

Revised Responses to Significant Comments Received on EPA's Response to State and Tribal Recommendations for
the 2015 Ozone National Ambient Air Quality Standards (NAAQS) for Counties Remanded to EPA

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List of Acronyms

| | |
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| CAA | Clean Air Act |
| CAMx | Comprehensive Air Quality Model with Extensions |
| CBSA | Core Based Statistical Areas |
| CFR | Code of Federal Regulations |
| CSA | Combined Statistical Area |
| EE | Exceptional Events |
| EGU | Electric Generating Unit |
| EPA | Environmental Protection Agency |
| FR | Federal Register |
| HYSPLIT | Hybrid Single Particle Lagrangian Integrated Trajectory Model |
| IEPA | Illinois Environmental Protection Agency |
| I/M | (Vehicle) Inspection and Maintenance |
| MPO | Metropolitan Planning Organization |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| NAA | Nonattainment Area |
| NAAQS | National Ambient Air Quality Standard |
| NEI | National Emissions Inventory |
| NFR | Notice of Final Rulemaking |
| NO _x | Oxides of Nitrogen |
| OAQPS | EPA Office of Air Quality Planning and Standards |
| OTR | Ozone Transport Region |
| PPB | Parts Per Billion |
| PPM | Parts Per Million |
| PSD | Prevention of Significant Deterioration |
| SIP | State Implementation Plan |
| TPY | Tons per Year |
| TSD | Technical Support Document |
| VMT | Vehicle Miles Traveled |
| VOC | Volatile Organic Compounds |

1.0 Introduction

This document, together with the final rule and technical support documents, presents revised responses of the Environmental Protection Agency (EPA) to significant comments received on EPA's April 30, 2018 initial designations for certain counties remanded to EPA by the District of Columbia Circuit Court in *Clean Wisconsin v. EPA*, 964 F.3d 1145 (D.C. Cir. 2020).

2.0 Background

On October 1, 2015, the EPA promulgated revised primary and secondary ozone national ambient air quality standards (NAAQS (80 FR 6592, October 26, 2015)). In that action, the EPA strengthened both standards to a level of 0.070 parts per million (ppm), while retaining their indicators, averaging times, and forms. The EPA revised the ozone standards based on an integrated assessment of an extensive body of new scientific evidence, which substantially strengthens our knowledge regarding ozone-related health and welfare effects, the results of exposure and risk analyses, the advice of the Clean Air Scientific Advisory Committee and consideration of public comments.

Following promulgation of a new or revised NAAQS, the Clean Air Act (CAA) requires EPA to determine if areas in the country meet the new standards. Accordingly, EPA designated all areas of the country as to whether they met, or did not meet, the NAAQS. EPA designated areas for the 2015 Ozone NAAQS in 3 rounds, resulting in 52 nonattainment areas. These are described below:

- Round 1- November 6, 2017: EPA designated 2,646 counties, 2 separate tribal areas and 5 territories as Attainment/Unclassifiable. We also designated 1 Unclassifiable area.
- Round 2- April 30, 2018: EPA designated 51 Nonattainment areas, 1 Unclassifiable area, and all remaining areas as Attainment/Unclassifiable, except for the 8 counties in the San Antonio, TX area.
- Round 3- July 17, 2018: EPA designated 1 county in the San Antonio area as Nonattainment and the other 7 counties as Attainment/Unclassifiable.

Challenges to EPA's Designations

Multiple petitioners (*i.e.*, several environmental and public health advocacy groups, 3 local government agencies, and the state of Illinois) filed six petitions for review challenging the EPA's 2015 ozone NAAQS designations promulgated on April 30, 2018. The District of Columbia Circuit Court consolidated the petitions into a single case, *Clean Wisconsin v. EPA*.

- Collectively, the petitioners challenged aspects of EPA's decisions associated with 9 nonattainment areas, involving at least 17 counties.
- Petitioners primarily argued that EPA improperly designated counties (in whole or part) as attainment that should have been designated as nonattainment based on contributions to nearby counties with violating monitors.
- In its brief, EPA requested voluntary remand of the final designation decisions for 10 counties associated with 4 nonattainment areas to further review those designations.

