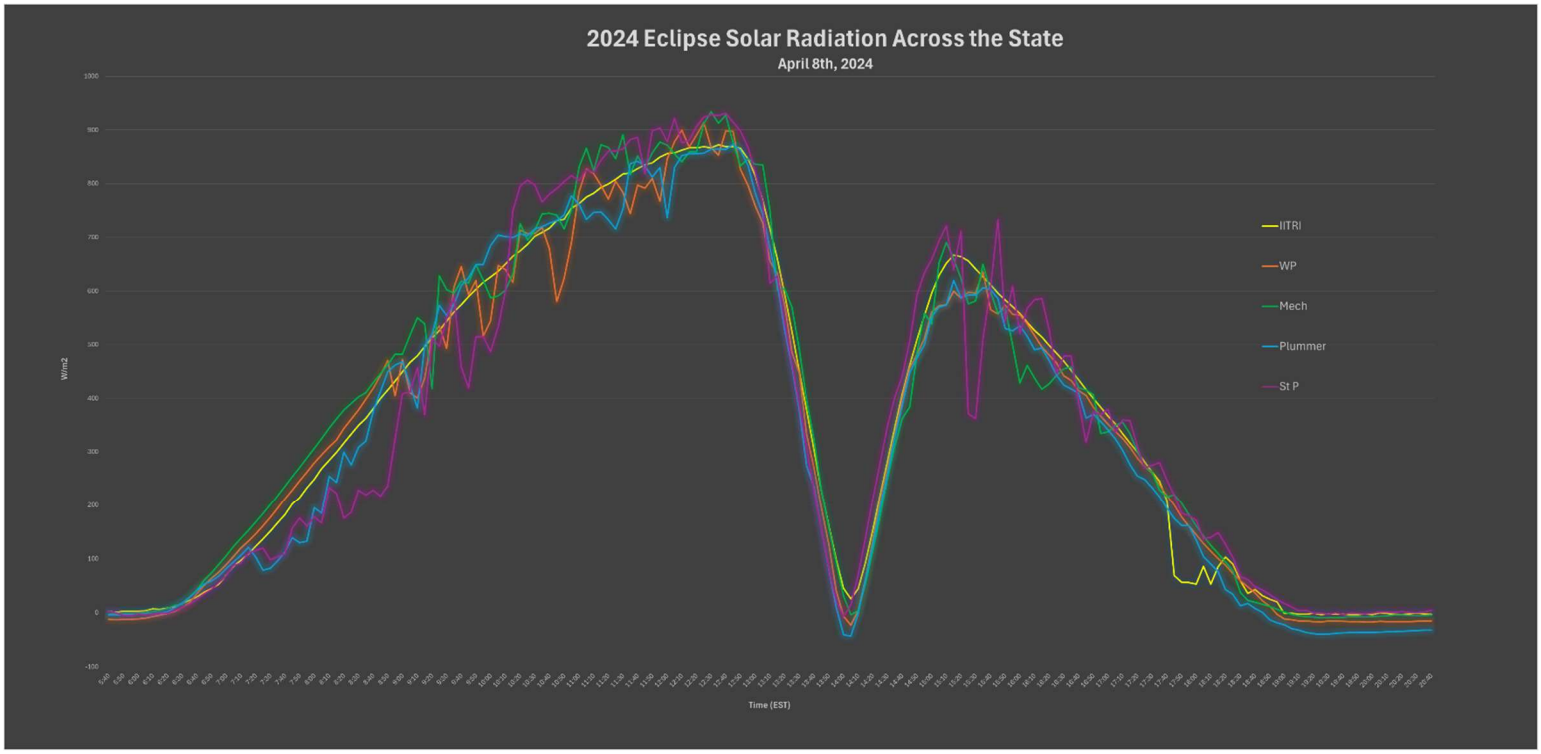
Indiana
2025
Ambient Air Monitoring Network Plan



Indiana Department of Environmental Management
Office of Air Quality
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Cover photo of: April 8, 2024, Total Solar Eclipse, credit: Tracy Gutierrez; and Solar Radiation data from the path of totality. Before, during and after the eclipse, the State set up extra Solar Radiation sensors at two sites to capture the changes in the data during the event.

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Acronyms

AADT	Annual Average Daily Traffic
AERMET	American Meteorological Society / Environmental Protection Agency Regulatory Meteorology
AERMOD	American Meteorological Society / Environmental Protection Agency Regulatory Model
ANP	Annual Network Plan (this document)
APCD	Louisville Metropolitan Air Pollution Control District
AQI	Air Quality Index
AQS	Air Quality System
BAM	Beta Attenuation Monitor
CAPS	Cavity Attenuated Phase Shift
CASTNET	Clean Air Status and Trends Network
CBSA	Core Based Statistical Area
CFR	Code of Federal Regulations
CSA	Combined Statistical Area
CSN	Chemical Speciation Network
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DNPH	2,4-Dinitrophenylhydrazine
DRR	Data Requirement Rule
DV	Design Value
EJ	Environmental Justice
EMITS	Emission Inventory Tracking System
EMP	Enhanced Monitoring Plan
ESAT	Environmental Services Assistance Team
FEM	Federal Equivalent Method
FID	Flame Ionization Detector
FR	Federal Regulations
FRM	Federal Reference Method
GC	Gas Chromatograph
GC/MS	Gas Chromatograph / Mass Spectrometry
HPLC	High Pressure Liquid Chromatography
HVAC	Heating Ventilation Air Conditioning
ICP/MS	Inductive Coupled Plasma / Mass Spectrometry
IDEM	Indiana Department of Environmental Management
INDOT	Indiana Department of Transportation
KDEP	Kentucky Department for Environmental Protection
LADCO	Lake Michigan Air Directors Consortium
mm	Millimeter
mb	millibar
MOA	Memorandum of Agreement
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standard
NADP	National Atmospheric Deposition Program
NATTS	National Air Toxics Trends Station
NCore	National Core multi-pollutant monitoring stations
NEI	National Emissions Inventory
NH_3	Ammonia
NIPSCO	Northern Indiana Public Services Company
NIST	National Institute of Standards and Technology
nm	Nanometer

NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NO_y	Total Reactive Nitrogen Oxides
NPAP	National Performance Audit Program
NWS	National Weather Service
O_3	Ozone
OAQPS	Office of Air Quality Planning and Standards
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PEP	Performance Evaluation Program
PM	Particulate matter
$PM_{2.5}$	Particulate matter with a diameter less than or equal to 2.5 micrometers
PM_{10}	Particulate matter with a diameter less than or equal to 10 micrometers
$PM_{10-2.5}$	Particulate matter with a diameter less than or equal to 10 micrometers, and greater than or equal to 2.5 micrometers
ppb	parts per billion
ppm	parts per million
PQAO	Primary Quality Assurance Organization
PSD	Prevention of Significant Deterioration
PWEI	Population Weighted Emissions Index
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RTD	Resistance Temperature Detector
SWOAQA	Southwest Ohio Air Quality Agency
SASS	Speciation Air Sampling System
SHARP	Synchronized Hybrid Ambient Real-time Particulate
SIP	State Implementation Plan
SLAMS	State or Local Air Monitoring Stations
SO_2	Sulfur Dioxide
SPM	Special Purpose Monitor
STN $PM_{2.5}$	Speciation Trends Network
S/V	Susceptible and Vulnerable Populations
TAD	Technical Assistance Document
TO-11A	Toxic Organic Compound sampling and analysis method-Determination of carbonyl compounds in Ambient Air
TO-15	Toxic Organic Compound sampling and analysis method-Determination of VOCs in air, collected in Canisters and Analyzed by GC/MS
TPY	Tons Per Year
TRI	Toxics Release Inventory
TSA	Technical Systems Audit
TSP	Total Suspended Particulate
TEOM	Tapered Element Oscillating Microbalance
$\mu g/m^3$	micrograms per cubic meter
U.S. EPA	United States Environmental Protection Agency
UV	Ultraviolet
VOC	Volatile Organic Compounds
VSCC	Very Sharp Cut Cyclone
XRF	X-Ray Fluorescence

Introduction

In October 2006, United States Environmental Protection Agency (U.S. EPA) issued final regulations concerning state and local agency ambient air monitoring networks. These regulations in 40 CFR Part 58.10 require states to submit an annual monitoring network review to U.S. EPA. This network plan is required to provide the framework for establishment and maintenance of an air quality surveillance system and to list any changes that are proposed to take place to the current network in 2025.

Public Review and Comment

The annual monitoring network plan must be made available for public inspection for 30 days prior to submission to U.S. EPA. Information on how to comment on the plan and any comments received are listed in Appendix A (page 80).

Indiana's Air Monitoring Network

The Indiana Department of Environmental Management (IDEM) regulates air quality to protect public health and the environment in the State of Indiana. Air monitoring data are required by regulation and are used to determine compliance with U.S. EPA's National Ambient Air Quality Standards (NAAQS). Other important uses of the air monitoring data include, the production of a daily AQI report, daily air quality forecast report, support of short and long-term health risk assessments, identification of a localized health concern, and tracking long-term trends in air quality. Indiana monitors the six criteria pollutants which have NAAQS identified for them; CO, Pb, NO_2, O_3, particulate matter (PM_{10} and $PM_{2.5}$), and SO_2. Other pollutants which do not have ambient standards established for them are also monitored: toxics (volatile organic compounds, VOCs), metals, carbonyls, $PM_{2.5}$ speciated compounds, ultrafine particles, ozone precursors, CO_2, and radiation. In addition, meteorological data are also collected to support the monitoring and aid in analysis of the data.

Air Quality Data

IDEM presents two different types of air quality data, noncontinuous and continuous, on IDEM's Internet website https://www.in.gov/idem/airmonitoring/. Monthly and annual summary reports of pollutants collected by manual methods are available as well as hourly values from continuous monitors. The **Data Management and Display System (DMDS)** provides on-line access to Indiana's air quality monitoring data. It has been available to the public since July 2007. The DMDS offers access to near real-time data from active air monitoring sites across Indiana. This allows anyone to track pollutant and meteorological values throughout the day. In addition, past data back to 1998 are available as raw data and canned summary reports or user specified retrievals. Noncontinuous PM_{10} and $PM_{2.5}$ data are available on IDEM's Internet website. Site information with site photographs can also be found at IDEM's Internet website linked above.

Overview of Monitored Parameters

Criteria Pollutants

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless, odorless gas that can be harmful when inhaled in large amounts. CO is a poisonous gas that, when introduced into the bloodstream, inhibits the delivery of oxygen to body tissue. The health risk is greatest for individuals with cardiovascular disease. CO is released when something is burned. The greatest sources of CO to outdoor air are cars, trucks and other vehicles or machinery that burn fossil fuels. A variety of items in your home such as unvented kerosene and gas space heaters, leaking chimneys and furnaces, and gas stoves also release CO and can affect air quality indoors.

Lead (Pb)

Lead (Pb) is a metal that is highly toxic when ingested or inhaled. It is a suspected carcinogen of the lungs and kidneys and has adverse effects on cardiovascular, nervous, and renal systems. Much of our exposure comes from human activities including the use of fossil fuels including past use of leaded gasoline, some types of industrial facilities and past use of lead-based paint in homes. Lead and lead compounds have been used in a wide variety of products found in and around our homes, including paint, ceramics, pipes and plumbing materials, solders, gasoline, batteries, ammunition, and cosmetics.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide (NO_2) is one of a group of highly reactive gases known as oxides of nitrogen or nitrogen oxides (NOx). NO2 is a highly toxic, reddish-brown gas that is created primarily from fuel combustion in industrial sources and vehicles. It creates an odorous haze that causes eye and sinus irritation, blocks natural sunlight, and reduces visibility.

Ozone (O_3)

Ground-level ozone (O_3), or photochemical smog, is not emitted into the atmosphere as ozone, but rather is formed by the reactions of other pollutants. The primary pollutants entering into this reaction, VOCs and oxides of nitrogen, create ozone in the presence of sunlight. Ozone is a strong irritant of the upper respiratory system and also causes damage to crops.

Particulate Matter (PM_{10})

Particulate Matter (also called particle pollution) is a mixture of solid particles and liquid droplets found in the air. Particulate matter with a mean diameter of 10 microns or less (PM_{10}) is emitted from transportation and industrial sources. Exposure to inhalable particle pollution is linked to a variety of significant health problems ranging from aggravated asthma to premature death in people with heart and lung disease.

Fine Particulate Matter ($PM_{2.5}$)

Particulate Matter (also called particle pollution) is a mixture of solid particles and liquid droplets found in the air. Fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$) is created primarily from industrial processes and fuel combustion. These particles are breathed deeply into the lungs. Exposure to particle pollution is linked to a variety of significant health problems ranging from aggravated asthma to premature death in people with heart and lung disease. Fine particles are also the main cause of reduced visibility (haze).

Sulfur Dioxide (SO_2)

Sulfur dioxide (SO_2) is a gaseous pollutant that is emitted primarily by industrial furnaces or power plants burning coal or oil containing sulfur. At high concentrations, SO_2 can cause breathing to be impaired. SO_2 and other sulfur oxides can contribute to acid rain that can harm sensitive ecosystems. SO_2 can damage vegetation and can also stain and damage stone and other materials such as monuments and statues . SO_2 and other sulfur oxides can react with other compounds in the atmosphere to form fine particles that reduce visibility (haze).

Non-Criteria Parameters and Networks

$PM_{2.5}$ Speciation

The chemical speciation monitoring program provides data regarding the makeup of the $PM_{2.5}$ fraction. Knowing the chemical composition of the $PM_{2.5}$ mix is important for determining sources of pollution and links between observed health effects. The basic objective of speciation analysis is to develop seasonal

and annual chemical characterizations of ambient particulates across the nation. This speciation data will be used to perform source attribution analyses, evaluate emission inventories and air quality models, and support health related research studies and regional haze assessments.

The speciation samplers use different inlet tubes and filters to collect the components of the $PM_{2.5}$ mixture. The process consists of using three different types of filters to separate out such specific compounds: sulfate, nitrate, organic and elemental carbon, ammonium, metals, and certain ions. A continuous monitor is also used to measure black carbon and organic carbon.

NCore Monitoring

NCore is a multi-pollutant approach to monitoring. NCore sites are intended to support multiple objectives with a greater emphasis on assessment, research support, and accountability than the traditional SLAMS networks. NCore provides an opportunity to address new directions in monitoring and begin to fill measurement and technological gaps that have accumulated in the networks. Indiana is required to establish and operate one urban NCore site. These sites are required to measure $PM_{2.5}$, speciated $PM_{2.5}$, $PM_{10\text{-}2.5}$, O_3, SO_2, CO, Nitrogen Oxides (NO/NO_2), Total Reactive Nitrogen Oxides (NO_y), and meteorology.

Photochemical Assessment Monitoring Station, PAMS (Ozone Precursors)

Of the six criteria pollutants, O_3 is the most encompassing. The most prevalent photochemical oxidant and an important contributor to “smog”, O_3 is not emitted directly into the air. Instead, it results from complex chemical reactions in the atmosphere between VOCs and NO_x in the presence of sunlight. There are thousands of sources of VOCs and NO_x located across the country. To track and control O_3, U.S. EPA is trying to create an understanding of not only the pollutant itself, but the chemicals, reactions, and conditions that contribute to its formation as well. Because of this, U.S. EPA called for improved monitoring of O_3 and its precursors, VOCs and NO_x, to obtain more comprehensive and representative data on O_3 air pollution. U.S. EPA initiated the PAMS program in February 1993. The PAMS program required the establishment of an enhanced monitoring network in all O_3 nonattainment areas classified as serious, severe, or extreme. PAMS are now required at each NCore site located in a CBSA with a population of 1,000,000 or more. Details of the 55 compounds sampled are found in the Parameter Networks section.

Toxics / Carbonyls / Metals

Toxic air pollutants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer, other serious health effects, or adverse environmental conditions. Air toxics include semi-volatile and volatile organic compounds (VOC), metals, and carbonyls.

Air toxic compounds are released from many different sources, including mobile sources (vehicles), stationary industrial sources, small area sources, indoor sources (cleaning materials, etc.), and other environmental sources (wildfires, etc.). The lifetime, transportation, and make-up of these pollutants are affected by weather and landscape. They can be transported far away from the original source or sources, or be caught in rain and deposited to waterways or land.

The air toxics, carbonyls, and metals are divided into separate categories due to different sampling and analytical methodologies used for each. With all three categories combined, more than eighty different pollutants are analyzed.

Carbon Dioxide (CO_2)

In 2009 the U.S. EPA declared CO_2 a pollutant. Carbon dioxide (CO_2) is the primary greenhouse gas emitted through human activities. Gases that trap heat in the atmosphere are called greenhouse gases. CO_2 is naturally present in the atmosphere as part of the earth's carbon cycle. The carbon cycle is the

natural circulation of carbon among the atmosphere, oceans, soil, plants, and animals. CO_2 emissions come from a variety of natural sources. Human activities can influence the carbon cycle by adding more CO_2 to the atmosphere and by influencing the ability of natural sinks, like forests, to remove CO_2 from the atmosphere. The main human activity that emits CO_2 is the combustion of fossil fuels like coal, natural gas, and oil used for energy and transportation.

Radiation

The normal background level of gamma radiation in the air is measured by RadNet, a U.S. EPA nationwide network. There are 140 stationary air monitors across all 50 states continuously sampling the air for radiation. The data are used to determine background levels and to detect any fluctuations. There are two sites in Indiana. One site operates at Indianapolis – Washington Park. The other site is operated in Fort Wayne by local authorities. For more information and access to data visit https://www.epa.gov/radnet.

Meteorological Monitoring

Any study of air pollution should include an analysis of the weather patterns (meteorology) of the local area because the fate of air pollutants is influenced by the movement and characteristics of the air mass into which they are emitted.

If the air is calm and pollutants cannot disperse, then the concentration of these pollutants will build up. Conversely, if a strong and turbulent wind is blowing, the pollutant will rapidly disperse into the atmosphere and will result in lower concentrations near the pollution source.

The measurements of wind speed and direction, temperature, humidity, rainfall, barometric pressure, ultraviolet radiation, solar radiation, and mixing height are important parameters used in the study of air quality monitoring results and to further understand the chemical reactions that occur in the atmosphere. Meteorological monitoring is used to predict air pollution events, high pollutant concentration days, and to simulate and predict air quality using computer models.

National Ambient Air Quality Standards (NAAQS)

NAAQS are identified for the criteria pollutants; CO, Pb, NO_2, O_3, particulate matter (PM_{10} and $PM_{2.5}$), and SO_2. Measuring pollutant concentrations in outdoor air and comparing the measured concentrations to corresponding standards determines the ambient air quality status of an area as attaining or not attaining the standards.

The NAAQS are separated into primary and secondary standards. Primary standards are those established to protect public health. Secondary standards are those established to protect the public welfare from adverse pollution effects on soils, water, vegetation, manmade materials, animals, weather, visibility, property, and economy.

The scientific criteria upon which the standards are based are reviewed periodically by U.S. EPA, which may retain or change the standards according to its findings. Note that there are hundreds of compounds that are generally considered pollutants when found in ambient air but whose health and welfare effects are not well enough understood for ambient standards to be defined.

A pollutant measurement that is greater than the ambient air quality standard for its specific averaging time is called an exceedance. An exceedance is not necessarily a synonym for a violation. For each pollutant there are specific rules about how many exceedances are allowed in a given time period before a pattern of exceedances is considered a violation of the NAAQS that may result in regulatory actions to further clean up the area's air. This distinction is made to allow for certain limited exceedances of the

standard that may occur during an unusual weather pattern, for example, reserving regulatory action for instances where the exceedances are too frequent.

The design value for a site is the level of pollutant concentration when the rules of the NAAQS calculations are applied to that specific pollutant. For example, the O_3 design value is calculated by taking the three-year average of the annual fourth highest daily 8-hour maximums. If this number is above the NAAQS for O_3, then it is a violation or 'nonattainment' of the NAAQS. If the design value is below the NAAQS, then the area is in 'attainment' of the standard. Generally, nonattainment is based on the highest design value reported for a specific geographic area (usually a CBSA), and the entire area would be defined by that monitor and classified accordingly. This number basically tells you how polluted an area would be in relation to a NAAQS. A listing of the NAAQS can be found at: https://www.epa.gov/criteria-air-pollutants/naaqs-table

5-Year Network Assessment

U.S. EPA requires a Network Assessment be performed every five (5) years, as per 40 CFR Part 58.10(d). The third Regional Network Assessment was published in 2020 by the Lake Michigan Air Directors Consortium (LADCO) for the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. It is available at: https://www.ladco.org/reports/monitoring-reports/
The second Regional Network Assessment published in 2015, and the first Regional Network Assessment, published July 1, 2010, by LADCO are also available on this website. Indiana uses the recommendations from the Regional Assessment as input into the Annual Network Review.

New U.S. EPA Monitoring Requirements

When the NAAQS and monitoring requirements for the various pollutants are undergoing revision, even though IDEM is aware of the proposals and how they could possibly affect Indiana's monitoring network, only those requirements which have been approved and are in effect at this time are considered when modifying Indiana's current network.

EJScreen

Indiana has reviewed its network using U.S. EPA's online EJScreen tool which looks at 12 metrics of Environmental Justice (EJ) concern. When planning changes to its network, Indiana considers EJ as one part of the decision-making process in siting ambient air monitoring. Indiana's ambient monitoring network includes representative concentration of monitors in areas of high population density as well as at-risk communities with a focus on anticipated exposures from local sources of emissions.

Network Overview

Indiana has reviewed its current ambient air quality network and has developed a proposed network to be implemented during 2025. Current NAAQS, data trends, site redundancy, siting problems, site access concerns and other identified monitoring issues all contribute to any proposed network revisions.

Indiana's air monitoring network for 2025 consists of the sites and monitors listed in Table 1. All site changes which have occurred or plan to take place in 2024 are included along with the planned network modifications for 2025. Figure 1 is an overview of Indiana's current monitoring network with population density showing the locations where monitoring takes place in 2025.

The number of monitoring locations operated by the State remains the same at 72 sites as will the number of monitored pollutant parameters at 156.

Table 1 – State Air Monitoring Network

Indiana Ambient Air Quality Monitoring Network 2025

AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O_3	SO_2	CO / CO_2	NO2 / NOy	PM_{10}	$PM_{10-2.5}$	$PM_{2.5}$ (FRM)	$PM_{2.5}$ (Cont)	$PM_{2.5}$ (Spec)	$PM_{2.5}$ (Spec Cont)	LEAD	TOXICS (VOCs)	O_3 PREC	CAR-BONYLS	METALS	MET
170230001	Clark, IL	West Union, IL	West Union	416 S. Hwy 1	X															X
180030002	Allen	Leo	Leo HS	Leo HS, 14600 Amstutz Rd.	X															
180030015	Allen	Fort Wayne	Ft Wayne - Coliseum	707 N Coliseum Blvd	X							X								X
180050007	Bartholomew		Hope	Hauser Jr-Sr HS, 9404 N775 E.	X															
180050008	Bartholomew	Columbus	Columbus - Rocky Ford Rd.	3475 Trestle Dr.								X								
180110001	Boone		Whitestown	Perry-Worth Elem Sch., 3900 E. 300 S, Lebanon	X															
180130001	Brown		Helmsburg	Jackson Twp Fire Dept., 4831 Helmsburg Road, Nashville	X															
180150002	Carroll		Flora	Flora Airport, 481 S. 150 W, Flora	X															X
180190010	Clark	Jeffersonville	Jeffersonville - Bates-Bowyer Ave.	Downtown Wastewater Plant, 1420 Bates-Bowyer Ave.					X		X	X	X	B. Carbon						
180190008	Clark		Charlestown State Park	Charlestown State Park, 12500 Highway 62, Charlestown	X															X
180190009	Clark	Clarksville	Clarksville	Falls of the Ohio State Park, 201 W. Riverside Dr.												X				
180350006	Delaware	Muncie	Muncie - Central HS	801 N. Walnut St.							X	X								
180350009	Delaware	Muncie	Muncie - Mt. Pleasant Blvd.	2601 W. Mt. Pleasant Blvd.											X				X	
180350010	Delaware	Albany	Albany	Albany Elem. Sch., 700 W. State St.	X															
180372001	Dubois	Jasper	Jasper - Post Office	Post Office, 206 E. 6th St.					X		X	X	X							
180390007	Elkhart	Bristol	Bristol	Bristol Elem. Sch. 705 Indiana Ave.	X															
180390008	Elkhart	Elkhart	Elkhart - Prairie St.	2745 Prairie St.								X		B. Carbon						
180430008	Floyd	New Albany	New Albany - 4H Rd	4-H Floyd County Fairgrounds	X	X					X	X								
180550001	Greene		Plummer	2500 S. 275 W	X						X	X								X
180570006	Hamilton	Noblesville	Noblesville - 191st St.	Our Lady of Grace Catholic Church, 9900 E. 191st St.	X															
180570007	Hamilton	Fishers	Fishers	11775 Brooks School Road								X								
180570008	Hamilton	Carmel	Carmel - Hazel Dell Pkwy	9609 Hazel Dell Parkway							X									
180630004	Hendricks	Avon	Avon	7203 E. US Highway 36	X															
180650003	Henry		Mechanicsburg	Shenandoah HS, 7354 W. Hwy. 36, Middletown							X	X	X							X
180670004	Howard	Kokomo	Kokomo - E. Vaile Ave.	1802 E. Vaile Ave.	X							X								
180890006	Lake	East Chicago	East Chicago - Franklin Sch.	Washington (formerly Franklin) Elem. Sch, 2400 Cardinal Dr.					X		X	X				X				
180890022	Lake	Gary	Gary - IITRI	IITRI Bunker, 201 Mississippi St.	X	X		X	X		X	X	X	B. Carbon		X				X
180890026	Lake	Gary	Gary - Burr St.	25th Ave. and Burr St.							X									
180890031	Lake	Gary	Gary - Madison St.	Indiana American Water Co. 650 Madison St.					X		X									
180890032	Lake	Gary	Gary - 4th Ave.	Gary SouthShore RailCats, One Stadium Plaza											X				X	
180890034	Lake	East Chicago	East Chicago - Marina	East Chicago Marina, 3301 Aldis St.		X			X		X	X			X	X			X	X
180890035	Lake	Whiting	Whiting - Center St.	1500 Center St. (H.S. Admin. Bldg.)												X				
180890036	Lake	Hammond	Hammond - 167th St.	NIPSCO district office and maintenance facility 1313 167th St.								X								
180890037	Lake	Hammond	Hammond - E. Lakeview St.	2141 E. Lakeview St.											X				X	
180892008	Lake	Hammond	Hammond - 141st St.	1300 E. 141st St.	X	X										X				X
180910005	LaPorte	Michigan City	Michigan City - W. Michigan Blvd.	NIPSCO Gas Station, 490 W. Michigan Blvd.	X															
180910010	LaPorte	LaPorte	LaPorte - E. Lincolnway	2011 E. Lincolnway	X															
180910011	LaPorte	Michigan City	Michigan City - Marsh Elem. Sch.	400 E. Homer St.							X	X								

