CHAPTER 4:
Air Quality Programs

The objective of the Air Quality Programs is to maintain and protect the quality of the outdoor air in Nebraska. Thousands of tons of pollutants are emitted into the air in the state each year from industrial and other human activities. These air pollutants can affect human health, cause property damage, harm the environment, and reduce visibility. The Air Programs work to maintain Nebraska's air quality by implementing state and federal air quality regulations, through permitting and compliance activities for stationary sources, and by monitoring outdoor ambient air for regulated pollutants. Nebraska's air quality rules are set forth in Nebraska Administrative Code (NAC) *Title 129 – Nebraska Air Quality Regulations* (Title 129).

Nebraska enjoys good ambient air quality, with all parts of the state in compliance with federal and state ambient air quality standards.

The regulated air pollutants of most concern are particulate matter, ozone, nitrogen oxides, sulfur dioxide, carbon monoxide, and lead. These pollutants are subject to National Ambient Air Quality Standards (NAAQS). All areas of the state are currently in attainment, meaning that the state has air at least as clean as the federal health-based standards for these pollutants. Maintaining compliance with these federal standards is important to protect the public health. NAAQS nonattainment could result in additional requirements and significant economic costs to regulated facilities and the state. The Department also regulates the emission of substances defined by the U.S. Environmental Protection Agency (EPA) as hazardous air pollutants (HAPs), which are toxic substances known to cause cancer or have other serious health impacts. Title 129 does not include any requirements specifically for the control of odors, however, many of the pollutants that are regulated do have an odor, so by minimizing such pollutants, odors may in turn be reduced.

The Air Quality Programs are found in several Divisions of the Department. In the Permitting and Engineering Division, air quality construction permits and operating permits are issued and air dispersion modeling is performed. The Inspection and Compliance Division compiles emission inventories and conducts inspections and other compliance and enforcement activities. The Remediation and Monitoring Division maintains an ambient air quality network and evaluates stack tests. Regulatory development, as well as state implementation plan maintenance is done within the Legal Division.

Lastly, the agreements with three local agencies — Lincoln-Lancaster County Health Department, Omaha Air Quality Control, and Douglas County Health Department are managed through the Planning and Aid Division. These local agencies have accepted responsibility for various facets of the air quality program within the jurisdictions of those agencies including air quality monitoring, permitting, and enforcement.

Air Quality Permitting

An air quality permit sets practical enforceable limits on the amounts of pollutants that a facility may emit, ensuring that facilities are constructed and operated in a manner that protects the quality of the surrounding ambient air. The Department issues two main types of air quality permits: construction permits and operating permits. A construction permit may be required for a facility before the construction or modification of an emission unit. An operating permit may be required for an existing facility source of certain air pollutants. Currently, there are over 1,200 facilities that have received a construction permit and/or an operating permit.

Title 129 provides for two types of construction and operating permits: individual and general. Some sources are not eligible for coverage under general permits. Some sources will require a construction permit but may not require an operating permit.

Individual permits are available for all regulated sources. These permits include all requirements applicable and specific to that source and location. Because it is tailor made for the source, significant time and labor is required for each permit issued. The individual permit process includes a required public notice with a 30-day comment period, which also offers the public the opportunity to request a public hearing.

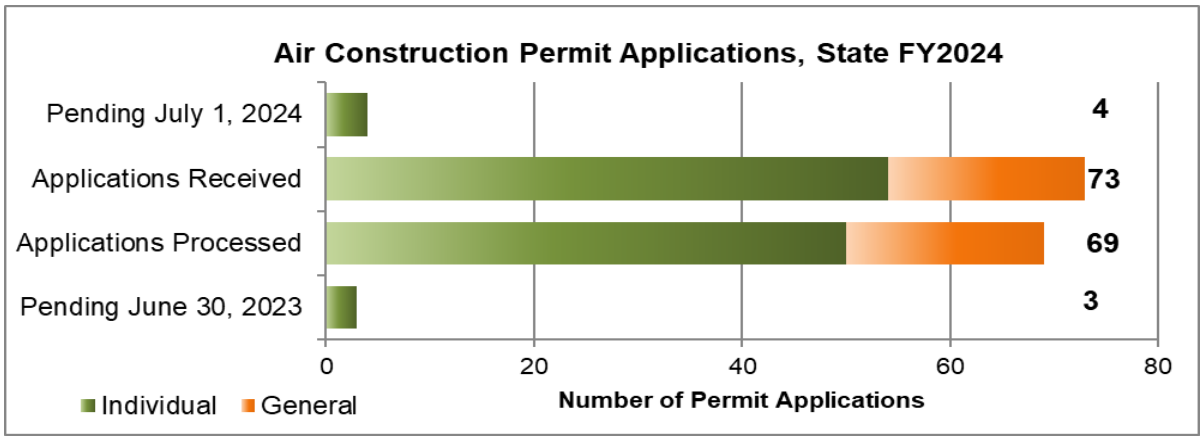
A general permit covers all sources in a particular industrial category, provided that the source meets the applicability criteria, applies for, agrees to the conditions of and obtains coverage. Requirements for a general permit are established in that general permit. Each general permit is issued only once (including the public notice period). Eligible applicants then apply for and obtain coverage without the need to develop an individual permit for that facility or to go through a public comment period each time coverage is approved for an eligible source under that general permit.

General construction permit coverage is currently available for eligible sources in nine categories (including time-sensitive construction activities), and general operating permit coverage is available for one category (small incinerators). Approval of general permit coverage takes much less time for the agency and for the facility than an individual permit. An online-only application process is used for general permit coverage, and approval may take only 5 days or less.

Construction Permit Program

The Department has maintained a construction permit program for air contaminant sources since the 1970s. The program is referred to as the New Source Review (NSR) program and has two categories; a minor source program (state) and a major source program (federal Prevention of Significant Deterioration). Both programs require facilities to obtain a permit before they construct, reconstruct, or modify any air contaminant source or emission unit where there is a net increase in the potential to emit above thresholds specified in Title 129 for particular pollutants. Only sources with potential emissions at or above these thresholds are required to obtain a construction permit. A construction permit is valid for the life of the covered emission units.

The following graph summarizes construction permit applications received, processed, and pending during the 2024 state fiscal year. (Note: The *Processed* category includes permits issued, withdrawn, denied, and determinations of no permit required.)

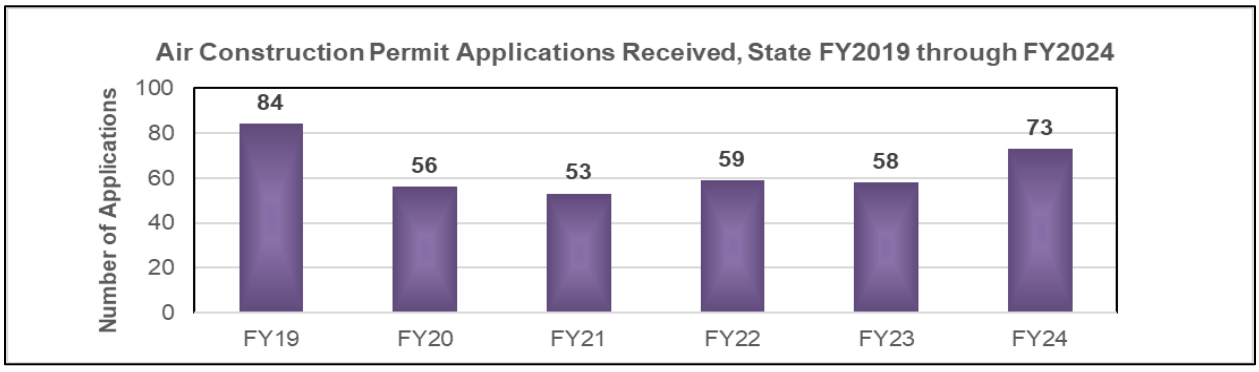


The Prevention of Significant Deterioration (PSD) program applies to construction of new major sources or modifications to existing major sources that emit significant levels of certain types of pollutants. The purpose of the PSD program is to protect air quality in areas where the air is cleaner than the ambient air quality standards while still allowing industrial and economic growth. The objective is to continue to maintain compliance with the health-based ambient air quality standards.

For facilities regulated under the construction permit program that emit pollutants at levels sufficient to trigger PSD requirements, air engineering staff conduct additional, more rigorous reviews to ensure that best available control technology will be employed to minimize impacts on the environment. The NDEE must also assure that the source will not cause or contribute significantly to any deterioration of air quality or violations or exceedances of the ambient air quality standards.

The PSD program helps to protect visibility in nearby national parks and wilderness areas. The Department notifies federal land managers and nearby States and Tribes of pending PSD decisions so those authorities can share relevant concerns for potential impacts.

The economy and business activity in the state impact the number of air quality construction permit applications received each year. The following graph shows the number of construction permits received annually from state FY2019 through FY2024.