Court Decision

On July 10, 2020, the District of Columbia Circuit Court issued its decision on the April 30, 2018, designations. The Court granted EPA's request for voluntary remand, as well as remanding a number of other areas to the Agency. In total, the Court remanded 16 counties associated with 9 nonattainment areas back to EPA. The Court did not vacate the existing designations, but required EPA to "issue revised designations as expeditiously as practicable."

3.0 Revised Responses to Significant Comments on the Proposed Designations for the Remand Counties

In light of the Court decision, EPA is strengthening the technical record or revising the designations for 14 remanded counties associated with 7 nonattainment areas. The remaining two remanded counties, El Paso, Texas and Weld, Colorado, will be addressed in a separate action wherein the agency will complete a 120-day process and initiate a new public comment period. EPA has re-evaluated our responses to significant comments received on those areas we received during the initial designations process. Comment summaries and revised responses are presented below. Comments are arranged by EPA Region, state, and nonattainment area. Additional detail for some nonattainment areas can be found in the revised technical support document (TSD) for that area. Commenters can find these TSDs in the electronic docket for this action (www.regulations.gov, docket number EPA-HQ-OAR-2017-0548) and at the EPA's Ozone Designations Web Page (www.epa.gov/ozone-designations).

3.1. Area-Specific Issues

3.1.1. Region V

3.1.1.1 Michigan

Comment: Sierra Club claimed that Ottawa County (in Western Michigan) should be designated as nonattainment for ozone because Ottawa County emissions impact violating monitors in Muskegon and Allegan Counties. More specifically:

- 22,558 tons of VOC and NO_x from Ottawa County
- JH Campbell plant (on western shore of Ottawa) emitted 5,049 and 143 tons of NO_x and VOC, respectively, in 2014. These emissions reflect control of NO_x emissions at two of its three units since 2011
- Sierra Club stated that J.H. Campbell can contribute ozone at levels exceeding 1 percent of the 2015 ozone NAAQS in Allegan, Berrien and Muskegon Counties. These estimates are based on 2011 daily emissions levels, which J.H. Campbell continues to emit despite the installation of NO_x emissions controls on two of its three units.
- CAMx APCA OSAT modeling showed a 1.29 ppb impact in Berrien County and a 0.82 ppb impact in Allegan County on June 13, 2011 when emissions from J.H. Campbell were 16.25 tons. A level that J.H. Campbell exceeded on four days during the 2017 ozone season.
- CAMx APCA OSAT modeling showed a 1.07 ppb impact in Muskegon County on May 29, 2011 when emissions from J.H. Campbell were 17.62 tons.
- In 2014, J.H. Campbell accounted for about 40% of Ottawa County NO_x emissions.

EPA Response: The EPA disagrees that Ottawa County should be designated as nonattainment based on a weight of evidence analysis, which includes the following assessments:

- HYSPLIT modeling for the violating monitors in Western Michigan are primarily impacted by emissions from the Chicago and Milwaukee CSAs.
- HYSPLIT back trajectories from Allegan on days that exceed the 70 ppb NAAQS for the 2014-2016 designation period do not traverse locations near the J H Campbell plant for which Sierra Club's source apportionment modeling (SAM) is focused. HYSPLIT back trajectories shown in from the Muskegon monitor on days that exceed 70 ppb in the 2014-2016 designation period originate primarily from the South and West. While several trajectories do skirt the Michigan coastline near the JH Campbell facility, there are far more trajectories that traverse locations farther offshore and are therefore less likely to be impacted by the JH Campbell plume.

- Sierra Club's submitted SAM that was based on EPA's 2011v6.1 modeling platform. Sierra Club's analysis focused on contributions from the J H Campbell EGU located along the shoreline in Ottawa County which is between Muskegon and Allegan. The emissions from the J H Campbell EGU have dropped significantly since 2011. The facility placed selective catalytic reduction (SCR) on 2 of their 3 units in 2013. This dropped ozone season NO_x emissions from 3600 tons in 2011 to an average of approximately 1600 tons for the 2014-2016 period. The 2011 modeling relied on by the Sierra Club does not reflect these controls. The SCR on these units must be run as part of the approved control equipment in J.H. Campbell's current operation permit (MI-ROP-B2835-2020a). Since JH Campbell's annual emissions dropped by approximately a factor of 2 between the modeled episode in 2011 and the 2014-2016 data years considered in the ozone designation process, it is expected that contributions to ozone from JH Campbell would have been substantially lower in 2014-2016 than they were in the 2011 modeling.
- Sierra Club identified the two 2011 modeled days, May 29 and June 13, in 2011 when the modeled daily emissions for J.H. Campbell's were at a level similar to the daily emissions levels in 2017. On these days, both modeled and observed ozone concentrations at the Muskegon and Allegan monitors were well below the 2015 ozone NAAQS.
- Sierra Club did not provide any information regarding whether those emissions levels occur on days when the relevant monitors are exceeding the 2015 ozone NAAQS, or that meteorological conditions support that emissions on those days are transported to the violating monitors.

