

State of Kansas

2020 KS Ambient Air Monitoring Network Plan



Division of Environment
Bureau of Air – Monitoring and Planning

Table of Contents

Sections

| | |
|--|-----------|
| PURPOSE AND INTRODUCTION..... | 3 |
| NETWORK OVERVIEW | 4 |
| NATIONAL CORE MONITORING (NCORE) NETWORK, PAMS IMPLEMENTATION | 7 |
| IMPROVE VISIBILITY MONITORING NETWORK | 9 |
| MERCURY DEPOSITION NETWORK | 9 |
| LEAD (PB) MONITORING IN KANSAS | 10 |
| SULFUR DIOXIDE MONITORING IN KANSAS | 13 |
| NITROGEN DIOXIDE MONITORING IN KANSAS | 13 |
| OZONE MONITORING IN KANSAS..... | 14 |
| PM MONITORING IN KANSAS | 15 |
| CARBON MONOXIDE MONITORING IN KANSAS | 19 |
| QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROGRAM | 21 |
| KANSAS AMBIENT AIR NETWORK PLAN ACTIVITIES 2020 | 22 |
| APPENDIX A. STREET ADDRESSES 2020 KANSAS AIR MONITORING SITES..... | 27 |
| APPENDIX B. PUBLIC COMMENTS..... | 28 |

Purpose and Introduction

The Kansas Ambient Air Monitoring Network Plan is updated annually per the Code of Federal Regulations (40 CFR §58.10). The plan is submitted to EPA by July 1 of each year. The purpose of this plan is to provide evidence the Kansas Ambient Air Monitoring Network meets current federal air monitoring requirements, a periodic assessment of the ambient air monitoring network, including specific information on each monitoring site, and to propose any changes that will take place during the following timeframe: July 1, to June 30, 2021.¹

Staff members in the Bureau of Air, Monitoring and Planning Section operate the Kansas Ambient Air Monitoring Network in cooperation with the Unified Government of Wyandotte County and Kansas City, KS to monitor ambient air quality throughout Kansas. Air quality data allows staff members to determine compliance with National Ambient Air Quality Standards (NAAQS). The monitoring data collected, and most current annual emission inventory are used to address ways to reduce pollution levels and to evaluate pollution trends. The year 2020 is proving to be a challenge due to the COVID-19 pandemic. Ambient air monitoring for certain air pollutants is an essential function of the State of Kansas. Staff members intend to continue quality assurance and quality control tasks in balance with health and safety concerns.

As required by 40 CFR §58.10, the draft 2020 Network Plan is being made available to the public on the Kansas Department of Health and Environment's (KDHE) website for a 30-day public examination. This notice is provided for the purpose of informing the public of this activity, and to provide an opportunity for interested parties to offer additional relevant information and comments to the KDHE. The Bureau of Air must receive comments no later than **June 8, 2020**, to assure consideration prior to submission of this plan.

Many KDHE staff members continue to work from home to do our part for public health and the environment. Submit comments electronically to ensure all comments are considered and included in the annual plan. **E-mail comments to: kathleen.waters@ks.gov**

Comments may also be submitted by mail to the following address:

Kansas Department of Health and Environment
Bureau of Air
1000 SW Jackson Street, Suite 310
Topeka, KS 66612-1366
Attention: Kathleen Waters

¹ Per request by EPA, KDHE will start plans in July and end plans the following June of each year.

Network Overview

The Kansas Ambient Air Monitoring Network consists of 17 sites throughout Kansas as shown in Figure 1. The sites satisfy many purposes including monitoring compliance with the NAAQS, reporting of the Air Quality Index (AQI) to AirNow, determining pollution trends, and establishing background conditions. Air monitoring sites within Kansas are included as a part of the following monitoring networks:

- National Core Monitoring (NCore)
- Mercury Deposition Network (MDN) / National Atmospheric Deposition Network (NADP)
- Interagency Monitoring of Protected Visual Environments (IMPROVE)
- Chemical Speciation Network (CSN)
- State and Local Air Monitoring Stations (SLAMS)
- Air Quality Index (AQI)
- Special Purpose Monitors (SPM)

In 1999, because of the promulgation of the PM_{2.5} NAAQS the Kansas Ambient Air Quality Network completed a primary disinvestment in PM₁₀ sampling, established five multi-pollutant sites, expanded the ozone monitoring network in Kansas City Metropolitan Statistical Area (MSA), and added two IMPROVE sites.

In 2009, the monitoring plan for NCore was submitted to and accepted by EPA Region VII. This plan included two monitoring locations, one urban and one rural, however due to EPA funding issues only the urban site has been established and is operating at this time in Kansas City, KS.

Additional modifications have been made to the network as required by 40 CFR §58.10 for oxides of nitrogen (NO_x) and sulfur dioxide (SO₂), and the network meets completion requirements established for carbon monoxide (CO), particulate matter (PM), and ozone (O₃). This includes equipment upgrades to increase data capture for PM₁₀ and PM_{2.5} by replacing aging sequential equipment with continuous monitors in 2019.

KDHE will continue efforts to implement PAMS protocols in 2020 for full implementation in 2021 as required by federal regulation. Working from home and travel restrictions to reduce the spread of COVID-19 will create timeline challenges for states.

Site information, including the parameters monitored and network affiliation, is available within Table 1.

2020 Kansas Air Monitoring Sites

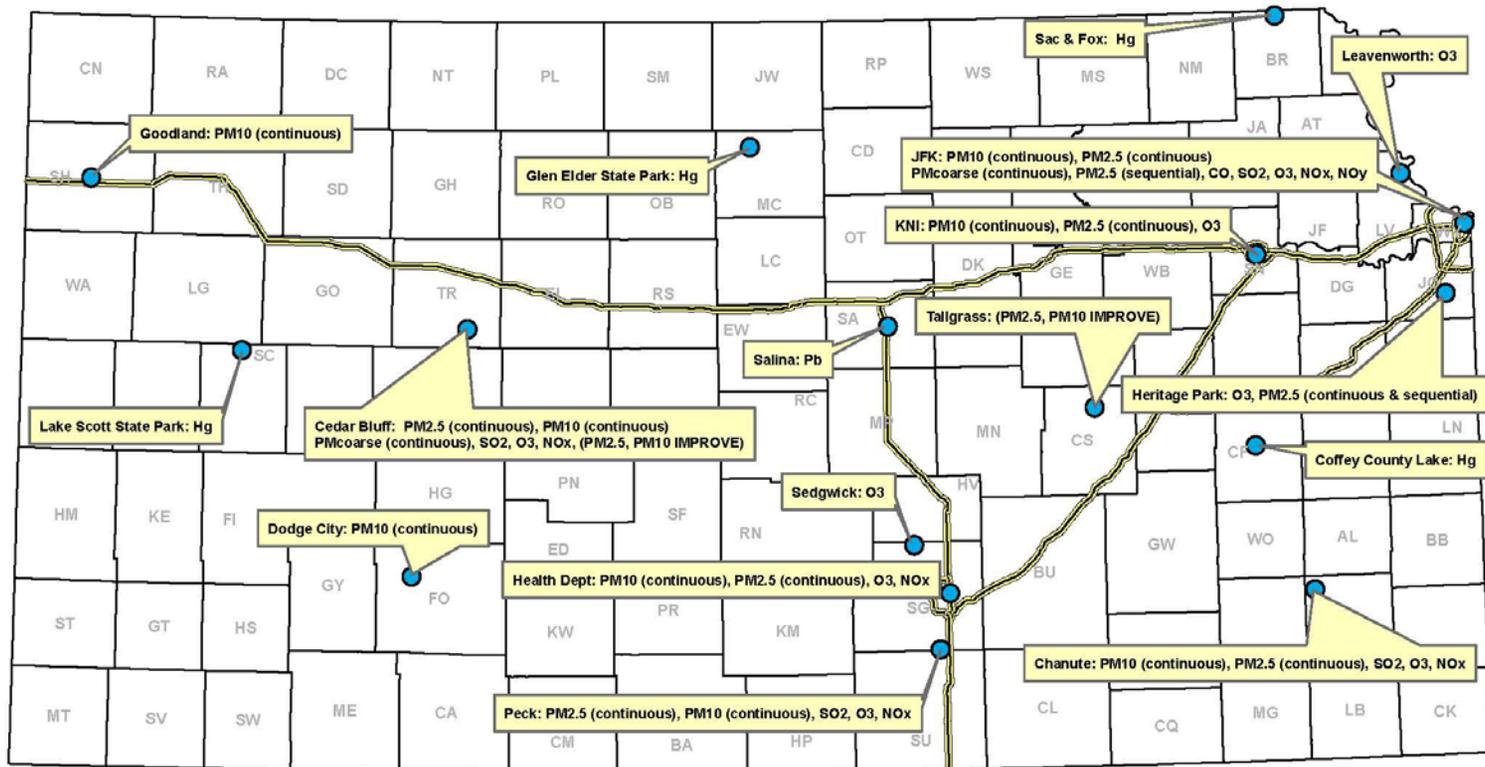


Figure 1. 2020 Kansas Ambient Air Monitoring Network

Table 1. Kansas Ambient Air Monitoring Network sites, network affiliation and parameters monitored, 2020