Air Dispersion Modeling

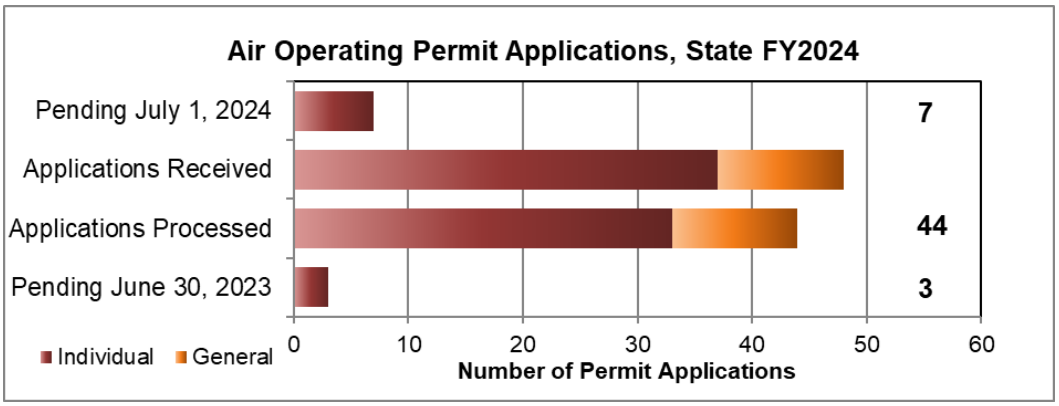
Air dispersion computer models predict how air pollutants emitted by a facility spread and disperse. These regulatory models use expected emissions, meteorological and geographical data, and other factors to estimate ground level concentrations of air pollutants at a large array of locations outside of the facility fence line. In a relatively short amount of time, a model can predict the maximum potential ground-level impact of facility emissions in a standardized and cost-effective manner.

Modeling is required with most air quality construction permit applications as part of the Department's review. An air dispersion model is the primary tool used to determine if, as permitted, the emissions from a new or modified facility or modification will comply with current health-based ambient air quality standards. Models are also used as a design tool to analyze the effects of different pollution control strategies. The air dispersion modeler reviews the inputs and outputs of the models that facilities provide as part of their construction permit applications. These reviews include facility emissions and meteorological data, background concentrations, existing nearby facilities, the modeling protocol, and the final modeling results.

Operating Permit Program

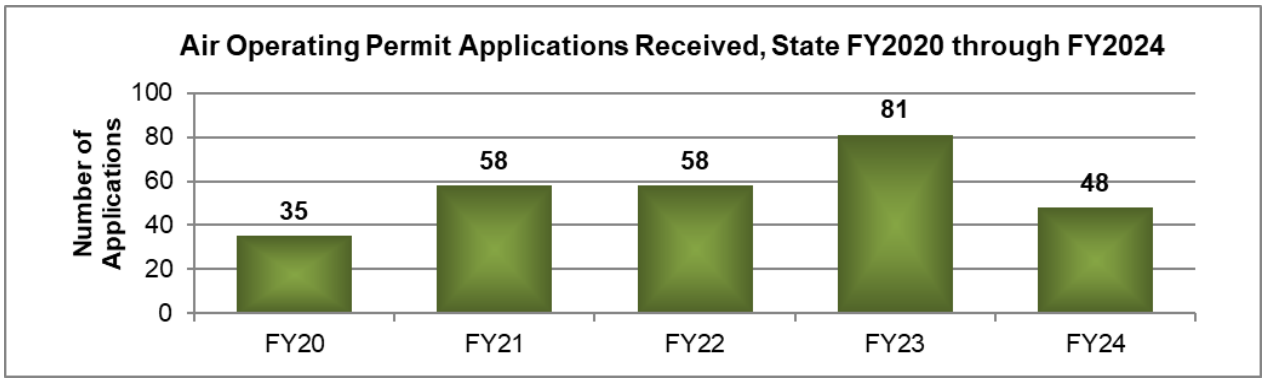
As required by Title V of the Federal Clean Air Act Amendments of 1990, Nebraska issues operating permits for Class I (major) sources of certain air pollutants. The Department also regulates minor sources using Class II operating permits as required under Nebraska law. Application for an operating permit is required by Title 129 within 12 months of startup of a regulated air contaminant source. Until recently, Title 129 provided for operating permit terms up to five years, after which the permit must be renewed. When Title 129 was revised in September 2022, changes to the operating permit program were made which allow the Department to issue Class II operating permits for a term longer than five years. An operating permit contains all applicable requirements for emission points at a facility. For a large, complicated, growing facility, an operating permit incorporates requirements from all construction permits issued for the facility, providing the source with one permit document to help compliance with all associated air permitting requirements.

The chart on the following page provides statistics on the number of operating permit applications received, processed, and pending during the 2024 state fiscal year. These statistics include general permit coverage approvals. The current general operating permit for small incinerators was issued in SFY2018, replacing the previous five-year general operating permit that expired that year. The general operating permit coverages issued in SFY2022 were for new applicants requesting coverage for small incinerators. The current general operating permit for small incinerators is available through an efficient online process, whereas the previous general permit required a paper application.



The Nebraska operating permit program also offers an innovative alternative for major sources that have taken measures to keep their emissions very low, called the Low Emitter Rule. To be eligible, a Class I (Title V) source must document five years of actual emissions at or below the minor source (Class II) threshold levels, meet other requirements established in the regulations, and not otherwise be required to obtain an operating permit. Since its inception in 1997, the Low Emitter Rule has allowed over 100 active sources to opt out of their Class I (Title V) operating permits, with no identifiable degradation of air quality in Nebraska.

The five-year renewal cycle, past delays in issuing renewals, and other factors have resulted in wide variations over time in the numbers of operating permits up for renewal each year. The chart below summarizes air quality operating permit applications received from State FY2020 through FY2024 (applications for all application types, including permit revisions, general operating permits, low emitters, etc.).



Permit Program Process Improvements

Individual construction and operating permits are complex, highly technical documents that must address all emission points for various pollutants at a facility in a manner that is enforceable as a practical matter. Processing a permit application includes complex analysis with multiple steps and personnel. In FY2020, the Operating Permits Team undertook a process improvement project on operating permit renewals and applications. The project resulted in a significant reduction in the time needed to prepare and process an operating permit renewal application. One applicant estimated an 80% reduction in their application preparation time. The Air Programs have documented similar savings in staff time to process the renewal.

Each construction and operating permit include a fact sheet, which provides a technical description of the facility, applicable regulatory requirements, and a statement of basis for each permit condition. Air Program staff made significant fact sheet process improvements in FY2018 and will revisit permit fact sheets each year to pinpoint opportunities for streamlining. Additional improvements were made in FY2022 that continue to make these fact sheets more uniform and easier to understand, making compliance easier for facility staff, which also assists the efforts of agency compliance inspectors.

With the process improvement event that started in 2016, fact sheet project initiated in 2018, and other ongoing efforts, the average time required to reach a decision on a construction permit application improved significantly from 188 days to approximately 120 days (including online-only general construction permit coverage) at the end of FY2024. The operating permit application backlog was also significantly improved down from approximately 120 applications a few years ago to 7 applications pending at the end of FY2024, even with a steady influx of applications. Although some impacts of improvements may not be realized in the immediate future, sources with permits being issued now should see processing times significantly improved at permit renewal time.

The Air Quality Permitting Programs have consistently had a significant amount of staff turnover, leading to recurring discussions about permit decisions, regulations, and other challenges. The Air Program staff established an electronic Air Quality Permitting Compendium that allows important information about existing permits — such as permit decisions, regulatory determinations, and internal procedures — to be archived, easily searched, and readily accessible to Air Program Staff. In addition, the Air Program revamped new employee onboarding procedures. These are two examples of the significant efforts to help improve staff training and permitting consistency. This tool allows Air Program staff to research past permitting actions and associated publications and documents to help facilitate more rapid permit and uniform permit decisions.

Air Compliance

Ambient Air Quality Monitoring Program

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment, which are called criteria pollutants. The Act established two types of national air quality standards: primary standards, which are intended to protect public health, and secondary standards, intended to protect the environment. National standards have been established for the following six pollutants:

- Particulate Matter (PM)
    - With a diameter of 10 micrometers or less (PM_{10})
    - With a diameter of 2.5 micrometers or less ($PM_{2.5}$)
- Sulfur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Ozone (O_3)
- Lead (Pb)

Nebraska has an additional ambient air quality standard for Total Reduced Sulfur (TRS). The TRS standard was adopted by the Environmental Quality Council in 1997 and is a public health-based standard.

Nebraska Ambient Air Monitoring Network

The State of Nebraska operates an ambient air-monitoring network to determine compliance with the NAAQS and with state air quality standards. The Nebraska network also includes a site for monitoring regional haze impacts that is part of a national program to help protect visibility in our National Parks and Monuments.

Three agencies are involved in the day-to-day operation of the network: NDEE, Lincoln-Lancaster County Health Department, and Douglas County Health Department. Omaha Air Quality Control (part of the Omaha Public Works Department) also provides technical support for network-related activities.