See the Western Michigan TSD for further analysis.

Thus, EPA has determined that it will not modify the State's recommendation and is retaining a designation of Attainment/Unclassifiable for Ottawa County.

3.1.1.2 Wisconsin

Comment: The Wisconsin Department of Natural Resources (WDNR), and Governor Walker submitted comments asking EPA to foremost consider designating the entire state as attainment of the 2015 ozone NAAQS as per the Governor's original September 21, 2016, recommendation, since WDNR believes ozone levels in Wisconsin are beyond the state's control due to out-of-state emissions and meteorology. If EPA does not designate the entire state as attainment, then WDNR urged EPA to only designate as nonattainment narrow parcels of land near the Lake Michigan shoreline around the violating monitors (essentially dismissing any contribution analysis), since WDNR believes these monitors are not meaningfully affected by in-state emissions.¹ For these reasons, U.S. Congressman F. James Sensenbrenner Jr. of Wisconsin would also like EPA to consider reducing the scope of EPA's intended

¹ In a September 21, 2016, letter to EPA from its Governor, Wisconsin recommended that the entire state be designated as attainment for the 2015 ozone NAAQS, despite having violating monitors, since, in Wisconsin's opinion, elevated ozone levels in Wisconsin are primarily due to emissions originating from other states, recent ozone levels in Wisconsin have greatly improved, and Wisconsin has already significantly reduced ozone-causing emissions. Later in an April 20, 2017 technical support document (TSD), WDNR submitted to EPA additional information to support the Governor's recommendation including estimates of the geographic extent of the areas in Wisconsin with design values above 0.070 ppm (70 ppb). Wisconsin requested that if EPA designates nonattainment areas in Wisconsin, the EPA should ensure that the geographic scope of these areas is minimized. Wisconsin emphasized that these descriptions should not be construed as a recommendation for a potential nonattainment area designation for the 2015 ozone NAAQS, which would conflict with the Governor's recommendation.

nonattainment designations in Wisconsin and believes pollution from beyond Wisconsin's borders should be accurately accounted for, especially as it pertains to monitors located along Lake Michigan.

In its April 2017 technical support document (TSD), WDNR provided a geographic estimate of areas experiencing nonattainment air (i.e. with design values > 70 ppb) based on an estimate of a "70-ppb ozone contour line" near the shoreline of Lake Michigan. WDNR's WDNR-calculated 70-ppb contour is based on a best-fit line developed by plotting the design values of six of the eight violating monitors and one of the four attainment monitors located within four miles of the Lake Michigan shoreline versus the location of each of these seven monitors expressed as distance in miles from the shoreline of Lake Michigan. The extent of this WDNR-calculated 70-ppb contour was described in WDNR's April 2017 TSD and again in WDNR's comment letter dated February 28, 2018 (0300), which included specific modifications to the location of the WDNR-calculated 70-ppb contour in Racine County (4.2 miles inland) and in Sheboygan County (2.3 miles inland) relative to WDNR's April 2017 TSD.

As a starting point for the distance from the lakeshore going inland, WDNR suggested EPA use the U.S. Army Corps of Engineers (USACE) Ordinary High Water Mark (OHWM), which for Lake Michigan is 581.5 feet, and cited the USACE website for the Detroit District's Regulatory Office.² According to WDNR the USACE OHWM is permanent (e.g., it does not change based on water level fluctuations), is legally-defined, can be easily identified, and is already widely-used in federal regulatory applications.

