Kentucky's Air

FISCAL YEAR 2025 ANNUAL REPORT

Prepared by

Kentucky Division for Air Quality

TEAM KENTUCKY
ENERGY AND ENVIRONMENT CABINET

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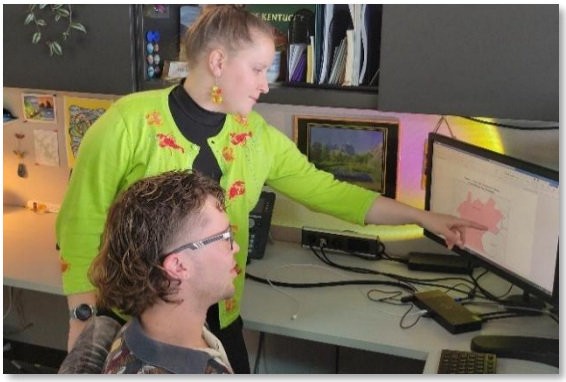
Welcome to the Kentucky Division for Air Quality's FY2025 Annual Report.

This report details the Division's accomplishments from July 1, 2024, through June 30, 2025. Due to varying schedules for data quality assurance, some data may be reported for the 2023 or 2024 calendar years.

Our Mission

To protect human health and the environment by achieving and maintaining acceptable air quality through:

- Operation of a comprehensive air monitoring network
- Creating effective partnerships with air pollution sources and the public
- Timely dissemination of accurate and useful information
- The judicious use of program resources
- Maintenance of a reasonable and effective compliance assurance program



Organization

The Division for Air Quality is part of the Kentucky Energy and Environment Cabinet (EEC) and is the third largest division within the Department for Environmental Protection. With a team of 150 environmental professionals working in Frankfort and eight regional offices across the commonwealth, the Division oversees air monitoring, permitting, regulation development, air program planning, compliance, facility and complaint inspections, and air quality outreach.

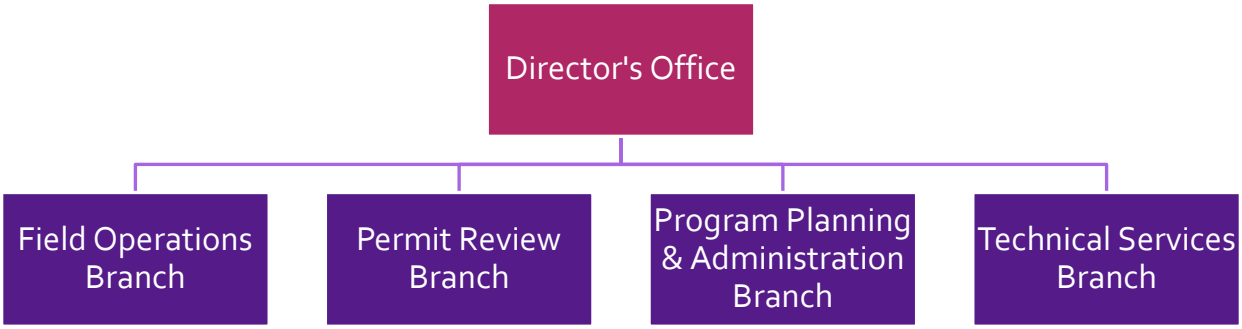


Figure 1: Division for Air Quality organizational chart

Environmental Education Outreach

The Division for Air Quality promotes environmental stewardship and public participation through environmental education programs, resources, and community partnerships. With one full-time outreach specialist and 18 outreach team members from across the Division for Air Quality, the Clean Air for Kentucky Program was able to reach more Kentuckians than ever during FY25:

- Virtual and in-person outreach to 2,745 Kentucky students
- In-person outreach to 200 university students
- In-person outreach to 241 educators
- Attendance at festivals and community events reaching more than 4,600 people.

Figure 2: Left: Environmental Scientist Advisor Jenna Nall shows students how to operate a particulate matter sampler. Right: A student constructs a model of an air pollution collector during a school outreach program.

Attainment Status

The Clean Air Act directs the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS) for six criteria pollutants that are considered harmful to human health and the environment. Based on ambient air monitoring data, EPA designates an area as **attainment** (measured pollutants for a three-year design value do not exceed the NAAQS) or **nonattainment** (measured pollutants for a three-year design value exceed the NAAQS). During FY24:

- All areas were designated attainment/unclassifiable for PM, CO, NOx, and lead.
- Bullitt, Jefferson, & Oldham counties remained designated nonattainment for the 2015 ozone standard.
- Henderson & Webster counties (partial) remained designated nonattainment for the 2010 sulfur dioxide standard.

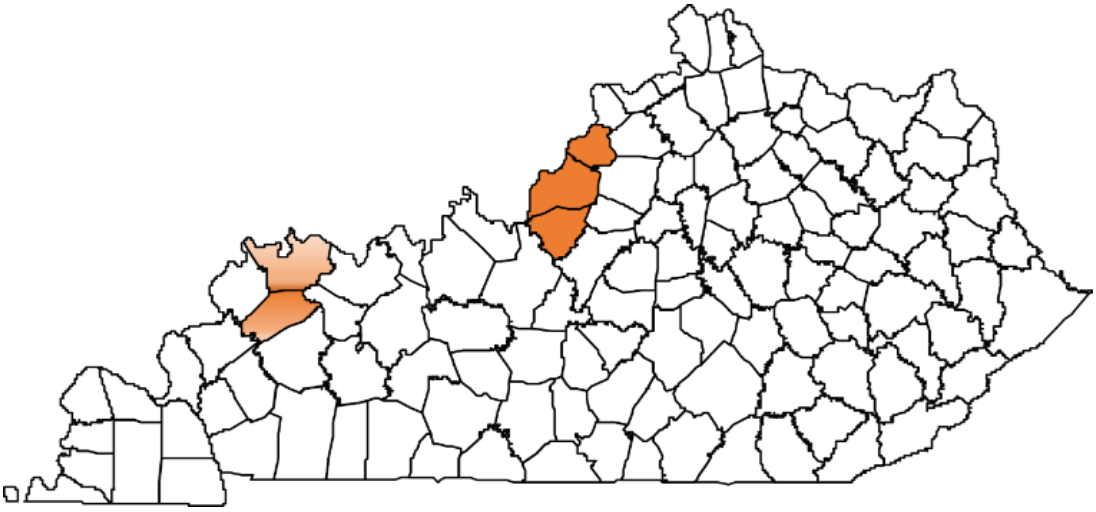


Figure 3: Kentucky Nonattainment Areas During FY25

Ozone

Effective Aug. 3, 2018, six Kentucky counties were designated nonattainment for the 2015 ozone standard: all of Bullitt, Jefferson and Oldham counties and the northern portions of Boone, Campbell, and Kenton counties. On Nov. 7, 2022, these six counties and partial counties were bumped up to the designation of "moderate" nonattainment.

In Sept. 2022, the division submitted requests to EPA to redesignate these areas as attainment. **Quality-assured air monitoring data demonstrated all these areas met the ozone NAAQS.**

On Oct. 4, 2023, EPA published the Final Rule for Northern Kentucky, redesignating the area as attainment. On April 18, 2023, EPA published the proposed redesignation for the Louisville area **but failed to take further action.** In response, DAQ filed a lawsuit to force EPA to act on the Louisville area submittal.

In January 2025, EPA published a second proposed rule, disapproving redesignation for the Louisville area. EPA also received adverse comment on this proposal.

LMAPCD submitted a final ozone exceptional event demonstration to U.S. EPA Region IV on June 11, 2025. This exceptional event demonstration included 9 days in the summer of 2023 (6/2, 6/6, 6/10, 6/15, 6/24, 6/28, 7/25, 8/4, 8/23) with elevated ozone levels (above the 2015 ozone standard) that could be attributed to smoke from Canadian wildfires that impacted much of the Midwestern and Eastern United States. On August 11, 2025, EPA

concurred that 6 of the 9 days were exceedances attributable to Canadian wildfire impacts and excluded the data from those days for regulatory purposes only. These exclusions lowered the 4th highest daily maximum 8-hour ozone concentration for the area in 2023 to 70 ppb. As a result, the area's 2023 Design Value (calculated as the three-year average of the annual 4th highest values from 2021 to 2023) is 70 ppb. EPA chose to defer action on the 3 additional days as those days were not regulatorily significant for the area's 2023 Design Value to meet the 2015 ozone standard.