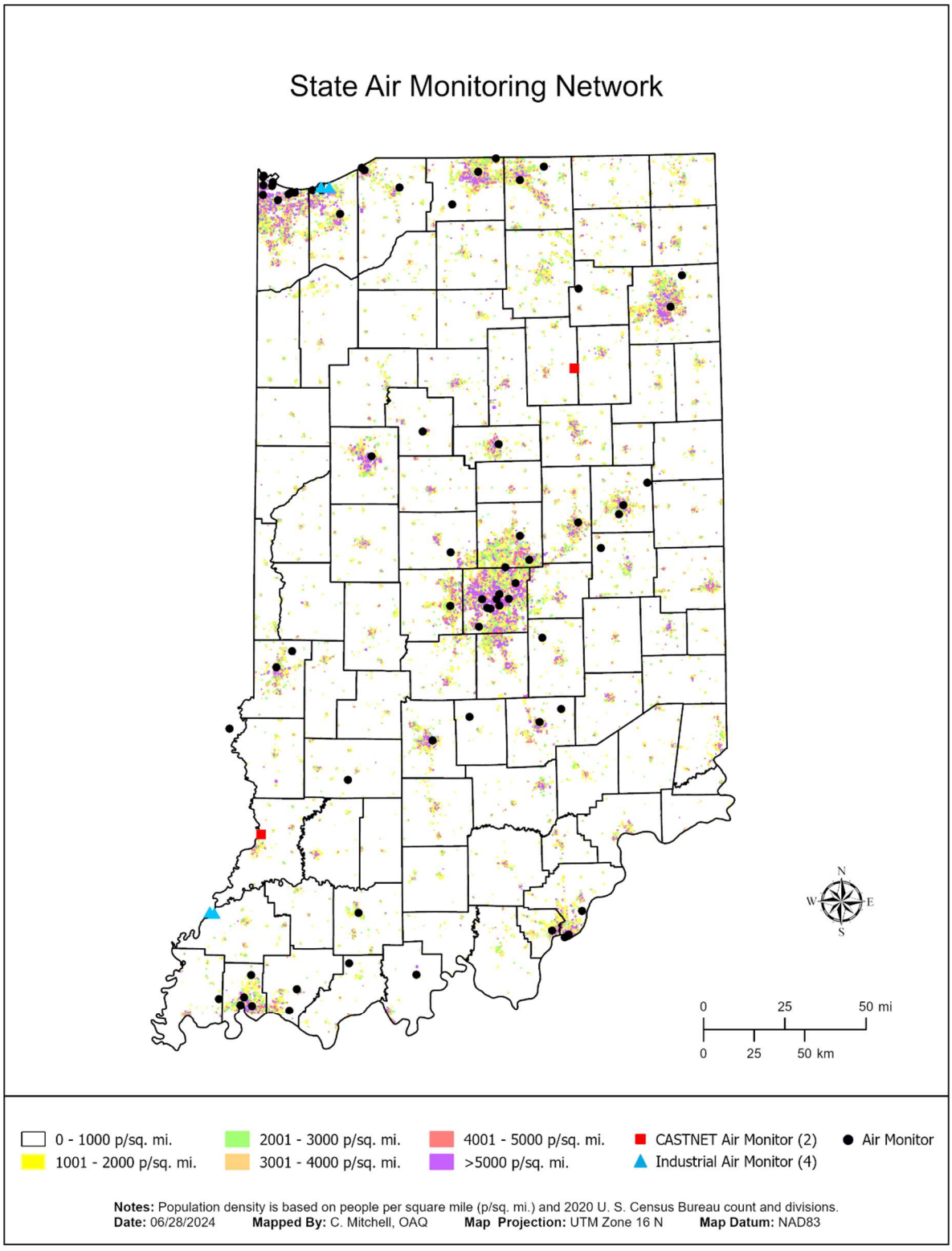
180950011	Madison	Anderson	Anderson - Eastside Elem.	Eastside Elem. Sch., 844 N. Scatterfield Rd.	X							X								
180970043	Marion	Indianapolis	Indpls - West St.	1735 S. West St.					X		X									
180970050	Marion	Indianapolis	Indpls - Ft. Harrison	Ft. Harrison St. Park, 5753 Glenn Rd.	X															
180970057	Marion	Indianapolis	Indpls - Harding St.	1321 S. Harding St.	X		X													
180970073	Marion	Indianapolis	Indpls - E. 16th St.	6125 E. 16th St.																X
180970078	Marion	Indianapolis	Indpls - Washington Park	Washington Park, 3120 E. 30th St,	X	X	X	X	X	X	X	X	X	B. Carbon		X	X	X		X
180970081	Marion	Indianapolis	Indpls - W. 18th St.	School 90, 3351 W. 18th St.							X	X								
180970084	Marion	Indianapolis	Indpls - School 21	School 21, 2815 English Ave.							X	X								
180970086	Marion	Indianapolis	Indpls - Southport	Southport Advanced Wastewater Treatment Plant, 3800 W. Southport Rd																X
180970087	Marion	Indianapolis	Indpls - I-70 E	1650 Ludlow Ave.	X		X	X			X	X		B. Carbon		X				X
181050003	Monroe	Bloomington	Bloomington - Binford	Binford Elem. Sch., 2300 E. 2nd St.							X	X								
181230009	Perry		Leopold	Perry Central HS, 18797 Old St. Rd 37, Leopold	X															
181270023	Porter	Portage	Portage - Hwy 12	Bethlehem Steel Waste Lagoon, Hwy. 12					X											
181270024	Porter	Ogden Dunes	Ogden Dunes	Water Treatment Plant, 84 Diana Rd.	X							X				X				
181270026	Porter	Valparaiso	Valparaiso	Valparaiso Water Dept., 1000 Wesly St.	X															
181270027	Porter		Burns Harbor - Port of Indiana	E. Boundary Rd											X				X	
181290003	Posey		St. Philips	2027 St. Phillips Rd., Evansville	X															X
181410010	St. Joseph		Potato Creek State Park	Potato Creek State Park, 25601 St. Rd. 4, N. Liberty	X															
181410015	St. Joseph	South Bend	South Bend - Shields Dr.	2335 Shields Dr.	X			X			X	X								X
181410016	St. Joseph	Granger	Granger - Beckley St.	12441 Beckley St., Granger	X															
181450001	Shelby		Fairland	Triton Central MS, 4740 W. 600N, Fairland	X															
181470009	Spencer	Dale	Dale	David Turnham School, 105 Dunn St.							X	X								
181570008	Tippecanoe	Lafayette	Lafayette - Greenbush St.	Cinergy Substation, 3401 Greenbush St.								X								
181630013	Vanderburgh		Inglefield	Scott Elem. School, 14940 Old State Rd.	X															
181630016	Vanderburgh	Evansville	Evansville - U. of E.	University of Evansville - Carson Center							X	X				X				
181630021	Vanderburgh	Evansville	Evansville - Buena Vista	1110 W. Buena Vista Rd.	X	X		X	X	X	X	X	X	B. Carbon						
181630022	Vanderburgh	Evansville	Evansville - Lloyd	10 S. 11th Ave.			X													
181670018	Vigo	Terre Haute	Terre Haute - Lafayette Ave.	961 N. Lafayette Ave.	X	X						X								
181670024	Vigo		Sandcut	7597 Stevenson Rd., Terre Haute	X															
181730008	Warrick	Boonville	Boonville	Boonville HS, 300 N. 1st St.	X															
181730011	Warrick		Dayville	3488 Eble Rd., Newburgh	X	X														X
181830003	Whitley		Larwill	Whitko Middle School, 710 N. State Rd. 5			X				X	X								X

	Number of Monitoring Sites	Number of Monitored Pollutant Parameters	O_3	SO_2	CO / CO_2	NO2 / NOy	PM_{10}	$PM_{10-2.5}$	$PM_{2.5}$(FRM)	$PM_{2.5}$(Cont)	$PM_{2.5}$(Spec)	$PM_{2.5}$(Spec Cont)	LEAD	TOXICS (VOCs)	O_3 PREC	CARBONYLS	METALS	MET
Current Monitoring Network (2024)	72	156	38	8	5	5	10	2	24	30	6	6	5	10	1	1	5	17
Proposed Monitoring Network (2025)	72	156	38	8	5	5	10	2	24	30	6	6	5	10	1	1	5	17

Indicates a site where a change is to occur or occurred in 2024

Indicates a site where a change is planned for 2025

Figure 1 – State Air Monitoring Network 2025



Review Summary

The changes proposed for the 2025 Monitoring Network are:

- Discontinuing Ozone at Dayville (181730011) at the end of the 2025 monitoring season.
- Discontinuing SR/UV at St. Phillips (181290003).

Updates on the changes made to the 2024 Monitoring Network:

- Discontinuation of the PM2.5 FRM filter-based method at Bloomington-Binford was delayed due to poor data comparison in 2021 and 2022. A new monitoring method has been installed to replace the current continuous method at the site.
- Discontinuation of the PM2.5 FRM filter-based method at Muncie Central High School and Indianapolis School 21 has been delayed due to site relocations allowing for both methods to run. Further analyses of the FRM and FEM data will occur before discontinuing the FRM method due to pending changes to the PM2.5 NAAQS and the firmware upgrade to address the continuous method bias.
- The new site, Ft. Wayne – Coliseum, is installed and began collecting data.

Unplanned changes to the 2024 Monitoring Network:

- Indianapolis School 21 site relocation has been delayed by problems with site agreements with local property owners.
- East Chicago – Franklin Sch. site move from the rooftop has been delayed by communication issues with the school.

Network Description

As per 40 CFR Part 58.10, an annual monitoring network plan which provides for the establishment and maintenance of an air quality surveillance system consisting of the air quality monitors in the state, is required to be submitted by all states to U.S. EPA.

Specifically, §58.10 (a) requires for each existing and proposed monitoring site:

1. A statement of whether operation of each monitor meets the requirements of appendices A, B, C, D, and E of 40 CFR Part 58, where applicable.
2. Proposals for any State and Local Air Monitoring Station (SLAMS) network modifications.
3. A detailed description of the PAMS network being operated in accordance with the requirements of appendix D to 40 CFR Part 58.

§58.10 (b) requires the plan must contain the following information for each existing and proposed site:

1. The Air Quality System (AQS) site identification number.
2. The location, including street address and geographical coordinates.
3. The sampling and analysis method(s) for each measured parameter.
4. The operating schedules for each monitor.
5. Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
6. The monitoring objective and spatial scale of representativeness for each monitor.
7. The identification of any sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in §58.30.
8. The Metropolitan Statistical Area (MSA), Core Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor.

9. The designation of any Pb monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR part 58.
10. Any source-oriented monitors for which a waiver has been requested or granted by the U.S. EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.
11. Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the U.S. EPA Regional Administrator for the use of Pb-PM_{10} monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.
12. The identification of required NO_2 monitors as near-road, area-wide, or vulnerable and susceptible population monitors in accordance with Appendix D, section 4.3 of this part.
13. The identification of any $PM_{2.5}$ FEMs used in the monitoring agency's network where the data are not of sufficient quality such that data are not to be compared to the NAAQS. For required SLAMS where the agency identifies that the $PM_{2.5}$ Class III FEM does not produce data of sufficient quality for comparison to the NAAQS, the monitoring agency must ensure that an operating FRM or filter-based FEM meeting the sample frequency requirements described in §58.12 or other Class III $PM_{2.5}$ FEM with data of sufficient quality is operating and reporting data to meet the network design criteria described in appendix D to this part.

Network Review Description

The following definitions represent the categories found in the Network Review. Over the years, the list of Monitor Type designations has changed. This is the current list.

Monitor Type – Indicates the "Administrative classification of a monitor." Each monitor can only have one monitor type at a time. The complete list allowed is listed below with those used in Indiana's network **underlined and in bold**:

- **SLAMS** – State or Local air monitoring station for parameters (pollutants and/or meteorological data) addressed by 40 CFR Part 58. The SLAMS make up the ambient air quality sites that are primarily needed for NAAQS comparison, but may serve other data purposes. U.S. EPA must approve all SLAMS sites.
- TRIBAL – Air monitoring stations operating under the authority of a federally recognized tribal agency for parameters addressed by 40 CFR Part 58.
- **SPECIAL PURPOSE (SPM**) – A monitor that an agency has designated as "Special Purpose" in its annual monitoring network plan for parameters addressed by 40 CFR Part 58. SPMs are not counted by the agency when showing compliance with the minimum network requirements for the number and siting of monitors. SPMs generally indicate a shorter term monitoring project. Or monitors are designated SPM for the first 24-months of monitoring to allow for ease of site movement due to unforeseen circumstances.
- **INDUSTRIAL** – A monitor that is operated by a private industry entity rather than under control of a State, Local, or Tribal government.
- **EPA** – A monitor that is operated by EPA or an EPA contractor for parameters addressed by 40 CFR Part 58.
- NON-EPA FEDERAL – A monitor operated by another Federal agency for parameters addressed by 40 CFR Part 58.
- **OTHER** – A monitor for a parameter not addressed by 40 CFR Part 58. It is not allowed for criteria pollutants or other parameters associated with a monitoring network such as NCORE, PAMS, NATTS, etc.

Network – The Monitor Network or Program affiliation of the monitor. A monitor may have more than one at a time or no value. Those networks in Indiana's plan are listed:

- NCore – *National Core (NCore) Multi-pollutant Monitoring Station*: Sites that measure multiple pollutants at trace levels in order to provide support to integrated air quality management data needs. There is currently one NCore site for Indiana located in Indianapolis.

- Near-Road – Monitors at sites meeting the near road design as per 40 CFR Part 58. Typically measure near road peak hourly NO_2 or CO concentrations in larger urban areas. There is currently one Near-Road site for Indiana located in Indianapolis.
- CSN Supplemental – *Supplemental Speciation Station*: Any $PM_{2.5}$ speciation station that is used to gain supplemental data and is not dedicated as part of the speciation trends network.
- CSN STN – *Trends Speciation Station*: A $PM_{2.5}$ speciation station designated to be part of the speciation trends network. This network provides chemical species data of fine particulates.
- PAMS – Photochemical *Assessment Monitoring Station*: Sites established in serious and severe O_3 nonattainment areas in the 1990s to obtain more comprehensive data of areas with ozone pollution by also monitoring NO_x and VOCs.
- CASTNET – Clean Air Status and Trends Network is a national monitoring network established to assess trends in pollutant concentrations, atmospheric deposition, and ecological effects due to changes in air pollutant emissions.

NO_2 Design Criteria – operation of a minimum number of required NO2 monitoring sites.

- Near-Road - Within the NO_2 network, there must be one microscale near-road NO_2 monitoring station in each CBSA with a population of 500,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts.
- Area-Wide - Within the NO_2 network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales.
- Regional Administrator Required Monitoring – *Susceptible and vulnerable populations (S/V).* The U.S. EPA Regional Administrators, in collaboration with States, must require additional NO_2 monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations.

Operating Schedule – specifies how often a sample is taken.

- Continuous - operates 24 hours per day, 7 days per week; applies mainly to gaseous analyzers and meteorological instruments, although some particulate samplers (TEOM, BAMs, T640, and T640X) operate continuously.
- Daily - a sample is taken every day; applies to manual method particulate samplers.
- 3 - Day - Manual method particulate samplers that run every third day.
- 6 - Day - Manual method particulate, toxics, or carbonyl samplers that run every sixth day.

Sampling Method – Each ambient air monitor is classified by a specific method number. This method combines both the collection procedure along with the analysis performed on the sample. These numbers can be found in the U.S. EPA "List of Designated Reference and Equivalent Methods" (see U.S. EPA Ambient Monitoring Technology Information Center web page at:
https://www3.epa.gov/ttn/amtic/criteria.html

Scale – The specific "spatial scales of representation" describes the physical dimensions of the air parcel around the monitoring station throughout which actual pollutant concentrations are reasonably similar.

- Microscale - Areas ranging from several meters to about 100 meters,
- Middle scale - Areas ranging from 100 meters to 0.5 kilometers,
- Neighborhood - 0.5 to 4.0 kilometers, and uniform land use,
- Urban scale - 4 to 50 kilometers,
- Regional - 50 to hundreds of kilometers.

Monitoring Objective – Describes the purpose/objective for monitoring at a site.

- General/Background concentration – sites located to determine general background concentration levels.

- Highest concentration – sites located to determine the highest concentrations expected to occur in the area covered by the network.
- Maximum Precursor Emissions Impact – sites where the magnitude and type of precursor emissions in the area are expected to impact. These sites are suited for the monitoring of urban air toxic pollutants.
- Population exposure – sites located to measure typical concentrations in areas of high population density.
- Quality assurance – sites where two monitors of the same type are located; one used to report air quality for the site, and the other dedicated as an audit monitor.
- Regional transport – sites located to determine the extent of regional pollutant transport among populated areas, and in support of secondary standards.
- Source-oriented – sites located to determine the impact of significant sources or source categories on air quality.
- Upwind background – sites established to characterize upwind background and transported ozone and its precursor concentrations into an area.

Waiver Required – 40 CFR Part 58 Appendix E Section 10 allows for waiver provisions. Most sampling probes or monitors can be located so they meet the requirements of Appendix E. There may be existing sites that may not meet these requirements. The U.S. EPA will consider a written request from the State agency to waive one or more siting criteria for some monitoring sites providing that the State can adequately demonstrate the need (purpose) for monitoring or establishing a monitoring site at that location.

NAAQS Comparable – 40 CFR Part 58 Subpart B requires the identification of any sites that are suitable or not suitable for comparison against the $PM_{2.5}$ NAAQS as described in § 58.11 and §58.30. If a 'No' is present in this category the data should not be used in comparison to the NAAQS.

Primary Monitor – The monitor identified by the monitoring organization that provides concentration data used for comparison to the NAAQS. For any specific site, only one monitor for each pollutant can be designated in AQS as primary monitor for a given period of time. The primary monitor identifies the default data source for creating a combined site record for purposes of NAAQS comparisons.

CBSA – Core-Based Statistical Area is defined by the U.S. Office of Management and Budget as a statistical geographic entity consisting of the county or counties associated with at least one urbanized area/urban cluster of at least 10,000 population, plus adjacent counties having a high degree of social and economic integration. CBSA replaces the term Metropolitan Statistical Area, MSA. The term MSA continues to be used in the CFR. Several border areas are included with other counties in bordering states. Figure 2 is a map of the CBSAs in Indiana.

CSA – Combined Statistical Area (CSA) is defined by the U.S. Office of Management and Budget as a geographical area consisting of two or more adjacent Core Based Statistical Areas (CBSA) with employment interchange of at least 15 percent.

Site Change Proposed – Designates whether this particular site is being considered for some type of modification during 2024 or 2025: relocation, discontinuation, or addition.

Monitoring Requirements

Appendix A of 40 CFR Part 58 outlines the Quality Assurance Requirements for SLAMS, and other monitor types whose data are intended to be used to determine compliance with the NAAQS. It details the calibration and auditing procedures used to collect valid air quality data, the minimum number of collocated monitoring sites, the calculation used for data quality assessments and the reporting requirements. All sites in Indiana operate following the requirements set forth in this appendix.

Appendix B of 40 CFR Part 58 specifies the Quality Assurance Requirements for the control and assessment of the quality of the ambient air monitoring data submitted to a PSD reviewing authority or the EPA by an organization operating an air monitoring station, or network of stations, operated in order to comply with Part 51 New Source Review—Prevention of Significant Deterioration (PSD).

Appendix C of 40 CFR Part 58 specifies the criteria pollutant monitoring methods which must be used in SLAMS and NCore stations. All criteria pollutant monitoring in Indiana follows the methods specified in this appendix.

Appendix D of 40 CFR Part 58 deals with the network design criteria for ambient air quality monitoring. The overall design criteria, the minimum number of sites for each parameter, the type of sites, the spatial scale of the sites, and the monitoring objectives of the sites are detailed in this appendix. In designing the air monitoring network for Indiana, the requirements of this appendix were followed. The specifics for each pollutant network are in the individual parameter chapters.

O_3, PM_{10}, and $PM_{2.5}$ have minimum monitoring requirements based upon the population of an MSA. Estimated 2022 population data from the U.S. Census Bureau are used in this report unless otherwise specified.

According to §2(e) of Appendix D, “The EPA recognizes that State and local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.” The individual tables list the data, the requirements, and the current sites for the full multi-agency MSAs or CBSAs. In instances where it is more logical or desirable to divide the monitoring requirements, Indiana has entered into an MOA, Memorandum of Agreement with some of the neighboring agencies to ensure that the minimum requirements for the MSA continue to be met and the resulting network provides adequate coverage. MOAs have been signed with the Southwest Ohio Air Quality Agency (SWOAQA), the Louisville Metropolitan Air Pollution Control District (APCD), and the Illinois EPA. In the past, IDEM has verified with these agencies that nothing has changed and the MOA is current and will pursue renewals when they are due.

Appendix E of 40 CFR Part 58, which deals with the placement of the monitoring probe, its spacing from obstructions and what materials the probe can be made of. All monitors operated in Indiana meet Appendix E criteria.

Most monitoring sites are visited weekly by site operators who confirm and document operations and note any potential siting problems that could cause noncompliance with Part 58.

Quality Assurance

Quality assurance (QA) actions fall under two categories:

- **quality control** – procedures built into the sampling and analysis methodologies to ensure data quality, and
- **quality assessment** – periodic outside evaluations of the analysis methodology and data quality.

The requirement establishing a QA program is set forth in 40 CFR Part 58 Appendix A. Program management is achieved through guidance found within the Air Monitoring Branch's Quality Assurance Project Plans (QAPPs). Five QAPPs have been approved by EPA Region V:

- Particulates – Volume I,
- Gases – Volume II,
- Meteorological – Volume III,
- Toxics – Volume IV, and
- Calibration, Certification, and Verification Methods of Transfer Standards – Volume V.

The technical framework for the QAPPs is based on the requirements and guidance outlined in the following documents:

- 40 CFR Part 58 Appendix A, which specifies the minimum quality system requirements applicable to SLAMS and other monitor networks (e.g., SPMs, NCore, Near-Road) whose data are used to determine compliance with the NAAQS.
- 40 CFR Part 58 Appendix C, which specifies the criteria pollutant monitoring methods (manual methods or automated analyzers) which must be used in SLAMS and NCore stations.
- 40 CFR Part 58 Appendix D, which describes monitoring objectives, spatial scales, and general criteria to be applied in establishing the required SLAMS ambient air quality monitoring stations and for choosing general locations for monitoring sites.
- 40 CFR Part 58 Appendix E, which has specific location criteria applicable to SLAMS, NCore, and PAMS ambient air quality monitoring probes, inlets, and optical paths for established stations to ensure the uniform collection of compatible and comparable air quality data.
- U.S. EPA guidance documents, primarily the QA Handbook for Air Pollution Measurement Systems: Volume II: Ambient Air Quality Monitoring Program and QA Handbook for Air Pollution Measurement Systems: Volume IV: Meteorological Measurements.
- U.S. EPA technical assistance documents and memoranda.

To further elaborate and define the information in the IDEM QAPPs, standard operating procedures (SOPs) are developed as methods in achieving consistent and accurate quality assurance of environmental data operations.

An integral part of the monitoring network design is ensuring the EPA-approved air monitoring equipment is collecting ambient air and not affected by environmental and anthropogenic influences. Siting requirements are outlined in 40 CFR Part 58 Appendices D and E, the IDEM QAPPs, and the U.S. EPA QA Handbooks. Over time, monitoring sites that initially met siting requirements may no longer conform to those requirements due to changes in the surrounding physical environment, the shelter conditions, and/or property land-use. During site visits any potential siting or safety problems may be noted and recommendations for corrections are made. On a biennial schedule (or sooner if site modifications are made), the Quality Assurance Section will visit the site to collect physical measurements, site photographs and other observations to verify each monitoring site continues to meet the siting requirements. If issues are uncovered or if a site no longer meets siting requirements, the Ambient Monitoring Sections are notified of the need for corrective actions.

Quality control (QC) procedures are necessary to ensure the instruments operate as intended and that the quality of the collected data meets acceptable limits for measurement uncertainty. For gas analyzers, automated systems for calibrations, daily span/zero checks, and weekly span/1-point quality control/zero checks ensure the validity of the collected data. For particulate matter (PM) instruments, calibrations are

performed annually, and QC checks are performed during monthly flow verification procedures. Meteorological sensors are calibrated or verified annually. The Data Management System administrator and the Ambient Monitoring Section parameter specialists review these results to find issues that may affect instrument performance and data validity. In addition, the parameter specialist can remotely review the operating performance of gas analyzers and continuous PM monitors, allowing them to identify potential issues with the instrument. Corrective action is undertaken when the one-point QC checks or the PM flow rate verifications exceed the limits prescribed in the IDEM QAPPs and Appendix D of the U.S. EPA Quality Assurance Handbook for Air Pollution Measurement System; Volume II.

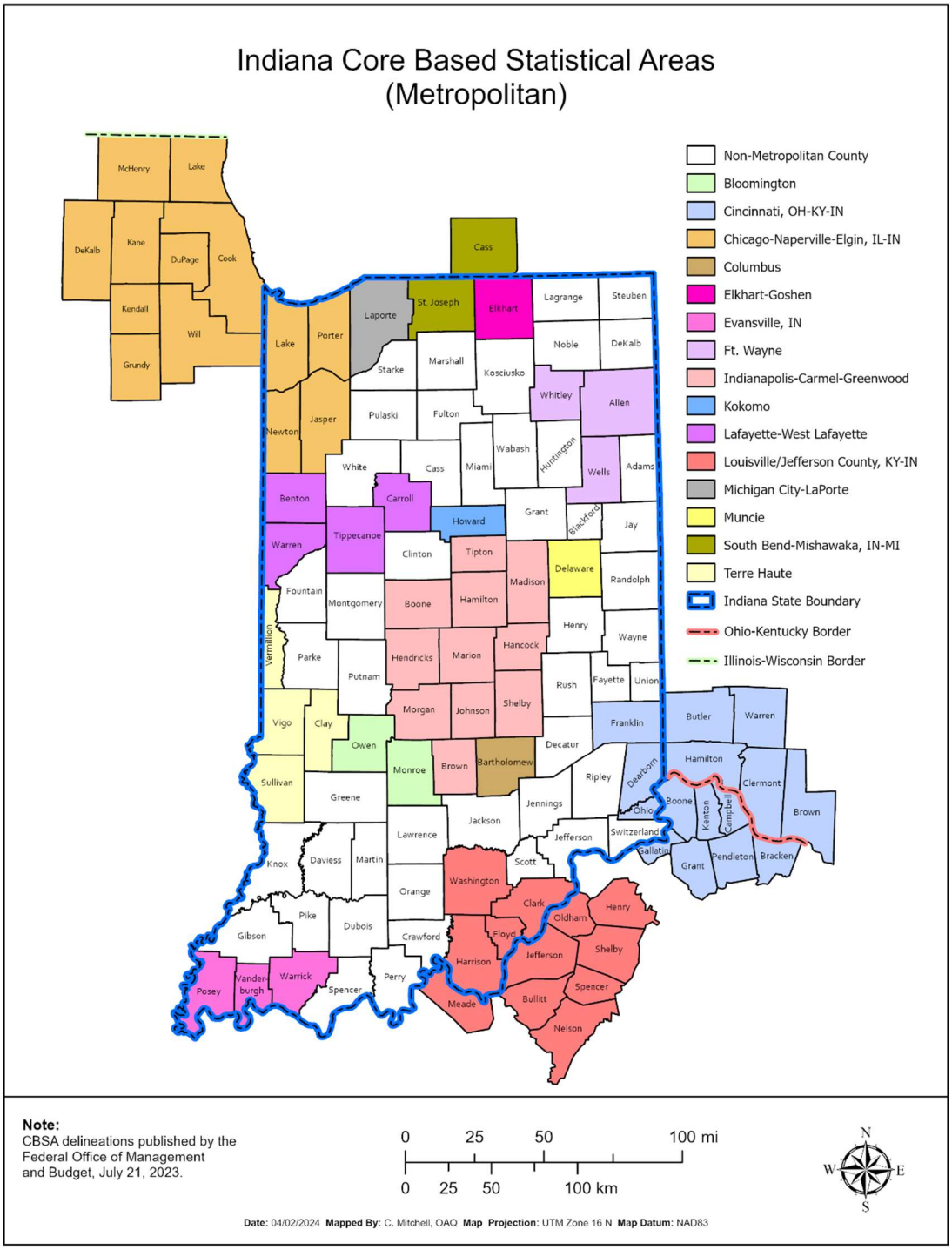
Data review is an examination of the collected data to ensure it has been recorded and processed correctly, verified, and validated. Criteria gas and continuous PM data are initially reviewed by the data acquisition system to invalidate data based on the results of calibration, QC checks, or other anomalies (power failures, communication errors). The ambient monitoring data (gas and PM) are verified by the Ambient Monitoring parameter specialists using associated audit results and other records (e.g., logbook entries, filter log sheets) to ensure the data is correct and complete. The QA Section staff confirm the verified ambient data to ensure correctness and that operational and systematic requirements are met. The validated environmental data and the associated QC/QA results are submitted to the U.S. EPA's Air Quality System (AQS) within 90 days after the end of the quarter. Annually, IDEM certifies the CO, NO_2, SO_2, ozone, lead, PM_{10}, $PM_{10-2.5}$, and $PM_{2.5}$ monitoring data collected by FRM and FEM monitors at its SLAMS and SPM monitoring stations. Certification signifies that

> (1) all the ambient data and all the quality assurance data that were collected, and that have completed and passed the data verification and validation process have been submitted to AQS, and
> (2) based on the results of all quality control checks and performance assessments, the ambient data, quality assessment and quality control data meet EPA regulatory requirements and the data quality requirements specified in the IDEM QAPPs.

