OZONE AND NONATTAINMENT

Frequently Asked Questions (FAQ)

Ozone is a regional pollutant that is formed in the atmosphere over time from emissions of Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOx). VOCs are compounds that evaporate easily into air. VOC emissions come from things such as industrial use of solvents and degreasing agents, evaporation of gasoline, and consumer products such as paints and cleaning products. NOx is emitted from cars, trucks, power plants, and various industrial sources, usually when some type of fuel is burned. When VOC and NOx emissions are combined on warm, sunny, non-breezy days, harmful ozone may be formed. In this document, you will find questions answered by topic, grouped together for your convenience.

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OZONE FORMATION

1. How is ozone formed?

Ozone is a regional pollutant that is formed in the atmosphere over time from emissions of Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOx). VOCs are compounds that evaporate easily into air. VOC emissions come from things such as industrial use of solvents and degreasing agents, evaporation of gasoline, and consumer products such as paints and cleaning products. NOx is emitted from cars, trucks, power plants, and various industrial sources, usually when some type of fuel is burned. When VOC and NOx emissions are combined on warm, sunny, non-breezy days, harmful ozone may be formed.

2. Why is some ozone good for us, and some is harmful?

The layer of ozone in the upper atmosphere helps protect the earth from the sun's harmful ultraviolet rays and is the "good" ozone. Ground-level ozone, however, is unhealthy to breathe. It can narrow a person's airways, causing the lungs to work harder to provide oxygen to the body. Individuals most susceptible to the effects of ozone exposure include those with a pre-existing or chronic respiratory disease, children, and adults who actively exercise or work outdoors.

HEALTH CONCERNS

3. At what level is ozone unhealthy?

The United States Environmental Protection Agency (USEPA) set air quality standards based on the latest health studies. The standards are set to protect the public against adverse health effects. In 2015, the USEPA lowered the standard from 75 to 70 parts per billion (ppb).

4. What effects can be caused by high ground-level ozone?

Exposure to high concentrations of ozone can include the following health effects:

- Eye irritation.
- Difficulty in breathing / shortness of breath.
- Aggravated / prolonged coughing and chest pain.
- Increased aggravation of asthma.
- Increased susceptibility to respiratory infection resulting in increased hospital admissions and emergency room visits.
- Repeated exposures could result in chronic inflammation and irreversible structural changes in the lungs, which can lead to premature aging of the lungs and illness such as bronchitis and emphysema.
- Growing evidence suggests association with heart disease and premature death.

Exposure to high ozone concentrations can include the following environmental effects:

- Ozone also impacts vegetation by reducing agricultural crop and forest yield, causing leaf injury.
- Diminishing resistance to pests and disease
- Reducing tree seedling survival

GEOGRAPHIC LOCATION

5. What is a regional pollutant?

A regional pollutant is one that may impact areas far away from the sources of emissions. The impacts of ozone are usually not found directly at sources of VOCs or NOx because it takes time for them to combine in the atmosphere. Ozone isn't directly emitted from sources, instead VOCs and NOx turn into ozone in the atmosphere. This causes higher measurements of ozone in areas downwind of emission sources and can lead to emissions from sources far away creating ozone in different areas than where pollutants were emitted, depending on the weather.

6. How does ozone move/transport from other areas?

Weather conditions play a part in how much ozone is produced and where it has high ground-level impacts. Ozone is usually produced on warm, sunny, non-breezy days. Ozone levels are also dependent on the wind to blow VOCs, NO_X, or already created ozone into an area. This phenomenon is known as "transport". In Michigan, transport of ozone is most visible on the Lake Michigan side of the state. Recent air quality studies have shown that ozone produced over Lake Michigan from VOC and NO_X emissions at upwind states is transported into the shoreline of West Michigan.

7. How can I find out about ozone levels near me?

The best way to find out about current ozone levels near you is to check out the **Ozone Action!** interactive map which shows ozone levels in near real time. Another helpful resource is **MiAir** which gives information on the daily Air Quality index, as well as information on pollutants in the air and ozone level ratings. You can also sign up to receive alerts telling you when ozone levels may be dangerous. You can easily sign up for **Enviroflash Alerts (Enviroflash.info/)** and get information sent right to your phone or e-mail. Additionally, you can download the USEPA **AirNow app (AirNow.gov)** to check the Air Quality index on the go.