On Aug. 4, 2025, the Division submitted a reformulated gasoline (RFG) opt-out request, pursuant to 40 CFR 1090.290. The RFG opt-out request was prepared jointly by the Division and the Louisville Metro Air Pollution Control District (District) and followed Governor Andy Beshear's petition submitted to U.S. Environmental Protection Agency (EPA) Administrator Lee Zeldin on Feb. 28, 2025. The RFG opt-out request demonstrates that removing the federal RFG requirements in Bullitt, Jefferson, and Oldham Counties will not interfere with any applicable requirements concerning attainment or reasonable further progress in nonattainment or maintenance areas within the Commonwealth.

EPA and the Cabinet have entered into a Consent Decree for a final action to be taken on the Division's Sep. 2022 redesignation request submittal for the Louisville area no later than December 2025.

Sulfur Dioxide

Portions of Henderson and Webster counties were designated nonattainment for the 2010 sulfur dioxide (SO_2) standard, effective March 13, 2021. The Division worked on a redesignation request for the area until the monitor picked up several exceedances that put the design value over the SO_2 standard of 75 ppb. At that point, the division began work on an attainment plan. As of the end of FY25, the Division was working to respond to public comments received during the attainment plan comment period.

Particulate Matter

On Feb. 7, 2024, the EPA announced a final rule for the $PM_{2.5}$ NAAQS, lowering the primary annual $PM_{2.5}$ standard from 12 µg/m^3 to 9 µg/m^3.

- On Feb. 7, 2025, the Division submitted Kentucky's initial area designation recommendations to EPA. Based on 2022-2024 monitoring data, the design values at all monitors were below the revised $PM_{2.5}$ standard; therefore, the Division recommended that Bell, Boyd, Campbell, Carter, Christian, Daviess, Fayette, Hardin, Jefferson, McCracken, Perry, Pike, Pulaski, and Warren counties be designated attainment.
- The Division recommended that the remainder of the state be designated attainment/unclassifiable.

Air Pollution Complaints

During FY25, **the Division for Air Quality received a total of 1,748 air pollution complaints.** Most complaints fell into three categories: open burning, odors, and fugitive emissions. The chart below displays the most common complaints by category with the following data:

- 344 odor complaints, of which 14 resulted in notices of violation (4 percent)
- 705 open burning complaints, of which 206 resulted in notices of violation (29 percent)
- 128 fugitive emissions complaints, of which 7 resulted in notices of violation (5 percent)

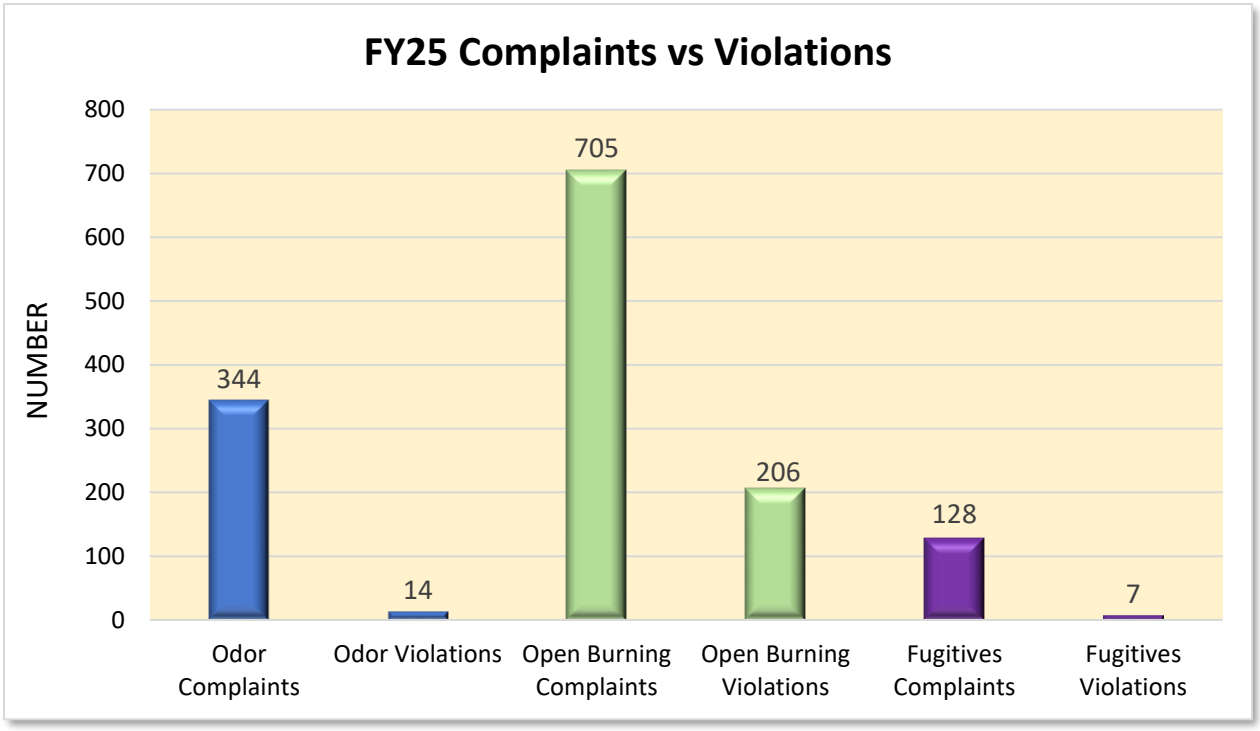


Figure 4: FY25 Complaints vs Violations

Compliance Inspections

- 2,731 compliance inspections
- 89 percent compliance rate

Field Operations Branch staff completed 2,731 compliance inspections of various types at mostly permitted sources (Conditional Major, Title V, & Minor). Eight percent of inspections resulted in documented violations; four percent resulted in notices of violation.

Inspection activities for all permitted facilities include excess emissions reviews, performance test reviews, semi-annual monitoring reviews, engineering inspections, follow-ups, infrared camera inspections, performance test observations, and record reviews. Inspection activities for major and minor facilities also include annual certification reviews, full compliance evaluations, and partial compliance evaluations.

Asbestos

Compliance with asbestos regulations is overseen by the Field Operations Branch. **During FY25, staff conducted 710 asbestos-related activities**. Asbestos activities include The Asbestos Hazard Emergency Response Act (AHERA) reviews and National Emission Standards for Hazardous Air Pollutants (NESHAP) inspections and investigations from asbestos notifications and complaints.

Permitting

- 340 air permits issued
- 537 permitting actions (Table 1)
- 13 economic development projects

The Permit Review Branch (PRB) issues air permits for industrial and commercial sources that release pollutants into the air. Air permits include information regarding which pollutants are being released, how much may be released, and what steps the source's owner or operator is required to take to reduce the pollution. Permits also include plans to measure and report air pollutants emitted.

At the close of the fiscal year, the branch had issued 340 permits (initial, renewals, revisions for stationary and portable sources) and had 247 applications in-house. PRB also issued new air permits or permit modifications for 13 economic development-referred projects during FY25. These projects were completed in partnership with the Cabinet for Economic Development.

Type of Permit Action	Number
Major Permit Applications	75
Conditional Major Permit Applications	92
Minor Permit Applications	173
Registrations	151
Administrative Amendments	46

Table 1: Permitting Actions during FY25

Program Funding & Planning

Fiscal Management

The Division operates primarily on Title V (pronounced "Title Five") emissions fees and federal grant funds. Funding under the Title V program is mandated by the Clean Air Act through air pollutant emission fees, which are assessed to permitted air pollution sources in the commonwealth that meet specific criteria. Kentucky statute further authorizes the division to charge fees sufficient to cover the cost of implementing and carrying out the requirements of the air quality program.

During FY25, **91 percent of the Division's funding came from emissions fees** under the Title V program. Another **8 percent came from federal grant funds**. The remaining funding came from asbestos license application fees, tank truck permits, and proceeds from asset sales.

Emissions Inventory

The Emissions Inventory Section surveys nearly 1,200 facilities per year to determine actual air pollutant emissions for the previous calendar year. Air emission fees are generated based on actual emissions in a calendar year. Sources are surveyed annually and charged a per ton fee for emissions.

Table 2 displays data for the 2023 calendar year. At the time of publication of this report, data for the 2024 calendar year was still being verified. It takes approximately nine months to verify and complete the inventory for the previous year.