EPA Response: As per the CAA, the EPA must designate an area nonattainment if it has an air quality monitor that is violating the standard or if it has sources of emissions that have the potential to contribute to a violation of the NAAQS in a nearby area. Therefore, EPA is designating as nonattainment those areas that do not meet the NAAQS, as measured by valid Federal Reference ozone monitors indicating violations of the 2015 ozone NAAQS, and nearby contributing areas based on EPA's 5-factor designations guidance.

EPA carefully considered the WDNR technical submissions from April 2017 and February 2018. The idea that Wisconsin precursor emissions do not contribute to Wisconsin ozone is not supported. Ozone is a secondary pollutant formed by photochemical reactions involving the primary precursor pollutants, volatile organic compounds (VOCs) and oxides of nitrogen (NO_x). Any emissions of NO_x and VOC have the potential to photochemically react to form ozone. Studies published in the peer-reviewed scientific literature show that single sources of ozone precursor emissions can have measurable nearby downwind ozone impacts.^{3,4} Maximum impacts typically occur within 50-100 km (31-62 miles) from the source and can occur up to 200 km (124 miles) away from the source. Actual sources³ and hypothetical single sources⁴ have been analyzed for their potential downwind ozone impacts. As a high-end example, a hypothetical source in northern Illinois emitting 500 tons per year (tpy) of NO_x can have a maximum 8-hour downwind ozone impact of 3.88 ppb.⁵ As a lower end example, a hypothetical source in northwest

² <http://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Links/Ordinary-High-Water-Mark-and-Low-Water-Datum/>

³ Baker, K. R. and Kelly, J. T.: Single source impacts estimated with photochemical model source sensitivity and apportionment approaches, *Atmospheric Environment* 96, 266-274, 2014.

⁴ Baker, K. R., Kotchenruther, R. A., and Hudman, R. C.: Estimating ozone and secondary PM_{2.5} impacts from hypothetical single source emissions in the central and eastern United States, *Atmospheric Pollution Research*, 7, 122-133, 2016.

⁵ EPA's Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program. Draft for Public Review and Comment. December 2, 2016.

Indiana emitting 500 tpy of NO_x can have a maximum 8-hour downwind ozone impact of 1.15 ppb.⁶ While there is evidence showing that a relatively large amount of precursor emissions originating from out-of-state are causing an ozone impact at the Wisconsin monitors, there is also evidence that precursor emissions originating in the state of Wisconsin are forming ozone in Wisconsin.⁷

Similarly, the WDNR-calculated 70-ppb contour line is not supported, for the reasons described below, as a tool to inform ozone designations. First, the WDNR-calculated 70-ppb contour does not take into consideration local precursor emissions, either with respect to magnitude or spatial distribution, nor does it take into consideration other factors pertaining to ozone outlined in EPA's designations guidance, such as meteorological factors. Second, the monitors and design values underlying the location of the WDNR-calculated 70-ppb contour were selectively chosen to achieve a desired and unsupported outcome. In creating the WDNR-calculated 70-ppb contour, WDNR fit an algebraic function to the design values of six of the eight violating monitors and one of the four attaining monitors located within four miles of the Lake Michigan shoreline as a function of the location of each of these monitors expressed as the distance in miles from the Lake Michigan shoreline.

WDNR provided explanations for why it excluded specific monitors when generating the WDNR-calculated 70-ppb contour, indicating that some of the monitors do not fall on the line generated by its algebraic function since ozone formed over the lake is not the only source of ozone to these monitors, rather these monitors also receive ozone transported from over land. WDNR seems to indicate that some Wisconsin ozone monitors receive ozone exclusively originating from over the lake and exclusively formed by out-of-state precursor emissions. There is no evidence to support the idea that Wisconsin ozone monitors are impacted exclusively by ozone formed over the lake or exclusively by precursors that have originated outside Wisconsin. Wisconsin precursor emissions can be transported over land and/or over the lake and result in ozone being formed and delivered to downwind areas in Wisconsin. Both Wisconsin precursor emissions and out-of-state precursor emissions can travel over land. Both in- and out-of-state precursor emissions can also be transported offshore with the morning land breeze, where they can react to form ozone, and later flow back onshore with the afternoon/evening lake breeze to downwind areas in Wisconsin. As a result, ozone transported over land as well as ozone formed over the lake both are impacted by emissions from within Wisconsin as well as emissions from other states. HYSPLIT trajectories indicate that Wisconsin's violating monitors receive ozone both from over land and from over the lake.

