Nebraska Department of Environment and Energy

DRAFT

Nebraska 2024 Ambient Air Monitoring Network Plan

For the period 1 July 2024 through 30 June 2025

NDEE Document #24-011

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NEBRASKA

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This document fulfills the requirements of 40 CFR Part 58.10 for an annual plan for the ambient air quality monitoring conducted by the Nebraska Department of Environment and Energy, the Lincoln-Lancaster County Health Department, and the Douglas County Health Department.

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Acronyms, Abbreviations, and Definitions

Agencies/Organizations

DCHD - Douglas County Health Department

EPA - United States Environmental Protection Agency

EPA R7 - United States Environmental Protection Agency Region VII

LLCHD - Lincoln-Lancaster County Health Department

NDEE - Nebraska Department of Environment and Energy

Regulations

CFR - Code of Federal Regulations

DRR - Data Requirements Rule or 40 CFR Part 51 Subpart BB - Data Requirements for Characterizing Air Quality for the Primary SO_2 NAAQS

NAAQS - National Ambient Air Quality Standards

Title 129 - Nebraska Air Quality Regulations

Site Types

IMPROVE - Interagency Monitoring of Protected Visual Environments (monitoring performed to evaluate regional haze)

MDN - Mercury Deposition Network (a type of NADP site)

NADP - National Atmospheric Deposition Program (analysis of deposition components in precipitation. May include NTN and MDN sites)

NCore - National Core multi-pollutant monitoring stations. Monitors at these sites are required to measure particles ($PM_{2.5}$, speciated $PM_{2.5}$, $PM_{10–2.5}$), O_3, SO_2, CO, nitrogen oxides (NO/NO_y), Pb, and basic meteorology.

NTN - National Trends Network (a type of NADP site that analyzes for acidity, sulfate, nitrate, ammonium, chloride, and base cations (e.g., CA, Mg, K and Na))

SLAMS - State and Local Air Monitoring Stations

Monitor Terminology

AirNow - EPA web application that reports current local air quality conditions (airnow.gov).

AQS - Air Quality System, the name for EPA's air monitoring data base

FRM - Federal Reference Method used for determining compliance with the NAAQS

FEM - Federal Equivalent Method used for determining compliance with the NAAQS

PWEI - Population Weighted Emissions Index (a term defined in 40 CFR Part 58 Appendix D that relates to SO_2 monitoring requirements)

2022 Network Plan - Nebraska's *2022 Ambient Air Monitoring Network Plan*

2023 Network Plan – Nebraska's *2023 Ambient Air Monitoring Network Plan (i.e., this document)*

Concentration Units

ppb - Parts per billion (a volume/volume concentration unit)

ppm - Parts per million (a volume/volume concentration unit)

mg/m^3 - Milligrams per cubic meter (a mass/volume concentration unit)

$\mu g/m^3$ - Micrograms per cubic meter (a mass/volume concentration unit)

Acronyms, Abbreviations, and Definitions (continued)

Pollutants

CO - Carbon Monoxide

NO - Nitric Oxide

NO_2 - Nitrogen Dioxide

NOx - Oxides of nitrogen, including NO, NO_2, and NOy

NOy - Total reactive oxides of nitrogen. The parameter NOy – NO measured at NCore sites approximates the concentration of NO_2 but may report higher than the actual concentration.

O_3 - Ozone

Pb - Lead

TSP - Total Suspended Particulates

TSP-Pb - Lead sampled using a TSP sampler

$PM_{2.5}$ - Particulate matter with an average diameter equal to or less than 2.5 micrometers or microns (reported as $\mu g/m^3$ with air volumes measured at local conditions)

PM_{10} - Particulate matter with an average diameter equal to or less than 10 micrometers or microns (reported as $\mu g/m^3$ with air volumes measured at standard conditions (25º C, 1 atm))

$PM_{10-2.5}$ - The difference between PM_{10} and $PM_{2.5}$ (both being calculated at local conditions)

SO_2 - Sulfur Dioxide

SOx - Group of sulfur oxides, including SO_2 and SO_3

Definitions

Criteria Pollutants – The six pollutants for which National Ambient Air Quality Standards (NAAQS) have been established: carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, particulates, and lead.

in situ - A Latin phrase meaning *in the place*. As used in this report it refers to the formation of pollutants in the atmosphere. For example, ozone is formed *in situ* from the photochemical reaction of pollutant precursors. Ozone is not emitted directly from sources. $PM_{2.5}$ and haze are also formed *in situ*, although they are also emitted by sources. PM_{10} and CO, on the other hand, are largely emitted from sources; *in situ* formation being of minimal importance. NOx and SOx are emitted and then undergo transformations to NO_2 and SO_2; they also can play a role in the *in-situ* formation of ozone and $PM_{2.5}$.

Census Terms

Core-Based Statistical Area (CBSA) – a geographic area defined by the Office of Management and Budget containing an urbanized core of at least 10,000 people and adjacent areas that have a high degree of social and economic integration with the core. CBSAs are made up of whole counties or county equivalents.

Metropolitan Statistical Area (MSA) – a CBSA that has at least one urbanized area with population of 50,000 or more.

Micropolitan Statistical Area (MiSA) – a CBSA that has at least one urban cluster with population at least 10,000 but less than 50,000.

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Nebraska 2024 Ambient Air Monitoring Network Plan

I. Introduction and Purpose

This Nebraska 2024 Ambient Air Monitoring Network Plan (hereafter referred to as the "2024 Network Plan") was prepared to meet federal requirements set forth in 40 CFR Part 58.10. State air monitoring agencies are required to submit to the U.S. Environmental Protection Agency (EPA) by July 1 each year an ambient air monitoring network plan with the following purposes:

- Describe the current ambient air monitoring network, including the location and purpose of each monitoring site.
- Describe changes made in the network since submission of the previous plan.
- Review whether the ambient air monitoring network meets the requirements set forth in 40 CFR Part 58 Appendices A, C, D, and E.
- Describe planned and possible changes in the ambient air monitoring network in the upcoming year, as best they can be determined at the time the plan is prepared.

II. Public Participation

Federal regulations require that annual ambient air monitoring network plans must be made available for public inspection and comment for at least 30 days prior to submission to the EPA. The Nebraska Department of Environment and Energy (NDEE) meets this requirement by posting the plan on the NDEE website (http://deq.ne.gov/Publica.nsf/Pubs_Air_Amb.xsp). Written comments regarding this 2024 Network Plan may be submitted to the Nebraska Department of Environment and Energy during the 30-day inspection period as provided below:

Mail:

Nebraska Department of Environment and Energy
Attn: David Adams – Monitoring Section
PO Box 98922
Lincoln, NE 68509-8922

Email:

NDEE.airquality@nebraska.gov

The deadline for submittal of written comments can be found on the NDEE website. Informal inquiries may also be directed to David Adams at 402-471-4159. Verbal comments are not necessarily included or addressed as review comments.

III. Purpose of Ambient Air Quality Monitoring

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants that are common in outdoor air, come from numerous and diverse sources, and are considered harmful to public health and the environment. Standards have been established for six "criteria" air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), lead, and particle pollution, which is subdivided into particulate matter less than 10 micrometers in diameter (PM_{10}) and particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$).

The statute established two types of national standards for each criteria pollutant. Primary standards set limits to protect public health, including the health of sensitive populations such as people with asthma, children, and the elderly. Secondary standards set limits to protect the public welfare and the environment, including protection against damage to animals, crops, vegetation, and to prevent visibility impairment. The current primary and secondary standards are shown in Table III-1. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu g/m^3$).

An ambient air monitoring network serves several purposes:

(1) Provide air pollution data to the public in a timely manner.
(2) Support compliance with ambient air quality standards and pollution control strategies.
(3) Support air pollution research studies.

An area that is in compliance with the standard for a criteria pollutant is said to be in *attainment*. All areas of Nebraska are currently in attainment for each of the NAAQS.

Table III-1. National Ambient Air Quality Standards (NAAQS) in effect in 2023.

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead		Primary and Secondary	Rolling 3-month average	0.15 μg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and Secondary	1 year	53 ppb (2)	Annual mean
Ozone (O_3)		Primary and Secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Primary	1 year	12.0 μg/m^3 (4)	Annual mean, averaged over 3 years
		Secondary	1 year	15.0 μg/m^3	Annual mean, averaged over 3 years
		Primary and Secondary	24 hours	35 μg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24 hours	150 μg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		Primary	1 hour	75 ppb (5)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 μg/m^3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015; retained in December 2020. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. In October 2021, EPA announced it will reconsider the 2020 decision to retain the 2015 O_3 NAAQS.
(4) A final rule published March 6, 2024, and effective May 6, 2024, revised the primary annual $PM_{2.5}$ standard, lowering it to 9 μg/m^3. The rule also revised category breakpoints for the $PM_{2.5}$ Air Quality Index. The agency retained the current primary and secondary 24-hour standards for $PM_{2.5}$ and PM_{10}.
(5) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet one year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

When an air quality monitor records pollutant levels that exceed the NAAQS limit, that measurement is termed a "NAAQS exceedance". For most criteria pollutants a single recorded exceedance does not violate the standard; monitor data from the most recent three-year period must be analyzed to make that determination. Federal regulations specify for each pollutant how the 3-year monitor data must be analyzed to calculate a "design value" that is compared to the level of the NAAQS to establish whether or not the measured air quality is in attainment with the standard. The Form column in Table III-1 specifies how the design value is calculated for each criteria pollutant. The most recent design values for Nebraska's ambient air monitors are presented in Appendix B.

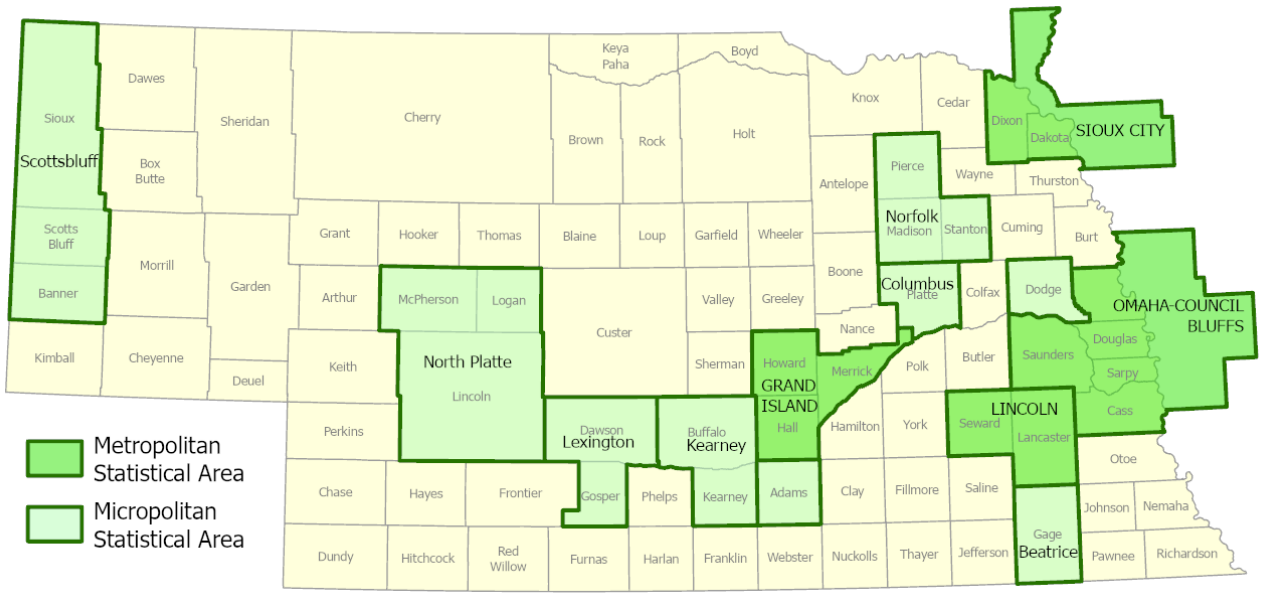
An ambient air monitoring network may include a variety of types of sites to provide information on peak air pollution levels, typical levels of exposure, air pollution levels near significant sources, and pollutant transport. EPA has identified the following general site types:

- Sites located to determine the highest concentrations expected to occur in the area covered by the network.
- Sites located to measure typical concentrations in areas of high population density.
- Sites located to determine the impact of significant sources or source categories.
- Sites located to determine general background levels.
- Sites located to determine the extent of regional pollutant transport among populated areas.
- Sites located to measure air pollution impacts on visibility, vegetation, or other welfare-based impacts.

IV. Nebraska Metropolitan and Micropolitan Statistical Areas

Discussions in this document of the ambient air monitoring network in Nebraska are organized around the Metropolitan Statistical Areas (MSAs) and Micropolitan Statistical Areas (MiSAs) in which the monitors are located. Nebraska includes all or part of four Metropolitan Statistical Areas along with nine Micropolitan Statistical Areas. Each of these federally-defined urbanized units consists of one or more entire counties. A map of Nebraska's MSAs and MiSAs is shown in Figure IV-1 below.

Figure IV-1. Nebraska Metropolitan and Micropolitan Statistical Areas (MSAs and MiSAs) *



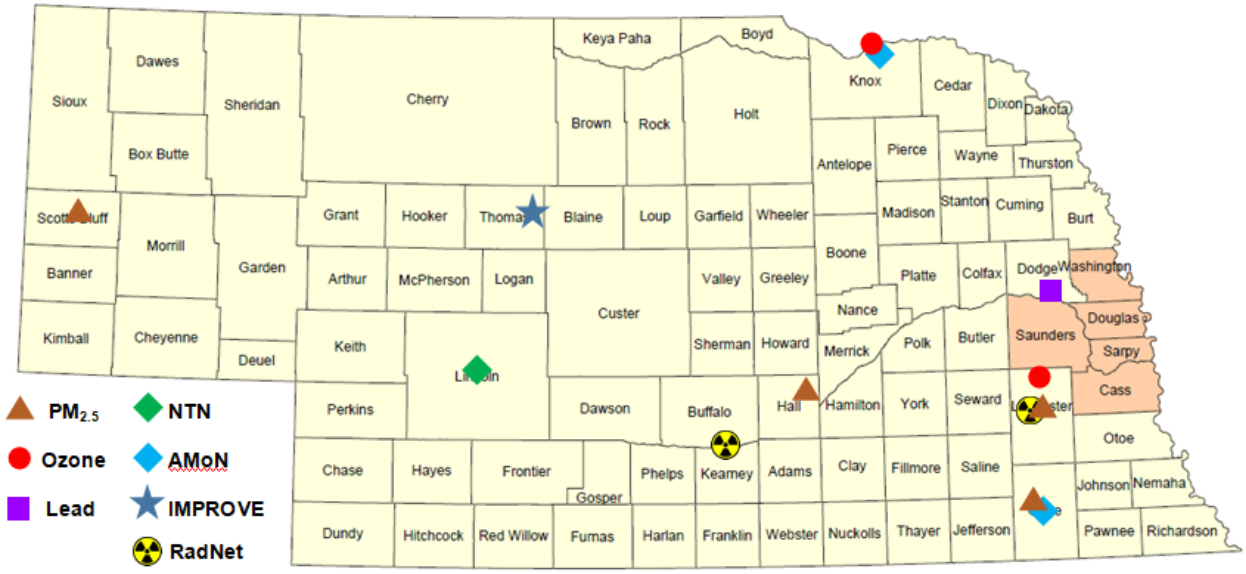
** Areas as defined by the U.S. Office of Management and Budget, September 2018.*

V. Overview of Current Nebraska Ambient Air Monitoring Network

Nebraska's current air monitoring network is summarized in Table V-1 below, and monitor locations are shown in Figures V-1 and V-2 below. The network description tables in Appendix A provide more detailed information on the network, including site locations and monitoring objectives.

Nebraska's State and Local Air Monitoring Stations (SLAMS) network includes sites for ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, lead, PM_{10}, $PM_{2.5}$, and $PM_{10-2.5}$. A National Core Multipollutant Monitoring Network (NCore) station is located in Omaha to provide continuous monitoring of particles, pollutant gases, and meteorology. Monitors at the SLAMS sites are subject to 40 CFR Part 58 requirements and are used for NAAQS attainment determinations. The network is operated by the Nebraska Department of Environment and Energy and two local agencies: the Douglas County Health Department (DCHD) and the Lincoln-Lancaster County Health Department (LLCHD).

Figure V-1. Nebraska Air Quality Monitoring Sites Outside of the Omaha-Council Bluffs Metropolitan Statistical Area, 3/31/2024



$PM_{2.5}$
Lincoln (Lancaster County)
Homestead National Historic Park (Gage County)
Grand Island (Hall County)
Scottsbluff (Scottsbluff County)

Ozone
Davey (Lancaster County)
Santee Sioux (Knox County; CASTNET site operated by EPA)

Lead
Fremont (Dodge County)

National Atmospheric Deposition Program (NADP)
North Platte (Lincoln County): NTN (National Trends Network)
Santee (Knox County): AMoN (Ammonia Monitoring Network)
Homestead (Gage County): AMoN

IMPROVE
Nebraska National Forest (Thomas County)

RadNet
Lincoln (Lancaster County), Kearney(Buffalo County)

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

EPA operates other specialized ambient air monitoring sites in Nebraska that are not part of NDEE's SLAMS network and are not used for NAAQS attainment determinations. These sites are part of the CASTNET, IMPROVE, NAPD, and RadNet networks.

The Clean Air Status and Trends Network (CASTNET) was established to assess trends in pollutant concentrations and dry deposition of acidic sulfur and nitrogen compounds. These sites also measure hourly ambient ozone concentrations. The ozone monitoring site in the Santee Sioux reservation in Knox County shown in the map above is a CASTNET site.

Interagency Monitoring of Protected Visual Environments (IMPROVE) sites host fine particulate and particulate speciation monitors intended to provide information for studying regional haze that may impact Class I National

Park and wilderness areas. The NDEE provides administrative support (with EPA funding) for one IMPROVE site at the Nebraska National Forest near Halsey, NE.

Four locations in Nebraska are part of the National Atmospheric Deposition Program (NADP), which includes several networks that measure surface deposition of air pollutants. The site at Mead (Saunders County) is part of the Mercury Deposition Network (MDN), which measures mercury concentrations in precipitation (rain and snow). The Mead and North Platte (Lincoln County) sites are part of the National Trends Network (NTN), which measures several chemicals in precipitation, including calcium, magnesium, sodium, potassium, sulfate, and nitrate. The Ammonia Monitoring Network (AMoN) measures ammonia concentrations in the air at rural sites, including the Santee Sioux CASTNET site and a location at Homestead National Historic Park. The NDEE provides administrative support (with EPA funding) for sample analyses for the NADP sites in the state.

Table V-1. Nebraska Ambient Air Monitoring Network on March 31, 2024. (1)

	DCHD Omaha MSA (2)(3)	NDEE Cass County (4)	LLCHD Lincoln MSA	NDEE Other Areas	Total
SLAMS Sites (includes NCore)	7 (5)	1	2	4	14
IMPROVE (6)	0	0	0	1	1
NADP (6)	1	0	0	3	4
CASTNET (6)	0	0	0	1	1
Total Monitoring Sites	8	1	2	9	20
Sites by Pollutant: SLAMS Sites including NCore (3)					
Ozone	2 (5)	0	1	0	3
Carbon Monoxide	2	0	0	0	2
Nitrogen Oxides	1	0	0	0	1
Sulfur Dioxide	2	0	0	0	2
PM_{10}	2 (5)	1	0	0	3
$PM_{2.5}$	4	0	1	3	8
$PM_{10-2.5}$	1	0	0	0	1
$PM_{2.5}$ Speciation	1	0	0	0	1
Lead	0	0	0	1 (7)	1
Total Pollutant Sites	15 (3)	1	2	4	22

Footnotes:

(1) This table summarizes the number of operating sites as of 3/31/24 in the NE SLAMS network (including NCore) by operating agency, as well as IMPROVE and NADP sites in Nebraska.

(2) The Omaha MSA encompasses five NE counties: Cass, Douglas, Sarpy, Saunders, & Washington. DCHD operates sites in Douglas, Sarpy & Washington counties. NDEE operates a site in Cass County.

(3) There were two multi-pollutant monitoring sites in the Omaha MSA in 2022: 1616 Whitmore – SO_2 & Ozone (2 pollutants); and NCore (42nd & Woolworth) – CO, NO-NOy, O_3, SO_2, and PM (8 pollutants). The number of monitoring sites by individual pollutant is thus greater than the number of monitoring locations within the Omaha MSA and for the state as a whole.

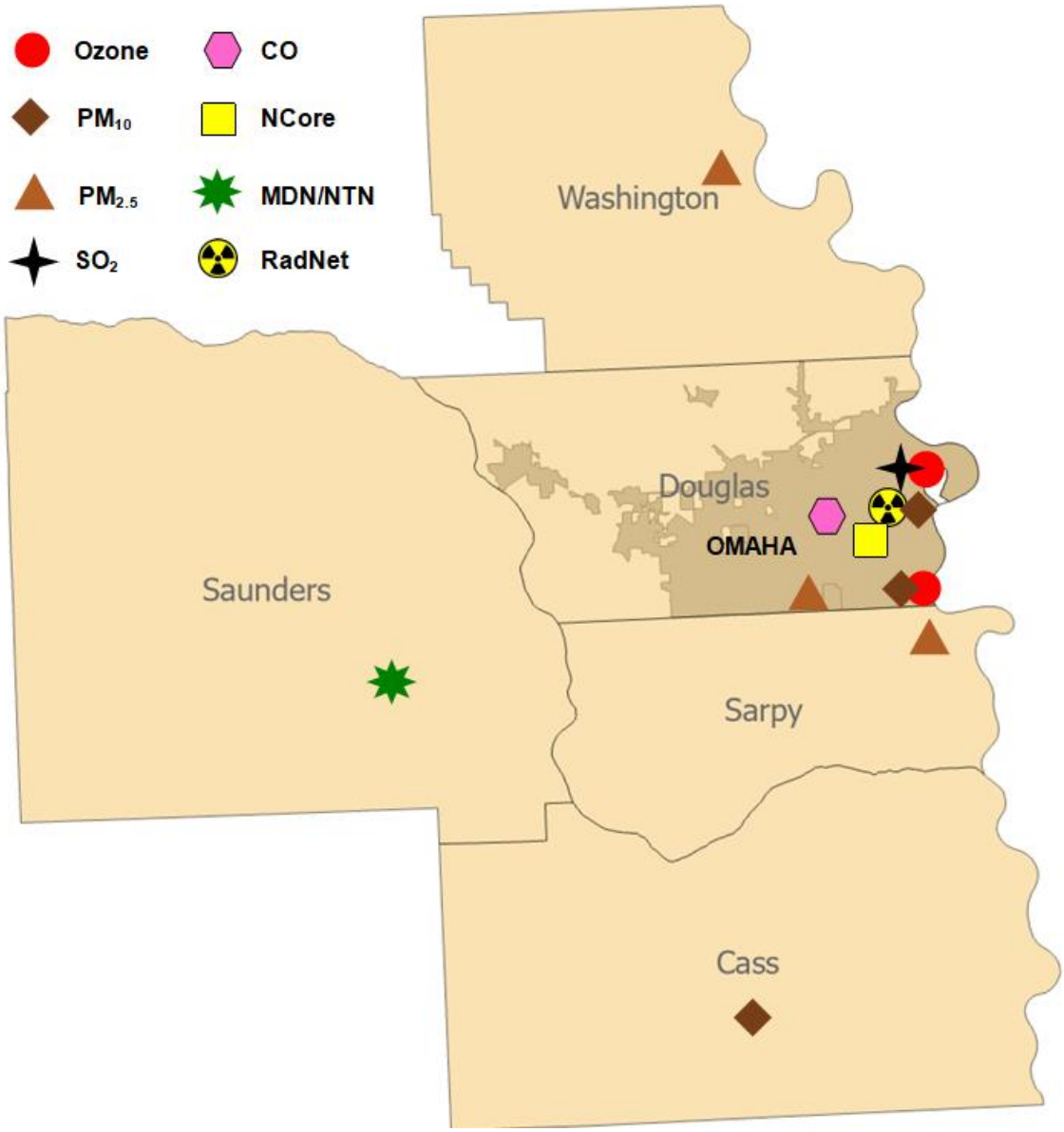
(4) Cass County has limestone mining and processing facilities, which are subject to specific air emission rules for the county set forth in Chapter 21 of Nebraska Administrative Code Title 129 – Nebraska Air Quality Regulations.

(5) Counts do not include the South Omaha ozone-PM_{10} site currently closed for relocation.

(6) See text for discussion of CASTNET, IMPROVE, and NADP sites.

(7) The lead monitor site in Fremont was closed in 2018 and reopened at a nearby location in July 2023.

Figure V-2. Air Quality Monitor Locations in the Nebraska Portion of the Omaha-Council Bluffs Metropolitan Statistical Area, 3/31/2024.



NCore
4102 Woolworth Avenue

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

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

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

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

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

National Atmospheric Deposition Program
Mead, Saunders County: MDN (Mercury Deposition Network), NTN (National Trends Network)

RadNet
Omaha

RadNet is a nationwide system that monitors air, precipitation, and drinking water to track radiation in the environment. RadNet sample testing and monitoring track changes in normal background levels of radiation and can also detect higher radiation levels during a radiological incident. RadNet air monitoring sites are located in Omaha, Lincoln, and Kearney. These stations continuously monitor and report gamma ray levels and also capture airborne particulates for laboratory analysis to detect radioactive particles.

VI. Nebraska Ambient Air Monitoring Network: January 1, 2023, through March 31, 2024

This section describes Nebraska's Ambient Air Monitoring Network in place from January 1, 2022, through March 31, 2023, and changes made during that period. Detailed information on individual monitoring sites, including purpose, scale, monitor specifications, and start dates is contained in Appendix A.

This section is organized around the Metropolitan Statistical Areas (MSAs) and Micropolitan Statistical Areas (MiSAs) in which monitoring is conducted.

A. Omaha-Council Bluffs MSA Sites Operated by the Douglas County Health Department (DCHD)

DCHD currently operates an ambient air network of seven sites in Douglas, Sarpy, and Washington Counties, Nebraska. Multi-pollutant monitoring is currently conducted at two of the sites:

- The NCore site monitors for eight pollutant parameters (CO, NOy/NO, O_3, SO_2, $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, and $PM_{2.5}$ speciation), as well as meteorological parameters and atmospheric radiation (RADNET*).
- The 1616 Whitmore site has both SO_2 and ozone monitors.

In addition, there are single-pollutant monitoring sites for carbon monoxide (one), $PM_{2.5}$ (three), and PM_{10} (one). The Omaha area monitoring network is therefore more extensive than the sevent-site total might indicate; if the pollutants are counted separately, there are 15 pollutant monitoring sites. See Appendix A for detailed information on the sites operated by DCHD.

NDEE and Iowa DNR share responsibilities for air quality monitoring in the Omaha-Council Bluffs MSA. Iowa currently relies on monitors in the Nebraska portion of the MSA to meet minimum monitoring requirements for ozone, $PM_{2.5}$, PM_{10}, and SO_2.

Several issues and changes have occurred or are in progress in the DCHD monitoring network in Omaha since January 2023.

1. Continued closure of the South Omaha Ozone-PM_{10} Monitoring Site Pending Relocation

Douglas County Health Department (DCHD) operated an ozone and PM_{10} monitoring site at 2411 O Street in south Omaha beginning in 1978. In late 2020 the owner of that property requested the removal of the equipment. Ozone monitoring ceased at the end of October 2020 (the end of the required ozone monitoring season), and PM_{10} monitoring ceased at the end of March 2021. Since then DCHD has had discussions with owners at several potential new sites, but at this time an alternative site in south Omaha has not yet been determined. The department continues working to find a suitable site with a willing property owner.

2. American Rescue Plan Continuous Monitor Replacements in Omaha

NDEE has provided American Rescue Plan grant funds to DCHD to replace older continuous monitoring equipment at several sites in the Omaha area. Replacements have been completed or are in progress at the following sites:

- Omaha NCore: $PM_{2.5}$, ozone, and SO_2 monitors
- 1616 Whitmore Street: SO_2 monitor

3. Modifications to $PM_{2.5}$ Monitoring at Berry Street and NCore Sites

As mentioned in the 2023 Network Plan, NDEE has provided American Rescue Plan grant funds to DCHD to replace the primary and collocated filter-based $PM_{2.5}$ samplers at the Berry Street location in Omaha (31-055-0052) with a continuous monitor and to replace an older continuous $PM_{2.5}$ monitor at the Omaha NCore site (31-055-0019) with a new continuous monitor. At the request of Douglas County Health Department, the sequential samplers from the Berry Street site will be relocated to the NCore monitoring site, making this the collocated $PM_{2.5}$ site in the Omaha-Council Bluffs MSA. These changes were approved by the Regional Administrator in January 2023 and are still in progress.

4. Replacement of 19th and Burt Street PM_{10} Samplers

High-Volume sequential PM_{10} samplers at the 19th and Burt Street site (31-055-0054) have been replaced by an E-BAM continuous PM_{10} monitor, which became operational on April 1, 2024.

B. Omaha-Council Bluffs MSA Site Operated by NDEE

NDEE operates a MetOne BAM 1020 continuous PM_{10} sampler at the Weeping Water wastewater treatment plant in Cass County. This is a population and source-oriented site that monitors nearby limestone mining and processing facilities in the surrounding rural area.

C. Lincoln MSA Sites Operated by the Lincoln-Lancaster County Health Department (LLCHD)

LLCHD operates two SLAMS monitoring sites:

- A $PM_{2.5}$ site at 3140 N Street in Lincoln, and
- An ozone site in Davey (northern Lancaster County).

The 3140 N Street $PM_{2.5}$ site has three monitors: a primary filter-based FRM sampler, a collocated filter-based FRM sampler, and a MetOne BAM 1020 FEM continuous monitor. Data from the FRM samplers is reported to EPA's AQS database and used to demonstrate NAAQS compliance. Data from the continuous monitor is transmitted to AirNow but is not reported to AQS.

NDEE has provided American Rescue Plan Grant funds to LLCHD to replace the continuous ozone monitor in Davey (completed) and to replace one of the FRM samplers at the 3140 N Street with a newer model (equipment received, replacement pending).

D. Sioux City MSA

There are no monitoring sites in the Nebraska portion of the Sioux City MSA (Dakota and Dixon Counties). There is currently one monitoring site in the Iowa portion of the MSA, a $PM_{2.5}$ site in Sioux City operated by the Iowa DNR.

The South Dakota Department of Agriculture and Natural Resources (DANR) operated a multi-pollutant site for SO_2, NO_2, O_3, PM_{10}, and $PM_{2.5}$ in Union County beginning in 2009. Nebraska and Iowa relied on the Union County monitoring site to meet minimum monitoring requirements for ozone in the Sioux City MSA. The 2021 South Dakota Ambient Air Monitoring Annual Plan stated that the contract for this site would expire in 2022, and the landowner indicated they did not wish to renew the contract. According to AQS records, monitoring of all pollutants at this site ceased on 9/30/2021. A replacement ozone monitoring site will need to be established within the Sioux City MSA to meet the minimum monitoring requirements set forth in 40 CFR Part 58 Appendix D. After negotiations between EPA Region 7 and the three states, Iowa DNR is expected to establish an ozone monitoring site in Sioux City, IA, the portion of the MSA expected to have the highest ozone concentrations.

Based on population size and ambient PM levels measured at the Iowa and South Dakota sites, $PM_{2.5}$ monitors are not currently required in the Sioux City MSA (see Table C-2 in Appendix C).

E. Grand Island MSA

NDEE began operating a filter-based FRM $PM_{2.5}$ sampler on the roof of Grand Island Senior High School in 2004. In 2019 NDEE acquired a continuous MetOne BAM 1020 Federal Equivalent Method (FEM) monitor as a replacement for the filter-based sampler. However, this rooftop location did not allow for a climate-controlled shelter required for operation of the continuous monitor, and NDEE was unable to obtain permission for a shelter elsewhere on the school grounds. As a result, NDEE relocated the Grand Island monitoring site about 2 miles south-southwest to a Nebraska Department of Transportation lot in Grand Island. The new site began operating on 11/26/2019, and the Grand Island Senior High School site was closed on 3/31/2020. The Grand Island continuous $PM_{2.5}$ data is reported to AirNow and to AQS.

F. Beatrice MiSA

In accordance with Nebraska's 2021 Network plan, in June 2021 NDEE established a new $PM_{2.5}$ monitoring site at Homestead National Historical Park, three miles west of Beatrice. This site has a primary continuous FEM monitor and a collocated sequential (filter-based) FRM sampler that samples every third day. Data from the continuous monitor is transmitted to AirNow. This site assists with background surveillance and is in the potential path of smoke moving northward from spring prescribed burns in the Kansas Flint Hills.

G. Scottsbluff MiSA

NDEE operates a $PM_{2.5}$ monitoring site at Scottsbluff Senior High School. A filter-based FRM sampler operated at this location on a 3-day sampling schedule until 3/24/2020, when a MetOne BAM 1020 FEM continuous monitor was installed at the same location. NDEE staff were unable to correctly update the monitor information in the EPA AQS under the existing AIRS ID, so a new AIRS ID was assigned and the previous one marked as closed. Recently, the old AIRS ID information was updated successfully, and the site has resumed use of the former ID to ensure data continuity. The Scottsbluff continuous $PM_{2.5}$ data is reported to AirNow in addition to AQS.

H. Fremont MiSA

NDEE operated primary and collocated total suspended particulate lead samplers at 1255 Front Street in Fremont beginning in 2010 to provide source-oriented monitoring of the Magnus LLC facility, which casts bronze railroad bearings. The site owner notified the Department in March 2018 that he no longer wished to host the lead monitors, which were removed from this location at the end of September 2018. After a protracted search and negotiations, an alternative site at an adjacent property was established and the samplers resumed operation on July 1, 2023.

VII. Considerations for Network Planning

A. EPA Air Monitoring and Network Design Requirements

The Nebraska Ambient Air Monitoring Network must comply with the applicable requirements of 40 CFR Part 58 Appendices A through E. As the review in Appendix C of this plan documents, the Nebraska network operated by NDEE, DCHD, and LLCHD is meeting all of the applicable requirements of 40 CFR Part 58 Appendices A, C, D, and E except for the requirement for one ozone monitoring site in the Sioux City MSA. As noted in section VI.D above, Iowa DNR is expected to establish an ozone monitoring site in Sioux City, Iowa.