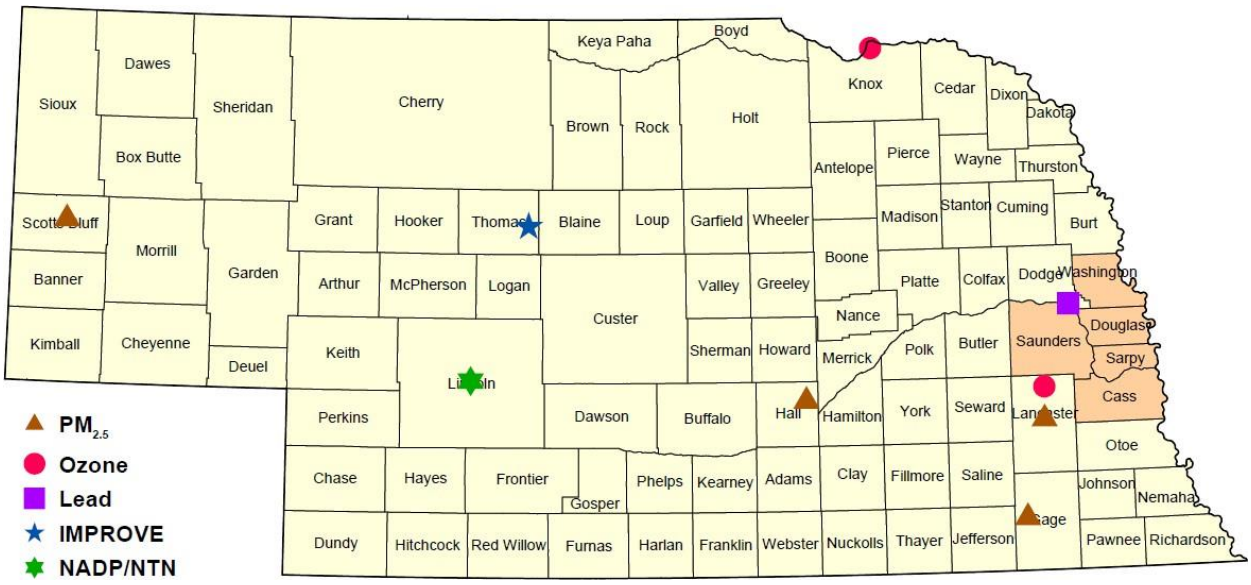
The Nebraska monitoring network includes sites at which air quality is monitored to evaluate attainment with the standards and other health and welfare-associated priorities. The Department evaluates the adequacy of its monitoring network in accordance with federal regulations each year. Changes may be made to the network due to changes in monitoring regulations, updates to the ambient standards, perceived changes in pollution trends, and/or funding issues. Loss of site access is another consideration that occasionally affects the network.

Most of the sites in the monitoring network evaluate pollutants for which standards are established *(i.e.*, $PM_{2.5}$, PM_{10}, CO, SO_2, Lead, or Ozone). Some sites monitor for more than one pollutant. The NCore site in Omaha is part of a National Core Network that monitors for nine pollutant parameters. There are two additional types of sites in the network: Interagency Monitoring of Protected Visual Environments (IMPROVE) and National Atmospheric Deposition Program/National Trends Network (NADP/NTN) sites. See the following maps for locations.

IMPROVE monitors provide information for studying regional haze that may impact the visibility in listed federal Class I National Park and Wilderness Areas. There is one IMPROVE monitoring site at Nebraska National Forest at Halsey, Nebraska. This site provides data on pollution trends and transport.

The National Trends Network (NTN) of the National Atmospheric Deposition Program (NADP) is a nationwide network of sites that monitor for pollutants deposited by precipitation. The deposition constituents examined include acidity, sulfates, nitrates, ammonium chloride, and base-cations (e.g., calcium, magnesium, potassium, and sodium). There are two NADP/NTN sites in Nebraska: one near Mead and one near North Platte, which have both been operational for over 20 years. These sites are operated by the University of Nebraska, with analytical and data development support from the NADP. The Mead site was upgraded to include mercury (Hg) deposition monitoring and is part of the NADP/Mercury Deposition Network (MDN). Both sites maintain the NADP monitoring. Additional information about the NADP/NTN can be found at http://nadp.slh.wisc.edu.

Nebraska Monitoring Sites Outside of the Omaha Metropolitan Statistical Area



$PM_{2.5}$
Lincoln (Lancaster County)
Grand Island (Hall County)
Scottsbluff (Scotts Bluff County)
Beatrice (Gage County)

Ozone
Davey (Lancaster County)
Santee (Knox County)

Lead
Fremont (Dodge County)

IMPROVE
Nebraska National Forest (Thomas County)

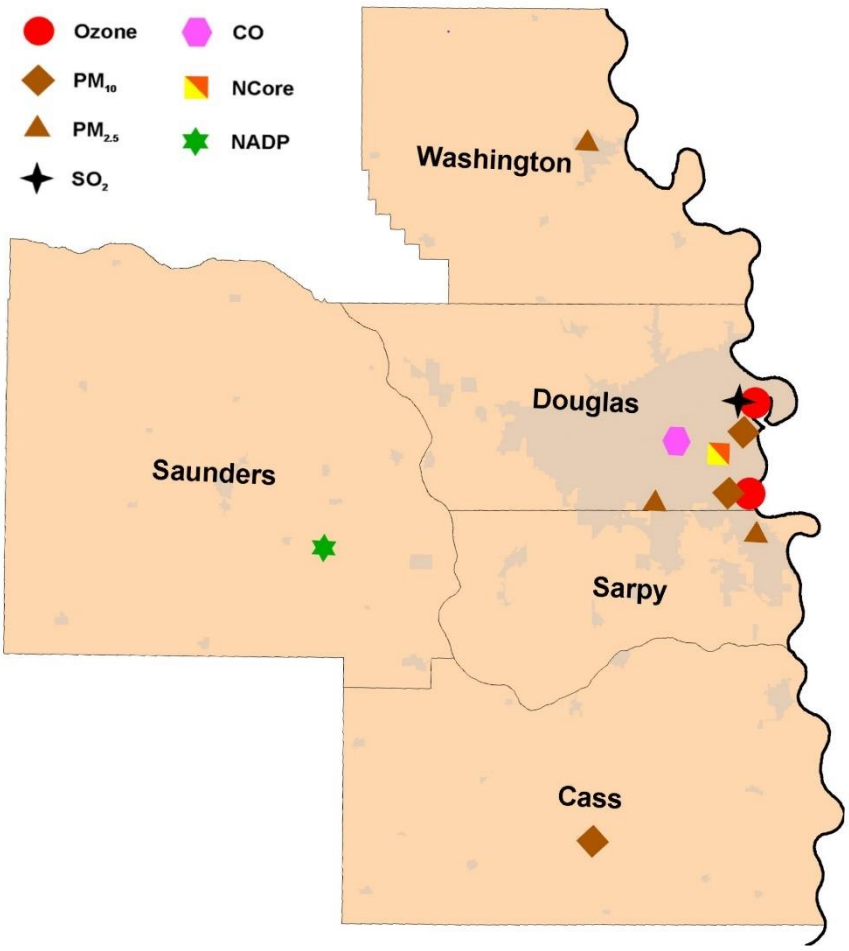
NADP/NTN
Maxwell (Lincoln County)

The Nebraska counties in the Omaha-Council Bluffs Metropolitan Statistical Area are indicated by orange shading.

The state map above shows the nine monitoring sites that are located outside of the Omaha-Council Bluffs Metropolitan Statistical Area (counties shown in orange). Four of these sites are operated by the Department, either directly or under contract. The two sites in Lancaster County are operated by the Lincoln-Lancaster County Health Department with NDEE oversight. The National Atmospheric Deposition Program site near North Platte is operated by the University of Nebraska. An additional ozone site near Santee in northeast Nebraska is operated by the U.S. EPA.

The map on the following page shows the location of the monitoring sites in the Nebraska portion of the Omaha-Council Bluffs Metropolitan Statistical Area (two sites monitor two pollutants and are represented by overlapping pairs of symbols). Nine of these sites, located in Douglas, Sarpy, and Washington Counties, are operated by the Douglas County Health Department with oversight by the Department. A PM_{10} site in Weeping Water in Cass County is operated by NDEE. The National Atmospheric Deposition Program site at Mead is operated by the University of Nebraska.

Monitor Locations in the Nebraska Portion of the Omaha-Council Bluffs Metropolitan Area



Carbon Monoxide
Omaha, 4102 Woolworth Avenue (NCore Trace Monitor)
Omaha, 7747 Dodge Street

NCore
4102 Woolworth Avenue

NADP/NTN
Mead, Saunders County

Ozone
Omaha, 4102 Woolworth Avenue (NCore)
Omaha, 1616 Whitmore Street
Omaha, 2411 O Street

$PM_{2.5}$
Omaha, 4102 Woolworth Avenue (NCore)
Omaha, 9225 Berry Street
Bellevue, 2912 Coffey Avenue
Blair, 2242 Wright Street

Sulfur Dioxide (SO_2)
Omaha, 4102 Woolworth Avenue (NCore Trace Monitor)
Omaha, 1616 Whitmore Street

PM_{10}
Omaha, 19th & Burt Streets
Omaha, 2411 O Street
Omaha, 4102 Woolworth Avenue (NCore)
Weeping Water, 102 P Street

Updates to the Monitoring Network

In work beginning in 2022 and completed this year, NDEE has provided American Rescue Plan grant funds to the Lincoln-Lancaster County Health Department and Douglas County Health Department to improve continuous monitoring of $PM_{2.5}$, sulfur dioxide, and ozone. The grant funded replacement of eight monitors at six sites in Lancaster and Douglas Counties along with auxiliary support equipment.

The Interagency Monitoring of Protected Visual Environments (IMPROVE) site in the Nebraska National Forest near Halsey (Thomas County) was destroyed in October 2022 by the Bovee wildfire. The fire consumed nearly 19,000 acres of grassland and forest in this northern Sandhills region, destroying a campground lodge, cabins, and lookout tower. At the IMPROVE site near the lookout tower, the wooden shelter, particulate samplers, and the overhead electrical line to the site were all destroyed.

NDEE, which provides administrative support for the site, obtained grant funds in 2023 through an Inflation Reduction Act – Clean Air Act program to restore this IMPROVE site. Working with the Bessy Ranger District of the USDA Forest Service and Custer Public Power District, a new underground electric service line has been completed to the site. NDEE staff have constructed a new shelter, and an electrical contractor has installed wiring and outlets. IMPROVE program staff are expected to complete installation of new particulate samplers at the site in fall of 2024.

Photos of IMPROVE monitor site in Nebraska National Forest. Left: remains of shelter after the Bovee Fire in October 2022. Right, new monitor shelter at the site. Photos by NDEE.