The implicit assumption in developing the WDNR-calculated 70-ppb contour is that ozone is somewhat uniform in its distribution going from the shoreline inland. While it is true that ozone generally decreases with increasing distance from the shoreline in the state of Wisconsin in counties such as Sheboygan, as evidenced by ozone monitoring data, this trend is by no means uniform, consistent, or completely predictable. Ozone production and transport varies from day to day with varying magnitudes of precursor emissions and varying meteorology, among other factors. A static WDNR-calculated 70-ppb contour does not exist in reality. Further, each portion of the eastern Wisconsin shoreline is different in terms of its magnitude of precursor emissions. For instance, the Milwaukee/Waukesha urban area releases a greater magnitude of emissions than the single county areas of Sheboygan and Manitowoc.

In many cases, as in the case of Milwaukee/Waukesha, the urban core area is the geographic origin of much of the local precursor emissions responsible for forming ozone. In the Milwaukee area, the most densely concentrated emissions sources across all emissions sectors are concentrated in the Milwaukee

⁶ EPA's Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program. Draft for Public Review and Comment. December 2, 2016.

⁷ The topic of the relative contribution of in-state versus out-of-state emissions impact on ozone detected at the violating monitors in Wisconsin is addressed in more detail in the source apportionment modeling comment summary and response section.

and Waukesha urban areas. Ozone takes time to form, and the highest concentrations tend to form downwind of the origin of the precursor emissions. Therefore, it is not surprising that the monitors located near the heart of these urban areas (where a substantial quantity of precursor emissions originate) detect lower ozone values compared to the monitors located downwind of these urban areas, which detect the ozone that can be formed as the local precursor pollutants, which also mix with emissions from upwind areas, react to form ozone while flowing downwind. Ozone monitors in urban core areas like Milwaukee/Waukesha generally measure lower ozone than monitors sited downwind of urban core areas. For example, there are ozone monitors located in the precursor origin cities of Milwaukee and Waukesha that are attaining the 2015 ozone NAAQS based on 2014-2016 data, and several monitors located downwind of these precursor originating urban areas that are violating the standard.⁸ It is also important to note that where there are high NO_x concentrations found in downtown metropolitan areas, especially near busy streets and roads, and in power plant plumes, there can be scavenging (sometimes referred to as titration) of ozone by reaction with nitric oxide (NO) to form nitrogen dioxide (NO₂) leading to localized depletion of ozone. However, as urban plumes are transported, diluted and mixed with ozone precursors present in the surrounding air, this NO₂ can lead to photochemical production of ozone downwind of the source areas. Therefore, these Milwaukee/Waukesha monitor data are consistent with the scientific understanding of ozone impacts being observed downwind of the origin of nearby precursor emissions. Further, these monitor data are consistent with the conceptual model of land/lake breeze ozone formation and transport.⁹

WDNR explained that the two attaining monitors in Milwaukee were excluded during its development of its WDNR-calculated 70-ppb contour since these monitors are impacted by “urban effects” of ozone chemistry, to which WDNR is referring to NO_x scavenging.¹⁰ By applying a power fit to a number of selectively chosen monitors as a function of distance from shoreline, the correlation coefficient, R², is 0.972, which makes the analysis, at first glance, appear as if there is a simple (and strong) relationship between the ozone monitor data as a function of distance from shoreline. This relationship is misleading in the context of ozone designations which require analyses of nearby contribution, since it does not consider local precursor emissions sources and locations relative to downwind violating monitors, nor does it consider meteorology, two of the most important factors influencing ozone formation and distribution. Therefore, it would be inaccurate to draw conclusions from the WDNR-calculated 70-ppb contour as has been done in WDNR’s April 2017 and February 2018 submittals.

⁸ Waukesha County has an attaining monitor near the center of the City of Waukesha with a 2014-2016 design value of 66 ppb. Milwaukee County has three monitors— (1) an attaining monitor (64 ppb) near the center of the City of Milwaukee, (2) another attaining monitor (68 ppb) about 3 miles north and slightly east (i.e. downwind) of the first monitor, but still in the City of Milwaukee, and (3) a violating monitor (71 ppb) downwind of the first two monitors sited in the northeastern corner of the county about 8 miles north and slightly east of the second monitor and about 12 miles northeast (i.e. downwind) of the center of the City of Milwaukee. There are two additional violating monitors (71 ppb and 73 ppb, respectively) farther to the north and generally downwind located in Ozaukee County.