Pollutant	Tons Emitted in 2023
Carbon monoxide	49,082
Nitrogen dioxide	45,572
Particulate matter 2.5	6,102
Particulate matter 10	10,682
Sulfur dioxide	42,012
Volatile organic compounds (as an ozone precursor)	63,320

Table 2: Regulated Pollutant Emissions, Calendar Year 2023

How are Emission Fees Calculated?

The Division surveys permitted sources subject to the Title V fee program each year. Once the agency has determined the overall cost of the program for the year, the number of tons of emitted pollutants are divided into the projected operating cost to calculate a per ton cost, and each source within the Title V programs is issued a bill based on that per ton cost.

At the same time, EPA determines a minimum cost per ton of pollutant that an agency should charge to fund the Title V permitting program. Figure 5 shows the comparison between EPA's presumptive minimum and the actual cost per ton that the Division has charged over the last twenty years. As emissions from Kentucky facilities have decreased with time, the per ton fee has necessarily increased.

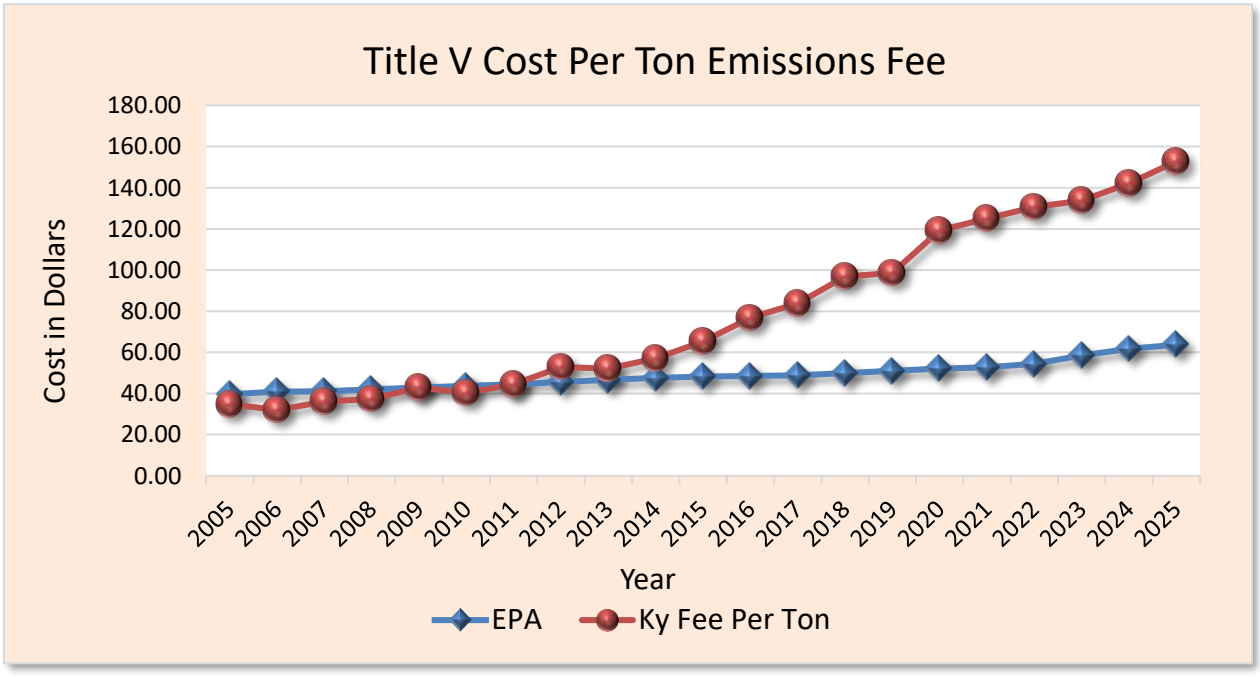


Figure 5: EPA's presumptive minimum vs. DAQ's per ton fee.

Kentucky Greenhouse Gas Emissions

Because some gases have a higher warming potential than others, emissions of greenhouse gases are typically expressed in "carbon dioxide equivalent" (CO_2e) to allow their impacts to be directly compared. EPA's Greenhouse Reporting Rule requires reporting of greenhouse gases from sources that emit 25,000 metric tons or more of CO_2e per year in the U.S.

Although the Division is not required to report greenhouse gas emissions on behalf of facilities, the Emissions Inventory Section collects this data when available.

Greenhouse Gas	2020 Actual Emissions (tons)	2021 Actual Emissions (tons)	2022 Actual Emissions (tons)	2023 Actual Emissions (tons)
Carbon dioxide	58,911,448	67,589,118	67,798,373	61,678,694
Methane	109,679	94,983	102,870	96,796
Nitrous oxide	3,156	4,071	3,861	3,592
CO2e (metric tonnes)	56,988,254	64,667,792	64,992,066	58,407,443
CO2e (tons)	62,818,800	71,284,038	71,641,490	64,383,167

Table 3: Kentucky Greenhouse Gas Emissions Reported, 2020-2023

Air Dispersion Modeling

Air dispersion modeling is an important tool that supports air program planning and permit review. Air modeling data is used to verify, adjust, or establish limits in permits, justify permit conditions, to support the State Implementation Plan, and to protect public health and air quality.

During FY25, the following assessments and demonstrations were completed:

- **48 air toxics modeling demonstrations** in compliance with 401 KAR 63:020 for affected facility applications that emit hazardous and/or toxic substances
- **5 PSD permit application reviews** in compliance with 401 KAR 51:017 and EPA's Guideline on Air Quality Models, 40 CFR Part 51, Appendix W. 2 of the demonstrations were Economic Development Projects.
- **2 SO_2 criteria pollutant model demonstrations**
- **1 Lead criteria pollutant model demonstration**
- **2 MOVES model demonstrations** performed for Louisville Metro Air Pollution Control District
- **1 Lead monitoring waiver demonstration** performed for the Technical Services Branch

Regional Haze

Regional haze is pollution that impairs natural visibility over a large region, including national parks, forests, and wilderness areas (known as "Class I" areas). As part of the Clean Air Act Amendments and further regulations adopted by the EPA, states must develop plans to restore natural visibility conditions in the 156 Class I areas throughout the nation by the year 2064. Kentucky's Mammoth Cave National Park is included in the list of Class I areas.

Figure 6: Good and bad visibility days at Mammoth Cave National Park; 144 miles visual range (left) vs 16 miles (right)

Revisions to state plans for Regional Haze are required periodically to ensure progress is being made toward long term goals. Kentucky's draft State Implementation Plan (SIP) revision concentrates on reducing sulfur dioxide (SO_2) emissions from facilities shown to impact Class I areas. **As of the publication of this report, the final SIP revision and response to comments had been submitted to EPA.**

Regulation Development

During FY25, the Regulation Development Section reviewed the deregulatory actions taken by the current administration. Since most staff time was spent reviewing federal regulations, no regulations were filed. The section did work on draft amendments to 401 KAR 60:005 (standards of performance for new stationary sources) and 63:002 (national emission standards for hazardous air pollutants) to file with LRC in FY26. Additionally, the section spent time working on state plans for both carbon pollution standards and oil and gas methane under Section 111(d) of the CAA.

State Implementation Plan

During FY25, the Energy and Environment Cabinet submitted three final revisions to Kentucky's SIP:

- **July 23, 2024** – Second 10-year Limited Maintenance Plan for the 1997 8-hour ozone NAAQS for Northern Kentucky
- **February 20, 2025** – Second 10-Year Maintenance Plan for the 2010 SO2 NAAQS for the Kentucky Portion of the Campbell-Clermont, KY-OH Area
- **February 20, 2025** – 2010 SO_2 Data Requirements Rule Annual Report

Diesel Emissions Reduction Act Grant

The Diesel Emissions Reduction Act (DERA) Grant Program provides financial support for projects that protect human health and improve air quality by reducing harmful emissions from diesel school buses. The Division administers this program with funding provided through the federal DERA grant.

During FY 2025:

- **$404,678 was awarded** to the Division through DERA.
- **Fayette County Public Schools** was the sole school district selected to receive funding.
- Funding will replace a total of **six** older model, diesel school buses with new diesel buses.
- The new buses will emit **56.4 percent less particulate matter and 76.5 percent less nitrogen oxide** pollution than the older buses they replaced.

