quality Survey (PAQS). This project aims to set up street level, neighborhood-oriented air sampling sites (initially 50) throughout the City to sample the ambient air for PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub>. The samplers contain meteorological sensors as well. PAQS captures the seasonal changes and neighborhood-to-neighborhood spatial variances in air quality. Data during the 12-month period from December 1, 2022 through November 30, 2023 has been analyzed. During this 12-month period, the citywide all-sites PM<sub>2.5</sub> average concentration was 10.3 µg/m<sup>3</sup>. Note that this includes data from June 2023 when multiple large-scale wildfires in North America caused widespread air quality deterioration over the course of several weeks. In regulatory processes, air quality data under this type of circumstances may be excluded under EPA's Exceptional Events Rule. If the PAQS data in June 2023 were excluded, the 12-month (12/1/2022 - 11/30/2023) citywide average PM<sub>2.5</sub> concentration would be 8.2 µg/m<sup>3</sup>. See Page 3 "2023 Exceptional Events" section. Considering the increasing efforts to fill monitoring gaps in the City with a proposed new monitoring station and other projects (including the Community-Scale Air Toxics monitoring, the ARP grant



project, the IRA grant project, the mobile platform, air sensors, etc.), AMS is adjusting the PAQS operation scale so that more resources can be allocated to upcoming monitoring work. More details about the PAQS project can be found in the 2023-2024 Philadelphia Air Monitoring Network Plan and the 2020 PAQS project report at <https://www.phila.gov/documents/air-management-reports-and-documents/>. The map below shows PAQS air sampling site locations.

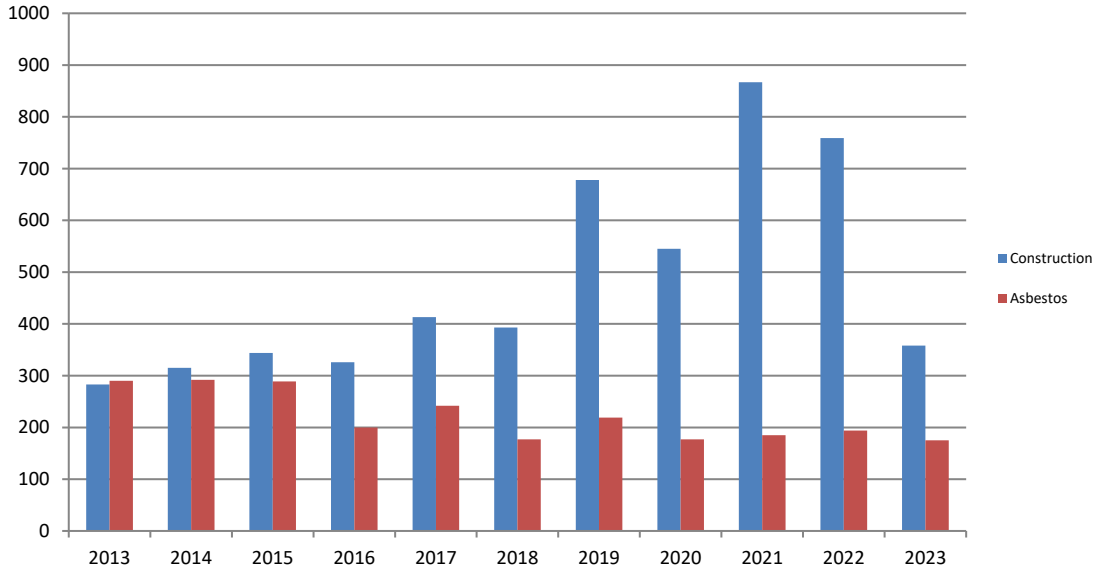


**Permitting Activities**

In 2023, AMS issued 358 construction and approximately 175 Asbestos permits. New construction permits in 2023 were fewer than 2022, and likely continue to decrease for the year 2024 as fewer permit applications are registered in the first quarter of 2024 so far. The number of Asbestos permits has decreased slightly in 2023, but by less than 10% which is within normal ranges. The trends seen last year for construction and asbestos permits are expected to continue in 2024.