⁹ In which precursor pollutants can flow out over the lake with the land breeze and become trapped in a shallow inversion layer over the lake where they photochemically react during the day to form ozone. As the inversion breaks up and the (typically afternoon time) lake breeze carries the ozone-rich air back toward the shore, the downwind monitors detect the ozone. Monitors located downwind of precursor origin cities (e.g. Milwaukee/Waukesha) and near the shoreline are well-sited to pick up the highest concentrations of ozone, to which the local population may be exposed.

¹⁰ High NO_x concentrations found in downtown metropolitan areas, especially near busy streets and roads, and in power plant plumes, there is scavenging (sometimes referred to as titration) of ozone by reaction with nitric oxide (NO) to form nitrogen dioxide (NO₂) leading to localized depletion of ozone. However, as urban plumes are transported and diluted, this NO₂ can lead to photochemical production of ozone downwind of the source areas. EPA (2013) Integrated Science Assessment for Ozone and Related Photochemical Oxidants. http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=511347.

To summarize, WDNR's method of estimating the geographic extent of air that would violate the standard is not consistent with the conceptual and practical understanding of ozone formation in urban areas, such as the Milwaukee/Waukesha area. The distance from shoreline approach oversimplifies the geographic extent of air with greater than 70 ppb ozone and it is not appropriate for determining nonattainment areas in Wisconsin, since it does not consider the ozone contribution from in-state precursor emissions, particularly those originating from Wisconsin's urban core areas. This method of delineating the geographic extent of nonattainment areas is predicated on its incorrect determination that Wisconsin precursor emissions do not meaningfully contribute to ozone at violating monitors in Wisconsin. For the reasons discussed above, the WDNR-calculated 70-ppb contour is not a valid basis for delineating nonattainment areas in Wisconsin. EPA's approximately 3.2-mile inland from the shoreline areas for Manitowoc and Sheboygan are fundamentally different than the approach that WDNR used to develop its WDNR-calculated 70-ppb contour line. EPA's roughly 3.2-mile approach is appropriate since it is based purely on measured data within these locations (specifically, Sheboygan) rather than a model fit (the WDNR-calculated 70-ppb contour) based on data points selectively chosen to achieve a desired and unsupported outcome.

Here we address the feasibility of WDNR's suggestion of using the OHWM to delineate a distance inland from the shoreline rather than EPA's roadway-based approach. The federal high-water mark for Lake Michigan is currently set at 581.5 feet.¹¹ The USACE OHWM is a jurisdictional benchmark for administering its regulatory program in navigable waterways under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The OHWM is the line on the shore coincident with the elevation contour that represents the approximate location of the line on the shore established by fluctuations of water and indicated by physical characteristics such as shelving, destruction of terrestrial vegetation, presence of litter or debris, or changes in the character of soil. WDNR did not provide details on the Wisconsin OHWM and only referenced the federal OHWM via the link to the USACE Detroit District's Regulatory Office without providing additional details or maps depicting what WDNR's suggested areas would look like if they were to be based upon the federal OHWM for Lake Michigan. Whether using the federal OHWM or simply using a standard map of the shoreline, a distance inland to delineate a nonattainment area is problematic, since the distance inland might bisect individual source facilities, thus making it difficult to regulate which part of the source is in the nonattainment area and which part of the source is outside of the nonattainment area. With county boundaries and/or roadways, it is clear as to which portion of a facility is located in a nonattainment area if a facility has several building units one of which may be located across a roadway from another.

Additional comments and responses regarding specific areas as well as the topic of contribution are summarized and addressed in further detail below.

Comment: One commenter submitted detailed concerns about the future emissions of criteria pollutants, hazardous air pollutants, and greenhouse gases from the proposed Foxconn facility in Racine County and the detrimental impact these emissions would have on air quality, human health, and the environment. The commenter cited EPA's December 22, 2017, TSD¹² and stated that Racine County is already within an EPA-designated non-attainment area for ozone. Because Foxconn will be a major source polluter of both VOCs and NOx and will account for about 5% of the annual local production of these contaminants the facility will contribute significantly to local ozone production.