Part 58 Appendix B applies to Prevention of Significant Deterioration (PSD) monitoring as part of New Source Review. Monitoring required for PSD is generally conducted by the source rather than a state or local monitoring agency. Therefore, compliance with Appendix B is not directly addressed in this network plan. No pre-construction monitoring took place in Nebraska during 2023.

40 CFR Part 58 Appendix A Section 3.2.3 specifies quality control sampling procedures for $PM_{2.5}$ with respect to Federal Reference Method (FRM) and Federal Equivalent Method (FEM) samplers. This section requires that for each distinct monitoring method (FRM or FEM) that a Primary Quality Assurance Organization (PQAO) utilizes as a primary monitor, there must be a collocated quality control monitor at 15% of the monitor sites, with a minimum of one collocated monitor. The first collocated monitor must be a designated FRM monitor. NDEE operates primary FEM samplers at three sites (Homestead, Grand Island, and Scottsbluff) with one collocated FRM sampler at Homestead, which meets this collocation requirement. DCHD operates collocated FRM samplers at one site in Omaha, which also satisfies this collocation requirement.

B. Air Quality and NAAQS Attainment

Nebraska's ambient air monitoring data for 2021 through 2023 show that all monitoring sites in Nebraska (and sites in portions of the Omaha and Sioux City MSAs in adjacent states) are in attainment with the NAAQS except for the non-regulatory ozone site at Santee. See the monitoring data tables in Appendix B for the detailed results.

1. Ozone

The current NAAQS for ozone (O_3) of 0.070 parts per million (ppm; or 70 parts per billion) for both the primary and secondary standard was set in 2015 and retained in 2020. The previous (2008) standard was 0.075 ppm. In October 2021 EPA announced that it would reconsider the previous administration's decision to retain the 2015 standard, with a target completion date at the end of 2023. On March 15, 2023, EPA released for public comment a draft Policy Assessment that stated a preliminary conclusion to retain the current standard without revision and revised the expected date for a final decision to spring 2024. In a letter to the EPA Administrator dated June 9, 2023, the EPA Clean Air Scientific Advisory Committee stated that all but one of the committee members disagreed with EPA's recommendation to retain the current primary and secondary standards and instead recommended revising the NAAQS level to between 55 and 60 ppb to be protective of public health. In August 2023 EPA announced a new review of the ozone NAAQS to ensure the standards reflect the most current relevant science.

Nebraska's ozone monitoring network includes four sites in the Omaha and Lincoln MSAs plus an EPA-operated nonregulatory site in the Santee Sioux reservation in northeast Nebraska. (An ozone monitoring site in Union County, SD, in the Sioux City MSA closed at the end of September 2021.) Ozone monitoring is only required in Metropolitan Statistical Areas (MSAs), with the required number of monitors set by population and whether the most recent ozone Design Values (DVs) are greater or less than 85% of the ozone NAAQS. Currently only the Omaha-Council Bluffs and Sioux City MSAs require ozone monitoring. The minimum ozone monitoring requirement is met in the Omaha-Council Bluffs MSA, but replacement of the Sioux City MSA ozone monitoring site is needed to meet this requirement.

As shown in Table VII-1 and in Appendix B, Table B-1, the 2021-2023 ozone DVs at monitoring sites in Nebraska all exceeded 85% of the ozone NAAQS. Sites in the Omaha and Lincoln MSAs remained in attainment with the standard, but both Omaha sites were only a few percent below that level. The DV of 71 at the non-regulatory Santee site exceeded the standard (101.4% of the NAAQS). Data from all four ozone monitoring sites in Nebraska are reported to AirNow and are used to compute the daily Air Quality Index (AQI). As shown in Table VII-1, AQI values for ozone were in the Good range less than 80% of measurement days at all four Nebraska sites. Each of the sites experienced days with AQI in the Unhealthy for Sensitive Groups range, with the highest number at the Whitmore and Santee sites. Both of these sites also had one day in the Unhealthy range.

Table VII-1. Ozone 2023 Design Values as Percentage of the NAAQS and Air Quality Index (AQI) Status (Number of Days and Percentage of Days Per Category) for Nebraska Locations.

	Design Value as Percent of NAAQS	Good		Moderate		Unhealthy for Sensitive Groups		Unhealthy	
		Days	%	Days	%	Days	%	Days	%
Omaha NCore (1)	97.1	278	78.3	63	17.7	1	0.3	0	0
1616 Whitmore, Omaha (2)	98.6	157	67.4	55	23.6	20	8.6	1	0.4
Davey (Lancaster Co.) (2)	85.7	189	76.8	55	22.4	3	1.2	0	0
Santee (Knox Co.) (1)	101.4	271	79.5	56	16.4	13	3.8	1	0.3

(1) Ozone monitoring is active year-round, but total number of monitoring days may be less than 365 due to maintenance and down-time.
(2) Ozone monitoring conducted between March 1 and October 31.

The highest daily ozone levels at Nebraska monitoring locations during 2023 occurred from the middle of May to the end of June, when Nebraska and the surrounding states were affected by persistent smoke from forest fires in western and eastern Canada. As shown in Table VII-2, during this period there were 24 days with maximum daily 8-hour ozone levels exceeding the ozone standard of 70 ppb. Exceedances occurred at more than one site on most of these dates, and the AQI values at the affected sites were in the Unhealthy for Sensitive Groups to Unhealthy ranges.

Table VII-2. Maximum Daily 8-hour OzoneLevels (in ppb) at Nebraska Monitoring Locations for 24 Dates in May and June 2023 with Levels Exceeding the Ozone NAAQS (70 ppb) (1)

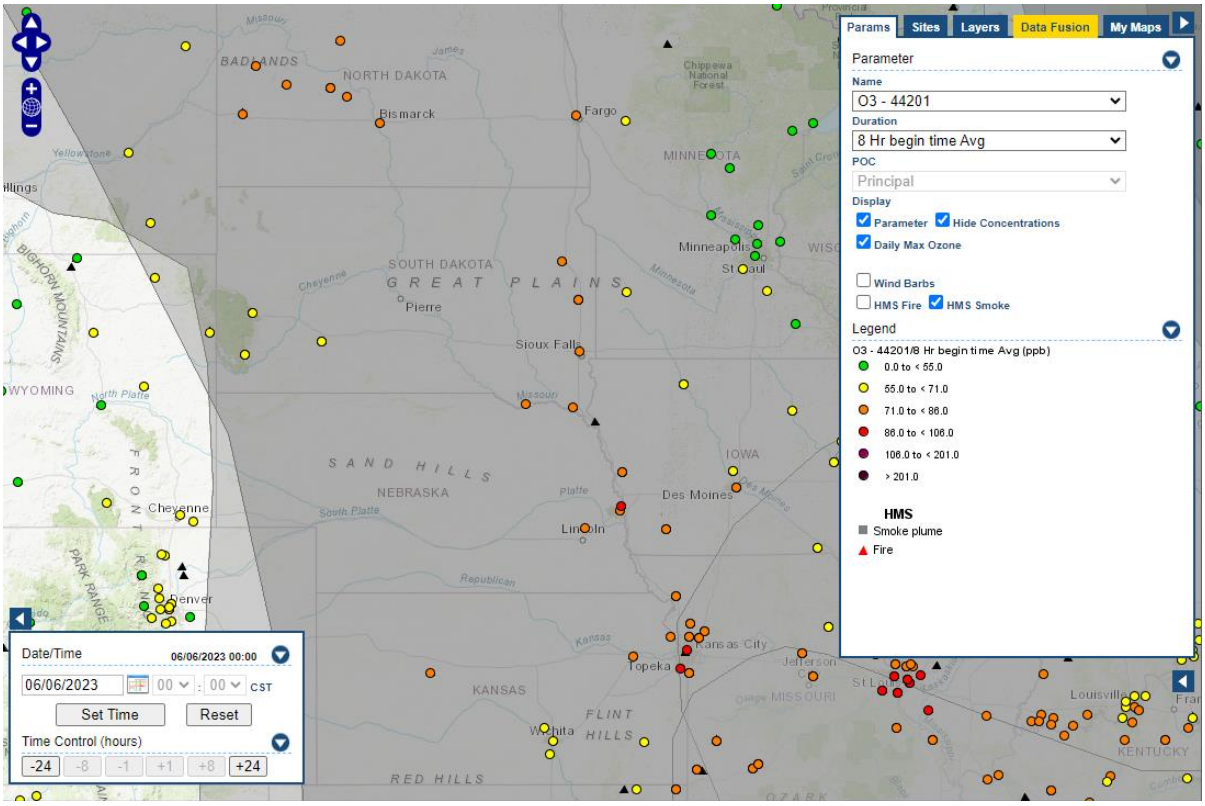
	Ozone Level (PPB)					Ozone Level (PPB)				
Date	**W (2)**	**N**	**S**	**D**		**Date**	**W**	**N**	**S**	**D**
5/17	**75**	**73**	61	58		6/6	**93**	**85**	**84**	**71**
5/18	**80**	**77**	59	68		6/7	**84**	**83**	**82**	**73**
5/21	**74**	67	**73**	62		6/8	65	70	**86**	56
5/22	**75**	67	**71**	60		6/10	**72**	**72**	52	58
5/23	**78**	**72**	**75**	61		6/13	**75**	**74**	65	57
5/24	**75**	**71**	**77**	64		6/14	**82**	**80**	**76**	64
5/26	66	62	**76**	64		6/15	**78**	70	**77**	56
5/27	**73**	67	**72**	60		6/16	**74**	69	62	55
5/28	**73**	68	68	60		6/19	66	61	**73**	52
6/3	**80**	**76**	70	64		6/20	**78**	**71**	**71**	62
6/4	**82**	**77**	**82**	67		6/21	**81**	**75**	65	64
6/5	**74**	70	**72**	57		6/28	**79**	70	67	70

(1) Values exceeding the standard are in bold font. Table cell background colors correspond to AQI categories as shown in Table VII-1

(2) Column labels: W = 1616 Whitmore St, Omaha N = NCore site, Omaha
S = Santee Reservation D = Davey (Lancaster County)

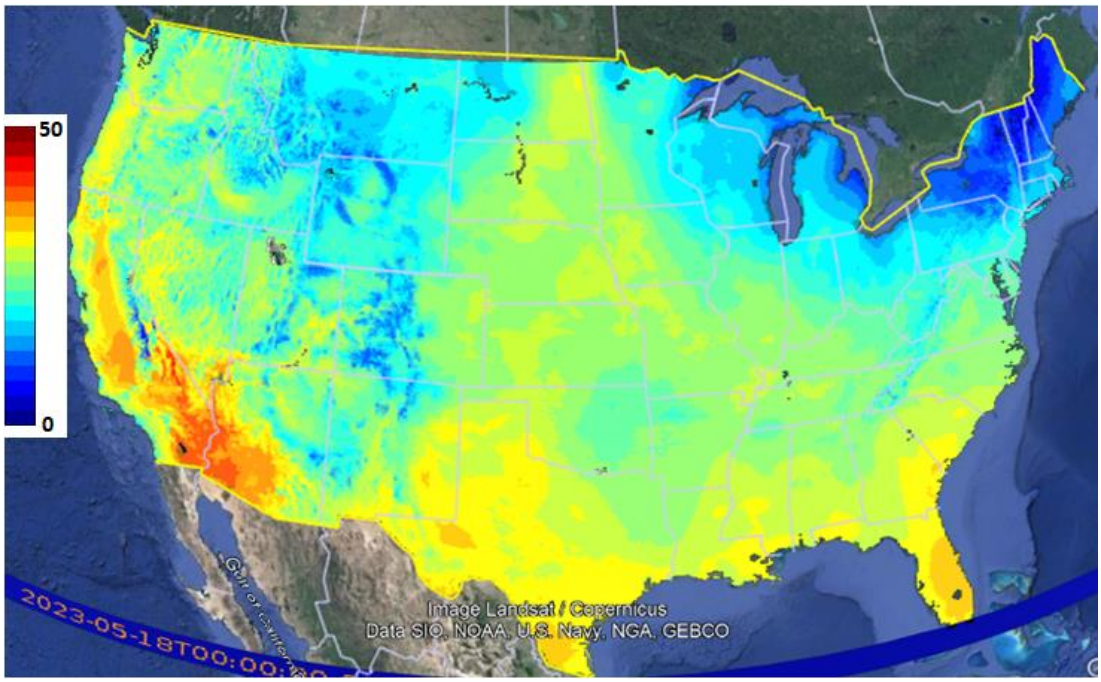
The ozone exceedances in May and June occurred on dates and at locations where high daytime temperatures triggered ozone formation from components of the smoke. Examples are shown in Figures VII-1 through VII-3 for the three dates with the highest ozone levels.

Figure VII-1a. Regional Map of Ozone Monitoring Sites and Wildfire Smoke for May 18, 2023*



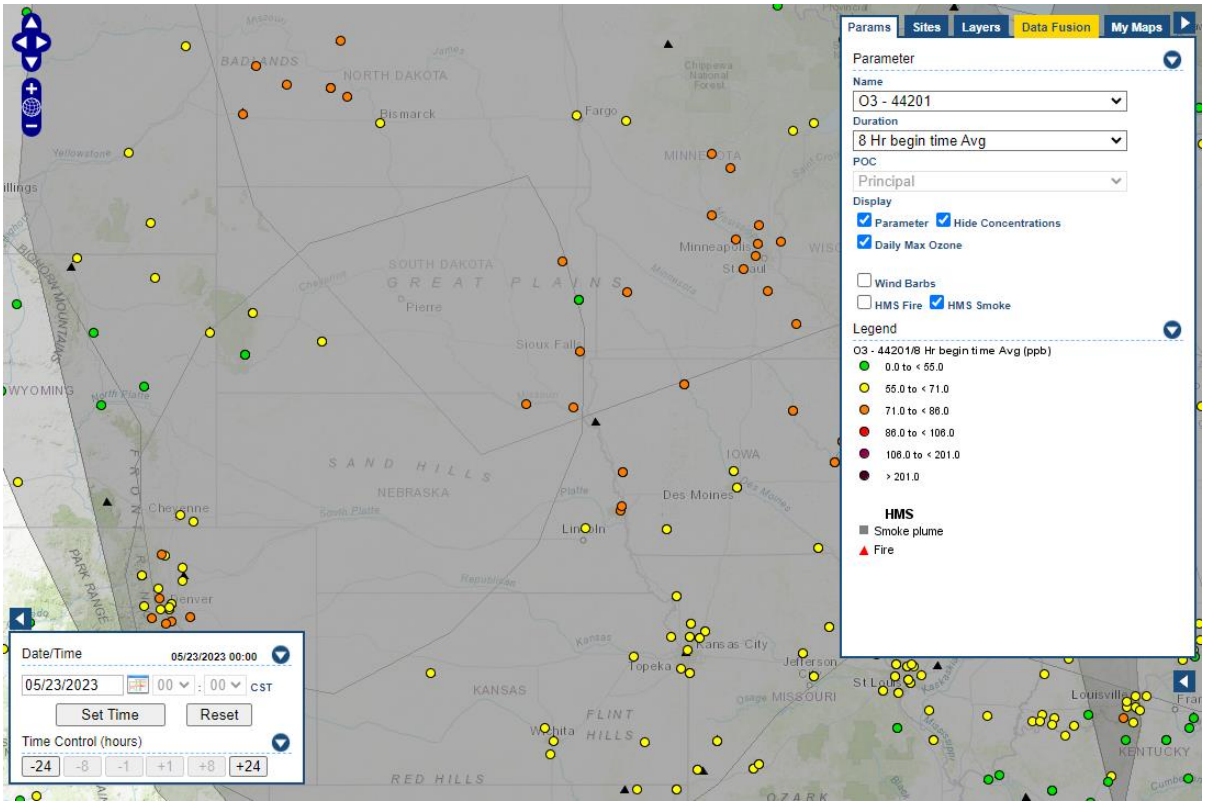
* Smoke plumes (gray) and monitoring locations with ozone values colored by AQI category, from EPA Air Now Tech website (http://www.airnowtech.org).

Figure VII-1b. Map of U.S. Maximum Daily Temperature (degrees C) May 18, 2023*.



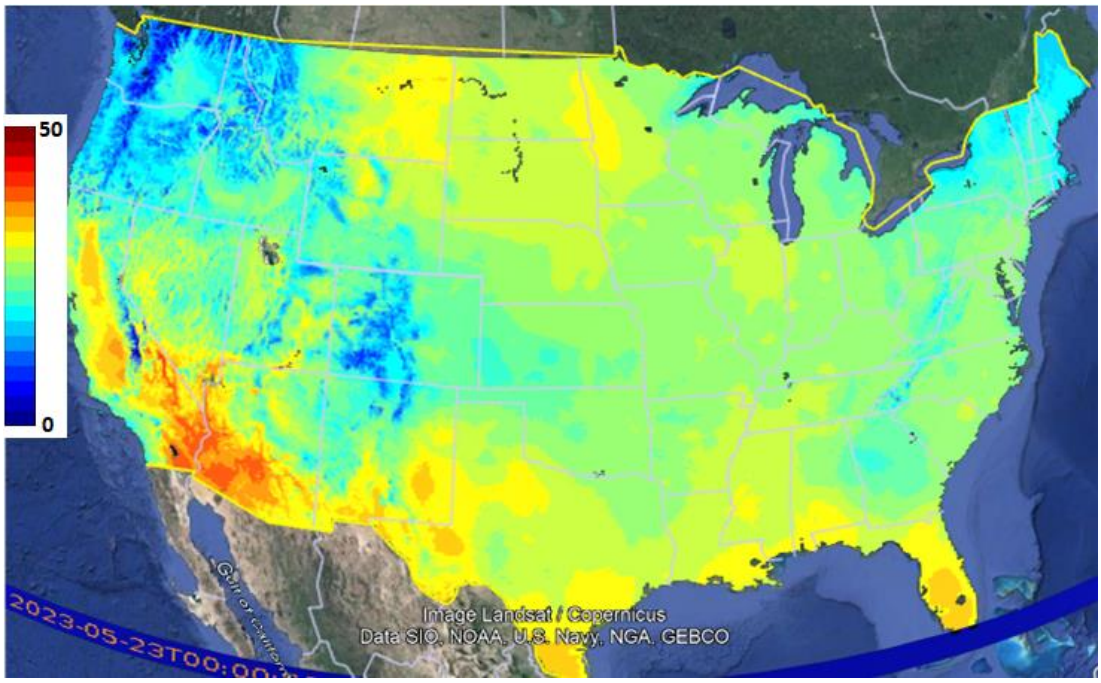
* Data from NOAA National Centers for Environmental Information, nClimGrid-Daily gridded data: https://www.ncei.noaa.gov/products/land-based-station/nclimgrid-daily

Figure VII-2a. Regional Map of Ozone Monitoring Sites and Wildfire Smoke for May 23, 2023*



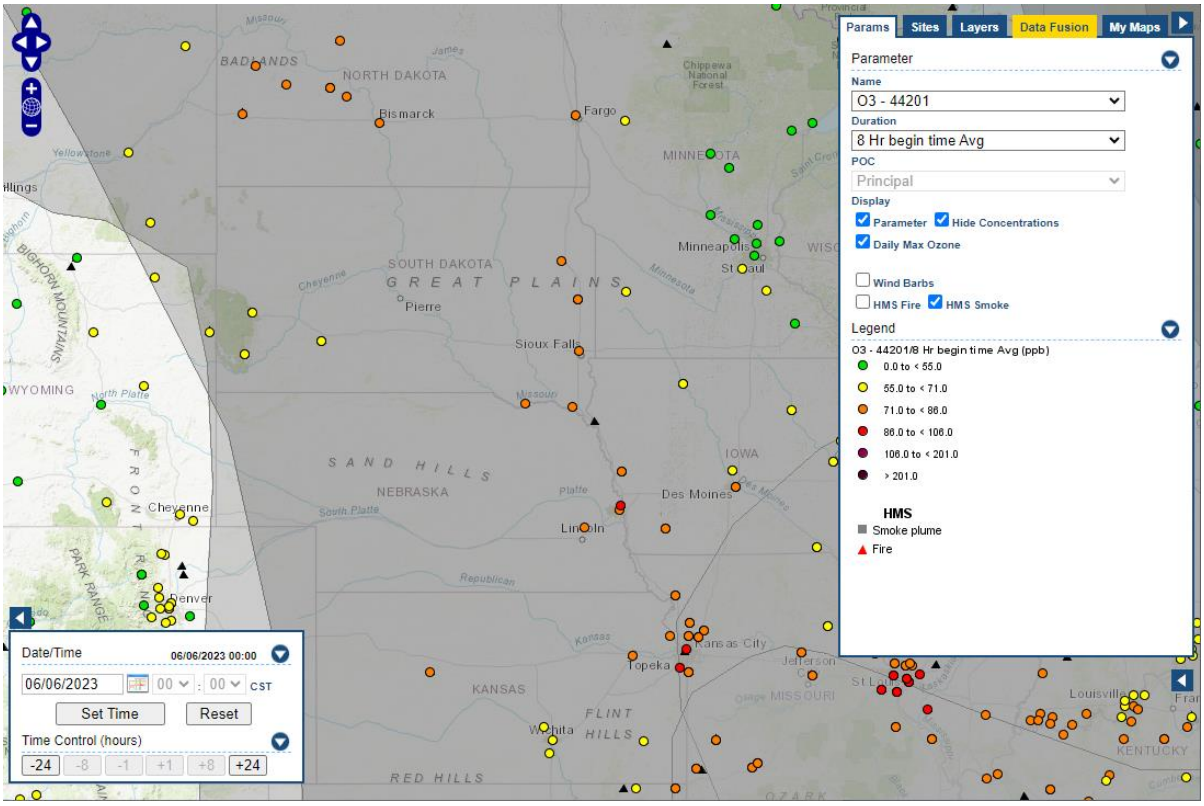
* Smoke plumes (gray) and monitoring locations with ozone values colored by AQI category, from EPA Air Now Tech website (http://www.airnowtech.org).

Figure VII-2b. Map of U.S. Maximum Daily Temperature (degrees C) May 23, 2023*.



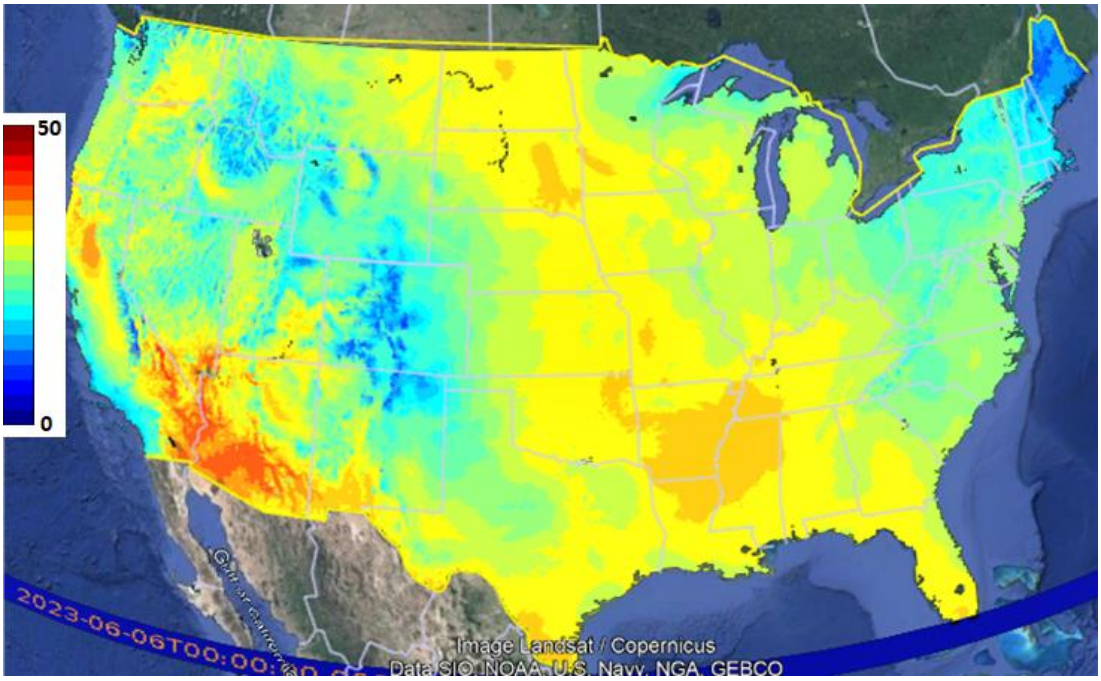
* Data from NOAA National Centers for Environmental Information, nClimGrid-Daily gridded data: https://www.ncei.noaa.gov/products/land-based-station/nclimgrid-daily

Figure VII-3a. Regional Map of Ozone Monitoring Sites and Wildfire Smoke for June 6, 2023*



* Smoke plumes (gray) and monitoring locations with ozone values colored by AQI category, from EPA Air Now Tech website (http://www.airnowtech.org).

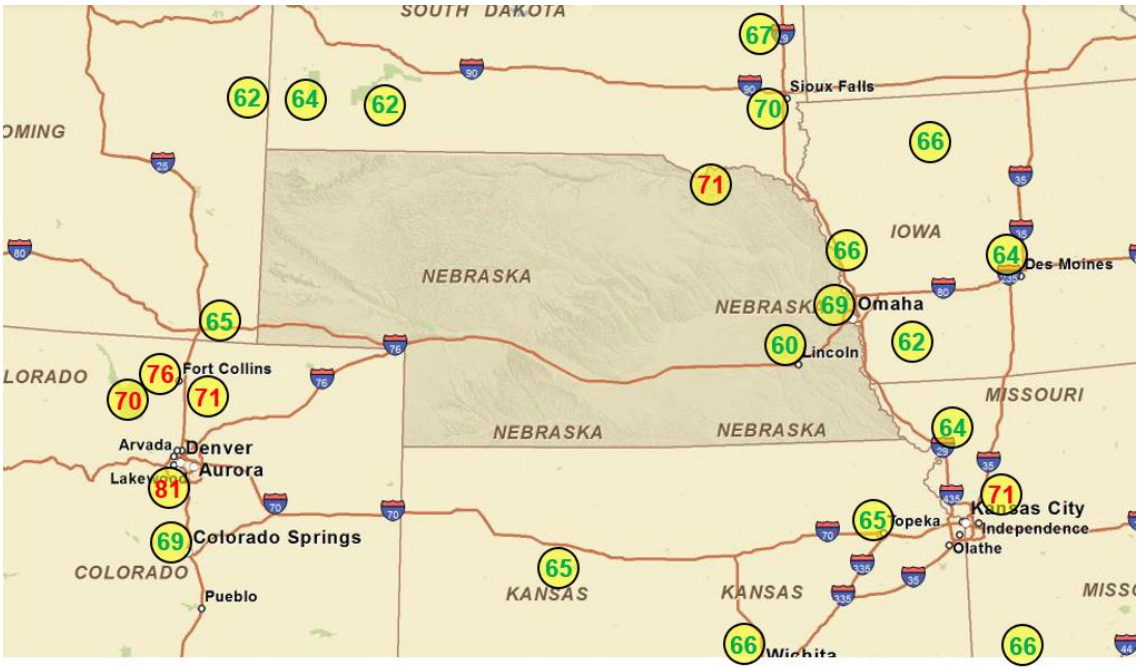
Figure VII-3b. Map of U.S. Maximum Daily Temperature (degrees C) June 6, 2023*.



* Data from NOAA National Centers for Environmental Information, nClimGrid-Daily gridded data: https://www.ncei.noaa.gov/products/land-based-station/nclimgrid-daily

The map in Figure VII-1 shows the 2020-2022 ozone DVs for monitoring sites in Nebraska and surrounding states. All urban and rural monitoring sites in the region show DVs above 60 ppb (a DV of 59.5 ppb is 85% of the NAAQS). Ozone monitoring sites in the larger urban areas (Omaha, Kansas City, and Sioux Falls, South Dakota) show more elevated design values. The highest ozone levels in the region are found in the northern Colorado Front Range area, including Colorado Springs, Denver, Fort Collins, and surrounding communities, where ozone levels at several sites are not in attainment with the NAAQS.

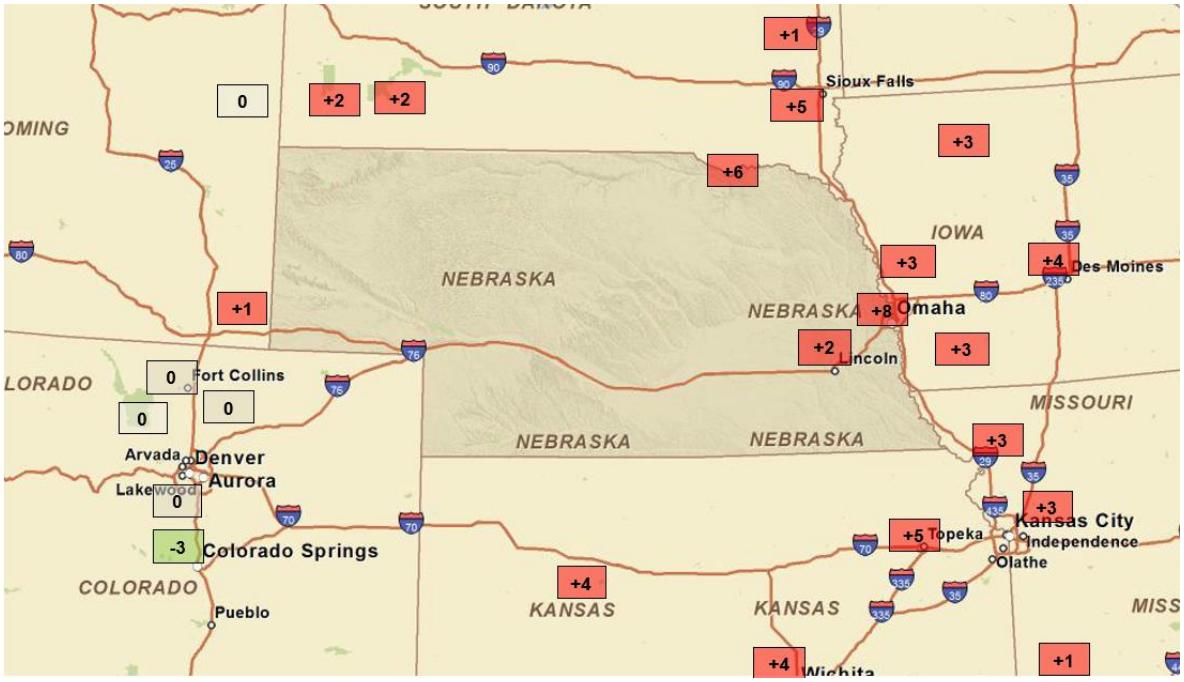
Figure VII-4. Three-Year (2021-2023) Ozone Design Values (DVs, in ppb) for Locations in and Around Nebraska *



* Where there is more than one monitoring site in a locale, the highest ozone DV is shown. DVs in green are in attainment with the NAAQS (70 ppb); values in red are not in attainment.

The map in Figure VII-5 shows the difference between the 2021-2023 ozone design value and the site-average design value from 2018 through 2022 for monitor sites in the Nebraska region. Sites in Nebraska, South Dakota, Iowa, Missouri, and Kansas all experienced ozone levels well above the site-average design value. These increases primarily reflect the impact of Canadian wildfire smoke on the region during the summer. The monitoring sites in northeast Colorado were outside or on the fringe of the smoke plumes during the worst ozone events, and the 2023 design values at these sites were at or below their site-average values.

Figure VII-5. Difference Between 2021-2023 Ozone Design Value (ppb) and 2018-2022 Site Average Design Value for Monitor Sites in and Around Nebraska *



* Red background color in boxes indicates sites with a 2023 DV higher than the site average; green background color indicates sites with a 2023 DV lower than the site average. Where there is more than one monitoring site in the locale, the value for the site with the highest 2023 DV is shown.

Figures VII-6a, VII-6b, and VII-6c show plots of annual 4th-highest daily maximum 8-hour ozone values for monitors in the Omaha-Council Bluffs MSA, Lincoln and Sioux City MSAs, and for rural monitor sites in the region, respectively. Values are shown for 2013 through 2023. These values are used in calculating the 3-year average design values.

These plots show that many monitoring sites in the region experienced an upward trend in 4th-highest 8-hour ozone values beginning in 2016 or 2017. Peak levels occurred at most sites in 2018, followed by a declining trend through 2020. From 2020 through 2022 trends were mostly flat, with small increases or decreases at some sites. The ozone values for 2023 were sharply elevated at all sites in Nebraska and most of the surrounding region due to the forest fire smoke impacts described above.