Kentucky's Air Monitoring Network

During the 2024 monitoring year, KDAQ operated 67 instruments, including 1 meteorological station, located at 24 ambient air monitoring sites in 23 Kentucky counties. LMAPCD operated an additional 34 instruments, including 5 meteorological stations, in Jefferson County.

When combined with the air monitoring site operated by the National Park Service (NPS) at Mammoth Cave National Park, the total ambient air monitoring network consisted of 103 instruments, including 7 meteorological stations, located at 30 sites across 25 counties of the Commonwealth. While not associated with the Division's air monitoring network, the EPA operates two additional CASTNET ozone monitoring stations in Kentucky.

Locations of ambient air monitoring stations are selected in accordance with EPA regulations (40 CFR 58, Appendix D). In general, monitors are placed in densely populated areas or near point sources of pollution. The site locations are reviewed annually to ensure adequate coverage is being provided and regulatory requirements are being met.

Ambient Air Monitoring Network Map

2024 Monitoring Year

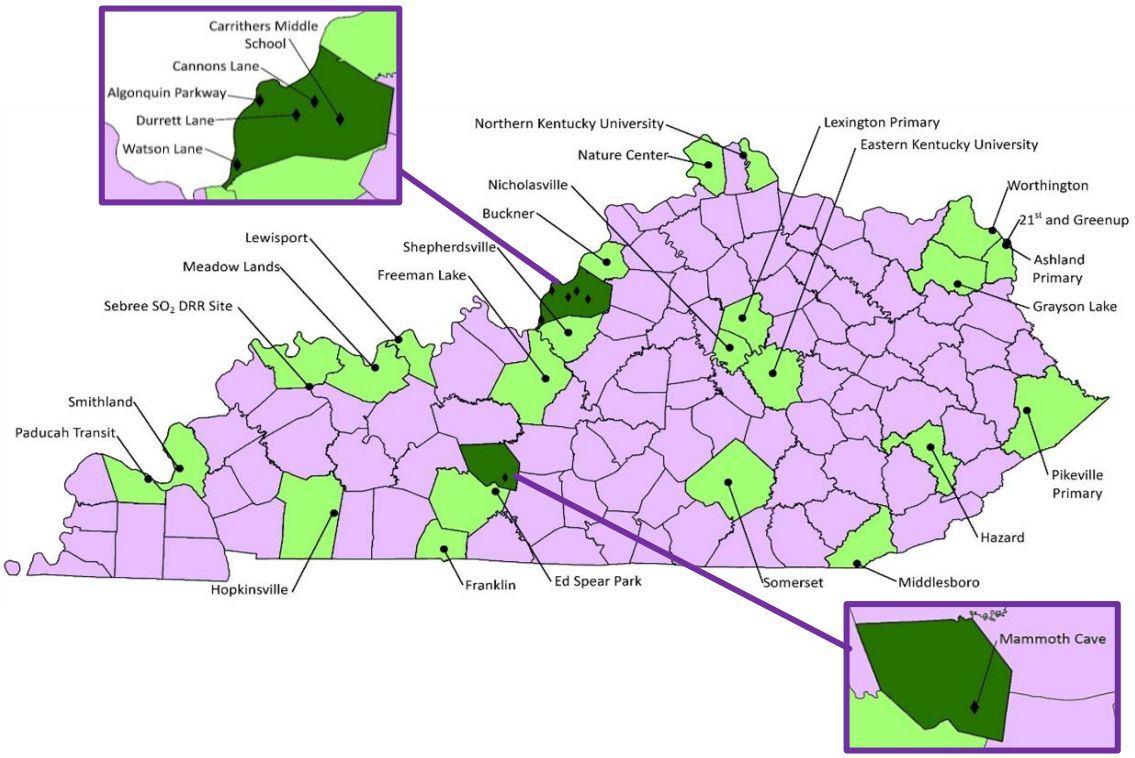


Figure 7: Kentucky's Ambient Air Monitoring Network Map

Air Monitoring Data

This annual report contains quality-assured data collected through calendar year 2024. The data summarizes criteria pollutant averages represented as statewide trends, as well as 2024 design values for each air monitoring site.

What's a Design Value?

A design value is a calculated metric that is used to determine compliance with a particular National Ambient Air Quality Standard (NAAQS). Design values are calculated in accordance with 40 CFR Part 50 and vary from pollutant to pollutant. For example, lead uses a 3-month rolling average and one of the primary NAAQS for nitrogen dioxide uses an annual average.

It is important to note that an exceedance of a particular pollutant is not the same as a violation of the NAAQS for that pollutant. Violations are determined according to the formula for each standard and involve the average of multiple measured values over a specific amount of time. Any data contained in this report is subject to change. The most current quality assured data set can be obtained through a Kentucky Open Records request.

Carbon Monoxide (CO)

Primary NAAQS: 8-hour average not to exceed 9 parts per million (ppm) more than once per year; 1-hour average not to exceed 35 ppm more than once per year
Secondary NAAQS: None

Carbon monoxide (CO) is an odorless, colorless gas that is produced by the incomplete combustion of carbon-containing fuels. The primary source of carbon monoxide is exhaust from motor vehicles, including highway and off-road vehicles. Other sources include industrial processes, open burning, and kerosene or wood-burning stoves in homes.

There were no exceedances of the CO standards in 2024. All Kentucky counties are currently in attainment of the standards.

Carbon Monoxide Design Values

Site	1-Hour Design Value (ppm)	8-Hour Design Value (ppm)
Cannons Lane (LMAPCD)	3.2	2.0
Durrett Lane (LMAPCD)	2.5	1.6

Table 4: Carbon monoxide design values for 2024, measured in parts per million (ppm)

Statewide averages for carbon monoxide (CO) have declined substantially since 1987, primarily due to improved emission controls on motor vehicles. Figure 8 displays the statewide 1-hour and 8-hour averages of the second highest reading of CO from 1994 through 2024, with downward trend lines marked. Note: Trends charts in this report do not demonstrate attainment for any area.

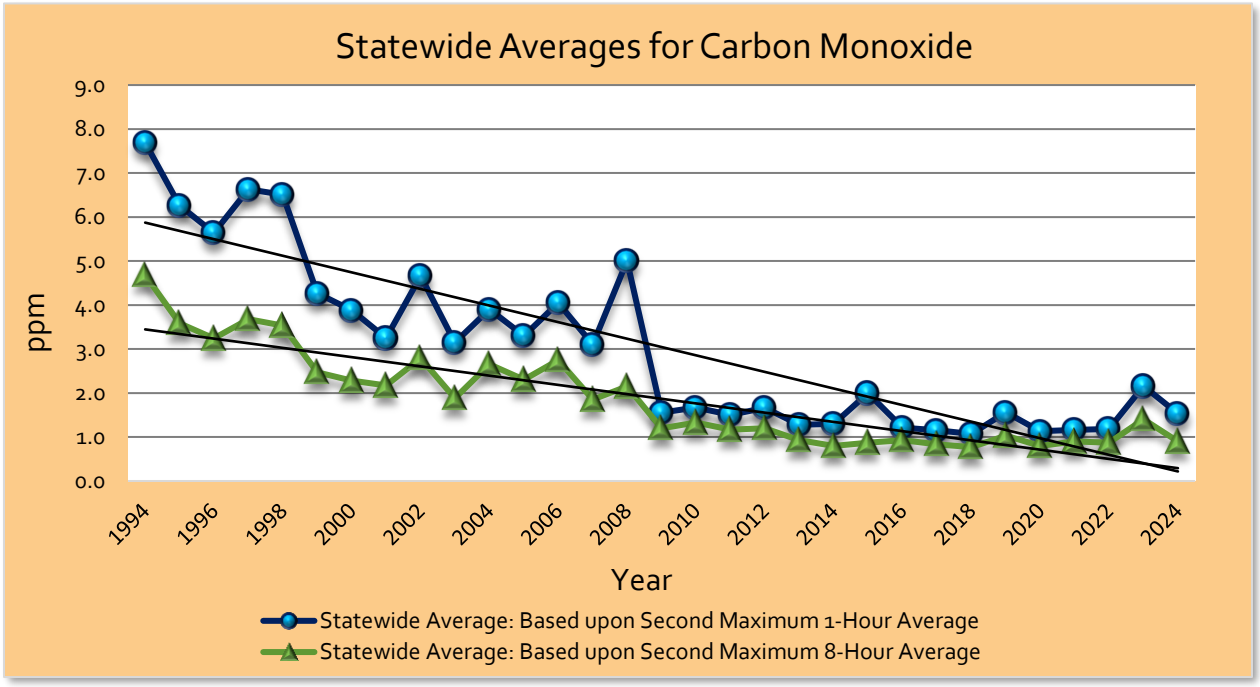


Figure 8: Statewide Averages for carbon monoxide from 1994-2024, measured in parts per million (ppm)

Lead (Pb)

Primary NAAQS: Rolling 3-month average not to exceed 0.15 micrograms per meter cubed (µg/m^3)
Secondary NAAQS: Same as primary standard

Lead is a soft, blue-gray metal that has historically been used in motor fuels, paint, plumbing and batteries. Since the 1970s when the U.S. EPA mandated the phase out of lead in gasoline, airborne lead concentrations have plummeted. By regulation, lead monitoring is now only required near major sources of lead.