MEASUREMENT

8. How are ozone levels measured?

Michigan has 26 state and tribal air monitors throughout the state measuring ozone. These monitors measure ozone 24-hours a day during the 8-month ozone season. This season runs from March through October, when ozone is most likely to form in Michigan due to high temperatures and humidity, as well as longer periods of daylight. For more information on EGLEs ozone air monitoring visit the **Air Monitoring webpage.**

9. How are locations of ozone monitors decided?

Locations of ozone monitors are chosen based on the requirements of the federal regulations. The regulations contain the minimum number of monitors that must be operated in population areas. Sometimes locations are required that are downwind of a city. In addition to meeting the population and other requirements, Michigan chooses the locations based on several considerations including but not limited to meteorology conditions, population, accessibility to power, and funding.

NONATTAINMENT

10. What does nonattainment mean?

After the USEPA sets a new ozone standard the USEPA and EGLE work together to determine whether areas are in attainment or nonattainment (see **What are the different types of area designations?** below).

If an area had air quality measurements of high ozone for three or more years, EGLE and USEPA staff review further data to determine if the area should be considered nonattainment. Nonattainment is based on a review of air quality measurements, emissions information, computer air modeling results which provide insight to the dispersion of air pollution, and weather patterns.

11. What are the different types of area designations?

The area will have one of three types of designations. Initial designations consist of classifications for areas in attainment, nonattainment, and unclassifiable, defined below. After initial designations USEPA reviews nonattainment areas after a set number of years to reassess if an area needs to be reclassified to a higher degree of nonattainment (see Are there different degrees of nonattainment areas? below).

Attainment is a term for areas that are meeting the air quality standards. The monitoring data for attainment areas shows over a long period of time that pollutant concentrations are at or below the federal air quality standard at the time of initial designations. Additionally, nonattainment areas can come back into attainment through what is referred to as redesignation (see **What does it mean if an area redesignates to attainment?** below).

Nonattainment is a term applied to an area that has pollutant concentrations above federal air quality standards over a long period of time. An area may also be considered nonattainment if pollution from that area is contributing to poor air quality in another area.

Unclassifiable is a term used when an areas status is not able to be determined after evaluating available information. Unclassifiable designations are used when there is not an ozone monitor present in the area (see **How are locations of ozone monitors decided?** above)

12. Are there different degrees of nonattainment areas?

The USEPA initially classifies nonattainment areas based on the severity of the air quality problem. All of Michigan's nonattainment areas were initially classified as marginal, which is the lowest classification level. This means the areas were over the federal standard, but not by very much, and had few mandatory requirements. However, the higher the measured concentration is over the standard upon initial designations or if an area cannot lower ozone pollution within a specified time frame, the state may be moved to a higher classification. Higher classifications result in more required actions.

Nonattainment Classifications	Potential Resulting Actions
Marginal	Company offsets required; EGLE submits baseline emissions inventory
Moderate	More company offsets, EGLE rules to reduce VOCs and NOx, and vehicle inspection and maintenance required for some areas
Serious	Even more company offsets and EGLE rules to reduce VOCs and NOx required; More intense vehicle inspection and maintenance required for some areas; Additional company permitting requirements required
Severe	All Serious classification requirements; Reformulated gasoline required
Extreme	All Severe classification requirements; Cleaner fuels for company boilers required

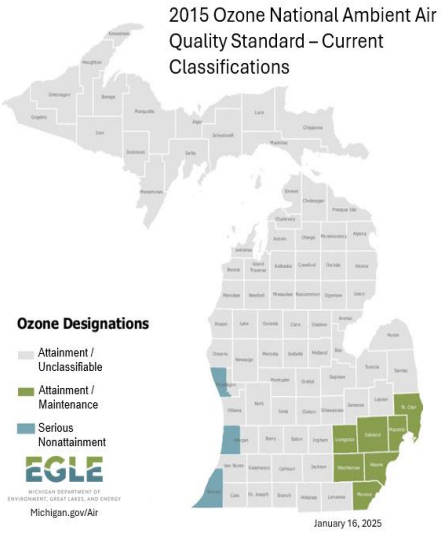
13. How do nonattainment areas go back to being attainment areas?

Reduce air pollution! After initial designations, nonattainment areas have a set timeframe to meet the federal ozone standard. If an area successfully lowers ozone levels and attains the standard, the area can be redesignated as attainment. When an area is designated back to attainment, federal law requires states to establish a maintenance plan showing how it will continue to meet the standard. You may see or hear this referred to as an attainment/maintenance designation.