Appendix A of 40 CFR Part 58 requires an independent assessment of the ambient data operations, which is provided by the Air Monitoring Branch's Quality Assurance Section. Audit equipment used by the QA Section staff is independent of that equipment used by the Ambient Monitoring sections for calibrations, QC checks, and flow verifications. The QA Section performs semi-annual audits of gas analyzers using select audit concentration levels outlined in Appendix A. For filter-based samplers, continuous PM samplers, and the CSN $PM_{2.5}$ monitoring network, the QA Section audits the flow rate, temperature, barometric pressure, and leak checks of those units quarterly. The QA Section has programs to compare the output of zero air generators against zero air cylinders, provide field zero air and gas checks of the Summa canister collection systems used in the Air Toxics program, and to annually audit meteorological sensors. In addition, the Quality Assurance Section operates the Air Monitoring Branch Quality Assurance standards laboratory. The standards laboratory calibrates, certifies and verifies calibration and testing equipment and verifies EPA Protocol Gas cylinder concentrations through comparison to equipment or test gas cylinders traceable to National Institute of Standards and Technology (NIST) standards.

U.S. EPA Region V staff and its Environmental Services Assistance Team (ESAT) contractor provide additional assessments of IDEM's monitoring operations and procedures. Each year the ESAT contractor conducts Performance Evaluation Program (PEP) audits on PM instruments and National Performance Audit Program (NPAP) audits on gas analyzers located at a select number of sites within the State. Every three years U.S. EPA Region V staff conducts a Technical Systems Audit (TSA) to evaluate the monitoring program, QA procedures, laboratory operations, and project documentation; the latest TSA was performed in 2024. These reviews ensure that Indiana has a monitoring program capable of collecting ambient air data that can be compared to the National Ambient Air Quality Standards (NAAQS) and is representative of the air that Hoosiers breathe.

Figure 2 – Indiana CBSAs



Parameter Networks

Carbon Oxides (CO, CO_2)

Monitoring Requirements

40 CFR Part 58 Appendix D §4.2 details the requirements for CO monitoring. One CO monitor is required to operate collocated with one required near-road NO_2 monitor in CBSAs having a population of 1,000,000 or more persons. Other CO monitors may be required if deemed necessary by the Regional Administrator. In addition, 40 CFR Part 58 Appendix D §3(b) states that CO measurements will be included at the NCORE multi-pollutant monitoring sites.

Microscale and middle scale measurements are useful classifications for SLAMS CO sites since most people have the potential for exposure on these scales. Maximum CO concentrations primarily occur in areas near major roadways and intersections with high traffic density and often poor atmospheric ventilation.

Middle scale CO monitoring is intended to represent areas with dimensions from 100 meters to 0.5 kilometers. In some cases, middle scale measurements may apply to areas that have a total length of several kilometers such as “Line Emission Sources.” This type of emission source area would include air quality along a commercially developed street, a shopping plaza, a freeway corridor, parking lots and feeder streets.

Microscale CO monitoring applies when air quality measurements are to be used to represent distributions within street canyons, over sidewalks and near major roadways. Microscale measurements in one location can often be considered as representative of similar locations throughout a city.

There are no requirements to monitor the greenhouse gas CO_2. One regional scale site, Larwill (181830003), will measure background CO_2 concentrations in Indiana while one neighborhood scale site, Indianapolis – Harding St. (180970056), will measure CO_2 concentrations in a high population site.

Monitoring Methodology

Indiana’s carbon oxides monitoring network collects data with Teledyne Advanced Pollution Instrumentation (API) T300 (CO) and T360 (CO_2) analyzers using nondispersive infrared monitoring methodology. The API Model T300U Trace level/Ultra-sensitive analyzers is used to collect trace level CO data at the NCore Indianapolis – Washington Park site.

Monitoring Network

On January 1, 2025, Indiana proposes operating three CO and two CO_2 monitors, as displayed in Figure 3. The details of the current network are listed in Table 2.

Network Modifications

There are no network modifications planned for 2025.

Figure 3 – Carbon Oxides Monitoring Network

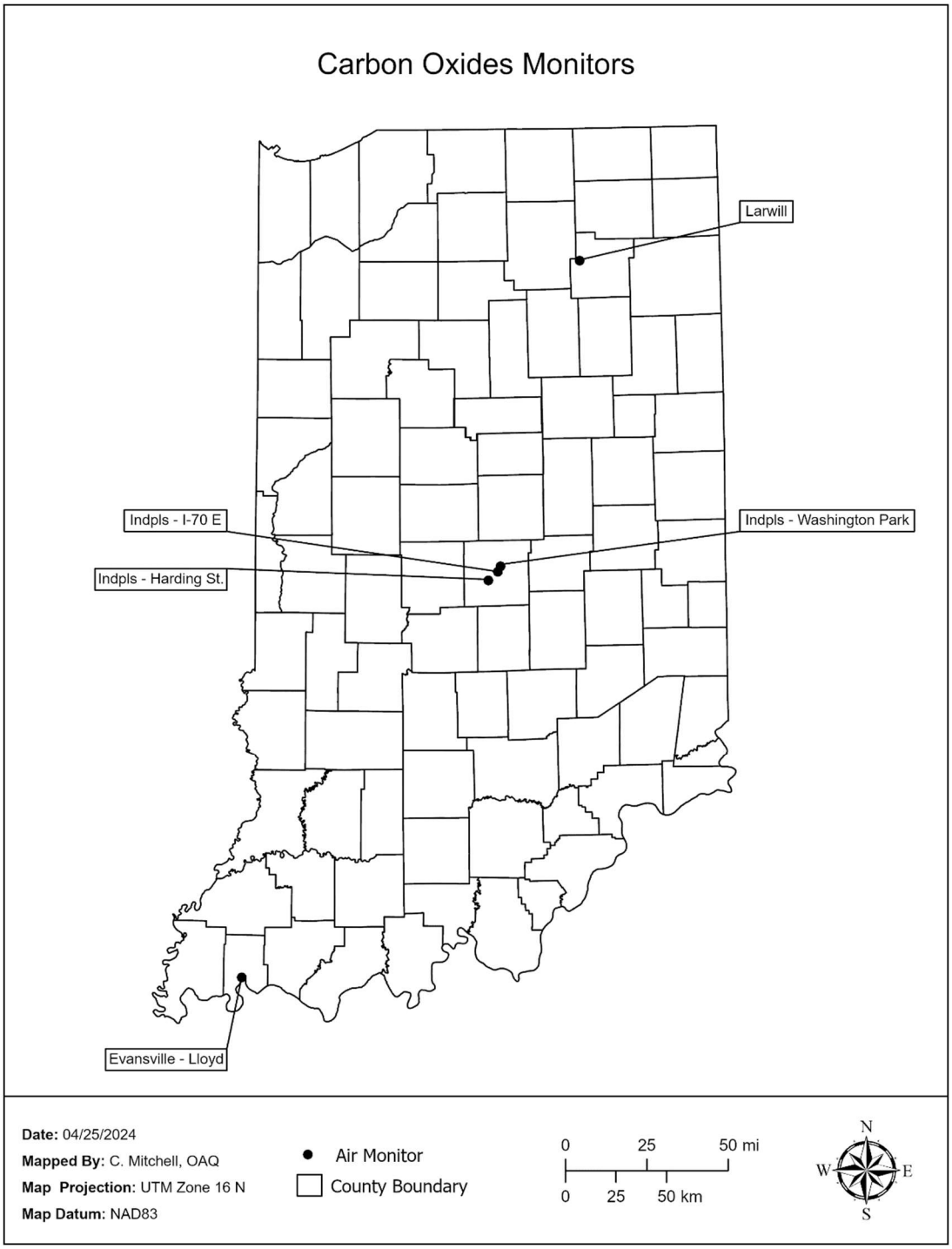


Table 2 – Carbon Oxides Monitoring Network

Parameter Code: 42101, 42102 **CO, CO_2 - Carbon Oxides**

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 S. Harding St.	OTHER	01/01/23	Continuous	012	Neigh	Background	39.749027	-86.186269	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE)	01/01/10	Continuous	593	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	SLAMS (NEAR ROAD)	05/02/14	Continuous	093	Micro	Highest Conc	39.787933	-86.130880	Indianapolis-Carmel-Anderson	No
181630022	Evansville - Lloyd	Vanderburgh	Evansville	10 S. 11th Ave	SLAMS	09/10/09	Continuous	093	Micro	Highest Conc	37.977680	-87.596836	Evansville, IN-KY	No
181830003	Larwill	Whitley	Larwill	Whitko Middle School, 710 N. State Rd. 5	OTHER	01/01/19	Continuous	012	Regional	Background	41.169722	-85.629444	Fort Wayne	No

CO MONITORING METHOD: *093 - TELEDYNE API T300*
593 - TELEDYNE API 300EU, T300EU TRACE-LEVEL
012 - TELEDYNE API T360 - CO2

Lead (Pb)

Monitoring Requirements

The lead NAAQS final rule of November 12, 2008, states that the primary and secondary standards for lead are not to exceed 0.15 µg/m^3 averaged over a rolling 3-month time period. 40 CFR Part 58 Appendix D §4.5 specifies that Pb monitoring must be conducted taking into account Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each Pb source which emits 0.5 or more tons per year (TPY). Annually IDEM works with U.S. EPA in reviewing the latest emissions inventories to determine if additional sources warrant monitoring. These emissions inventories include the most recent versions of the National Emissions Inventory (NEI), Toxics Release Inventory (TRI), and Indiana's Emission Inventory Tracking System (EMITS). IDEM reviewed the current emissions inventories and determined no new sources exceed the 0.5 TPY threshold, so no new Pb monitoring is required.

Waivers may be granted if the state can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50% of the NAAQS, per 40 CFR Part 58 App. D Section 4.5 The waivers must be renewed once every 5 years as part of this ANP.

Collocated samplers are required at 15% of the sites operated by a Primary Quality Assurance Organization (PQAO) or a minimum of one per network. Indiana is required to operate one collocated site.

Monitoring Scale

The appropriate scales for the source-oriented sites are either microscale (up to 100 meters) or middle scale (100 to 500 meters). The neighborhood scale (0.5 – 4.0 kilometers) is the appropriate scale for population-oriented monitoring.

Monitoring Methodology

Indiana utilizes TSP filter sampling with inductively coupled plasma mass spectrometry analysis to generate ambient Pb concentrations from the monitoring sites.

Monitoring Network

A waiver renewal was granted for ALCOA Warrick Power Plant AGC Div of Al in Newburgh, IN in 2020.

A waiver renewal was granted for Crane Army Ammunition Activity Area in Martin County in 2022.

The Pb monitoring network in Indiana in 2025 will consist of five sites. These sites are displayed in Figure 4 and detailed in Table 3.

Network Modifications

There are no planned network modifications for 2025.

Figure 4 – Lead Monitoring Network

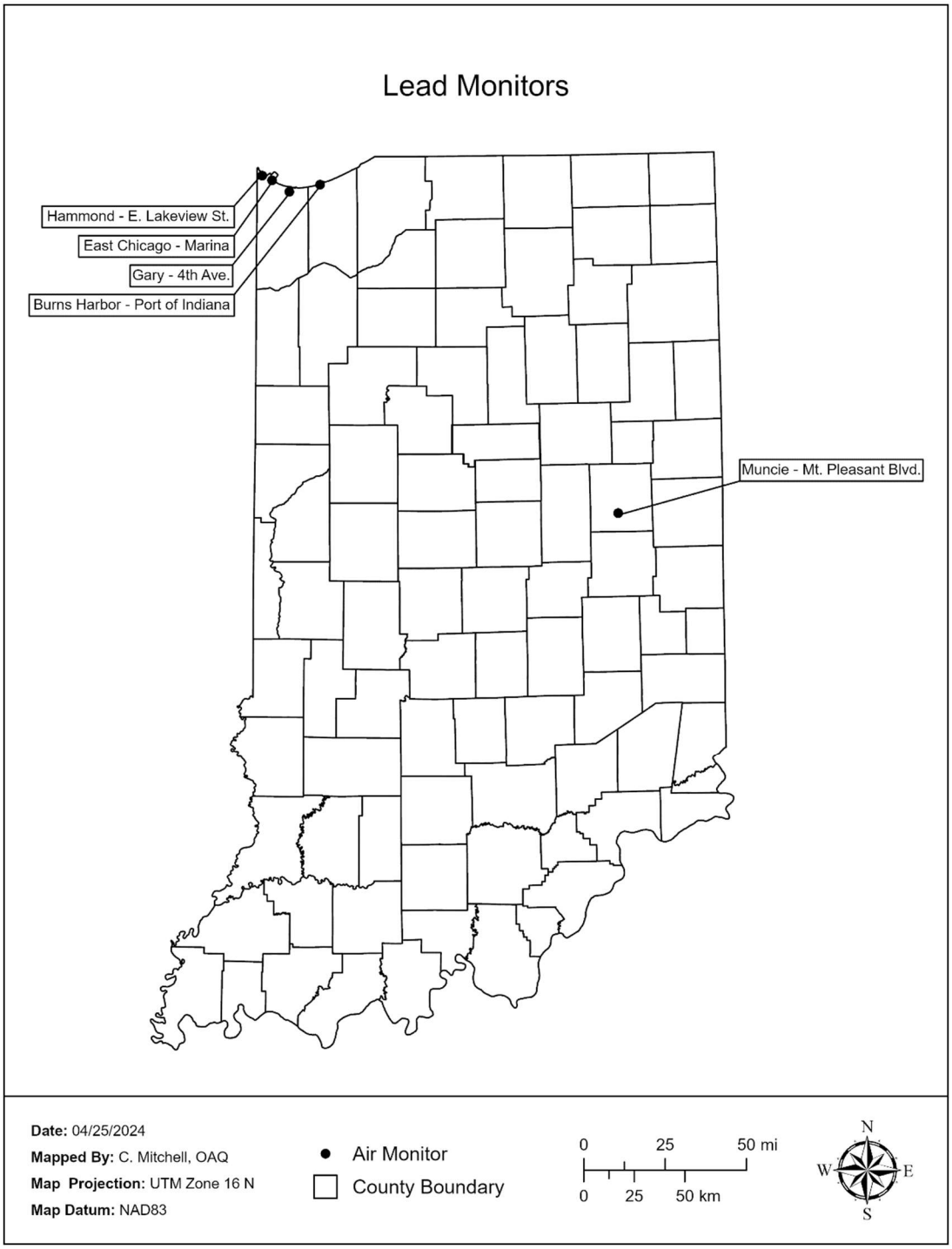


Table 3 – Lead Monitoring Network

Parameter Code: 14129 **Pb - Lead**

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Source Oriented?	Site Change Proposed?
180350009	Muncie - Mt. Pleasant Blvd.	Delaware	Muncie	2601W. Mt. Pleasant Blvd.	SLAMS	01/02/10	6-Day	192	Middle	Source Oriented	40.158417	-85.415021	Muncie	Yes Exide	No
180350009	Muncie - Mt. Pleasant Blvd.	Delaware	Muncie	2601W. Mt. Pleasant Blvd.	SLAMS	01/01/18	6-Day	192	Middle	Quality Assurance	40.158417	-85.415021	Muncie	Yes Exide	No
180890032	Gary - 4th. Ave	Lake	Gary	Gary SouthShore RailCats, One Stadium Plaza	SLAMS	01/02/10	6-Day	192	Middle	Source Oriented	41.603582	-87.332658	Chicago-Naperville-Elgin, IL-IN-WI	Yes US Steel	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301Aldis St.	SLAMS	10/30/12	3-Day	192	Middle	Source Oriented	41.653446	-87.435435	Chicago-Naperville-Elgin, IL-IN-WI	Yes Cleveland Cliffs - Indiana Harbor	No
180890037	Hammond - E. Lakeview St.	Lake	Hammond	2141E. Lakeview St.	SLAMS	08/03/18	6-Day	192	Middle	Source Oriented	41.674189	-87.495024	Chicago-Naperville-Elgin, IL-IN-WI	Yes Whiting Metals	No
180890037	Hammond - E. Lakeview St.	Lake	Hammond	2141E. Lakeview St.	SLAMS	01/01/20	6-Day	192	Middle	Quality Assurance	41.674189	-87.495024	Chicago-Naperville-Elgin, IL-IN-WI	Yes Whiting Metals	No
181270027	Burns Harbor-Port of Indiana	Porter		E. Boundary Rd	SLAMS	08/18/11	6-Day	192	Middle	Source Oriented	41.635161	-87.150376	Chicago-Naperville-Elgin, IL-IN-WI	Yes Cleveland Cliffs - Burns Harbor	No

MONITORING METHOD: 192 - HI-VOL SAMPLER / ANALYSIS METHOD: ICP MASS SPEC (ICPMS) with GLASS FILTERS

Oxides of Nitrogen (NO, NO_2, NO_y)

Monitoring Requirements

On February 9, 2010, the Federal Register amended 40 CFR Parts 50 and 58 establishing a new NO_2 NAAQS for 1-hour concentrations and new monitoring requirements to be implemented by January 1, 2014.

One near-road NO_2 monitor is required for CBSAs with a population of 1,000,000 or more persons and were to be operational by January 1, 2014. An additional near-road NO_2 monitoring station is required for any CBSA with a population of 2,500,000 or more persons or with a population of 1,000,000 or more persons plus one or more roadway segments having annual average daily traffic counts of 250,000 or more. These were to be operational by January 1, 2015. For Indiana, only one near-road site is required for the Indianapolis-Carmel-Anderson CBSA. Additionally, sites are required for the Cincinnati, OH-KY-IN CBSA, the Louisville/Jefferson County, KY-IN CBSA, and the Chicago-Naperville-Elgin, IN-IL-WI CBSA. These cross-state requirements are addressed in agreements signed with the appropriate neighboring agencies.

One area-wide NO_2 monitoring station must also be located in each CBSA with a population greater than 1,000,000 people and was required to be installed by January 1, 2013. Each area listed above also requires an area-wide monitor.

Gary – IITRI (180890022) has been designated a Regional Administrator Required Monitor by the U.S. EPA. 40 CFR Part 58 Appendix D §4.3.4(a) states: “The Regional Administrators, in collaboration with States, must require a minimum of forty additional NO_2 monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations.” Susceptible and vulnerable populations include asthmatics and disproportionately exposed groups at particular risk of NO_2-related health effects, both because of increased exposure and because these groups have a higher prevalence of asthma and higher hospitalization rates for asthma. These monitors were to be designated by January 1, 2013.

Indianapolis - Washington Park serves as the NCore/PAMS monitoring site for Indiana. 40 CFR Part 58 Appendix D §3(b) and 40 CFR Part 58 Appendix D §4.3 state that direct NO2 and NO/NO_y measurements should be included at the NCore multi-pollutant monitoring sites and in the PAMS program. NO/NO_y monitors are used at these sites because it is important to collect data on total reactive nitrogen species in order to better understand O_3 photochemistry.

Monitoring Methodology

The NO_2 network uses Teledyne Model T500U Cavity Attenuated Phase Shift (CAPS) NO_2 analyzers to collect data. The CAPS NO_2 analyzer measures NO_2 directly unlike the traditional chemiluminescence monitors that measure NO_2 by subtracting NO from NO_x. The API Model T200U NO_y Trace level/Ultra-sensitive analyzer is used to collect NO and NO_y data at the Indianapolis – Washington Park NCore/PAMS site (180970078).

Monitoring Network

Indiana operates five CAPS NO_2 monitors and one trace level NO_y monitor as displayed in Figure 5. The current network, along with any changes planned in 2025, is listed in Table 4.

Network Modifications

There are no network modifications planned for 2025.

Figure 5 – Oxides of Nitrogen Monitoring Network

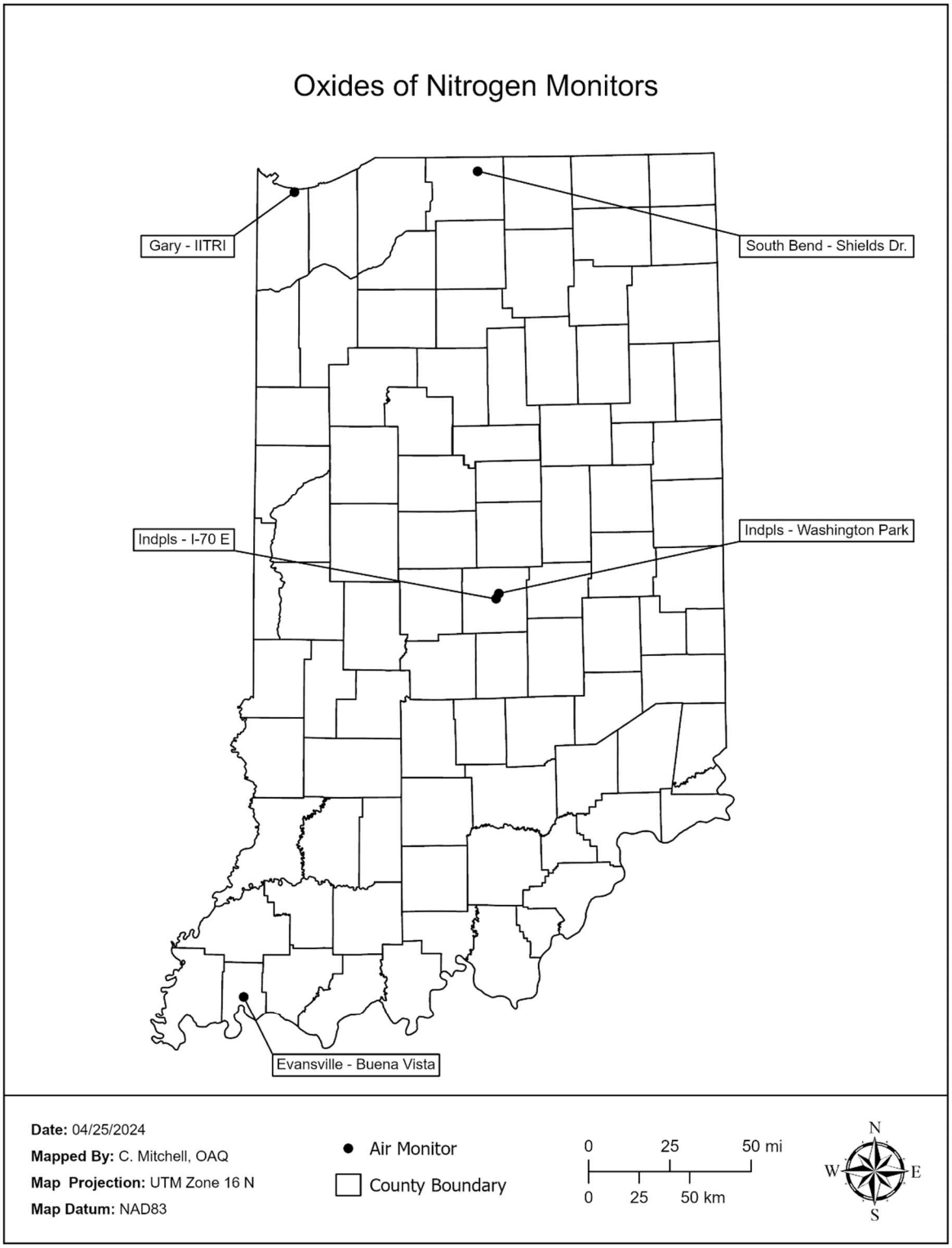


Table 4 – Oxides of Nitrogen (NO, NO_2, NO_y) Monitoring Network

Parameter Code: 42601, 42602, 42600 **NO, NO_2, NO_y - Oxides of Nitrogen**

Site ID	Site Name	County	City	Address	Monitor Type (Network)	NO_2 Design Criteria	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	S/V	06/27/95	Continuous	212	Neigh	Highest Conc	41.606563	-87.305015	Chicago-Naperville-Elgin, IL-IN-WI	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE/PAMS)	Area-Wide	01/01/13	Continuous	212	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE/PAMS)		01/01/11	Continuous	699	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	SLAMS (NEAR ROAD)	Near-Road	02/07/14	Continuous	212	Micro	Pop Exp	39.787933	-86.130880	Indianapolis-Carmel-Anderson	No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS		06/06/06	Continuous	212	Neigh	Pop Exp	41.696667	-86.214722	South Bend-Mishawaka, IN-MI	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS		07/08/09	Continuous	212	Neigh	Pop Exp	38.013333	-87.577222	Evansville, IN-KY	No

NO2 MONITORING METHOD: 212-TELEDYNE API T500U CAPS
NOy MONITORING METHOD: 699-TELEDYNE API 200EU NOy TRACE-LEVEL

Ozone (O_3)

Monitoring Requirements

Table D-2 in 40 CFR Part 58 Appendix D details the number of O_3 sites required in each CBSA. The number of sites is based on the population of a CBSA and if the design value exceeds 85% of the standard, or 0.060 ppm, for that area. Table 5 lists the requirements stated in Part 58. Table 6 lists the requirements as they relate to Indiana. There are five CBSAs which cross state lines. Except for the Cincinnati, OH-KY-IN CBSA, Indiana meets the requirement for all CBSAs, including multi-agency CBSAs. A past multi-agency agreement between the Southwest Ohio Air Quality Agency (Cincinnati, OH) and IDEM specified that the Southwest Ohio Air Quality Agency will fulfill all the O_3 monitoring requirements in this CBSA. In the absence of an agreement, Indiana would be required to operate two sites in the Cincinnati, OH-KY-IN CBSA. A renewal of this agreement is planned.

Monitoring Season

Table D-3 of Appendix D of Part 58 defines the O_3 monitoring season for all of the states. Indiana's monitoring season is from March 1 to October 31 which is the same as all surrounding states.

Indianapolis – Washington Park (180970078) is Indiana's NCore site and Indianapolis – I-70 E (180970087) is Indiana's near-road site. They are both required to collect data all year. Indiana elected to conduct year-round O_3 monitoring at all sites starting on January 1, 2018 due to the extension of the O_3 season by two months in 2017. The previous benefits of being able to turn equipment off for six months to save wear and expendables was lessened with the longer season.

Data

The design value for an area, usually a county or a CBSA, is determined by the 3-year average of the 4th highest daily 8-hour maximum from the highest site in the area. If this value is greater than 0.070 ppm, the area is considered to be in violation of the NAAQS and could potentially be designated as a nonattainment area. If the air quality improves and the design value is 0.070 ppm or less, the area may be reclassified as a maintenance area.

The design values for all sites for the most recent sampling period (2021 – 2023) along with the 2008 and 2015 8-hour nonattainment areas are illustrated in Figure 6. The following sites design values exceeded the 2015 NAAQS of 0.070 ppm: Gary – IITRI (180890022) 0.072 ppm, Michigan City – W. Michigan Blvd. (180910005) 0.073 ppm, Indianapolis. – Washington Park (180970078) 0.071 ppm, and Ogden Dunes (181270024) 0.074 ppm. All other sites had design values for the most recent sampling period (2021 – 2023) that meet the current 2015 NAAQS of 0.070 ppm.

Monitoring Methodology

Monitoring sites in Indiana use Federal Equivalent Method O_3 analyzers from Thermo Scientific; Models 49c, 49i or 49iQ (Method Code 047), or monitors from API, Model T400 (Method Code 087). These monitors use ultraviolet absorption photometry. Ambient air is drawn through a sample cell through which ultraviolet light (254 nm wavelength) passes. Any O_3 in the ambient air absorbed by the UV light is directly related to the O_3 concentration as described by the Beer-Lambert Law. The State also operated one chemiluminescence O_3 analyzer from API, Model T265 (Method Code 199) that uses gas-phase titration of excess NO gas to determine the O_3 concentration.