| AQS Site ID | Site Name | Network Affiliation | | | | | | | Parameters Monitored | | | | | | | | | | | |
|-------------|---------------|---------------------|-------|---------|----------|-----|-----|-----|----------------------|------|--------------------|-------|------------------------------|------------------------------|-------------------------|-----------------------------|-----------|----------------|--------------------|-------------|
| | | NCORE | SLAMS | IMPROVE | MDN/NADP | CSN | AQI | SPM | Carbon Monoxide | Lead | Oxides of Nitrogen | Ozone | PM _{2.5} Sequential | PM _{2.5} Continuous | PM ₁₀ Filter | PM ₁₀ Continuous | PM Coarse | Sulfur Dioxide | Mercury Deposition | Meteorology |
| 20-209-0021 | JFK/NCORE | X | | | | X | X | | X | | X | X | X | X | | X | X | X | | X |
| 20-195-0001 | Cedar Bluff | | X | X | | | X | | | | X | X | | X | | X | X | X | | |
| 20-057-0002 | Dodge City | | X | | | | X | | | | | | | | X | | | | | |
| 20-181-0003 | Goodland | | X | | | | X | | | | | | | | X | | | | | |
| 20-169-0004 | Salina | | X | | | | | | X | | | | | | | | | | | |
| 20-173-0018 | Sedgwick | | X | | | | X | | | | X | | | | | | | | | |
| 20-173-0010 | Wichita HD | | X | | | | X | | | X | X | | X | | X | | | | | |
| 20-191-0002 | Peck | | X | | | | X | | | X | X | | X | | X | | X | | | |
| 20-017-0001 | Tallgrass | | | X | | | | | | | | X | | X | | | | | | |
| 20-177-0013 | KNI | | X | | | | X | | | | X | | X | | X | | | | | |
| 20-103-0003 | Leavenworth | | X | | | | X | | | | X | | | | | | | | | |
| 20-091-0010 | Heritage Park | | X | | | | X | | | | X | X | X | | | | | | | |
| 20-133-0003 | Chanute | | X | | | | X | | | X | X | | X | | X | X | X | | | |
| N/A | Lake Scott | | | | X | | | | | | | | | | | | | | X | |
| N/A | Glen Elder | | | | X | | | | | | | | | | | | | | X | |
| N/A | Sax & Fox | | | | X | | | | | | | | | | | | | | X | |
| N/A | Coffey County | | | | X | | | | | | | | | | | | | | X | |

National Core Monitoring (NCore) Network, PAMS Implementation

In October 2006, the EPA established the National Core (NCore) multi-pollutant monitoring network in its final amendments to the ambient air monitoring regulations for criteria pollutants (codified in 40 CFR parts 53 and 58). EPA requires each state to have at least one NCore station. Nationwide, there are approximately 80 sites, mostly in urban areas.² At a minimum, NCore monitoring sites must measure the parameters listed in Table 2.

Table 2: Required NCore Parameter List

| Measurements | Comments |
|--|---|
| PM _{2.5} FRM mass | Typically, 24-hour average at least every 3 rd day |
| Continuous PM _{2.5} mass | 1-hour reporting interval; FEM or pre-FEM monitor |
| PM _{2.5} speciation | Organic and elemental carbon, major ions, and trace metals (24-hour average, every 3 rd day) |
| PM _{10-2.5} mass | Filter-based or continuous |
| Ozone (O ₃) | all gases through continuous monitors |
| Carbon Monoxide (CO) | capable of trace levels where needed |
| Sulfur Dioxide (SO ₂) | capable of trace levels where needed |
| Nitrogen Oxide (NO) | capable of trace levels where needed |
| Total reactive nitrogen (NO _y) | capable of trace levels where needed |
| Surface meteorology | wind speed and direction, temperature, relative humidity |

In 2009, the Kansas City, Kansas urban core multi-pollutant monitoring site was designated as an NCore station. This station is located near the John F. Kennedy Community Center on Nebraska Avenue and North 10th street in Kansas City, KS. (Figures 2 and 3). This site is referenced as the JFK/ NCore station (AQS ID 20-209-0021, N 39.11722; W -94.63560). KDHE anticipates significant changes to the JFK/NCore station by the summer of 2021 with the inclusion of photochemical assessment of ground-level ozone. Photochemical Assessment Monitoring Stations (PAMS) measures ozone, the pollutants that form it, and meteorology to better understand ozone formation and to evaluate national and local ozone-reduction options.³

² NCore Network and Sites Information: <https://www3.epa.gov/ttn/amtic/ncorenetworks.html>

³ PAMS parameters: <https://www3.epa.gov/ttn/amtic/pamsmain.html>



Figure 2. JFK/NCore Site Location



Figure 3. JFK/NCore equipment, met tower and shelters.

IMPROVE Visibility Monitoring Network⁴

The IMPROVE Aerosol Network is a cooperative air quality monitoring effort between federal land managers; regional, state, and tribal air agencies; and the EPA. The program was developed in 1985 to aid in developing Federal and State Implementation plans for the protection of visibility in Class I areas. Class I areas are National Parks and other wilderness areas that are designated by the United States Department of Agriculture (USDA). The IMPROVE network consists of approximately 160 monitoring sites.

The objectives of the IMPROVE network are:

- to establish current visibility and aerosol conditions in Class I areas;
- to identify chemical species and emission sources responsible for existing man-made visibility impairment;
- to document long-term trends for assessing progress towards the national visibility goal; and
- with the enactment of the Regional Haze Rule, to provide regional haze monitoring representing all visibility-protected federal class I areas where practical.

The Kansas Ambient Air Monitoring Network includes two IMPROVE sites. The Tallgrass Prairie National Preserve (AQS ID 20-017-0001) site is located at N 38.43361; W -96.5594, northwest of Strong City, Kansas on Kansas Highway 177. The Cedar Bluff State Park site (AQS ID 20-195-0001) is located at N 38.77027; W -99.76361, on the south side of Cedar Bluff State Park in Trego County. The Cedar Bluff State Park site also serves as a SLAMS multi-pollutant background site.

Mercury Deposition Network

The Mercury Deposition Network (MDN), coordinated through the National Atmospheric Deposition Program (NADP), is designed to study and quantify the atmospheric fate and deposition of mercury. The network is used to develop a national database of weekly concentrations of total mercury in precipitation and the seasonal and annual trends of total mercury in wet deposition. More information is available on the NADP webpage.⁵

The Kansas Mercury Wet Deposition Network developed in response to KSA 75-5673, which originally required that the Kansas Department of Health and Environment (KDHE) establish a statewide mercury deposition network consisting of at least six monitoring sites. Monitoring was to be completed for a period long enough to determine trends (five or more years). Legislative changes enacted in 2014 kept a network in place but allowed the KDHE to re-examine the network size and location of the original six sites as established. The locations of existing and future sites in the states of Nebraska and Oklahoma

⁴ Interagency Monitoring of Protected Visible Environments: <https://airquality.ucdavis.edu/improve>

⁵ National Atmospheric Deposition Program: <http://nadp.slh.wisc.edu/>

were considered to optimize regional mercury network coverage and to assure compatibility with MDN. The current Kansas Mercury Wet Deposition Monitoring Network (KMDN) consists of four sites distributed across the state. A more detailed report on the KMDN is available on the Bureau of Air webpage.⁶ A map of the network appears in Figure 4.