Lead Design Values

Site	1st Max	2nd Max	3rd Max	4th Max	Observations > 0.15	Design Value
EKU	0.09	0.09	0.09	0.02	0	0.09

Table 5: 2024 Top 3-month averages and design values, measured in micrograms per cubic meter

In 2024, the Division operated one lead monitoring site at Eastern Kentucky University. There were several exceedances of the lead NAAQS in 2018; all were related to a compliance issue with a single stationary source. Figure 9 displays the three-month rolling averages for lead from October 2014 – December 2024, measured in micrograms per cubic meter (µg/m^3). Data is shown from four discontinued monitoring sites as well as the current site at EKU.

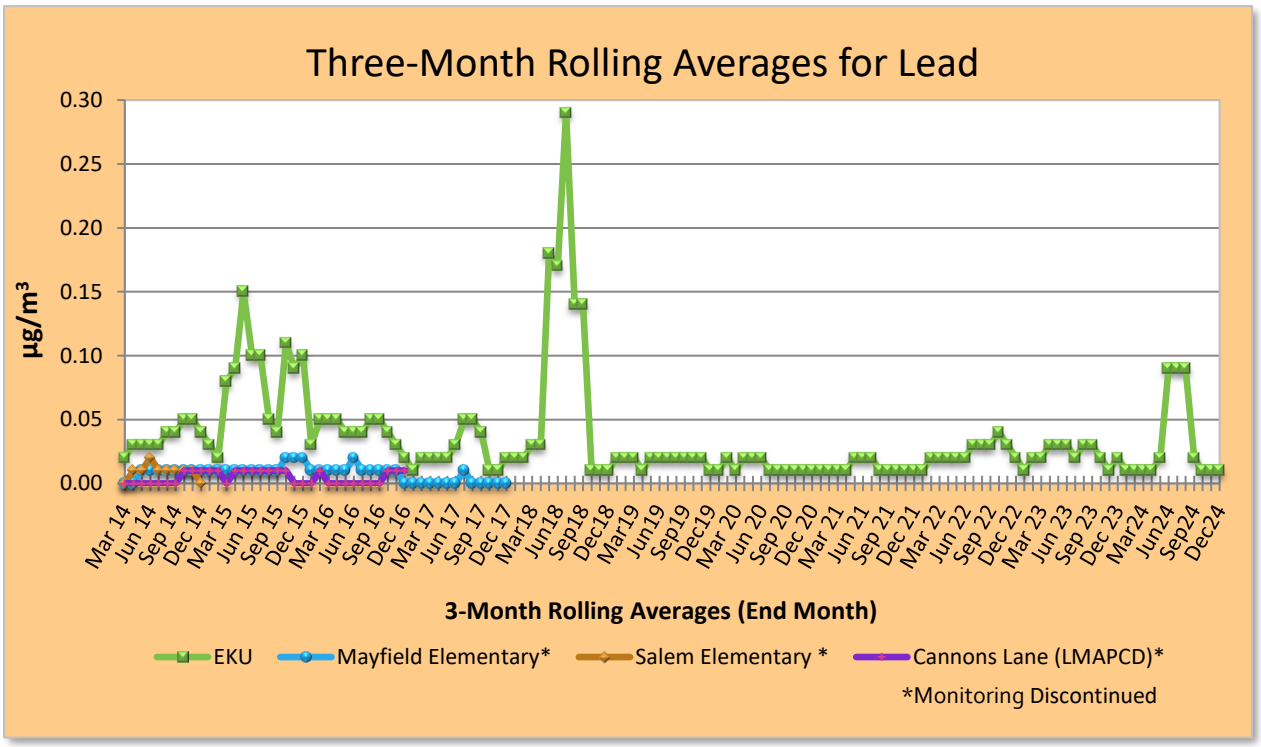


Figure 9: Three-month rolling averages for lead from Mar. 2014 – Dec. 2024, measured in micrograms per cubic meter

Nitrogen Dioxide (NO_2)

Primary NAAQS:
3-year average of the 98th percentile of daily maximum one-hour averages must not exceed 100 parts per billion (ppb)**.** Annual arithmetic mean must not exceed 53 ppb
Secondary NAAQS: Annual arithmetic mean must not exceed 53 ppb

Nitrogen dioxide is a reddish-brown gas that is produced during high-temperature combustion. During combustion, nitrogen and oxygen combine to form a family of highly reactive gases called nitrogen oxides (NOx), which include nitrogen dioxide (NO_2) and nitrogen oxide (NO). Major combustion sources that produce NO_2 include motor vehicles, power plants, incinerators, boilers, and chemical processes. NO_2 is also produced through a photochemical reaction between NO and sunlight.

There have been no recorded exceedances of an NO_2 NAAQS since the inception of sampling in 1970. All Kentucky counties are currently in attainment of the standards for nitrogen dioxide.

Nitrogen Dioxide Design Values

County/Site Name	1-Hour Design Value	Annual Design Value
Boyd	29	6
Campbell	26	4
Daviess	22*	5*
Fayette	40	7
Cannons Lane (LMAPCD)	40	8
Durrett Lane (LMAPCD)	46	13
McCracken	34*	5

*Table 6: Nitrogen dioxide design values for 2024, measured in parts per billion. * Data does not meet design value validity*

Statewide averages for nitrogen dioxide (NO_2) have declined substantially since the 1990s. Figure 10 displays the statewide 1-hour and annual averages of NO_2 from 1994 through 2024, with downward trend lines marked.

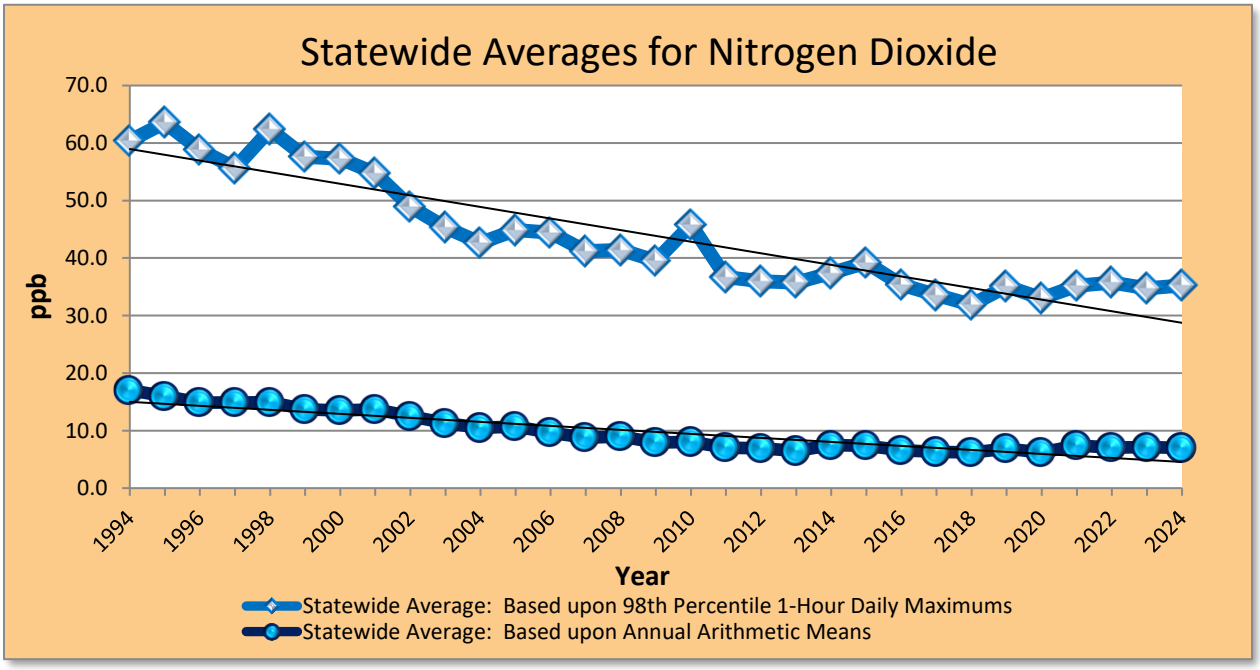


Figure 10: Statewide averages for NO_2 from 1994-2024, measured in parts per billion

Ozone (O_3)

Primary & Secondary NAAQS: 3-year average of the 4th highest daily maximum 8-hr concentration not to exceed 0.070 parts per million.