However, if ozone concentrations in a nonattainment area remain above 70 ppb, the area will continue to be nonattainment. If that occurs, then more stringent requirements will apply to reduce ozone pollution further (see **Are there different degrees of nonattainment areas?** above).

14. What are the current area designations for Michigan?

In Michigan, the following counties are designated as nonattainment for the ozone standard: Berrien and the western portions of Allegan and Muskegon counties. Historically, for the most recent ozone standard, several additional areas were given initial designations of nonattainment including the three previously mentioned, along with Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties. The seven-county area located in southeast Michigan was redesignated as attainment in 2023 (see **What does it mean if an area redesignates to attainment?** below).



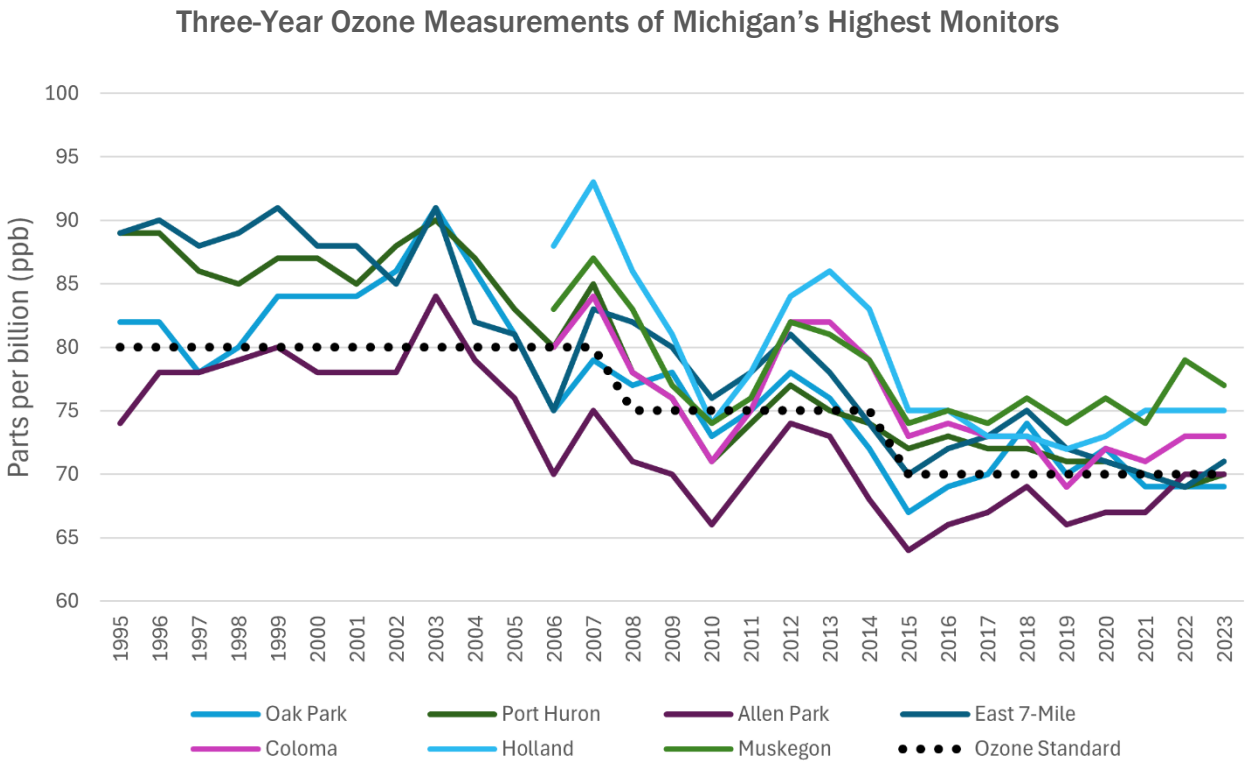
15. What does it mean if an area redesignates to attainment?

A nonattainment area can submit a request for approval by the USEPA to redesignate to attainment if the long-term data shows all the monitors in the area have met or been below the federal standard. Approval of this request by the USEPA does not mean that the work to reduce ozone in the area stops. When an area is designated back to attainment, federal law requires states to establish a maintenance plan showing how it will continue to meet the standard. The redesignation request includes Michigan's maintenance plan detailing how air quality will be maintained considering projected growth for a period of 20 years. If future monitoring shows that ozone levels are no longer meeting the criteria, the maintenance plan helps determine the ways the problem will be addressed.