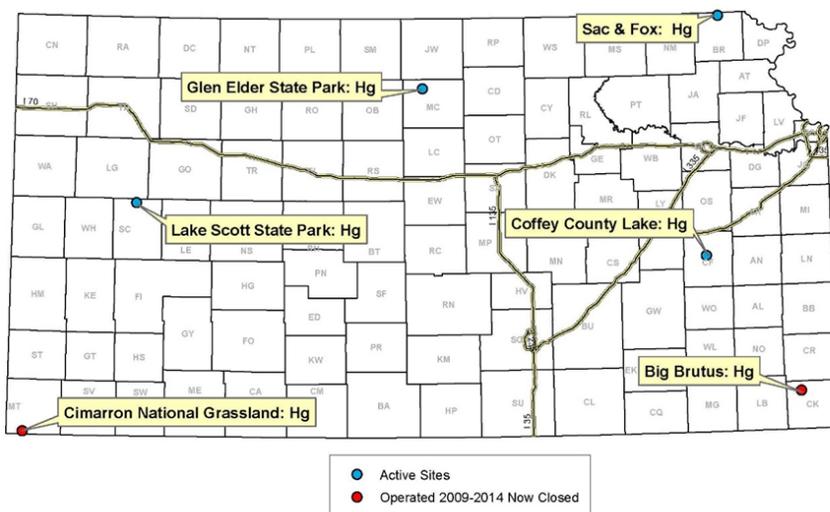


Figure 4. Kansas Mercury Deposition Network and closed sites

Lead (Pb) Monitoring in Kansas

Source-oriented Monitoring

According to 40 CFR Part 58, Appendix D, paragraph 4.5(a), state and, where appropriate, local agencies are required to conduct ambient air monitoring for lead (Pb) considering lead sources that are expected to or have been shown to contribute to a maximum lead concentration in ambient air in excess of the NAAQS. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum lead concentration in ambient air resulting from each lead source that emits one-half (0.5) or more tons per year. Currently, one source located in Salina, KS (Exide Technologies) exceeded the one-half ton threshold. According to 40 CFR Part 58, Appendix D, paragraph 4.5(a), source-oriented monitors are to be sited at the location of predicted maximum concentration in ambient air considering the potential for population exposure, and logistics. Typically, dispersion modeling is required to identify the location of predicted maximum concentration. Dispersion modeling performed by KDHE determined the area of maximum concentration for sampler placement. KDHE prepared a monitoring plan for airborne lead in 2009.

⁶ Latest annual report: http://www.kdheks.gov/bar/air-monitor/mercury/Hg_Report.pdf

As of 3/22/2009 the lead monitoring site near the Exide Technologies facility at Salina, KS is designated with AQS site ID 20-169-0004. A high volume (HiVol), total suspended particulate (TSP) sampler is running at the site on a 1 in 6-day schedule. Sampling began on February 2, 2010. KDHE installed an additional high volume (HiVol), total suspended particulate (TSP) sampler on location in 2013. This sampler runs on the same 1 in 6-day sampling schedule as the primary lead sampler. The co-located sampler is situated beside the primary as shown in Figure 5. Data from these samplers are used to establish compliance with applicable National Ambient Air Quality Standards (NAAQS). The lead NAAQS requires three consecutive years of a 3-month rolling average to be at or below $0.15 \mu\text{g}/\text{m}^3$ to be classified as attaining the standard. The lead monitoring site operated near Exide Technologies facilities is currently not meeting this requirement and is classified non-attainment. The lead non-attainment area is shown in Figure 6.

Discussions about relocating this site were held throughout 2018 and early 2019 due to the anticipated sale of the property where the sequential samplers were located. An appropriate new location was selected approximately 90 meters east of the previous location. The move to the proposed location occurred in early October 2019 and the samplers restarted on October 6, 2019. The current location of the samplers in comparison to the Exide Technologies facility is shown in Figure 7; the old location is also noted on this figure.



Figure 5. Salina, KS HiVol TSP Samplers

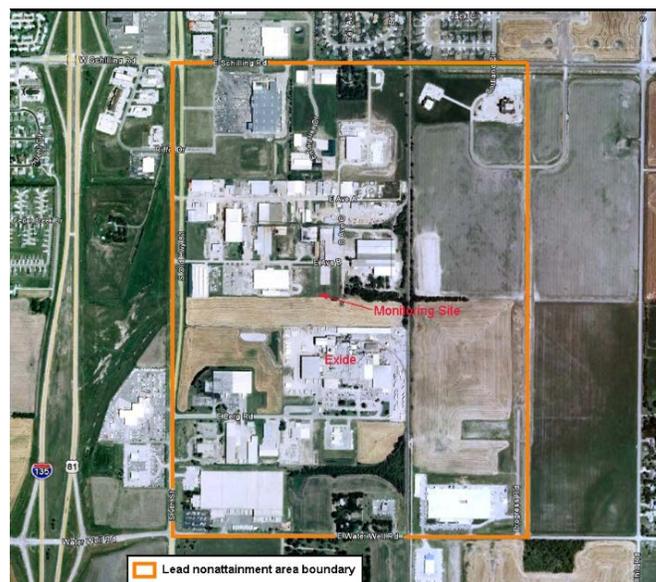


Figure 6. Salina, KS Lead Non-Attainment Area



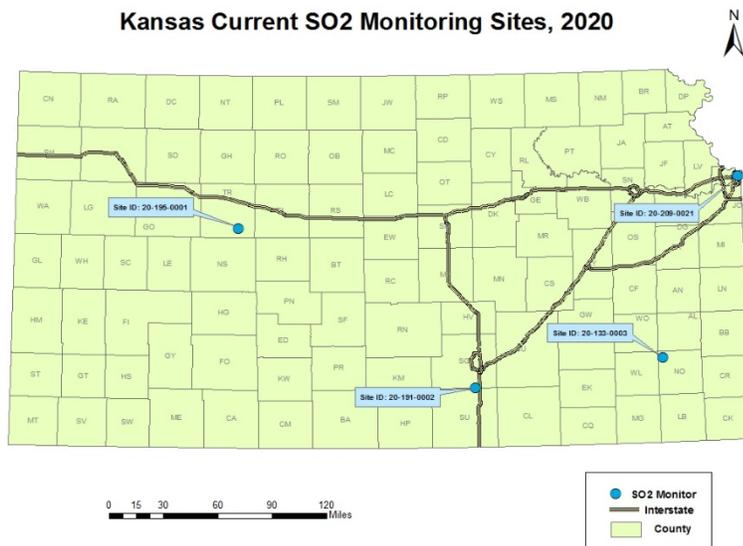
Figure 7. Salina, KS Old and Current Locations for Lead Sampling Site

Population-Based Lead Monitoring

EPA also requires lead monitoring in large urban areas. These monitors are typically located with National Core multi-pollutant ambient monitoring sites (NCore sites). Lead monitoring at these sites began January 1, 2012. KDHE located a high volume (HiVol), total suspended particulate (TSP) sampler at the JFK NCore site in Kansas City, Kansas to fulfill this requirement. It began running on a 1 in 6-day schedule on December 27, 2011 and took its first sample on January 4, 2012. On March 28, 2016, EPA published a rule entitled, “*Revisions to Ambient Monitoring Quality Assurance and Other Requirements*”. This EPA rule allowed for the discontinuance of population-based lead monitoring at NCore sites if states provided three years of data showing the monitor was below the lead standard. With more than four years of lead data showing a maximum three-month rolling average of $0.01 \mu\text{g}/\text{m}^3$ lead monitoring at the JFK NCore site was discontinued with the last operating sample occurring on June 29, 2016.