Ozone is a colorless gas that is not emitted directly into the atmosphere from sources. Instead, ozone forms in the lower atmosphere from a photochemical reaction between volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight.

Ozone's chemistry makes it more likely to form during warm, sunny weather. Vehicle and factory emissions, open burning, and wildfire smoke are some of the largest sources of NOx and VOCs, which contribute to ozone formation.

In 2024, eight sites measured 8-hour ozone concentrations greater than 0.070 ppm. The fourth highest daily maximum 8-hour ozone concentration was above the level of the standard at three Kentucky sites. A valid 2022-2024 3-year average (design value) was at or below the level of the standard for all Kentucky sites except for the Cannons Lane site in Jefferson County.

Ozone Design Values

County/Site Name	Design Value
Algonquin (LMAPCD)	0.070*
Bell	0.059
Boone	0.068
Boyd	0.062
Bullitt	0.067
Campbell	0.066
Cannons Lane (LMAPCD)	0.074
Carrithers Middle School (LMAPCD)	0.070
Carter	0.058
Christian	0.065
Daviess	0.068*
Edmonson (NPS)	0.064
Fayette	0.065
Greenup	0.060
Hancock	0.067
Hardin	0.062*
Jessamine	0.065
Livingston	0.067
McCracken	0.067*
Morgan	0.060
Oldham	0.067
Perry	0.058
Pike	0.058
Pulaski	0.059
Simpson	0.067
Warren	0.064
Washington	0.062
Watson Lane (LMAPCD)	0.068

*Table 7: Ozone design values for 2023, measured in parts per million (LMAPCD = Louisville Metro Air Pollution Control District) *Data does not meet DV validity*

Figure 11 on the following page displays the statewide averages of ozone from 1994-2024, measured in parts per million. Though statewide ozone averages have varied from year to year, the overall trend is downward.

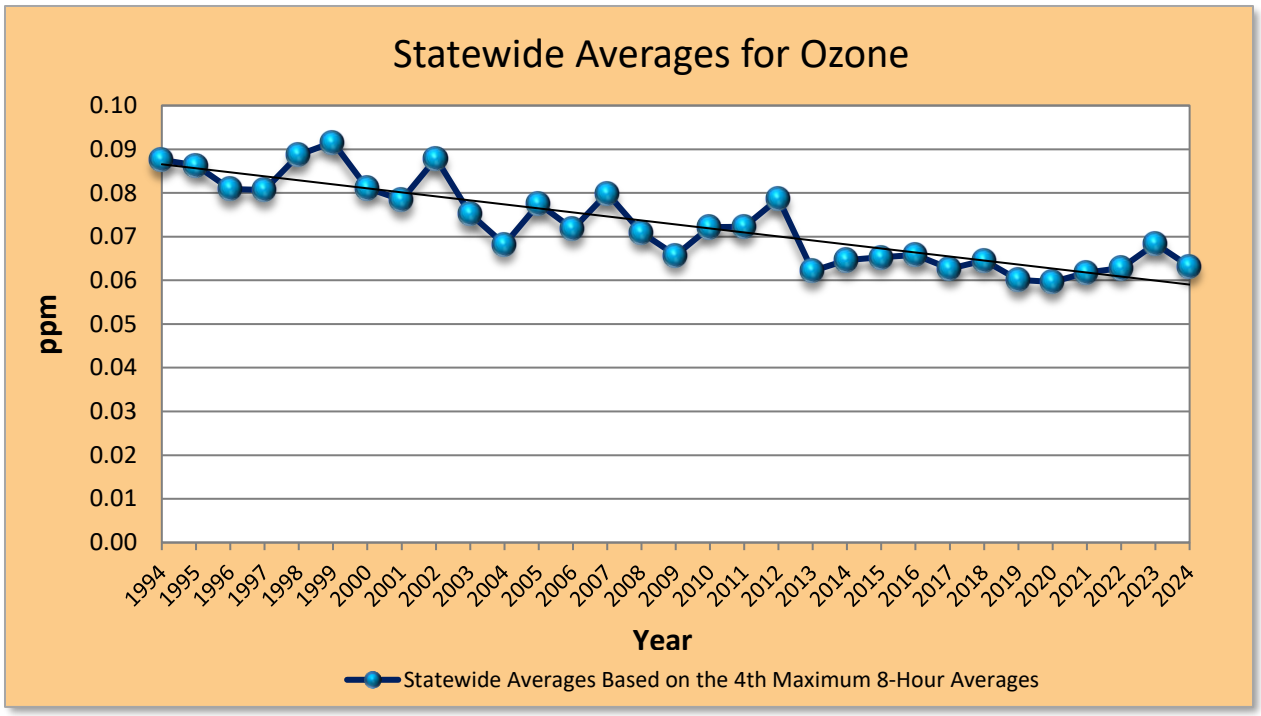


Figure 11: Statewide averages for ozone from 1994-2024, measured in parts per million

Fine Particulate Matter ($PM_{2.5}$)

Primary NAAQS: 3-year average of the annual weighted mean not to exceed 9.0 micrograms per meter cubed (µg/m^3); 3-year average of the 98th percentile of 24-hour concentrations not to exceed 35 µg/m^3

Secondary NAAQS: 3-year average of the annual weighted mean not to exceed 15.0 µg/m^3; 3-year average of the 98th percentile of 24-hour concentrations not to exceed 35 µg/m^3

Fine particulate matter ($PM_{2.5}$) is a mixture of solid particles and liquid droplets that are 2.5 microns or smaller in size. Sources include power plants, wood burning, industrial processes, and combustion. Fine particulates are also formed in the atmosphere when gases such as sulfur dioxide, nitrogen oxides and VOCs are transformed through chemical reactions.

There were no exceedances of the three-year 24-hour standard nor the three-year annual standard during the 2022 - 2024 averaging period. All Kentucky counties are currently in attainment for the $PM_{2.5}$ standards.

Figure 13 on the following page displays the statewide annual and 24-hour averages of fine particulate matter from 2001, when monitoring first began for $PM_{2.5}$, to 2024, measured in micrograms per cubic meter. The uptick of $PM_{2.5}$ levels in 2023 was partially influenced by several Canadian wildfire smoke events.

Fine Particulate Matter Design Values

County/Site	Annual Design Value	24-Hour Design Value
Bell	8.6	21
Boyd	7.2	18
Campbell	7.2	19
Carter	6.0	16
Christian	7.9	19
Daviess	7.0*	15*
Fayette	7.1*	19*
Hardin	7.2*	20*
Algonquin Parkway (LMAPCD)	8.4	21
Cannons Lane (LMAPCD)	7.8	21
Carrithers Middle School (LMAPCD)	8.2	22
Durrett Lane (LMAPCD)	8.8	22
Watson Lane (LMAPCD)	8.8	22
McCracken	7.7*	18*
Perry	7.8	21
Pike	6.4	17
Pulaski	7.1	17
Warren	6.9	18

*Table 8: Fine particulate matter ($PM_{2.5}$) design values for 2023, measured in micrograms per cubic meter($\mu g/m^3$) (LMAPCD = Louisville Metro Air Pollution Control District). * Data does not meet DV validity*