EPA Response: EPA is designating a portion of Racine County as nonattainment of the 2015 ozone NAAQS due to the results of EPA's 5-factor analysis that such portion of Racine County potentially contributes to the Milwaukee area. While the 5-factor analysis includes an evaluation of emissions, it does

¹¹ <http://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Links/Ordinary-High-Water-Mark-and-Low-Water-Datum/>

¹² https://www.epa.gov/sites/production/files/2017-12/documents/wi_120d_tsd_rewrite_final.pdf

not take into consideration future projected emissions in the area of analysis. Therefore, the analysis did not consider the future emissions from the proposed Foxconn facility.

Comment: Governor Walker commented that WDNR has data and modeling to show that the vast majority of emissions leading to nonattainment come from out-of-state. WDNR (0300) commented that LADCO source apportionment modeling results show that out-of-state emissions are responsible for the elevated ozone concentrations observed at Wisconsin's lakeshore monitors, including those in the 5-county Milwaukee area. For instance, according to the model, only 7% of the ozone at Milwaukee's Bayside monitor originated from Wisconsin and much larger portions came from out-of-state (e.g., 26% from Illinois and roughly 20% from "boundary conditions" also denoted as "BC" which they interpret to represent international sources). WDNR commented that Chicago emissions dwarf those of the Wisconsin emissions, estimating that the Chicago area emits 79-81% of the NO_x and VOC emissions in the southwestern Lake Michigan area.

Several cited the source apportionment modeling in the WDNR submittal which show the contribution from the entire state of Wisconsin to be approximately 12%, 15%, and 7% at the Harrington, Grafton, and Bayside monitors respectively. Commenters believed that it takes 17,349 to 25,604 tpy of precursor emissions to make 1 ppb of ozone.¹³ One commenter indicated this would translate to ozone concentrations of 0.49, 0.41, and 1.16 ppb on the high end of the range for Racine, Washington, and Waukesha county emissions, respectively. This commenter indicated that "assuming this relationship to be true, sources in Racine County would result in an increase of no more than 0.5 ppb ozone for any monitor in Wisconsin."

EPA Response: The source apportionment modeling cited in WDNR's April 2017 submittal and February 2018 comments does not support the argument that Wisconsin emissions are not meaningfully contributing to ozone nonattainment at violating monitors Wisconsin. On the contrary, each bar chart depicting source apportionment modeling results in the form of contributions from various states, etc., to each violating monitor in Wisconsin, shows contributions from Wisconsin. Contributions from Wisconsin are approximately 15%, 12%, and 7% at the Grafton, Harrington, and Bayside monitors, respectively. Fifteen percent, 12%, and 7% roughly convert to 10.5 ppb, 8.4 ppb, and 4.9 ppb of ozone if the overall ozone impact at the violating monitors were 70 ppb. These results indicate that, according to the modeling numbers, while the contributions from Wisconsin are lower than contributions from some other states,¹⁴ these contributions are not negligible. This is consistent with EPA's analyses and conclusions, which did not rely on the use of this modeling since this modeling was not clearly documented in WDNR's April 2017 TSD. It is also important to note that WDNR interprets "BC" or "boundary conditions" as contributions from outside the U.S.; in reality, boundary conditions are a mix of international and natural sources as well as some recirculation from the U.S.

The results of the source apportionment modeling show substantial contributions from Wisconsin to all violating monitors in Wisconsin, and, therefore, do not support WDNR's argument. Rather this modeling provides further evidence that Wisconsin emissions do, in fact, contribute to the violating monitors in Wisconsin despite large contributions from upwind areas like Chicago.

With respect to the assertion that it takes 17,349 to 25,604 tpy of precursor emissions to form 1 ppb of ozone, firstly, the commenters are referencing a description of an analysis that derived these estimates by looking at changes in modeled emissions and ozone between years without accounting for other changes between years such as meteorology, biogenic emissions, and upwind US and international anthropogenic

¹³ See WDNR "Correspondence Memorandum, Ozone Air Quality Analysis for a PSD Permit for Arrowcast – Shawano," Dated June 7, 2012: "...it is estimated that it takes from 17,349 tons per year to 25,604 tons per year of total VOC and NO_x reductions to result in a 1 ppb reduction in ozone concentration."