Figure VII-6a. Annual 4th High Daily Maximum 8-hour Ozone Trends 2013 through 2023 for Monitors in the Omaha-Council Bluffs MSA

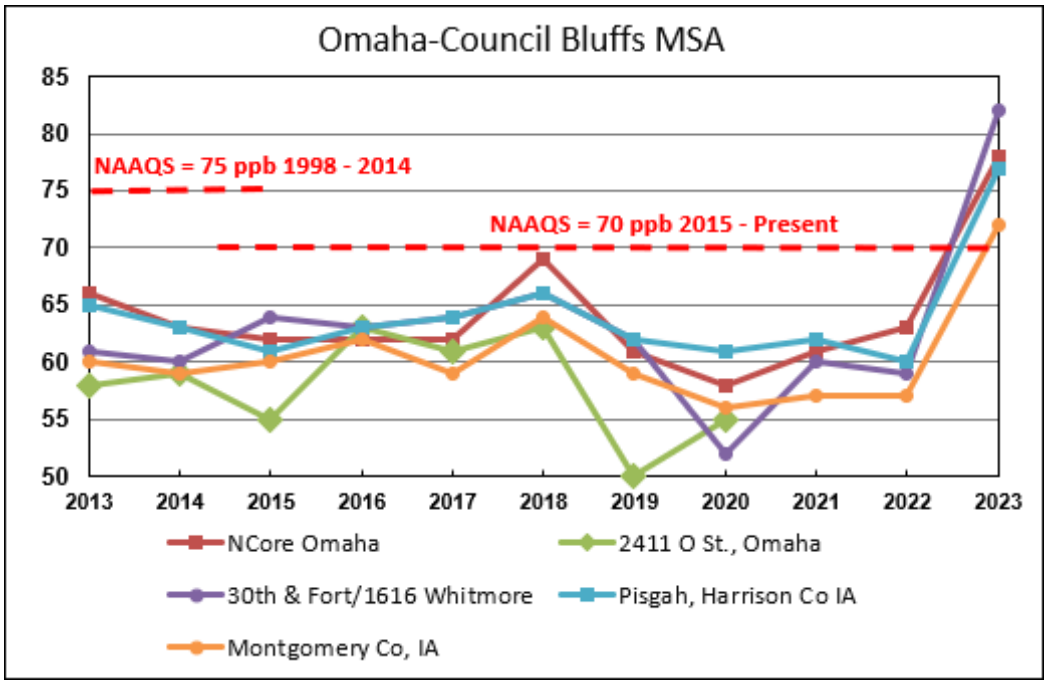


Figure VII-6b. Annual 4th High Daily Maximum 8-hour Ozone Trends 2013 through 2023 for Monitors in the Lincoln, NE and Sioux City, IA MSAs

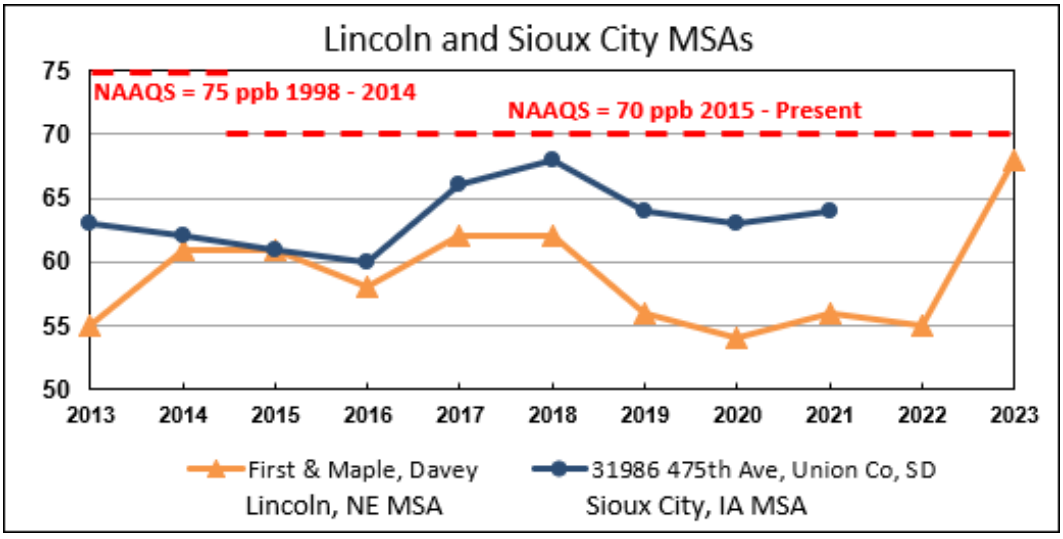
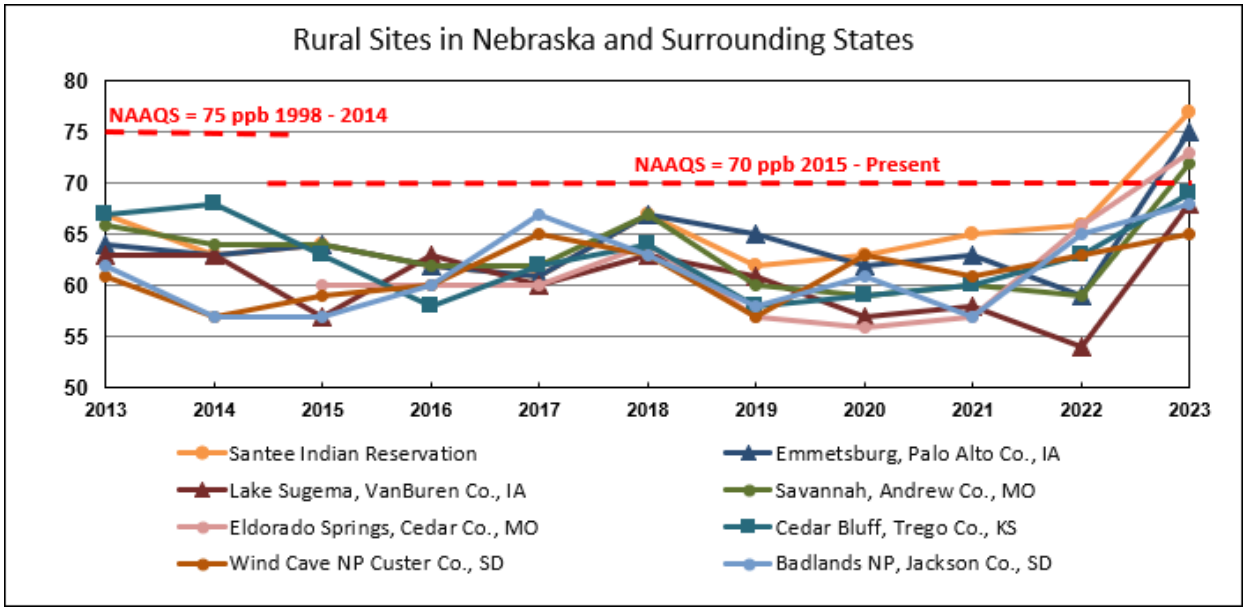


Figure VII-6c. Annual 4th High Daily Maximum 8-hour Ozone Trends 2013 through 2023 for Monitors at Rural Sites in Nebraska and Surrounding States



2. Fine Particulate Matter: $PM_{2.5}$

In December 2020 EPA announced that it would retain, without revision, the existing primary (health-based) and secondary (welfare-based) $PM_{2.5}$ NAAQS. On June 10, 2021, EPA announced that it would reconsider the December 2020 decision on particulate matter standards. On March 6, 2024, EPA published a final rule lowering the primary annual $PM_{2.5}$ standard to 9.0 µg/m^3, retaining the secondary annual standard, and retaining the primary and secondary 24-hour $PM_{2.5}$ standards. The final rule is effective on May 6, 2024.

As shown in Table VII-3 and in more detail in Appendix B, Tables B-6a and B-6b, all monitored metropolitan areas in Nebraska are in attainment with the annual average and 24-hour $PM_{2.5}$ NAAQS in effect in 2023. The design values range from 44% to 72% of the 24-hour standard and 38% to 73% of the annual average standard. The 24-hour design values at all sites would also be in attainment with the revised standard.

Table VII-3. 2023 24-hour $PM_{2.5}$ Design Values (as percentage of the NAAQS) and Daily Air Quality Index (AQI) results (number and percentage of days in each category) for Nebraska continuous monitoring locations.

	24-hour Design Value (%)	Good		Moderate		Unhealthy for Sensitive Groups		Unhealthy	
		# Days	%	# Days	%	# Days	%	# Days	%
Blair	57	313	86.9%	43	11.9%	3	0.8%	1	0.3%
Omaha NCore	54	292	81.6%	63	17.6%	1	0.3%	1	0.3%
Bellevue	64	280	84.4%	48	14.5%	1	0.3%	1	0.3%
Beatrice	59	317	90.3%	31	8.8%	2	0.6%	1	0.3%
Grand Island	58	207	60.5%	37	10.8%	0	0%	3	0.9%
Scottsbluff	44	329	95.9%	13	3.8%	0	0%	1	0.3%

Smoke from wildfires and prescribed fires can temporarily increase $PM_{2.5}$ levels in Nebraska. Prescribed burns are used in Nebraska and in near-by states for prairie conservation and maintenance of grazing lands. Ranchers in the Flint Hills of Kansas and Oklahoma and surrounding areas make extensive use of prescribed fires, primarily in the spring months, to improve pastures and reduce the spread of invasive vegetation. The extent of Flint Hills burning varies from year to year depending on spring weather conditions, but the average area burned is about two million acres. Smoke impacts on Nebraska during periods of intense spring burning depend on wind direction and atmospheric mixing conditions. In addition, smoke from distant large wildfires in Canada and the western United States occasionally affects $PM_{2.5}$ levels in Nebraska during the summer months.

Continuous $PM_{2.5}$ monitors at seven Nebraska locations report data to AirNow that are used to compute a daily Air Quality Index (AQI). As shown in Table VII-3, the percentage of days in 2023 in the AQI Good range for $PM_{2.5}$ ranged from 60.5 to 95.9%. Due to smoke impacts, four sites experienced from 1 to 3 days in the Unhealthy for Sensitive Groups level, and all sites recorded at least one day in the Unhealthy level.

Daily exceedances of the $PM_{2.5}$ standard were registered at one or more Nebraska monitoring sites on five dates from April to September, 2023 (Table VII-4). On April 7, eastern Nebraska sites were affected by smoke blown north and northeastward from prescribed fires in Kansas (as shown by the regional smoke map in Figure VII-7). The smoke caused an exceedance at the Beatrice monitoring site (AQI level Unhealthy for Sensitive Groups) and Moderate AQI levels at other sites in the area. However, the area subjected to prescribed burns in the Kansas Flint Hills in March and April 2023 was only 58% of the 10-year average, and smoke impacts in Nebraska were light overall during that period.

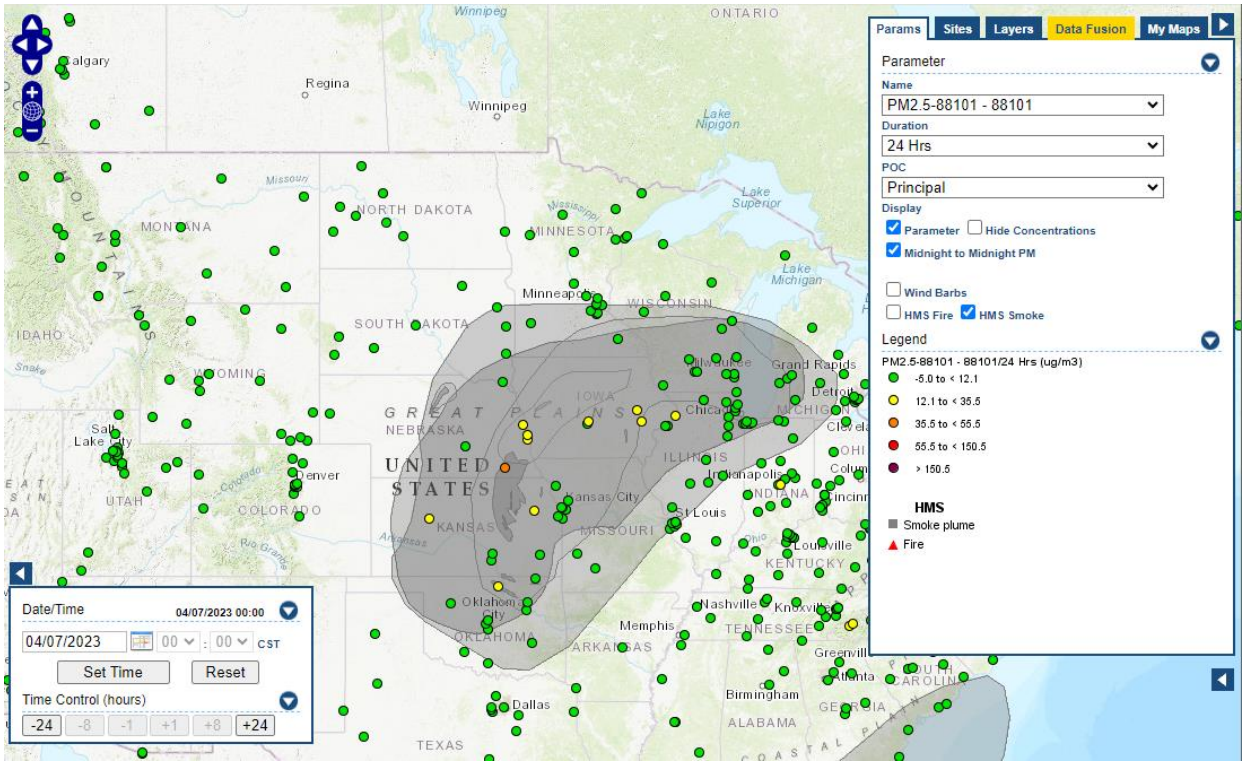
Table VII-4. Maximum Daily 24-hour $PM_{2.5}$ Levels at Nebraska Continuous Monitoring Sites for Dates in 2023 with Exceedances of the NAAQS (35 µg/m^3) *.

Date	Blair 31-177-0002	NCore Omaha 31-055-0019	Bellevue 31-153-0007	Beatrice (Homestead Nat. Pk.) 31-067-0005	Grand Island 31-079-0005	Scottsbluff 31-157-0004
4/7	18.1	19.5	18.5	**49.6**	10.5	2.6
5/18	**42.9**	33.8	16.6	9.8	**110.6**	**149.8**
7/15	**36.7**	30.5	27.0	No Data	22.9	11.7
9/6	**59.8**	**58.8**	**57.6**	**73.3**	**72.0**	34.9
9/7	**37.6**	**39.4**	**38.7**	**51.7**	**58.3**	16.6

* Values exceeding the standard are in bold font. Cell colors indicate Air Quality Index category as shown in Table VII-3.

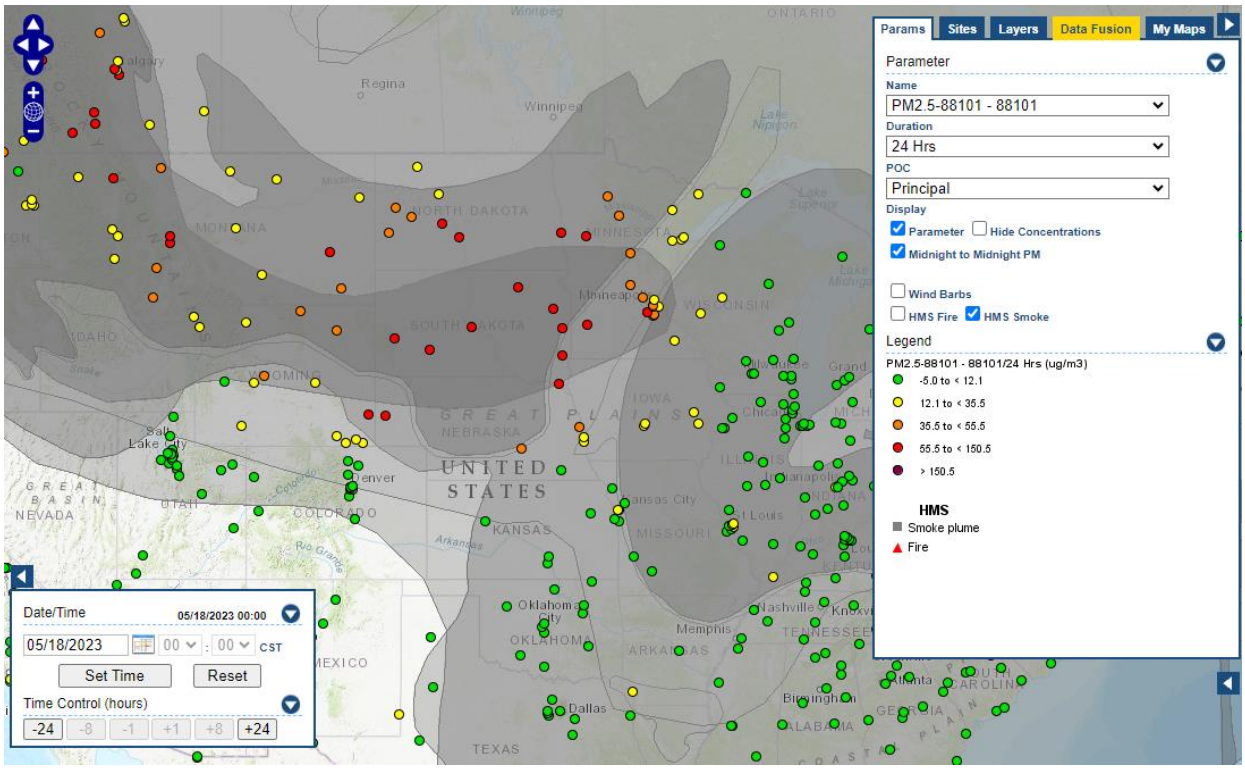
The 24-hour NAAQS exceedances in May, July, and early September can be attributed to smoke from the same persistent Canadian forest fires that caused elevated ozone levels throughout the region. AQI scores reached the Unhealthy level in Grand Island and Scottsbluff on May 18th, and at all sites except Scottsbluff on September 6. Maps of monitoring sites and smoke plumes are shown for May 18, July 15, and September 6 in Figures VII-8 through VII-10.

Figure VII-7. Regional Map of $PM_{2.5}$ Monitoring Sites and Smoke for April 7, 2023*



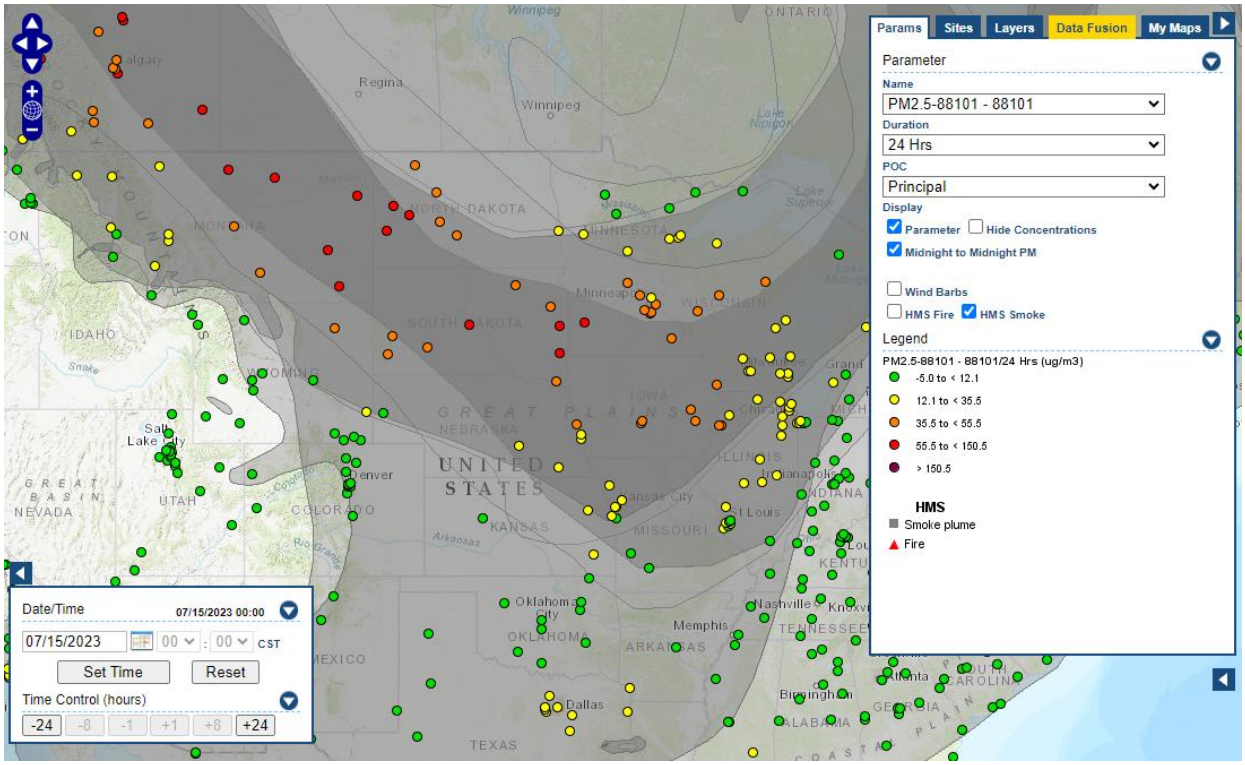
* Smoke plumes (gray) and monitoring locations with $PM_{2.5}$ values colored by AQI category, from EPA Air Now Tech website (http://www.airnowtech.org).

Figure VII-8. Regional Map of $PM_{2.5}$ Monitoring Sites and Smoke for May 18, 2023*



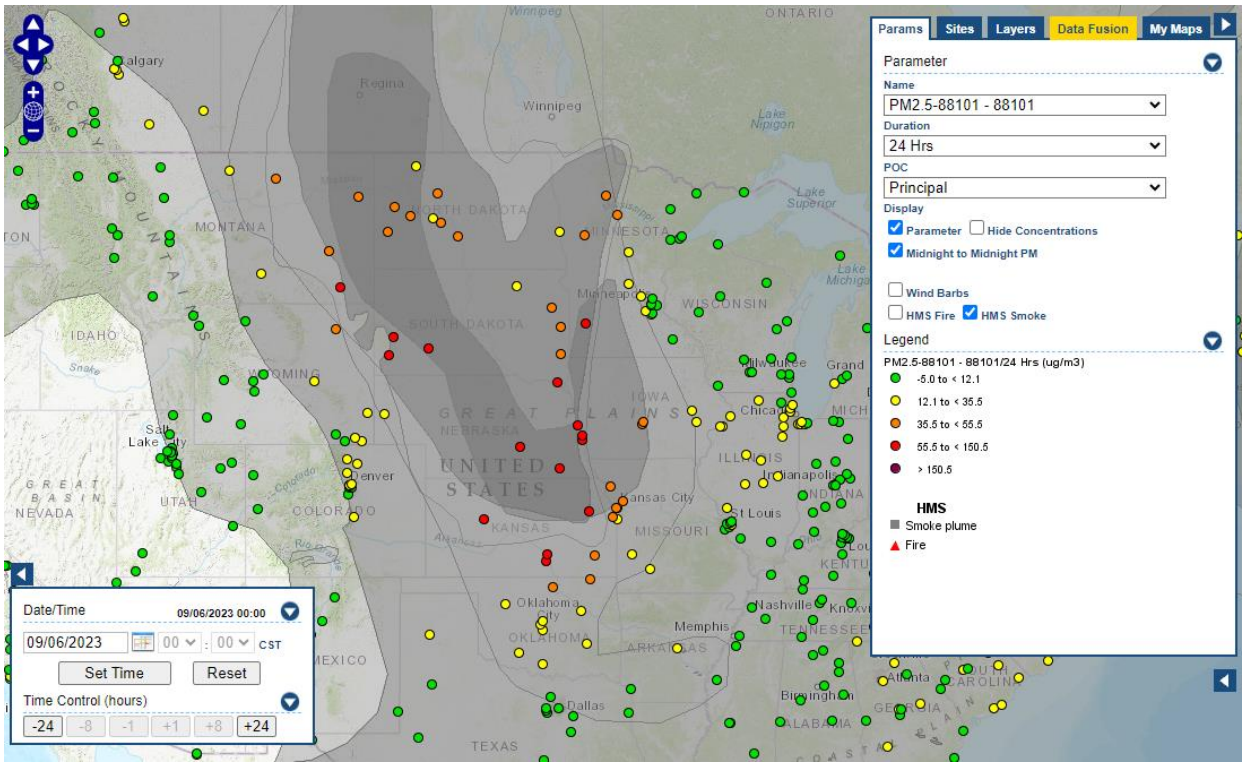
* Smoke plumes (gray) and monitoring locations with $PM_{2.5}$ values colored by AQI category, from EPA Air Now Tech website (http://www.airnowtech.org).

Figure VII-9. Regional Map of $PM_{2.5}$ Monitoring Sites and Smoke for July 15, 2023*



* Smoke plumes (gray) and monitoring locations with $PM_{2.5}$ values colored by AQI category, from EPA Air Now Tech website (http://www.airnowtech.org).

Figure VII-10. Regional Map of $PM_{2.5}$ Monitoring Sites and Smoke for September 6, 2023*



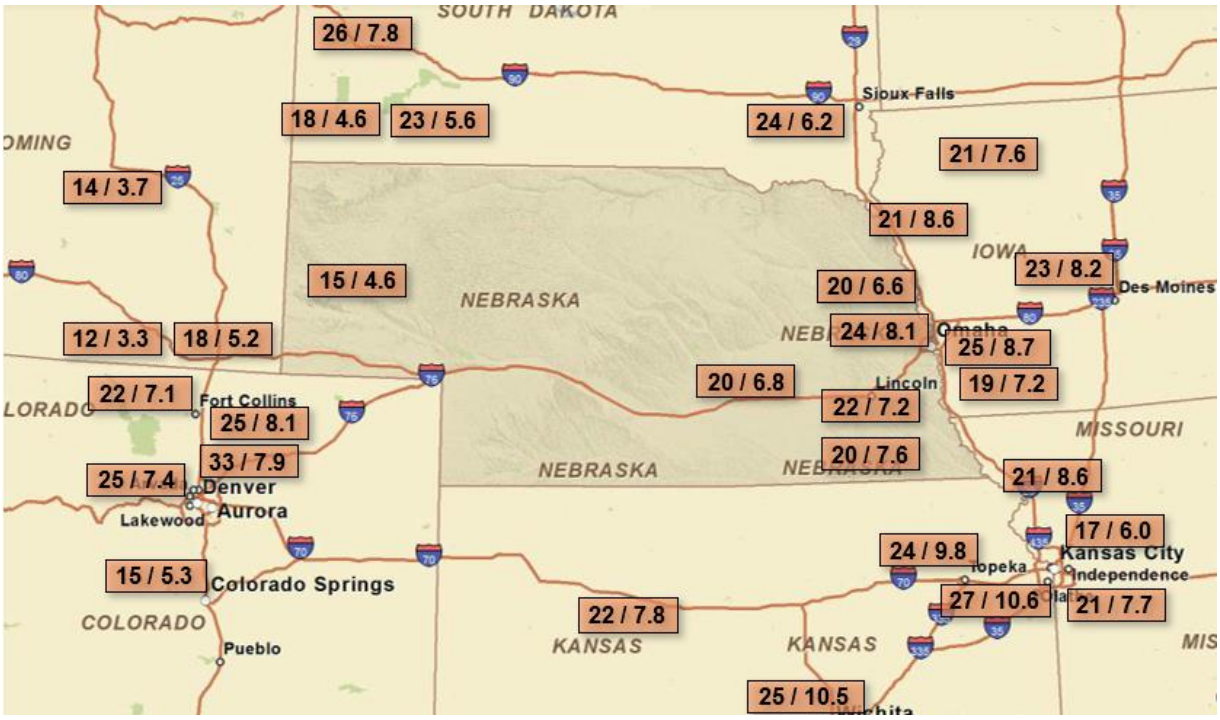
* Smoke plumes (gray) and monitoring locations with $PM_{2.5}$ values colored by AQI category, from EPA Air Now Tech website (http://www.airnowtech.org).

NDEE has worked with Kansas Department of Health and Environment (KDHE), EPA Region 7, the National Weather Service, local air quality agencies, and other stakeholders on strategies to improve communications on air quality in Nebraska during the spring prescribed burn season and in response to wildfire events. To provide up-to-date information to the public regarding potential smoke impacts, NDEE created a smoke awareness web page in March 2017. During the spring burn season, current smoke forecast information is provided along with links to the Kansas Smoke Management Plan, AirNow, and other related information. The Department also monitors the AirNow Fire and Smoke Map throughout the year to evaluate the potential for wildfire smoke impacts in Nebraska.

NDEE has collaborated with the National Weather Service, the Nebraska Department of Health and Human Services (DHHS), LLCHD, and DCHD to develop a public smoke advisory system that was announced on April 10, 2018. Smoke advisories are issued by DHHS for impacted counties during the prescribed burn season based on forecasts provided by KDHE and for wildfire smoke events based on NDEE analysis and consultations with the National Weather Service.

Figure VII-11 shows the 2021-2023 Design Values for $PM_{2.5}$ monitoring sites in and around Nebraska. The highest values were measured in the larger metropolitan areas in the region (Omaha-Council Bluffs, Kansas City, and Denver). All sites in the region were in attainment with both primary $PM_{2.5}$ NAAQS standards.

Figure VII-11. $PM_{2.5}$ 2021-2023 Design Values (DVs) for Sites in and Around Nebraska. (1)

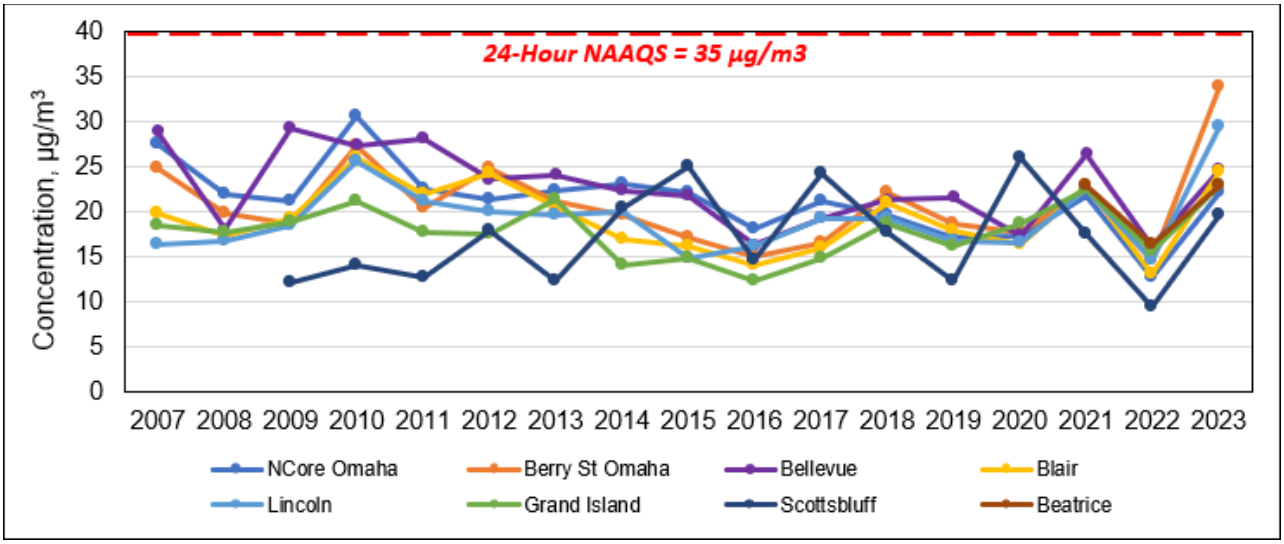


Footnotes:

(1) The first number is the 24-hour DV and the second number is the annual average DV. Where there is more than one site in a metropolitan area, the highest DVs are shown.

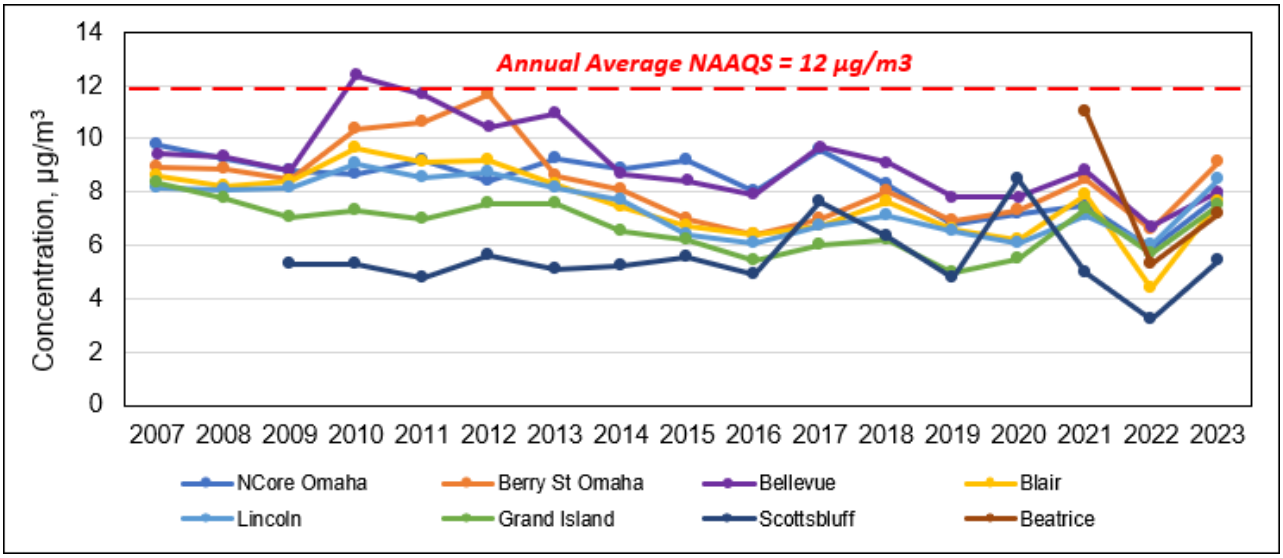
Figures VII-12 and VII-13 plot trends in $PM_{2.5}$ values from 2007 through 2023 for the annual 98th percentile of daily maximum 24-hour data and the annual average data, respectively. Most sites in eastern and central Nebraska show a small overall downward or flat trend in both parameters despite large year-to-year variations. All sites showed elevated levels for 2023 due to the persistent wildfire smoke that blanketed the region from May through September.

Figure VII-12. Trends in Annual 98th Percentile of Daily Maximum 24-hour $PM_{2.5}$ for Nebraska Monitoring Sites 2007-2023. *



* A new continuous monitor was installed at Scottsbluff in 2020. The 2020 value shown was computed from only 252 days of continuous monitor data and is thus not valid for NAAQS comparison.

Figure VII-13. Trends in Annual Average $PM_{2.5}$ for Nebraska Monitoring Sites 2007-2023 *)



* A new continuous monitor was installed at Scottsbluff in 2020. The 2020 value shown was computed from only 252 days of continuous monitor data and is thus not valid for NAAQS comparison.

3. Coarse Particulate Matter: PM_{10}

The current national ambient air quality 24-hour standard (NAAQS) for PM_{10} is 150 µg/m^3 for both the primary standard and the secondary standard. These standards were retained by EPA in December 2020 but were part of the reconsideration announced by EPA in June 2021. The final rule announced March 15, 2024 retains the primary and secondary standard, effective May 6. The PM_{10} NAAQS states that the 24-hour standard of 150 µg/m^3 is not to be exceeded more than once per year on average over the latest 3-year time

frame, where an exceedance is a 24-hour average value of 155 μg/m^3 or more. This means that the 4th highest value over the most recent 3 years needs to be below 155 μg/m^3 to avoid nonattainment of the NAAQS.

Coarse particulate matter remains more localized to the source than $PM_{2.5}$, so monitoring must address both background levels and maximum levels near sources. At the beginning of 2021 there were five PM_{10} monitoring sites in the Omaha MSA: three in Omaha operated by DCHD, one in Council Bluffs operated by Iowa DNR, and a source-oriented monitor in Weeping Water, Nebraska, operated by NDEE. PM_{10} monitoring was discontinued at a south Omaha site at the end of March 2021 at the request of the property owner, leaving four active sites at the end of the year. South Dakota DANR operated a PM_{10} monitor in Union County, SD in the Sioux City MSA until the site was closed at the end of September 2021.