Monitoring Network

In 2025 there will be 38 monitoring sites in Indiana's O_3 monitoring network as displayed in Figure 7. As part of the Enhanced Monitoring plan for the Chicago MSA, Indiana is committed to running

ozone monitors year-round in Indiana's portion of the MSA. Also, the number of monitors that Indiana operates is greater than the minimum required for the entire MSA.
In addition, CASTNET operates two O_3 analyzers in Indiana at Vincennes (180839991) and Salamonie Reservoir (181699991). CASTNET's Annual Network Plan can be found at: https://www.epa.gov/castnet/documents-reports

Indiana's O_3 monitoring network with proposed changes for 2025 is in Table 7.

Network Modifications

The 2025 O_3 network modification is to discontinue monitoring at Dayville (18173011) at the end of the 2025 O_3 monitoring season on 10/31/25. As part of the maintenance plan for the redesignation of Warrick County, Indiana committed to operating the monitor for 20 years past the redesignation date of January 2006. The O_3 monitoring site is redundant with a nearby O_3 site in the same county.

The site discontinuation justification will use the following criteria in §58.14 System modification (c) "Other requests for discontinuation may also be approved on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of a NAAQS and if the requirements of appendix D to this part, if any, continue to be met."

The Dayville (18173011) site is located 7.1 miles (11.5 km) south of Boonville (18173008). The Boonville O_3 data trends between 0.001 to 0.002 ppm higher than the Dayville site.

O_3 Design Values in PPM

3 Year Period	Dayville	Boonville
2014 - 2016	0.067	0.068
2015 - 2017	0.068	0.069
2016 - 2018	0.068	0.069
2017 - 2019	0.064	0.066
2018 - 2020	0.063	0.065
2019 - 2021	0.063	0.064
2020 - 2022	0.065	0.066
2021 - 2023	0.067	0.069

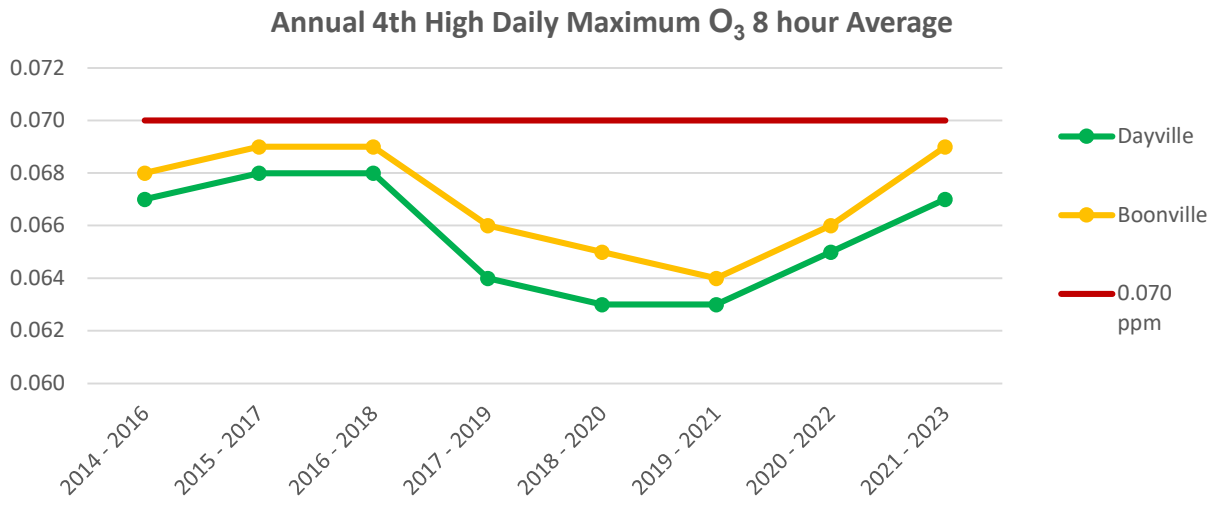


Table 5 – SLAMS Minimum O_3 Monitoring Requirement

# of Sites Required per Population and Design Value		
MSA Population	**3 yr. Design Value>=85% of NAAQS (0.060 ppm)**	**3 yr. Design Value < 85% of NAAQS (0.060 ppm)**
>10 million	4	2
4-10 million	3	1
350,000 - 4 million	2	1
50,000 - 350,000	1	0

Table 6 – SLAMS O_3 Sites Required for Indiana

Indiana MSAs	MSA Population (Est 2022) [1]	Design Value (ppm) (2021-2023)	# of Sites Required per CFR	2024 No. of Sites	2025 No. of Sites
Bloomington	161,227	0.062	1	1 [4]	1 [4]
Chicago-Naperville-Elgin, IL-IN-WI (total MSA)	9,441,957	0.077 [2]	3	21 [2]	-
Chicago-Naperville-Elgin, IL-IN-WI (IN only)	9,441,957	0.074 [3]	3	4 [3]	4
Cincinnati, OH-KY-IN (total MSA)	2,265,051	0.070 [2]	2	10 [2]	-
Cincinnati, OH-KY-IN (IN only)	2,265,051	No Data [3]	2	0 [3]	0
Columbus	83,540	0.068	1	1	1
Elkhart-Goshen	206,890	0.064	1	1	1
Evansville, IN-KY (total MSA)	314,038	0.069 [2]	1	5 [2]	-
Evansville, IN-KY (IN only)	314,038	0.069 [3]	1	5 [3]	4
Fort Wayne	426,076	0.069	2	2	2
Indianapolis-Carmel-Anderson	2,141,779	0.071	2	9 [4]	9 [4]
Kokomo	83,574	0.069	1	1	1
Lafayette-West Lafayette	226,452	0.068	1	1	1
Louisville/Jefferson County, KY-IN (total MSA)	1,284,553	0.072 [2]	2	7 [2]	-
Louisville/Jefferson County, KY-IN (IN only)	1,284,553	0.066 [3]	2	2 [3]	2
Michigan City-LaPorte	111,675	0.073	1	2	2
Muncie	112,031	0.067	1	1	1
South Bend-Mishawaka, IN-MI (total MSA)	323,637	0.070 [2]	1	4 [2]	-
South Bend-Mishawaka, IN-MI (IN only)	323,637	0.070 [3]	1	3 [3]	2
Terre Haute	184,875	0.067	1	2	2
Non MSA					
West Union - Clark Co., IL		0.066		1	1
Plummer - Greene Co. [3]		0.068		1	1
Leopold - Perry Co.		0.065		1	1
	DV exceeds NAAQS				
	DV ≥ 85% of NAAQS				
# of sites needed if Indiana meets all multi-state MSA requirements			21		
		Sites in Indiana Network		**38**	**36**

[1] Population from estimated 2021 US Census Bureau

[2] Information for full MSA.

[3] Information for Indiana's portion of MSA.

[4] Bloomington MSA impact site is located in Brown County, part of Indianapolis-Carmel-Anderson MSA.

Figure 6 – O_3 Design Values (2021 – 2023)

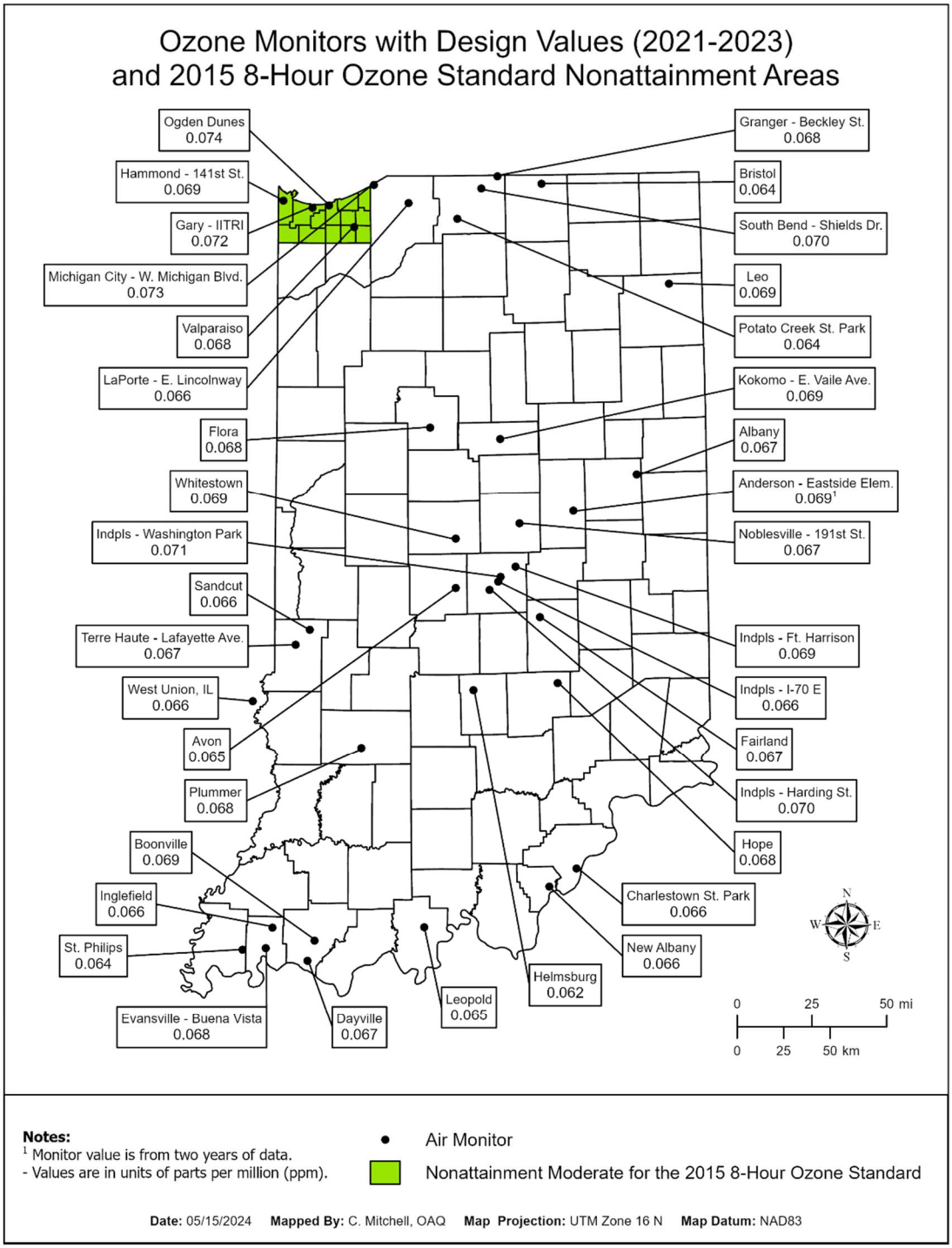


Figure 7 – O_3 Monitoring Network

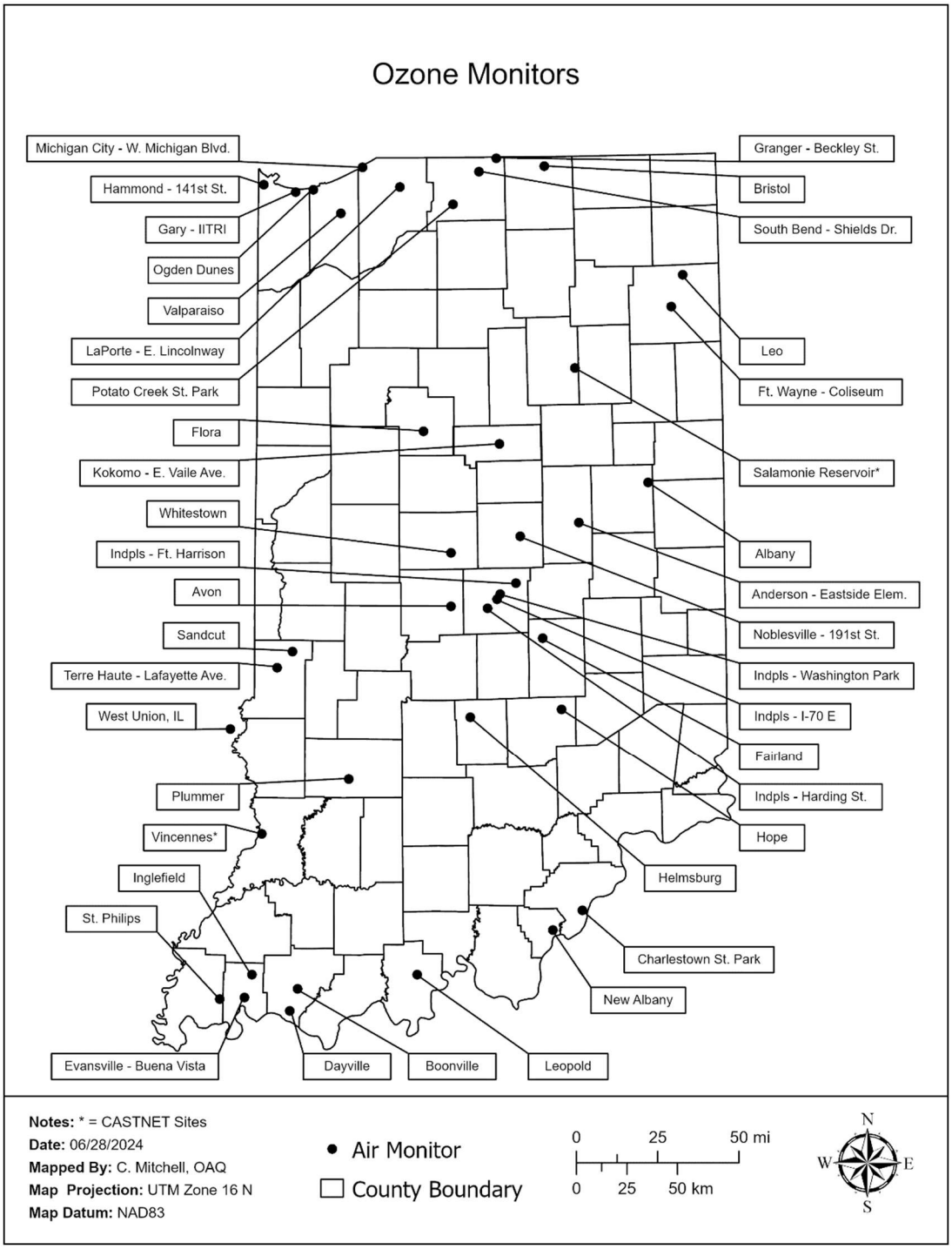


Table 7 – Ozone Monitoring Network

Parameter Code: 44201 **O_3 - Ozone**

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
170230001	West Union	Clark, IL		416 S. Hwy 1, West Union, IL	SLAMS	04/01/01	Continuous	087	Urban	General Bkgrd	39.210857	-87.668297	Non-MSA County	No
180030002	Leo HS	Allen	Leo	Leo HS, 14600 Amstutz Rd.	SLAMS	04/01/86	Continuous	087	Urban	Highest Conc	41.221418	-85.016821	Ft. Wayne	No
180030015	Fort Wayne - Coliseum	Allen	Fort Wayne	707 N. Coliseum	SLAMS	07/01/22	Continuous	087	Neigh	Pop Exp	41.081864	-85.088313	Ft. Wayne	No
180050007	Hope	Bartholomew		Hauser Jr-Sr HS, 9404 N 775 E.	SLAMS	05/28/13	Continuous	047	Urban	Pop Exp	39.294322	-85.766846	Columbus	No
180110001	Whitestown	Boone		Perry - Worth Elem Sch., 3900 E. 300 S, Lebanon	SLAMS	04/01/01	Continuous	047	Urban	Highest Conc	39.997773	-86.395394	Indianapolis-Carmel-Anderson	No
180130001	Helmsburg	Brown		Jackson Twp Fire Dept. 4831 Helmsburg Road, Nashville	SLAMS	05/16/14	Continuous	047	Urban	Highest Conc	39.263914	-86.292261	Indianapolis-Carmel-Anderson	No
180150002	Flora	Carroll		Flora Airport, 481 S. 150 W., Flora	SLAMS	04/01/01	Continuous	047	Urban	Pop Exp	40.540455	-86.553035	Lafayette-West Lafayette	No
180190008	Charlestown State Park	Clark		Charlestown State Park, 12500 Hwy 62, Charlestown	SLAMS	05/04/07	Continuous	047	Urban	Highest Conc	38.393823	-85.664118	Louisville/Jefferson County, KY-IN	No
180350010	Albany	Delaware	Albany	Albany Elem. Sch., 700 W. State St.	SLAMS	04/01/01	Continuous	047	Urban	Pop Exp	40.300385	-85.245862	Muncie	No
180390007	Bristol	Elkhart	Bristol	Bristol Elem Sch., 705 Indiana Ave.	SLAMS	04/01/02	Continuous	047	Urban	Pop Exp	41.716959	-85.824696	Elkhart-Goshen	No
180430008	New Albany	Floyd	New Albany	Floyd County 4-H Fairgrounds	SLAMS	01/01/23	Continuous	047	Neigh	Pop Exp	38.317813	-85.833322	Louisville/Jefferson County, KY-IN	No
180550001	Plummer	Greene		2500 S. 275 W	SLAMS	04/03/00	Continuous	087	Regional	Upwind Bkgrd	38.985556	-86.990000	Non-MSA County	No
180570006	Noblesville - 191st St.	Hamilton	Noblesville	Our Lady of Grace Catholic Church, 9900 E. 191st St.	SLAMS	05/13/10	Continuous	047	Urban	Highest Conc	40.068297	-85.992451	Indianapolis-Carmel-Anderson	No
180630004	Avon	Hendricks	Avon	7203 E. US 36, Avon	SLAMS	04/01/00	Continuous	047	Urban	Pop Exp	39.758889	-86.398611	Indianapolis-Carmel-Anderson	No
180670004	Kokomo - E. Vaile Ave.	Howard	Kokomo	1802 E. Vaile Ave.	SLAMS	01/01/18	Continuous	087	Urban	Pop Exp	40.481347	-86.109688	Kokomo	No
180839991	Vincennes	Knox		Southwest Purdue Agricultural Center	EPA (CASTNET)	04/04/11	Continuous	047	Regional	Highest Conc	38.740792	-87.484923	Non-MSA County	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	07/01/95	Continuous	087	Neigh	Pop Exp	41.606563	-87.305015	Chicago-Naperville-Elgin, IL-IN-WI	No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st St.	SLAMS	01/01/76	Continuous	047	Neigh	Pop Exp	41.639444	-87.493611	Chicago-Naperville-Elgin, IL-IN-WI	No
180910005	Michigan City - W. Michigan Blvd.	La Porte	Michigan City	NIPSCO Gas Station, 490 W. Michigan Blvd.	SLAMS	05/24/90	Continuous	199	Urban	Pop Exp	41.717662	-86.907786	Michigan City-LaPorte	No
180910010	LaPorte - E. Lincolnway	La Porte	La Porte	2011 E. Lincolnway	SLAMS	05/07/97	Continuous	087	Urban	Pop Exp	41.629167	-86.684444	Michigan City-LaPorte	No

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180950011	Anderson - Eastside Elem.	Madison	Anderson	Eastside Elementary Sch., 844 N. Scatterfield Rd.	SLAMS	01/01/21	Continuous	087	Urban	Pop Exp	40.125690	-85.652127	Indianapolis-Carmel-Anderson	No
180970050	Indpls - Ft Harrison	Marion	Indianapolis	5753 Glenn Rd	SLAMS	12/01/79	Continuous	047	Urban	Highest Conc	39.858889	-86.021389	Indianapolis-Carmel-Anderson	No
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 S. Harding St.	SLAMS	03/01/82	Continuous	047	Neigh	Pop Exp	39.749027	-86.186269	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE/PAMS)	04/01/09	Continuous	047	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	SLAMS (NEAR ROAD)	05/14/14	Continuous	047	Neigh	Pop Exp	39.787933	-86.130880	Indianapolis-Carmel-Anderson	No
181230009	Leopold	Perry		Perry Central HS, 18797 Old St Rd 37, Leopold	SLAMS	04/01/04	Continuous	087	Urban	Highest Conc	38.115152	-86.603250	Non-MSA County	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	SLAMS	11/01/83	Continuous	047	Urban	Highest Conc	41.617500	-87.199167	Chicago-Naperville-Elgin, IL-IN-WI	No
181270026	Valparaiso	Porter	Valparaiso	Valpo Water Department, 1000 Wesley St.	SLAMS	04/01/98	Continuous	047	Urban	Pop Exp	41.512118	-87.036236	Chicago-Naperville-Elgin, IL-IN-WI	No
181290003	St Philips	Posey		2027 South St. Phillips Rd., Evansville	SLAMS	07/01/96	Continuous	047	Urban	Upwind Bkgrd	38.006414	-87.718414	Evansville, IN-KY	No
181410010	Potato Creek State Park	St Joseph		Potato Creek St. Park, 25601 St. Rd 4, North Liberty	SLAMS	04/24/91	Continuous	047	Urban	Upwind Bkgrd	41.551667	-86.370556	South Bend-Mishawaka, IN-MI	No
181410015	South Bend-Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/06/06	Continuous	087	Neigh	Pop Exp	41.696667	-86.214722	South Bend-Mishawaka, IN-MI	No
181410016	Granger-Beckley St.	St Joseph	Granger	12441 Beckley St., Granger	SLAMS	04/01/12	Continuous	047	Urban	Highest Conc	41.754722	-86.110000	South Bend-Mishawaka, IN-MI	No
181450001	Fairland	Shelby		Triton Central MS, 4740 W. 600N , Fairland	SLAMS	04/01/00	Continuous	047	Urban	General Bkgrd	39.613367	-85.870669	Indianapolis-Carmel-Anderson	No
181630013	Inglefield	Vanderburgh		Scott School, 14940 Old State Road	SLAMS	05/01/80	Continuous	047	Urban	Highest Conc	38.113889	-87.536667	Evansville, IN-KY	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/08/09	Continuous	047	Neigh	Pop Exp	38.013333	-87.577222	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	07/01/83	Continuous	087	Neigh	Pop Exp	39.485987	-87.401312	Terre Haute	No
181670024	Sandcut	Vigo		7597 N. Stevenson Rd., Terre Haute	SLAMS	04/01/01	Continuous	047	Urban	Pop Exp	39.558525	-87.312883	Terre Haute	No
181699991	Salamonie Reservoir	Wabash		Hamilton Rd., Largo	EPA (CASTNET)	06/01/11	Continuous	047	Regional	Highest Conc	40.816038	-85.661407	Non-MSA County	No
181730008	Boonville	Warrick	Boonville	Boonville HS, 300 N. 1st St.	SLAMS	04/16/91	Continuous	047	Urban	Highest Conc	38.052416	-87.281502	Evansville, IN-KY	No
181730011	Dayville	Warrick		3488 Eble Rd., Newburgh	SLAMS	04/01/07	Continuous	047	Urban	Highest Conc	37.954444	-87.321667	Evansville, IN-KY	Discontinue

O3 MONITORING METHOD: 047 - THERMO ELECTRON 49C, 49i
087 - TELEDYNE API T400
199 - TELEDYNE API T265

Particulate Matter (PM_{10})

Monitoring Requirements

The requirements for the design of the PM_{10} monitoring network are listed in 40 CFR Part 58 Appendix D §4.6. Indiana must operate the minimum number of sites as defined by the CBSA population and the ambient PM_{10} data of the area. Table 8 lists the sites required per CBSA along with the highest monitored PM_{10} value in the proper category for each CBSA. The current and proposed networks are also listed. There are five CBSAs which cross state lines. Indiana meets the requirement for the number of sites for the full CBSA, in the multi-agency CBSAs, except for the Cincinnati, OH-KY-IN and Louisville/Jefferson County, KY-IN CBSAs. IDEM has multi-agency agreements with the Southwest Ohio Air Quality Agency (Cincinnati, OH) and the Louisville Metropolitan Air Pollution Control District (APCD) specifying the sites which will operate in each district to fulfill the PM_{10} monitoring requirements in the Cincinnati, OH-KY-IN and Louisville/Jefferson County, KY-IN CBSAs.

Collocated samplers are required at 15% of the sites in the network to determine monitoring precision. IDEM is required to operate one collocated sampler.

Monitoring Methodology

Noncontinuous PM_{10} samples are collected on a pre-weighed 46.2 mm diameter Teflon™ filter. Air is drawn through an inlet designed to pass only particles smaller than 10 microns in diameter and across the filter for 24 hours. The filter is then removed and weighed again. Concentrations are calculated by dividing the weight gain by the volume of air that passed through the filter.

Continuous PM_{10} concentrations are obtained by using two different methods. A Thermo Scientific Model 1405 (EQPM-1090-079) collects the particulate on a filter attached to an oscillating glass rod. The concentration of the particulate is proportional to the change in oscillating frequency. A second monitor method used is the Teledyne API T640X (EQPM-0516-239). The T640X is a real-time, continuous PM mass monitor that uses scattered light spectrometry for measurement.

Monitoring Network

Indiana currently operates 10 monitoring sites in the State. The 2025 network is displayed in Figure 8. Concentrations at all sites except for two sites in Indiana, Indianapolis – Washington Park (180970078) and Portage – Hwy 12 (181270023), are under the 24-hour NAAQS of 150 $\mu g/m^3$. The high concentration for the Indianapolis – Carmel – Anderson MSA of 241 $\mu g/m^3$ is considered by the State to be anomalous. This value occurred during a Canadian wildfire smoke event and is being investigated as an Exceptional Event. In addition, this value occurred before the Network Alignment firmware update and has not yet been recalculated in AQS by EPA. The State seeks a waiver from EPA Region 5 to not increase the number of monitor sites in the MSA to the minimum required of 6 for a High Concentration MSA. Table 9 details the current PM_{10} network.

Network Modifications

No changes are planned for 2025.

Table 8 – PM_{10} Site Requirements

CFR Requirement	MSA Population		High Conc.[1]	Medium Conc.[2]	Low Conc.[3]		
	> 1,000,000	# of Required Sites =>	6-10	4-8	2-4		
	MSA	**Population**	**MSA Highest Value**			**# of Sites 2024**	**# of Sites 2025**
	Chicago-Naperville-Elgin, IL-IN-WI	9,441,957	159 [6]			8	-
	Chicago-Naperville-Elgin, IL-IN-WI	9,441,957	159 [7]			5	5
	Cincinnati, OH-KY-IN	2,265,051	197 [4, 6]	170 [5, 8]		5	-
	Cincinnati, OH-KY-IN	2,265,051			No Data [7]	0	0
	Indianapolis-Carmel-Anderson	2,141,779	241			2	2
	Louisville-Jefferson County, KY-IN	1,284,553			118 [6]	3	-
	Louisville-Jefferson County, KY-IN	1,284,553			43 [7]	1	1

CFR Requirement	MSA Population		High Conc.[1]	Medium Conc.[2]	Low Conc.[3]		
	500,000 - 1,000,000	# of Required Sites =>	4-8	2-4	1-2		
	MSA	**Population**	**MSA Highest Value**			**# of Sites 2024**	**# of Sites 2025**
	No MSAs in this category						

CFR Requirement	MSA Population		High Conc.[1]	Medium Conc.[2]	Low Conc.[3]		
	250,000 - 500,000	# of Required Sites =>	3-4	1-2	0-1		
	MSA	**Population**	**MSA Highest Value**			**# of Sites 2024**	**# of Sites 2025**
	Evansville, IN-KY	314,038		133 [6]		1	-
	Evansville, IN-KY	314,038		133 [7]		1	1
	Fort Wayne	426,076			No Data	0	0
	South Bend-Mishawaka, IN-MI	323,637			No Data	0	0
	South Bend-Mishawaka, IN-MI	323,637			No Data	0	0

CFR Requirement	MSA Population		High Conc.[1]	Medium Conc.[2]	Low Conc.[3]		
	100,000 - 250,000	# of Required Sites =>	1-2	0-1	0		
	MSA	**Population**	**MSA Highest Value**			**# of Sites 2024**	**# of Sites 2025**
	Bloomington	161,227			No Data	0	0
	Elkhart-Goshen	206,890			No Data	0	0
	Kokomo	83,574			No Data	0	0
	Lafayette-West Lafayette	226,452			No Data	0	0
	Michigan City-LaPorte	111,675			No Data	0	0
	Muncie	112,031			No Data	0	0
	Terre Haute	184,875			No Data	0	0

Non MSA		**Highest Value**			**# of Sites 2024**	**# of Sites 2025**
Jasper - Dubois Co.	55,800			65	1	1
				Sites in Indiana Network	**10**	**10**

[1] Exceeds NAAQS by 20% (180 $\mu g/m^3$).