Sulfur Dioxide Monitoring in Kansas

EPA conducted a review of the SO₂ NAAQS and decided to retain the existing primary standard in 2019. The decision was based on evidence that the standard established in 2010 protects public health, with an adequate margin of safety, including the health of at-risk populations with asthma.⁷ Therefore, the SO₂ standard remains at 75 parts per billion (ppb) based on the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum concentrations. In 2012, EPA decided to retain the current secondary standard for SO₂. The secondary SO₂ standard is 500 ppb averaged over three hours, not to be exceeded more than once per year.⁸ All sites meet the NAAQS for SO₂.



KDHE currently monitors for SO₂ at sites shown in the above site map. The sites include Cedar Bluff State Park (AQS ID 20-195-0001), Peck (AQS ID 20-191-0002), Chanute (AQS ID 20-133-0003), and JFK/NCore (AQS ID 20-209-0021).

Nitrogen Dioxide Monitoring in Kansas

On December 22, 2016 EPA removed the requirement to install near-road nitrogen dioxide (NO₂) monitoring stations in Core Based Statistical Areas (CBSAs) having populations between 500,000 and 1 million.

EPA, based on a review of the full body of scientific evidence, decided to retain the current standards (NAAQS) for oxides of nitrogen (NO_x). The conclusion was that the current NAAQS protect the public health, including at risk populations of older adults, children, and people with asthma, with an adequate margin of safety. The NAAQS for nitrogen oxides is a 1-hour standard at a level of 100 ppb based on the 3-year average of 98th percentile of the yearly distribution of 1-hour maximum concentrations.⁹

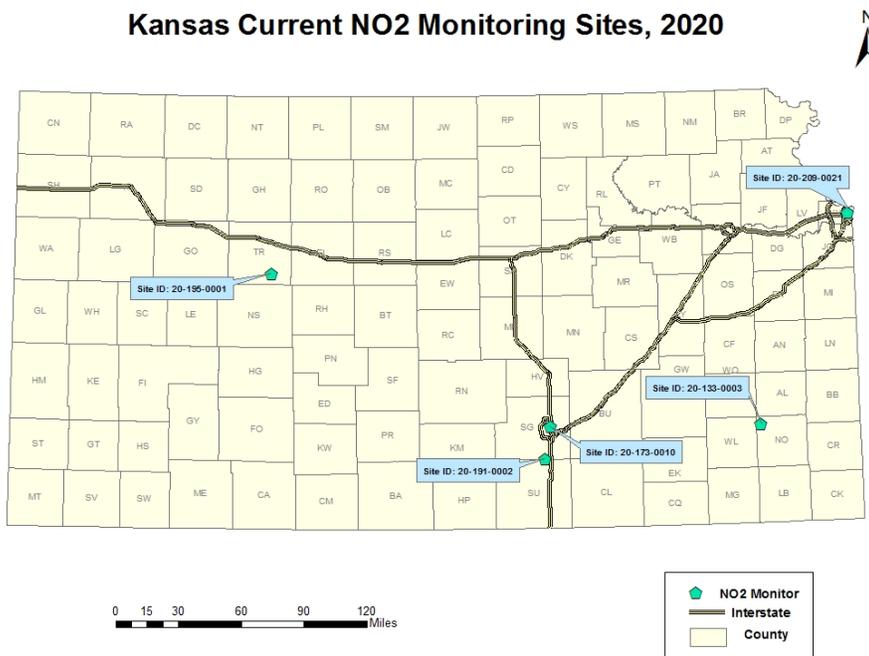
⁷ <https://www.epa.gov/so2-pollution/setting-and-reviewing-standards-control-so2-pollution#standards>

⁸ <https://www.epa.gov/so2-pollution/secondary-national-ambient-air-quality-standards-naaqs-nitrogen-dioxide-no2-and-sulfur>

⁹ <https://www.epa.gov/no2-pollution/primary-national-ambient-air-quality-standards-naaqs-nitrogen-dioxide>

Monitoring requirements are also established for area-wide NO₂ monitoring. KDHE and MDNR cooperate to ensure that any monitoring changes that could affect the other states monitoring network requirements are discussed and evaluated to ensure minimum requirements are met. Requirements state there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO₂ concentrations representing the neighborhood or larger spatial scales. The Kansas City CBSA is the only required area within the state of Kansas to operate an area-wide NO₂ monitor, and this requirement is satisfied by the JFK/NCore monitoring site (AQS ID 20-209-0021). Additional NO₂ monitoring is conducted as a part of the SLAMS network at Cedar Bluff (AQS ID 20-195-0001), Peck (AQS ID 20-191-0002), Wichita Health Department (AQS ID 20-173-0010), and Chanute (AQS ID 20-133-0003). All sites meet the NAAQS for NO₂. These sites are shown in the site map.

Kansas Current NO₂ Monitoring Sites, 2020



Additional NO₂ monitoring is conducted as a part of the SLAMS network at Cedar Bluff (AQS ID 20-195-0001), Peck (AQS ID 20-191-0002), Wichita Health Department (AQS ID 20-173-0010), and Chanute (AQS ID 20-133-0003). All sites meet the NAAQS for NO₂. These sites are shown in the site map.

Ozone Monitoring in Kansas

Ozone Standard and Monitoring Requirements

The current NAAQS for O₃ is set at 0.070 parts per million (ppm) for both the primary standard and the secondary standard. Attainment of the standard is established by calculating the annual fourth-highest daily maximum 8-hour concentration, averaged over three years. Monitoring requirements are established using Metropolitan Statistical Area (MSA) population and the most recent 3-year design value concentrations.

There are nine ozone monitors located throughout the state. Monitors locations and appropriate spatial scales are provided in Table 3. Monitor locations are also shown in Figure 10 combined with a Kansas population density map. Co-located ozone measurements are not required in Kansas. The implementation of the 2015 Ozone NAAQS beginning in 2017 included an expanded ozone season in Kansas from March 1 to October 31. Kansas ozone monitors are operated year-round. All sites meet the NAAQS for ozone.

Table 3. State of Kansas Ozone Monitor Network

| Site Name | AQS Site ID | Latitude | Longitude | Spatial Scale |
|----------------------|-------------|-----------|------------|---------------|
| Heritage Park | 20-091-0010 | 38.838575 | -94.746424 | Neighborhood |
| Leavenworth | 20-103-0003 | 39.327391 | -94.951020 | Neighborhood |
| Chanute | 20-133-0003 | 37.67696 | -95.47594 | Regional |
| Sedgwick | 20-173-0018 | 37.897506 | -97.492083 | Neighborhood |
| Wichita Health Dept. | 20-173-0010 | 37.702066 | -97.314847 | Urban |
| Topeka KNI | 20-177-0013 | 39.024265 | -95.711275 | Urban |
| Peck | 20-191-0002 | 37.476890 | -97.366399 | Neighborhood |
| Cedar Bluff | 20-195-0001 | 38.770081 | -99.763424 | Regional |
| JFK/NCore | 20-209-0021 | 39.117219 | -94.635605 | Urban |

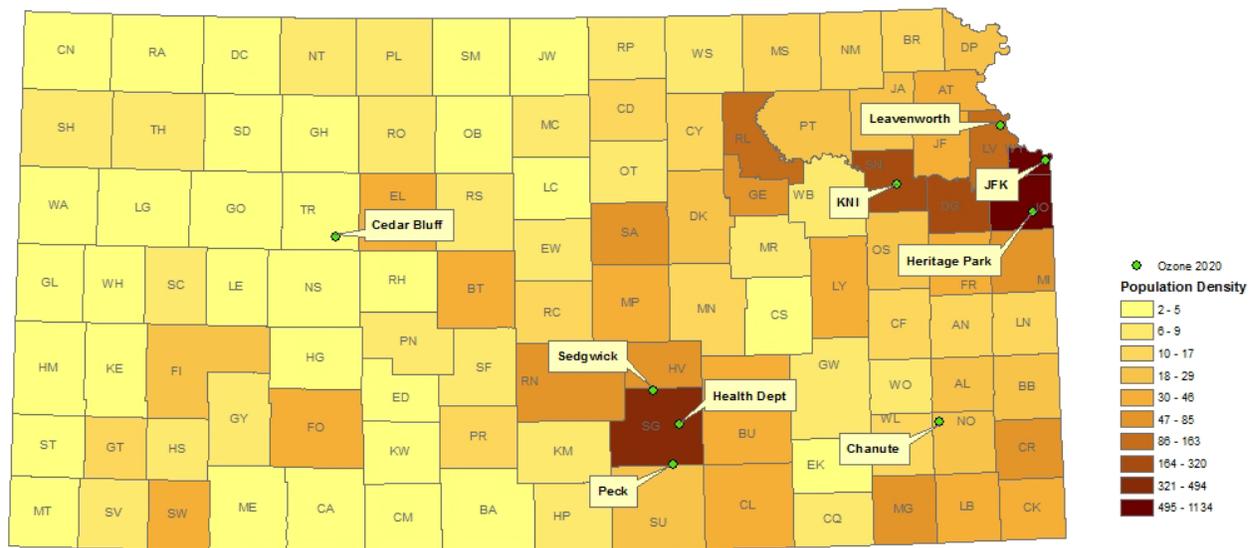


Figure 10. Kansas Population Density Map and the Location of Ozone Monitors.