There were no 24-hour exceedances of the 150 μg/m^3 value over the 2021-2023 period at any of these sites, so all are in attainment with the NAAQS. Their 4th highest values over that period ranged from 37% to 61% of the NAAQS (see Appendix B, Table B-5a and B-5b).

4. Sulfur Dioxide (SO_2)

The NAAQS for sulfur dioxide (SO_2) was revised in 2010 to establish a 1-hour standard of 75 ppb (99th percentile of daily maximum one-hour average concentrations), which was reviewed and retained in 2018. All areas of Nebraska were designated as "Attainment/Unclassifiable" with respect to this standard in 2016 except for Lancaster County, which was designated "Unclassifiable", and Douglas County, which was to be designated by December 31, 2020. Both counties were later designated as "Attainment/Unclassifiable", effective April 30, 2021 for Douglas County and August 16, 2021 for Lancaster County.

DCHD operates two SO_2 monitors in Omaha, one at the multipollutant NCore site and the other in an industrial area in north Omaha. Currently SO_2 monitors are not required in the other Nebraska MSAs or elsewhere in the state. South Dakota DANR monitored SO_2 at the multipollutant site in Union County, SD, within the Sioux City MSA until that site was closed at the end of September 2021.

The 2021-2023 1-hour SO_2 annual levels and Design Values (DVs) for Nebraska-area monitoring sites are listed in Appendix B, Table B-3. The highest DV (59% of the NAAQS) was recorded at the Whitmore Street site in north Omaha. The DV at the neighborhood-scale Omaha NCore site was 23% of the NAAQS.

Nebraska has three areas adjacent to coal-fired electrical generating plants that are subject to requirements set forth in 40 CFR Part 51 Subpart BB (known as the SO_2 Data Requirements Rule). These areas are required to demonstrate attainment with the 2010 SO_2 NAAQS by air dispersion modeling. As required by 40 CFR Subpart BB, §51.1205(b), NDEE is submitting an annual report to document the SO_2 emissions of the applicable source in each of these areas and assess the cause of any emissions increase from the previous year. This report is being submitted as Appendix E of this Network Plan.

5. Nitrogen Dioxide (NO_2)

In 2010 EPA established a primary 1-hour NAAQS for NO_2 of 100 parts per billion (ppb; based on the 98th percentile of the annual distribution of daily maximum one-hour NO_2 concentrations, averaged over three years) and retained a primary and secondary annual average standard of 53 ppb. Both standards were retained in 2018. EPA has designated all areas of Nebraska (and all areas of the country) as "unclassifiable/attainment" with respect to these standards.

Currently there are no NO_2 monitoring sites within Nebraska. Until the end of September 2021, South Dakota DANR monitored NO_2 at the multipollutant site in Union County, SD, within the Sioux City MSA. This was an area background site with a 2019-2021 design value that was 19% of the NAAQS.

At multipollutant NCore sites EPA requires measurement of reactive oxides of nitrogen (NOy) instead of NO_2 in order to quantify more of the oxidation products of nitric oxide (NO). These additional oxidation

products are relevant to the secondary formation of ozone and $PM_{2.5}$. NO and NOy are therefore measured at the Omaha NCore site.

The difference between measured NOy and NO (NOy-NO) generally approximates NO_2, with NOy-NO being equal to or possibly higher than NO_2. Table B-4b in Appendix B shows the measured NOy-NO annual values for 2021-2023. The three-year average of the 98th percentile one-hour NOy-NO levels at the Omaha NCore site was 36% of the NAAQS, while the annual average value was 27% of the NAAQS.

6. Carbon Monoxide (CO)

Vehicle emissions are a primary source of carbon monoxide emissions. EPA last reviewed the carbon monoxide NAAQS in 2011, at which time it retained a primary one-hour standard of 35 parts per million (ppm) and a primary 8-hour standard of 9 ppm. The Omaha NCore site includes a required neighborhood-scale CO monitor, and DCHD also operates a near-road, highest-concentration site at 78th and Dodge Streets in Omaha. As shown in Table B-2 in Appendix B, during the 2021-2023 time frame both sites recorded CO design values 5% or less of the one-hour NAAQS and less than 20% of the 8-hour standard.

7. Lead (Pb)

The lead NAAQS was last changed in 2008, when it was tightened from a concentration of 1.5 μg/m^3 to 0.15 μg/m^3 as determined from the highest three-month average concentration of suspended particulates in the last three years. This standard was reviewed and retained in 2016. In 2020 EPA initiated a review of the air quality criteria for the health and welfare effects of lead and the primary and secondary NAAQS, and published an external review draft of the Integrated Science Assessment for Lead in March 2023. Final action on the review of the lead NAAQS is pending.

EPA requires source-oriented SLAMS lead monitoring near industries that emit over 0.5 tons per year of lead. The rule allows for the EPA Regional Administrator to waive the monitoring requirements if the air agency can demonstrate that the lead source will not contribute to a maximum lead concentration in ambient air in excess of 50% of the NAAQS. This demonstration can be made through historical monitoring data or air dispersion modeling.

Currently there are two lead sources in Nebraska that are potentially subject to the lead monitoring requirement.

a. Magnus Bearings, Fremont

Magnus Bearings in Fremont is a casting facility that produces high-leaded bronze railway traction motor support bearings. NDEE began operating a lead monitoring site at 1255 Front Street, north of this facility, in 2010. The site had primary and collocated total suspended particulate samplers. In 2012 the maximum three-month average ambient lead level was 0.14 μg/m3 or 93% of the NAAQS. In 2016 through 2018 the maximum three-month average lead concentrations were lower at 41%, 28%, and 16% of the NAAQS, respectively. Facility awareness and diligence, coupled with agency feedback on ambient air lead concentrations, appear to have facilitated the air quality improvements.

In 2018 the landowner that hosted this monitoring site asked that the monitors be removed; removal occurred at the end of September 2018. Due to the location of this plant in an industrial area, there are few options for a nearby monitoring location. NDEE and EPA Region 7 staff evaluated several alternative monitoring sites, and EPA approved the relocation to a nearby convenience store property south of the facility as requested in Nebraska's 2019 Network Plan. However, NDEE had difficulty contacting the property owner, who subsequently put the property up for sale.

In 2022 NDEE learned that an industrial property at 1500 Front Street, immediately adjacent to the former lead monitoring site, had been sold in 2019. NDEE contacted the new owner, who agreed to host the lead monitors. A site lease agreement was signed by the new property owner in March 2023, and installation of the samplers was completed in May 2023. The site began operation July 1, 2023. EPA approved the new site as part of the approval of the 2023 Network Plan.

b. Nucor Steel, Norfolk (Lead Monitoring Waiver)

Nucor Corporation's production facility in Norfolk, Nebraska, is a steel recycling facility that utilizes ferrous metal scrap material in the production of steel billets and various finished steel bar products. In April 2014 EPA approved a lead monitoring waiver request from Nucor Steel that provided modeling demonstrating that ambient lead levels would not exceed 50% of the NAAQS. The waiver was effective for five years and expired in April 2019.

Nebraska's 2019 Ambient Air Quality Monitoring Network Plan included a request to renew the Nucor Steel lead monitoring waiver for an additional five years. Modeling presented with the request predicted three-month rolling average lead emissions of 0.04 $\mu g/m^3$, or 27% of the lead NAAQS. EPA Region 7 approved this waiver as part of the 2019 Network Plan on 4 October 2019. The five-year waiver expired in April 2024. NDEE's request to renew the Nucor Steel lead monitoring waiver for an additional five years is included as Appendix D of this document.

C. Population Trends and Network Design

Population data is reviewed as part of the network planning process because:

- Population growth may be associated with pollution source growth.
- High population density generally correlates with high air pollution potential.
- Some 40 CFR Part 58 requirements are based on population and/or federally defined metropolitan statistical definitions.

Overall growth trends in Nebraska appear basically unchanged from those described in previous annual Network Plans. Nebraska's population increased by 7.4% between 2010 and 2020, but almost all of this growth is occurring in the four Metropolitan Statistical Areas (12.6% growth). Population grew little in the Micropolitan Statistical Areas (1.3%), and population in the remaining rural counties declined by 3.6%

The basic design of the Nebraska SLAMS ambient air monitoring network remains consistent with these population trends: 71% of the monitoring sites and 82% of the separate pollutant monitors are located within the Omaha and Lincoln MSAs. The Omaha MSA network contains 50% of the monitoring sites in Nebraska and 68% of the monitors.

D. Funding

Air monitoring is supported by a combination of fees and federal, state, and local funding sources. Table VII-5 provides a summary of the primary funding sources used for air monitoring. Federal CAA §105 funding supports operation of the Nebraska SLAMs network, and Federal CAA §103 funding supports operation of $PM_{2.5}$ and IMPROVE monitors. Current funding levels are adequate to continue the operation of the existing and planned Nebraska air monitoring network, provided major new equipment purchases are not required.

NDEE received American Rescue Plan funding in 2022 to replace filter-based sequential $PM_{2.5}$ samplers with continuous monitors that will report real-time data to the public via EPA's AirNow website and through local agency websites. Because NDEE had previously replaced several sequential samplers with continuous monitors, some of these funds are being used to replace aging continuous ozone and SO_2 monitors, along with required supporting equipment. NDEE is also using a Clean Air Act Grant under the Inflation Reduction Act to restore the damaged IMPROVE monitoring site in north-central Nebraska.

Table VII-5: Primary Funding Sources Used to Support Air Monitoring in Nebraska	
Nebraska Department of Environment and Energy (NDEE)	
Funding Source	**Comments**
State General Funds	At a minimum must be sufficient to meet minimum federal match requirements
State Title V Funds	Fees paid by major sources based on the quantity of air pollutants they emit. NDEE collects Title V fees for sources throughout Nebraska, except those regulated by LLCHD and Omaha Air Quality Control. Title V funds cannot be used for state/local match.
CAA §105 Funds	Federal grant funds used for air monitoring activities set forth in a bi-annually negotiated EPA-NDEE work plan. Requires a 40% state/local match. A portion of this grant funding is passed on to DCHD and LLCHD.
CAA §103 Funds	Federal grant funds used for air monitoring activities set forth in a bi-annually negotiated EPA-NDEE work plan. This money is currently limited to funding $PM_{2.5}$ and IMPROVE monitoring, and sometimes for specified equipment purchases and/or special monitoring studies. Requires no state/local match. A portion of this grant funding is passed on to DCHD and LLCHD.
Douglas County Health Department (DCHD) and Omaha Air Quality Control (OAQC)	
Local County Funds	At a minimum must be sufficient to meet minimum federal match requirements
City of Omaha Title V funds	See *State Title V Funds* comments above. Omaha Air Quality Control regulates air emission sources in the City of Omaha, including the collection of Title V fees from major sources. A portion of the Omaha Title V funds are directed to DCHD to support air monitoring. Title V funds cannot be used for state/local match.
CAA §105 Funds	NDEE passes through a portion of the Federal §105 funds to DCHD for activities described in an NDEE/DCHD work plan. DCHD is required to meet the 40% state/local match requirement.
CAA §103	NDEE passes through a portion of the federal §103 funds to DCHD for activities described in an NDEE/DCHD work plan, primarily $PM_{2.5}$ related monitoring activities. There is no state/local match requirement.
Lincoln Lancaster County Health Department (LLCHD)	
Local County Funds	At a minimum must be sufficient to meet minimum federal match requirements
Lancaster County Title V funds	See *State Title V Funds* comments above. LLCHD regulates air emission sources in Lancaster County, including the collection of Title V fees from major sources. A portion of the Title V funds are used to support air monitoring activities performed by LLCHD. Title V funds cannot be used for state/local match.
CAA §105 Funds	NDEE passes through a portion of the Federal §105 funds to LLCHD for activities described in an NDEE/LLCHD work plan. LLCHD is required to meet the 40% state/local match requirement.
CAA §103	NDEE passes through a portion of the federal §103 funds to LLCHD for activities described in an NDEE/LLCHD work plan, primarily $PM_{2.5}$ related monitoring activities. There is no state/local match requirement.

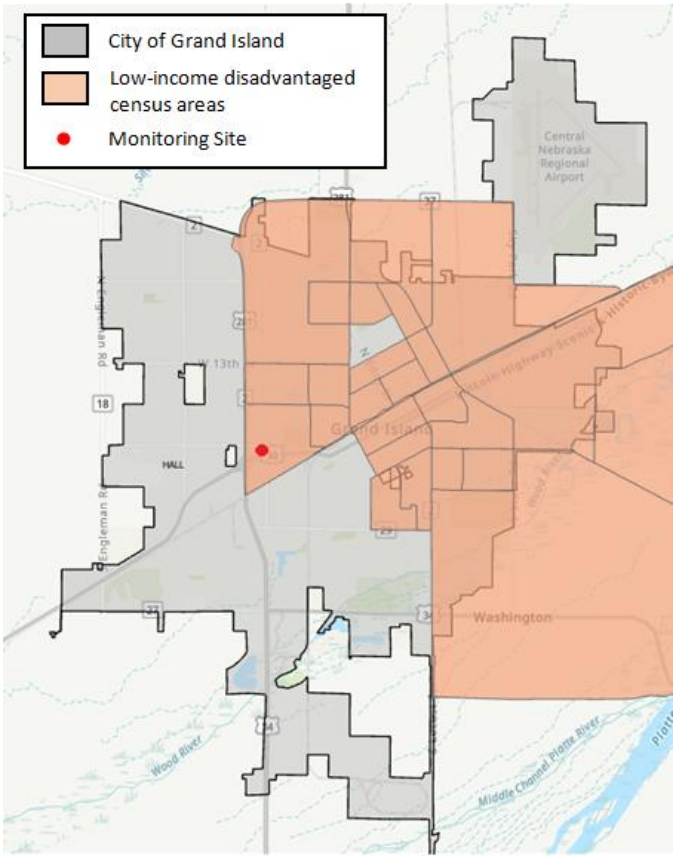
VIII. Anticipated Nebraska Ambient Air Monitoring Network Modifications

A. Establishing Ozone Monitoring in Grand Island

NDEE currently maintains a continuous $PM_{2.5}$ monitor in Grand Island, Nebraska (AIRS ID: 31-079-0005) at 3305 West Old Potash Highway. NDEE plans to utilize funds from an Air Monitoring Direct Award under the Inflation Reduction Act to add a continuous ozone monitor at this site.

Grand Island is the fourth-largest city by population in Nebraska and part of the three-county Grand Island MSA, which had an estimated 2023 population of 76,333. Hispanic/Latino residents make up 34% of the population, and most of the northern and eastern census tracts/blocks in the city have been designated as low-income and disadvantaged (LIDAC) in the Climate and Economic Justice Screening Tool and/or via thresholds in EJScreen supplemental indices. As shown in Figure VIII-1 below, the monitoring site is located within a large group of contiguous LIDAC census areas. Although ozone monitoring is not currently required in the Grand Island MSA, establishing continuous ozone monitoring at this site would provide the city and these underserved areas with additional real-time air quality information.

Figure VIII-1. Map of Grand Island Monitoring Site and LIDAC Areas



B. Relocation of Ozone and PM_{10} Monitors from 2411 O Street, Omaha

Douglas County Health Department (DCHD) operated an ozone and PM_{10} monitoring site at 2411 O Street in south Omaha beginning in 1978. As discussed in section VI.A.1, in late 2020 the owner of that property requested the removal of the monitors. Ozone monitoring ceased at the end of October 2020 (the end of the ozone monitoring season), while PM_{10} monitoring continued until the site was closed at the end of March 2021. DCHD continues to work to locate and seek approval of a new ozone and PM_{10} monitoring site (or sites) in south Omaha or the surrounding area.

C. Relocation of 19th and Burt Streets PM_{10} Monitor Site in Omaha

Douglas County Health Department has operated a PM_{10} monitoring site near 19th and Burt Streets, on the Creighton University Campus in Omaha, since 2001. The site was originally located on the rooftop of a building at 1909 Burt Streets. In 2019 DCHD was notified that the university planned to demolish this building, but that action was postponed. In March 2021 the site was moved one and one-half blocks to the east to the roof of a university engineering-maintenance building at 723 North 19th Street. Creighton University has now informed DCHD of plans to demolish that building as well, likely by December 2024.

DCHD is proposing to relocate this monitoring site to the roof of the Ryan Athletic Center on the Creighton campus. The new location is approximately 360 feet southwest of the current location and higher above ground level (second storey rooftop at the new location compared to first storey at the old). The street address of the proposed new location is 702 North 18th Street. The old and new locations are shown in figures VIII-2 and VIII-3. NDEE is requesting EPA approval for this relocation.

Figure VIII-2. Current (red circle) and Proposed New (green circle) Locations of 19th & Burt Streets PM_{10} Monitoring Site in Omaha and Distance Measurement.

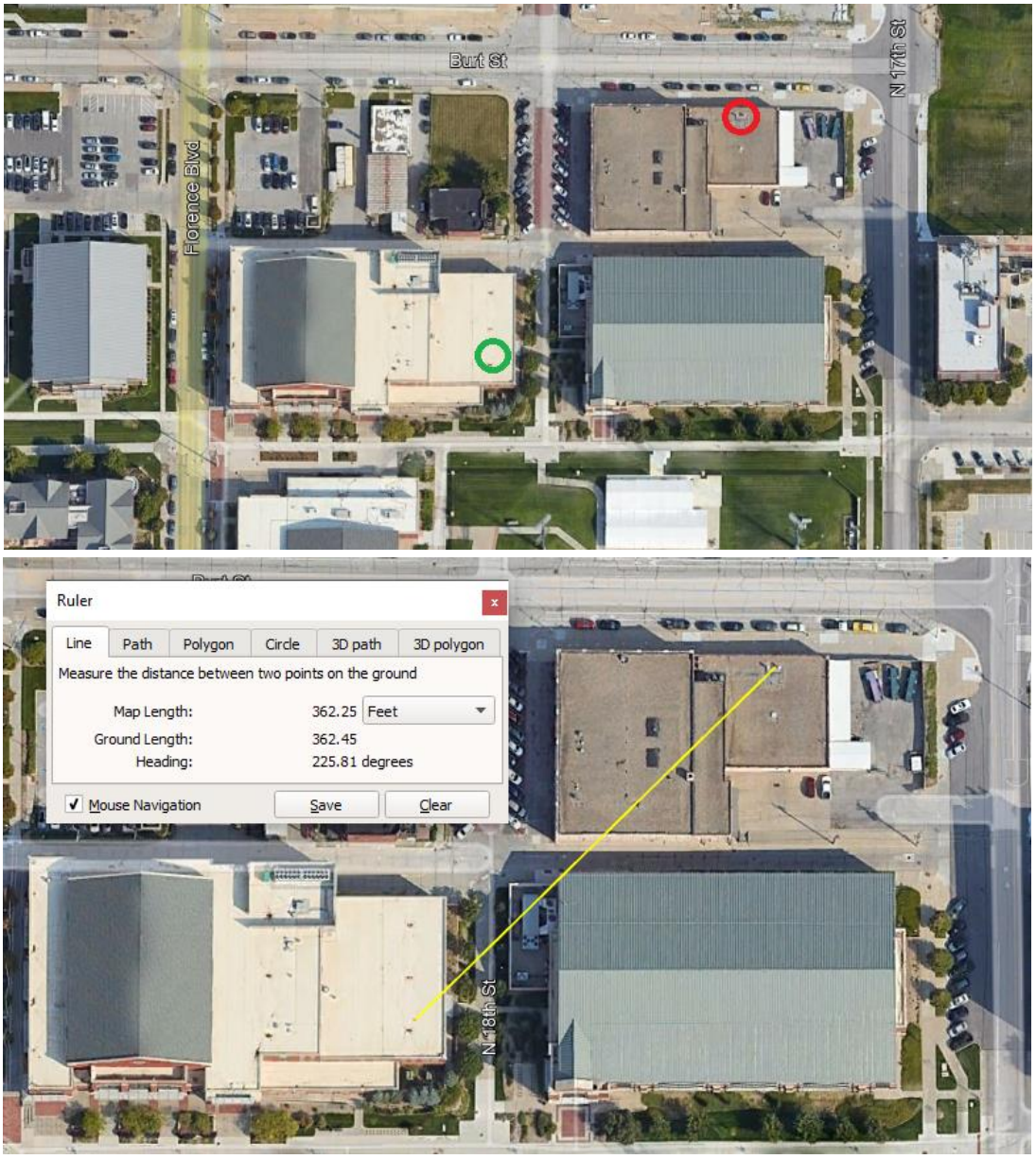


Figure VIII-3. Oblique Aerial View of Current (red circle) and Proposed New Location (green circle) of 19th & Burt Streets PM_{10} Monitoring Site in Omaha.

D. Replacement Ozone Monitoring Site in the Sioux City MSA

As discussed in section VI.D, in September 2021 the South Dakota Department of Agriculture and Natural Resources closed a multipollutant monitoring site in Union County at the request of the landowner. This site in the South Dakota portion of the Sioux City MSA included an ozone monitor. Based on the population of the Sioux City MSA and the recent ozone design values at the Union County site, 40 CFR Part 58 Appendix D requires one ozone monitor within the MSA (see Appendix C, Table C-2.c of this document for details). After negotiations between EPA Region 7 and the three states, Iowa DNR is expected to establish an ozone monitoring site in Sioux City, IA, the portion of the MSA expected to have the highest ozone concentrations.

D. American Rescue Plan $PM_{2.5}$ Monitor Replacements in Omaha

NDEE is using American Rescue Plan funds to replace the primary and collocated filter-based $PM_{2.5}$ samplers at the Berry Street location in Omaha (31-055-0052) with a continuous monitor and to replace an older continuous $PM_{2.5}$ monitor at the Omaha NCore site (31-055-0019) with a new continuous monitor. At the request of Douglas County Health Department, the sequential samplers from the Berry Street site will be relocated to the NCore monitoring site, making this the collocated $PM_{2.5}$ site in the Omaha-Council Bluffs MSA. These changes were approved by the Regional Administrator in January 2023. All new equipment has been ordered and delivered, and replacements are pending.

E. American Rescue Plan $PM_{2.5}$ Monitor Replacement in Lincoln

NDEE has provided American Rescue Plan funds to the Lincoln-Lancaster County Health Department to replace a Thermo 2025 sequential $PM_{2.5}$ sampler with a new Thermo 2025i sampler. The sampler will be

installed and designated as POC1, and a Thermo 2025i supplied to LLCHD as a long-term loan will be redesignated from POC1 to POC2.

F. Additional American Rescue Plan Equipment Replacements in Omaha and Lincoln

American Rescue Plan funds have also been allocated for replacement of other continuous pollutant monitors and supporting equipment in the Omaha and Lincoln areas. All equipment has been ordered and delivered, and monitor replacements are pending. New ozone monitors will be installed at the Omaha NCore site and the future replacement South Omaha site, and at the Davey site in Lancaster County. In addition, SO_2 samplers at Omaha NCore and the Whitmore Street site in north Omaha will be replaced.

G. Restoration of the IMPROVE Monitoring Site near Halsey, Nebraska

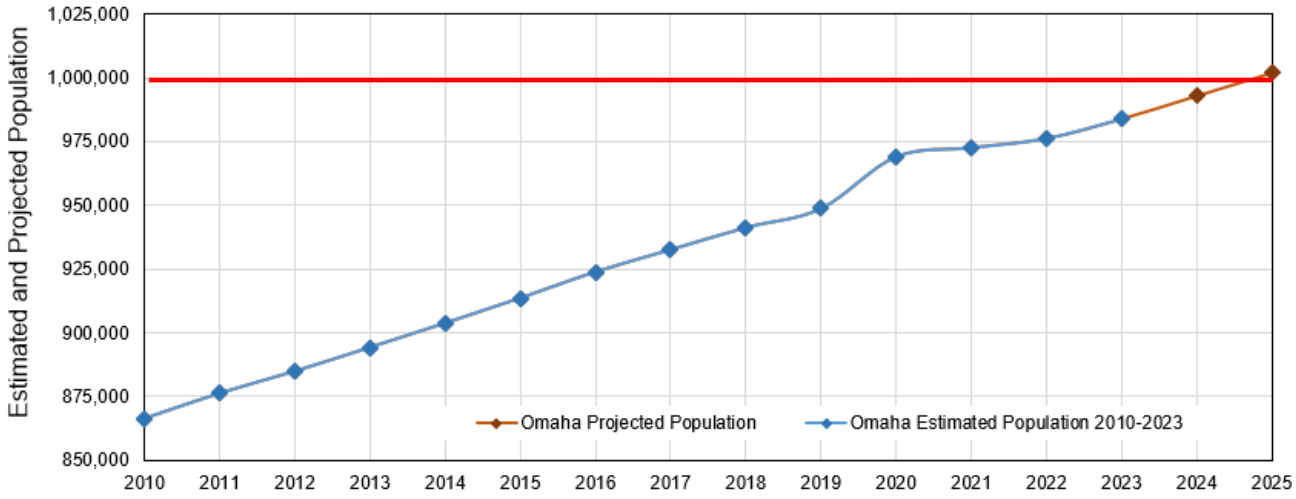
The Interagency Monitoring of Protected Visual Environments (IMPROVE) site in the Nebraska National Forest near Halsey (Thomas County) was destroyed by the Bovee wildfire, which began on October 2, 2022. The fire consumed nearly 19,000 acres of grassland and forest in this northern Sandhills region, destroying a campground lodge, cabins, and a lookout tower. At the IMPROVE site north of the lookout tower, the wooden shelter, particulate samplers, and the overhead electrical line to the site were all destroyed.

Although the IMPROVE site is not part of NDEE's SLAMS network, NDEE provides administrative support for the site. NDEE has provided Inflation Reduction Act – Clean Air Act grant funds to the Bessy Ranger District of the U.S.D.A. Forest Service to contract with Custer Public Power District to install a new buried electrical line and transformer for the site. Burying the utility line will help reduce potential damage from any future wildfires. This utility work has been completed. NDEE is using grant funds to reconstruct the shelter for the site; this work is expected to be completed in May or June 2024. An electrical contractor will then be hired to wire and connect the shelter. The IMPROVE project will then replace and calibrate the sampling equipment.

IX. Long-Term Planning for Additional Monitoring Needs in the Omaha-Council Bluffs MSA

The 2020 Decennial Census determined the population of the Omaha-Council Bluffs Metropolitan Statistical Area to be 967,604, a substantial increase from the 2010 population of 866,226. The Census Bureau's mid-year 2023 population estimate for the MSA was 983,969, which yields an average annual population increase of 9,057 since 2010. Figure IX-1 shows a graph of the Census Bureau's annual population estimates for the Omaha-Council Bluffs MSA along with projected populations through 2025 assuming this estimated average growth rate continues. At this rate of growth, the mid-year 2024 population would exceed 993,000, and the 2025 mid-year population estimate will likely exceed 1,000,000. (The 2025 official population estimates should be available in early 2026.)

Figure IX-1. Omaha-Council Bluffs MSA Estimated and Projected Population 2010-2025



* Mid-year population estimates from U.S. Census Bureau. See Appendix D, Figure D-5 for population data.

Under current federal rules in 40 CFR Part 58 Appendix D, attainment of a population in excess of 1,000,000 in the Omaha-Council Bluffs MSA would impose additional air quality monitoring requirements on Nebraska and Iowa, which share responsibility for monitoring in this MSA. Additional requirements would apply to monitoring NO_2, CO, and to Photochemical Assessment Monitoring Stations (PAMS).

A. Anticipated Photochemical Assessment Monitoring Station (PAMS) Requirements

Section 182(c)(1) of the 1990 Clean Air Act Amendments required the EPA Administrator to promulgate rules for the enhanced monitoring of ozone, oxides of nitrogen (NOx), and volatile organic compounds (VOC) to obtain more comprehensive and representative data on ozone air pollution. The regulations establishing the PAMS requirements are in 40 CFR Part 58, Appendix D, Section 5. Significant revisions to these requirements were made as part of the 2015 Ozone NAAQS review. The revised requirements call for ozone precursor measurements to be made during the 3-month PAMS season (June, July, and August) at existing NCore sites in core-based statistical areas (CBSA) with a population of one million or more as of the latest available census figures. The main objective of the required PAMS sites is to develop a database of ozone precursors and meteorological measurements to support ozone model development and track the trends of important ozone precursor concentrations.

The 2015 Ozone NAAQS review revisions required states subject to PAMS requirements to start making PAMS measurements by June 1, 2019. A Final Rule promulgated by EPA effective 2/7/2020 extended the required start date to June 1, 2021. Thus NDEE anticipates that PAMS monitoring will be required at the Omaha NCore station when the latest U.S. Census estimates show an Omaha-Council Bluffs MSA population exceeding 1,000,000, possibly beginning in 2026.

Required PAMS measurements include:

1. Hourly average speciated VOCs;
2. Three 8-hour averaged carbonyl samples per day on a 1-in-3 day schedule, or hourly averaged formaldehyde;
3. Hourly averaged O_3;
4. Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO_2), and total reactive nitrogen (NOy);
5. Hourly averaged ambient temperature;
6. Hourly vector-averaged wind direction;
7. Hourly vector-averaged wind speed;

8. Hourly averaged atmospheric pressure;
9. Hourly averaged relative humidity;
10. Hourly precipitation;
11. Hourly averaged mixing height;
12. Hourly averaged solar radiation; and
13. Hourly averaged ultraviolet radiation.

B. Anticipated Area-Wide and Near-Road NO_2 Monitoring Requirements

A CBSA with a population of 1,000,000 or more is required to have one site to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales (i.e., an area-wide site). A PAMS site collecting NO_2 data that is situated in an area of expected high NO_2 concentrations at the neighborhood or larger spatial scale may be used to satisfy this minimum monitoring requirement if the NO_2 monitor is operated year-round.

In addition, a CBSA with a population of 1,000,000 or more is required to have one microscale near-road NO_2 site to monitor a location of expected maximum hourly concentrations sited near a major road with high annual average daily traffic counts. Measurements at near-road NO_2 monitor sites utilizing chemiluminescence FRMs must include, at a minimum, NO, NO_2, and NOx.

Nebraska's 2015 Ambient Air Quality Monitoring Network Plan and 5-Year Assessment (submitted when near-road monitoring was required to begin by January 2017 in MSA's with a population over 500,000) included a proposal from Douglas County Health Department to use the existing 78th and Dodge Streets CO site as a near-road NO_2 monitoring site. This location is a microscale, highest concentration site in a high-traffic area with the monitor situated immediately adjacent to the roadway. It is likely that NDEE and DCHD would carry that proposal forward when the Omaha-Council Bluffs MSA exceeds the population threshold of 1,000,000 people.

C. CO Monitoring Requirement

A CBSA with a population of 1,000,000 or more is required to have one CO monitor collocated with a required near-road NO_2 monitor. If the existing 78th and Dodge Streets near-road CO monitor site in Omaha is selected as the near-road NO_2 monitor location, this requirement will be satisfied.

D. Near-Road $PM_{2.5}$ Monitoring Requirement

A CBSA with a population of 1,000,000 or more is required to have at least one $PM_{2.5}$ monitor collocated at a required near-road NO_2 monitoring station. If the existing 78th and Dodge Streets near-road CO monitor site in Omaha is selected as the near-road NO_2 monitor location, a $PM_{2.5}$ monitor would also have to added to this site.

Appendix A: Ambient Air Monitoring Sites in Nebraska

See Appendix C for a compliance review with respect to 40 CFR Part 58 Appendices A through E.

Omaha NCore Site Operated by DCHD

Site Name: Omaha NCore (1)	AIRS ID: 31-055-0019 (1)
Location: 4102 Woolworth Ave., Omaha	Latitude: 41.246792º Longitude: -95.973964º
Operating Agency: Douglas County Health Department	
Purpose: NCore	Scale: Neighborhood
Monitor/Pollutant: Carbon Monoxide (CO) - Trace Level	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 48i-TLE	EPA Method: RFCA-0981-054 (AQS 554)
Start-Up Date: 1/20/2011	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: Ozone (O_3)	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 49iQ	EPA Method: EQOA-0880-047
Start-Up Date: 4/1/2011	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: Nitrogen Oxides (NO/NO_y)	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 42i NO/NO_2/NOx	EPA Method: RFNA-1289-074
Start-Up Date: 1/20/2011	Closure Date: Currently operating
Data used for NAAQS comparison: Not Applicable. Monitors for NO & NOy, but not NO_2	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: Sulfur Dioxide (SO_2) – Trace Level	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 43i-TLE	EPA Method: EQSA-0486-060 (AQS 560)
Start-Up Date: 1/20/2011	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: $PM_{2.5}$ (2)	
Type/POC: Primary Continuous / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 (2) (3)	EPA Method: EQPM-0308-170
Start-Up Date: 2/1/2004 (2)	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: $PM_{2.5}$ (2)	
Type/POC: POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Met One E-SEQ-FRM (2)	EPA Method: RFPS-0717-245
Start-Up Date: 1/1/1999 (2)	Closure Date: Currently operating
Data used for NAAQS comparison: Only when POC 1 data is not available.	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Continued on next page	

Omaha NCore Site Operated by DCHD - continued

Site Name: Omaha NCore AIRS ID: 31-055-0019 (See Comment 1)
Location: 4102 Woolworth Ave., Omaha Latitude: 41.246792º Longitude: -95.973964º
Operating Agency: Douglas County Health Department (continued from previous page)

Monitor/Pollutant: $PM_{2.5}$ Speciation
Type/POC: Speciation / POC 05 Monitoring Frequency: Once every 3 days
Analyzer/Sampler: $PM_{2.5}$ Speciation Sampler Type: SASS and a 3000 URG (3)
Start-Up Date: 5/25/2001 Closure Date: Currently operating
Data used for NAAQS comparison: Not applicable
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Monitor/Pollutant: PM_{10} – STP & Local Conditions
Type/POC: Continuous / POC 01 Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 (3) EPA Method: EQPM-0798-122
Start-Up Date: 1/1/2011 (3) Closure Date: Currently operating
Data used for NAAQS comparison: Local conditions data only
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Monitor/Pollutant: $PM_{10-2.5}$ – Local Conditions
Type/POC: Continuous / POC 01 Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 (3) EPA Method: EQPM-0709-185
Start-Up Date: 1/1/2011 (3) Closure Date: Currently operating
Data used for NAAQS comparison: Yes
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Meteorological Parameters – Manufacturer & Model – Start Date
Wind Direction & Velocity – MetOne 50.5 Sonic - 5/13/11
Temperature - MetOne Model 083D – 4/12/2011 Barometric Pressure – MetOne Model 090D – 4/12/2011
Relative Humidity – MetOne 083D – 4/12/2011 Solar Radiation – MetOne Model 096-1 – 4/12/2011
Closure Date: Currently operating

Atmospheric Radiation – RadNet Air Monitor
RadNet is a nationwide system that monitors the nation's air, drinking water, precipitation, and pasteurized milk to determine levels of radiation in the environment. RadNet sample analyses and monitoring results provide baseline data on background levels of radiation in the environment and can detect increased radiation from radiological incidents. The RadNet monitor is not subject 40 CFR Part 58 requirements. It is recognized in this Network Plan for informational purposes only. The RadNet monitor began operating at the Woolworth site in June 2006.