[2] Exceeds 80% of NAAQS (120 $\mu g/m^3$).

[3] <80% of NAAQS (120 $\mu g/m^3$).

[4] Highest value from source oriented site (not indicative of entire MSA).

[5] Highest value from population oriented sites.

[6] Information for full MSA.

[7] Information for Indiana's portion of MSA
Population from estimated 2022 US Census Bureau

Figure 8 – PM_{10} Monitoring Network

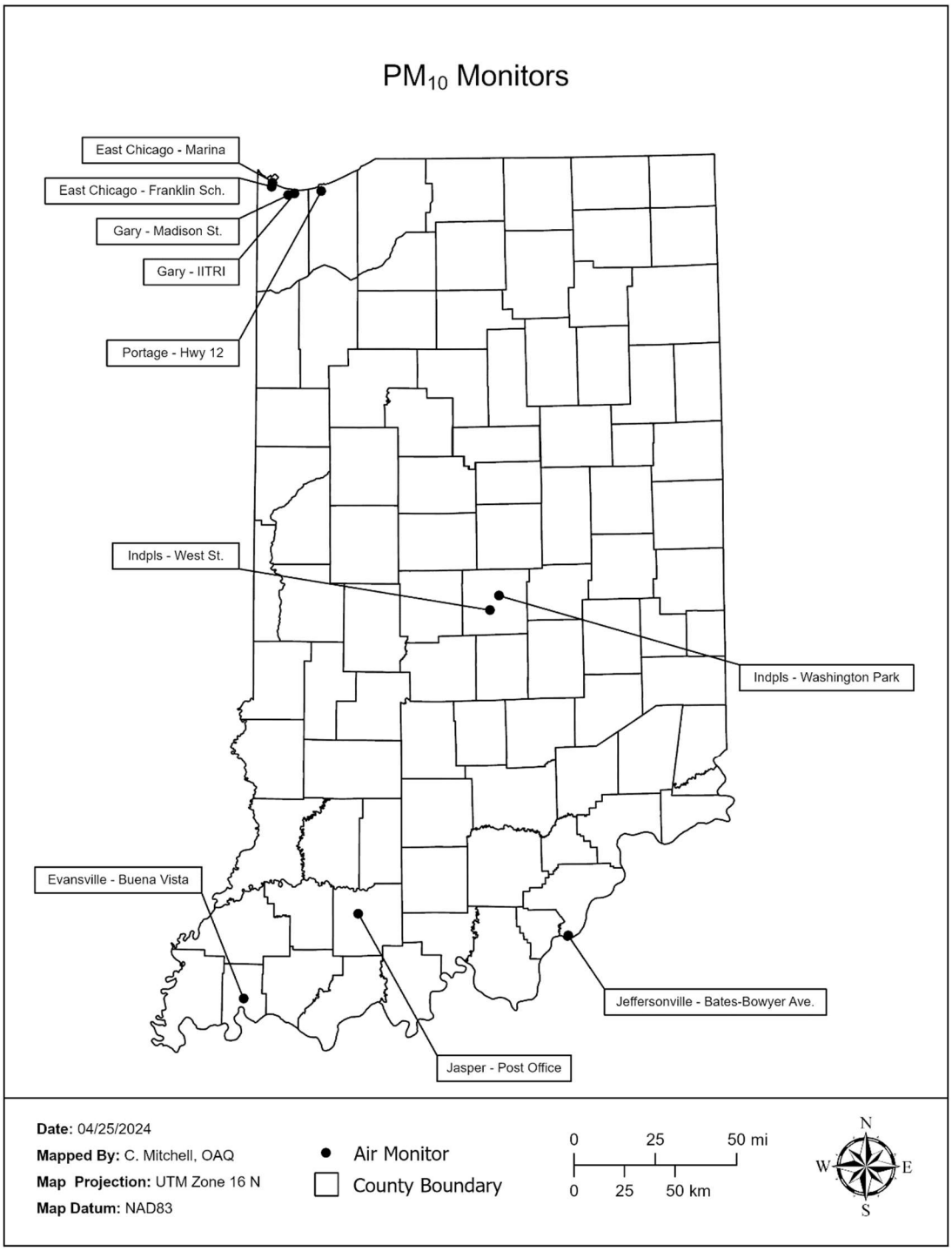


Table 9 – PM_{10} Monitoring Network

Parameter Code: 81102 **PM_{10} - Particulate Matter**

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180190010	Jeffersonville - Bates-Bowyer Ave.	Clark	Jeffersonville	Downtown Wastewater Plant, 1420 Bates-Bowyer Ave.	SLAMS	05/21/19	6-Day	127	Neigh	Pop Exp	38.288191	-85.741337	Louisville/Jefferson County, KY-IN	No
180372001	Jasper - Post Office	Dubois	Jasper	Jasper Post Office, 206 E. 6th St.	SLAMS	01/01/23	Continuous	239	Neigh	Highest Conc	38.391389	-86.929167	Non-MSA County	No
180890006	East Chicago - Franklin Sch.	Lake	East Chicago	Washington (formerly Franklin) School, Alder & 142nd St.	SLAMS	01/01/23	Continuous	239	Middle	Highest Conc	41.636111	-87.440833	Chicago-Naperville-Elgin, IL-IN-WI	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	03/01/97	Continuous	079	Middle	Source Oriented	41.606563	-87.305015	Chicago-Naperville-Elgin, IL-IN-WI	No
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	SLAMS	07/01/05	6-Day	127	Neigh	Pop Exp	41.598456	-87.342972	Chicago-Naperville-Elgin, IL-IN-WI	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301 Aldis St.	SLAMS	10/30/12	6-Day	127	Middle	Source Oriented	41.653501	-87.435561	Chicago-Naperville-Elgin, IL-IN-WI	No
180970043	Indpls - West St.	Marion	Indianapolis	1735 S. West St.	SLAMS	10/29/86	6-Day	127	Middle	Highest Conc	39.744957	-86.166496	Indianapolis-Carmel-Anderson	No
180970043	Indpls - West St.	Marion	Indianapolis	1735 S. West St.	SLAMS	01/01/13	6-Day	127	Middle	Quality Assurance	39.744957	-86.166496	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	SLAMS	07/01/10	3-Day	127	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	SLAMS	08/02/11	Continuous	239	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
181270023	Portage - Hwy 12	Porter	Portage	Bethlehem Steel Waste Lagoon, Hwy 12	SLAMS	10/01/95	Continuous	079	Neigh	Highest Conc	41.616561	-87.146921	Chicago-Naperville-Elgin, IL-IN-WI	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	08/01/16	Continuous	239	Neigh	Pop Exp	38.013333	-87.577222	Evansville, IN-KY	No

PM10 MONITORING METHODS: *079 - THERMO SCIENTIFIC 1405*
127 - R&P 2025A or 2025B SEQUENTIAL
239 - TELEDYNE T640X

Fine Particulate Matter ($PM_{2.5}$)

Monitoring Requirements

40 CFR Part 58, Appendix D §4.7 details the number of $PM_{2.5}$ sites required in each CBSA. The number of sites is based on the population of a CBSA and if the design value for that area is greater or less than 85% of either NAAQS. Table 10 (table D-5 to Appendix D) lists the minimum requirements as stated in Part 58. Table 11 lists the requirements as they relate to Indiana.

In addition, 40 CFR, Appendix D §4.7.2 states that "The State, or where appropriate, local agencies must operate continuous $PM_{2.5}$ analyzers equal to at least one-half (round up) the minimum required sites listed in table D-5 to this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM monitors, unless at least one of the required FRM/FEM monitors is itself a continuous FEM monitor in which case no collocation requirement applies."

Indiana meets the minimum number of sites for each CBSA within Indiana's boundaries. There are five CBSAs which cross state lines. Except for the Cincinnati, OH-KY-IN CBSA, Indiana meets the requirement for the number of sites for the full CBSA in the multi-agency CBSAs. An agreement between the SWOAQA and IDEM specifies that the SWOAQA will fulfill the $PM_{2.5}$ monitoring requirements in the Cincinnati, OH-KY-IN CBSA. In the absence of an agreement, Indiana would be required to operate three sites in the Cincinnati, OH-KY-IN CBSA. In addition, as the continuous requirements are applied to Indiana, thirteen continuous sites would be required. Indiana meets this requirement in all CBSAs, except in the Cincinnati, OH-KY-IN. IDEM had a multi-agency agreement with SWOAQA (Cincinnati, OH) specifying the sites which will operate in the CBSA to fulfill the $PM_{2.5}$ continuous monitoring requirements in the Cincinnati, OH-KY-IN CBSA. In both cases, a renewal of this agreement is planned.

Collocated samplers are required at 15% of the FRM/FEM sites operated by each PQAO. IDEM is the sole PQAO for Indiana and in 2025 will operate 34 sites requiring the operation of six collocated samplers. For the filter-based method (145), there are four collocated samplers located at some of the highest concentration sites: Gary-Madison St. (180890031), South Bend – Shields Dr. (181410015), Indianapolis – W. 18th St (180970081), New Albany – 4H Rd (180430008). For continuous method 170, one collocation is at the Kokomo – E Vaile Ave (180670004) due to site issues at some of the other higher concentration sites. For continuous method 636, one collocation is at the Hammond – 167th St (180890036) site which tends to be a higher concentration area.

Table 10 – SLAMS Minimum $PM_{2.5}$ Monitoring Site Requirements

Number of Sites per MSA and Design Value		
MSA Population	3 yr DV >= 85% of either NAAQS	3 yr DV < 85% of either NAAQS
> 1,000,000	3	2
500,000 - 1,000,000	2	1
50,000 - 500,000	1	0
	also	
	Statewide Background Site	1
	Statewide Transport Site	1
85% of 24-hour NAAQS (35) = 29.75 μg/m3		
85% of Annual NAAQS (9) = 7.6 μg/m3		

Monitoring Methodology

Noncontinuous $PM_{2.5}$ is sampled by drawing air through a specially designed inlet that excludes particles larger than 2.5 microns in diameter. The remaining particles are collected on a 46.2 mm diameter Teflon™ Microfiber filter that is weighed before and after the sampling period to determine the particulate mass. Indiana uses the R&P or Thermo Scientific Model 2025A/B/i Sequential Samplers (EQPM-0202-145) to collect noncontinuous data. A VSCC is used instead of the original WINS impactor to remove particles larger than 2.5 microns from the sample stream. This modified setup was originally classified as an FEM in 2002 but was designated as an FRM in December 2006.

The normal sampling schedule varies, as determined by the regulations. Reporting monitors sample every third day. Collocated monitors used for assessing data precision operate on a one-in-six-day schedule.

Continuous data is collected using one of the following monitors: Met One BAM 1020 $PM_{2.5}$ (FEM) (EQPM-0308-170) or Teledyne Models T640 or T640X PM Mass Monitor (EQPM-0516-236 and EQPM-0516-238). The BAM 1020 collects fine particulate through a sampling inlet onto a filter tape, using a beta ray transmission to measure the amount of particulate concentration collected during a specific sampling period. The Teledyne API Model T640 and Model T640X is a real-time, continuous particulate matter (PM) mass monitor that uses scattered light spectrometry for measurement.

Table 11 – Number of SLAMS $PM_{2.5}$ Monitoring Sites Required for Indiana

MSA	MSA Population (Est 2022) [1]	Annual Design Value (µg/m3) (2021-2023)	Daily Design Value (µg/m3) (2021-2023)	# of Sites Required per CFR	2024 # of Sites	2025 # of Sites (IN)	2024 # of Cont. Mont.	2025 # of Cont. Mont. (IN)
Bloomington	161,227	8	20	1	1	1	1	1
Chicago-Naperville-Elgin, IL-IN-WI (total MSA)	9,441,957	10.5 [2]	26 [2]	3	24 [2]	-	9 [2]	-
Chicago-Naperville-Elgin, IL-IN-WI (IN only)	9,441,957	10.5 [3]	26 [3]	3	7 [3]	7	5 [3]	5
Cincinnati, OH-KY-IN (total MSA)	2,265,051	10.9 [2]	29 [2]	3	11 [2]	-	8 [2]	-
Cincinnati, OH-KY-IN (IN only)	2,265,051	No Data [3]	No Data [3]	3	0 [3]	0	0 [3]	0
Columbus	83,540	7.6	19	1	1	1	1	1
Elkhart-Goshen	206,890	8.9	27	1	1	1	1	1
Evansville, IN-KY (total MSA)	314,038	9.5 [2]	24 [2]	1	3 [2]	-	2 [2]	-
Evansville, IN-KY (IN only)	314,038	9.5 [3]	24 [3]	1	2 [3]	2	2 [3]	2
Fort Wayne	426,076	8.6	24	1	2	2	2	2
Indianapolis-Carmel-Anderson	2,141,779	11.9	34	3	8	8	6	6
Kokomo	83,574	8	21	1	1	1	1	1
Lafayette-West Lafayette	226,452	8.3	22	1	1	1	1	1
Louisville-Jefferson County, KY-IN (total MSA)	1,284,553	9.9 [2]	26 [2]	3	7 [2]	-	5 [2]	-
Louisville-Jefferson County, KY-IN (IN only)	1,284,553	9.9 [3]	26 [3]	3	2 [3]	2	2 [3]	2
Michigan City-LaPorte	111,675	8.3	20	1	1	1	1	1
Muncie	112,031	8.2	22	1	1	1	0	0
South Bend-Mishaw aka, IN-MI (total MSA)	323,637	9.4 [2]	26 [2]	1	1 [2]	-	1 [2]	-
South Bend-Mishaw aka, IN-MI (IN only)	323,637	9.4 [3]	26 [3]	1	1 [3]	1	1 [3]	1
Terre Haute	184,875	9.5	25	1	1	1	1	1
Other Requirements								
State Background Site - Green Co.		8	22	1	1	1	1	1
State Transport Site - Henry Co.		8.1	28	1	1	1	1	1
Non MSAs								
Jasper - Dubois Co.		8.9	23		1	1	1	1
Dale - Spencer Co.		8.4	21		1	1	1	1
		Values above NAAQS						
		DV ≥ 85% of NAAQS						
# of sites needed if Indiana meets all multi-state MSA requirements				25				
# of continuous monitors required (1/2 of the required sites)(rounded up)				13				
			Sites in Indiana Network		**34**	**34**	**29**	**29**

[1] Population from estimated 2022 US Census Bureau

[2] Information for full MSA.

[3] Information for Indiana's portion of MSA.

Data / Design Value

The data collected from the noncontinuous FRM monitors are considered eligible for comparison to the NAAQS and used for calculation of the design value for a site. The continuous data from a site at or greater than two years is also eligible for comparison to the NAAQS.

A site's annual design value is determined by first calculating the quarterly average concentrations, then calculating the weighted annual concentration by averaging the quarterly values, and then averaging the three consecutive annual averages. The highest site design value in a CBSA is generally determined to be the design value for the area. It is compared to the annual NAAQS of 9.0 $\mu g/m^3$ to determine attainment/nonattainment for the area. Similarly, a site's 24-hour design value is obtained by averaging the 98^{th} percentile value from three consecutive years. This value is then compared to the 24-hour NAAQS, 35 $\mu g/m^3$, to determine attainment/nonattainment of the 24-hour standard.

The design values (as of May 22, 2024) for all sites for the most recent sampling period (2021 - 2023), along with the designation status of areas for $PM_{2.5}$ are shown in Figure 9. Currently, all counties in Indiana meet the 24-hour, and 2012 annual NAAQS for $PM_{2.5}$. Designations are pending for the 2024 annual NAAQS for $PM_{2.5}$.

Annual NAAQS Data Exclusions

Gary IITRI (180890022), Gary – Burr St. (180890026), and Indpls. – West St (180970043) sites are requested to be excluded from the annual $PM_{2.5}$ NAAQS due to source-oriented location of these sites. Gary IITRI is sited less than 250 meters to the south of the Gary Works Industrial area. Gary – Burr St is located within 30 meters of a major truck stop. Indpls. – West St is located in an industrial area of the city and within 100 meters of a train yard.

Unplanned Changes to the Network Plan

The Indianapolis School 21 site (180970084) non-continuous FRM will be continued due to delays in obtaining a replacement site. A site relocation is planned for this site due to siting and safety issues. It is anticipated that this new site will be established sometime in 2024.

Network Modifications

In 2025, the Indiana $PM_{2.5}$ monitoring network will consists of 34 monitoring sites. Continuous monitors will be collecting data at 30 site locations. The $PM_{2.5}$ monitoring network with the changes proposed for 2025 is shown in Table 12. A map of the 2025 network is shown in Figure 10.

No changes are proposed for 2025.

Figure 9 – $PM_{2.5}$ Site Design Values (2021 – 2023)

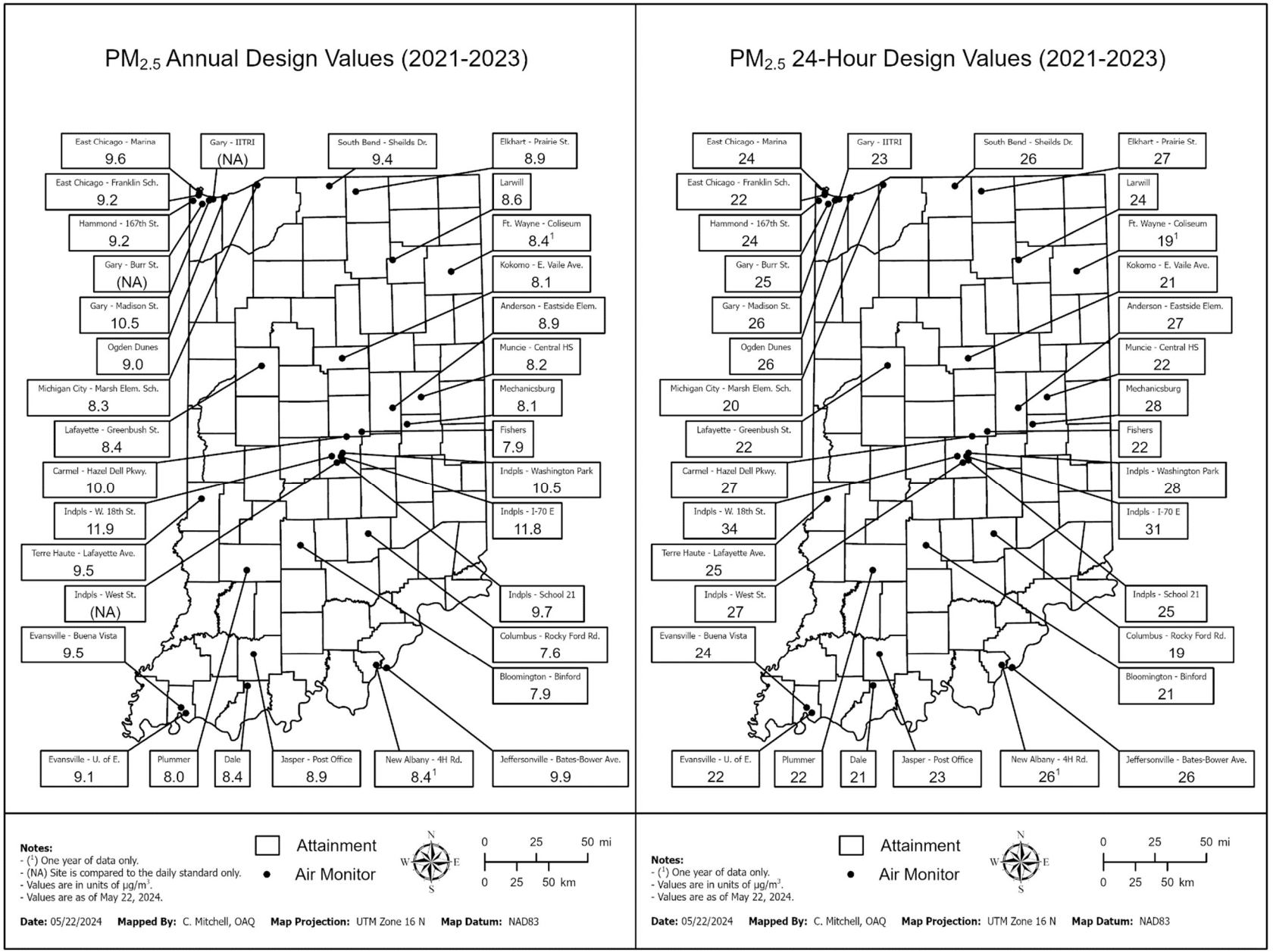


Figure 10 – $PM_{2.5}$ Monitoring Network

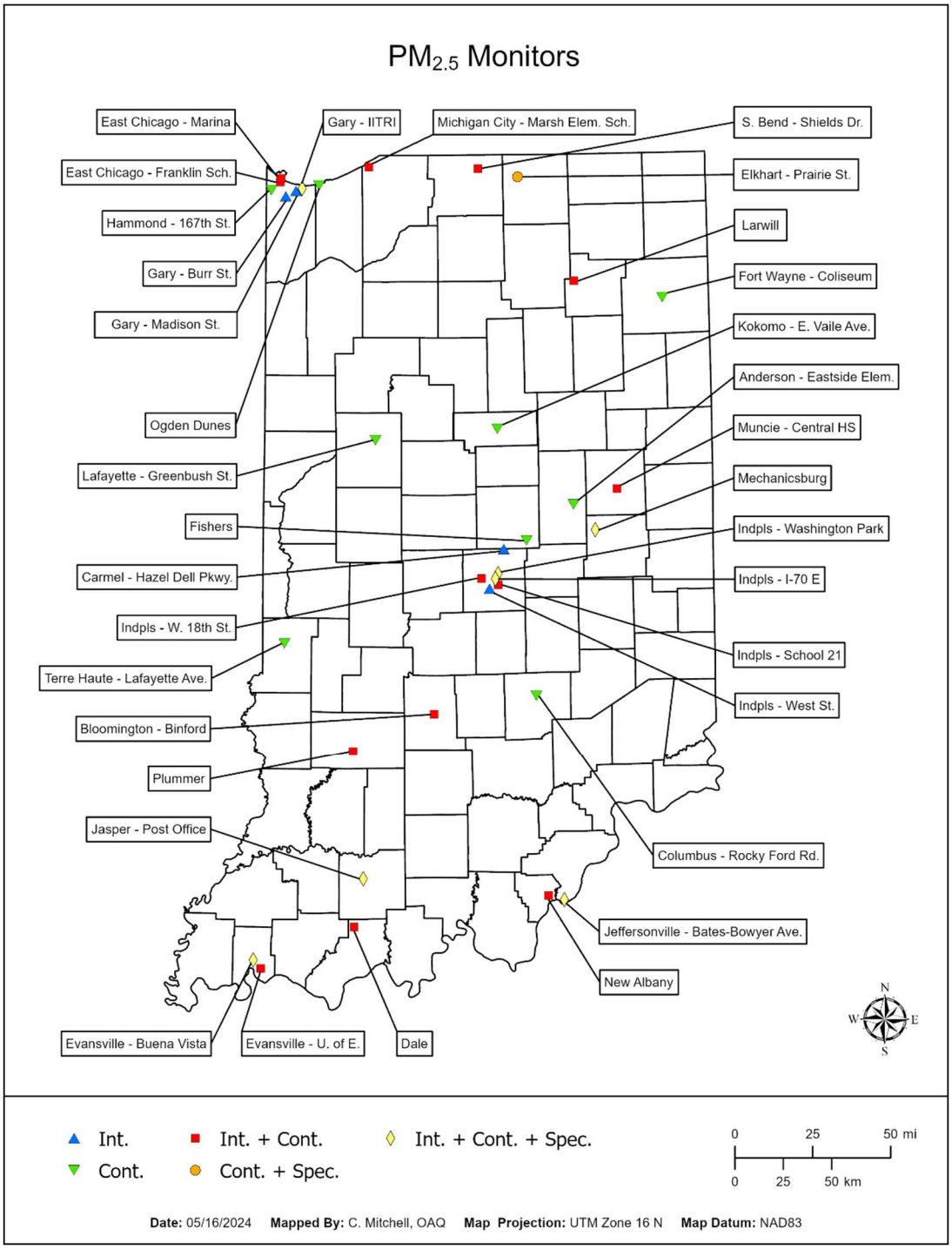


Table 12 – $PM_{2.5}$ Monitoring Network

$PM_{2.5}$ Monitoring Network															
Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	NAAQS Comparable (2025)	CBSA	Site Change Proposed?
180030015	Fort Wayne - Coliseum	Allen	Fort Wayne	707 N. Coliseum	SLAMS	10/12/23	Continuous	170	Neigh	Pop Exp	41.081864	-85.088313	Primary	Ft. Wayne	No
180050008	Columbus - Rocky Ford Rd.	Bartholomew	Columbus	3475 Trestle Dr.	SLAMS	07/25/14	Continuous	170	Neigh	Pop Exp	39.237457	-85.891332	Primary	Columbus	No
180190010	Jeffersonville - Bates-Bowyer Ave.	Clark	Jeffersonville	Downtown Wastewater Plant, 1420 Bates-Bowyer Ave.	SLAMS	05/21/19	3-Day	145	Neigh	Pop Exp	38.288191	-85.741337	Secondary	Louisville/Jefferson County, KY-IN	No
180190010	Jeffersonville - Bates-Bowyer Ave.	Clark	Jeffersonville	Downtown Wastewater Plant, 1420 Bates-Bowyer Ave.	SLAMS	06/14/19	Continuous	236	Neigh	Pop Exp	38.288191	-85.741337	Primary	Louisville/Jefferson County, KY-IN	No
180350006	Muncie - Central HS	Delaware	Muncie	Muncie Central HS, 801N. Walnut St.	SLAMS	10/15/99	3-Day	145	Neigh	Pop Exp	40.199502	-85.387908	Primary	Muncie	No
180350006	Muncie - Central HS	Delaware	Muncie	Muncie Central HS, 801N. Walnut St.	SLAMS	01/01/23	Continuous	236	Neigh	Pop Exp	40.199502	-85.387908	Exclude	Muncie	No
180372001	Jasper - Post Office	Dubois	Jasper	Post Office, 206 E. 6th St.	SLAMS	01/01/00	3-Day	145	Neigh	Pop Exp	38.391389	-86.929167	Primary	Non-MSA County	No
180372001	Jasper - Post Office	Dubois	Jasper	Post Office, 206 E. 6th St.	SLAMS	07/01/23	Continuous	238	Neigh	Pop Exp	38.391389	-86.929167	Exclude	Non-MSA County	No
180390008	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	SLAMS	11/23/10	Continuous	170	Neigh	Pop Exp	41.657155	-85.968446	Primary	Elkhart-Goshen	No
180430008	New Albany	Floyd	New Albany	Floyd County 4-H Fairgrounds	SLAMS	01/01/23	3-Day	145	Neigh	Pop Exp	38.317813	-85.833322	Primary	Louisville/Jefferson County, KY-IN	No
180430008	New Albany	Floyd	New Albany	Floyd County 4-H Fairgrounds	SLAMS	01/01/23	6-Day	145	Neigh	Quality Assurance	38.317813	-85.833322	No	Louisville/Jefferson County, KY-IN	No
180430008	New Albany	Floyd	New Albany	Floyd County 4-H Fairgrounds	SLAMS	01/01/23	Continuous	236	Neigh	Pop Exp	38.317813	-85.833322	Secondary	Louisville/Jefferson County, KY-IN	No
180550001	Plummer	Greene		2500 S. 275 W	SLAMS	01/12/12	3-Day	145	Regional	Upwind Bkgrd	38.985556	-86.990000	Primary	Non-MSA County	No
180550001	Plummer	Greene		2500 S. 275 W	SLAMS	02/06/23	Continuous	236	Regional	Upwind Bkgrd	38.985556	-86.990000	Exclude	Non-MSA County	No
180570007	Fishers	Hamilton	Fishers	11775 Brooks School Rd.	SLAMS	12/06/13	Continuous	170	Urban	Pop Exp	39.960884	-85.939546	Primary	Indianapolis-Carmel-Anderson	No
180570008	Carmel - Hazel Dell Pkwy	Hamilton	Carmel	9609 Hazel Dell Parkway	SLAMS	01/10/19	3-Day	145	Middle	Source & Pop Exp	39.928804	-86.078775	Primary	Indianapolis-Carmel-Anderson	No
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36, Pendleton	SLAMS	09/06/00	3-Day	145	Regional	Regional Transport	40.009544	-85.523470	Primary	Non-MSA County	No
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36, Pendleton	SLAMS	01/25/23	Continuous	236	Regional	Regional Transport	40.009544	-85.523470	Exclude	Non-MSA County	No
180670004	Kokomo - E. Vaile Ave.	Howard	Kokomo	1802 E. Vaile Ave.	SLAMS	04/03/14	Continuous	170	Urban	Pop Exp	40.481347	-86.109688	Primary	Kokomo	No
180670004	Kokomo - E. Vaile Ave.	Howard	Kokomo	1802 E. Vaile Ave.	SLAMS	04/03/14	Continuous	170	Urban	Quality Assurance	40.481347	-86.109688	Secondary	Kokomo	No
180890006	East Chicago - Franklin Sch.	Lake	East Chicago	Washington (formerly Franklin) School, Alder & 142nd St.	SLAMS	01/27/99	3-Day	145	Neigh	Pop Exp	41.636111	-87.440833	Primary	Chicago-Naperville-Elgin, IL-IN-WI	No
180890006	East Chicago - Franklin Sch.	Lake	East Chicago	Washington (formerly Franklin) School, Alder & 142nd St.	SLAMS	01/01/24	Continuous	238	Neigh	Pop Exp	41.636111	-87.440833	Exclude	Chicago-Naperville-Elgin, IL-IN-WI	No