PM Monitoring in Kansas

On April 14, 2020, the U.S. Environmental Protection Agency (EPA) proposed to retain the current standard for particulate matter (PM). The current primary and secondary standards for PM₁₀ and PM_{2.5} were established during the 2012 revision.

PM_{2.5} Standard and Monitoring Requirements

The primary annual National Ambient Air Quality Standard (NAAQS) for PM_{2.5} remains at 12.0 micrograms per cubic meter (µg/m³). The 24-hour PM_{2.5} standard remains at 35 µg/m³. The existing secondary standards for PM_{2.5} was also retained as an annual standard at 15.0 µg/m³ and a 24-hour

standard of 35 $\mu\text{g}/\text{m}^3$. The primary annual standard is based on a three-year average of the weighted annual mean. The primary 24-hour standard is based on a three-year 98th percentile average of 24-hour values. The secondary standard addresses PM-related effects including visibility impairment, ecological effects, damage to materials and climate impacts. The PM_{2.5} secondary standard remains at 15.0 $\mu\text{g}/\text{m}^3$.

Current minimum monitoring requirements for PM_{2.5} as provided by 40 CFR §58.10 are shown in Table 4.

Table 4. PM_{2.5} Minimum Monitoring Requirements (Number of Stations per MSA)

| Population Category | 3-yr design value > 85% of NAAQS | 3-yr design value < 85% of NAAQS |
|---------------------|-------------------------------------|-------------------------------------|
| > 1,000,000 | 3 | 2 |
| 500,000 - 1,000,000 | 2 | 1 |
| 50,000 - 500,000 | 1 | 0 |

¹ Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).
² Population based on latest available census figures.
³ The PM_{2.5} National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
⁴ These minimum monitoring requirements apply in the absence of a design value.
⁵ Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

In addition to the minimum number of monitors required, at least one-half (fifty percent) of the minimum required sites must be operated with continuous PM_{2.5} analyzers. This requires at least two continuous analyzers within the state of Kansas. Each state must also operate at least one site to monitor for regional background, and at least one site for regional transport. The monitors at Cedar Bluff State Park serve as the regional background site and the monitors at Peck, KS serve as the regional transport site. Table 5 outlines the minimum monitoring requirements and number of existing monitors for each Kansas MSA based upon population and design value criteria.

Table 5. Minimum Number of PM_{2.5} Monitors Required in Kansas MSAs

| MSA | Population (2019 estimate) ¹⁰ | Number of Existing PM _{2.5} Monitors | PM _{2.5} Monitors Required |
|-----------------|---|--|--|
| Kansas City, KS | 893,528 | 4 (KS side 2 primary and 2 co-located) | 2 |
| Wichita, KS | 640,218 | 2 | 1 |
| Topeka, KS | 231,969 | 1 | 0 |
| Manhattan, KS | 130,285 | 0 | 0 |
| Lawrence, KS | 122,259 | 0 | 0 |

¹⁰ https://www.census.gov/data/tables/time-series/demo/popest/2010s-counties-total.html#par_textimage_242301767

The Kansas PM_{2.5} monitoring network includes nine monitors located throughout the state at seven different monitoring sites. When the current 2020 Kansas Ambient Air Monitoring Network Plan changes are complete there will be two filter-based (sequential) and five continuous monitors. Two monitoring sites (JFK/NCore and Heritage Park) operate both a continuous and a co-located sequential monitor. Table 6 includes current monitor locations and type for the Kansas PM_{2.5} monitoring network.

Table 6. State of Kansas PM_{2.5} Monitor Site ID and Location

| Site Name | City | AQS Site ID | Latitude | Longitude | Sequential | Continuous |
|---------------|-------------|-------------|----------|-----------|------------|------------|
| Cedar Bluff | Cedar Bluff | 20-195-0001 | 38.77008 | -99.76342 | NO | YES |
| Heritage Park | Olathe | 20-091-0010 | 38.83857 | -94.74642 | YES | YES |
| Health Dept. | Wichita | 20-173-0010 | 37.70206 | -97.31484 | NO | YES |
| KNI | Topeka | 20-177-0013 | 39.02426 | -95.71127 | NO | YES |
| Peck | Peck | 20-191-0002 | 37.47689 | -97.36639 | NO | YES |
| Chanute | Chanute | 20-133-0003 | 37.67696 | -95.47594 | NO | YES |
| JFK/NCore | Kansas City | 20-209-0021 | 39.11721 | -94.63560 | YES | YES |

Figure 11 shows the population density in Kansas along with the PM_{2.5} monitoring sites. All monitors have three-year design values at or below the 85% of the NAAQS concentration category.

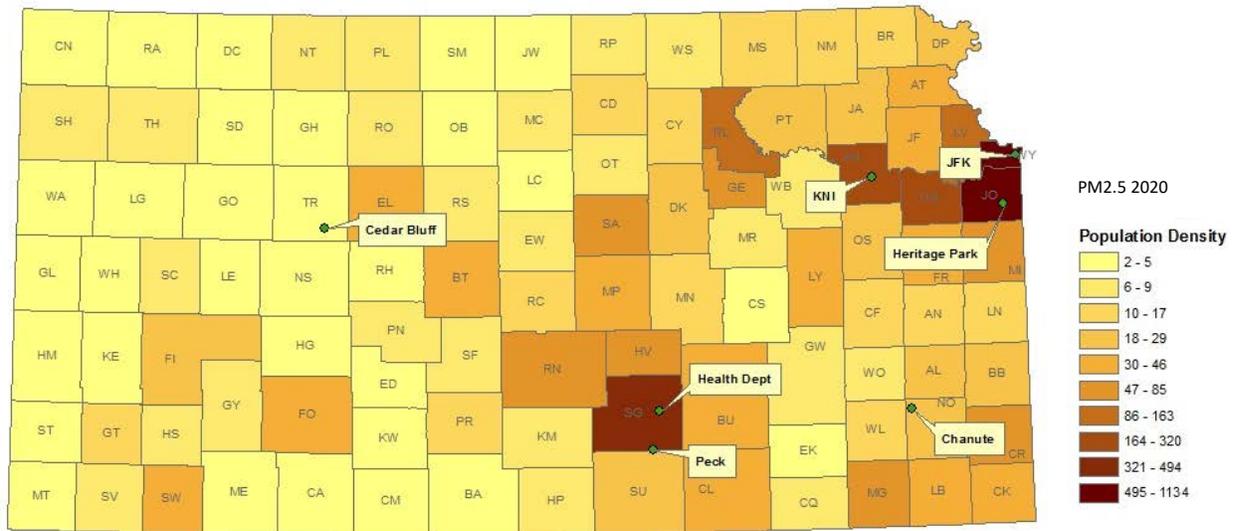


Figure 11. Population Density Map and the Locations of PM_{2.5} Monitors

Current PM₁₀ Standard and Monitoring Requirements

As described above, the current PM₁₀ (course) standard (NAAQS) remains at 150 µg/m³ for both the primary standard and the secondary standard. This standard is not to be exceeded more than once per year on average over 3 years. These standards were established in 1987. Current minimum monitoring requirements for PM₁₀ as provided by 40 CFR 58 §58.10 are shown in Table 7.