The chart below lists the number of constructions permits (installation permits, plan approvals, and general permits) to install or modify sources of air pollution and the number of asbestos abatement permits issued from 2013 to 2023.

**Construction and Asbestos Permits**



**Enforcement Activities**

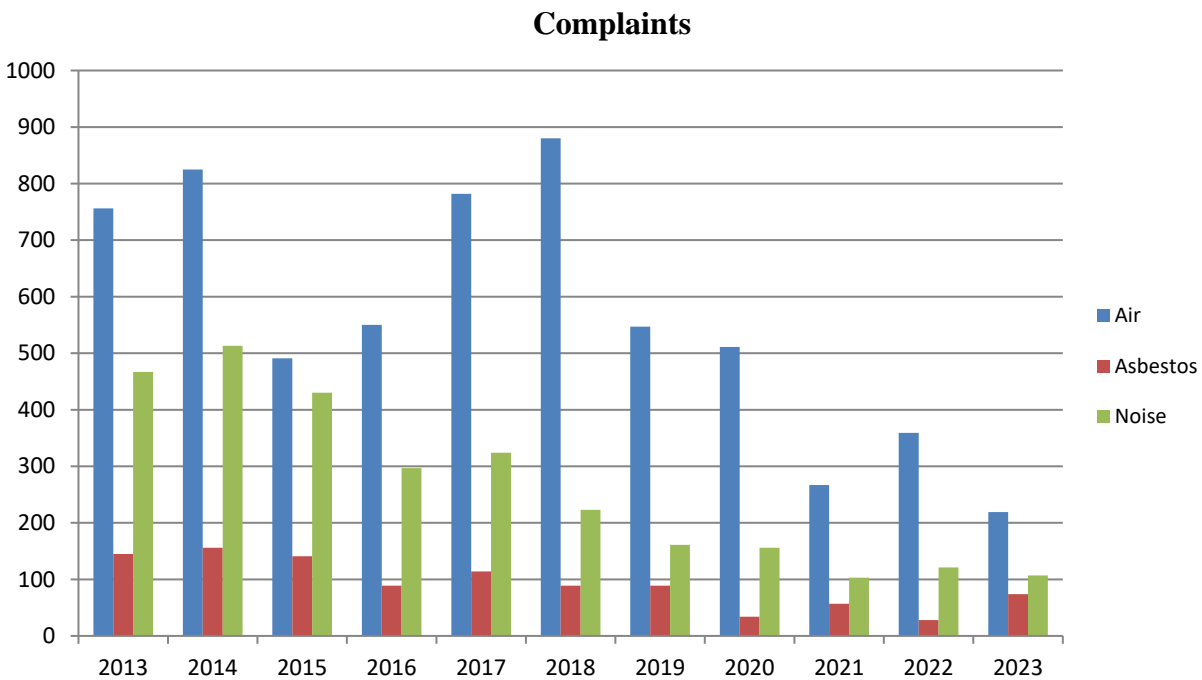
AMS handles citizen complaints, periodic inspections of regulated facilities, and enforces state, local and federal laws related to air quality in the City of Philadelphia. In 2023, the enforcement of violations continued to be distributed amongst AMS Enforcement Engineers and Enforcement Specialist. Having additional staff trained in the enforcement process will help improve efficiency of enforcement. During 2023, violations were not resolved within our goal of 180 days from the date of issuance due to significant staff turnover. Enforcement is delayed due to staff turnovers and orientation needed for new staff. 7 staff members left FCE in 2023. Violations issued prior to 2022 are being addressed on a priority to clear up the backlog.