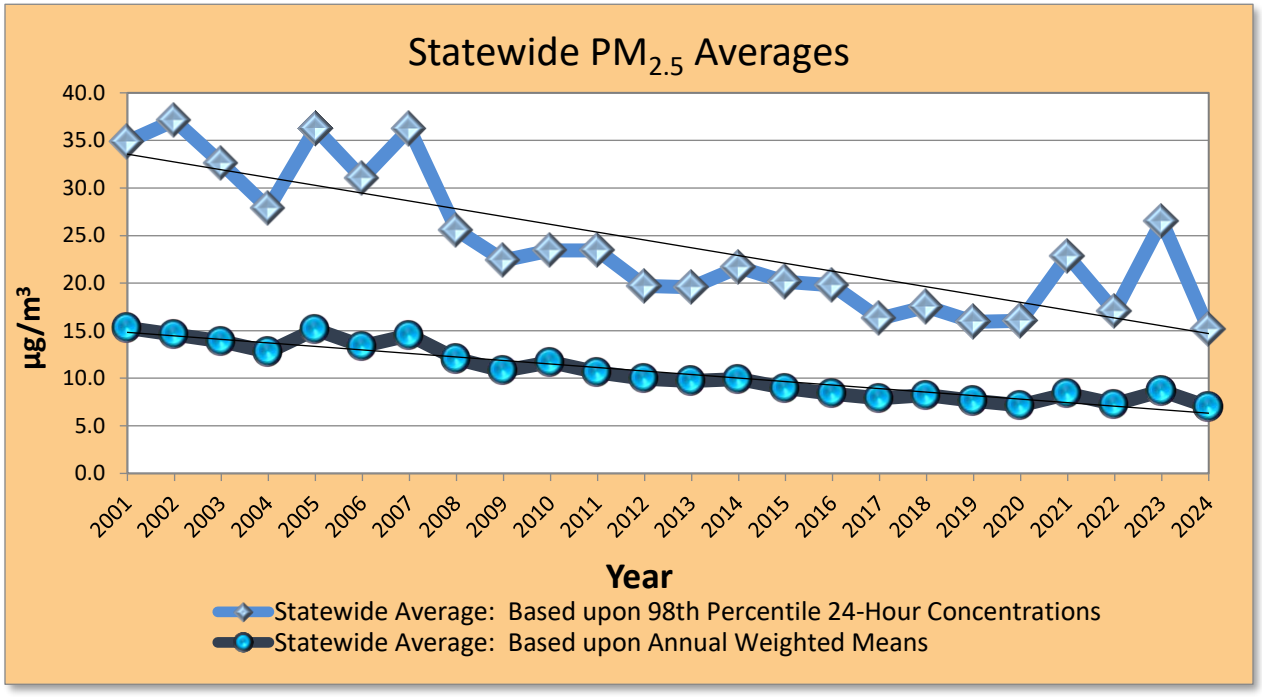


Figure 13: Statewide $PM_{2.5}$ averages from 2001-2024, measured in micrograms per cubic meter

Course Particulate Matter (PM_{10})

Primary NAAQS: Expected number of days with a maximum 24-hour concentration greater than 150 micrograms per meter cubed ($\mu g/m^3$) must be less than or equal to one, on average over three years.
Secondary NAAQS: Same as Primary Standard

Coarse particulate matter of 10 microns or less in diameter is known as PM_{10}. Common sources of PM_{10} are prescribed fires, construction activities, agricultural practices, metal recycling, and smokestacks.

There were no exceedances of the annual PM_{10} standard in 2024. The last exceedance of the standard occurred on March 22, 2012, at the Ashland site, which is located next to a metals recycler. All Kentucky counties are currently in attainment for the PM_{10} standards.

Coarse Particulate Matter Design Values

Monitoring Site	1st Max	2nd Max	3rd Max	4th Max	Estimated Exceedance (Design Value)
Boyd	37	33	31	30	0
Carter	19	17	17	15	0
Fayette	49	46	27	27	0
Algonquin Parkway (LMAPCD)	54	52	50	47	0
Cannons Lane (LMAPCD)	46	41	38	36	0

Table 9: PM_{10} maximum 24-hour concentrations and design values for 2024, measured in micrograms per cubic meter

Figure 14 displays the statewide average of the annual maximum 24-hour concentration for PM_{10} from 2004-2024, measured in $\mu g/m^3$ (micrograms per cubic meter). The average is calculated using the first maximum PM_{10} measurement at each monitoring location.

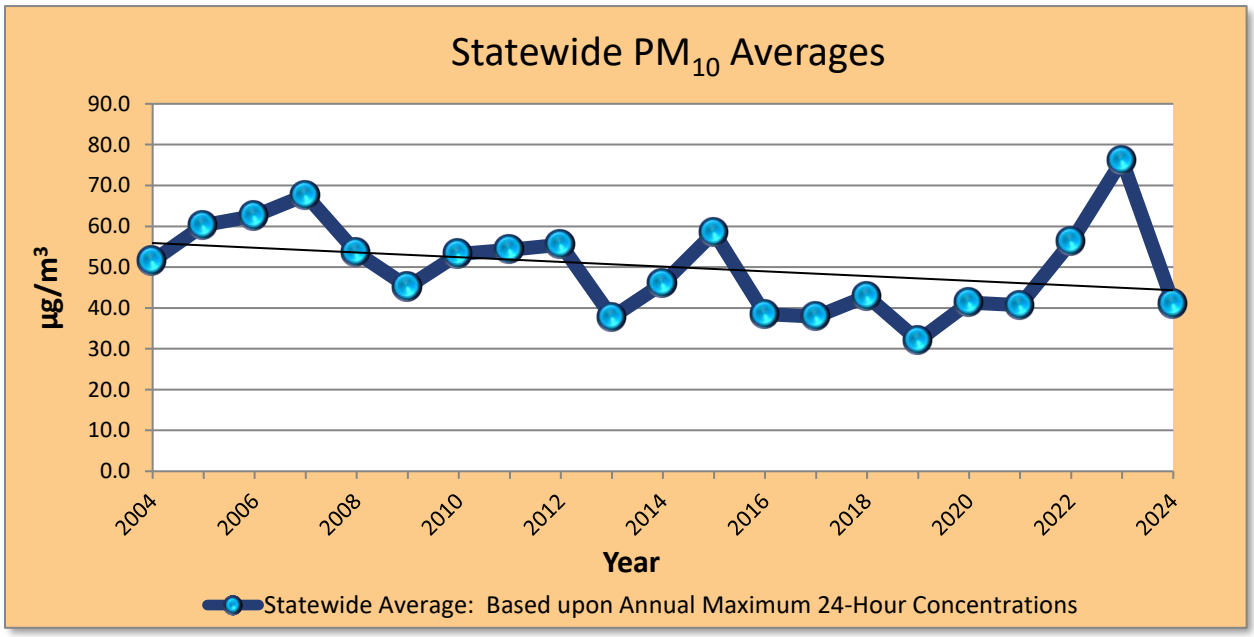


Figure 14: Statewide PM_{10} averages, 2004-2024

Sulfur Dioxide (SO_2)

Primary NAAQS: 3-year average of the 99th percentile of the daily maximum 1-hour concentration not to exceed 75 ppb

Secondary NAAQS: 3-hour concentrations not to exceed 0.5 ppm (500 ppb) more than once per year

Sulfur dioxide (SO2) is a colorless gas that has a pungent odor at concentrations exceeding 0.5 ppm. SO_2 is produced during the combustion of sulfur-containing fuels, ore smelting, petroleum processing, and the manufacturing of sulfuric acid. Nationwide, coal-fired power plants are the largest sources of SO_2.

During 2024, one site recorded 4 exceedances of the daily one-hour standard of 75 ppb. That site, located near Sebree, Kentucky, was established to characterize maximum hourly sulfur dioxide concentrations for specific stationary sources. No other exceedances were recorded in the state.

Sulfur Dioxide Design Values

County	Design Value
Boyd	5
Campbell	7
Daviess	7*
Edmondson (NPS)	2*
Fayette	3
Greenup	6
Henderson	82

County	Design Value
Algonquin (LMAPCD)	5*
Cannons Lane (LMAPCD)	9
Watson Lane (LMAPCD)	15
Jessamine	5
McCracken	10*

*Table 10: Sulfur dioxide (SO_2) design values for 2024, measured in parts per billion. NPS=National Park Service; LMAPCD=Louisville Metro Air Pollution Control District; Data marked with * do not meet design value criteria.*

Figure 15 displays the statewide average for SO_2 from 1994-2024, measured in parts-per-billion (ppb). The dramatic decline of sulfur dioxide levels is one of Kentucky's biggest air quality success stories. Emission controls on coal-fired power plants, as well as the trading allowances in the federal Acid Rain Program, have directly contributed to the decline in ambient SO_2 concentrations across the region.