Table 7. PM₁₀ Minimum Monitoring Requirements (Number of Stations per MSA)¹

| Population Category | High Concentration² | Medium Concentration³ | Low Concentration⁴ 5 |
|----------------------------|---------------------------------------|---|--|
| > 1,000,000 | 6 - 10 | 4 - 8 | 2 - 4 |
| 500,000 - 1,000,000 | 4 - 8 | 2 - 4 | 1 - 2 |
| 250,000 - 500,000 | 3 - 4 | 1 - 2 | 0 - 1 |
| 100,000 - 250,000 | 1 - 2 | 0 - 1 | 0 |

¹ Selection of urban areas and actual numbers of stations per area within the ranges shown in this table will be jointly determined by EPA and the State Agency.
² High concentration areas are those for which ambient PM₁₀ data show ambient concentrations exceeding the PM₁₀ NAAQS by 20% or more.
³ Medium concentration areas are those for which ambient PM₁₀ data show ambient concentrations exceeding 80% of the PM₁₀ NAAQS.
⁴ Low concentration areas are those for which ambient PM₁₀ data show ambient concentrations < 80% of the PM₁₀ NAAQS.
⁵ These minimum monitoring requirements apply in the absence of a design value.

Table 8 lists the minimum monitoring requirements and number of existing monitors for each Kansas MSA accounting for population and design value criteria. For the Kansas City, MO-KS MSA, the Kansas Department of Health and Environment and the Missouri Department of Natural Resources plan to operate a single PM₁₀ monitor in each state to meet the minimum two monitor requirement. KDHE and MDNR cooperate to ensure that any monitoring changes that could affect the other states monitoring network requirements are discussed and evaluated to ensure minimum requirements are met.

Table 8. Minimum Number of PM₁₀ Monitors Required in Kansas MSAs

| MSA | Population (2019 estimate) | Number of Existing PM₁₀ Monitors | PM₁₀ Monitors Required |
|-----------------|-----------------------------------|--|--|
| Kansas City, KS | 893,528 | 1 (KS side) | 1 - 2 |
| Wichita, KS | 640,218 | 2 | 1 - 2 |
| Topeka, KS | 231,969 | 1 | 0 |
| Manhattan, KS | 130,285 | 0 | 0 |
| Lawrence, KS | 122,259 | 0 | 0 |

State of Kansas Current PM₁₀ Monitoring Sites

Current Kansas PM₁₀ monitoring network includes eight monitors at eight monitoring sites throughout the state. All PM₁₀ monitors operating in the state of Kansas are continuous. Table 9 includes PM₁₀ monitor locations in the Kansas monitoring network.

Table 9. State of Kansas PM₁₀ Monitor Site ID and Location.

| Site Name | City | AQS Site ID | Latitude | Longitude |
|--------------|-------------|-------------|----------|------------|
| Dodge City | Dodge City | 20-057-0002 | 37.77530 | -100.03544 |
| Health Dept. | Wichita | 20-173-0010 | 37.70206 | -97.31484 |
| Chanute | Chanute | 20-133-0003 | 37.67630 | -95.47464 |
| Goodland | Goodland | 20-181-0001 | 39.34845 | -101.71340 |
| JFK/NCore | Kansas City | 20-209-0021 | 39.11721 | -94.63560 |
| Cedar Bluff | Cedar Bluff | 20-195-0001 | 38.77027 | -99.76361 |
| Peck, KS | Peck | 20-191-0002 | 37.477 | -97.366 |
| KNI | Topeka | 20-177-0013 | 39.02426 | -95.71127 |

Figure 12 shows the population density in Kansas along with the PM₁₀ monitoring sites. All monitors have three-year design values at or below the 80% of the NAAQS concentration category.

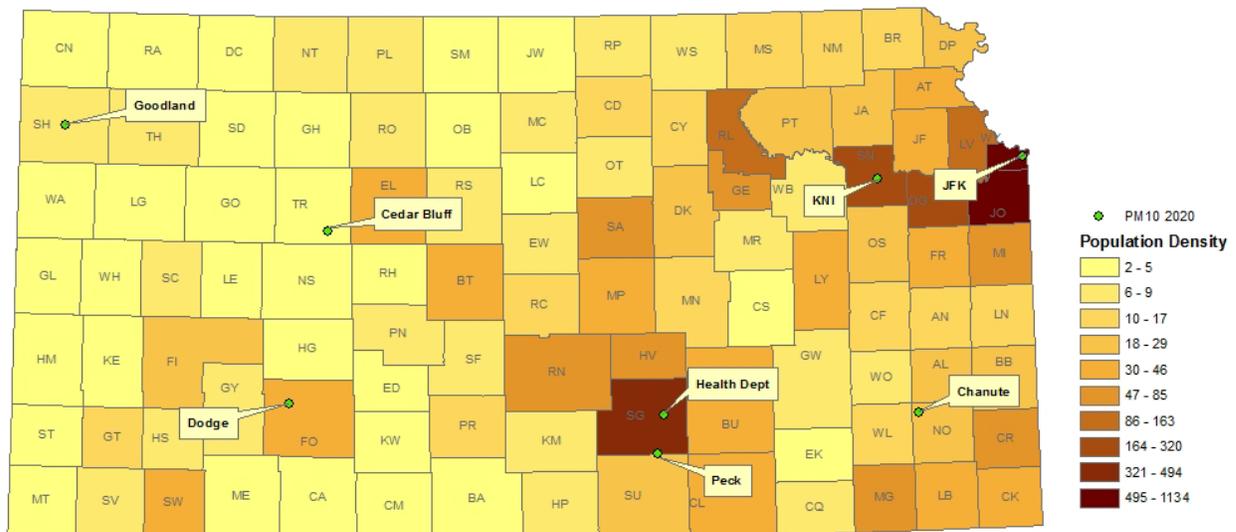


Figure 12. State of Kansas Population Density Map and the location of PM₁₀ Monitors

Carbon Monoxide Monitoring in Kansas

The Carbon Monoxide (CO) NAAQS is an 8-hour average no greater than 9 parts per million and a 1-hour average no greater than 35 parts per million, neither to be exceeded more than once per year. Monitoring requirements include a CO monitor at a co-located site with the near-road NO₂ monitor in CBSAs having a population more than 1,000,000 or more. The Missouri Department of Natural Resources Air Pollution Control Program operates the Kansas City CBSA near-road NO₂ monitor and the required co-located CO monitor.

The Kansas Ambient Air Monitoring Network includes a single CO monitoring site at the JFK/NCore site (AQS ID 20-209-0021) in Kansas City, KS. The site meets the NAAQS for CO.