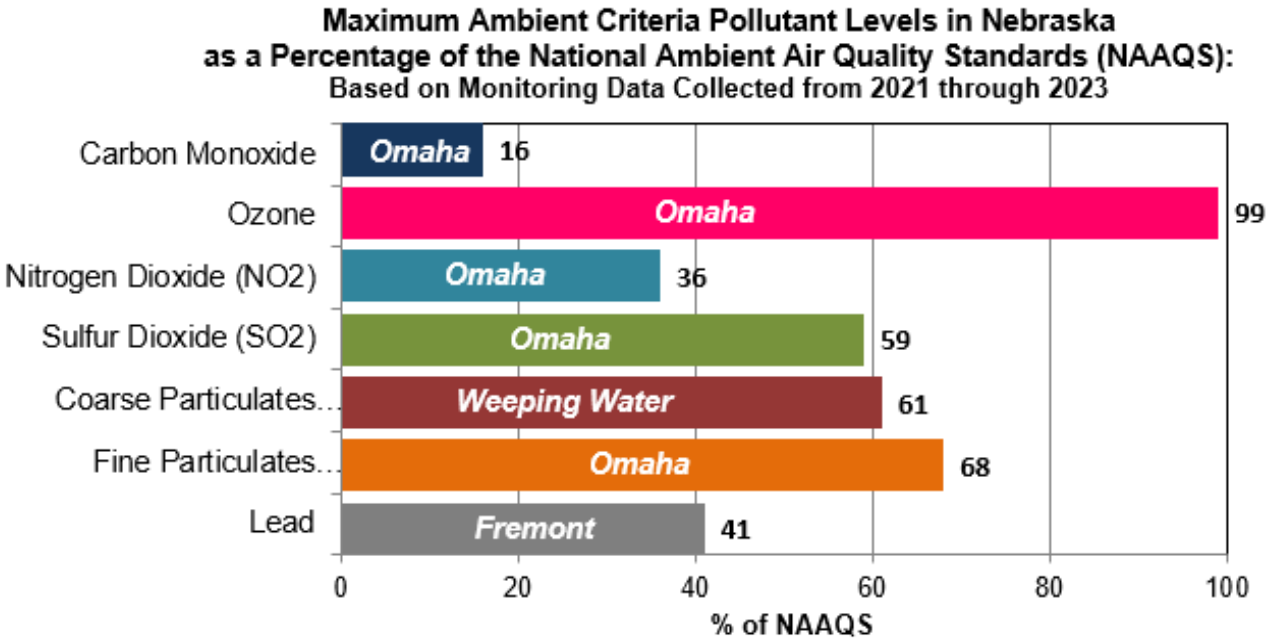
NDEE has also received an Air Monitoring Direct Award from an Inflation Reduction Act program. These funds are being used to establish continuous ozone monitoring in Grand Island, Nebraska's fourth largest city by population. The new monitor will be installed at the current $PM_{2.5}$ monitoring site. New equipment has been purchased, and installation will be complete before the beginning of the 2025 ozone monitoring season in March.

Monitoring Information Online

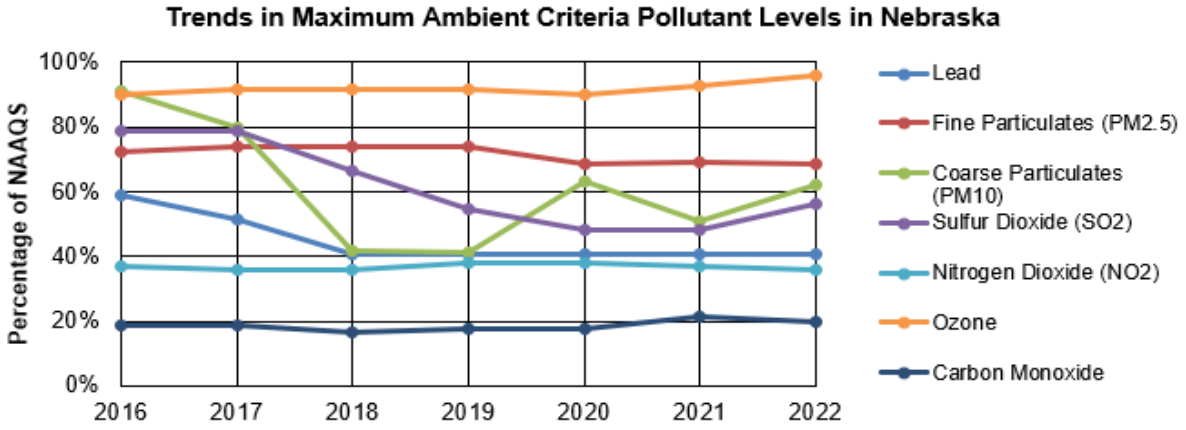
Data from continuous ozone and $PM_{2.5}$ monitors in Lincoln, Omaha, Grand Island, Homestead National Historical Park, and Scottsbluff are reported hourly to the EPA AirNow system, which makes current air quality information available to the public on the web at http://www.airnow.gov. EPA uses the data to calculate an hourly Air Quality Index (AQI) for each monitor location. The AQI is a numeric rating of the current air quality that provides the public with a quick and simple means to evaluate current air quality in each metro area. The Douglas County Health Department and Lincoln-Lancaster County Health Department websites provide links to current AQI values for their cities. The Douglas County Health Department also participates in the ENVIROFLASH program that allows members of the public to sign up to receive air quality alerts via email.

Compliance with National Ambient Air Standards (NAAQS)

Current air quality monitoring data shows that all areas of Nebraska are in attainment (in compliance) with the NAAQS. The chart below shows where the highest air pollutant levels are being detected in Nebraska for each criteria pollutant and how their levels compare to the NAAQS. A reading of greater than 100% would mean that the NAAQS standard was exceeded, but the highest readings for all criteria pollutants are below 100%.



In March 2024, EPA revised the primary annual $PM_{2.5}$ standard by lowering the regulatory level from 12.0 micrograms per cubic meter to 9.0 micrograms per cubic meter. Recent data from all monitoring sites in Nebraska are in compliance with both the old and new standard. NDEE will be submitting recommendations for Nebraska county designations in early 2025.



The chart above shows trends in the maximum measured levels of criteria pollutants in Nebraska from 2016 through 2022. The value for each pollutant and year is the maximum measured at any monitoring site in the state (as a percentage of the NAAQS for that pollutant). Ozone is the criteria pollutant of most concern, as maximum levels have remained above 90% of the NAAQS at a number of urban and rural monitor sites in Nebraska as well as in the adjacent states. Levels for ozone, NO_2, CO, and $PM_{2.5}$ have remained fairly constant or have declined slightly since 2016, while the maximum SO_2 level has decreased significantly since 2017. The level and location of the maximum PM_{10} readings have fluctuated widely during this period.

The Department compiles an annual Ambient Air Monitoring Network Plan that provides a more detailed analysis of ambient air monitoring data, pollutant trends through time, and NAAQS compliance. These reports are available on the Department website: http://dee.ne.gov/Publica.nsf/Pubs_Air_Amb.xsp.

Inspections and Facility Compliance

The Compliance Program is responsible for conducting compliance inspections of air pollution sources, responding to citizen complaints, observing and evaluating emission tests, and the acid rain program. Consistent with the Nebraska Environmental Protection Act, the Air Quality Program attempts to obtain compliance with environmental regulations first through voluntary efforts. Voluntary compliance has helped bring about a better working relationship with the regulated community without sacrificing environmental quality. However, enforcement actions are pursued by the Department when compliance issues are serious, chronic or cannot otherwise be resolved. This table lists the compliance activities conducted by the Department during the year.

FY2024 Air Compliance Activity	NDEE
On-site Inspections	195
Facility Stack Tests Conducted On-Site Observations Conducted	107 39
Continuous Emission Monitoring Audits Conducted On-site Observations Conducted	35 11
Complaints Received	61
Burn Permits Issued Burn Permits Denied Burn Permits Withdrawn	41 20 0

Emission Inventory and Emission Fees

Each year the Department conducts an inventory of emissions from major industrial sources and a representative sample of lower-emitting minor industrial sources. Emission inventories are due on March 31 each year for the previous calendar year. Every three years, the Department assists the EPA in preparing a comprehensive national inventory of emissions. The 2023 national inventory has been submitted and uses emissions reported by sources for the calendar years 2021-2023. The emissions inventory is used to support the planning efforts for national rulemaking and to assess trends in emissions through time.

The Department also uses the emission inventories to determine the assessment of annual emission fees. Facilities that emit major sources of air pollution are required to pay emission fees for each ton of pollutant emitted during the previous calendar year. The maximum emission for which a fee is assessed is 4,000 tons per pollutant. For electrical generating facilities with a capacity between 75 and 115 megawatts, the maximum emission for which a fee is assessed is 400 tons per pollutant. The Department attempts to set the fee rate at the minimum level needed to pay reasonable direct and indirect costs of developing and administering the air quality permit program. An analysis detailing how the Department arrived at the fee rate is made available to fee payers. The rate for emissions generated in 2023 was $56 per ton.

The Department transitioned to an online reporting system called State and Local Emissions Inventory System (SLEIS) during calendar year 2019. Training sessions for those new to the system continue on an annual basis.

Planning for Air Quality Issues in Nebraska

National Ambient Air Quality Standards (NAAQS) are established by EPA for six pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter ($PM_{2.5}$ and PM_{10}), and sulfur dioxide. EPA periodically reviews the NAAQS using the most current scientific information available and revises or retains the standards as appropriate. When a new or revised standard is issued, states determine their compliance (attainment) status with respect to the standard and submit to EPA their recommendations for attainment or nonattainment designations for areas within the state. State Implementation Plans (SIPs) are then developed to describe how the state meets the CAA requirements for the NAAQS, specifically describing how the Department will implement, maintain, and enforce the standard.