AMS fully implemented the online cloud based CitizenServe system to monitor and track inspections and enforcement activities for the Asbestos and Facility Compliance and Enforcement units. In 2023, AMS continued to use the enforcement timeline and routing system within CitizenServe to assign and track enforcement activities. In 2024, AMS will continue to make changes to the system to tailor it to specific needs and improve user friendliness.

In 2024, AMS anticipates the number of inspections and number of violations to increase as a direct result of a planned staff increase of air pollution control inspectors and filling vacant enforcement engineer positions. The staff increase is needed to inspect new air pollution sources for the dust control and parking garage regulations and to increase inspections of unpermitted facilities.

## **Complaint Response**

AMS responds to complaints from the public regarding various nuisance and air pollution issues, such as noise, vibration, odor, smoke, idling vehicles, dust, asbestos, and carbon monoxide. Below is a summary of recent activities:



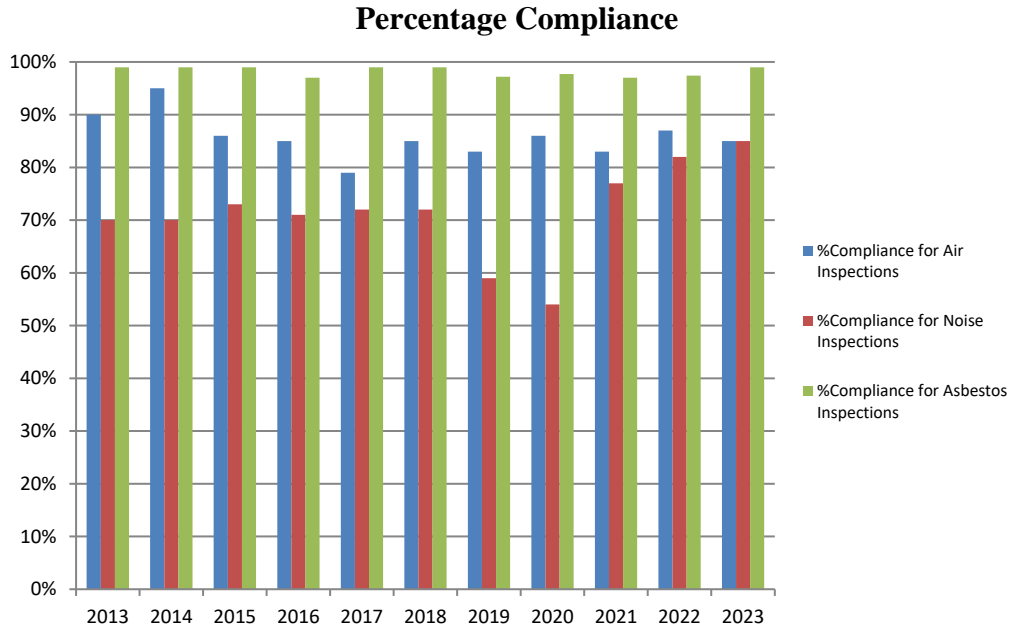
In 2023, there were 74 asbestos complaints, 219 air complaints and 107 noise complaints. As illustrated above, asbestos complaints have tended to stay relatively consistent, albeit with a slightly downward trend since 2015, over time when compared with air and noise complaints. It is anticipated the total number of asbestos complaints received and serviced will remain consistent on an annual basis. Air and Noise complaints tend to be more variable and depend on factors like more warm days, more regulations resulting in increased awareness of health impacts of toxics, noise, dust etc. Complaints are sometimes clustered when there is a significant issue in a particular community and may decline once that problem is resolved. When violations are unresolved, AMS would receive multiple complaints until the case is closed.

## **Inspection Activities**

AMS is supported by a team of well-trained engineers and inspectors who enforce state, local and federal laws related to air quality and noise. They respond to citizen complaints and conduct periodic inspections of regulated facilities. When necessary, they issue Notices of Violation (NOVs) when regulation or permit deviations are observed.