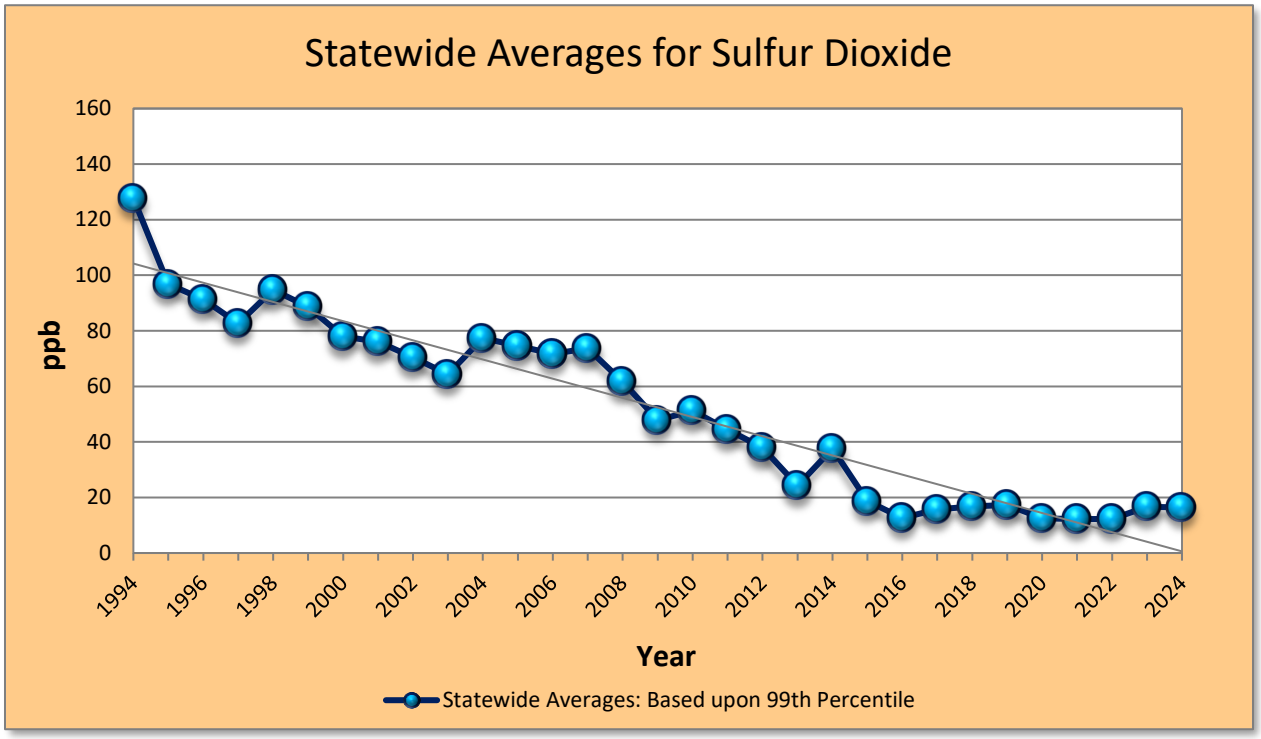


Figure 15: Statewide SO_2 averages from 1994-2024, measured in parts per billion (ppb)

APPENDIX A: The National Ambient Air Quality Standards

The Clean Air Act requires EPA to set standards for six criteria air pollutants to protect public health (Primary Standard) and welfare (Secondary Standard). "Welfare" includes damage to plants and animals, impairment of visibility, and property damage.

Carbon Monoxide	**Primary Standard**	**Secondary Standard**
8-Hour Average	9 ppm	None
1-Hour Average	35 ppm	None
Lead	**Primary Standard**	**Secondary Standard**
Rolling Three-Month Average	0.15 μ/m^3	Same as Primary
Nitrogen Dioxide	**Primary Standard**	**Secondary Standard**
Annual Average	53 ppb	Same as Primary
1-Hour Average	100 ppb	None
Particulate Matter (PM_{10})	**Primary Standard**	**Secondary Standard**
24-Hour Average	150 μ/m^3	Same as Primary
Particulate Matter ($PM_{2.5}$)	**Primary Standard**	**Secondary Standard**
Annual Average	9 μ/m^3	15 μ/m^3
24-Hour Average	35 μ/m^3	Same as Primary
Ozone	**Primary Standard**	**Secondary Standard**
8-Hour Average	0.070 ppm	Same as Primary
Sulfur Dioxide	**Primary Standard**	**Secondary Standard**
1-Hour Average	75 ppb	10 ppb, annual mean averaged over 3 years

Figure 16: The National Ambient Air Quality Standards

Glossary

Asbestos Hazard Emergency Response Act: AHERA requires schools to inventory their asbestos materials and document strategies for dealing with these materials.

Ambient air quality: The level of pollution in the air outside.

Attainment: When an area meets the national air quality standard set by the federal EPA for a particular pollutant.

Cation: A positively charged particle, having more protons than electrons.

Chemiluminescence: The emission of light by a substance because of a chemical reaction that does not involve an increase in its temperature.

Clean Air Act: Federal clean air program established by Congress in 1963.

Class I Area: Areas of special natural, scenic, or historic importance are known as "Class 1 Areas," and are protected to maintain long distance, panoramic views.

Criteria Pollutant: A regulated air pollutant. Currently, there are six criteria pollutants under the Clean Air Act. They are carbon monoxide, lead, ozone, particulate matter, nitrogen oxides and sulfur dioxide.

Emissions Inventory: A list of sources of air contaminants, containing for each source the amount of each contaminant emitted.

Exceedance (of NAAQS): One occurrence of a measured or modeled concentration that exceeds the specified concentration level of a NAAQS for the averaging period specified by that standard.

Fugitive Emissions: Emissions of air pollutants from nonpoint sources into the open air. The most common form of fugitive emissions is dust from gravel quarries, construction sites, unpaved roadways, grain bins, and open fields. In Kentucky, most fugitive emissions complaints are related to dust from one or more of these sources.

Hazardous Air Pollutant: Any pollutant listed in Subsection B of Section 112 of the Clean Air Act.

Inspection: A scheduled determination of compliance with an existing regulation.

Investigation: A complaint driven determination of compliance with an existing regulation.

Major Source: A stationary source that emits and has the potential to emit 100 tons per year or more of a regulated air pollutant.

Minor Source: A stationary source that emits and has the potential to emit less than the major source threshold.

Mobile Source: A *moving*, non-stationary source of air pollutants, such as motor vehicles, ships, airplanes, construction equipment, etc.

National Ambient Air Quality Standards (NAAQS): Standards established by the United States Environmental Protection Agency (EPA) under authority of the Clean Air Act that apply for outdoor air throughout the country.

National Emissions Standards for Hazardous Air Pollutants (NESHAP): With respect to asbestos, NESHAP governs renovation and demolition activities and requires safe handling, removal (when applicable), and disposal of asbestos from facilities (everything except for single private homes).

Nonattainment: When an area does not meet the National Ambient Air Quality Standard set by the U.S. EPA for a particular pollutant.

Notification: Required reporting by facilities of regulated activities. For example, facilities are required to notify DAQ of certain air emission releases or upcoming asbestos disturbance (removal/demolition activities).

Primary Standard: A National Ambient Air Quality Standard which establishes limits on specific criteria pollutants to protect public health, including the health of sensitive populations such as children, asthmatics, and the elderly.

Promulgate: To officially announce, publish, make known to the public; to formally announce a statute or decision by the court.

Secondary Standard: A National Ambient Air Quality Standard which establishes limits on specific criteria pollutants to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Speciation: The process of determining the physical and chemical makeup of pollutants such as particulate matter, which may be composed of droplets and particles of various compounds.

Stationary Source: An emission source that does not move, also known as a point source. Stationary sources include factories, power plants, cement plants, and quarries.

Synthetic Minor: A facility that has the PTE that could exceed major Title V thresholds, but they have agreed to control emissions below major threshold. Synthetic minors include conditional major facilities.

Title V: Any source that has the PTE of greater than 100 Tons of criteria pollutants or 10/25 TPY of a single HAP or any combined HAP.

Toxic Air Pollutant: A subset of the pollutants listed as Hazardous Air Pollutants by the U.S. EPA.