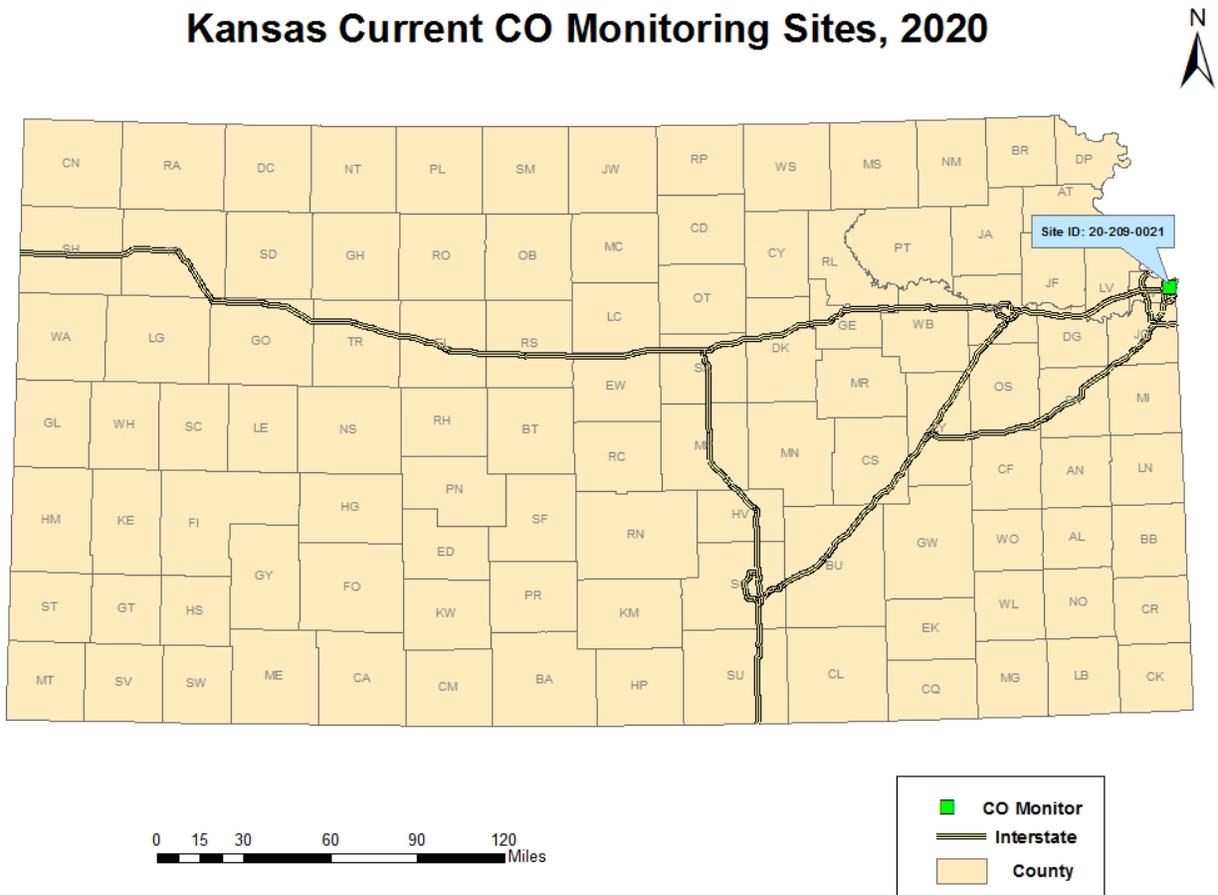


Figure 13. Kansas Carbon Monoxide Monitoring Site, 2020

Quality Assurance/Quality Control (QA/QC) Program

The purpose of the QA/QC program is to assure the quality of data obtained from the KDHE air monitoring networks. The KDHE meets or exceeds the quality assurance requirements defined in 40 CFR 58 and all applicable appendices.

The QA/QC program includes but is not limited to the following activities:

- instrument performance audits,
- monitor siting evaluations,
- one-point QC checks and checks for zero and span,
- bias determinations,
- flow rate audits,
- leak checks, and
- data validation

For independent quality assurance activities, the KDHE participates in the National Performance Audit Program and the Performance Evaluation Program for criteria pollutant monitoring and performance.

As the Primary Quality Assurance Organization (PQAO) for ambient air monitoring activities in Kansas, the KDHE operates under an EPA approved Quality Management Plan (QMP) and utilizes Quality Assurance Project Plans (QAPP) for each statewide monitoring network. The primary purpose of the QAPP is to provide an overview of the project, describe the need for the measurements, and define QA/QC activities to be applied to the project. All other ambient air monitoring initiatives including state, tribal and industrial projects must have a KDHE approved monitoring plan for each specific project.

Kansas Ambient Air Network Plan Activities 2020

It is the intention of the Monitoring and Planning Section to complete all planned activities in the year 2020. The restrictions implemented to limit the spread of COVID-19 affect monitoring and planning staff making it difficult to be more specific as to what month a planned task will be complete.

Sequential PM_{2.5} and aging continuous PM₁₀

It is the intention that the Bureau of Air, Monitoring and Planning staff will continue to work towards upgrading one PM_{2.5} continuous sampler to include a PM₁₀ parameter and full replacement of an aging PM₁₀ and PM_{2.5} with a new system. Further replacement will be dependent upon funding.

Ozone Analyzers

The Bureau of Air, Monitoring and Planning staff have established a schedule to replace aging ozone monitors throughout the network. Two aging ozone monitors will be replaced in 2020. Both older monitors are currently in good working order but are not compatible with upgraded communications. Further replacement will be dependent upon funding available and the sustainability of current operating equipment.

Support Equipment for Continuous Monitors

It is the intention of the Bureau of Air, Monitoring and Planning staff to establish a schedule to replace aging support equipment used to verify continuous analyzers. Equipment includes but is not limited to items like transfer standards for ozone verifications and gas dilution calibrators for SO₂ and NO_x verifications. Replacement will be dependent upon funding available and the sustainability of current operating equipment.

PAMS at NCore/JFK

A Photochemical Assessment Monitoring Site (PAMS) is to be located in Kansas City, KS along with the NCore/JFK site (20-209-0021). Upon full implementation, the site will operate during the summer months as an enhanced ozone monitoring site to obtain more comprehensive and representative data on ozone air pollution.

Based on 40 CFR part 58, Appendix D, State air monitoring agencies are required to begin making PAMS measurements at their NCore location(s) by June 1, 2021. Some of the equipment needed to measure PAMS parameters was to be purchased by EPA using a nationally negotiated contract. Equipment was to be delivered to monitoring agencies in summer 2020. Health concerns related to COVID-19 may affect this schedule.

Purple Air Sensors

KDHE will continue to explore the usability of air sensor devices manufactured by Purple Air. KDHE began running, in March 2019, a year-long testing/research project at the Topeka-KNI site with three Purple Air PM_{2.5} monitors. KDHE's goals will be to compare the Purple Air monitor data with the existing PM_{2.5} NAAQS monitor located at the KNI site and to test the monitors durability and operations under differing meteorological conditions.

Site Specific Activities for 2020

20-181-0003; Goodland – PM₁₀ continuous

The Goodland site was originally established in 1969. The sequential monitor was located on the roof of the Goodland Fire Station. Due to age of the equipment and the goal of increasing continuous monitoring for particulate matter; a shelter and continuous monitor were established in April of 2017. The current location is north of the Goodland City Park.

Plans for 2020– Monitoring efforts will continue at this site; no changes are anticipated. The continuous monitor at Goodland is aging but in good working order, replacement is a priority upon major mechanical failure.

20-195-0001; Cedar Bluff – Continuous PM_{2.5}, and PM₁₀, SO₂, Ozone and NO_x¹¹

The Cedar Bluff site located at Cedar Bluff State Park in Trego County was established in 2000. There were no changes to this site during the last planning period.

Plan for 2020- Monitoring efforts will continue at this site; A new SO₂ monitor was installed in spring of 2019 but it did not perform as expected. It was removed and returned to the manufacturer for assessment and repair. The new monitor was return from the manufacturer and reinstalled in March of 2020. The removed monitor is in good condition and will be used as a spare instrument; therefore, reducing data loss at a site should other SO₂ monitors fail. It is further anticipated that the TEOM 1405DF for PM₁₀ and PM_{2.5} will be replaced with a new monitor for both parameters in 2020.

20-057-0002; Dodge City – PM₁₀ continuous

The Dodge City site was established in 2008. A possible relocation of this site was discussed in 2018 and 2019 due to the sale of the property on which the monitor is located. The property was sold in 2019 but no move for the station is required.

Plans for 2020 - Monitoring efforts will continue at this site; no changes are anticipated.

20-169-0004; Salina – Pb primary and Pb co-located

The Salina site was established in 2010 with one sampler and a second (co-located) sampler was installed in 2013. Discussions for relocating the site took place in 2018 and early 2019 due to an anticipated sale of the property. The sale resulted in the move of the primary and co-located samplers approximately 90 meters east of the old location. The move took place in between sampling episodes. Sampling resumed on October 6, 2019 at the new site.

Plans for 2020 – Sequential sampling efforts will continue at the new site established on 10/6/2019.

¹¹ This site also includes an IMPROVE protocol site operated by the KS Department of Wildlife, Parks and Tourism.

20-173-0018; Sedgwick – Ozone

The Sedgwick site was established in 2008. There were no changes to this site during the last planning period.

Plans for 2020 – Monitoring efforts will continue at this site; no changes are anticipated.