Comments:
1. Site History: Site 31-055-0019 was referred to as the "Woolworth site" through 12/31/10. The Woolworth site was a PM monitoring site with $PM_{2.5}$ filter-based, continuous and speciation monitors located on the roof of Douglas County Hospital. To accommodate NCore monitoring, more space was required, and the site was moved approximately 550 ft north to the roof of an adjacent/attached building in December 2010. Gaseous and meteorological monitors began operation in 2011 and lead in 2012. Lead monitoring was discontinued at the end of 2017 in accordance with the 2017 Network Plan. Permanent discontinuation of lead monitoring was approved by EPA Region 7 in December 2018.
2. On 1/1/99 $PM_{2.5}$ sampling was initiated using primary and collocated R&P 2025 filter-based FRM samplers. A continuous monitor was first operated at this site 2/1/04. It was replaced by a MetOne BAM FEM monitor on 1/6/09. The MetOne BAM was operated as an auxiliary monitor to the primary and collocated R&P 2025 FRM samplers through September 2009. Beginning 10/1/09, the MetOne BAM was designated the primary sampler and an R&P 2025 FRM sampler was retained as the collocated sampler. The 2025 FRM sampler was replaced by a MetOne E-SEQ-FRM 16-channel sequential sampler on 1/1/2020.
3. Two Met One BAM-1020 samplers operate as a paired $PM_{10-2.5}$ monitoring system. The paired units comprising the $PM_{10-2.5}$ monitoring system were put on-line on 1/1/11.

Appendix A: Ambient Air Monitoring Sites in Nebraska

Carbon Monoxide Sites in the Omaha MSA Operated by DCHD

Site Name: 78th & Dodge – Omaha	AIRS ID: 31-055-0056
Location: 78th St and W Dodge Rd, Omaha	Latitude: 41.259175º Longitude: -96.028628º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Carbon Monoxide (CO)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 48c	EPA Method: RFCA-0981-054 (AQS 554)
Purpose: Highest Concentration	Scale: Microscale
Start-Up Date: 10/01/2007	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: None	

Combined Sulfur Dioxide & Ozone Site in the Omaha MSA Operated by DCHD

Site Name: Whitmore – Omaha	AIRS ID: 31-055-0053
Location: 1616 Whitmore St, Omaha (1)	Latitude: 41.297778º Longitude: -95.937500º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Sulfur Dioxide (SO_2)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 43c-TLE	EPA Method: EQSA-0486-060 (AQS 560)
Purpose: High Conc. & Population Oriented (1)	Scale: Neighborhood (1)
Start-Up Date: 7/1/1999	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: Ozone (O_3) (2)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 49C	EPA Method: EQOA-0880-047
Purpose: Population Oriented (1)	Scale: Neighborhood (1)
Start-Up Date: 4/1/2015	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: (1) This site is in a socioeconomically disadvantaged area. (2) The ozone monitor from the 30th & Fort Street site was re-located to this site in 2015.	

Appendix A: Ambient Air Monitoring Sites in Nebraska

Temporarily Closed Combined Ozone & PM10 Site in the Omaha MSA Operated by DCHD

Site Name: South Omaha – Ozone	AIRS ID: 31-055-0028
Location: 2411 O Street, Omaha	Latitude: 41.207500º Longitude: -95.947500º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Ozone (O_3)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 49C	EPA Method: EQOA-0880-047
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 7/1/1978	Closure Date: 12/31/2020
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: SA / GMW Hi-Vol Filter	EPA Method: RFPS 1287-063
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 6/1/2006 (1)	Closure Date: 3/31/2021
Data used for NAAQS comparison: Only when there is no primary data	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	

Comments:
(1) The PM_{10} sampler was initially set-up as a SPAM at 25th & L Sts and then moved to 2411 O St on 8/22/07.
(2) In 2020 the landowner at 2411 O Street asked for the site to be removed from the property. Ozone monitoring continued through the end of October 2020, the end of the required monitoring season. PM_{10} sampling was allowed to continue until the end of March 2021. As of May 2024 a new site has not been located.

PM_{10} Sites in the Omaha MSA Operated by DCHD

Site Name: 19th & Burt, Omaha	AIRS ID: 31-055-0054
Location: 723 North 18th St, Omaha	Latitude: 41.26664º Longitude: -95.93940º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: SA / GMW Hi-Vol Filter	EPA Method: RFPS 1287-063
Purpose: Population & Source Oriented	Scale: Middle
Start-Up Date: 6/1/2001	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days (1)
Analyzer/Sampler: SA / GMW Hi-Vol Filter	EPA Method: RFPS 1287-063
Purpose: Population & Source Oriented	Scale: Middle
Start-Up Date: 6/1/2001	Closure Date: Currently operating
Data used for NAAQS comparison: Only when there is no primary data	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	

Comments: The 19th & Burt Streets site was originally located at 1909 Burt Streets on the rooftop of a building owned by Creighton University. In 2019 the Douglas County Health Department was notified that the university planned to demolish this building to make way for new construction, but that action was postponed. The site was moved on March 10, 2021, one and one-half blocks to the east to the new location at 723 North 19th Streets.

Appendix A: Ambient Air Monitoring Sites in Nebraska

$PM_{2.5}$ Sites in the Omaha MSA Operated by DCHD

Site Name: Berry Street Omaha	AIRS ID: 31-055-0052
Location: 9225 Berry Street, Omaha	Latitude: 41.19812º Longitude: -96.00562º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: Thermo 2025 Sequential	EPA Method: RFPS-0498-118
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 1/1/1999	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: R&P/Thermo 2025 Sequential	EPA Method: RFPS-0498-118
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 10/1/2014	Closure Date: Currently operating
Data used for NAAQS comparison: Only when there is no primary data	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: None	

Site Name: Bellevue	AIRS ID: 31-153-0007
Location: 2912 Coffey Ave., Bellevue	Latitude: 41.166944º Longitude: -95.923889º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary Continuous / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 (1)	EPA Method: EQPM-0308-170
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 3/1/1999	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: (1) This site was operated with a 2025 sequential sampler from 3/1/99 thru 6/30/10 (RFPS-0498-118). On 7/1/10 a Met One BAM monitor began operating.	

Site Name: Blair	AIRS ID: 31-177-0002
Location: 2242 Wright St., Blair	Latitude: 41.551136º Longitude: -96.146753
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 (1)	EPA Method: EQPM-0308-170
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 4/6/1999	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: This site was operated with a 2025 sequential sampler from 4/6/99 thru 3/31/22 (RFPS-0498-118). On 4/1/22 a Met One BAM monitor began operating.	

Appendix A: Ambient Air Monitoring Sites in Nebraska

PM_{10} Site in the Weeping Water Area* Operated by NDEE

* The Weeping Water Area is in Cass County, which is part of the Omaha MSA. This is a relatively non-urbanized area of the county with limestone mining and processing activities. The PM_{10} monitoring conducted here is for evaluation of air quality in the vicinity of Weeping Water, and not the Omaha MSA as a whole.

Site Name: Weeping Water City (1)	AIRS ID: 31-025-0002
Location: 102 P Street, Weeping Water	Latitude: 40.866228 Longitude: -96.137678
Operating Agency: Nebraska Department of Environment and Energy	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM (2)	EPA Method: EQPM-0798-122
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 01/01/1985	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes. See Section V.A.1.a. App B not applicable	

Comments:

(1) Site is located at the city wastewater treatment facility.

(2) This site was operated with a primary 2025 sequential monitor from 8/12/2004 to 9/30/2016. A MetOne BAM continuous monitor began operating on 10/1/2016. A collocated 2025 sequential monitor at the site suffered a major electronic breakdown and last sampled on 3/25/15. With the installation of the continuous monitor, collocation is no longer required.

Appendix A: Ambient Air Monitoring Sites in Nebraska

Sites in the Lincoln MSA Operated by LLCHD

Site Name: Davey	AIRS ID: 31-109-0016
Location: 1st & Maple Sts., Davey	Latitude: 40.984722º Longitude: -96.677222º
Operating Agency: Lincoln Lancaster County Health Department	
Monitor Information	**Pollutant: Ozone**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Teledyne API T400E	EPA Method: EQOA-0992-087
Purpose: Population Oriented	Scale: Urban
Start-Up Date: 1/1/1985	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: This site was upgraded at the beginning of the 2014 ozone season with the Teledyne API 400E analyzer replacing the Dasibi 1003 AH analyzer.	

Site Name: LLCHD Building	AIRS ID: 31-109-0022
Location: 3140 N St., Lincoln	Latitude: 40.812590º Longitude: -96.683020º
Operating Agency: Lincoln Lancaster County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary / POC 01(1)	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: Thermo 2025i Seq. Filter	EPA Method: RFPS 0498-118
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 1/1/1999	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: R&P 2025 Seq. Filter	EPA Method: RFPS 0498-118
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 1/1/1999	Closure Date: Currently operating
Data used for NAAQS comparison: Only when primary data is not available.	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Continuous / POC 03(2)	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020	EPA Method: EQPM-0308-170
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 7/1/2006	Closure Date: Currently operating
Data used for NAAQS comparison: No. Reports to AirNow, but not AQS (1)	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	

Comment:

(1) The Thermo 2025i sampler replaced an R&P 2025 sampler in March 2023. The Thermo sampler previously operated in Scottsbluff, Nebraska but was replaced with a MetOne BAM in 2020.

(2) The MetOne BAM monitor reports data to AirNow, but not AQS. Data from the MetOne BAM is not used for NAAQS comparison. The MetOne BAM data typically demonstrate a negative bias when compared to same day FRM data. In 2022, there was a -8.5% bias on same-day annual average data, and a -7.1% bias for the same-day 98th percentile.

Appendix A: Ambient Air Monitoring Sites in Nebraska

$PM_{2.5}$ Sites Operated by NDEE

Site Name: Homestead National Historical Park AIRS ID: 31-067-0005
Location: 24405 SW 75 Rd, Beatrice Latitude: 40.28506º Longitude: -96.82431º
Operating Agency: Nebraska Department of Environment and Energy

Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary Continuous/ POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020	EPA Method: EQPM-0308-170
Purpose: Background Surveillance	Scale: Regional
Start-Up Date: 06/02/2021	Closure Date: Currently operating

Data used for NAAQS comparison: Yes
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Thermo 2025i Sequential	EPA Method: RFPS-0498-118
Purpose: Background Surveillance	Scale: Regional
Start-Up Date: 06/02/2021	Closure Date: Currently operating

Data used for NAAQS comparison: Only when primary data is not available.
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Comments: None

Site Name: Grand Island NDOT AIRS ID: 31-079-0005
Location: 3305 W Old Potash Hwy, Grand Island Latitude: 40.915555º Longitude: -98.378889º
Operating Agency: Nebraska Department of Environment and Energy

Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary Continuous/ POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020	EPA Method: EQPM-0308-170
Purpose: Population Oriented & Transport	Scale: Regional
Start-Up Date: 11/26/2019	Closure Date: Currently operating

Data used for NAAQS comparison: Yes
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Comments: None

Site Name: Scottsbluff Senior High School AIRS ID: 31-157-0004
Location: Hwy 26 & 5th Ave, Scottsbluff (1) Latitude: 41.875556º Longitude: -103.658056º
Operating Agency: Nebraska Department of Environment and Energy

Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary Continuous/ POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020	EPA Method: EQPM-0308-170
Purpose: Population Oriented & Transport	Scale: Regional & Neighborhood
Start-Up Date: 3/24/2020	Closure Date: Currently operating

Data used for NAAQS comparison: Yes
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Comments:
(1) A Thermo 2025i FRM Sequential sampler operated at this location on a 3-day sampling schedule until 3/24/20, when a continuous sampler was installed. Due to AQS software issues a new AIRS ID (31-157-0006) was assigned at that time. In April 2022 the site reverted back to the original AIRS ID.

Appendix A: Ambient Air Monitoring Sites in Nebraska

Source-Oriented Lead (Pb) Site Operated by NDEE

Site Name: Fremont	AIRS ID: 31-053-0005	
Location: 1500 Front St., Fremont, NE	Latitude: 41.425º	Longitude: -96.48º
Operating Agency: Nebraska Department of Environment and Energy		

Monitor Information	**Pollutant: Lead (Pb)**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Hi-Vol TSP-Pb (ICP-MS)	EPA Method: EQL-0310-189
Purpose: Source Oriented [(1)]	Scale: Microscale
Start-Up Date: 3/9/10	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	

Monitor Information	**Pollutant: Lead (Pb)**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 12 days
Analyzer/Sampler: Hi-Vol TSP-Pb (ICP-MS)	EPA Method: EQL-0310-189
Purpose: Source Oriented	Scale: Microscale
Start-Up Date: 3/9/10	Closure Date: Currently operating
Data used for NAAQS comparison: Only if primary sampler data is not available	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	

Comment: Source-oriented with respect to Magnus LLC facility. Monitoring at this site was suspended in September 2018 at the request of the landowner. The site was moved a short distance to an adjacent property and resumed sampling on July 1, 2023.

Source-Oriented Lead Monitoring Waivers pursuant to 40 CFR Part 58 Section 4.5(ii)

(1) Nucor Steel in Norfolk, NE: Waiver first approved by the EPA R7 Administrator in April 2014 and effective through April 2019. Renewal of this waiver was requested in the Nebraska 2019 Network Plan, which was approved by the EPA R7 Administrator in October 2019. The waiver remains in effect until April 2024. Renewal is requested as part of this document.

Appendix A: Ambient Air Monitoring Sites in Nebraska

Temporarily Closed Interagency Monitoring of Protected Visual Environments (IMPROVE) Site *

* Interagency Monitoring of Protected Visual Environments (IMPROVE) monitors are operated to evaluate regional haze that may impact Federal Class I areas in National Parks and Wilderness Areas. Fine particulate and particulate speciation monitoring is conducted at these sites. They do not have an AIRS ID, are not subject to 40 CFR Part 58 requirements, and are not used for NAAQS attainment determinations.

Site Name: NE National Forest IMPROVE **Location: Nebraska National Forest, Thomas Co.**	AIRS ID: Not applicable, See Comments Latitude: 41.8888º Longitude: -100.3387º
Operating Agency: Nebraska Department of Environment and Energy / US Forest Service	
Monitor Information Type/POC: IMPROVE Method Description: : IMPROVE Purpose: Background & Transport Start-Up Date: 2002	**Pollutant: IMPROVE** (See Comments) Monitoring Frequency: Every 3 days EPA Method: Not applicable Scale: Regional Closure Date: Temporarily closed due to wildfire damage.
Data used for NAAQS comparison: Not applicable. Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Not applicable	
Comments: Samplers, shelter, and electrical supply line were destroyed by a wildfire in October 2022. Work is in progress to reconstruct the site in summer 2024.	

National Atmospheric Deposition Program (NADP) Sites**

** The NADP site information below is included in the Network Plan for informational purposes only. They are not subject to 40 CFR Part 58 requirements, nor used for NAAQS attainment determinations.

Site Name: Mead NADP **Location: U of NE Field Lab, Saunders Co.** Operating Agency: University of Nebraska	AIRS ID: Not applicable, See Comments Latitude: 41.1528º Longitude: -96.4912
Monitor Information Type/POC: NTN/MDN Method Description: NTN/MDN Purpose: Background & Transport Start-Up Date: 7/25/1978	**Pollutant: TNT/MDN** Monitoring Frequency: Weekly EPA Method: Not applicable Scale: Regional Closure Date: Currently operating
Comments: The Mead and North Platte National Atmospheric Deposition Program (NADP) sites are operated by the University of Nebraska with analytical and data processing support from the NADP. NADP sites are not subject to review under the provisions of 40 CFR Part 58.10, and thus are not subject to review under this Network Plan. They are included herein for informational purposes only. • Monitoring methods are specific to this program and are not Federal Reference or Equivalent Methods (FRM/FEM). • The National Trends Network (NTN) sites collect deposition data on acidity, sulfate, nitrate, ammonium, chloride, and base cations (e.g., calcium, magnesium, potassium, and sodium). • Mercury Deposition Network (MDN) sites collect mercury deposition data. • The NADP oversees both NTN and MDN sites and provides analytical and data processing support. • The Mead site began operation as an NTN site in 1978 and began MDN operations in June 2007. NDEE provides financial support for MDN operations at this site through Title V fees.	

Appendix A: Ambient Air Monitoring Sites in Nebraska

National Atmospheric Deposition Program (NADP) Sites (continued)

Site Name: North Platte NADP	AIRS ID: Not applicable, See Comments
Location: U of Ne Ag Station, Lincoln, Co.	Latitude: 41.0592º Longitude: -100.7464º
Operating Agency: University of Nebraska	
Monitor Information	**Pollutant:** NTN
Type/POC: NTN	Monitoring Frequency: Weekly
Method Description: NTN	EPA Method: Not applicable
Purpose: Background & Transport	Scale: Regional
Start-Up Date: 9/24/1985	Closure Date: Currently operating

Comments: The Mead and North Platte National Atmospheric Deposition Program (NADP) sites are operated by the University of Nebraska with analytical and data processing support from the NADP. NADP sites are not subject to review under the provisions of 40 CFR Part 58.10, and thus are not subject to review under this Network Plan. They are included herein for informational purposes only.

- Monitoring methods are specific to this program and are not Federal Reference or Equivalent Methods (FRM/FEM).
- The National Trends Network (NTN) sites collect deposition data on acidity, sulfate, nitrate, ammonium, chloride, and base cations (e.g., calcium, magnesium, potassium, and sodium).
- Mercury Deposition Network (MDN) data was collected at this site from October 2009 thru October 2011 using Nebraska Environmental Trust funding.
- The NADP oversees both NTN and MDN sites and provides analytical and data processing support.

Site Name: Homestead NADP	AIRS ID: Not applicable, See Comments
Location: Homestead Nat. Historic Park	Latitude: 40.2850º Longitude: -96.8244º
Operating Agency: National Park Service	
Monitor Information	**Pollutant:** Ammonia
Type/POC: AMoN	Monitoring Frequency: Weekly
Method Description: AMoN	EPA Method: Not applicable
Purpose: Background & Transport	Scale: Regional
Start-Up Date: 7/26/2016	Closure Date: Currently operating

Comments: The Homestead National Atmospheric Deposition Program (NADP) site is operated by the National Park Service. NADP sites are not subject to review under the provisions of 40 CFR Part 58.10, and thus are not subject to review under this Network Plan. They are included herein for informational purposes only.

- Monitoring methods are specific to this program and are not Federal Reference or Equivalent Methods (FRM/FEM).
- The Ammonia Monitoring Network (AMoN) sites measure ammonia concentrations in ambient air at rural location.
- The NADP oversees the AMoN sites and provides analytical and data processing support.

Appendix A: Ambient Air Monitoring Sites in Nebraska

National Atmospheric Deposition Program (NADP) Sites (continued)

Site Name: Santee Sioux NADP **Location: State Spur 54D** Operating Agency: EPA	AIRS ID: Not applicable, See Comments Latitude: 42.8292º Longitude: -97. 8541º
Monitor Information Type/POC: AMoN Method Description: AMoN Purpose: Background & Transport Start-Up Date: 4/26/2011	**Pollutant:** Ammonia Monitoring Frequency: Weekly EPA Method: Not applicable Scale: Regional Closure Date: Currently operating

Comments: The Santee Sioux National Atmospheric Deposition Program (NADP) site is operated by the U.S. EPA. NADP sites are not subject to review under the provisions of 40 CFR Part 58.10, and thus are not subject to review under this Network Plan. They are included herein for informational purposes only.

- Monitoring methods are specific to this program and are not Federal Reference or Equivalent Methods (FRM/FEM).
- The Ammonia Monitoring Network (AMoN) sites measure ammonia concentrations in ambient air at rural location.
- The NADP oversees the AMoN sites and provides analytical and data processing support.

Clean Air Status and Trends Network (CASTNET) Site

Site Name: Santee Sioux CASTNET **Location: State Spur 54D** Operating Agency: EPA	AIRS ID: 31-107-9991 Latitude: 42.8292º Longitude: -97. 8541º
Monitor Information Type/POC: CASTNET Method Description: CASTNET Purpose: Background & Transport Start-Up Date: 7/5/2006	**Pollutant:** CASTNET, Ozone Monitoring Frequency: Weekly/Continuous (O_3) EPA Method: Not applicable Scale: Regional Closure Date: Currently operating

Comments: The Santee Sioux CASTNET site is operated by the U.S. EPA. CASTNET sites are not subject to review under the provisions of 40 CFR Part 58.10, and thus are not subject to review under this Network Plan. They are included herein for informational purposes only.

Except for ozone, monitoring methods are specific to this program and are not Federal Reference or Equivalent Methods (FRM/FEM).

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

This appendix compares ambient air quality data from 2021 through 2023 to the NAAQS. The annual data and estimated Design Values (DVs) presented below were retrieved from the EPA AQS database.

Table B-1: Ozone Data

Comparison of 3-Year Design Values for 8-hour Ozone to NAAQS (1)						
Site	**Operator**	**2021**	**2022**	**2023**	**DV**	**% NAAQS**
Omaha MSA and Near-By Montgomery Co., IA						
Omaha NCore	DCHD	0.064	0.063	0.078	0.068	97.1%
1616 Whitmore St, Omaha	DCHD	0.066	0.059	0.082	0.069	98.6%
Pisgah, Harrison Co., IA	IA DNR	0.063	0.060	0.077	0.066	94.3%
Montgomery County, IA	IA DNR	0.058	0.057	0.072	0.062	88.6%
Lincoln MSA						
First & Maple, Davey	LLCHD	0.059	0.055	0.068	0.060	85.7%
Sioux City MSA						
1005 N Crawford Rd., Clay Co., SD (2)	SD DANR		0.062	0.072		
Nebraska Non-MSA						
Santee Sioux Indian Reservation	US EPA	0.072	0.066	0.077	0.071	101.4%
Sites in Surrounding States						
Emmetsburg, IA	IA DNR	0.064	0.059	0.075	0.066	94.3%
Des Moines, IA	IA DMR	0.061	0.055	0.077	0.064	91.4%
Savanah, MO	MO DNR	0.061	0.059	0.072	0.064	91.4%
Kansas City Metro (Max DV site)	MO DNR	0.071	0.069	0.074	0.071	101.4%
Topeka KS	KS DHE	0.063	0.059	0.074	0.065	92.9%
Cedar Bluff Reservoir, KS	KS DHE	0.064	0.063	0.069	0.065	92.9%
Denver, CO Metro (Max DV site)	CO DPHE	0.089	0.078	0.076	0.081	115.7%
Greeley, CO	CO DPHE	0.076	0.070	0.068	0.071	101.4%
Cheyenne, WY (Max DV site)	WY DEQ	0.075	0.062	0.059	0.065	92.9%
Newcastle, WY	WY BLM	0.068	0.058	0.062	0.062	88.6%
Sioux Falls, SD (3)	SD DANR	0.065	0.065	0.082	0.070	100%
Wind Cave NP, Custer Co., SD	SD DANR	0.065	0.063	0.065	0.064	91.4%
Badlands NP, Jackson Co., SD	SD DANR	0.054	0.065	0.068	0.062	88.6%

Notes and Explanations:

(1) EPA AQS data retrieval 4/11/24. Concentrations are in units of ppm. Annual values are the 4th highest daily maximum 8-hour concentrations (ppm). The Design Value (DV) is the truncated 3-year average of the 4th highest maximum values. The NAAQS = 0.070 ppm (promulgated 10/1/2015). Values shown in red indicate insufficient data.

(2) A Union Co., SD site was operated in the Sioux City MSA by the South Dakota Department of Agriculture & Natural Resources and closed in October 2021. In 2022 the site was relocated to Clay County, 10 miles from the Union Co. site and just outside the Sioux City MSA.

(3) The Sioux Falls NCore monitoring site was moved to a new location at the end of March 2021. The 2022 annual value and Design Value use a data composite from both old and new locations.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-2: Carbon Monoxide Data

Comparison of 3-Year Maximum Annual Values for 1-Hour Carbon Monoxide to NAAQS (1) (2)					
Site	**2021**	**2022**	**2023**	**Design Value (2)**	**% NAAQS**
Omaha MSA					
78th & Dodge Streets, Omaha	1.3	1.69	1.59	1.69	5%
Omaha NCore (4)	0.75	1.39	0.75	1.39	4%
Comparison of 3-Year Maximum Annual Values for 8-Hour Carbon Monoxide to NAAQS (1) (3)					
Site	**2021**	**2022**	**2023**	**Design Value (3)**	**% NAAQS**
Omaha MSA					
78th & Dodge Streets, Omaha	1.1	1.4	1.1	1.4	16%
Omaha NCore (4)	0.5	0.6	0.6	0.6	7%

Notes and Explanations:

(1) EPA AQS data retrieval 4/15/24. The CO NAAQS were last revised in 1984. The latest review was concluded in August 2011 when EPA determined no changes in the CO NAAQS were warranted.

(2) The 1-hour NAAQS = 35 ppm. The annual values shown are the 2nd highest maximum values. The Design Value is the highest annual 2nd highest maximum value over the last 3 years. Concentrations are in units of ppm.

(3) The 8-hour NAAQS = 9 ppm. The annual values shown are the 2nd highest 8-hour maximum values. The Design Value is the highest annual 2nd highest maximum value over the last 3 years. Concentrations are in units of ppm.

(4) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

Table B-3: Sulfur Dioxide Data

Comparison of Daily Maximum 1-Hour Sulfur Dioxide Levels to the Primary NAAQS (1)					
Site	**2021**	**2022**	**2023**	**Design Value (1)**	**% NAAQS**
Omaha MSA					
1616 Whitmore St., Omaha	0.048	0.046	0.039	0.044	59%
Omaha NCore (2)	0.018	0.018	0.016	0.017	23%

Notes and Explanations:

(1) EPA AQS data retrieval 4/15/24. The 1-hour NAAQS is 75 ppb or 0.075 ppm (promulgated in June 2010 and retained in December 2020). The annual values shown are the 99th percentile of the daily maximum values in ppm units. The Design Value is the three-year average of the annual 99th percentile daily maximum values. Annual values and Design Values that do not meet data completeness requirements are shown in red.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-4: Nitrogen Oxide Data from the Omaha NCore Site (1)(2)

Parameter	2021	2022	2023	Approx. DV (3)	Max % NAAQS
1-Hour Data: 98th Percentile (3)					
NOy-NO (5)(6)(7)	0.037	0.037	0.034	0.036	36%
Annual Average Data (4)					
NOy-NO	0.0063	0.0051	0.0143	0.0143	27%

Footnotes:

(1) EPA AQS data retrieval 4/15/23. All concentrations expressed in ppm units.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(3) The 1-hour NO_2 NAAQS is 0.100 ppm (promulgated Feb. 2010 and retained Apr. 2018). NAAQS attainment is achieved if the 3-year average of the annual 98th percentile of the daily maximum 1-hour values does not exceed 0.100 ppm.

(4) The Annual Average NO_2 NAAQS is 0.053 ppm not to be exceeded in a calendar year. It was promulgated 1971 and retained in the 1996 and 2010 reviews. The Design Value is the highest annual average over the 3-year comparison period.

(5) NOy – Reactive oxides of nitrogen, which include NO, NO_2 and other nitrogen oxides, including organic nitrogen oxide compounds.

(6) NO – Nitrogen oxide

(7) NOy-NO provides an approximation of nitrogen dioxide (NO_2), with some possibility of over-estimating the true NO_2 concentration. For this reason, the NOy-NO parameter can be used to demonstrate attainment, but not non-attainment.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-5a: PM_{10} – Annual Number of Exceedances (1) (2)

Site	2021	2022	2023	Design Value (1)
Omaha MSA Sites				
Omaha NCore, 4102 Woolworth St. (3)	0	0	0	0.0
2411 O St, Omaha (4)	0	ND	ND	
19th & Burt Streets, Omaha	0	0	0	0.0
3130 C Ave, Council Bluffs, IA (5)	0	0	0	0.0
Weeping Water City (6)	0	0	0	0.0
Sioux City MSA Site				
31986 475th Ave, Union Co, SD (7)	0	ND	ND	

Notes and Explanations:

(1) EPA AQS data retrieval 4/16/24. The PM_{10} NAAQS is an exceedance-based standard with a 24-hour averaging time and 150 µg/m^3 level at standard temperature (25° C) and pressure (760 mm Hg) conditions. This standard is not to be exceeded more than once per year on average over 3 years, where exceedance is defined as a value of 155 µg/m^3 or more. Sites with 3-year average of exceedances of 1.0 or less are in attainment with the NAAQS. ND = No data.

(2) NAAQS History: The primary 24-hour NAAQS was initially set at 150 µg/m^3 in 1987 and was retained at this level in the 1997, 2006 and 2012 PM NAAQS reviews.

(3) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(4) The 2411 O Street site was closed for relocation 3/31/2021.

(5) The Council Bluffs, IA site is operated by the IA DNR

(6) Weeping Water is a limestone mining and processing area in Cass County, which is located 15 to 20 miles south of the main urbanized area within the Omaha MSA.

(7) The Union Co., SD site was operated by the South Dakota Department of Agriculture & Natural Resources. This site was closed on 9/30/2021.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-5b: PM_{10} – Annual Maximum 24-Hour Data [1] [2]

Site	2021	2022	2023	4th Highest Value [1]	% NAAQS
Omaha MSA Sites [6]					
Omaha NCore, 4102 Woolworth St. [3]	74	79	77	69	46%
2411 O St, Omaha [4]	46	ND	ND		
19th & Burt Streets, Omaha	48	75	56	56	37%
3130 C Ave, Council Bluffs, IA [5]	59	63	59	59	39%
Weeping Water City [6]	81	127	85	92	61%
Sioux City MSA Site					
31986 475th Ave, Union Co, SD [7]	92	ND	ND		

Notes and Explanations:

(1) EPA AQS data retrieval 4/16/24. Year columns show annual maximum 24-hour average values of PM_{10}. NAAQS = 150 µg/m^3, not to be exceeded more than once per year on average over 3 years, where exceedance is defined as a value of 155 µg/m^3 or more. Annual values that do not meet completeness requirements are shown in red; ND = No data. The 4th-highest 24-hour average value in the three-year period is shown for informal comparison to the NAAQS.

(2) NAAQS History: The primary 24-hour NAAQS was initially set at 150 µg/m^3in 1987, and was retained at this level in the 1997, 2006 and 2012 PM NAAQS reviews.

(3) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(4) The 2411 O Street site was closed for relocation 3/31/2021 at the request of the landowner. A new site has not yet been determined.

(5) The Council Bluffs, IA site is operated by the IA DNR

(6) Weeping Water is a limestone mining and processing area in Cass County, which is located 15 to 20 miles south of the main urbanized area within the Omaha MSA.

(7) The Union Co., SD site was operated by the South Dakota Department of Agriculture & Natural Resources. This site was closed on 9/30/2021.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-5c: PM_{10} - Annual Average Data (1)

Site	2021	2022	2023	3-Year Average	% Old Std
Omaha MSA (4)					
Omaha NCore, 4102 Woolworth St. (2)	23.0	21.0	20.9	21.6	43%
2411 O St, Omaha (3)	19.1	ND	ND		
19th & Burt Streets, Omaha	22.8	25.4	23.3	23.8	48%
3130 C Ave, Council Bluffs, IA 4)	22.3	21.4	20.5	21.4	43%
Weeping Water City (5)	22.4	24.1	21.2	22.6	45%
Sioux City MSA					
31986 475th Ave, Union Co, SD (6)	21.2	ND	ND		

Notes and Explanations:

(1) EPA AQS data retrieval 4/16/24. There is currently no NAAQS for the annual average PM_{10} concentration. An annual average NAAQS of 50 $\mu g/m^3$ was established in 1987, and then rescinded on December 18, 2006. Annual values and average values that do not meet completeness requirements are shown in red; ND = No data. Comparison to the rescinded NAAQS is provided for informational purposes only. Concentrations are in units of $\mu g/m^3$.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(3) The 2411 O Street site was closed for relocation 3/31/2021 at the request of the landowner. A new site has not yet been determined.

(4) The Council Bluffs IA site is operated by the IA DNR

(5) Weeping Water is a limestone mining and processing area in Cass County, which is located 15 to 20 miles south of the main urbanized area within the Omaha MSA.

(6) The Union Co., SD site was operated by the South Dakota Department of Agriculture & Natural Resources. This site was closed on 9/30/2021.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-6a: $PM_{2.5}$ - 98th Percentile 24-Hour Data (1)

Site	2021	2022	2023	Design Value (1)	% NAAQS
Omaha MSA & Montgomery Co., IA (4)					
Omaha NCore (2)	21.6	12.7	22.0	18.8	54%
9225 Berry St.; Omaha	22.4	14.5	33.8	23.6	67%
2912 Coffey Ave., Bellevue	26.3	16.0	24.6	22.3	64%
2242 Wright St., Blair	22.9	13.0	24.3	20.1	57%
3130 C Ave., Council Bluffs, IA (3)	23.9	19.0	33.1	25.3	72%
Montgomery Co., IA (outside Omaha MSA) (3) (4)	20.9	15.5	19.7	17.1	49%
Lincoln MSA					
3140 N Street, Lincoln	20.6	14.6	29.3	21.5	61%
Sioux City MSA					
901 Floyd Blvd, Sioux City, IA (3)	22.8	13.4	27.8	21.3	61%
1005 N Crawford Rd., Clay Co., SD (5)		13.8	41.3		
Other Nebraska Sites					
Beatrice (6)	22.9	16.3	22.9	20.7	59%
Grand Island	22.4	15.5	22.9	20.3	58%
Scottsbluff	17.4	9.3	19.6	15.4	44%

Notes and Explanations:

(1) EPA AQS data retrieval 3/31/23. The Design Values are the 3-year average of the annual 98th percentile values. To determine attainment status, the Design Values are compared to the 35 μg/m^3 NAAQS. Concentrations are in units of μg/m^3. Annual values and Design Values that do not meet data completeness requirements are shown in red; ND = No data.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(3) The Council Bluffs, Montgomery Co., and Sioux City IA sites are operated by the IA DNR

(4) The Montgomery County, IA site is located outside the Omaha MSA at Viking Lake State Park, ~18 miles east of the Mills-Montgomery County line and ~ 45 miles SE of the I-29/I-80 intersection.