In 2023, 353 air inspections were conducted resulting in 28 violations, and 216 noise inspections conducted resulting in 32 violations. The number of air inspections should continue to increase

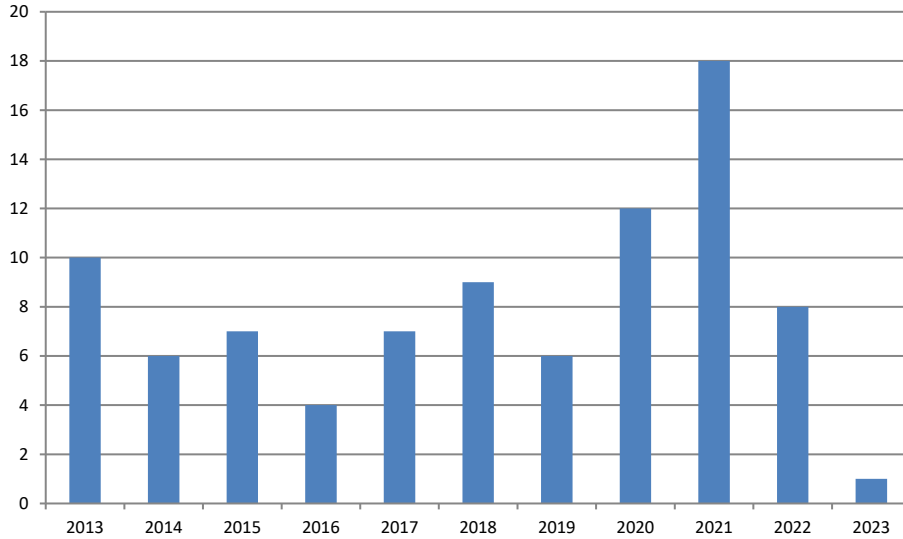
in 2024 due to new sources needing permits to comply with the dust control, parking garage regulations and more inspections of unpermitted sources. AMS is planning to hire more inspectors to address the increased workload. The compliance rate in 2023 for air inspections was 85%, which is around the average over the past nine years. The noise compliance rate increased from around 82% in 2022 to 85% in 2023. As for noise inspections, the compliance rate is generally lower than air inspections due to the longer time frame to resolve violations, which often involves installing and/or repairing equipment to come into compliance with the restrictions of the Code.



AMS issued 39 asbestos violations as a result of inspecting 2,377 total projects in 2023. The compliance rate is 98.8 %, which is relatively consistent with previous years in Philadelphia. The consistent number of asbestos violations issued from 2022 to 2023 is directly attributed to the continued and vigilant oversight by the unit inspectors whose primary focus is to properly inspect notified asbestos projects as often as possible in order to bring increased awareness of project compliance. For 2024, it is anticipated that the total number of asbestos violations resulting from inspections will increase as more inspectors are hired in an effort to get back to normal staffing levels as were seen in the past.

A Title V facility is a major source of pollution that is required to have air quality permits to operate under Title V of the 1990 Federal Clean Air Act Amendments. In 2023, AMS issued emission-related violations to one Title V facility. The variation from last year is mainly due to staff shortage.