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	NAAQS Comparable (2024)	CBSA	Site Change Proposed?
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	03/04/99	3-Day	145	Middle	Source & Pop Exp	41.606563	-87.305015	Primary**	Chicago-Naperville-Elgin, IL-IN-WI	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	01/01/03	Continuous	170	Middle	Source & Pop Exp	41.606563	-87.305015	Secondary**	Chicago-Naperville-Elgin, IL-IN-WI	No
180890026	Gary - Burr St	Lake	Gary	Truck Stop, 25th Ave & Burr St.	SLAMS	02/12/00	3-Day	145	Middle	Source & Pop Exp	41.573056	-87.405833	Primary**	Chicago-Naperville-Elgin, IL-IN-WI	No
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	SLAMS	07/01/05	3-Day	145	Neigh	Pop Exp	41.598456	-87.342972	Primary	Chicago-Naperville-Elgin, IL-IN-WI	No
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	SLAMS	07/01/05	6-Day	145	Neigh	Quality Assurance	41.598456	-87.342972	No	Chicago-Naperville-Elgin, IL-IN-WI	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301 Aldis St.	SLAMS	10/23/19	3-Day	145	Middle	Source Oriented	41.653501	-87.435561	Secondary	Chicago-Naperville-Elgin, IL-IN-WI	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301 Aldis St.	SLAMS	10/28/19	Continuous	236	Middle	Source Oriented	41.653501	-87.435561	Primary	Chicago-Naperville-Elgin, IL-IN-WI	No
180890036	Hammond - 167th St.	Lake	Hammond	NIPSCO maintenance facility 1313 167th St.	SLAMS	02/01/18	Continuous	236	Neigh	Pop Exp	41.594427	-87.495044	Primary	Chicago-Naperville-Elgin, IL-IN-WI	No
180890036	Hammond - 167th St.	Lake	Hammond	NIPSCO maintenance facility 1313 167th St.	SLAMS	01/01/22	Continuous	236	Neigh	Quality Assurance	41.594427	-87.495044	Secondary	Chicago-Naperville-Elgin, IL-IN-WI	No
180910011	Michigan City - Marsh Elem. Sch.	La Porte	Michigan City	Marsh Elem. Sch., 400 E. Homer St.	SLAMS	12/17/99	3-Day	145	Neigh	Pop Exp	41.706944	-86.891111	Primary	Michigan City-LaPorte	No
180910011	Michigan City - Marsh Elem. Sch.	La Porte	Michigan City	Marsh Elem. Sch., 400 E. Homer St.	SLAMS	04/09/24	Continuous	236	Neigh	Pop Exp	41.706944	-86.891111	Exclude	Michigan City-LaPorte	No
180950011	Anderson - Eastside Elem.	Madison	Anderson	Eastside Elementary Sch., 844 N. Scatterfield Rd.	SLAMS	07/08/10	Continuous	236	Middle	Pop Exp	40.125690	-85.652127	Primary	Indianapolis-Carmel-Anderson	No
180970043	Indpls - West St.	Marion	Indianapolis	1735 South West Street	SLAMS	01/24/99	3-Day	145	Middle	Pop Exp	39.744957	-86.166496	Primary**	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE)	03/07/99	3-Day	145	Neigh	Pop Exp	39.810833	-86.144444	Secondary	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE)	01/01/04	Continuous	238	Neigh	Pop Exp	39.810833	-86.144444	Primary	Indianapolis-Carmel-Anderson	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch 90, 3351 W. 18th St.	SLAMS	02/03/99	3-Day	145	Neigh	Pop Exp	39.788889	-86.214722	Primary	Indianapolis-Carmel-Anderson	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch 90, 3351 W. 18th St.	SLAMS	02/11/99	6-Day	145	Neigh	Quality Assurance	39.788889	-86.214722	No	Indianapolis-Carmel-Anderson	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch 90, 3351 W. 18th St.	SLAMS	11/01/07	Continuous	236	Neigh	Pop Exp	39.788889	-86.214722	Secondary	Indianapolis-Carmel-Anderson	No
180970084	Indpls - School 21	Marion	Indianapolis	IPS Sch 21, 2815 English Ave.	SLAMS	02/16/09	3-Day	145	Neigh	Pop Exp	39.759167	-86.144722	Primary	Indianapolis-Carmel-Anderson	No
180970084	Indpls - School 21	Marion	Indianapolis	IPS Sch 21, 2815 English Ave.	SLAMS	01/01/24	Continuous	236	Neigh	Pop Exp	39.759167	-86.144722	Exclude	Indianapolis-Carmel-Anderson	No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	(NEAR ROAD)	02/01/14	3-Day	145	Middle	Highest Conc	39.787933	-86.130880	Primary	Indianapolis-Carmel-Anderson	No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	(NEAR ROAD)	11/05/15	Continuous	236	Middle	Highest Conc	39.787933	-86.130880	Secondary	Indianapolis-Carmel-Anderson	No
181050003	Bloomington - Binford	Monroe	Bloomington	Binford Elementary Sch, 2300 E. 2nd St.	SLAMS	04/01/09	3-Day	145	Neigh	Pop Exp	39.159372	-86.504747	Primary	Bloomington	No
181050003	Bloomington - Binford	Monroe	Bloomington	Binford Elementary Sch, 2300 E. 2nd St.	SLAMS	04/01/09	Continuous	236	Neigh	Pop Exp	39.159372	-86.504747	Primary	Bloomington	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	SLAMS	12/03/03	Continuous	170	Neigh	Pop Exp	41.617500	-87.199167	Primary	Chicago-Naperville-Elgin, IL-IN-WI	No

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	NAAQS Comparable (2024)	CBSA	Site Change Proposed?
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/01/06	3-Day	145	Neigh	Pop Exp	41.696667	-86.214722	Primary	South Bend-Mishawaka, IN-MI	No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/01/06	6-Day	145	Neigh	Quality Assurance	41.696667	-86.214722	No	South Bend-Mishawaka, IN-MI	No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	02/01/20	Continuous	236	Neigh	Pop Exp	41.696667	-86.214722	Secondary	South Bend-Mishawaka, IN-MI	No
181470009	Dale	Spencer	Dale	David Turnham School, Dunn & Locust	SLAMS	02/01/00	3-Day	145	Urban	Regional Trans	38.167500	-86.983333	Primary	Non-MSA County	No
181470009	Dale	Spencer	Dale	David Turnham School, Dunn & Locust	SLAMS	01/01/24	Continuous	236	Urban	Regional Trans	38.167500	-86.983333	Exclude	Non-MSA County	No
181570008	Lafayette - Greenbush St.	Tippecanoe	Lafayette	Cinergy Substation, 3401 Greenbush St	SLAMS	04/01/05	Continuous	170	Neigh	Pop Exp	40.431667	-86.852500	Primary	Lafayette-West Lafayette	No
181630016	Evansville - U of E	Vanderburgh	Evansville	Carson Center, Walnut St.	SLAMS	06/05/99	3-Day	145	Neigh	Pop Exp	37.974444	-87.532222	Primary	Evansville, IN-KY	No
181630016	Evansville - U of E	Vanderburgh	Evansville	Carson Center, Walnut St.	SLAMS	01/01/24	Continuous	236	Neigh	Pop Exp	37.974444	-87.532222	Exclude	Evansville, IN-KY	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/10/09	6-Day	145	Neigh	Pop Exp	38.013333	-87.577222	Secondary	Evansville, IN-KY	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/14/09	Continuous	238	Neigh	Pop Exp	38.013333	-87.577222	Primary	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	07/02/03	Continuous	170	Neigh	Pop Exp	39.485987	-87.401312	Primary	Terre Haute	No
181830003	Larwill	Whitley	Larwill	Whitko Middle School, 710 N. State Rd. 5	SLAMS	04/08/10	3-Day	145	Regional	Regional Transport	41.169722	-85.629444	Secondary	Ft. Wayne	No
181830003	Larwill	Whitley	Larwill	Whitko Middle School, 710 N. State Rd. 5	SLAMS	04/08/10	Continuous	236	Regional	Regional Transport	41.169722	-85.629444	Primary	Ft. Wayne	No

** According to 40 CFR Part 58 Subpart D, PM2.5 data that is representative of a unique population-oriented scale or localized hot spot are only eligible for comparison to the 24-hour PM2.5 NAAQS. The annual standard does not apply. A waiver has been requested.

MONITORING METHODS:
145 - R&P 2025A or B or THERMO 2025i
170 - MET ONE BAM - FEM
236 - TELEDYNE T640
238 - TELEDYNE T640X

Sulfur Dioxide (SO_2)

Monitoring Requirements

The monitoring requirements for SO_2 are detailed in 40 CFR Part 58 Appendix D §4.4. Section 4.4.2 of the Appendix lists the number of monitors to be located in a CBSA based on the Population Weighted Emissions Index, PWEI. The PWEI combines the population of the area and the SO_2 emissions from the 2017 National Emissions Inventory for each county. The 2022 population estimates from the U.S. Census Bureau is multiplied by the emissions and divided by one million. The PWEI dictates the number of sites required:

PWEI	# of Sites
>1,000,000	3
100,000 to 1,000,000	2
5,000 to 100,000	1
<5,000	0

As depicted in Table 13, the CBSAs in Indiana which require monitoring sites are the Chicago-Naperville-Elgin, IL-IN-WI CBSA, the Cincinnati, OH-KY-IN CBSA, and the Louisville/Jefferson County, KY-IN CBSA. Indiana meets the monitoring requirements in two of the three areas which require monitors. For the Cincinnati, OH-KY-IN CBSA, SWOAQA meets the monitoring requirements in that area as per the planned agreement between Indiana and SWOAQA.

Industrial Monitoring

Many industries with large sources of SO_2 emissions were required to operate ambient SO_2 monitoring sites due to Indiana's "SO_2 Rule," (Rule 3. Ambient Monitoring of Article 7. SULFUR DIOXIDE RULES of Title 326 of the Indiana Administrative Code (326 IAC 7-3)). As emissions and ambient concentrations decreased over the years, nearly all the ambient monitoring networks were allowed to discontinue operations. Duke Energy continues to operate two SO_2 monitors, one in Gibson County and the other across the state line in Wabash County, Illinois to monitor the air around the Gibson Station power plant. In addition, a meteorological station is located at the Wabash County site.

U.S. EPA published its final Data Requirements Rule (DRR) for the 2010 1-hour SO_2 NAAQS (https://www.gpo.gov/fdsys/pkg/FR-2015-08-21/pdf/2015-20367.pdf) on August 21, 2015, This rule directed states to provide data to U.S. EPA to identify maximum 1-hour SO_2 concentrations in ambient air for areas with large sources of SO_2 emissions. The DRR required states to indicate the approach used for each listed source to characterize spatial air quality at the site: air quality characterization through air quality modeling or ambient monitoring, or establishment of a federally enforceable emission limit (or facility shut down). As required by the DRR, IDEM identified to U.S. EPA the approach it used to characterize the air quality in each of the areas identified under the DRR.

In Indiana, one source –Cleveland-Cliffs Burns Harbor – characterized the air quality around its facilities using ambient monitoring. A monitoring site location was selected based on modeling conducted in accordance with U.S. EPA's SO_2 NAAQS Monitoring Technical Assistance Document and in consultation with U.S. EPA. As required by the DRR, this monitor was installed and operational by January 1, 2017. To provide additional information in support of the DRR, Cleveland-Cliffs assumed the operation of the former NIPSCO – Dunes Acres meteorological station.

All industrial facilities monitoring for SO_2 are their own PQAO operating similar to the IDEM SO_2 monitoring sites and their data is NAAQS comparable.

Table 13 – Number of SO_2 Sites Required by CFR

CBSA Name - Required Areas	2020 NEI Data (tons/year)	2022 Pop. Estimate [2]	PWEI Values	PWEI Required Sites	Current No. of Sites	2025 No. of Sites
Chicago-Naperville-Elgin, IL-IN-WI (total CBSA)	29,902	9,441,957	282,333	2	6	-
Chicago-Naperville-Elgin, IL-IN-WI (IN only)					3	3
Cincinnati, OH-KY-IN (total CBSA)	34,128	2,265,051	77,302	1	6	-
Cincinnati, OH-KY-IN (IN only)					0	0
Indianapolis-Carmel-Anderson, IN	6,836	2,141,779	14,641	1	1	1
Evansville, IN-KY (total CBSA)	14,196	314,038	4,458	0	2	-
Evansville, IN-KY (IN only)					2	2
Louisville-Jefferson County, KY-IN (total CBSA)	5,800	1,284,553	7,450	1	4	-
Louisville-Jefferson County, KY-IN (IN only)					1	1
Terre Haute, IN	4,281	184,875	791	0	1	1
# of sites needed to meet full CBSA requirements				4		
Sites in Indiana Network					**8**	**8**
[2] Population estimates from US Census Bureau						

Monitoring Methodology

Indiana's SO_2 monitoring network collects data with Thermo Scientific Model 43i and 43iQ using pulsed ultra-violet fluorescence monitoring methodology. A Thermo Scientific Model 43i Trace Level-Enhanced is used to collect trace level SO_2 data at the NCore, Indianapolis – Washington Park site (180970078).

Monitoring Network

Monitoring of SO_2 is also required at the NCore sites as per 40 CFR Part 58 Appendix D, 4.4.5. Indiana operates eight SO_2 monitors located throughout the state, as displayed in Figure 11. This Figure includes one township designated nonattainment for SO_2. The current network is listed in Table 14 and includes the Industrial network.

Network Modifications

There are no changes planned for 2025.

Figure 11 – SO_2 Monitoring Network

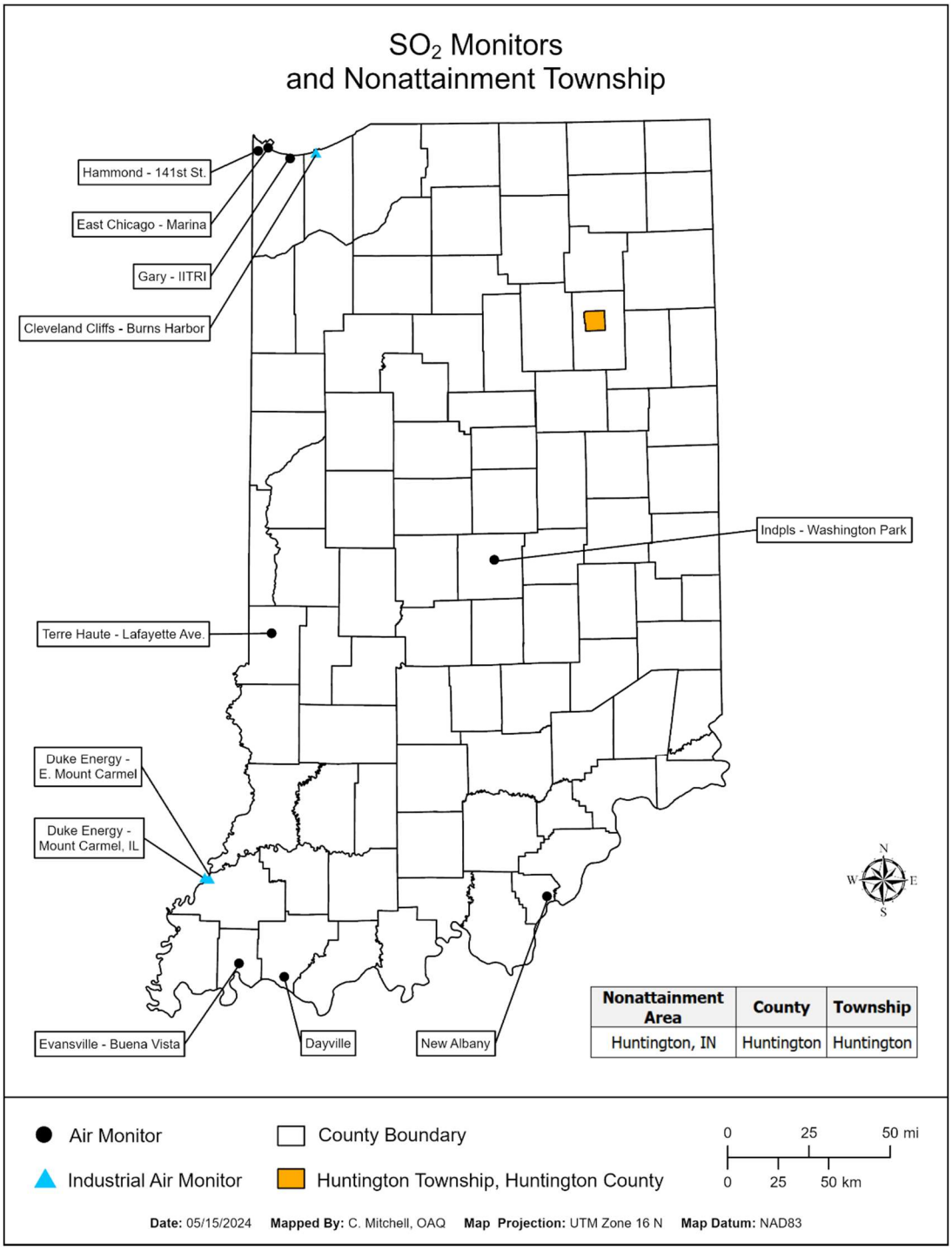


Table 14 – SO_2 Monitoring Network

Parameter Code: 42401 **SO_2 - Sulfur Dioxide**

PQAO: 0520 REPORTING AGENCY: Indiana Department of Environmental Management

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180430008	New Albany	Floyd	New Albany	Floyd County 4-H Fairgrounds	SLAMS	01/01/23	Continuous	060	Neigh	Pop Exp	38.317813	-85.833322	Louisville/Jefferson County, KY-IN	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	06/12/97	Continuous	060	Neigh	Pop Exp	41.606563	-87.305015	Chicago-Naperville-Elgin, IL-IN-WI	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301 Aldis St.	SLAMS	11/01/19	Continuous	060	Middle	Source Oriented	41.653446	-87.435435	Chicago-Naperville-Elgin, IL-IN-WI	No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st St.	SLAMS	08/01/75	Continuous	060	Neigh	Highest Conc	41.639444	-87.493611	Chicago-Naperville-Elgin, IL-IN-WI	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE)	01/01/10	Continuous	560	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/08/09	Continuous	060	Neigh	Pop Exp	38.013333	-87.577222	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	07/01/83	Continuous	060	Neigh	Pop Exp	39.485987	-87.401312	Terre Haute	No
181730011	Dayville	Warrick		3488 Eble Rd., Newburgh	SPM	01/01/21	Continuous	060	Neigh	Pop Exp	37.954444	-87.321667	Evansville, IN-KY	No
PQAO: 1324 REPORTING AGENCY: Duke Energy														
171850001	Duke Energy - Mount Carmel	Wabash, IL		Division St.	Industrial	01/01/79	Continuous	060	Middle	Source Oriented	38.397789	-87.773853	Non-MSA County	No
180510002	Duke Energy - E. Mount Carmel	Gibson		Gibson Coal Road	Industrial	01/01/81	Continuous	060	Middle	Source Oriented	38.392887	-87.748341	Non-MSA County	No
PQAO: 0235 REPORTING AGENCY: Cleveland Cliffs														
181270028	Cleveland Cliffs - Burns Harbor	Porter		E. Boundary Rd	Industrial	01/01/17	Continuous	060	Middle	Source Oriented	41.635404	-87.150567	Chicago-Naperville-Elgin, IL-IN-WI	No

MONITORING METHOD: 060 - THERMO ELECTRON 43i, 43iQ SO2
560 - THERMO ELECTRON 43i TRACE LEVEL SO2

$PM_{2.5}$ Speciation

Monitoring Requirements

Monitoring requirements in 40 CFR Part 58 Appendix D §4.7.4 states that "each state shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the STN $PM_{2.5}$." The STN $PM_{2.5}$ is part of the CSN.

Monitoring Methodology

Noncontinuous speciation samples are collected on three different filter mediums, each for a specific analysis and list of compounds. A Teflon™ filter, using the Energy Dispersive X-ray Fluorescence analysis methodology, is used to target 33 trace metals. A nylon filter, using Ion Chromatography for an analytical method, is used to target sulfates, nitrates, and three cations (ammonium, potassium, and sodium). A quartz fiber filter, using Thermal Optical Analysis, is used to target organic, elemental, and total carbon.

The Met One SASS and SuperSASS are used to collect $PM_{2.5}$, trace elements, Cations-$PM_{2.5}$, Nitrate-$PM_{2.5}$, and Sulfate-$PM_{2.5}$ data. The URG-3000N sampler is used to collect organic and elemental carbon data. Samples are collected on a 1/6 day sampling frequency at all sites except the Indianapolis – Washington Park (180970078) site, which samples every third day.

Indiana also operates continuous speciation monitors at six different locations. A MetOne BC 1060 Black Carbon Monitor, using optical absorption analysis methodology, is used for sampling black carbon under local ambient conditions at the Indianapolis – Washington Park, Gary – IITRI (180890022), Evansville – Buena Vista (181630021) and Elkhart – Prairie St. (180390008) sites. A Teledyne API 633 Aethalometer, using optical adsorption analysis methodology, is used for sampling black carbon under local ambient conditions at the Indianapolis – I-70 E. (180970087) and Jeffersonville – Bates-Bowyer Ave. (180190010) sites.

Monitoring Network

Currently the Indiana speciation network consists of six STN $PM_{2.5}$ and six continuous monitors across the state. The current network, along with any changes planned for 2025, is listed in Table 15 and displayed in Figure 12.

Network Modifications

No changes are planned in 2025.

Figure 12 – Speciation Monitoring Network

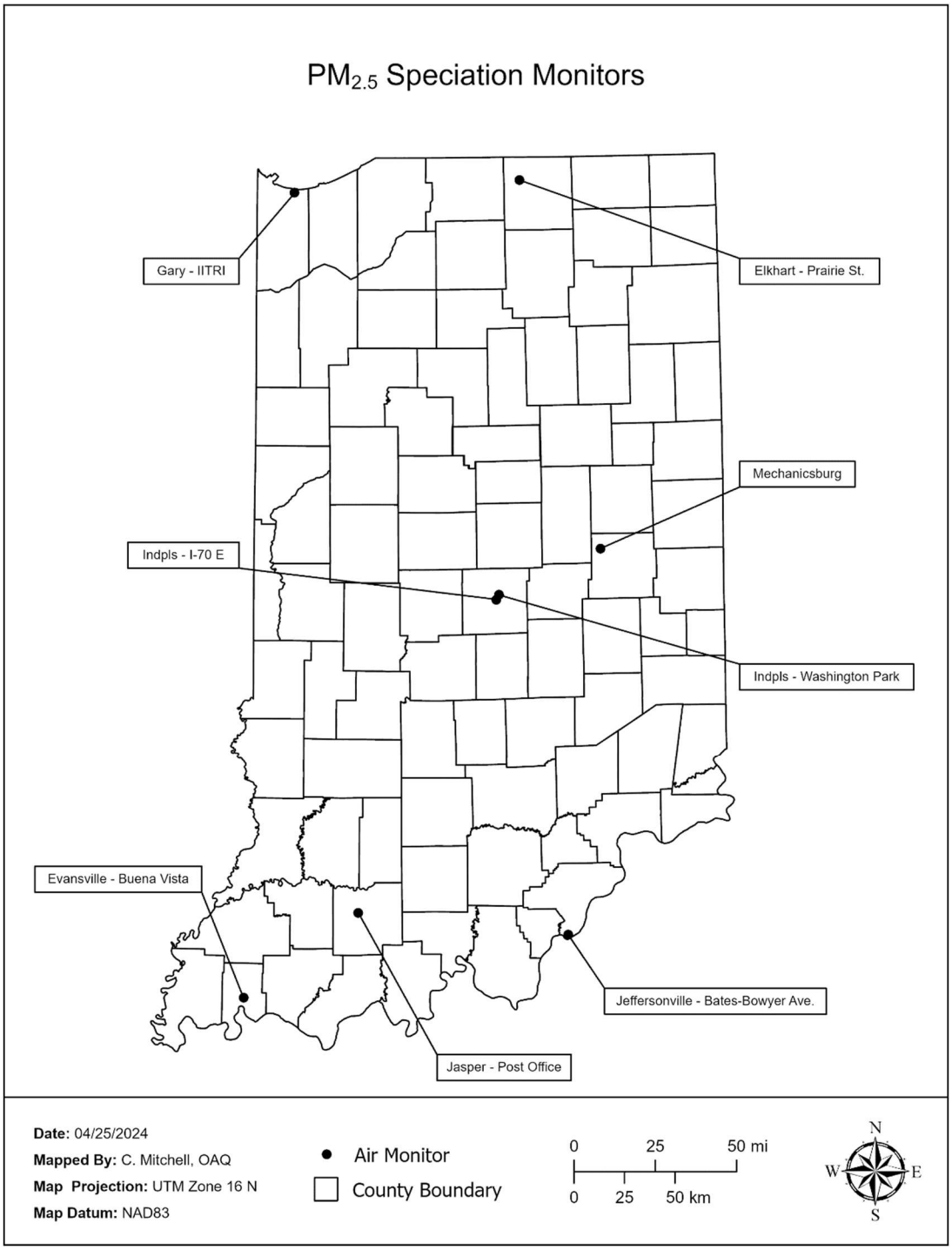


Table 15 – $PM_{2.5}$ Speciation Monitoring Network

PM2.5 Speciation (Sulfate, Nitrate, Carbon, etc.)