At the present time, Nebraska is in attainment with each of the NAAQS. Planning activities are currently underway to address the recently revised Particulate Matter annual primary standard, which was strengthened; proposed revisions to state Air Quality regulations (Title 129); and Regional Haze. At the federal level, EPA is undertaking a new review of the ozone standard; conducting its review of the lead standard; and finalizing its review of the secondary (welfare-based) sulfur dioxide, nitrogen oxides, and particulate matter standards. EPA recently finalized its approval of Nebraska's SIP revision for Title 129.

Sulfur dioxide (SO_2)

The 2010 sulfur dioxide (SO_2) standard required states to demonstrate attainment in the areas surrounding large sources of the pollutant. EPA finalized the Data Requirements Rule

(DRR) in 2015 to assist in implementation of the 2010 standard, requiring characterization of the air quality near sources that emit 2,000 tons per year or more of SO_2. Sources in Nebraska subject to this rule include coal-fired power plants, specifically Whelan Energy Center (Adams County), Sheldon Station (Lancaster County), North Omaha Station (Douglas County), Gerald Gentleman Station (Lincoln County), and Nebraska City Station (Otoe County).

EPA issued its designations of attainment for Nebraska areas in 2016, 2018, and 2021; all areas continue to comply with this standard.

The DRR requires annual reporting (termed "ongoing requirements") for areas characterized by modeling, and this year's report was submitted as part of the Nebraska's annual Ambient Air Monitoring Network Plan in July 2024. The two areas subject to these ongoing requirements surround Whelan Energy Center and Gerald Gentleman Station; the area around Nebraska City Station was also addressed in this year's report due to an increase in emissions. Facility emissions data indicate that all areas in Nebraska continue to demonstrate attainment with the federal standard.

Ozone

EPA issued revised ozone standards in 2015, lowering the standard from 0.075 parts per million (ppm) to 0.070 ppm. In November 2017 EPA designated the entire state of Nebraska as in attainment and approved Nebraska's SIP revision for ozone in April 2020. In December 2020, following a review of the standard, EPA retained the current NAAQS; in October 2021 it announced a decision to reconsider the previous administration's retention decision. EPA is expected to release the Integrated Review Plan to describe the timeline of its review of the standard in late 2024.

Particulate Matter

EPA finalized its review of the particulate matter (PM) standards, initiated based on its concern that the standards retained in 2020 are not adequate. A final rule with a revised annual $PM_{2.5}$ standard was issued in February 2024. The primary (health-based) annual standard was strengthened, and the secondary annual standard and primary and secondary 24-hour standards were retained. Because the annual primary standard is used as the lower breakpoint for the Moderate Air Quality Index (AQI) category, this revision was anticipated to result in more days with Moderate AQI during prescribed burning and wildfire season. It's important to note that Moderate AQI is reflective of elevated levels of $PM_{2.5}$ that are at or below the NAAQS.

NDEE is preparing its designation recommendations to address the revised standard (to recommend that all areas of Nebraska are in attainment) for submission to EPA later this year. The next step will be development of a revised SIP to address the more stringent annual standard.

Lead

EPA's review of the lead standard is underway and the Risk and Exposure Assessment and Policy Assessment are expected to be completed by early 2025. Nebraska was designated in attainment with the NAAQS by EPA in 2011 and the state's SIP revision was approved in 2015.

Regional Haze

Regional Haze refers to impaired visibility at national parks and wilderness areas caused by particulates in the atmosphere. EPA issued the Regional Haze Rule in 1999 to improve visibility in these areas, requiring state and federal agencies work together to achieve this goal. Numerous amendments to the Rule have been issued addressing the Cross-State Air Pollution Rule (CSAPR) as an alternative to Best Available Retrofit Technology (BART) for particular pollutant sources, and regulatory requirements for SIPs. In addition, guidance and technical support documents were provided to assist states in preparing SIPs for the second implementation period (2019-2028). EPA is preparing to undertake a revision to the most recent rule to address the third implementation period (2029-2038).

Nebraska submitted its Regional Haze SIP for the first implementation period (2008-2018) in July 2011; in 2012, EPA issued a partial approval/partial disapproval of the SIP. The disapproved portions include the BART analysis for sulfur dioxide for NPPD's Gerald Gentleman Station (GGS) and the state's long-term strategy for regional haze insofar as it relied on the BART determination. EPA issued a Federal Implementation Plan (FIP) that relies on the Cross-State Air Pollution Rule (CSAPR) to satisfy BART for sulfur dioxide at GGS. This source participates in the CSAPR trading program, which allots each source an emissions budget for SO_2 and permits trading of allotments. The remaining disapproved portion (long-term strategy) is being addressed by a proposed FIP published in August 2024. Prior to this proposal, no additional control measures have been required.

The Department submitted its Regional Haze Five-Year Progress Report in April 2017, and recently submitted its SIP revision for the second implementation period on August 20, 2024. This revision addresses portions of the initial SIP and progress report, as well as state obligations for the current implementation period that ends in 2028. EPA review and rulemaking is pending.

Municipal Solid Waste Landfill Plan

On May 21, 2021, EPA finalized the federal implementation plan for municipal solid waste landfills (MSWL). The plan supports the following federal rule located at 40 CFR Part 60 Subpart Cf: Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills. The emission guidelines apply to landfills constructed prior to July 17, 2014 which accepted waste after November 8, 1987, and lowered the threshold for which facilities must install gas collection and control equipment from 50 Mg/yr to 34 Mg/yr of nonmethane organic compounds (NMOCs).

Air Toxics Program

EPA currently lists 188 substances as hazardous air pollutants, or air toxics, which are air pollutants known to cause cancer and other serious health impacts. The Department developed an Air Toxics Notebook, found on the agency website, as a reference tool for the air toxics program and developed a set of web pages for the New Sources Performance Standards (NSPS), which are federal rules that apply largely to new stationary sources.

Both sets of rules have been issued by EPA. The Notebooks are intended to help the regulated community and the public understand the air toxics and NSPS regulations. For each standard the Notebook contains a page that provides applicability information, regulatory citations, amendment dates, guidance documents, and forms.

Smoke Awareness Program

The impact of prescribed fires and wildfires on Nebraska's air quality continues to receive attention statewide. In early to mid-spring, ranchers and land managers burn an average of two million acres of tallgrass prairie in the Flint Hills of Kansas to control invasive plant species and to encourage growth of pasture grasses. Unpredictable spring weather conditions may provide only a few days of optimal weather for burning, which can result in widespread burning and large amounts of smoke on those days. Wind from the south is typical during the spring and Nebraska may experience air quality impacts (elevated fine particulates, known as $PM_{2.5,}$ and ozone) for 24-48 hours following these events. Rangeland prescribed burning and wildfires also occur in Nebraska, with the number of incidents and acres burned due to human-caused fires increasing dramatically in 2022, making it the second worst year for wildfires in state history.

Impacts on air quality in Nebraska from wildfires continue to draw more interest due to drought conditions in the state and recurring annual wildfires in Canada and the Pacific northwest. Air quality impacts that persist over several days due to heavy smoke from these fires are becoming more common and often impact large areas of the United States, typically in the form of fine particulate matter ($PM_{2.5}$). In June 2023, portions of the state were impacted by elevated ozone levels – a pollutant that forms when nitrogen oxides (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. Elevated ozone levels are uncommon in Nebraska and these occurrences were attributed to Canadian wildfire smoke impacting the area. Air quality thus far in 2024 has been minimally impacted by smoke from prescribed burning and wildfires.

The Department continues its collaborative efforts with key stakeholder agencies in state FY2024, and held a pre-season meeting in March 2024. Participants included NDEE and other Nebraska agencies, local health departments, EPA, University of Nebraska, National Weather Service, adjacent state and local air agencies, and land managers who rely on prescribed fire as a management practice. Other activities included outreach and notification of potential smoke and air quality impacts, collaboration with Nebraska DHHS and local air agencies to develop guidance for schools and youth sports, and planning for future burn seasons.

Tasks performed by NDEE staff during the 2024 burn season include:

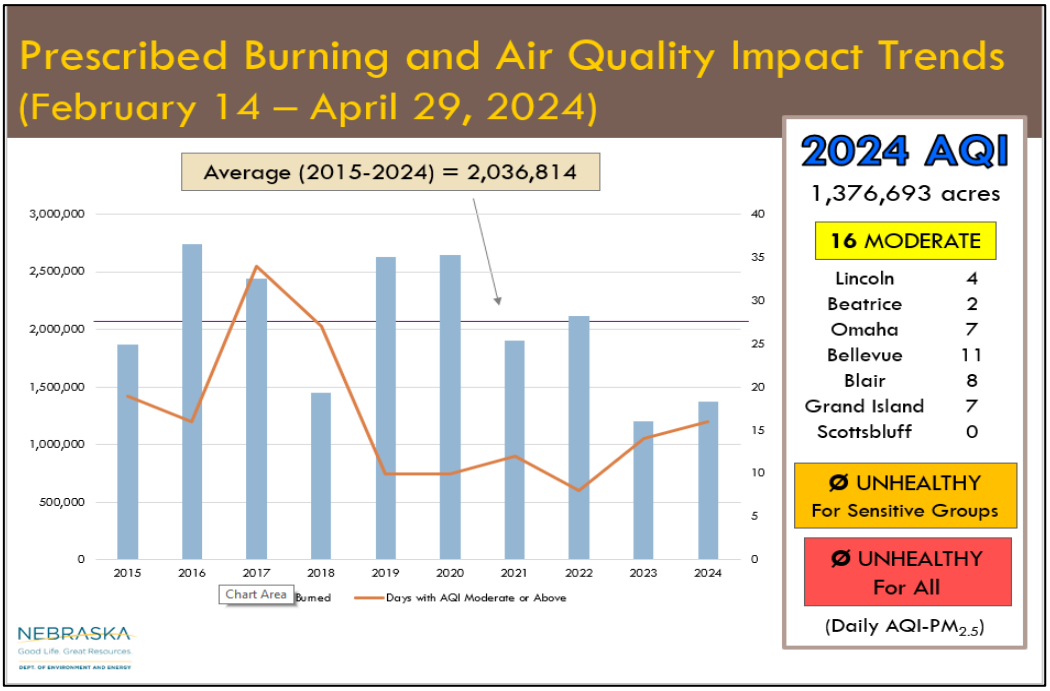
- Monitoring air quality ($PM_{2.5}$ and ozone levels)
- Generating maps showing fire locations and smoke plumes
- Reviewing weather and smoke forecasts, prescribed fire and smoke updates from Kansas, and smoke prediction models
- Updating the NDEE Smoke Awareness webpage with current information on smoke impacts and pollutant monitoring
- Discussions with stakeholders to determine the likelihood for smoke impacts and to generate advisories/alerts for the public
- Coordinating Air Quality Advisories with the Nebraska Department of Health and Human Services (DHHS)
- Generating and coordinating Air Quality Alerts with the National Weather Service
- Providing email updates to stakeholders on air quality conditions and wildfire conditions
- Interpreting and deploying National Weather Service software technologies.

Agency staff coordinate and consult with other stakeholder agencies on days when heavy burning and smoke impacts are predicted. If a health advisory is warranted, NDEE staff coordinate with the Nebraska DHHS to issue a Smoke Advisory, and with NWS to issue an Air Quality Alert to the public. In calendar year 2024, advisories and alerts were issued for July 25-26, July 30-31, and August 16-18. The Department takes a conservative approach to ensure that advisories and alerts are not issued unless confidence in predicted conditions and consensus among stakeholder agencies is strong.

EPA uses the Air Quality Index (AQI) to report air quality conditions to the public through its webpage at https://www.airnow.gov/. The AQI is similar to a yardstick that runs from 0 to 500 – the higher the value, the greater the amount of air pollution and greater the health concern. AQI values ranging from 0 to 50 (*Good* AQI) and from 51-100 (*Moderate* AQI) are indicative of pollutant concentrations in compliance with the NAAQS. At concentrations within the *Moderate* AQI category, those who are unusually sensitive to air pollution may experience health effects such as coughing or shortness of breath.

Higher AQI values (101-150) fall within the *Unhealthy for Sensitive Groups* AQI category; those in sensitive groups may experience health effects such as coughing or shortness of breath at this AQI level. Sensitive groups include people with heart or lung disease, older adults, children and teenagers, minority populations, and outdoor workers. At the *Unhealthy* AQI level (151-200), it's possible that everyone may experience health effects.

During the 2024 prescribed burn season, Nebraska experienced a total of 22 days with an Air Quality Index (AQI) for fine particulates ($PM_{2.5}$) in the *Moderate* range (29% of days) and no days in the *Unhealthy for Sensitive Groups* or *Unhealthy* range, as noted in the chart below. There were four days (5%) with *Moderate* AQI for ozone, one of which was concurrent with a *Moderate* AQI day for $PM_{2.5}$. During prescribed burn seasons for the previous five years (2019-2023) Nebraska has averaged 24 days in the *Moderate* category, about one day in the *Unhealthy for Sensitive Groups* category, and less than one day for the *Unhealthy* category.



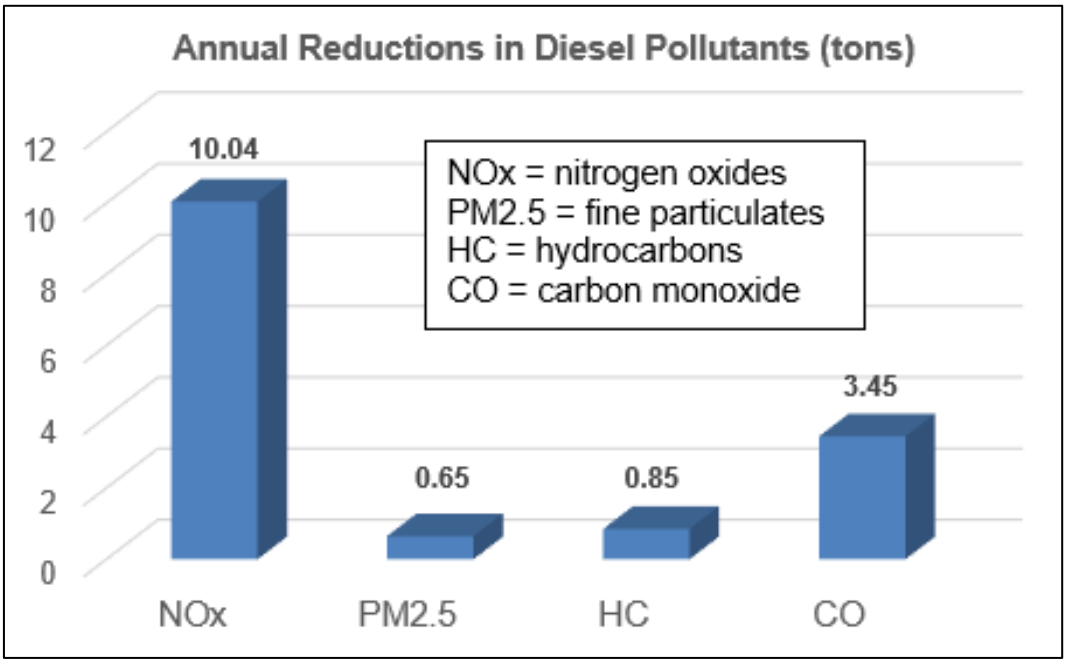
The 2024 wildfire season produced 71 days with *Moderate* AQI, with no days in the *Unhealthy for Sensitive Groups* or *Unhealthy* AQI range through the month of October. In 2023, the state experienced 70 days with an AQI of *Moderate* or higher; of these days, 21 were in the *Unhealthy for Sensitive Groups* AQI range and two were in the *Unhealthy* AQI range.

Though impacts from both prescribed burning and wildfires affect local air quality it has not compromised the State's attainment status. In fact, Nebraska remains one of the few states to comply with all of the NAAQS.

Nebraska Clean Diesel Rebate Program

The Department established the Nebraska Clean Diesel Program in 2008 to distribute federal funding received from the EPA to reduce diesel emissions, as authorized by Congress in the Diesel Emissions Reduction Act (DERA). The DERA program provides annual funding to states for the establishment of grant, rebate, and loan programs for the early replacement of diesel engines and vehicles and the installation of diesel emission controls. Starting in 2017, NDEE has elected to supplement the federal grant in most years with funds from Nebraska's portion of the *Volkswagen Diesel Emissions Environmental Mitigation Trust* (*VW Trust*; see next section), which earns bonus EPA funding.

For the Clean Diesel Rebate Program annual funding cycle that opened in October 2023, NDEE has awarded or expects to award $599,411 in rebates to 31 irrigation engine projects. The irrigation engine rebates are for replacement of a diesel irrigation engine with an electric motor (to power a surface pump) or for connecting an existing submersible pump directly to the electric grid. The rebate reimburses up to 60% of the cost of the electric equipment, installation, and required extension of electric service lines, up to a maximum reimbursement of $20,000. All replaced diesel engines must be scrapped in order to eliminate their emissions. Estimated annual reductions in diesel pollutants expected from these replacement projects are shown below.



2023-2024 Irrigation Engine Replacement Rebates: $599,411

Name	County	Replacement	Rebate Amount
Peter Baumgartner	Lincoln	Electric Motor	$20,000
Sheralee Boe	Madison	Electric Motor	$18,888
Peter E. Brummels	Cedar	Electric Motor	$20,000
Shane Czarnick	Nance	Electric Motor	$20,000
DBR Farms Inc.	Thayer	Electric Motor	$20,000
Eagle Creek Acres	Holt	Electric Motor	$19,603
Harry Feeny	Lincoln	Electric Motor	$20,000
Lori Fricke	Butler	Electric Motor	$20,000
Terry K. Harimon	Morill	Electric Motor	$20,000
Herman's Heritage LLC	Fillmore	Electric Motor	$20,000
Cody Jensen	Greeley	Electric Motor	$9,869
Keetle Farms Inc.	Antelope	Electric Motor	$16,711
Kemling Farms LLC	Perkins	Electric Motor	$20,000
Kerkman Sandhills Farms	Antelope	Electric Motor	$20,000
Collin Krupicka	Thayer	Electric Motor	$19,979
Eric Krupicka	Thayer	Electric Motor	$18,210
Maxwell-Zikmund LLC	Butler	Electric Motor	$20,000
Keith Reichmuth	Madison	Electric Motor	$20,000
Sandi Reichmuth	Madison	Electric Motor	$20,000
Robert Sandberg Jr.	Keith	Electric Motor	$20,000
Sanne Trust	Antelope	Electric Motor	$20,000
T&T Bader Farms	Butler	Electric Motor	$20,000
Nelson and Kelly Trambly	Franklin	Electric Motor	$17,933
Nelson F. and Maryetta Trambly	Franklin	Electric Motor	$20,000
Twin Pine Ranch	Custer	Electric Motor	$20,000
Matthew Winkelbauer	Holt	Electric Motor	$20,000
Adam Woitaszewski	Hall	Electric Motor	$20,000
Andrew Woitaszewski	Hall	Electric Motor	$18,218
Yindrick Farms LLC	Butler	Electric Motor	$20,000
Todd Yindrick	Butler	Electric Motor	$20,000
Bruce Young	Keith	Electric Motor	$20,000