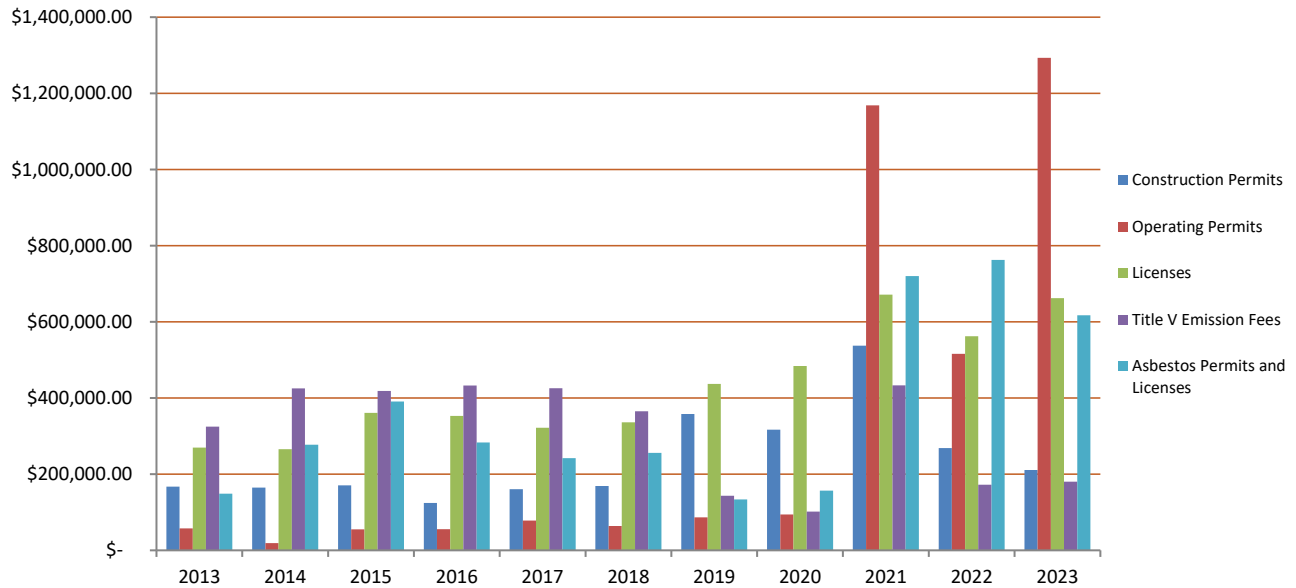
### Title V Facilities with Emissions Related Violations



### Revenue Generation

The chart below shows the fees received from construction permits (application fees), operating permits (application and annual administration fees), licenses including asbestos (application and renewal fees and Title V permits (emission fees) in the CY years 2013-2023. Construction Permit fees in CY 2023 decreased to \$210,775.00 from the \$268,585 in CY 2022. This was a result of fewer applications received in CY 2023. Construction Permit fees generated are expected to be similar in CY2024. Asbestos fees from licensing and certifications in CY 2023 were \$172,085 and Asbestos Permit Fees were \$445,256, both of which are in line with projected amounts. Operating license fees in CY 2023 increased to \$ 662,332 from \$562,393 in CY 2022. The increase was the result of new permitted sources being conformed from years which now required operating licenses. Operating permit fees significantly increased to \$1,293,258 in CY 2023 from the \$515,802 in CY 2022. This is due to the increased amount of number of facilities paying the annual administrative fees in 2023 and the increase in the permit application fees and annual administrative fees established under the PA Code. Title V emission fees in CY 2023 increased to \$180,323 from the \$172,155 in CY 2022. Emission fees for 2024 are expected to be the same in 2024.