(5) A Union Co., SD site was operated in the Sioux City MSA by the South Dakota Department of Agriculture & Natural Resources and closed in October 2021. In 2022 the site was relocated to Clay County, 10 miles from the Union Co. site and just outside the Sioux City MSA.

(6) The Beatrice site is located at Homestead National Historical Park, 3 miles west of town. Monitoring at the site began in 2021.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-6b: $PM_{2.5}$ - Annual Average Data [1]

Site	2021	2022	2023	Design Value [1]	% NAAQS
Omaha MSA & Montgomery Co., IA [4]					
Omaha NCore [2]	7.5	5.9	7.8	7.1	59%
9225 Berry St.; Omaha	8.5	6.6	9.1	8.1	67%
2912 Coffey Ave., Bellevue	8.8	6.7	8.0	7.8	65%
2242 Wright St., Blair	7.9	4.4	7.6	6.6	55%
3130 C Ave., Council Bluffs, IA [3]	8.9	7.5	9.7	8.7	73%
Montgomery Co., IA (outside Omaha MSA) [3] [4]	7.4	6.1	8.1	7.2	60%
Lincoln MSA					
3140 N Street, Lincoln	7.1	6.0	8.5	7.2	60%
Sioux City MSA					
901 Floyd Blvd, Sioux City, IA [3]	9.1	7.0	9.7	8.6	72%
1005 N Crawford Rd., Clay Co., SD [5]		6.0	8.7		
Other Nebraska Sites					
Beatrice [6]	11.0	5.3	7.2	7.8	65%
Grand Island	7.4	5.7	7.5	6.9	57%
Scottsbluff	5.0	3.2	5.4	4.5	38%

Notes and Explanations:

(1) EPA AQS data retrieval 3/31/23. The Design Values are the 3-year average of the annual average values. To determine attainment status, the Design Values are compared to the 12 µg/m^3 NAAQS. Concentrations are in units of µg/m^3. Annual values and Design Values that do not meet completeness requirements are shown in red; ND = No data.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(3) The Council Bluffs, Montgomery Co., and Sioux City IA sites are operated by the IA DNR

(4) The Montgomery County, IA site is located outside the Omaha MSA at Viking Lake State Park, ~18 miles east of the Mills-Montgomery County line and ~ 45 miles SE of the I-29/I-80 intersection.

(5) A Union Co., SD site was operated in the Sioux City MSA by the South Dakota Department of Agriculture & Natural Resources and closed in October 2021. In 2022 the site was relocated to Clay County, 10 miles from the Union Co. site and just outside the Sioux City MSA.

(6) The Beatrice site is located at Homestead National Historical Park, 3 miles west of town. Monitoring at the site began in 2021.

Table B-7: Lead in Total Suspended Particulate (TSP-Pb)

Annual Maximum Rolling 3-Month Average Values (1) (2)					
Site	**2021**	**2022**	**2023**	**DV** (1)	**% NAAQS**
Fremont (3)	ND	ND	0.02	0.02	13%

Notes and Explanations:

(1) Concentrations are in units of μg/m^3. The 3-month average NAAQS = 0.15 μg/m^3. The DV or Design Value is the highest 3-month average in the last 3 years. Annual values and Design Values that do not meet completeness requirements are shown in red; ND = No data.

(2) NAAQS History: The initial NAAQS was promulgated in 1978 and was set at 1.5 μg/m^3 calendar quarter average. In 2008, it was modified to 0.15 μg/m^3 3-month running average.

(3) The Fremont lead monitor was temporarily closed 9/31/2018 pending relocation at the request of the site host. A new location was located on an adjacent property, and sampling resumed 7/1/2023.

Appendix C: Compliance Verification with 40 CFR Part 58

This appendix reviews compliance with applicable requirements in 40 CFR Part 58 Appendices A through E. Nebraska Ambient Monitoring activities and network are in compliance with these requirements.

I. 40 CFR Part 58 Appendix A Review

40 CFR Part 58 Appendix A sets forth quality assurance requirements for the collection, calculation, and reporting of ambient air monitoring data. The *Quality Assurance Project Plan (QAPP) for the Nebraska Ambient Air Monitoring Program Revision 3.0* (approved by EPA in October 2022) was developed to comply with Part 58 requirements and the provisions of the EPA *Quality Assurance Handbook for Air Pollution Measurement Systems Volume II* (May 2013). The DCHD, LLCHD and NDEE all use this QAPP. Actual procedures for operating monitors, as well as for collecting, reviewing and submitting data, are set forth in Standard Operating Procedures (SOPs) that comply with the QAPP.

40 CFR Part 58 Appendix A also sets forth requirements specifying the number of collocated monitors required for $PM_{2.5,}$ $PM_{10,}$ $PM_{10\text{-}2.5}$ and Lead (Pb) monitors. Table C-1 summarizes the collocated sites in Nebraska. All PM and Pb sub-networks operated by DCHD, LLCHD and NDEE either currently meet collocation requirements or will do so after network changes outlined in this 2024 Network Plan.

II. 40 CFR Part 58 Appendix C Review

40 CFR Part 58 Appendix C contains requirements for approved ambient air monitoring methodologies. Any monitor that is used to evaluate NAAQS compliance must be a Federal Reference Method (FRM) or a Federal Equivalent Method (FEM) sampler or an alternatively approved method as defined in Appendix C. The network description tables in Appendix A of this network plan identify the sampling method used by each monitor in the Nebraska ambient air monitoring network. All monitors used to evaluate compliance with the NAAQS are FRM or FEM certified. The only monitors that are not FRM/FEM certified are those not subject to 40 CFR Part 58 requirements (i.e., NADP, IMPROVE, RadNet, etc.)

Appendix C: Compliance Verification with 40 CFR Part 58

Table C-1: Compliance Summary: Particulate Sampling Collocation Requirements of 40 CFR Part 58 Appendix A[1]

Parameter	Primary Sampler Method FRM = Federal Reference Method FEM = Federal Equivalent Method	Percent Collocation Required	NDEE/LLCHD [2]			DCHD [2]		
			# of Sites	# Collocated	% Collocated	# of Sites	# Collocated	% Collocated
PM_{10}	Hi-Vol Sampler (FRM)	15%	0	0	na	1 [3]	1	100%
PM_{10}	Sequential 2025 Sampler (FRM)	15%	0	0	na	0	0	na
PM_{10}	Met One BAM Continuous (FEM)	None	1	0	na [4]	1	0	(3)
$PM_{2.5}$	Sequential 2025 Sampler (FRM)	15%	1	1	100%	1	1	100%
$PM_{2.5}$	Met One BAM Continuous (FEM)	15%	3 [5]	1 [5]	33%	3	1	33%
$PM_{10-2.5}$	Met One BAM Continuous (FEM)	None	0	0	na	1	0	(6)
TSP-Lead	Hi-Vol Sampler (FRM)	15% except NCore	1 [7]	1	100%	0	0	0

Footnotes:

(1) Collocation Requirements: 40 CFR Part 58 Appendix A requires 15% of the particulate monitoring sites in each parameter/method category to have collocated monitors with certain exceptions and additional requirements. Listed site counts incorporate any network changes outlined in this Network Plan.

(2) Collocation requirements apply to each Primary Quality Assurance Organization (PQAO) separately. There are two PQAO's in Nebraska: DCHD and NDEE/LLCHD.

(3) Does not include the South Omaha site currently closed for relocation.

(4) Collocated monitors are not required for continuous PM_{10} monitors.

(5) LLCHD operates a MetOne BAM $PM_{2.5}$ sampler for AirNow and AQI reporting. It is collocated with the primary and collocated sequential samplers at the site.

(6) DCHD operates 2 MetOne BAM samplers at the NCore site. One is set-up to sample $PM_{2.5}$ and the other samples PM_{10}. $PM_{10-2.5}$ is calculated using the results from these 2 samplers. There is a sequential $PM_{2.5}$ collocated sampler at the NCore site, but not a collocated PM_{10} sampler. Collocated PM_{10} samplers are not required in Appendix A for continuous PM_{10} samplers. EPA has designated some NCore sites to have collocated samplers for $PM_{10-2.5}$; the Omaha NCore site is not one of them.

(7) Fremont lead site was closed at the request of the property owner in 2018 and reopened at a nearby site in July 2023.

Network Descriptions:

NDEE Continuous PM_{10}: Weeping Water City (collocation not required)
NDEE MetOne BAM Continuous $PM_{2.5}$: Grand Island and Scottsbluff
NDEE MetOne BAM Continuous and collocated sequential 2025i $PM_{2.5}$: Homestead
LLCHD Primary and collocated sequential 2025 $PM_{2.5}$: Lincoln
NDEE TSP-Lead: Fremont (collocated)

DCHD Hi-Vol PM_{10}: 19 & Burt (collocated) and South Omaha (currently closed)
DCHD MetOne BAM Continuous PM_{10}: NCore
DCHD Primary and collocated sequential 2025 $PM_{2.5}$: Berry St
DCHD MetOne BAM Continuous and collocated sequential 2025 $PM_{2.5}$: NCore
DCHD MetOne BAM Continuous $PM_{2.5}$: Bellevue and Blair
DCHD MetOne BAM Continuous $PM_{10-2.5}$: NCore (collocation not required)

III. 40 CFR Part 58 Appendix D Review

40 CFR Part 58 Appendix D sets forth monitoring objectives and minimum monitoring site requirements that must be met. The review that follows demonstrates that the Nebraska ambient air monitoring network meets the current Appendix D requirements.

EPA periodically re-evaluates the NAAQS and monitoring requirements. Regulatory modifications may impact the minimum monitoring requirements in one of two ways:

- Appendix D minimum monitoring requirements may be changed (i.e., more or less monitoring could be required); or
- Monitoring needs may change as a result of a NAAQS modification (e.g., when the annual average $PM_{2.5}$ NAAQS was lowered from 15 $\mu g/m^3$ to 12 $\mu g/m^3$, the 85% of NAAQS threshold set forth in 40 CFR Part 58 Appendix D Sec. 4.7 Table D.5 was crossed, and the minimum number of $PM_{2.5}$ monitoring sites for the Omaha MSA increased from 1 to 2).

A. 40 CFR Part 58 Appendix D - Objectives Review

40 CFR Part 58 Appendix D Section 1.1 sets forth three objectives that ambient air monitoring networks must be designed to meet:

- Provide air pollution data to the general public in a timely manner.
- Support compliance with ambient air quality standards and emissions strategy development.
- Support for air pollution research studies.

Each of these objectives is discussed below.

1. Timely Dissemination of Data - Met

Air monitoring data is made available to the public and other parties in several ways.

a. Ambient air monitoring data is reviewed quarterly and entered into the national EPA-operated AQS database. The AQS database is available to federal, state, and local monitoring agency personnel, as well as some other public agencies and researchers. AQS data cannot be directly accessed by the general public, but the NDEE does respond to data requests.

b. Current Air Quality Index values are posted for public view by DCHD and LLCHD for their respective jurisdictions. The AQI information is made available on their respective agency websites.

c. Monitoring data from continuous particulate, ozone, and CO monitors in the Omaha, Lincoln, and Grand Island MSAs and the Beatrice and Scottsbluff MiSAs report directly to the EPA AirNow system. The general public can access air quality index information online at www.airnow.gov. From 2019 through 2021 NDEE replaced sequential $PM_{2.5}$ samplers in Grand Island and Scottsbluff with continuous monitors reporting to AirNow, and the Department added a new $PM_{2.5}$ continuous monitoring site at Homestead National Historic Park near Beatrice to increase public access to real-time particulate monitoring data.

2. Support compliance with ambient air quality standards and emissions strategy development: Met

The NDEE reviews all data collected by DCHD, LLCHD, and NDEE during the previous year as part of the annual data certification process, the results of which are submitted to EPA by May 1st. At this time design values are calculated and compared with the NAAQS. This design value information is then incorporated into the annual Network Plan. The annual Network Plans discuss attainment/non-attainment status and monitoring strategies that may be related.

The NDEE, DCHD, and LLCHD also perform data validation reviews at least once each quarter and in many instances monthly. Any potential non-attainment or near non-attainment circumstances will be recognized during these reviews. If such conditions are identified, efforts are made to ascertain the cause and to the extent possible bring about corrective action through regulatory and/or voluntary mechanisms.

NDEE staff can access current ozone and $PM_{2.5}$ values through the AirNow Tech website when needed. When elevated ozone or $PM_{2.5}$ levels are reported, this information is passed on to air quality managers at DCHD, LLCHD, and NDEE.

The examples below illustrate how state and local air quality programs have recognized air quality issues and reacted to them.

a. In the spring of 2014, 2016, and 2017, smoke from prescribed grassland fires in the Flint Hills area of Kansas impacted Nebraska. AirNow data was used to track the degree and extent of the impact on ambient ozone and $PM_{2.5}$. At times, the impact from these controlled burns raised ozone and $PM_{2.5}$ levels in Nebraska, but there were no NAAQS violations. Both DCHD and LLCHD issued air quality alerts related to these burns.

b. Beginning in early 2018, NDEE has engaged with stakeholders and key players to address the air quality impacts associated with prescribed fires in the Flint Hills and the surrounding region. Roundtable meetings are held in February each year to discuss current trends, research, and options for collaboration and coordination to provide timely health advisories and notifications to the public. In addition to the local Nebraska air quality agencies, the group includes representatives from EPA Region 7, Kansas Department of Health and Environment (KDHE), the National Weather Service, the University of Nebraska Lincoln, the Nebraska Department of Health and Human Services (DHHS), the Nebraska Game and Parks Commission, and the Nebraska Prescribed Fire Council.

   As a result of this effort, beginning with the 2018 spring burn seasons KDHE has provided NDEE and local Nebraska air quality agencies with weekly summaries of burn activity in the Flint Hills and the resulting smoke impacts. KDHE also issues predictions of fire activity and impacts for the upcoming week and more frequently as needed.

c. In 2021 NDEE established a new $PM_{2.5}$ monitoring site at Homestead National Historical Park near Beatrice, Nebraska. The site has co-located continuous and sequential monitors, with continuous data provided to AirNow. Located north of the Flint Hills and south of the urban centers of southeastern Nebraska, the real-time data provided by this site provides advance warning of potential impacts from Flint Hills burn activity in the spring.

d. NDEE has partnered with the National Weather Service and the Nebraska Department of Health and Human Services (DHHS) to establish a smoke impact working group to assess potential smoke impacts from prescribed fires and wildfires and to issue health advisories when needed. These advisories are relayed to relevant local health departments in Nebraska and disseminated to the public by DHHS. The Smoke Awareness web page on the NDEE website has been expanded with additional information on spring burn activity and to provide access to smoke impact outlooks from prescribed burning and wildfires. This communication framework has been instrumental in addressing smoke and air quality impacts from nearby and distant wildfires and has provided timely communication to the public regarding those impacts and related health concerns.

3. Support for air pollution research studies – Met

The NDEE, DCHD, and LLCHD operate the Nebraska SLAMS network in accordance with the monitor specifications, site placement, and QA requirements set forth in 40 CFR Part 50 and 58. EPA R7 provides oversight to ensure that regulatory requirements are met with respect to methodology and QA.

Data are reviewed quarterly before being submitted to EPA's AQS database. Once in AQS, the data are available for pollution research studies.

Near real-time data are also reported to the EPA AirNow data from the continuous PM, CO, and ozone monitors operating in the Omaha and Lincoln MSA and Beatrice MiSA. These data are also available for research purposes.

B. 40 CFR Part 58 Appendix D Review – Minimum Monitoring Site Requirements for MSAs

Nebraska meets the requirements set forth in 40 CFR Part 58 Appendix D for the minimum number of monitoring sites. The minimum monitoring site requirements are set by Core Based Statistical Areas (CBSAs), which include Metropolitan Statistical Areas (MSAs) and Micropolitan Statistical Areas (MiSAs). The minimum monitoring site requirements for each of the four MSAs in Nebraska are examined separately and documented in Tables C-2.a through C-2.d below.

The review for non-MSA areas of the state was performed on a pollutant-specific basis. This review is documented in narrative form in Section III.C below.

It should be noted that the number of monitoring sites required in a network generally needs to be greater than the minimum number required by 40 CFR Part 58 Appendix D. This is stated in 40 CFR Part 58 Appendix D Section 1.1.2: "… total number of monitoring sites that will serve the variety of data needs will be substantially higher than these minimum requirements provide…".

C. 40 CFR Part 58 Appendix D Review – Minimum Monitoring Requirements for non-MSAs

NCore – (40 CFR Part 58 App. D Sec. 3) No sites required or operated outside of MSAs.

Nebraska has one required NCore site located in the Omaha MSA. At this time there is no requirement or plan to develop an additional NCore site in Nebraska.

Ozone (O_3) – (40 CFR Part 58 App. D Sec. 4.1) No sites required or operated.

At this time there is no requirement or plan to deploy ozone monitoring sites outside of the MSAs.

Carbon Monoxide (CO) – (40 CFR Part 58 App. D Sec. 4.2) No sites required or operated.

At this time there is no requirement or plan to conduct CO monitoring outside the MSAs. Elevated CO levels are primarily associated with vehicle emissions and congested traffic areas. Highest levels would be anticipated in the Omaha and Lincoln MSAs. Highest concentration site monitoring in Lincoln and Omaha has consistently found CO levels well below the NAAQS. Thus there is no need for additional monitoring sites in less populated communities.

Nitrogen Dioxide (NO_2) – (40 CFR Part 58 App. D Sec. 4.3) No sites required or operated.

At this time there is no requirement or plan to conduct NO2 monitoring outside the MSAs.

Sulfur Dioxide (SO_2) – (40 CFR Part 58 App. D Sec. 4.4) No sites required or operated.

There are no Part 58 requirements to operate SO2 monitoring sites in non-MSA areas. However, pursuant to Part 51, Subpart BB, monitoring may be used to demonstrate attainment with the 1-hour SO2 NAAQS. NDEE has no current plans for SO2 monitoring in non-MSA areas.

Lead (Pb) – (40 CFR Part 58 App. D Sec. 4.5)

Two source-oriented sites required; 1 currently active and 1 waived.

40 CFR Part 58 Appendix D requires source-oriented monitoring near sources with lead emissions of 0.5 tpy or more. Three sources in Nebraska initially met this threshold: Magnus LLC in Fremont, Magnolia Metals in Auburn, and Nucor Steel in Norfolk.

Monitoring near the Magnus facility in Fremont and Magnolia Metals in Auburn was initiated in 2010. A waiver pursuant to Part 58 Appendix D Section 4.5 was sought from and granted by EPA R7 for Nucor Steel in Norfolk in April 2014. This waiver expired in April 2019. NDEE sought a renewal of this waiver in the 2019 Network Plan, which was approved by EPA R7 in October 2019 and remains in force until April 2024.

In 2012 and 2013 Magnolia Metals installed pollution-control equipment that reduced their lead emissions to 0.1 tpy. Ambient lead levels dropped to below 5% of the NAAQS in 2015. The 2015 Network Plan proposed to discontinue lead monitoring near Magnolia Metals. The Auburn lead site was shut down in June 2016 in accordance with the approved 2015 Network Plan.

The Magnus LLC facility in Fremont currently is the only Nebraska facility that requires lead monitoring. Monitoring on a property adjacent to this facility was discontinued in September 2018 at the request of the site host. NDEE identified an alternative site on a nearby commercial property; this location was approved by EPA Region 7 during a site visit on December 5, 2019. However, negotiations with the property owner stalled. An alternative site was located in 2022 and a site lease agreement was signed by the new property owner in March 2023. NDEE requested EPA approval of the new site in the 2023 Network Plan, and installation of the samplers at the new was completed at the beginning of July 2023.

Coarse Particulate Matter (PM_{10}): (40 CFR Part 58 App. D Sec. 4.6) No sites required. No sites operated.

There are no minimum PM_{10} monitoring requirements for areas outside of MSAs.

Fine Particulate Matter ($PM_{2.5}$): (40 CFR Part 58 Appendix D Section 4.7 & 4.7.3) Two (2) sites required and three operated.

States are required to operate a background site and a transport site for PM2.5. The Homestead (Beatrice MSA) location is a background site, Scottsbluff is a transport site, and the Grand Island monitor serves as both a background and transport site.

Coarse Particulate Matter ($PM_{10-2.5}$): (40 CFR Part 58 App D Sec 4.8) No sites required or operated.

Photochemical Assessment Monitoring Stations (PAMS): (40 CFR Part 58 Appendix D Section 5) No sites required or deployed.

EPA requires state and local air monitoring agencies to make PAMS measurements (including hourly averaged mixing height) at NCore sites in CBSAs with a population of 1,000,000 or more. The 2023 estimated population of the Omaha-Council Bluffs MSA, where Nebraska's only NCore site is located, was 983,969, which is below the threshold requiring PAMS monitoring.

Appendix C: Compliance Verification with 40 CFR Part 58

Tables C-2.a through C-2d: Minimum Monitoring Reviews for Each Nebraska MSA

Table C-2a: 40 CFR Part 58 Appendix D Review: Omaha-Council Bluffs MSA (MSA Population ~ 976,671) *					
Pollutant	**App. D Citation**	**Review Criteria & *Comments***	**Sites Required**	**NE Sites Operated**	**Criteria Met?**
Ozone	Sec. 4.1 Table D-2	The Omaha MSA population is between 350K to 4M and O_3 levels are ≥ 85% of NAAQS (*See Design Values in Attachment B).*	2	2** Includes NCore	Y
CO	Sec. 4.2	The population threshold for requiring a near-road CO monitoring site in a CBSA is 1 million. The population of the Omaha MSA is below this threshold.	0	2 Includes NCore	Y
NO_2	Sec. 4.3.2	The Omaha MSA has a population between 500K and 1M and is thus not currently required to have a near-road NOx monitoring site.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA ≥ 1M (Omaha MSA population < 1 M)	0	1 @ NCore	Y
	Sec. 4.3.4	Regional Administrator required monitoring: None at this time.	0	0	Y
SO_2	Sec. 4.4	The need for SO_2 sites is based on the *Population Weighted Emissions Index* (PWEI). Omaha's PWEI = 19,941, which falls within the 5,000 to 100,000 range requiring 1 site (see Table C-3 below for PWEI calculation data). The current network of one highest concentration site and one NCore site exceeds the minimum requirements.	1	2 Includes NCore	Y
		Regional Administrator required monitoring: None at this time.	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting ≥ 0.5 tpy of lead in the Nebraska portion of the Omaha MSA.	0	0	Y
	Sec. 4.5 (b)	Revised regulations effective 4/27/16 eliminated the requirement for one community-based lead monitor at each NCore site. DCHD discontinued lead monitoring at the Omaha NCore site at the end of 2017 in accordance with this regulation change and the 2017 Network Plan.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: None at this time.	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	The Omaha MSA has a population between 500K – 1M and a low PM_{10} concentration range with max values < 80% of NAAQS. No sites in the MSA have exceeded this threshold since 2017. See Attachment B for PM_{10} data.	1-2	3** Includes NCore & 1 site @ Weeping Water	Y
$PM_{2.5}$	Sec 4.7 Table D-5	The Omaha MSA has a population between 500K – 1M and $PM_{2.5}$ levels < 85% of NAAQS range (*See Design Values in Appendix B).*	1	4 Includes NCore	Y
	Sec 4.7.2	Continuous monitor required.	1	3 Includes NCore	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring required (included SASS and URG samplers as one)	1	1 @ NCore	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3 and at NCore sites in CBSAs with populations over 1,000,000. Omaha MSA population < 1 million.	0	0	NA
NCore	Sec. 3	Omaha has been designated to operate an NCore site with NOx/NOy monitoring.	1	1	Y

* Unless noted otherwise, this analysis does not count monitors located in Iowa toward meeting the minimum monitoring requirements. It does consider pollutant levels measured at Iowa sites when determining minimum monitoring needs for ozone and $PM_{2.5}$.

** Counts do not include the South Omaha Ozone-PM_{10} site that is currently closed for relocation.

Table C-2b: 40 CFR Part 58 Appendix D Review: Lincoln MSA (Population ~ 342,448)					
Pollutant	App. D Citation	**Review Criteria & *Comments***	Sites Required	Sites Operated	Criteria Met?
Ozone	Sec. 4.1 Table D-2	The Lincoln MSA population is between 50K to 350K and O_3 levels < 85% of NAAQS (*See Design Values in Attachment B).*	0	1	Y
CO	Sec. 4.2	Near-road monitoring: No requirement for CBSA < 1 M.	0	0	Y
NO_2	Sec. 4.3.2	Near-road monitoring: No requirement for CBSA < 500K.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA $\geq$ 1M (Lincoln MSA population < 1 M).	0	0	Y
	Sec. 4.3.4	Regional Administrator required monitoring: none.	0	0	Y
SO_2	Sec. 4.4	The number of SO_2 sites required is based on the *Population Weighted Emissions Index* (PWEI). Lincoln's PWEI = 320, which falls below 5,000 (see Table C-3 below for PWEI calculation data). Thus no sites are required.	0	0	Y
		Regional Administrator required monitoring: none.	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting $\geq$ 0.5 tpy of lead.	0	0	Y
	Sec. 4.5 (b)	Community-based monitoring not required.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: none.	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	The Lincoln MSA population is between 250K and 500K. Monitoring is only required if current monitoring indicates PM_{10} $\geq$ 85% of NAAQS.	0-1	0	Y
$PM_{2.5}$	Sec 4.7 Table D-5	The Lincoln MSA population is between 50K – 500K and $PM_{2.5}$ levels < 85% of NAAQS (*See Design Values in Appendix B).*	0	1	Y
	Sec 4.7.2	Continuous monitor not required.	0	1	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring not required.	0	0	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3.	0	0	Y
NCore	Sec. 3	Lincoln has not been designated to operate an NCore site.	0	0	Y

Appendix C: Compliance Verification with 40 CFR Part 58

Table C-2c: 40 CFR Part 58 Appendix D Review: Sioux City MSA (Population ~ 174,921) *					
Pollutant	App. D Citation	**Review Criteria & *Comments***	Sites Required	NE Sites Operated	Criteria Met?
Ozone	Sec. 4.1 Table D-2	The Sioux City MSA population is between 50K and 350K. Appendix D Sec. 4.1, Table D-2 states that for MSAs of this size one ozone site is required if the DV ≥ 85% of the NAAQS. Until 9/31/2021 there was one ozone monitor in the MSA located in a rural area of Union County, SD. The latest 3-year Design Value from this Union County site is 64 ppb or 91% of the NAAQS. Thus a replacement for the Union County ozone monitoring site will be required. A new site is expected to be designated in Sioux City, IA.	1	0	N See comment
CO	Sec. 4.2	Near-road monitoring: No requirement for CBSA < 1 M.	0	0	Y
NO_2	Sec. 4.3.2	Near-road monitoring: No requirement for CBSA < 500K.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA ≥ 1M (Sioux City MSA population < 1 M)	0	0	Y
	Sec. 4.3.4	Regional Administrator required monitoring; none.	0	0	Y
SO_2	Sec. 4.4	The number of SO_2 sites required is based on the *Population Weighted Emissions Index* (PWEI). Sioux City MSA's PWEI = 304, which falls below the 5,000 to 100,000 range requiring 1 site (see Table C-3 below for PWEI calculation data).	0	0	Y See comment
		Regional Administrator required monitoring: none	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting ≥ 0.5 tpy of lead in the Nebraska portion of the Sioux City MSA.	0	0	Y
	Sec. 4.5 (b)	Community-based lead monitoring not required.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: none.	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	The Sioux City MSA population is between 100K – 250K and PM_{10} levels are < 80% of NAAQS (*See Design Values in Attachment B).*	0	0	Y
$PM_{2.5}$	Sec 4.7 Table D-5	The Sioux City MSA population is between 50K and 500K and $PM_{2.5}$ levels are < 85% of NAAQS, thus no monitor is required. (*See Design Values in Appendix B).*	0	0	Y
	Sec 4.7.2	Continuous monitor not required	0	0	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring not required	0	0	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3	0	0	Y
NCore	Sec. 3	The Nebraska portion of the Sioux City MSA has not been designated to operate an NCore site.	0	0	Y

* Unless noted otherwise, this analysis does not count monitors located in Iowa and South Dakota toward meeting the minimum monitoring requirements. It does use pollutant levels measured at IA and SD monitoring sites when determining minimum monitoring needs for ozone and PM.

Appendix C: Compliance Verification with 40 CFR Part 58

Table C-2d: 40 CFR Part 58 Appendix D Review: Grand Island MSA (Population ~ 76,333)					
Pollutant	App. D Citation	**Review Criteria & *Comments***	Sites Required	Sites Operated	Criteria Met?
Ozone	Sec. 4.1 Table D-2	Grand Island MSA population is between 50K -350K. Monitoring is only required if current monitoring finds O_3 > 85% of NAAQS as set forth in Part 58 Appendix D Table D-2.	0	0	Y
CO	Sec. 4.2	Near-road monitoring: No requirement for CBSA < 1 M.	0	0	Y
NO_2	Sec. 4.3.2	Near-road monitoring: No requirement for CBSA < 500K.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA $\geq$ 1M (Grand Island MSA population < 1 M)	0	0	Y
	Sec. 4.3.4	Regional Administrator required monitoring: none	0	0	Y
SO_2	Sec. 4.4	*Population Weighted Emissions Index* (PWEI) = 4, which falls below 5,000 (see Table C-3 below for PWEI calculation data). No monitoring sites required.	0	0	Y
		Regional Administrator required monitoring: none	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting $\geq$ 0.5 tpy of lead	0	0	Y
	Sec. 4.5 (b)	Community-based lead monitoring not required.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: none	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	PM_{10} monitoring is not required if MSA population < 100,000	0	0	Y
$PM_{2.5}$	Sec 4.7 Table D-5	Grand Island's CBSA population is between 50K – 500K and $PM_{2.5}$ levels are < 85% of NAAQS (*See Design Values in Appendix B)*	0	1(1)	Y
	Sec 4.7.2	Continuous monitoring is not required	0	0	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring is not required	0	0	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3	0	0	Y
NCore	Sec. 3	The Grand Island MSA has not been designated to operate a NCore site	0	0	Y

Footnote:
(1) The $PM_{2.5}$ site operated in Grand Island as one of Nebraska's transport and background monitoring sites.

Table C-3: SO_2 Population Weighted Emissions Index (PWEI) Data for Nebraska Core Based Statistical Areas (CBSAs) [a] [b] [c] Page 1 of 2

CBSA	County	Population 7/1/2022 [c]	SO_2 Emissions (tons/year)		SO_2 Emissions % Change	PWEI [a] [b]	
			2017 EI	2020 EI		2017 EI	2020 EI
Omaha MSA	Douglas	586,327	8,951	5,691	-36%	20,266	**19,941**
	Sarpy	196,553	267	79	-70%		
	Cass	27,122	749	702	-6%		
	Saunders	23,118	46	13	-72%		
	Washington	21,167	63	95	52%		
	Pottawattamie, IA	93,173	10,430	5,983	-43%		
	Mills, IA	14,553	30	10	-68%		
	Harrison, IA	14,658	60	32	-47%		
	Totals	**976,671**	**20, 596**	**12,605**	**-39%**		
Lincoln MSA	Lancaster	324,756	2,628	1,654	-37%	930	**320**
	Seward	17,692	73	33	-54%		
	Totals	**342,448**	**2,701**	**1,687**	**-37%**		
Sioux City MSA	Woodbury, IA	105,671	9,316	2,900	-69%	1,732	**304**
	Plymouth, IA	25,681	331	12	-96%		
	Dakota	21,042	138	20	-86%		
	Dixon	5,464	29	11	-61%		
	Union, SD	17,063	50	66	33%		
	Totals	**174,921**	**9,865**	**3,010**	**-69%**		
Grand Island MSA[d]	Hall	62,097	622	395	-36%	54	**4**
	Howard	6,515	27	13	-53%		
	Merrick	7,721	52	12	-77%		
	Totals	**76,333**	**701**	**419**	**-40%**		

Observation: The EPA's emission inventory data indicates that SO_2 emissions from the four Nebraska MSAs decreased by 37% to 69% from 2017 to 2020.

Footnotes at bottom of page 2 of this table.

Table C-3 (continued): SO_2 Population Weighted Emissions Index (PWEI) Data for Nebraska Core Based Statistical Areas (CBSAs) [a] [b] [c] Page 2 of 2

CBSA	County	Population 7/1/2022 [c]	SO_2 Emissions (tons/year)		SO_2 Emissions (% Change)	PWEI [a] [b]	
			2017 EI	2020 EI		2017 EI	2020 EI
Kearney MiSA	Buffalo	50,586	137	37	-73%	9	**0.5**
	Kearney	6,690	16	3	-79%		
	Totals	**57,276**	**153**	**40**	**-73%**		
Norfolk MiSA	Madison	35,368	102	13	-87%	16	**0.8**
	Pierce	7,332	37	23	-37%		
	Stanton	5,717	188	216	15%		
	Totals	**48,417**	**327**	**252**	**-14%**		
Hastings MiSA	Adams	**30,970**	**2,604**	**2,235**	**-14%**	80	**2.5**
Scottsbluff MiSA	Banner	660	1	52	5058%	8	**0.3**
	Scotts Bluff	35,603	224	162	-27%		
	Sioux	1,127	1	3	195%		
	Totals	**37,390**	**226**	**217**	**-4%**		
North Platte MiSA	Lincoln	33,685	21,346	18,332	-14%	735	**25**
	Logan	675	4	24	503%		
	McPherson	372	2	1	-55%		
	Totals	**34,732**	**21,352**	**18,357**	**-14%**		
Fremont MiSA	Dodge	**36,997**	**1,032**	**935**	**-9%**	38	**1.4**
Columbus MiSA	Platte	**34,296**	**516**	**411**	**-20%**	18	**0.6**
Lexington MiSA	Dawson	23,884	114	23	-80%	3	**0.1**
	Gosper	1,808	11	3	-70%		
	Totals	**25,692**	**125**	**26**	**-79%**		
Beatrice MiSA	Gage	**21,583**	**93**	**41**	**-56%**	2	**0.04**

Footnotes:

(a) Population Weighted Emission Index (PWEI) = (CBSA Population) x (SO_2 Emissions (tpy))/1,000,000.

(b) SO_2 Emission data were obtained from the EPA National Emission Inventory (EI) database for 2017 and 2020. The 2020 NEI data are the most recent available from EPA at the time this table was created (April 24, 2024).