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180190010	Jeffersonville - Bates-Bowyer Av	Clark	Jeffersonville	Downtown Wastewater Plant, 1420 Bates-Bowyer Ave.	SLAMS (CSN SUPPLEMENTAL)	05/21/19	6-Day	810,811,812,826,831,838,839,840,841,842	Neigh	Pop Exp	38.288191	-85.741337	Louisville/Jefferson County, KY-IN	No
180190010	Jeffersonville - Bates-Bowyer Av	Clark	Jeffersonville	Downtown Wastewater Plant, 1420 Bates-Bowyer Ave.	SLAMS (CSN SUPPLEMENTAL)	06/01/19	Continuous Black Carbon	894	Neigh	Pop Exp	38.288191	-85.741337	Louisville/Jefferson County, KY-IN	No
180372001	Jasper - Post Office	Dubois	Jasper	Post Office, 206 E. 6th St	SLAMS (CSN SUPPLEMENTAL)	01/04/05	6-Day	810,811,812,826,831,838,839,840,841,842	Neigh	Pop Exp	38.391389	-86.929167	Non-MSA County	No
180390008	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	SLAMS	02/01/12	Continuous Black Carbon	879	Neigh	Pop Exp	41.657155	-85.968446	Elkhart-Goshen	No
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36	SLAMS (CSN SUPPLEMENTAL)	02/01/02	6-Day	810,811,812,826,831,838,839,840,841,842	Regional	Regional Trans	40.009544	-85.523470	Non-MSA County	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201Mississippi St.	SLAMS (CSN SUPPLEMENTAL)	04/03/03	6-Day	810,811,812,826,831,838,839,840,841,842	Middle	Pop Exp	41.606563	-87.305015	Chicago-Naperville-Elgin, IL-IN-WI	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201Mississippi St.	SLAMS	04/01/05	Continuous Black Carbon	879	Middle	Pop Exp	41.606563	-87.305015	Chicago-Naperville-Elgin, IL-IN-WI	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (CSN STN) (NCORE)	12/13/00	3-Day	810,811,812,826,831,838,839,840,841,842	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS	10/01/03	Continuous Black Carbon	879	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	SLAMS (NEAR ROAD)	05/06/15	Continuous Black Carbon	894	Middle	Source Oriented	39.787933	-86.130880	Indianapolis-Carmel-Anderson	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS (CSN SUPPLEMENTAL)	07/12/09	6-Day	810,811,812,826,831,838,839,840,841,842	Neigh	Pop Exp	38.013333	-87.577222	Evansville, IN-KY	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/08/09	Continuous Black Carbon	879	Neigh	Pop Exp	38.013333	-87.577222	Evansville, IN-KY	No

MONITORING METHOD:
810 - MET ONE SASS NYLON / GRAVIMETRIC
811 - MET ONE SASS TEFLON / ANALYSIS METHOD: ENERGY DISPERSIVE XRF
812 - MET ONE SASS NYLON / ANALYSIS METHOD: ION CHROMATOGRAPHY
826 - URG 3000 w. PALL QUARTZ FILTER AND CYCLONE INLET / IMPROVE_A TOT
831 - URG 3000 w. PALL QUARTZ FILTER AND CYCLONE INLET / EC1+EC2+EC3-(OP(TOR))
838 - URG 3000 w. PALL QUARTZ FILTER AND CYCLONE INLET / IMPROVE TOT
839 - URG 3000 w. PALL QUARTZ FILTER AND CYCLONE INLET/OC1+OC2+OC3+OC4+(OP(TOT))
840 - URG 3000 w. PALL QUARTZ FILTER AND CYCLONE INLET / EC1+EC2+EC3-(OP(TOT))
841 - URG 3000N w. PALL QUARTZ FILTER AND CYCLONE INLET / IMPROVE_A
842 - URG 3000N w. PALL QUARTZ FILTER AND CYCLONE INLET / IMPROVE_A TOR
879 - MET ONE 1060 / ANALYSIS METHOD: OPTICAL ABSORPTION
894 - TELEDYNE API MODEL 633 AETHALOMETER / ANALYSIS METHOD: OPTICAL ABSORPTION

NCore/PAMS

Monitoring Requirements

40 CFR Part 58 Appendix D §3 requires each state to operate at least one NCore site and lists the minimum parameters which must be measured at that site. Currently the required parameters are continuous and noncontinuous PM2.5, PM2.5 speciation, PM10-2.5 particle mass, CO, O3, SO2, NO/NOy, wind speed, wind direction, relative humidity, and ambient temperature.

40 CFR Part 58 Appendix D §5 requires ozone precursor monitoring as part of the PAMS program. PAMS measurements are required at each NCore site located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures. The required measurements include: hourly averaged speciated VOCs; three 8-hour averaged carbonyl samples per day on one-in-three day schedule; hourly averaged O3; hourly averaged NO, true NO2, and NOy; hourly averaged ambient temperature; hourly vector-averaged wind direction; hourly vector-averaged wind speed; hourly averaged barometric pressure; hourly averaged relative humidity; hourly precipitation; hourly averaged mixing-height; hourly averaged solar radiation; and hourly averaged ultraviolet radiation.

This section deals with speciated VOCs. The other parameters are addressed in their own area.

Monitoring Methodology

Ozone precursor VOCs are collected continuously using a Markes Unity-XR Thermal Desorber and Agilent 7890B GC with dual FID with a Kori-xr Water Management Device and a CIA Advantage autosampler. The PAMS target compounds are shown in Table 16.

Carbonyl data are collected using Method TO-11A of the U.S. EPA's Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Compendium of Method. Currently Indiana uses the ATEC 8000 for one-in-six day sampling at the Indianapolis – Washington Park (180970078) site. Samples are collected on one-in-three day schedule June-August (PAMS Season). Samples are collected by drawing a known volume of air through a cartridge filled with silica gel coated with activated DNPH. These samples are analyzed by an EPA contract laboratory using HPLC with a UV absorption detector.

Table 16 – PAMS Target Compounds

Priority Compounds				Optional Compounds			
1	1,2,3-trimethylbenzene	21	o-xylene	1	1,3 Butadiene[c]	21	Carbon Tetrachloride[c]
2	1,2,4-trimethylbenzene	22	p-ethyltoluene	2	1,3,5-trimethylbenzene	22	cyclohexane
3	1-butene	23	Propane	3	1-pentene	23	cyclopentane
4	2,2,4-trimethylpentane	24	Propylene	4	2,2-dimethylbutane	24	Ethanol[c]
5	acetaldehyde[a]	25	styrene	5	2,3,4-trimethylpentane	25	isopropylbenzene
6	benzene	26	TNMOC	6	2,3-dimethylbutane	26	m-diethylbenzene
7	c-2-butene	27	toluene	7	2,3-dimethylpentane	27	Methylcyclohexane[c]
8	ethane	28	t-2-butene	8	2,4-dimethylpentane	28	methylcyclopentane
9	ethylbenzene			9	2-methylheptane	29	n-decane
10	Ethylene			10	2-methylhexane	30	n-heptane
11	formaldehyde[a]			11	2-methylpentane	31	n-nonane
12	Isobutane			12	3-methylheptane	32	n-octane
13	Isopentane			13	3-methylhexane	33	n-propylbenzene
14	Isoprene			14	3-methylpentane	34	n-undecane
15	m&p-xylenes			15	acetone[a]	35	p-diethylbenzene
16	m-ethyltoluene			16	Acetylene	36	Tetracholroethylene[c]
17	n-butane			17	Alpha Pinene[c]	37	t-2-pentene
18	n-hexane			18	Benzaldehyde[a]		
19	n-pentane			19	Beta Pinene[c]		
20	o-ethyltoluene			20	c-2-pentene		
Other Compounds				1	n-dodecane[b]	2	1-hexene[b]

[a] Carbonyl compounds, measured using Method TO-11a
[b] Compounds measured and reported, not required for regulatory purposes
[c] Optional Compounds on U.S. EPA Target List that will not be measured, as missing from calibration standard

Monitoring Network

As shown in Figure 13, Indiana's NCore site is Indianapolis – Washington Park (180970078). The details for all the NCore parameters are listed in Table 17. Except for $PM_{10-2.5}$, parameters are also listed in the individual parameter sections.

Indiana operates a PAMS monitoring site collecting ozone precursor VOCs at Indianapolis – Washington Park NCore for the Indianapolis-Carmel-Anderson CBSA. The normal PAMS monitoring season is June, July, and August, but Indiana collects data year-round to observe values outside the season as well. The monitor location is shown in Figure 13 and site details are in Tables 17 & 18.

Network Modifications

There are no planned network modifications for 2025.

Table 17 – NCore/PAMS Required Parameters

Parameter	Monitor Type	Start Date	Sampler or Monitor	Method Code	Analysis Method	Sample Frequency	Requirement	
							NCORE	PAMS
CO – trace level	SLAMS	1/1/2010	Teledyne API 300EU	593	Automated reference method utilizing trace level non-dispersive infrared analysis.	Continuous	X	
NO	SLAMS	3/10/2010	Teledyne API 200EU	699	Automated reference method utilizing chemiluminescence analysis.	Continuous	X	X
NO_y	SLAMS	3/10/2010	Teledyne API 200EU	699	Automated reference method utilizing chemiluminescence analysis.	Continuous	X	X
O_3	SLAMS	4/1/2009	Thermo Scientific 49i	047	Automated equivalent method utilizing uv photometry analysis.	Continuous	X	X
SO_2 – trace level	SLAMS	1/1/2010	Thermo Scientific 43i TLE	560	Automated equivalent method utilizing Trace Level UV Fluorescence Analysis	Continuous	X	
Intermittent $PM_{2.5}$	SLAMS	3/7/1999	Thermo Scientific 2025	145	Manual reference method utilizing gravimetric analysis.	1/3 day	X	
Continuous $PM_{2.5}$	SLAMS	1/1/2004	Teledyne API T640X	238	Automated equivalent method utilizing broadband spectroscopy	Continuous	X	
Intermittent $PM_{10-2.5}$	SLAMS	7/1/2010	Thermo Scientific Partisol-Plus Model 2025 Sequential sampler pair	176	Manual reference method utilizing gravimetric analysis.	1/3 day	X	
Continuous $PM_{10-2.5}$	SLAMS	7/22/2011	Teledyne API T640X	240	Automated equivalent method utilizing broadband spectroscopy	Continuous	X	
$PM_{2.5}$ Speciation	SLAMS	12/13/2000	Met One SASS & URG 3000N	811 / 812 / 833	Multi-species manual collection method utilizing thermal optical, ion chromatography, gravimetric, and x-ray fluorescence analyses.	1/3 day	X	
WS/WD	SLAMS	10/11/2009	RM Young 86004-39	020	Air quality measurements approved instrumentation for wind speed and wind direction	Continuous	X	X
OT/RH	SLAMS	10/11/2009	RM Young 41372VF	040 / 020	Air quality measurements approved instrumentation for humidity and temperature	Continuous	X	X
PAMS	SLAMS	7/1/2011	Markes/Agilent 7890B Gas Chromatograph	128	Cryogenic Preconcentration GC/FID Detection	Continuous	X	X
Mixing Height	SLAMS	6/1/2018	Vaisala CL51 Ceilometer	128	Optical scattering pulsed diode laser LIDAR (Light Detection And Ranging)	Continuous	X	X
Carboynls	SLAMS	4/18/1999	ATEC 8000-2-4	102	Silica DNPH cartridge w/KI O3 scrubber with HPLC (TO-11A)	1/6 day 1/3 day Jun-Aug	X	X
NO_2	SLAMS	1/1/2013	Teledyne API T500U	212	Direct-read Cavity Attenuated Phase Shift (CAPS)	Continuous	X	X
Precipitation	OTHER	10/11/2009	RM Young 52202E	014	Air quality measurements approved instrumentation for rainfall	Continuous	X	X
BP	OTHER	10/11/2009	Met One 092	011	Air quality measurements approved instrumentation for barometric pressure	Continuous	X	X
Solar Radiation	OTHER	1/1/2013	Eppley Precision Spectral Pyranometer	011	First Class Radiometer	Continuous	X	X
Ultraviolet Radiation	OTHER	1/1/2013	Eppley Total Ultraviolet Radiometer	011	Hermetically sealed selenium barrier-layer cell	Continuous	X	X
Intermittent PM_{10}	SLAMS	7/1/2010	Thermo Scientific 2025	127	Manual reference method utilizing gravimetric analysis.	1/3 day		
Continuous PM_{10}	SLAMS	8/2/2011	Teledyne API T640X	239	Automated equivalent method utilizing broadband spectroscopy	Continuous		

Figure 13 – NCore / Ozone Precursors Network

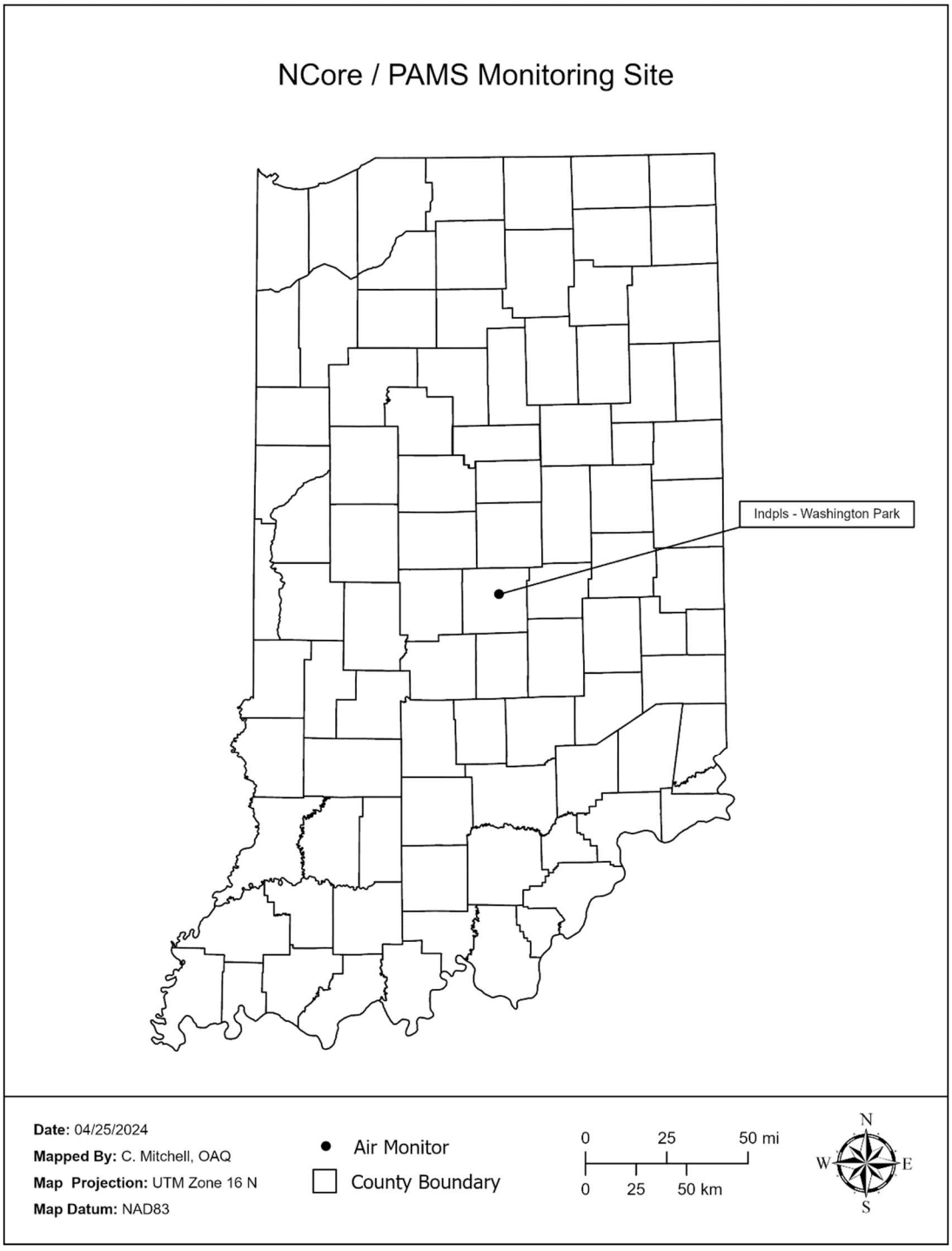


Table 18 – Ozone Precursor Monitoring Network

Ozone Precursors													
Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE/PAMS)	07/01/11	Continuous	128	Middle	Max Prec. Em. Impact	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No

MONITORING METHOD: 128 - AUTO GC; SUBAMBIENT - DUAL FID

Near-Road

Monitoring Requirements

40 CFR Part 58 Appendix D § 4.3.2 promulgated new NO_2 monitoring requirements. These included the requirement for establishing near-road NO_2 monitoring stations to be operational by January 1, 2014. The requirements for the near-road site as they apply to Indiana are as follows:

(a) Within the NO_2 network, there must be one microscale near-road NO_2 monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO_2 monitoring station is required for any CBSA with a population of 2,500,000 persons or more, or in any CBSA with a population of 1,000,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.

(1) The near-road NO_2 monitoring sites shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, where maximum hourly NO_2 concentrations are expected to occur and siting criteria can be met in accordance with appendix E of this part. Where a state or local air monitoring agency identifies multiple acceptable candidate sites where maximum hourly NO_2 concentrations are expected to occur, the monitoring agency shall consider the potential for population exposure in the criteria utilized to select the final site location. Where one CBSA is required to have two near-road NO_2 monitoring stations, the sites shall be differentiated from each other by one or more of the following factors: fleet mix; congestion patterns; terrain; geographic area within the CBSA; or different route, interstate, or freeway designation.

From the most recent census data from 2023 for Indiana's CBSAs there are four CBSAs which have more than 1,000,000 persons:

CBSA	Population
Chicago-Naperville-Elgin, IL-IN-WI	9,441,957
Cincinnati, OH-KY-IN	2,265,051
Indianapolis-Carmel-Anderson, IN	2,141,779
Louisville-Jefferson County, KY-IN	1,284,553

Indiana has a MOA with Illinois and agreements in place with Ohio, and Kentucky with regard to how the monitoring requirements are shared in these multi-state CBSAs. The near-road monitoring in these areas will be the responsibility of the adjoining states. Indiana will be responsible for and deploy the near-road site in the Indianapolis-Carmel-Anderson CBSA.

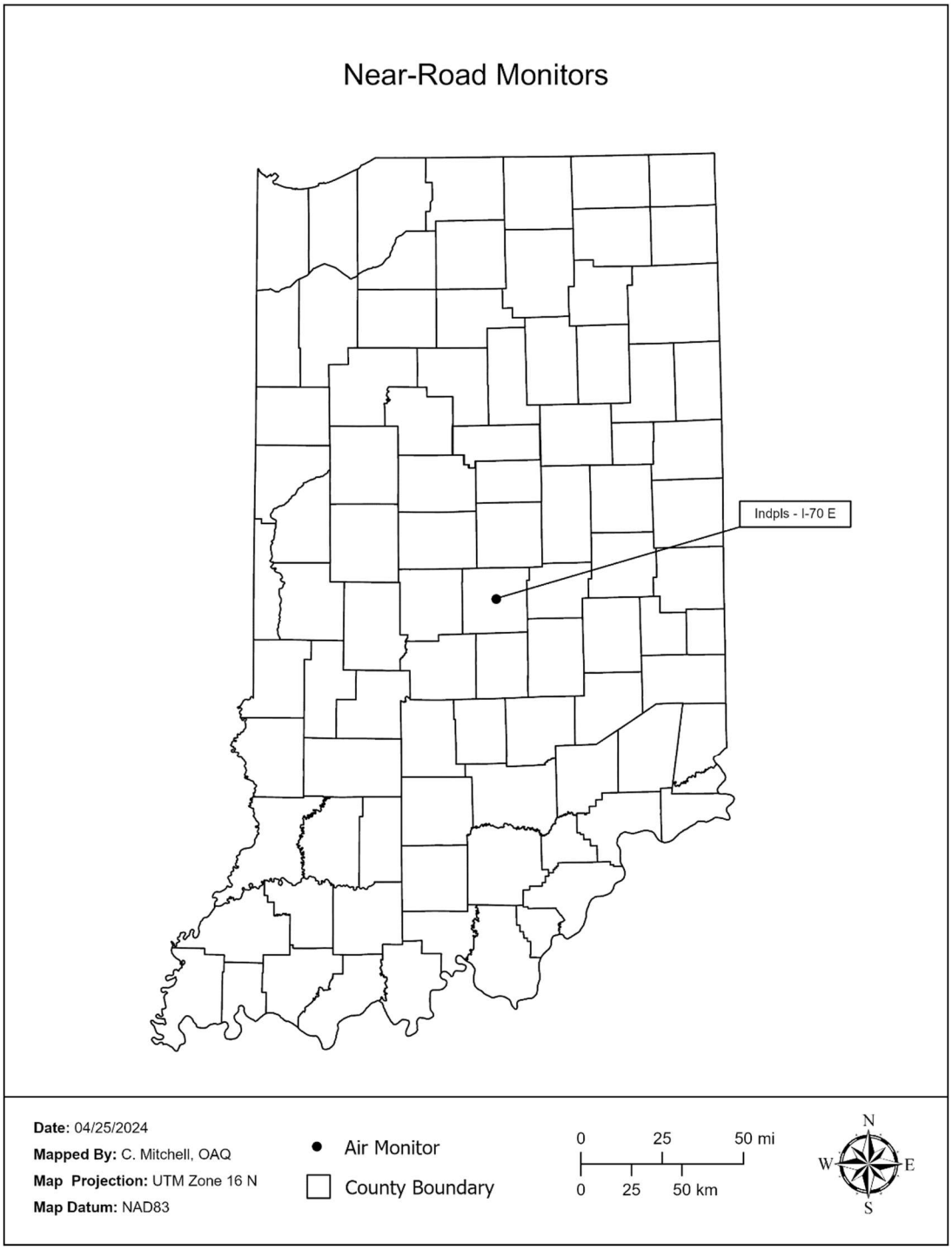
Monitoring Network

IDEM worked with INDOT to obtain a location for this site along Interstate 70, between the northeast interchange of I-70 and I-65 and the Keystone Ave. exit. As shown in Figure 14, Indiana's near-road site is Indianapolis – I-70 E. (180970087). Monitors at the site include NO_2, CO, O_3, wind speed, wind direction, ambient temperature, relative humidity, black carbon, air toxics, $PM_{2.5}$, and ultrafine particle count. These parameters are also listed in the individual parameter sections.

Network Modifications

There are no modifications planned for 2025.

Figure 14 – Near-Road Monitoring Network



Toxics (VOCs)

Monitoring Requirements

There are no requirements for toxics monitoring listed in 40 CFR Part 58.

Monitoring Methodology

Indiana uses a modification of the TO-15 method to collect toxics VOC data. TO-15 is part of U.S. EPA's Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air and consists of guidance for the sampling and analysis of volatile organic compounds in air. Ambient air is collected in a stainless steel canister in the field using either the Meriter MCS-1-R or the ATEC 2200 Air Toxic Samplers and analyzed using an Agilent 8890 GC/5977 MS to determine the concentration of the compounds found in the sample obtained. Samples are collected for
24 hours on a one-in-six day sampling schedule. Table 19 lists the 62 different VOCs, and an aggregate currently being analyzed and reported.

Table 19 – VOCs

Propene	Freon-12	Chloromethane	Freon-114
Vinyl Chloride	1,3-Butadiene	Bromomethane	Chloroethane
Ethanol	Acrolein	Acetone	Freon-11
Isopropanol	Vinylidene Chloride	Dichloromethane	Carbon Disulfide
Freon-113	t-1,2-Dichloroethene	1,1-Dichloroethane	Methyl Tert-Butyl Ether
Vinyl acetate	Methyl Ethyl Ketone	c-1,2-Dichloroethene	Hexane
Ethyl Acetate	Chloroform	Tetrahydro-Furan	1,2-Dichloroethane
1,1,1-Trichloroethane	Benzene	Carbon Tetrachloride	Cyclohexane
1,2-Dichloropropane	Bromodichloromethane	Trichloroethene	1,4-dioxane
Heptane	c-1,3-Dichloropropene	Methyl Isobutyl Ketone	t-1,3-Dichloropropene
1,1,2-Trichloroethane	Toluene	Methyl Butyl Ketone	Dibromochloromethane
1,2-Dibromoethane	Tetrachloroethene	Chlorobenzene	Ethylbenzene
m+p-Xylenes	Bromoform	Styrene	1,1,2,2-Tetrachloroethane
o-Xylene	p-Ethyltoluene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene
Benzyl Chloride	m-Dichlorobenzene	p-Dichlorobenzene	o-Dichlorobenzene

1,2,4-Trichlorobenzene	Hexachloro-1,3-butadiene	Total NMOC

Monitoring Network

In 2025 Indiana will operate 10 toxics sites. The current network along with any changes planned in 2025, is listed in Table 20 and shown in Figure 15.

Network Modifications

There are no modifications planned for 2025.

Figure 15 – Toxics Monitoring Network

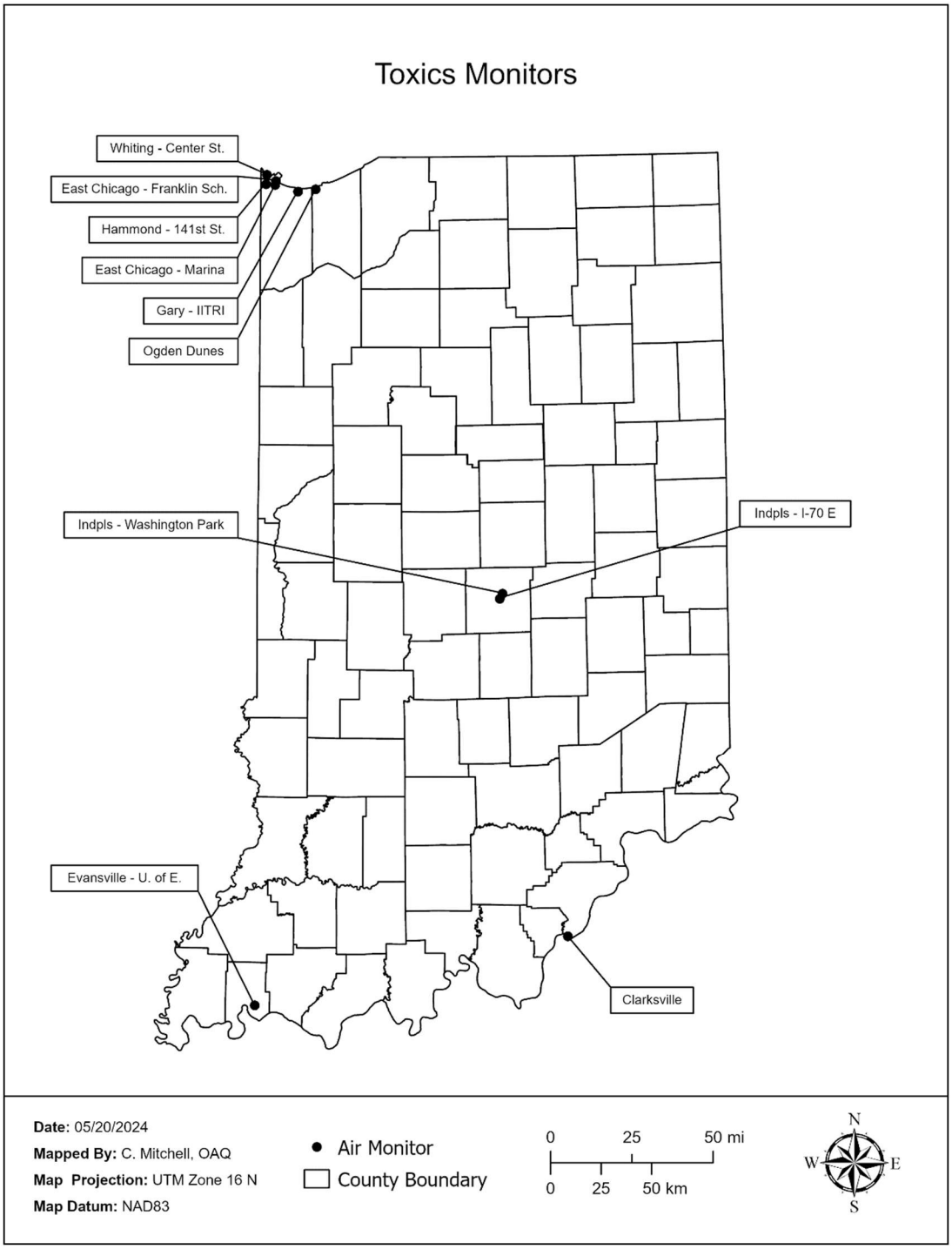


Table 20 – Toxics Monitoring Network

Toxics - VOC

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Site Change Proposed?
180190009	Clarksville	Clark	Clarksville	Falls of the Ohio SP, 201W. Riverside Dr.	OTHER	03/07/08	6-Day	126,150	Neigh	Pop Exp	38.276557	-85.763791	Louisville/Jefferson County, KY-IN	No
180890006	East Chicago - Franklin Sch.	Lake	East Chicago	Washington (formerly Franklin) School, Alder & 142nd St.	OTHER	01/01/23	6-Day	126,150	Neigh	Pop Exp	41.636111	-87.440833	Chicago-Naperville-Elgin, IL-IN-WI	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201Mississippi St.	OTHER	07/06/95	6-Day	126,150	Middle	Pop Exp	41.606563	-87.305015	Chicago-Naperville-Elgin, IL-IN-WI	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301Aldis St.	OTHER	10/30/12	6-Day	126,150	Neigh	Pop Exp	41.653501	-87.435561	Chicago-Naperville-Elgin, IL-IN-WI	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301Aldis St.	OTHER	2019	1-Hour Benzene	134	Neigh	Pop Exp	41.653501	-87.435561	Chicago-Naperville-Elgin, IL-IN-W	No
180890035	Whiting - Center St.	Lake	Whiting	1500 Center St. (H.S. Admin. Bldg.)	OTHER	12/26/15	6-Day	126,150	Neigh	Pop Exp	41.681393	-87.490233	Chicago-Naperville-Elgin, IL-IN-WI	No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st St.	OTHER	02/01/89	6-Day	126,150	Neigh	Pop Exp	41.639444	-87.493611	Chicago-Naperville-Elgin, IL-IN-WI	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	OTHER	04/18/99	6-Day	126,150	Neigh	Pop Exp	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	OTHER	01/01/22	6-Day	126,150	Neigh	Quality Assurance	39.810833	-86.114444	Indianapolis-Carmel-Anderson	No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	SLAMS (NEAR ROAD)	01/01/16	6-Day	126,150	Middle	Source Oriented	39.787933	-86.130880	Indianapolis-Carmel-Anderson	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd.	OTHER	08/05/98	6-Day	126,150	Neigh	Pop Exp	41.617500	-87.199167	Chicago-Naperville-Elgin, IL-IN-WI	No
181630016	Evansville - U of E	Vanderburgh	Evansville	Carson Center, Walnut St.	OTHER	06/23/99	6-Day	126,150	Neigh	Pop Exp	37.974444	-87.532222	Evansville, IN-KY	No

MONITORING METHOD: 126 - CRYOGENIC PRECONCENTRATION GC/FID DETECTION
134 - SEMI-CONTINUOUS ANALYZER GC/PID
150 - CRYOGENIC PRECONCENTRATION GC/MS

Metals

Monitoring Requirements

There are no requirements for metals monitoring listed in 40 CFR Part 58.