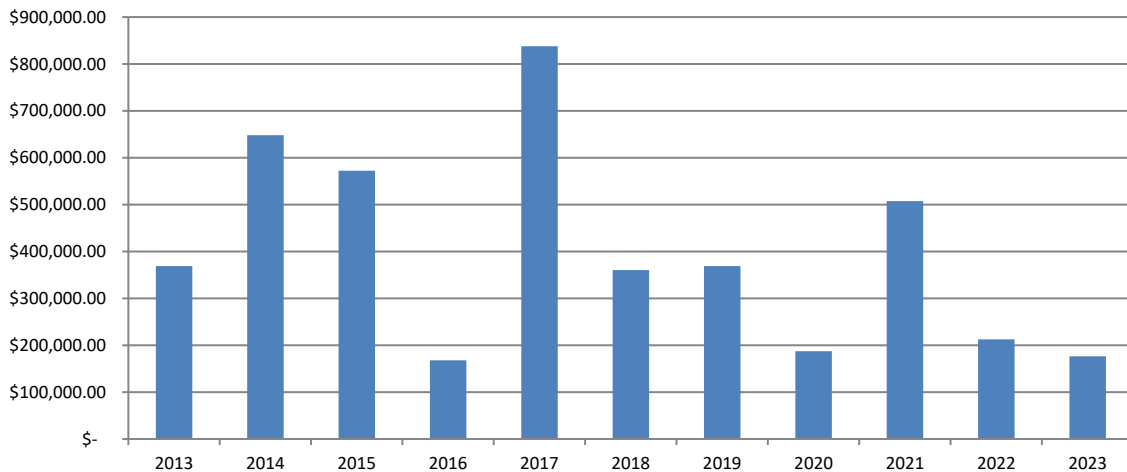
## Permitting Revenue



\*Note: Asbestos income since 2021 includes both permitting, and licensing and certification

Below is the sum of fines and penalties revenue collected from 2013 to 2023. In 2023, AMS collected \$176,368 in penalties. Asbestos penalty revenue (for CY 2022 - \$72,175) has increased and is now more in line with routine asbestos related violations and fewer NESHAP related violations. In CY 2023, Asbestos has collected, and is projected to collect several additional and significant civil penalties with the assistance of the law department as it relates to the industry growth of building lease re-positioning and development violation issuance, case development and subsequent resolution. Other penalties were lower in 2023 due to the PES Refinery shut down and staff shortage. The enforcement of violations is currently distributed amongst enforcement engineers, the penalty specialist and the Asbestos Program Manager.

## Total Fines and Penalties Revenue



## Conclusion

AMS has implemented its agency-wide Strategic Plan to review its operations for improving air quality and reducing the impact of nuisances while promoting sustainability and job creation as well as outreach and education on air quality issues. It has been focused on finding ways to allow permit and license applicants to submit forms and pay fees online, investigating ways to improve staff training and exploring ways to connect more closely to the public as well as partners such as universities and nonprofits. In addition, AMS has been working to educate the public about the importance of air quality. These are the major AMS accomplishments throughout the years:

- The Asbestos, Source Registration, and Facilities Compliances & Enforcement sections continue to utilize a cloud-based permit, license, and enforcement system. The system allows the online submission of asbestos notifications, license applications, and fees. It also allowed inspectors to use (internet and VPN capable laptops in the field to document their inspections.
- AMS is researching lower cost sensors that may be used in community air monitoring. AMS will also focus on EJ communities in air quality monitoring.
- The Air Pollution Control Board amended the Regulation III (AMR III) heavy Fuel oil on July 2021 so that no person may deliver, exchange in trade, or sell heavy fuel oil to be burned or used in Philadelphia.
- AMS has previously found more than 3,000 emission sources that can generate revenue for the city and reduce emissions by permitting sources, inspections, conduction maintenance, and limiting emissions. AMS continues actively to find new unpermitted sources and enforce regulations.
- AMS issued temporary installation permits for minor sources and started analysis of emission controls for major toxic sources (equal to or greater than 10 tons of methyl bromide/year) of fumigation at the port.
- AMS has collected one year's samples of air toxics under the CSAT grant project. AMS also finalized procuring field instruments and developed QAPP and QMP for EAMP for Environmental Justice communities, which will help establish three new air monitoring sites in EJ communities in Philadelphia, especially around Nicetown and Port Richmond.
- AMS acquired a mobile van monitor which measures toxics and criteria pollutants in real time in 2022. The mobile van is dispatched to collect real-time data in areas of fires and other emergencies, around EJ communities, and near facilities with large emission sources. Additional data quality management plans and reporting protocols for the mobile van are being prepared by the Program Services unit. AMS is now in a better position to quickly respond to emergency and citizen's complaints.
- AMS continues to measure air toxics at the former refinery area.
- AMR VI amendment was finalized in 2023 and the implementation started on January 1, 2024.