(c) U.S. Census population estimate data for 7/1/2023 were used in this table and the PWEI calculations.

(d) Prior to September 2018, the Grand Island MSA also included Hamilton County, Nebraska.

The PWEI calculated with 2020 Emission Inventory data is currently applicable. The PWEI was also calculated with 2017 EI data to document any change that might have occurred.

IV. 40 CFR Part 58 Appendix E Review

Appendix E sets forth requirements for probe and monitoring path placement, including: horizontal and vertical placement, spacing from minor sources, spacing from obstructions, spacing from trees, spacing from roadways, cumulative interferences on a monitoring path, maximum monitoring path length, and probe material and sample residence time. Compliance with these criteria is verified when the site is set up and periodically thereafter. Compliance is evaluated using review sheets developed for that purpose.

Appendix D: Request for Renewal of Nucor Steel Lead Monitor Waiver

Background

State air quality agencies are required to conduct source-oriented lead monitoring from each source that emits lead at a rate equal to or greater than the emission threshold of 0.50 tons per year (tpy), unless a waiver is granted as allowed by 40 CFR part 58 Appendix D, paragraph 4.5(a)(ii) for sources that will not contribute to lead concentrations in ambient air in excess of 50% of the NAAQS (based on historical monitoring data, modeling, or other means). A lead monitoring waiver is currently in place with U.S. EPA for Nucor Steel, in Norfolk, NE. The waiver was first approved by EPA on 16 April 2014 and renewed with approval of the 2019 Nebraska Ambient Air Monitoring Network Plan on 4 October 2019. The waiver must be renewed every five years.

This appendix is a request for the renewal of this waiver. Emissions inventories and stack emissions tests confirm that annual lead emissions have been less than 0.5 tpy throughout the term of the current waiver, and previous modeling results for this facility demonstrated that it does not have the potential to contribute to a maximum lead concentration greater than 50% of the NAAQS.

Facility Description

Nucor Steel is a steel recycling facility that utilizes ferrous metal scarp as the primary raw material in the production of steel billets and finished steel bar products. The source operates under Standard Industrial Classification (SIC) code 3312 for Blast Furnaces and Steel Mills, and under North American Industrial Classification System (NAICS) code 331110 for Iron and Steel Mills and Ferroalloy Manufacturing. The main lead emission points are in the meltshop, where scrap is melted in two electric arc furnaces and where casting operations also take place. The facility operates around the clock throughout the year (8760 hrs/yr). Although Nucor Steel's permit revision in 2013 authorized an increase in steel production to 1,350,000 tons annually, production has not exceeded the previous limit of 1,300,000 tons since 2005 and has only exceeded 1,000,000 tons in 2018 and 2021.

Lead emissions from the meltshop are controlled primarily via a canopy hood exhausted to a positive-pressure baghouse (EP-8a.1) installed in 1997 and a direct evacuation control system exhausted to a negative-pressure baghouse (EP-8a.2) installed in 2014. The facility currently operates under a facility-wide potential to emit (PTE) lead limit of 1.55 tons per year, and the combined hourly emission rate limit of lead from the two meltshop baghouses is 0.38 lbs/hr, averaged over a 3-hour test period.

Facility Lead (PB) Emissions

Nucor's facility-wide Pb emissions as reported in annual emission inventories from 2012 through 2023 are shown in Table D-1 below. After the negative-pressure baghouse became fully operational during 2015, reported annual facility-wide lead emissions have not exceeded the 0.5-ton threshold, with no significant overall change in steel production level. The largest annual emissions total reported during that period was 0.362 tons in 2023.

Table D-1. Historical Lead Emissions as Reported to NDEE in Emissions Inventories (tpy)

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0.63	0.81	0.11	0.91	0.15	0. 19	0.22	0.264	0.322	0.347	0.315	0.362

Emission Test Results

Nucor Steel has submitted to NDEE source emission test results for lead emission rates for the two meltshop baghouses at approximately two-year intervals since 2015. The tests report the average hourly emission rates for three test runs for each baghouse. The test data are summarized in Table D-2.

Appendix D: Request for Renewal of Nucor Steel Lead Monitor Waiver

Table D-2. Lead Stack Emission Rate Test Results for the Nucor Meltshop Baghouses 2015 through 2023						
Date	Average Lead Emission Rate (lb/hr)			Permit Limit (lbs/hr)	Percent of Permit Limit	Annualized Emissions (ton)
	EP-8a.1	EP-8a.2	Combined			
4/18/2023	0.0021	0.0110	0.0130	0.38	3.4%	0.057
4/6/2021	0.0110	0.0059	0.0170	0.38	4.5%	0.074
4/24 & 4/25/2019	0.0013	0.0006	0.0019	0.38	0.5%	0.008
4/5 & 4/6/2018	0.0077	0.0049	0.0126	0.38	3.3%	0.055
4/9 & 4/10/2017	0.0116	0.0055	0.0171	0.38	4.5%	0.075
6/6 & 6/7/2015	0.0030	0.0250	0.0280	0.38	7.4%	0.123

The emission tests since 2017 show combined hourly lead emission rates for the two meltshop baghouses have not exceeded 5% of the permit limit of 0.38 lbs/hr. Assuming year-round operation of the meltshop at the tested rates, annual lead emissions for the two meltshop baghouses would not exceed 0.075 ton in any of the test years after 2015, including the most recent test in 2023. These test results indicate that Nucor Steel's reported annual facility-wide lead emissions are based on conservative calculations.

Air Dispersion Modeling

In 2019 NDEE conducted air dispersion modeling of the Nucor Steel facility using AERMOD version 18081. The model design and results were reported in NDEE's 2019 Network Plan. The maximum monthly AERMOD results yielded a predicted 3-month rolling average of 0.04 $\mu g/m^3$, or 27% of the Pb NAAQS.

Conclusion

Reported annual lead emissions, emissions testing, and air dispersion modeling all demonstrate that Nucor Steel is not emitting lead in amounts equal to or greater that 0.5 tpy, and maximum concentrations are well below 50% of the lead NAAQS. NDEE requests renewal of the lead monitoring waiver for Nucor Steel for an additional 5-year period.

Nebraska Department of Environment and Energy

2024 Annual Report on Modeled Facilities (Data Requirements Rule, 2010 SO_2 NAAQS)

Thaddeus D. Fineran, Interim Director
May 15, 2024

Appendix E: 2024 Annual Report on Modeled Facilities

Introduction

The Data Requirements Rule (DRR) for the 2010 1-hour SO_2 Primary National Ambient Air Quality Standards (NAAQS) was issued in August 2015 and describes ongoing requirements for states with areas designated as attainment based on air quality modeling. Of the three areas in Nebraska subject to the rule, two meet the criteria for ongoing requirements.

The Nebraska Department of Environment and Energy (NDEE) asserts that all areas continue to demonstrate attainment with the NAAQS, and that additional air quality modeling is not necessary at this time. Analysis and discussion of emissions data are provided in this report.

Areas Subject to Ongoing Requirements

The following pages describe areas in Nebraska subject to the ongoing requirements described in 40 CFR Part 51.1205. Modeling analyses used to characterize these areas utilized actual emissions data and these areas have no subsequent “nonattainment” designations.

Appendix E: 2024 Annual Report on Modeled Facilities

The area surrounding Gerald Gentleman Station (GGS), Sutherland, NE

Nebraska Public Power District (Lincoln County)

The modeling analysis used to characterize this area was performed in September 2015 and utilized actual facility emissions from 2012-2014. This analysis indicated the SO_2 impact (99th percentile 1-hour SO_2 concentration) on the area to be 144.8 ug/m^3, or 55.3 parts per billion (ppb). This impact value equates to 73.7% of the 1-hour SO_2 NAAQS of 75 ppb, and this area (Lincoln County) was designated "unclassifiable/attainment" on July 12, 2016 (81 FR 45039).

Emissions data for GGS are shown in **Table E-1**. Data from 2012-2014 used in the modeling analysis, and emissions data for 2021-2023, are included for comparison. The SO_2 emissions reported for 2023 indicate an 1.7% decrease from 2022, with overall facility SO_2 emissions decreasing on average by about 1.1% annually since 2012. The 2021-2023 average actual emissions are 22.5% lower than the 2012-2014 modeled three-year average. Therefore, NDEE asserts that the area surrounding GGS continues to be in attainment with the 1-hour SO_2 NAAQS, and additional modeling is not necessary at this time.

GGS participates in the Cross-State Air Pollution Rule (CSAPR) trading program for SO_2, and actual 2023 facility emissions are below the SO_2 allocations of 13,780 tons (Unit 1) and 15,116 tons (Unit 2).[1]

Table E-1. Gerald Gentleman Station

Unit	SO_2 Emissions (tons per year)					
	2012	2013	2014	2021	2022	2023
GGS1	14,832	13,047	12,539	10,220	10,127	10,202
GGS2	11,605	15,383	11,945	9,184	11,101	10,675
Total	**26,437**	**28,430**	**24,484**	**19,404**	**21,228**	**20,877**
Average (2012-2014)	**26,450**					
Average (2021-2023)				**20,503**		

Emissions data were acquired from the Clean Air Markets Division, https://campd.epa.gov/data.

[1] CSAPR Allowance Allocations https://www.epa.gov/csapr/csapr-allowance-allocations.

Appendix E: 2024 Annual Report on Modeled Facilities

The area surrounding Gerald Whelan Energy Center (WEC)

Hastings Utilities (Adams County)

The modeling analysis used to characterize this area was performed in December 2016 and utilized actual facility emissions data from 2013-2015. This analysis indicated the SO_2 impact (99th percentile 1-hour SO_2 concentration) on the area to be 188.7 µg/m^3, or 72.02 ppb, which equates to 96% of the NAAQS. This impact value is below the 1-hour SO_2 NAAQS of 75 ppb and the area (Adams County) was designated "attainment/unclassifiable" on January 9, 2018 (83 FR 1098).

Emissions data for Whelan Energy Station is shown in **Table E-2a**. Data from 2013-2015 used in the modeling analysis, and reported emissions data for 2021-2023 are included to provide comparison. The 2023 SO_2 emissions show an 20.4% decrease from 2022, however, the 2021-2023 average shows a 4.8% increase over the 2013-2015 modeled three-year average.

Table E-2a. Gerald Whelan Energy Center Emissions

Unit	SO_2 Emissions (tons per year)					
	2013	2014	2015	2021	2022	2023
WEC1	1,439	2,302	1,495	1,898	2,051	1,653
WEC2	692	598	409	578	619	473
Total	**2,131**	**2,900**	**1,904**	**2,476**	**2,670**	**2,126**
Average (2013-2015)	**2,312**					
Average (2021-2023)				**2,424**		

Emissions data were acquired from the Clean Air Markets Division, https://campd.epa.gov/data.

The SO_2 Continuous Emission Monitoring System (CEMS) on Unit 2 (WEC2) experienced a malfunction in 2023; it was removed from service on June 16, 2023 and sent to Texas for repair. A substitute CEMS unit was installed on July 11, 2023; this unit was on site being used to monitor inlet SO_2 gas concentrations ahead of the SO_2 Scrubber. The substitute unit was similar but was only configured for SO_2 and not SO_2+NOx as was the CEM unit removed for repair.

After notification that the malfunctioning CEMS unit would require repairs in Germany, a new unit was purchased and installed on September 13, 2023. The repaired (original) CEMS unit is currently in storage as a backup for the new unit installed on WEC2.

Based upon historical data, an analysis[2] was conducted to determine the amount of excess SO_2 emissions recorded in June and July of 2023; the excess emissions are attributed to the Acid Rain substitution routine. A comparison was made using data from operating years 2022 and 2023 for all months having 500 or more hours of operation. This parameter was used to remove bias due to boiler

[2] See Appendix E-1.

startup and the use of diesel fuel. For the period of time when data substitution occurred, the boiler operated continuously in the month of June and July.

The as-received coal reports were reviewed to determine if sulfur content had changed between 2022 and 2023. On the annual averages, the year 2022 had a high sulfur content compared to year 2023. No adjustment was made for this sulfur content change; the sulfur content bias would increase the amount of excess SO_2 emissions and would allow for a conservative estimation of excess SO_2 emissions.

The WEC2 SO_2 emissions for 2023 were recorded as 478.80 tons. Recomputing the emissions for June and July with a corrected emission rate results in an SO_2 emissions total of 423.59 tons. This is a reduction of 55.21 tons.

During the CEMS unit outage, the SO_2 scrubber operations were optimized to the best of the operator's ability; this was based upon the inlet concentration and, ultimately, the use of the temporary exit monitor. The amount of lime used for the SO_2 scrubber is similar to the tonnage used per ton of coal burned. The rate of lime used in 2022 for the months of June through September was 0.0109 – 0.0117 tons of lime per ton of coal. The rate of lime usage in 2023 for the months of June through September was slightly lower at 0.00892 – 0.00955 tons of lime per ton of coal. The change in the range of lime usage is consistent with the change in as-received sulfur content of 0.3498 (2022) – 0.3060 (2023).

Recalculated emissions data are shown in **Table E-2b**. Data from 2013-2015 used in the modeling analysis, and emissions data for 2021-2023 – reflecting the recalculated WEC2 emissions for 2023 – are included for comparison. The SO_2 emissions reported for 2023 indicate a 22.2% decrease from 2022, with overall facility SO_2 emissions increasing on average by 2.3% annually since 2013.

Table E-2b. Gerald Whelan Energy Center Recalculated Emissions

Unit	SO_2 Emissions (tons per year)					
	2013	2014	2015	2021	2022	2023
WEC1	1,439	2,302	1,495	1,898	2,051	1,653
WEC2	692	598	409	578	619	**424**
Total	**2,131**	**2,900**	**1,904**	**2,476**	**2,670**	**2,077**
Average (2013-2015)	**2,312**					
Average (2021-2023)				**2,408**		

Emissions data (except for WEC2 (2023)) were acquired from the Clean Air Markets Division, https://campd.epa.gov/data.

Though the 2021-2023 average emissions are 4.2% more than the 2013-2015 modeled three-year average, the calculated impact using the 2021-2023 revised emissions average is equal to that of the NAAQS. Impact values for the modeled average and the 2021-2023 revised average are shown in **Table E-2c**. Therefore, NDEE asserts that the area surrounding WEC continues to be in attainment with the 1-hour SO_2 NAAQS, and additional modeling is not necessary at this time.

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Table E-2c. Gerald Whelan Energy Center Estimated Impact				
2013-2015 Emissions Average (actual)	2021-2023 Emissions Average (revised)	Change in Emissions Average (%)	2013-2015 Estimated Impact (ug/m3) (ppb)	2021-2023 Estimated Impact (ug/m3) (ppb)
2,312	**2,408**	4.1	188.7	**196.5**
			72.02	**75.0**

Conversion factor (SO_2) 1 ppb = 2.62 ug/m^3

WEC participates in the Cross-State Air Pollution Rule (CSAPR) trading program for SO_2 (WEC1); actual 2023 emissions from WEC1 were below the SO_2 allocations[3] of 1,722 tons for that unit.

[3] CSAPR Allowance Allocations https://www.epa.gov/csapr/csapr-allowance-allocations.

Appendix E: 2024 Annual Report on Modeled Facilities

The area surrounding Nebraska City Station (NCS)

Omaha Public Power District (Otoe County)

This area was addressed in the 2023 Modeled Facilities Report to address an increase in annual emissions in 2022; it is included in this year's report to address an emissions increase in 2023. Per 40 CFR Part 51.1205(b)(2), the state is not required to annually report on areas in which the impact value is less than 50% of the NAAQS. The modeled impact from this source was estimated to be 39.9% of the NAAQS.

The modeling analysis used to characterize this area was performed in August 2015, utilizing actual facility emissions data from 2012-2014. This analysis indicated the SO_2 impact (99th percentile 1-hour SO_2 concentration) on the area to be 78.5 ug/m3, or 32.7 ppb. This value is well below the 1-hour SO_2 NAAQS of 75 ppb and the area was designated "unclassifiable/attainment" on July 12, 2016 (81 FR 45039).

Emissions data for NCS is shown in **Table E-3**. Data from 2012-2014 used in the modeling analysis, and emissions data for 2021-2023, are included for comparison. The SO_2 emissions reported for 2023 indicate a 4.1% increase from 2022, with overall facility SO_2 emissions decreasing on average by 1.3% annually since 2012. The increase in 2023 emissions is largely due to normal variations in the sulfur content of the coal. The 2021-2023 average emissions are 39.2% less than the 2012-2014 modeled three-year average, and the calculated SO_2 impact on the area is 24.3% of the NAAQS. Therefore, NDEE asserts that the area surrounding NCS continues to be in attainment with the 1-hour SO_2 NAAQS, and that additional modeling is not necessary at this time.

NCS participates in the Cross-State Air Pollution Rule (CSAPR) trading program for SO_2, and actual 2023 facility emissions are below the SO_2 allocations[4] of 12,313 tons (Unit 1) and 3,337 tons (Unit 2).

Omaha Public Power District voluntarily requested and obtained a plantwide applicability limit (PAL) permit, issued by NDEE in March of 2020, that limits total NCS SO_2 emissions to less than 17,389 tons per year. This PAL is 4.7% greater than the 2012-2014 average SO_2 emissions that was the basis for modeling. This facility continues to demonstrate compliance with the PAL.

Table E-3. Nebraska City Station Emissions

Unit	SO_2 Emissions (tons per year)					
	2012	**2013**	**2014**	**2021**	**2022**	**2023**
NCS1	14,544	14,696	13,969	7,467	8,378	9,292
NCS2	2,222	2,214	2,165	1,999	1,822	1,325
Total	**16,766**	**16,910**	**16,134**	**9,466**	**10,200**	**10,616**
Average (2012-2014)	**16,603**					
Average (2021-2023)				**10,094**		

Emissions data were acquired from the Clean Air Markets Division, https://campd.epa.gov/data.

[4] CSAPR Allowance Allocations https://www.epa.gov/csapr/csapr-allowance-allocations.

Appendix E: 2024 Annual Report on Modeled Facilities

Conclusion

Emissions data analysis from the areas subject to the ongoing requirements indicates that areas in Nebraska subject to the DRR continue to demonstrate attainment with the 2010 1-hour SO_2 NAAQS. Based on this analysis, NDEE asserts that no additional modeling is necessary at this time to further characterize these areas.

Public Notice

This document was made available for public inspection and comment from **DATE**, 2024 until **DATE**, 2024. No comments were received during this time. A copy of the public notice is attached.

Nebraska 2024 Ambient Air Monitoring Network Plan

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

WEC2 Fuel, Generation and Lime Use Comparison

WEC2 RY2022

Month	Generation GW-Hrs	Operational Hours	Diesel Burned Gallons	Coal Burned Tons	SO2 CEM Emission Data, Tons	SO2 Emission Tons/ kTons Coal	Tons Coal Burned Per GW-Hrs	Lime Used Tons	Tons of Lime Per Ton of Coal	Remarks
January	132.903	730.00	17,155.00	76,139.80	69.40	0.911	572.90	991.887	0.0130	
February	85.752	495.00	28,568.00	47,989.24	46.20	0.963	559.63	712.793	0.0149	Boiler outage and restart
March	79.853	462.00	5,621.00	44,668.52	37.00	0.828	559.38	608.04	0.0136	
April	0.000	0.00	0.00	0.00	0.00	#DIV/0!	#DIV/0!	0	#DIV/0!	
May	82.838	467.00	29,802.00	48,091.00	47.90	0.996	580.54	489.287	0.0102	Boiler started early May and a restart in Mid-May
June	147.842	720.00	2,423.00	80,593.96	67.10	0.833	545.14	878.84	0.0109	
July	170.823	744.00	6,572.00	94,092.44	82.30	0.875	550.82	1033.3085	0.0110	
August	170.715	744.00	19,458.00	92,605.37	85.20	0.920	542.46	1084.825	0.0117	
September	151.107	720.00	6,852.00	82,785.27	74.10	0.895	547.86	952.59	0.0115	
October	35.760	173.0	5,495.0	17,941.56	15.80	0.881	501.72	168.4305	0.0094	
November	49.454	417.0	18,167.0	28,845.73	33.10	1.147	583.28	245.5985	0.0085	Fall outage
December	143.065	744.0	11,196.0	82,374.21	63.70	0.773	575.78	908.24	0.0110	
Total	1,250.112	6,416.000	151,309.000	696,127.09	621.80	0.893	556.85	8073.84	0.0116	

WEC2 RY2023

Month	Generation GW-Hrs	Operational Hours	Diesel Burned Gallons	Coal Burned Tons	SO2 CEM Emission Data, Tons	SO2 Emission Tons/ kTons Coal	Tons Coal Burned Per GW-Hrs	Lime Used Tons	Tons of Lime Per Ton of Coal	Remarks
January	53.638	278.0	5,096.0	30,842.60	24.00	0.78	575.01	380.2365	0.01233	
February	41.277	241.0	21,867.0	24,797.60	29.60	1.19	600.76	253.1385	0.01021	Boiler startup mid-Febrauy
March	0.000	0.0	1.0	0.00	0.00	#DIV/0!	#DIV/0!	0.04	#DIV/0!	Boiler Maintenance Outage
April	34.21	216.0	20,894.0	18,931.93	25.40	1.34	553.35	124.604	0.00658	Only Diesel burned no coal
May	33.81	226.0	30,299.0	18,792.90	31.80	1.69	555.90	54.5845	0.00290	Minimual coal burned Boiler statup end of May
June	140.07	708.0	24,421.0	77,170.47	85.40	1.11	550.96	736.738	0.00955	
July	157.220	744.0	17,762.0	85,875.27	110.00	1.28	546.21	765.916	0.00892	
August	151.633	744.0	6,149.0	83,808.89	67.30	0.80	552.71	812.709	0.00970	
September	131.492	720.0	13,987.0	72,368.73	59.70	0.82	550.37	689.049	0.00952	
October	21.883	147.0	4,929.0	12,432.55	11.00	0.88	568.14	190.1305	0.01529	In October the plant increased Lime input to lower SO2 30-day Rolling Average
November	0.000	1.0	0.0	0.00	0.00	#DIV/0!	#DIV/0!	0	#DIV/0!	Boiler Maintenance Outage
December	65.517	564.0	20,790.0	37,011.52	34.60	0.93	564.91	114.7365	0.00310	
Total	830.744	4,589.000	166,195.000	462,032.45	478.80	0.93	575.01	4121.88	0.00892	

Typical SO2 Emission based upon Tons of Coal Burned for Year 2022 and 2023 for months having more than 500 operational hours.
June and July of 2023 had data substitution of SO2 data due to CEM outage

RY2022 Data Month	Generation GW-Hrs	Coal Burned Tons	SO2 CEM Emission Data, Tons	SO2 Emission Tons/ kTons Coal
January	132.903	76,139.80	69.40	0.911
June	147.842	80,593.96	67.10	0.833
July	170.823	94,092.44	82.30	0.875
August	170.715	92,605.37	85.20	0.920
September	151.107	82,785.27	74.10	0.895
December	143.065	82,374.21	63.70	0.773
Subtotal	916.455	508,591.04	441.80	

RY2023 Data Month	Generation GW-Hrs	Coal Burned Tons	SO2 CEM Emission Data, Tons	SO2 Emission Tons/ kTons Coal
June	140.07	77,170.47	85.40	1.107
July	157.220	85,875.27	110.00	1.281
August	151.633	83,808.89	67.30	0.803
September	131.492	72,368.73	59.70	0.825
December	65.517	37,011.52	34.60	0.935
Subtotal (Blue)	348.642	193,189.13	161.60	
Total (Blue)	1,265.097	701,780.17	603.40	
Average SO2 Tons per /kTons of Coal Burned is			0.860	

Ave received sulfur content of coal received

2022	0.3498
2023	0.3060

Note: Using 2022 will bias 2023 SO2 emission higher

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

WEC2 RY2023 corrected to average SO2 emission per ton of coal burned										
Month	**Generation**	**Operational**	**Diesel Burned**	**Coal Burned**	**SO2 CEM Emission**	**SO2 Emission**	**Tons Coal Burned**	**Lime Used**	**Tons of Lime**	**Remarks**
	GW-Hrs	**Hours**	**Gallons**	**Tons**	**Data, Tons**	**Tons/ kTons Coal**	**Per GW-Hrs**	**Tons**	**Per Ton of Coal**	
January	53.638	278.0	5,096.0	30,842.60	24.00	0.78	575.01	380.2365	0.01233	
February	41.277	241.0	21,867.0	24,797.60	29.60	1.19	600.76	253.1385	0.01021	Boiler startup mid-Febrauy
March	0.000	0.0	1.0	0.00	0.00	#DIV/0!	#DIV/0!	0.04	#DIV/0!	Boiler Maintenance Outage
April	34.21	216.0	20,894.0	18,931.93	25.40	1.34	553.35	124.604	0.00658	Only Diesel burned no coal
May	33.81	226.0	30,299.0	18,792.90	31.80	1.69	555.90	54.5845	0.00290	Minimual coal burned Boiler statup end of May
June	140.07	708.0	24,421.0	77,170.47	**66.35**	0.86	550.96	736.738	0.00955	
July	157.220	744.0	17,762.0	85,875.27	**73.84**	0.86	546.21	765.916	0.00892	
August	151.633	744.0	6,149.0	83,808.89	67.30	0.80	552.71	812.709	0.00970	
September	131.492	720.0	13,987.0	72,368.73	59.70	0.82	550.37	689.049	0.00952	
October	21.883	147.0	4,929.0	12,432.55	11.00	0.88	568.14	190.1305	0.01529	In October the plant increased Lime input to lower SO2 30-day Rolling Average
November	0.000	1.0	0.0	0.00	0.00	#DIV/0!	#DIV/0!	0	#DIV/0!	Boiler Maintenance Outage
December	65.517	564.0	20,790.0	37,011.52	34.60	0.93	564.91	114.7365	0.00310	
Total	830.744	4,589.000	166,195.000	462,032.45	**423.59**	0.93	575.01	4121.88	0.00892	

Uncorrected SO2 emission for 2023 of	478.80	Tons
Correct SO2 emission for 2023 of	**423.59**	Tons
Net difference due to data substitution	55.21	Tons

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

Coal Analysis Summary
Reporting Year 2022
Annual Summary

Mine	Shipment No.	Date	Ton's Rec'd	% Sulfur	%Ash	%Moist	Btu per Lb.	Ash Content lbs/mmBtu	SO2 Content lbs/mmBtu	% Calcium	% Sodium Oxide	Phosphorus Pentoxide	Ave BTU Content	Ave Ash Content	Ave SO2 Content
Min.							8000								
Max.				0.46	7.00	33.00	9000		1.1	27.00	2.1	1.5			
RWM	01A	1/5/2022	15642.170	0.38	6.79	30.61	8036	8.44947735	0.9447828	20.65	0.92	0.85	125700478.1	106210.33	5944.02
RWM	02A	1/10/2022	15783.210	0.33	5.62	31.24	8112	6.92800789	0.81278243	23.45	1.19	0.57	128033399.5	88701.64	5208.46
RWM	03A	1/15/2022	15654.060	0.32	6.73	30.51	8050	8.36024845	0.79422291	19.93	1.17	0.48	126015183.0	105351.82	5009.30
RWM	04A	1/18/2022	15629.320	0.44	5.49	30.72	8227	6.67314939	1.06856142	23.19	1.51	0.50	128582415.6	85804.97	6876.90
RWM	05A	1/22/2022	15827.460	0.38	5.47	31.11	8150	6.71165644	0.93156744	23.27	1.09	0.81	128993799.0	86576.21	6014.43
RWM	06A	1/26/2022	15692.920	0.32	5.61	31.08	8135	6.89612784	0.78592433	21.55	1.16	0.76	127661904.2	88037.28	5021.73
RWM	07A	1/29/2022	15762.000	0.37	6.01	30.66	8152	7.37242395	0.90682997	20.37	1.15	0.58	128491824.0	94729.62	5831.94
RWM	08A	2/2/2022	15862.030	0.34	5.55	31.06	8160	6.80147059	0.83248625	21.66	1.48	0.44	129434164.8	88034.27	5393.09
RWM	09A	2/6/2022	15746.560	0.40	5.39	30.45	8281	6.50887574	0.96508489	22.92	1.63	0.43	130397263.4	84873.96	6298.62
RWM	10A	2/9/2022	15898.650	0.38	6.33	29.65	8260	7.66343826	0.91916157	20.48	1.28	0.55	131322849.0	100638.45	6041.49
RWM	11A	2/13/2022	15891.360	0.25	5.32	30.66	8255	6.44457904	0.60507783	21.59	1.75	0.67	131183176.8	84542.04	3972.84
RWM	12A	3/4/2022	15880.910	0.36	5.72	30.45	8248	6.93501455	0.87205155	21.32	1.46	0.55	130985745.7	90838.81	5717.13
RWM	13A	3/12/2022	15235.200	0.29	5.59	30.77	8207	6.81125868	0.70599541	21.78	1.27	0.70	125035286.4	85164.77	4418.21
RWM	14A	3/15/2022	15811.590	0.35	5.75	30.61	8197	7.0147615	0.8531029	21.67	1.28	0.74	129607603.2	90916.64	5534.06
RWM	15A	3/21/2022	16002.870	0.34	5.65	30.92	8155	6.92826487	0.83299666	23.18	1.35	0.76	130503404.9	90416.22	5440.98
RWM	16A	3/27/2022	16005.530	0.36	6.38	30.38	8174	7.80523611	0.87994632	19.61	1.32	0.74	130829202.2	102115.28	5761.99
RWM	17A	4/22/2022	15815.610	0.37	5.99	30.03	8226	7.28178945	0.89867225	21.9	1.38	0.42	130099207.9	94735.50	5851.78
RWM	18A	5/7/2022	15905.770	0.30	5.51	31.03	8147	6.76322573	0.73571879	22.35	1.54	0.48	129584308.2	87640.79	4771.73
RWM	19A	5/11/2022	15761.890	0.32	6.02	30.44	8142	7.39376075	0.78524864	21.19	1.5	0.43	128333308.4	94886.58	5043.80
RWM	20A	5/14/2022	15918.040	0.35	6.12	30.66	8110	7.54623921	0.86225456	21.24	1.42	0.52	129095304.4	97418.40	5571.31
RWM	21A	5/18/2022	15757.160	0.35	5.77	30.64	8152	7.07801766	0.85781213	21.20	1.51	0.53	129410880.5	91597.25	5556.16
RWM	22A	5/21/2022	15911.440	0.33	5.29	31.30	8149	6.49159406	0.80909205	22.61	1.51	0.5	129662324.6	84171.52	5250.78
RWM	23A	5/25/2022	15892.040	0.39	5.80	31.01	8125	7.13846154	0.95902416	21.53	1.49	0.51	129122825.0	92173.83	6197.90
RWM	24A	5/28/2022	15913.650	0.37	5.79	31.00	8121	7.12966383	0.91029158	21.43	1.62	0.96	129234751.7	92140.03	5888.05
RWM	25A	6/1/2022	15930.310	0.33	5.72	31.04	8084	7.0757051	0.81559761	22.14	1.48	0.49	128780626.0	91121.37	5257.00
RWM	26A	6/5/2022	15904.870	0.30	5.39	31.56	8075	6.6749226	0.74227876	23.16	1.68	0.65	128431825.3	85727.25	4771.46
RWM	27A	6/8/2022	15909.890	0.41	5.68	31.20	8123	6.99249046	1.00845312	21.39	1.5	0.82	129236036.5	90368.18	6523.05
RWM	28A	6/14/2022	15903.640	0.30	5.45	31.26	8116	6.71513061	0.73852896	21.8	1.5	0.42	129073942.2	86674.84	4771.09
RWM	29A	6/17/2022	15933.980	0.38	5.84	30.51	8165	7.1524801	0.92985604	21.67	1.42	0.78	130100946.7	93054.44	6054.91
RWM	30A	6/23/2022	15903.010	0.34	5.72	31.30	8068	7.08973723	0.84197915	21.21	1.4	0.41	128305484.7	90965.22	5407.02
RWM	31A	6/26/2022	15925.780	0.37	5.77	21.49	8070	7.14993804	0.91604435	21.19	1.4	0.44	128521044.6	91891.75	5892.54
RWM	32A	6/30/2022	15789.730	0.30	5.47	31.20	8118	6.73811284	0.73834701	21.83	1.51	0.87	128181028.1	86369.82	4736.92
RWM	33A	7/4/2022	15921.730	0.37	5.70	31.11	8101	7.03616837	0.91253893	21.41	1.42	0.95	128981934.7	90753.86	5891.04
RWM	34A	7/7/2022	15813.550	0.35	5.79	31.65	8053	7.18986713	0.86835769	20.05	1.40	0.84	127346518.2	91560.45	5534.74
RWM	35A	7/11/2022	15936.810	0.32	5.33	31.20	8133	6.55354728	0.78611759	22.22	1.37	0.79	129614075.7	84943.20	5099.78
RWM	36A	7/15/2022	15874.720	0.36	6.20	30.69	8062	7.6903994	0.89217083	20.55	0.95	0.49	127981992.6	98423.26	5714.90
RWM	37A	7/20/2022	15921.430	0.41	5.81	31.25	8089	7.18259365	1.01269189	21.60	1.14	0.41	128788447.3	92503.51	6527.79
RWM	38A	7/23/2022	15919.790	0.33	5.63	30.72	8175	6.88685015	0.80651879	22.17	1.23	0.64	130144283.3	89628.42	5253.53
RWM	39A	7/27/2022	15923.290	0.37	5.46	31.30	8140	6.70761671	0.90816682	23.33	1.00	0.61	129615580.6	86941.16	5891.62
RWM	40A	7/31/2022	15877.070	0.38	5.62	31.06	8126	6.91607187	0.9343188	22.95	1.00	0.99	129017070.8	89229.13	6033.29
RWM	41A	8/4/2022	15914.190	0.38	5.99	30.58	8141	7.35781845	0.9325973	21.4	1.1	0.88	129557420.8	95326.00	6047.39
RWM	42A	8/7/2022	15902.040	0.41	5.90	30.54	8210	7.1863581	0.99776671	20.75	1.38	0.53	130555748.4	93822.04	6519.84
RWM	43A	8/10/2022	15889.100	0.42	6.30	29.85	8218	7.66609881	1.0211075	20.04	0.79	0.48	130576623.8	100101.33	6673.42
RWM	44A	8/15/2022	15921.330	0.43	6.71	30.49	8107	8.27679783	1.05973333	18.47	0.69	0.44	129074222.3	106832.12	6846.17
RWM	45A	8/19/2022	15913.930	0.38	5.01	31.76	8113	6.17527425	0.93581593	25.2	0.95	0.55	129109714.1	79728.79	6047.29
RWM	46A	8/23/2022	15901.070	0.36	6.13	29.91	8240	7.43932039	0.8728982	19.45	1.14	0.45	131024816.8	97473.56	5724.39
RWM	47A	8/26/2022	15912.800	0.39	5.61	30.93	8176	6.86154599	0.95304199	21.34	1.57	0.63	130103052.8	89270.81	6205.99
RWM	48A	8/30/2022	15942.930	0.35	5.66	30.58	8220	6.88564477	0.85071588	21.16	1.57	0.57	131050884.6	90236.98	5580.03
RWM	49A	9/2/2022	15921.930	0.32	5.66	30.94	8111	6.97817778	0.78824983	21.56	1.36	0.51	129142774.2	90118.12	5095.02
RWM	50A	9/7/2022	15893.860	0.39	5.80	30.55	8194	7.07835001	0.95094841	20.98	1.22	0.73	130234288.8	92184.39	6198.61
RWM	51A	9/11/2022	15913.670	0.36	6.24	31.27	8046	7.75540641	0.89394497	19.48	1.27	0.83	128041388.8	99301.30	5728.92
RWM	52A	9/14/2022	15924.070	0.31	5.54	30.52	8215	6.74376141	0.75394981	21.61	1.68	0.80	130816235.1	88219.35	4936.46
RWM	53A	9/17/2022	15915.580	0.33	6.28	30.63	8077	7.77516405	0.81630446	18.29	1.48	0.65	128550139.7	99949.84	5252.14
RWM	54A	9/21/2022	15905.170	0.26	5.33	21.22	8138	6.54952077	0.63832812	21.67	1.71	0.79	129436273.5	84774.56	4135.34
RWM	55A	9/26/2022	15804.540	0.29	5.97	30.79	8129	7.34407676	0.71276963	20.52	1.15	0.83	128475105.7	94353.10	4583.32
RWM	56A	9/30/2022	15783.420	0.30	5.45	30.74	8185	6.65852169	0.73230312	22.86	1.20	0.68	129187292.7	86019.64	4735.03
RWM	57A	10/6/2022	15877.120	0.30	5.17	30.69	8230	6.2818955	0.72829903	21.65	1.55	0.62	130668697.6	82084.71	4763.14
RWM	58A	10/10/2022	15907.780	0.32	5.56	30.31	8239	6.7483918	0.77600369	21.98	1.41	0.49	131064199.4	88447.26	5090.49
RWM	59A	10/13/2022	15908.290	0.36	6.07	30.01	8200	7.40243902	0.87715624	21.39	1.38	0.44	130447978.0	96563.32	5726.98
RWM	60A	11/16/2022	15818.390	0.34	6.02	30.75	8151	7.38559686	0.83340545	21.02	1.74	0.66	128935696.9	95226.71	5378.25
RWM	61A	11/20/2022	15901.240	0.39	5.75	30.45	8231	6.98578545	0.94667371	21.64	1.65	0.51	130883106.4	91432.13	6201.48
RWM	62A	11/24/2022	15789.010	0.30	6.15	30.19	8176	7.52201566	0.73310922	20.99	1.76	0.90	129090945.8	97102.41	4736.70
RWM	63A	11/27/2022	15881.670	0.36	6.13	30.59	8137	7.533489	0.88394755	20.44	1.71	0.76	129229148.8	97354.64	5717.40
RWM	64A	12/4/2022	15886.800	0.33	6.11	30.16	8179	7.4703509	0.80612436	20.74	1.73	0.73	129938137.2	97068.35	5242.64
RWM	65A	12/7/2022	15840.330	0.36	6.32	29.17	8351	7.56795593	0.8612958	19.16	1.77	0.35	132282595.8	100110.89	5702.52
RWM	66A	12/10/2022	15812.340	0.34	5.87	29.93	8285	7.08509354	0.81992611	20.94	1.73	0.56	131005236.9	92818.44	5376.20
RWM	67A	12/16/2022	15796.890	0.35	6.47	30.45	8142	7.9464505	0.8588657	19.04	1.64	0.58	128618278.4	102205.88	5528.91
RWM	68A	12/29/2022	15824.000	0.34	6.29	30.31	8182	7.68760694	0.83024784	17.18	1.34	0.47	129471968.0	99532.96	5380.16
													0.0	0.00	0.00
Total			1,078,194.53			**Avg. Moist.**	**8157.24**						Sum	8796013418.9	6275531.69	377131.62
													Average	**8158.0950**	**5.8204**	**0.3498**