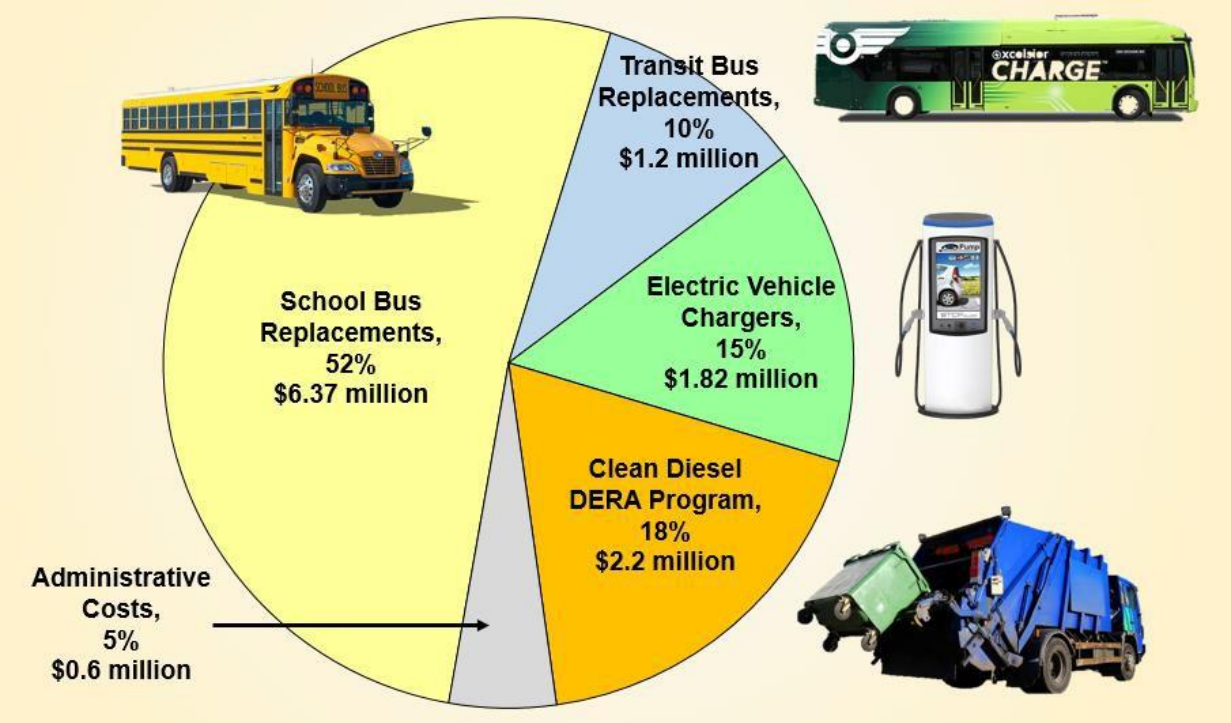
New electric motor and related equipment replacing a diesel engine at an irrigation well in Lincoln County, partially funded by the 2022 Nebraska Clean Diesel Rebate Program. Photo courtesy of the owner.

Volkswagen State Trust Activities

NDEE is the lead agency administering funds allocated to Nebraska from the *Volkswagen Environmental Mitigation Trust for State Beneficiaries, Puerto Rico, and the District of Columbia* (VW State Trust). The VW State Trust was established in 2017 as part of court settlements with Volkswagen AG and its subsidiaries to resolve charges that their diesel passenger vehicles were equipped with devices to circumvent emissions testing and allow them to emit excess nitrogen oxide gases in normal operation, in violation of the Clean Air Act. The initial allocation to Nebraska from the VW State Trust is approximately $12.25 million, which has been supplemented by over $238,000 in investment income. As directed by the Trust Agreement, these funds are to be used to undertake authorized actions to reduce nitrogen oxide (NOx) emissions in Nebraska.

Beneficiary Mitigation Plan

In April 2020, NDEE submitted a revised Beneficiary Mitigation Plan that summarized how Nebraska intended to use the funds allocated to it under the Trust. The following table and figure present the project types selected for funding in Nebraska and the percentage of funds allocated to each type.



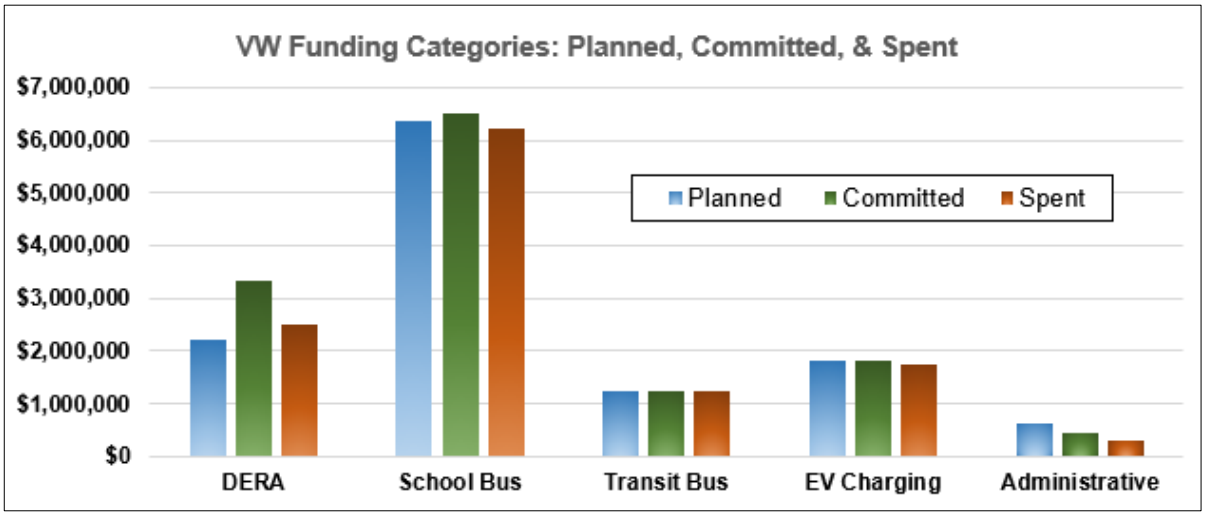
Planned Allocations of VW State Trust Funds by Mitigation Action		
Action	**Percent**	**Dollars**
Transit Bus Alternative Fuel Replacements (completed)	10%	$1,224,835
School Bus Diesel & Propane Replacements (completed)	52%	$6,369,141
Electric Vehicle Charging Infrastructure (completed)	15%	$1,818,224
DERA: Diesel Irrigation Engine, School Bus, & Truck Replacements	18%	$2,223,729
Administrative Costs*	5%	$612,417
TOTAL	100%	$12,248,347.48

* The Trust agreement allows reimbursement of administrative costs up to 15% of each funded project.

Nebraska's Beneficiary Mitigation Plan was intended to provide the public with insight into the Department's intentions for the use of the mitigation funds and information about the specific uses for which funding is expected to be requested. Nebraska may adjust its goals and specific spending plans at its discretion by providing an updated Beneficiary Mitigation Plan to the Trustee. Each state beneficiary must expend at least 80% of its initial allocation by October 2, 2027; otherwise, the unexpended funds will be reallocated to other beneficiaries that have complied with that guideline. By the end of FY2024, the Department expended 96% of the VW principal, meeting that threshold, and has set a goal of expending Nebraska's share of the funds by the end of 2027.

Nebraska Diesel Emission Mitigation Program

NDEE established the Nebraska Diesel Emission Mitigation Program to use VW State Trust funds for projects to mitigate NOx emissions in Nebraska. The program has carried out projects in all of the categories laid out in the Beneficiary Mitigation Plan. As of the end of June 2024, NDEE has requested Trust funds for ten projects and expended $11,980,565 of those funds. The distribution of spending in the different project categories is shown in the following chart. The transit bus, school bus, and electric vehicle charging rebate programs have been completed. Remaining funds are dedicated to DERA projects.



NDEE's Beneficiary Mitigation Plan set a goal to limit administrative costs to no more than 5% of Trust funds spent. To date only 2.4% of Trust funds spent have been for administrative costs.

Climate Pollution Reduction Planning Grant

In August 2023 NDEE received a $3 million Climate Pollution Reduction Planning Grant from the U.S. Environmental Protection Agency (EPA) to develop Nebraska's first state-wide climate action plans to reduce greenhouse gas (GHG) emissions and other harmful air pollutants in the state. The grant requires two key deliverables proposing measures to reduce GHG emissions: 1) a Priority Climate Action plan to propose high-priority, short-term, readily implemented measures in one or more economic sectors, and 2) a Comprehensive Climate Action Plan exploring longer-term measures covering all of the state's economy.

The Nebraska Priority Climate Action Plan (PCAP) is Nebraska's first statewide climate action plan. It proposes over a dozen voluntary, high-impact, readily-implemented measures to reduce greenhouse gas emissions in the state by 2030. The plan, which was submitted to EPA on March 1, 2024, was the result of a year-long planning effort that included significant input and advice from citizens and stakeholders across the state, including other state agencies, public power districts, agricultural trade groups, nonprofit and environmental organizations, and interested members of the public.