16. Why are we nonattainment now when we weren't before?

The amount of ozone pollution in the state has been falling since the creation of the federal Clean Air Act in 1970. For example, the table below shows the drop in ozone pollution measured at seven of the air monitors throughout Michigan's nonattainment areas. These are the seven monitors consistently measuring the highest ozone levels in the state. This table also shows how the USEPA ozone standard has been lowered over time. As the USEPA gathers new and more complete information, they reassess what levels of ozone are protective of human health. This assessment is completed every few years and has resulted in the limit being reduced over time.

In 2008, the USEPA set the ozone standard at 75 ppb. That limit was based on the health data available. At that time the entire state of Michigan was measuring attainment. In 2015, the USEPA reviewed the ozone standard again and based on a review of updated scientific data and health studies which indicated health impacts are seen at ozone levels above 70 ppb, lowered the standard. Based on the 70 ppb ozone level, there are now three nonattainment areas in the state.



17. What is the state doing to improve air quality in nonattainment areas?

EGLE is required to update its plan for how it will reduce ozone pollution. The state must submit this updated plan, known as the 2015 ozone State Implementation Plan (SIP), to the USEPA for approval. The 2015 ozone SIP was due in 2021. Because ozone is produced by a combination of VOC and NOx emissions, EGLE is currently working to decide the best VOC and NOx reduction strategies to include in the plan. This may include reducing VOC content of consumer products, adopting more stringent regulations on industrial sources, and increasing public awareness of ways individuals can help reduce ozone formation (see **What can I do as a resident?** below). This can mean cutting down emissions from vehicles, industrial factories and more sources that produce ozone. The most common sources include gasoline stations, gasoline powered machinery, and car exhaust. In addition, any time a company requests through a permitting action to emit VOC or NOx pollution in a nonattainment area, they must find ways of reducing pollution in that same area (see **What is an offset?** below).

Michigan currently has measures in place to reduce ozone, including low-vapor gasoline, consumer product regulations, regulations for industrial painting and solvent-using operations, and **DERA** and **Volkswagen** grants to local communities to replace dirtier buses with cleaner ones. In addition, EGLE is currently working with stakeholders to develop VOC and NOx emission reduction regulations as part of the 2015 ozone SIP.

GETTING INVOLVED

18. What can I do as a resident?

Residents can play their part, especially on hot days, by limiting driving, fueling up vehicles and lawn mowers in the evening, not mowing the lawn or using other gasoline powered equipment on clean air action days, setting air conditioning thermostats to 1 or 2 degrees higher, switching to more energy efficient lighting, and turning off lights and air conditioners when not needed.

- In West Michigan, more information can be found at www.wmcac.org/take-action-1.
- In Southeast Michigan, more information can be found at www.semcog.org/keep-the-air-clean.

For more information on clean air action days and to sign up for notifications visit EnviroFlash Alerts (https://www.enviroflash.info/).

COMPANY ACTIONS

19. What do companies have to do differently in a nonattainment area?

The main difference for companies in attainment areas and nonattainment areas is the process they go through to request an increase of emissions. For large increases in emissions requiring permitting, companies in nonattainment areas must meet additional requirements, including the requirement to get offsets. This means that there will be emission reductions with the offsets, likely from a nearby area of the original pollutant source. The goal of the offsets is to move towards lower overall pollutant levels in an area.

Additionally, depending on the process type of the company they may need to change existing processes or materials to meet any new regulations applicable to the nonattainment areas.

20. What is an "*offset*"/ Why can companies increase emissions in nonattainment areas?

Companies located in nonattainment areas may apply for permits to increase emissions, but they must be balanced by equal or greater decreases in emissions in the same nonattainment area, called an "offset". These offsets require companies to either reduce emissions from another part of their company or find another company with decreasing emissions to balance out their increase in emissions. The goal is to allow for continued economic development, while still working towards the goal of improved air quality.

Offsetting works to improve air quality because ozone is a regional pollutant. Reductions of VOCs or NOx even miles away can end up reducing ozone pollution in the nonattainment area since ozone can be transported from other locations.

MORE INFORMATION

EGLE Air Quality Web Site:

- Michigan.gov/Air
- SIP & Attainment webpage
- Air Monitoring webpage
- Michigan.gov/OzoneAction

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