As per Air Permit Minimum heat content is 8000 BTU/lb
Maximum Sulfur content is 0.48% by weight
Maximum Ash content is 10% by weight

six train rolling limit			Max	6 train Avg
Sodium Ox		in ash	1.9	
Calcium Ox		in ash	24	
Phosphorus		Pentoxide	1.5	
	(weighted averages)			

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

public power generation agency

Ash Content lbs/mmBtu	SO2 Content lbs/mmBtu	% Calcium	% Sodium Oxide	Phosphorus	Ave BTU Content	Ave Ash Content	Ave SO2 Content
	1.1	27.00	2.1	1.5			
6.484724067	0.916830648	22.69	1.6	0.56	122312440.3	793.16	5612.70
6.355162813	0.773937102	22.40	1.73	0.41	128150993.0	814.42	4964.09
6.935702826	0.862999445	21.82	1.48	0.44	122425958.2	849.11	5288.05
6.948195433	0.85844396	22.61	1.45	0.48	128485636.1	892.74	5520.50
7.298554984	0.807407678	22.11	1.54	0.48	128154264.2	935.34	5178.90
6.345547197	0.872686387	23.15	1.66	0.55	129461132.6	821.50	5654.70
8.325086591	0.988603167	19.55	1.20	0.41	122146087.2	1016.88	6043.84
6.818181818	0.830044941	21.97	1.38	0.46	124591415.5	849.49	5176.09
6.548198637	0.656586039	21.89	1.57	0.33	127822391.8	837.01	4200.59
6.651939126	0.735628498	21.78	1.53	0.54	128012087.3	851.53	4713.26
7.611355849	0.757916997	19.76	1.40	0.35	128748797.6	979.95	4884.01
6.751623576	0.807902353	21.39	1.26	0.56	128400277.4	866.91	5192.02
7.486963	0.595371343	18.38	1.57	0.55	125016362.6	935.99	3725.34
6.301905227	0.658831326	22.75	1.22	0.69	119275414.8	751.66	3933.12
6.420682122	0.654753113	22.55	1.16	0.58	129764250.0	833.18	4252.50
7.49536178	0.64251258	19.29	1.35	0.84	127867185.6	958.41	4111.99
6.549579217	0.706684266	22.67	1.37	0.69	130698537.2	856.02	4622.83
6.75146771	0.6597983	22.52	1.56	0.93	127988984.5	864.11	4226.64
7.121807466	0.711456815	21.77	1.46	0.56	128675607.2	916.40	4582.01
7.033184745	0.766926412	22.6	1.43	0.54	128679592.1	905.03	4939.41
7.01276174	0.792156412	22.48	1.36	0.55	128595081.6	901.81	5098.55
6.804552686	0.880269392	23.41	1.35	0.52	130347060.4	886.95	5742.86
6.347452425	0.834019374	23.77	1.49	0.53	129554370.0	822.34	5408.04
7.161410019	0.889632801	21.66	1.53	0.59	129060774.2	924.26	5746.68
7.132225254	0.941735872	21.49	1.3	0.50	128280367.3	914.92	6046.46
6.865634979	0.736170597	22.60	1.82	0.95	129751319.1	890.83	4780.82
7.106164384	0.855294092	21.36	1.62	0.8	130382099.7	926.52	5581.43
7.100737101	0.736351474	20.93	1.62	1.02	129458967.0	919.25	4771.22
7.539100684	0.903284201	20.68	1.18	0.42	130413922.3	983.20	5896.04
6.851168512	0.810982915	22.80	1.14	0.54	129334641.6	886.09	5249.75
7.03762328	0.778460295	22.08	1.05	0.51	131777256.5	927.40	5134.39
7.520549626	0.833405447	20.90	1.10	0.75	129464370.8	973.64	5400.31
7.007140264	0.94300754	22.49	1.16	0.51	131112822.0	918.73	6188.31
6.566397652	0.757360932	22.86	1.39	0.82	130180348.1	854.82	4934.69
6.403036239	0.78274907	23.32	1.07	0.66	130143684.5	833.31	5098.68
6.358949178	0.83391699	23.84	0.62	0.54	128757468.1	818.76	5374.11
6.949712468	0.782270207	22.21	0.57	0.46	129893243.8	902.72	5085.75
6.634484466	0.791372001	23.54	1	0.9	128752760.9	854.21	5099.75
7.892795672	1.031652496	19.38	0.66	0.47	129668323.7	1023.45	6695.44
6.813159833	0.932024871	20.92	0.61	0.67	129846099.6	884.66	6057.15
7.099068171	0.906385226	21.85	1.62	0.79	129714736.8	920.85	5884.56
7.096616587	0.951761488	21.29	0.84	0.77	130228234.8	924.18	6203.62
6.583760059	0.682066277	22.36	1.11	0.95	130713305.5	860.59	4462.29
7.047061692	0.852582846	21.28	0.64	0.50	130847326.2	922.09	5583.59
7.384352496	0.731588063	20.29	0.99	0.69	130528008.5	963.86	4779.50
6.63524293	0.934509583	23.09	1.34	0.78	132061562.2	876.26	6176.92
7.405596969	0.813868997	20.52	1.15	0.90	130401260.3	965.70	5311.88
6.899073623	0.754960714	21.20	1.08	0.61	130757321.0	902.10	4940.85
7.782101167	0.923185141	19.50	1.19	0.44	130849925.8	1018.29	6046.08
6.932876041	0.783132582	22.06	1.50	0.51	127067680.0	880.94	4980.60
6.724644782	0.832078368	22.68	1.65	0.63	130077501.8	874.72	5417.24
6.714040676	0.685408919	22.45	1.74	1.22	127249987.5	854.36	4365.35
6.994212535	0.688869302	21.55	1.61	0.99	120760406.9	844.62	4163.64
6.839164237	0.970829446	21.89	0.98	0.48	131142674.9	896.91	63.72
7.204327514	0.810584104	21.16	0.93	0.47	128613262.5	926.57	52.18
7.287449393	0.955965072	20.10	0.85	0.44	129507897.1	943.78	61.97
7.703667241	0.860556793	19.00	0.88	0.39	128533411.3	990.18	55.36
#DIV/0!	#DIV/0!				0.0	0.00	0.00
				Sum	7330506899.0	51142.74	274762.33
				Average	**8164.1871**	**0.0570**	**0.3060**

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

CSAPR Allocation

WEC2 SO2 and NOx Monthly Emission Summary - 2022

WEC2 Monthly Emission and Operating Data

	SO2 Tons	NOx Tons	Heat Input mmBtu	Ave SO2 lbs/mmBtu	Ave NOx lbs/mmBtu	Generation MW (Gross)	
January	69.40	52.70	1,227,868.30	0.113	0.086	132,903.00	
February	46.20	34.70	764,670.70	0.121	0.091	85,752.00	
March	37.00	31.30	719,558.20	0.103	0.087	79,853.00	
April	-	-	-	#DIV/0!	#DIV/0!	-	Unit Did not Operate in April 2022
May	47.90	33.30	770,471.10	0.124	0.086	82,838.00	
June	67.10	58.70	1,355,145.20	0.099	0.087	147,842.00	
July	82.30	67.20	1,560,718.90	0.105	0.086	170,823.00	
August	85.20	66.50	1,535,146.70	0.111	0.087	170,715.00	
September	74.10	58.30	1,354,146.50	0.109	0.086	151,107.00	
October	15.80	13.80	320,606.00	0.099	0.086	35,760.00	
November	33.10	22.20	473,391.90	0.140	0.094	49,454.00	
December	63.70	48.70	1,262,456.40	0.101	0.077	143,065.00	

CSAPR Alloc	SO2, Tons	NOx, Tons			Total Generation	1,250,112.00	
Allocated	575.10	398.80			to date, MW		
Unused Allo	333.00	360.50					
Allocation used to date, Tons	621.80	487.40					
Allocation Remaining, Tons	286.30	271.90					

\\ASPEN\Employess\RAspen\Public\CSAPR\WEC2 CSAPR 2022 Emission Summary

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

CSAPR Allocation

WEC2 SO2 and NOx Monthly Emission Summary - 2023

public power generation agency

WEC2 Monthly Emission and Operating Data

	SO2 Tons	NOx Tons	Heat Input mmBtu	Ave SO2 lbs/mmBtu	Ave NOx lbs/mmBtu	Generation MW (Gross)	
January	24.00	18.20	471,299.30	0.102	0.077	53,638.00	
February	29.60	13.50	361,423.60	0.164	0.075	41,277.00	
March	-	-	-	na	na	-	**Unit did not run in March**
April	25.40	11.80	312,451.40	0.163	0.076	34,213.00	
May	31.80	12.00	302,344.20	0.210	0.079	33,806.00	
June	85.40	57.50	1,241,363.50	0.138	0.093	140,065.00	GM32 OOS, SO2 and NOx, June 14
July	110.00	133.40	1,415,398.70	0.155	0.188	157,220.00	Inlet SO2 Only GM32 put on Stack
August	67.30	186.40	1,352,574.30	0.100	0.276	151,633.00	Inlet SO2 Only GM32 on Stack
September	59.70	103.70	1,178,920.10	0.101	0.176	131,492.00	New GM32 Installed Sept 13
October	11.00	6.10	198,178.20	0.111	0.062	21,883.00	
November	-	-	0.20	na	na	-	**Unit did not run in November**
December	34.60	37.90	606,480.40	0.114	0.125	65,517.00	

CSAPR Allocation	SO2, Tons	NOx, Tons
Allocated	575.10	398.80
Unused Allocation	333.00	360.50
Allocation used to date, Tons	478.80	580.50
Allocation Remaining, Tons	429.30	178.80

Total Generation to date, MW: 830,744.00

NOx updated with Substitute Data when new monitor was installed.

\\ASPEN\Employess\RAspen\Public\CSAPR\WEC2 CSAPR 2023 Emission Summary

WEC2 EMISSION SUMMARY

Hastings Utilities, Hastings, Nebraska				Page 1 of 2
CEM Reporting Period	4	Qtr.	Year	2022
MASS EMISSIONS		Qtr. Totals		Annual Totals
S02 Tons Emitted	1st Qtr.	152.4		
	2nd Qtr.	114.8		
	3rd Qtr.	240.0		
	4th Qtr.	112.1		619.3
Quarterly NOX Tons Emitted	1st Qtr.	119.5		
	2nd Qtr.	92.5		
	3rd Qtr.	191.3		
	4th Qtr.	85.3		488.7
Quarterly CO2 Tons Emitted	1st Qtr.	284,839.6		
	2nd Qtr.	222,935.6		
	3rd Qtr.	466,709.3		
	4th Qtr.	215,679.7		1,190,164.2
EMISSION RATES				
Quarterly Ave. S02 Emission Rates	1st Qtr.	0.112		
	2nd Qtr.	0.108		
	3rd Qtr.	0.108		
	4th Qtr.	0.109		0.109
Quarterly Ave. N0X Emission Rates	1st Qtr.	0.088		
	2nd Qtr.	0.087		
	3rd Qtr.	0.086		
	4th Qtr.	0.083		0.086
OPERATING DATA				
Quarterly Heat Input MMBTU	1st Qtr.	2,715,878		
	2nd Qtr.	2,125,616		
	3rd Qtr.	4,449,933		
	4th Qtr.	2,056,467		11,347,894
Quarterly Operating Hour	1st Qtr.	1,687		
	2nd Qtr.	1,187		
	3rd Qtr.	2,208		
	4th Qtr.	1,334		6,416

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

WEC2 EMISSION SUMMARY

Hastings Utilities, Hastings, Nebraska				Page 2 of 2
CEM Reporting Period	4	Qtr.	Year	2022
MONITOR AVAILABILITY		Qtr. Totals		
S02 ppm Percent Data Availability	1st Qtr.	98.8		
	2nd Qtr.	98.5		
	3rd Qtr.	95.0		
	4th Qtr.	98.4		
N0X lb. BTU Percent Data Availability	1st Qtr.	98.9		
	2nd Qtr.	98.7		
	3rd Qtr.	99.1		
	4th Qtr.	97.5		
C02 Percent Data Availability	1st Qtr.	98.5		
	2nd Qtr.	98.2		
	3rd Qtr.	96.2		
	4th Qtr.	98.1		
Flow SCFH Percent Data Availability	1st Qtr.	99.4		
	2nd Qtr.	98.4		
	3rd Qtr.	99.6		
	4th Qtr.	99.3		
Generation GW Hrs.	1st Qtr.	298.508		
	2nd Qtr.	230.680		
	3rd Qtr.	429.645		
	4th Qtr.	228.279		1,187.112

WEC2 EMISSION SUMMARY

Hastings Utilities, Hastings, Nebraska				Page 1 of 2
CEM Reporting Period	4	Qtr.	Year	2023
MASS EMISSIONS		Qtr. Totals		Annual Totals
S02 Tons Emitted	1st Qtr.	50.0		
	2nd Qtr.	140.4		
	3rd Qtr.	237.0		
	4th Qtr.	45.6		473.0
Quarterly NOX Tons Emitted	1st Qtr.	31.8		
	2nd Qtr.	80.7		
	3rd Qtr.	424.3		
	4th Qtr.	42.3		579.1
Quarterly CO2 Tons Emitted	1st Qtr.	87,744.4		
	2nd Qtr.	194,668.0		
	3rd Qtr.	413,950.5		
	4th Qtr.	84,410.7		780,773.6
EMISSION RATES				
Quarterly Ave. S02 Emission Rates	1st Qtr.	0.120		
	2nd Qtr.	0.151		
	3rd Qtr.	0.120		
	4th Qtr.	0.113		0.127
Quarterly Ave. N0X Emission Rates	1st Qtr.	0.076		
	2nd Qtr.	0.087		
	3rd Qtr.	0.215		
	4th Qtr.	0.105		0.156
OPERATING DATA				
Quarterly Heat Input MMBTU	1st Qtr.	836,616		
	2nd Qtr.	1,856,115		
	3rd Qtr.	3,946,893		
	4th Qtr.	804,827		7,444,451
Quarterly Operating Hour	1st Qtr.	531		
	2nd Qtr.	1,150		
	3rd Qtr.	2,208		
	4th Qtr.	564		4,453

WEC2 EMISSION SUMMARY

Hastings Utilities, Hastings, Nebraska				Page 2 of 2
CEM Reporting Period	4	Qtr.	Year	2023
MONITOR AVAILABILITY		Qtr. Totals		
S02 ppm Percent Data Availability	1st Qtr.	93.4		
	2nd Qtr.	61.6		
	3rd Qtr.	86.5		
	4th Qtr.	97.5		
N0X lb. BTU Percent Data Availability	1st Qtr.	96.6		
	2nd Qtr.	65.3		
	3rd Qtr.	18.8		
	4th Qtr.	97.5		
C02 Percent Data Availability	1st Qtr.	96.8		
	2nd Qtr.	96.0		
	3rd Qtr.	97.3		
	4th Qtr.	83.0		
Flow SCFH Percent Data Availability	1st Qtr.	98.7		
	2nd Qtr.	98.8		
	3rd Qtr.	95.4		
	4th Qtr.	98.4		
Generation GW Hrs.	1st Qtr.	94.915		
	2nd Qtr.	208.084		
	3rd Qtr.	440.345		
	4th Qtr.	87.400		830.744

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

WEC2 Air Emission Summary - 2022

Lime Consumption

Month	Pebble / Granulated Lime	Hydrated Lime	Calc Dry Scrubber Ash Generation	Calc Wet Scrubber Pond Ash Generation	Calc Scrubber Pond Ash	Pebble Lime Used
	Tons	Tons	Tons	Tons	Cyds	Tons
January	678.74		1,798.7	2359.84	1665.43	991.887
February	711.58		1,885.7	2474.02	1746.01	712.793
March	650.83		1,724.7	2262.81	1596.94	608.04
April	85.70		227.1	297.96	210.28	0
May	339.24		899.0	1179.47	832.39	489.287
June	807.95		2,141.1	2809.08	1982.47	878.84
July	880.92		2,334.4	3062.78	2161.52	1033.3085
August	1255.24		3,326.4	4364.22	3079.99	1084.825
September	1025.97		2,718.8	3567.09	2517.43	952.59
October	83.07		220.1	288.82	203.83	168.4305
November	401.16		1,063.1	1394.75	984.33	245.5985
December	603.68		1,599.8	2098.87	1481.25	908.24
Total	**7,524.08**	**0.00**	**19,938.81**	**26,159.72**	**18,461.86**	**8073.839**

Data found at \\CYPRESS\ Wec Departments\Operations\Shift Foreman\Consumables\Pebble Lime Inventory

Actual lime consumption may vary monthly however,over the course of several months/years the over quantities of material placed in to the Scrubber Ash will be reflected in these quantities.

Scrubber Ash Conversion Factors	**MW Ratio**	**Conversion Factor**
Pebble Lime to Scrubber Ash	56.08 to 147.6	2.65
Hydrated Lime to Scrubber Ash	74.10 to 147.6	2.00

Note the scrubber ash molecular wieght is based upon 75% CaSO4-2H2O and 25% Ca(OH)2 or MW of 147.66

Scrubber Ash to Pond Ash Conversions		
Assumed Dry Density of Scrubber Ash	**80**	pcf
Scrubber pond Ash Moisture content	**40**	%
Wet Scrubber Ash Density	**105.0**	pcf
Dry Scrubber Ash Tons to Wet Scrubber Pond Ash Tons	**1.312**	Ratio
Dry Scrubber Ash Tons to Wet Scrubber Pond Ash Cyds	**0.926**	Cyds/Tons
Wet Scrubber Pond Ash Tons to Wet Scrubber Pond Ash Cyds	**0.706**	Cyds/Tons

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

WEC2 Air Emission Summary - 2023

Lime Consumption

Month	Pebble / Granulated Lime	Hydrated Lime	Calc Dry Scrubber Ash Generation	Calc Wet Scrubber Pond Ash Generation	Calc Scrubber Pond Ash	Pebble Lime Used
	Tons	Tons	Tons	Tons	Cyds	Tons
January	768.12	0	2,035.5	2670.60	1884.74	380.2365
February	171.05	0	453.3	594.71	419.71	253.1385
March	29.05	0.00	77.0	101.00	71.28	0.04
April	0.00	0	0.0	0.00	0.00	124.604
May	0.00	0	0.0	0.00	0.00	54.5845
June	298.99	0	792.3	1039.53	733.63	736.738
July	1215.82	0	3,221.9	4227.16	2983.26	765.916
August	1131.65	0	2,998.9	3934.52	2776.73	812.709
September	381.19	0	1,010.2	1325.32	935.33	689.049
October	477.52	0	1,265.4	1660.24	1171.69	190.1305
November	0.00	0	0.0	0.00	0.00	0
December	123.77	0	328.0	430.32	303.69	114.7365
Total	**4,597.16**	**0.00**	**12,182.47**	**15,983.41**	**11,280.07**	**4121.8785**

Data found at \\CYPRESS\ Wec Departments\Operations\Shift Foreman\Consumables\Pebble Lime Inventory

Actual lime consumption may vary monthly however,over the course of several months/years the over quantities of material placed in to the Scrubber Ash will be reflected in these quantities.

Scrubber Ash Conversion Factor	MW Ratio	Conversion Factor
Pebble Lime to Scrubber Ash	56.08 to 147.66	2.65
Hydrated Lime to Scrubber Ash	74.10 to 147.66	2.00

Note the scrubber ash molecular wieght is based upon 75% CaSO4-2H2O and 25% Ca(OH)2 or MW of 147.66

Scrubber Ash to Pond Ash Conversions

Assumed Dry Density of Scrubber Ash	**80**	pcf
Scrubber pond Ash Moisture content	**40**	%
Wet Scrubber Ash Density	**105.0**	pcf
Dry Scrubber Ash Tons to Wet Scrubber Pond Ash Tons	**1.312**	Ratio
Dry Scrubber Ash Tons to Wet Scrubber Pond Ash Cyds	**0.926**	Cyds/Tons
Wet Scrubber Pond Ash Tons to Wet Scrubber Pond Ash Cyds	**0.706**	Cyds/Tons

WEC2 Air Emission Summary - 2022

Fuel Use

Month	Generation GW-Hours	Operational Hours	Diesel Fuel Used Gallons per month	Coal used Tons per month
January	132.903	730.00	17,155.00	76,139.80
February	85.752	495.00	28,568.00	47,989.24
March	79.853	462.00	5,621.00	44,668.52
April	0.000	0.00	0.00	0.00
May	82.838	467.00	29,802.00	48,091.00
June	147.842	720.00	2,423.00	80,593.96
July	170.823	744.00	6,572.00	94,092.44
August	170.715	744.00	19,458.00	92,605.37
September	151.107	720.00	6,852.00	82,785.27
October	35.760	173.0	5,495.0	17,941.56
November	49.454	417.0	18,167.0	28,845.73
December	143.065	744.0	11,196.0	82,374.21
Total	**1,250.112**	**6,416.00**	**151,309.00**	**696,127.09**

Note: WEC2 Diesel Fuel Use is for Flame Stabilization and Startup only

Note: No coal burned in May

WEC2 Emission Summary - RY2023

Fuel Use

Month	Generation GW-Hours	Operational Hours	Diesel Fuel Used Gallons per month	Coal used Tons per month
January	53.638	278.0	5,096.0	30,842.60
February	41.277	241.0	21,867.0	24,797.60
March	0.000	0.0	1.0	0.00
April	34.21	216.0	20,894.0	0.00
May	33.81	226.0	30,299.0	18,792.90
June	140.07	708.0	24,421.0	77,170.47
July	157.220	744.0	17,762.0	85,875.27
August	151.633	744.0	6,149.0	83,808.89
September	131.492	720.0	13,987.0	72,368.73
October	21.883	147.0	4,929.0	12,432.55
November	0.000	1.0	0.0	0.00
December	65.517	564.0	20,790.0	37,011.52
Total	**830.744**	**4,589.00**	**166,195.00**	**443,100.52**

Note: WEC2 Diesel Fuel Use is the total of Flame Stabilization / Startup

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

WEC2 Air Emission Summary - 2022							
SO2 30-Day Rolling Average				SO2 Limit 0.122 lbs/mmbtu			
MAS		1/10/2023					
Begin Date and		End Date and		Deviations Listed	SO2	Cause of Deviation	Corrective Action or Repair
Time mm/dd/	hh:mm	Time mm/dd/	hh:mm		lb/mmBtu		
1st Qtr				Deviations Listed			
01/01/2022	22:00	01/02/2022	04:59	Invalid Data	NA	Boiler Startup	Normal Operation once CEM could be calibrated and passed
01/06/2022	05:00	01/06/2022	06:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
02/22/2022	23:00	02/23/2022	04:59	Invalid Data	NA	Boiler Startup	Normal Operation once CEM could be calibrated and passed
02/24/2022	10:00	02/24/2022	10:59	Invalid Data	NA	Linearity	Returned to normal operations after passing linearity
03/01/2022	05:00	03/01/2022	09:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
01/01/2022	00:00	01/07/22	23:59	Excess Emission	0.136 to 0.149	Care over from higher SO2 due to bag filter change out	Ran lower SO2 Control to recover from bag filter change out
2nd Qtr							
05/06/2022	08:00	05/06/2022	08:59	Invalid Data	NA	Boiler Startup - ID Fan on prior to startup	Normal pre-check of equipment. The ID Fan is what triggers unit on.
05/12/2022	15:00	05/12/2022	04:59	Invalid Data	NA	Boiler Startup - ID Fan on prior to startup	Normal pre-check of equipment. The ID Fan is what triggers unit on.
05/13/2022	06:00	05/13/2022	07:59	Invalid Data	NA	Boiler Startup - CEM not certified	Daily Cal ran once unit is operational and stack temperature allows for CEM Calibration
06/04/2022	12:00	06/04/2022	12:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
3rd Qtr							
07/11/2022	05:00	07/11/2022	07:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
08/01/2022	05:00	08/01/2022	07:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
08/03/2022	05:00	08/03/2022	07:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
08/03/2022	09:00	08/03/2022	14:59	Invalid Data	NA	Linearity	Returned to normal oerations after passing linearity
08/04/2022	5:00	08/04/2022	08:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
08/05/2022	11:00	08/06/2022	04:59	Invalid Data	NA	Boiler Trip - C Mill	Short duration trip left ID Fan on which indicates exhausting of gas - Fuel Oil used to keep boiler hot
09/05/2022	5:00	09/28/2022	10.59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
09/7/2022	5:00	09/07/2022	11:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
09/10/2022	5:00	09/10/2022	05:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
09/17/2022	5:00	09/18/2022	04:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
09/22/2022	5:00	09/22/2022	07:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
09/25/2022	6:00	09/26/2022	09:59	Invalid Data	NA	Failed Daily Cal	Daily Cal Failed on Sunday and did not get fixed until Monday - Reran Daily Cal and passed
09/28/2022	5:00	09/28/2022	08:59	Invalid Data	NA	Failed Daily Cal	Reran Daily Cal and passed
4th Qtr							
10/12/2022	7:00	10/12/2022	07:59	Invalid Data	NA	During outage a unit on signal was sent to DAHS	The unit status erorr is typically due to FD Fan being run for maintenance, testing of oil guns or clearing air in equipment
11/13/2022	15:00	11/14/2022	08:59	Invalid Data	NA	Boiler Startup - CEM not certified	Daily Cal ran once unit is operational and stack temperature allows for CEM Calibration
12/06/2022	13:00	12/06/2022	13:59	Invalid Data	NA	Linearity Failed - Adjusted Regression Values	Completed Linearity the following day and passed
12/07/2022	8:00	12/07/2022	09:59	Invalid Data	NA	Linearity	Returned to normal operations after passing linearity

Appendix E-1: 2024 Modeled Facilities Report – Whelan Energy Center Data

WEC2 Emission Summary - RY2023							
SO2 3-Hour Rolling Average				SO2 Limit 0.12 lbs/mmbtu			
RMA		1/19/2024					
Begin Date and Time mm/dd/	hh:mm	End Date and Time mm/dd/	hh:mm	Deviations Listed	SO2 lb/mmBtu	Cause of Deviation	Corrective Action or Repair
1st Qtr				Deviations Listed			
01/10/2023	05:00	01/10/2023	07:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
01/12/2023	05:00	01/12/2023	08:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
02/15/2023	15:00	02/16/2023	04:59	Invalid Data	NA	Boiler Startup	Normal startup ran daily cal when at operating temperature
02/20/2023	13:00	02/20/2023	13:59	Invalid Data	NA	Linearity	Returned to normal operation once linearity completed
02/20/2023	15:00	02/20/2023	15:59	Invalid Data	NA	Maintenance of CEM Equipment	Conducted testing and maintenance inspection
02/21/2023	08:00	02/21/2023	08:59	Invalid Data	NA	Maintenance of CEM Equipment	Conducted testing and maintenance inspection
02/23/2023	05:00	02/23/2023	10:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
02/24/2023	12:00	02/24/2023	12:59	Invalid Data	NA	Maintenance of CEM Equipment	Adjusted and aligned optics and passed daily cal
02/25/2023	05:00	02/25/2023	08:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
01/01/2022	22:00	01/02/2022	04:59	Invalid Data	NA	Boiler Startup	Normal Operation once CEM could be calibrated and passed
2nd Qtr							
04/22/2023	05:00	04/23/2023	09:59	Invalid Data	NA	Failed Daily Cal - Bottles not on	Turned bottles on and reran Daily Cal and Passed
04/25/2023	09:00	04/25/2023	10:59	Invalid Data	NA	Maintenance of CEM Equipment	Adjusted and aligned optics
05/25/2023	14:00	05/25/2023	17:59	Invalid Data	NA	Boiler Startup	Normal startup ran daily cal when at operating temperature
05/25/2023	22:00	05/26/2023	16:59	Invalid Data	NA	Boiler Startup	Normal startup ran daily cal when at operating temperature
05/27/2023	05:00	05/27/2023	10:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
06/05/2023	09:00	06/05/2023	10:59	Invalid Data	NA	Boiler Startup	Normal startup ran daily cal when at operating temperature
06/09/2023	09:00	06/05/2023	7:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
06/14/2023	08:00	06/14/2023	09:59	Invalid Data	NA	Maintenance of CEM Equipment	Conducted testing and maintenance inspection
06/14/2023	13:00	06/14/2023	17:59	Invalid Data	NA	Maintenance of CEM Equipment	Conducted testing and maintenance inspection
06/15/2023	05:00	06/15/2023	10:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
06/16/2023	08:00	06/25/2023	23:59	Invalid Data	NA	Out of Service	Unit Sent to Germany for Repairs
06/26/2023	02:00	06/26/2023	08:59	Invalid Data	NA	Out of Service	Unit Sent to Germany for Repairs
06/26/2023	19:00	06/30/2023	23:59	Invalid Data	NA	Out of Service	Unit Sent to Germany for Repairs
3rd Qtr							
07/01/2023	00:00	07/11/2023	13:59	Invalid Data	NA	Out of Service	Unit Sent to Germany for Repairs
07/11/2023	17:00	07/11/2023	17:59	Invalid Data	NA	Inlet GM32 (SO2 Only) moved to stack	Ran Cal and Passed
07/14/2023	07:00	07/14/2023	07:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
07/16/2023	07:00	07/17/2023	04:59	Invalid Data	NA	Daily Cal Error	Reran Daily Cal and Passed
07/18/2023	10:00	07/18/2023	10:59	Invalid Data	NA	In Stack Zero	Reran Daily Cal and Passed
07/26/2023	21:00	07/27/2023	07:59	Invalid Data	NA	Fatal Fault GM32	Reran Daily Cal and Passed
09/13/2023	09:00	09/13/2023	14:59	Invalid Data	NA	Out of Service	Installing New GM32 Analyzer
09/14/2023	13:00	09/14/2023	14:59	Invalid Data	NA	Installing New Analyzer	Ran Daily Cal and Passed
4th Qtr							
11/07/2023	14:00	11/07/2023	14:59	Invalid Data	NA	ID Fan on during outage	Bad Unit On data as boiler was shut down
12/14/2023	16:00	12/15/2023	04:59	Invalid Data	NA	Boiler Startup	Normal startup ran daily cal when at operating temperature