20-173-0010; Wichita Health Department – Continuous PM_{2.5} and PM₁₀, Ozone and NO_x

The Wichita Health Department site was established in 1973. There were no changes to this site during the last planning period.

Plans for 2020 – Monitoring efforts will continue at this site. The existing ozone monitor is an older model. It is anticipated that this site will receive updated ozone equipment in 2020.¹²

Updated Plan for 2020 - The replacement of the current monitors for PM parameters will also occur in 2020. The purchase of one continuous monitor for PM₁₀ and PM_{2.5} will replace the two separate systems currently operating at this site.¹³

20-191-0002; Peck – Continuous PM_{2.5}, and PM₁₀, SO₂, Ozone and NO_x

The Peck site was established in 1999. The continuous PM₁₀ monitor was moved from the now closed K96 & Hydraulic site to the Peck site to expand this multi-pollutant neighborhood and regional transport site. The PM₁₀ monitor has been operating since March 2018. In May of 2018, this site received a new ozone monitor capable of network reporting of diagnostic parameters. The existing sequential sampler for PM_{2.5} and continuous PM₁₀ were replaced with a monitor for both parameters which began operating on October 1, 2019.

Plan for 2020 – Monitoring efforts will continue at this site.; no changes are anticipated.

20-103-0003; Leavenworth – Ozone

The Leavenworth site was established in 2004. There were no changes to this site during the last planning period.

Plan for 2020 Monitoring efforts will continue at this site; no changes are anticipated.

20-209-0021; JFK/NCore – Sequential PM_{2.5} (co-located), continuous PM_{2.5} (primary), PM₁₀ PMcourse, CO, SO₂, Ozone, NO_x and NO_y

¹² This statement was correct at the time the plan was posted for comments in May of 2020.

¹³ This statement reflects discussions held after the draft plan was posted for comments.

The JFK site was established in 1999. The site became a National Core (NCore) site in 2013. The JFK/NCore site will be the location for PAMS implementation in summer of 2021. In November of 2019 the TEOM 1405DF for PM₁₀ and PM_{2.5} was replaced with a new monitor to measure both parameters.

Plan for 2020 – Monitoring efforts will continue at this site. For PAMS implementation, monitoring staff at KDHE and the Unified Government currently attend trainings and monthly meeting in preparation of operating new equipment and providing quality assured data. KDHE anticipates implementation to begin as funding is available from EPA. KDHE also anticipates purchase and installation of monitoring equipment for True NO₂ measurements. It is preferred that the instrument chosen will include current NCore requirements for NO, NO₂ and NO_x.

20-091-0007; Justice Center, Overland Park, KS – Sequential PM_{2.5} Site closed on 9/30/2019.

The Justice Center site was established in 1991. The sequential PM_{2.5} sampler that is no longer supported by the manufacturer as of end of 2018. It was the intention that when this monitor can no longer be maintained it would be removed and the Justice Center site will be closed. As per 40 CFR 58 §58.14(c), the PM_{2.5} monitor at Justice Center was eligible for removal as it has shown attainment during the prior five years and had a probability of less than 10 percent of exceeding 80 percent of the applicable NAAQS.

Plan for 2020 – The equipment for the Justice Center site will be returned to KDHE inventory for useful parts.

20-091-0010; Heritage Park, Olathe, KS – Continuous PM_{2.5} (Primary), Sequential PM_{2.5} (co-located) and Ozone

The Heritage Park site was established in 2003. The Heritage Park site received a sequential PM_{2.5} sampler to co-locate the continuous method at this site in fall of 2019.

Plan for 2020 – Monitoring efforts will continue at this site; no changes are anticipated.¹⁴

Updated Plan for 2020 – KDHE has partnered with Johnson County Department of Health and Environment to update the site. This includes new fence, shelter replacement, new ozone monitor, new continuous PM₁₀ and PM_{2.5} monitor and removal of the sequential PM_{2.5} sampler. These actions will occur during the summer of 2020 while observing social distancing and using an appropriate face mask when distancing cannot be maintained.¹⁵

20-177-0013; KNI (Topeka) – Continuous PM_{2.5} and PM₁₀ and Ozone

The KNI site was established in 2006. There were no changes to this site during the last planning period.

¹⁴ This statement was correct at the time the plan was posted for comments in May of 2020.

¹⁵ This statement reflects discussions held after the draft plan was posted for comments. Shelter is from KDHE current inventory. PM₁₀ will be included in the reporting parameters once the monitor is operating at this site.

Plan for 2020 - Monitoring efforts will continue at this site; it is anticipated that the current method for PM_{2.5} monitor will be upgraded to include the PM₁₀ parameter in 2020.

20-133-0003; Chanute – Continuous PM_{2.5}, continuous PM₁₀, Ozone, NO_x and SO₂

The Chanute site was established in 2014. There were no changes to this site during the last planning period.

Plans for 2020 - Monitoring efforts will continue at this site. The existing ozone monitor is an older model. It is anticipated that this site will receive updated ozone equipment in 2020.

Interagency Monitoring of Protected Visible Environments (IMPROVE) (2)

Tallgrass (Chase County)

Cedar Bluff (Trego County, located with site 20-195-0001)

Plans for 2020 – Operations will continue.

National Atmospheric Deposition Sites/Mercury Deposition Network (4)

Lake Scott (Scott County)

Glen Elder (Mitchell County)

Sac and Fox (Brown County)

Coffey County Lake (Coffey County)

Plans for 2020 - Operations will continue with an annual report of activities posted to the KDHE website for the previous year's sample period.¹⁶

¹⁶ Latest version of report: http://www.kdheks.gov/bar/air-monitor/mercury/Hg_Report.pdf

Appendix A. Street addresses 2020 Kansas Air Monitoring Sites

| AQS Site ID | Site Name | Street Address | City/Area | County | Notes |
|-------------|--------------------|-------------------------|-------------------------------------|-------------|-------------------------------------|
| 20-017-0001 | Tallgrass | KS-177 Scenic | Tallgrass Prairie National Preserve | Chase | IMPROVE Site |
| 20-057-0002 | Dodge City | 1510 Soule Street | Dodge City | Ford | KS Air Monitoring Site |
| 20-091-0010 | Heritage Park | 16050 S Pflum Rd | Olathe | Johnson | KS Air Monitoring Site |
| 20-103-0003 | Leavenworth | 2010 Metropolitan | Leavenworth | Leavenworth | KS Air Monitoring Site |
| 20-133-0003 | Chanute | 7th and Henshall Drive | Chanute | Neosho | KS Air Monitoring Site |
| 20-169-0004 | Salina | 304 E Avenue B | Salina | Saline | KS Air Monitoring Site |
| 20-173-0010 | Wichita HD | 1900 East 9th Street | Wichita | Sedgwick | KS Air Monitoring Site |
| 20-173-0018 | Sedgwick | 12831 W 117th Street N | Sedgwick | Sedgwick | KS Air Monitoring Site |
| 20-177-0013 | KNI | 2501 Randolph Avenue | Topeka | Shawnee | KS Air Monitoring Site |
| 20-181-0003 | Goodland | 16th and Arcade | Goodland | Sherman | KS Air Monitoring Site |
| 20-191-0002 | Peck | 707 East 119th Street S | Peck | Sumner | KS Air Monitoring Site |
| 20-195-0001 | Cedar Bluff | Page Creek Area | Cedar Bluff State Park | Trego | KS Air Monitoring Site/IMPROVE Site |
| 20-209-0021 | JFK/NCORE | 1210 N 10th Street | Kansas City (KS) | Wyandotte | KS Air Monitoring Site/NCORE |
| N/A | Lake Scott | Lake Scott State Park | Lake Scott State Park | Scott | Mercury Deposition Site |
| N/A | Glen Elder | Glen Elder State Park | Glen Elder State Park | Mitchell | Mercury Deposition Site |
| N/A | Sax & Fox | 4th and Arch | Reserve | Brown | Mercury Deposition Site |
| N/A | Coffey County Lake | 12th and Quail Road | Coffey County Lake | Coffey | Mercury Deposition Site |

Appendix B. Public Comments

No public comments were received.