The plan includes measures that touch all sectors of Nebraska's economy and would provide benefits to both rural and urban communities. If implemented, the proposed voluntary measures and financial incentives would reduce air pollution, stimulate economic growth, create high-quality jobs, and enhance the quality of life for all Nebraskans. The planning effort included a significant focus on benefits to low-income and underserved rural and urban communities across the state. The measures included in the PCAP and their estimated greenhouse gas emissions reductions are listed in the table below. The reductions are expressed as millions of metric tons of CO_2 equivalents (MMT CO_2e)

Measure	Cumulative GHG Emissions Reductions through 2030 (MMT CO_2e)
Energy Efficiency and Electrification	**1.085**
Promote Energy Efficiency and Electrification Upgrades for Non-Residential Facilities	0.989
Incentives for Home Energy Efficiency Equipment Upgrades for Low- and Middle-Income Homeowners	0.074
Residential Pre-Weatherization Program	0.007
Incentives for Irrigation Well Conversion from Diesel to Electric	0.015
Solar Projects	**0.398**
Incentives for Micro-Solar Arrays for Critical Infrastructure in Low-Income Rural Communities	0.008
Funding for Solar Projects on Unused/Contaminated Land, Ag & Industrial Facilities, and Parking Lot/Feedlot Solar Canopies	0.390
Agriculture	**22.13**
Measures to Reduce Emissions in Agricultural Production: • Establish a Carbon Intensity Score Registry • Provide Incentives for Regenerative Agriculture Practices • Provide Incentives for Precision Agriculture Equipment	22.13
Transportation	**0.096**
Incentives for Alternative-Fuel and Electric Replacement of Diesel Vehicles	0.096
Incentives for New Public Electric Vehicle Charging Stations	Not Determined
Waste Management	**1.996**
Establish Hub-and-Spoke Anaerobic Digester/Biogas Hubs for Agricultural Waste	1.037

Incentives to Reduce Food Waste	0.946
Incentives for Production and Use of Biochar to Reduce Organic Waste and Sequester Carbon in Soil	0.013
TOTAL	**25.705**

Submission of the Priority Climate Action Plan qualified Nebraska to apply to EPA for funding to implement measures in the plan. In late March 2024 NDEE submitted an application for a Climate Pollution Reduction Implementation Grant, requesting $341 million dollars to implement eight of the measures in the PCAP. Announcement of awards was expected in July 2024.

In the second phase of the planning program, NDEE is developing a Comprehensive Action Plan (CAP) to propose short-term and long-term greenhouse gas reduction measures across all sectors of Nebraska's economy. Like the PCAP, this plan will propose voluntary measures and financial incentives that could produce environmental and economic benefits across Nebraska. The plan will assess the potential benefits of these measures statewide and for low-income and underserved communities, which include both urban and rural areas. The CAP, which is due by December 2025, will also propose long-term greenhouse gas reduction targets and analyze workforce impacts arising from the proposed actions and their associated training needs.

NDEE has established the ONE RED (Opportunity for Nebraska: Reducing Emissions and Decarbonization) program to continue with these planning activities. Beginning in fall 2024, the Department will undertake extensive outreach to stakeholder groups and the public for ideas, discussion, and comments. NDEE will invite stakeholders to join one or more sector-based workgroups to suggest and discuss potential GHG reduction measures and targets to guide development of an effective plan tailored to the needs of Nebraska.

Small Business and Public Assistance Program

The Small Business and Public Assistance program and associated Small Business Compliance Advisory Panel (SBCAP) were created to comply with the Clean Air Act Amendments of 1990 to assist businesses in complying with air quality regulations. However, the Department now provides the same compliance assistance services and support to the Water Quality, Land Management, and Energy Programs.

Key activities of this program include developing guidance and outreach materials; responding to outside requests for information; hosting training and informational workshops, webinars, and one-stop meetings to help new businesses determine their permit applicability; expanding partnerships; helping the regulated community understand their obligations under state and federal law; and promoting compliance and permit assistance visits to small businesses and municipalities.

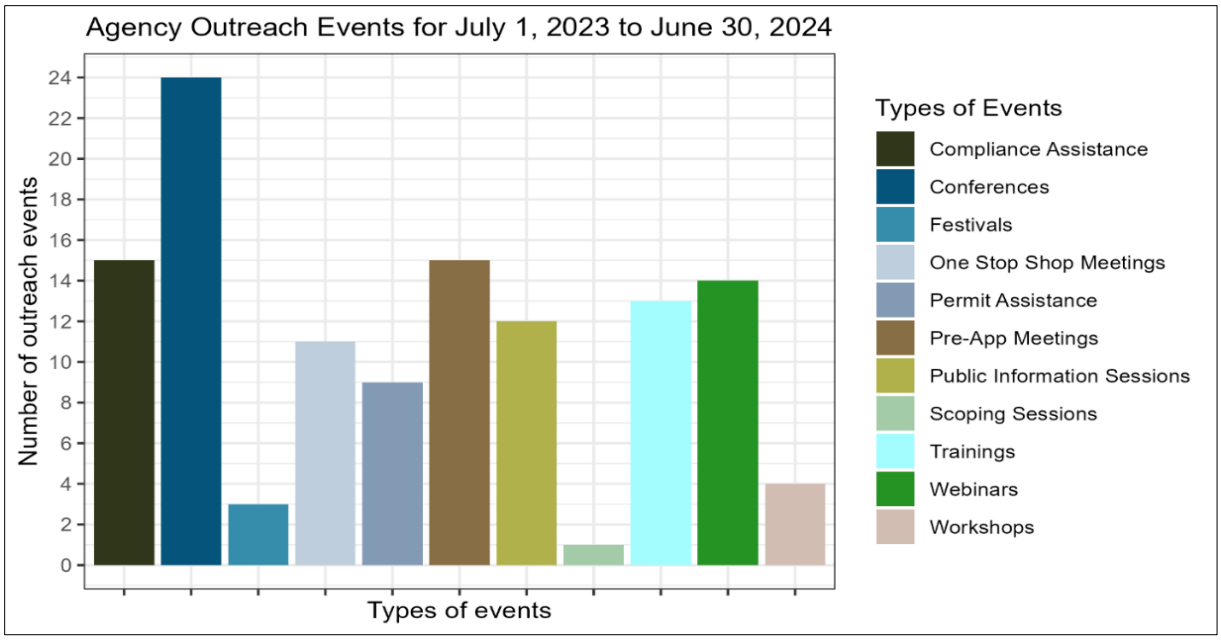
NDEE's internal Grow Nebraska Team (GNT) provides outreach to new businesses proposing operations in Nebraska within 10-days of a request for information, in addition to the services outlined below.

The following summarizes the primary compliance assistance activities offered by the agency.

- Compliance Assistance Visit (CAV): An on-site service offered by NDEE in response to a request by a business or regulated party to receive support for one or multiple environmental program areas to which they are currently subject or considering under proposed operations. Compliance assistance activities (see Individual Site Assistance/Training below) may be provided during an inspection; however, a CAV cannot be requested after an inspection that may result in enforcement until that issue is resolved. A CAV focuses on supporting the efforts of an entity to achieve voluntary compliance; however, it does not absolve it from receiving an enforcement action if egregious violations are found during the visit.
- Permit Assistance Visit (PAV): An on-site service (or meeting) offered by NDEE in response to a request by a business or regulated party to receive support under a new, modified, or existing permit to address permit related questions.
- One-Stop Permit Meeting: A One-Stop meeting allows for a newly proposed or expanding business and their selected representatives to engage with applicable NDEE permitting programs and other regulatory agencies. The goal of each meeting is to provide the permittee an opportunity to ask questions and receive direction toward attainment of the necessary permits to achieve environmental regulatory compliance.
- Scoping Meeting: A meeting within or outside of NDEE to introduce a new or proposed business to involved staff, programs, and agencies. The meeting may include a review of processes or technologies, tools, resources, and strategic partnerships to assist the business in making the appropriate contacts for applicable regulatory requirements or business needs.
- Individual Site Assistance/Training: An on-site service offered by NDEE in response to a request or during or after a Compliance Inspection.

Key accomplishments for the agency team during FY2024:

- Hosted and provided support to the Small Business Compliance Advisory Panel's annual meeting
- Participated in regular engagement opportunities with the Nebraska Industrial Council on the Environment (NICE), the Nebraska Natural Resource Districts and other industry and businesses interested in regulatory information
- NDEE programs provided nearly 121 outreach/training events/presentations to the public and regulated community. The events provided information, trainings and updates on agency programs.



- Provided webinars on the Climate Pollution Reduction Grants program and its development, lead remediation in schools program, an educational experience with international students on being a Nebraska environmental regulator, and litter and water grants applications
- Conducted five Permit Assistance Visits to municipal and industry permittees and coordinated four additional permit assistance meetings
- Hosted 11 One-Stop Permitting meetings where new and expanding businesses talk with NDEE experts from multiple program areas regarding permitting questions
- Programs processed approximately 21,600 compliance assistance and permit assistance phone calls from businesses and communities with compliance questions throughout the fiscal year
- Developed ten new guidance documents and revised nearly 25 others to assist the public and regulated community with information or direction regarding the general application of state statutes or regulations
- Maintained Permit Matrix information and resources. The Matrix assists small businesses with compliance-related topics by sharing links to guidance documents, program overviews, regulations, supporting NDEE web pages, and additional resources.
- Engaged in social media outreach via Twitter, Facebook, and LinkedIn, and monitoring of metrics in conjunction with the Public Information Office

The Department is committed to work on enhancements and improvements to its outreach and assistance activities which educate and inform Nebraska's regulated community in ways that will assist making regulatory compliance easy.