Monitoring Methodology

Metals data are collected using a TSP sampler. The sample is collected on high purity glass microfiber filters for a 24-hour period according to an every-sixth-day sampling schedule. Filters are analyzed using the inductively couple plasma mass spectrometry method.

Monitoring Network

All the metal's sites will be analyzed for the following metals: arsenic, aluminum, beryllium, cadmium, chromium, manganese, and nickel.

The metals sites are detailed in Table 21 and shown in Figure 16.

Network Modifications

There are no planned network modifications for 2025.

Figure 16 – Metals Monitoring Network

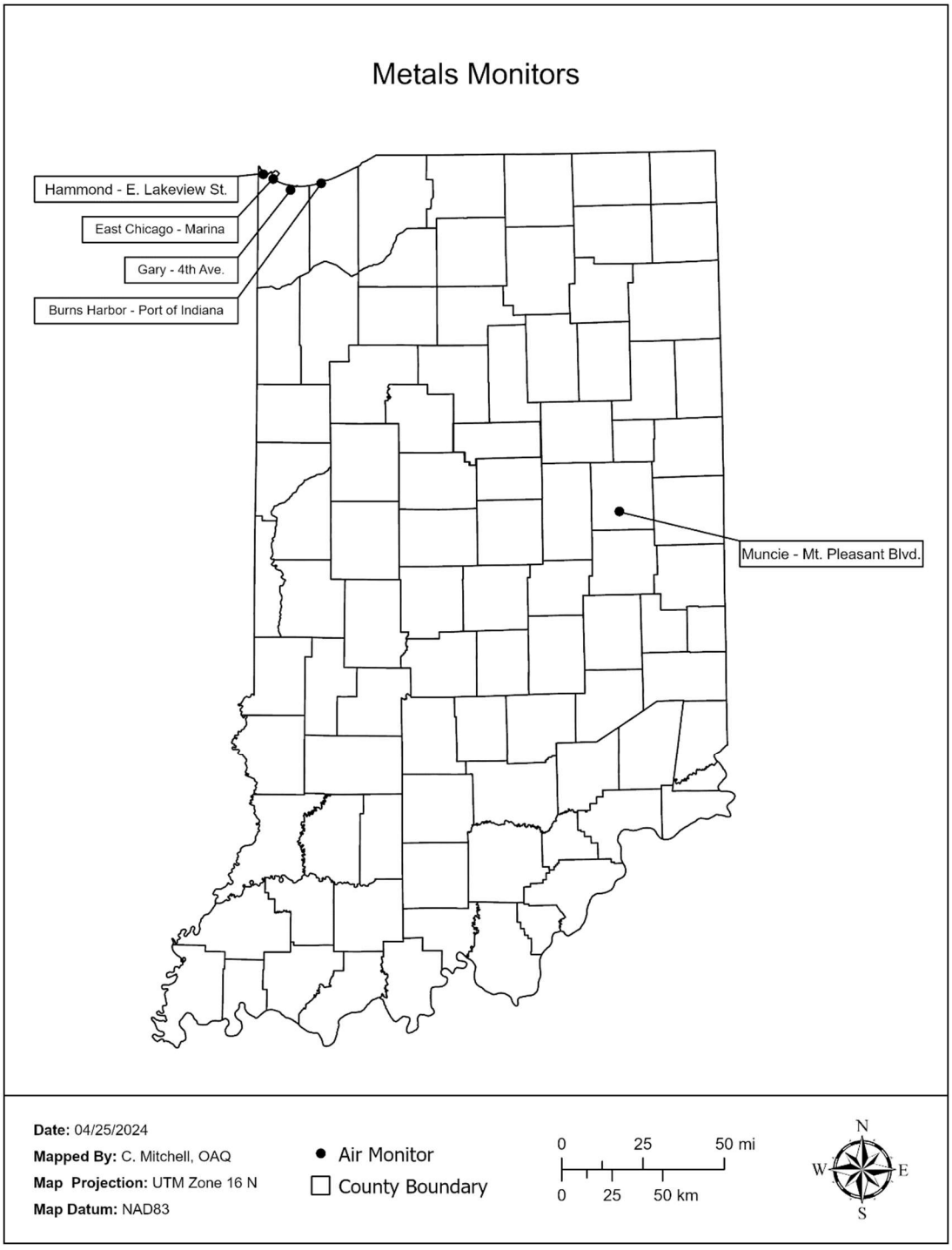


Table 21 – Metals Monitoring Network

Metals

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	CBSA	Source Oriented?	Site Change Proposed?
180350009	Muncie - Mt. Pleasant Blvd.	Delaware	Muncie	2601W. Mt. Pleasant Blvd.	SLAMS	01/02/10	6-Day	108	Middle	Source Oriented	40.158417	-85.415021	Muncie	Yes Exide	No
180350009	Muncie - Mt. Pleasant Blvd.	Delaware	Muncie	2601W. Mt. Pleasant Blvd.	SLAMS	01/01/18	6-Day	108	Middle	Quality Assurance	40.158417	-85.415021	Muncie	Yes Exide	No
180890032	Gary - 4th. Ave	Lake	Gary	Gary SouthShore RailCats, One Stadium Plaza	SLAMS	01/02/10	6-Day	108	Middle	Source Oriented	41603582	-87.332658	Chicago-Naperville-Elgin, IL-IN-WI	Yes US Steel	No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301Aldis St.	SLAMS	10/30/12	3-Day	108	Middle	Source Oriented	41653446	-87.435435	Chicago-Naperville-Elgin, IL-IN-WI	Yes Cleveland Cliffs - Indiana Harbor	No
180890037	Hammond - E. Lakeview St.	Lake	Hammond	2141E. Lakeview St.	SLAMS	08/03/18	3-Day	108	Middle	Source Oriented	41674189	-87.495024	Chicago-Naperville-Elgin, IL-IN-WI	Yes Whiting Metals	No
180890037	Hammond - E. Lakeview St.	Lake	Hammond	2141E. Lakeview St.	SLAMS	01/01/20	6-Day	108	Middle	Quality Assurance	41674189	-87.495024	Chicago-Naperville-Elgin, IL-IN-WI	Yes Whiting Metals	No
181270027	Burns Harbor-Port of Indiana	Porter		E. Boundary Rd	SLAMS	08/18/11	6-Day	108	Middle	Source Oriented	41635161	-87.150376	Chicago-Naperville-Elgin, IL-IN-WI	Yes Cleveland Cliffs - Burns Harbor	No

Metals Monitored

Arsesnic	Chromium
Aluminum	Manganese
Berylium	Nickel
Cadmium	

MONITORING METHOD: 108 - HI-VOL SAMPLER / ANALYSIS METHOD: ICP MASS SPEC (ICPMS) with GLASS FILTERS

Meteorological Monitoring

Monitoring Requirements

Meteorological monitoring is generally not required for SLAMS, however meteorological monitoring data support the suitability of the site along with other data sets. Many factors determine the amount and types of meteorological data that are collected in Indiana. Some of the factors include the intended use of the data and the availability of representative meteorological data that is already being collected by the National Weather Service in any given area of interest. Meteorological monitoring is required at two types of sites: NCore and PAMS. 40 CFR Part 58 Appendix D §3(b) specifies that at a minimum wind speed, wind direction, relative humidity, and ambient temperature be measured at NCore sites. Meteorology measurements are required at PAMS according to 40 CFR Appendix D §5. The required meteorological measurements are as follows; hourly averaged ambient temperature, hourly vector-averaged wind direction, hourly vector-averaged wind speed, hourly average atmospheric pressure, hourly averaged relative humidity, hourly precipitation, hourly averaged mixing height, hourly averaged solar radiation and hourly averaged ultraviolet radiation.

The near-road NO_2 monitoring sites do not require meteorological monitoring according to 40 CFR Part 58. However, meteorological monitoring is listed as a recommended Primary Priority in the Near-Road NO_2 Monitoring TAD. U.S. EPA suggests (at a minimum) to monitor wind speed, wind direction, temperature and relative humidity. If possible, other measurements such as precipitation, solar radiation and barometric pressure (among others) should be considered as well.

Monitoring Methodology

Monitoring sites in Indiana use a number of different sensors to record meteorological conditions. For wind data collection there are four sites with RM Young 3D Ultrasonic wind units. These sites are Gary – IITRI (180890022), Mechanicsburg (180650003), Indianapolis – I-70 E (180970087) and St. Philips (181290003). The remainder of sites collect wind data with RM Young 2D Ultrasonic wind units.

One instrument collects both Outdoor Temperature and Relative Humidity data at each site where these parameters are collected. The RM Young model 41372VF is currently in use. It uses platinum RTD for temperature and a Rotronic Hygromer® for humidity detection. Dew Point is calculated using the Outdoor Temperature and Relative Humidity data.

There are several different types of Barometric Pressure sensors deployed throughout the network. The manufacturers are Novalynx, Met One and RM Young but the technology used in each is a similar electronic barometer with a lower level of 500 millibars and an upper level of 1100 millibars.

Solar Radiation data are collected at three sites in Indiana with one type of precision spectral pyranometer, model PSP, manufactured by The Eppley Laboratory, Inc. Ultraviolet Radiation data are also collected at the same three sites with one type of Total Ultraviolet Radiometer, model TUVR, also manufactured by The Eppley Laboratory, Inc.

Precipitation data are collected at two sites in Indiana with one type of tipping bucket rain gauge, model 52202-E, manufactured by RM Young.

Mixing height is collected with a Vaisala CL51 at Indianapolis – Washington Park (180970078) PAMS. U.S. EPA is ensuring that the mixing height data is extracted properly from the ceilometer data files and reported to AQS.

Monitoring Network

Figure 17 shows meteorological data are to be collected at 17 sites across Indiana in 2025. Sites are established to provide coverage in all areas of the state where pollutant monitoring is conducted. Table 22 details the meteorological sites and the parameters collected. Included in Table 22 are two Industrial meteorological sites in support of SO_2 monitoring.

Network Modifications

The Solar Radiation (SR) and Total Ultraviolet Radiation (UV) monitoring at St. Philips (181290003) monitoring site will be discontinued as of January 1, 2025. The manufacturer of the SR and UV sensors we currently have is out of business and therefore annual calibration of our instruments will be problematic. We will continue to monitor SR and UV at our Gary – IITRI (180890022) site for internal IDEM dispersion modeling purposes. SR and UV monitoring at our Indianapolis-Washington Park (180970078) site will remain as well as it is a PAMS requirement. The State will be purchasing new SR and UV sensors to install at the Gary – IITRI and Washington Park sites.

Figure 17 – Meteorological Monitoring Network

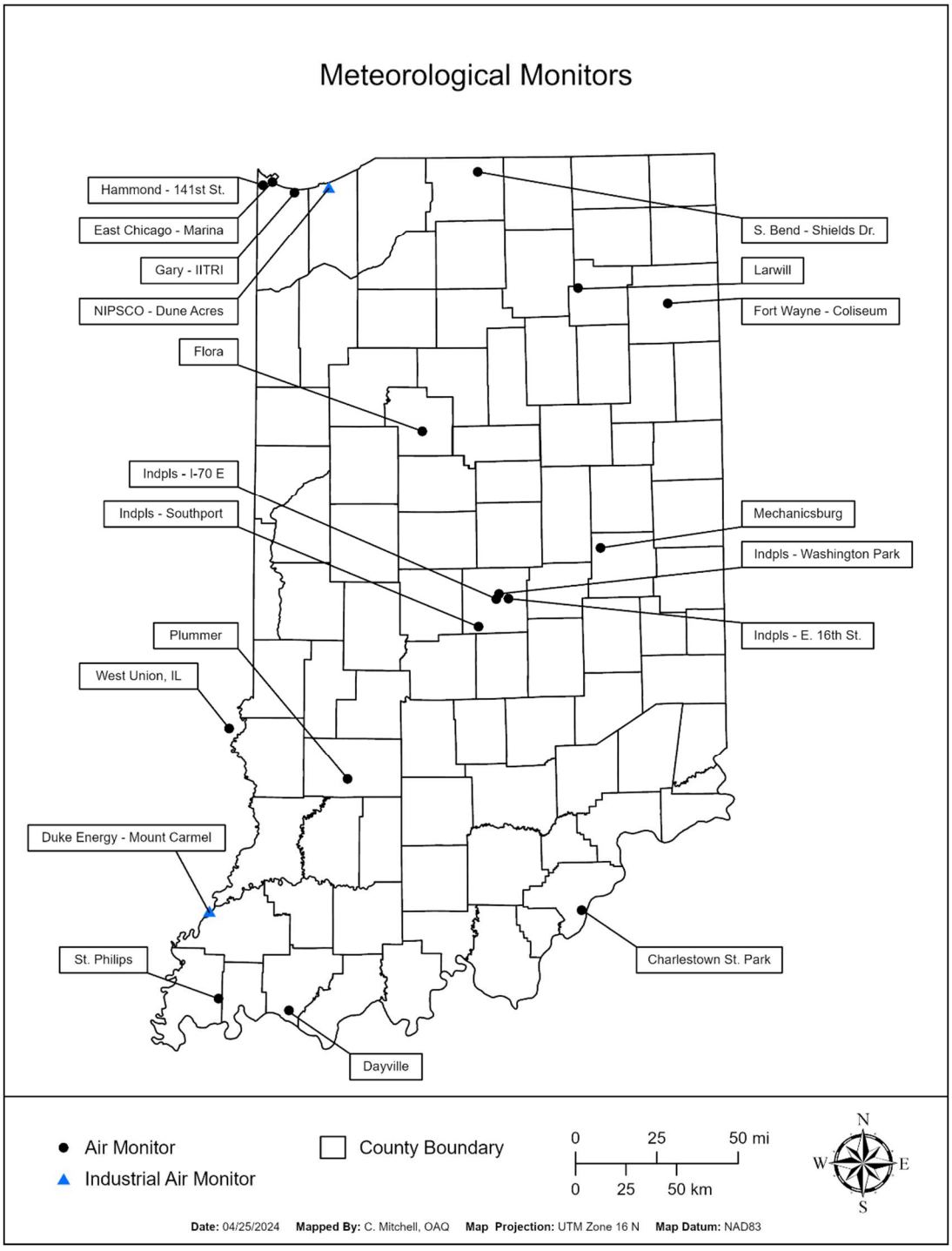


Table 22 – Meteorological Monitoring Network

Meteorological Parameters by Site

Site ID	Site Name	County	City	Address	Monitor Type (Network)	Latitude	Longitude	61103/ 61104 WS / WD	62201 RH	64101 Baro Press	62101 Outside Temp	63302 UV Rad	63301 Solar Rad	65102 Precip	61301 Ceilometer Mixing Height	Site Change Proposed?
PQAO: 0520 REPORTING AGENCY: Indiana Department of Environmental Management																
170230001	West Union	Clark Co., IL	West Union	416 S. St. Hwy 1	OTHER	39.210857	-87.668297	■	■	■	■					No
180030015	Fort Wayne - Coliseum	Allen	Fort Wayne	707 N. Coliseum	OTHER	41.081864	-85.088313	■	■	■	■					No
180150002	Flora	Carroll		Flora Airport, 481 S. 150 W	OTHER	40.540455	-86.553035	■	■		■					No
180190008	Charlestown State Park	Clark		Charlestown State Park, 12500 Hwy 62	OTHER	38.393823	-85.664118	■	■	■	■					No
180550001	Plummer	Greene		2500 S. 275 W	OTHER	38.985556	-86.990000	■	■		■					No
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36	OTHER	40.009544	-85.523470	■	■	■	■					No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	41.606563	-87.305015	■	■	■	■	■	■	■		No
180890034	East Chicago-Marina	Lake	East Chicago	East Chicago Marina, 3301 Aldis St.	OTHER	41.653501	-87.435561	■	■		■					No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st St.	OTHER	41.639444	-87.493611	■	■		■					No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	OTHER	39.789167	-86.060833	■								No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS (NCORE/PAMS)	39.810833	-86.114444	■	■	■	■	■	■	■	■	No
180970086	Indpls - Southport	Marion	Indianapolis	Southport Wastewater Treatment Plant, 3800 W. Southport Rd	OTHER	39.664498	-86.234898	■								No
180970087	Indpls - I-70 E	Marion	Indianapolis	1650 Ludlow Ave.	SLAMS (NEAR ROAD)	39.787933	-86.130880	■	■	■	■					No
181290003	St Philips	Posey		2027 S. St. Phillips Rd., Evansville	OTHER	38.006414	-87.718414	■	■	■	■	X	X			Yes
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	OTHER	41.696667	-86.214722	■	■	■	■					No
181730011	Dayville	Warrick		3488 Eble Rd., Newburgh	OTHER	37.954444	-87.321667	■	■	■	■					No
181830003	Larwill	Whitley		Whitko Middle School, 710 N. State Rd. 5	OTHER	41.159722	-85.629444	■	■		■					No
PQAO: 1324 REPORTING AGENCY: Duke Energy																
171850001	Duke Energy - Mount Carmel	Wabash, IL		Division St.	INDUSTRIAL	38.397789	-87.773853	■								No
PQAO: 0235 REPORTING AGENCY: Cleveland Cliffs																
181270011	NIPSCO - Dune Acres	Porter	Dunes Acres	246 Bailey Station Rd.	INDUSTRIAL	41.634104	-87.101452	■	■		■					No
X	= Discontinue															

Appendix A - Comment Submittal Information

The 2025 Ambient Air Monitoring Network Plan is posted on the IDEM website at https://www.in.gov/idem/airmonitoring/indianas-ambient-air-monitoring-network/ for review and comment for thirty (30) days. The Plan will be posted from May 31 to June 30, 2024.

Comments should be emailed to:

Neil Deardorff (ndeardor@idem.IN.gov)

Or mailed to:

Neil Deardorff
IDEM/OAQ/AMB
2525 North Shadeland Avenue
Ste 100
Indianapolis, IN 46219

Or faxed to: (317) 308-3239

Network Comments

Based on feedback from EPA Region 5, Indiana made a few updates between the posted for public comment draft and final draft. These include delaying the Dayville ozone shut-down until the end of the 2025 ozone season and postponing the Potato Creek ozone shutdown until a later Plan.

No other public comments were received.

Appendix B

Evaluation of Indiana's Continuous $PM_{2.5}$ Data
Use and Exclusion of Data for Comparison to the NAAQS
July 1, 2024

Introduction

The State of Indiana through the Office of Air Quality of IDEM has operated continuous $PM_{2.5}$ monitors since 2000. Over the years the network has expanded to 29 sites. The monitors had been converted from available non FEM monitors to FEM monitors as they became approved, the reliability was considered adequate, and funding was sufficient to purchase them. All data from the continuous FEM monitors currently are used for AQI purposes and for submittal to AirNow for national and regional mapping purposes. At certain sites, where past FRM to FEM data comparison was deemed adequate, the FEM data were used along with the FRM data for comparison to the NAAQS.

Due to better comparison over the past several years and a revised grant funding formula from U.S. EPA, Indiana plans to use more FEMs for NAAQS comparison and to discontinue the noncontinuous FRM samplers. The criteria for comparison between the data from the noncontinuous FRMs and the continuous FEMs is set forth in 40CFR Part 53. This analysis and proposal details Indiana's determination of the data which are acceptable for use in NAAQS calculations and provides assistance to determine which sites should have FRMs discontinued.

Rules and Guidance

The rules and procedures for the testing and approval of ambient air monitoring reference and equivalent methods are contained in 40CFR part 53. Table C-4 of Subpart C contains the specific criteria for the determination of Class III FEM monitors for the collection of $PM_{2.5}$ concentrations.

On January 15, 2013 U.S. EPA promulgated new requirements (78 FR 3086) for assessing the continuous $PM_{2.5}$ data. These included amending "§58.11 Network Technical Requirements" by adding a new subsection (e) which defined the data and the requirements needed to determine if continuous FEM data from a State's or Local Agency's network should be used for comparison to the NAAQS.

§58.11(e) is summarized as follows:

1. State and local governments must assess the data from the Class III FEM $PM_{2.5}$ monitors using the performance criteria in Table C-4 of subpart C to identify data which does not meet criteria and should not be used in comparison to the NAAQS.
2. The assessment should be included in the agency's annual network plan.
3. Values down to 0 $\mu g/m^3$ can be included.
4. A minimum of one test site with one FRM and at least one FEM is required.
5. The precision statistic does not apply.
6. All seasons must be covered, with no more than 36 consecutive months aggregated together.

7. The key statistic metric is the bias (both additive and multiplicative) of the FEM compared to the FRM. Correlation is required to be reported, but failure to meet these criteria is not cause to exclude the data.

In April 2013, detailed instructions and a template for requesting exclusion of the data were distributed by OAQPS. It provided a detailed summary of the items required, explanation of the required statistics, and a variety of analysis tools available to aid in the analysis. The procedures for submitting the exclusion request outside of the annual network review were also included.

All FEM data collected during the past three years were assessed using this analytical tool.

Indiana's Network

At the start of 2024 Indiana operated FEMs at 30 sites across the state. Twenty FEMs are collocated with noncontinuous FRMs (R&P/Thermo 2025 w/VSCC) and ten sites operated FEMs only, eight Met One BAM 1020s and two Teledyne T640. The MetOne BAM 1020 is used at 9 sites, seventeen sites have a Teledyne T640, and four sites have a Teledyne T640X deployed. Table 1 lists the current $PM_{2.5}$ Continuous Network Sites evaluated and a summary of the overall results.

Data Period to Review

In general, Indiana evaluated the data for the current monitor being used at the sites for the past three years, 2021 thru 2023.

Analysis Results

The current analysis results for each site are listed and graphed on the top half of Table 2.

The following information for each site is listed on the bottom half of the table:

Results from past evaluations and U.S. EPA responses, along with the current data analyses, were reviewed to determine which POC, or monitoring method, to be used as the primary and secondary data source for design value calculations. The decision on which noncontinuous FRMs could be discontinued was based on this information, as well as the need to maintain the required FRMs for programs such as NCore, Near-Road, speciation, and method collocation.

Network Requests

In past years, Larwill has produced very poor comparison data. The slope, intercept, and correlation for this site are not in the acceptable range and exclusion of the data for NAAQS comparison was requested. Due to consistently poor comparison, the method was changed to a Teledyne T640 mid-2021. The most recent comparison has improved and the State now sees the continuous data as acceptable for NAAQS comparison.

Bloomington – Binford has recently shown poorer results than in years past. Due to this, the State performed a method change to a Teledyne T640 in early 2023. Data will be evaluated for NAAQS comparison after at least 2 full years of data, but the FRM will remain for data quality checks. The State has already requested to exclude this data until the evaluation can be performed.

Michigan City – Marsh ES, Muncie HS, Mechanicsburg, Jasper – Post Office, the new Dale site and the new Evansville site all have less than 2 full years of data for comparison. The State will reserve the analysis of these sites for after this criteria has been met.

Table 1
PM2.5 FEM / FRM Network Summary
Proposed FEM Data Usage

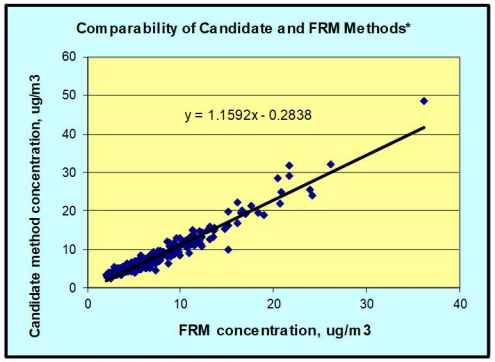
Site Name	County	City	AQS#	POC	Current FEM Sampler	Current FEM Method Start Date	Monitoring Criteria Met	Siting Criteria Met	FEM NAAQS Data Usage	Date Range	Comments
Larwill	Whitley		181830003	3	Met One BAM 1020	4/7/2010	1/1/2013	7/21/2015	Exclude	4/7/10 to 6/8/21	Method change from MetOne BAM to T640 in Jun '21
					Teledyne T640	6/9/2021	1/1/2013	7/21/2015	Acceptable	6/9/21 on	

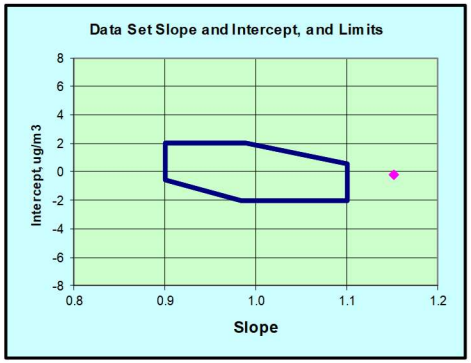
Table 2
Larwill

Site Name	**Larwill**	**FEM Installed**	**4/7/2010**
City		**Siting Criteria Met**	**7/21/2015**
AQS #	**181830003**		
POC	**3**		
Instrument	**Teledyne T640**		
Method Description	**Optical**		

Current Data Evaluation

PM2.5 Continuous Data Period		Sample Pairs Evaluated			Slope Criteria			Intercept Criteria			Correlation Criteria			
Begin Date	End Date	Total	Min. Req.	Meets Req?	Acceptable Range	Slope (m)	Meets Req?	Acceptable Range	Intercept (y)	Meets Req?	Acceptable Correlation Range	Correlation	Meets Req?	Data Status
6/9/2021	12/31/2023	Winter =	52	Yes	1 +/-0.10	1.1520	No	-0.1564 to -2.0000	-0.2030	Yes	>=0.9500	0.96723	Yes	Acceptable
		Spring =	57											
		Summer =	88											
		Fall =	85											
		Total =	282											





FEM Data Evaluations

Network Plan Year	Data period	Indiana Plan Submittal	EPA Response
2022	1/1/19 to 12/31/21	Data Excluded	Concur
2023	1/1/20 to 12/31/22	Data Excluded	Concur
2024	6/9/21 to 12/31/23	Acceptable	Pending

NAAQS Comparable Data Usage

Monitor	Sample Frequency	POC	Year	2013	2014	2015		2016	2017	2018	2019	2020	2021		2022	2023
			Time Period			1/1 to 7/20	7/21 to 12/31						1/1 to 6/9	6/9 to 12/31		
FRM	Intermittent	1		Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
FEM	Continuous	3		Exclude	Exclude	Exclude	Exclude	Exclude	Exclude	Exclude	Exclude	Exclude	Exclude	Acceptable	Acceptable	Acceptable