¹⁴ For example, approximately 26% contribution from the state of Illinois for the Bayside monitor in Milwaukee County Wisconsin, which would convert to about 18.2 ppb if the overall impact at the monitor were 70 ppb.

emissions.¹⁵ Secondly, ozone formation chemistry is complex and nonlinear. It varies based upon many factors, such as magnitude of precursor emissions, local meteorology, geographical features, etc. Any emissions of NO_x and VOC have the potential to photochemically react to form ozone. Peer-reviewed scientific studies show that single sources of ozone precursor emissions can have measurable nearby downwind ozone impacts.^{16,17} Maximum impacts typically occur within 50-100 km (31-62 miles) from the source and can occur up to 200 km (124 miles) away from the source. Actual sources²⁷ and hypothetical single sources²⁸ have been analyzed for their potential downwind ozone impacts. As a high-end example, a hypothetical source in northern Illinois emitting 500 tpy of NO_x can have a maximum 8-hour downwind ozone impact of 3.88 ppb.¹⁸ As a lower end example, a hypothetical source in northwest Indiana emitting 500 tpy of NO_x can have a maximum 8-hour downwind ozone impact of 1.15 ppb.¹⁹ These examples would translate to 129 tons NO_x per ppb of ozone and 435 tons of VOC per ppb of ozone, respectively, which are 1-2 orders of magnitude lower than the numbers referenced by the commenters, which suggests serious flaws in the methodology used to derive the numbers referenced by the commenters.

Comment: WDNR commented that EPA failed to acknowledge that WDNR submitted two sensitivity modeling scenarios showing emissions reductions in Wisconsin would not meaningfully impact ozone design values along the lake and therefore local emissions have little to no impact on lakeshore ozone concentrations. One of these scenarios involved modeling a 10% reduction in both NO_x and VOC emissions from all sectors excluding on-road and biogenic emissions from a 10-county area in southeast Wisconsin. The other scenario involved “zero out” modeling of emissions from all sectors in Sheboygan County (excluding biogenic emissions). The modeling results showed that eliminating Sheboygan County emissions would not reduce the design values at the county’s monitors and the modeled emissions reduction in the 10 southeast Wisconsin lakeshore counties would not meaningfully impact ozone design values along the lake. WDNR indicated the modeling suggests that even Wisconsin’s highest-emitting counties (Milwaukee and Waukesha) do not have a meaningful impact on lakeshore ozone concentrations, which is further evidence that emissions from these two counties are overwhelmed by those from the upwind regions, including the Chicago area, which emits six to seven times more NO_x and VOC.

EPA Response: A 10% emissions cut²⁰ model simulation cannot alone be used as a contribution analysis. Due to the nonlinear nature of ozone chemistry this type of sensitivity analysis can be used to determine the impacts of the specific emissions changes modeled but cannot be used to infer the overall impact that results from total emissions from the sources in question.

When modeling precursor emissions reductions scenarios, also referred to as ozone control strategy scenarios, it is appropriate to select one precursor at a time (either VOC or NO_x) in order to get a sense of

¹⁵ See WDNR “Correspondence Memorandum, Ozone Air Quality Analysis for a PSD Permit for Arrowcast – Shawano,” Dated June 7, 2012: “...it is estimated that it takes from 17,349 tons per year to 25,604 tons per year of total VOC and NO_x reductions to result in a 1 ppb reduction in ozone concentration.”

¹⁶ Baker, K. R. and Kelly, J. T.: Single source impacts estimated with photochemical model source sensitivity and apportionment approaches, *Atmospheric Environment* 96, 266-274, 2014.

¹⁷ Baker, K. R., Kotchenruther, R. A., and Hudman, R. C.: Estimating ozone and secondary PM_{2.5} impacts from hypothetical single source emissions in the central and eastern United States, *Atmospheric Pollution Research*, 7, 122-133, 2016.

¹⁸ EPA’s Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program. Draft for Public Review and Comment. December 2, 2016.

¹⁹ EPA’s Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program. Draft for Public Review and Comment. December 2, 2016.

²⁰ As noted in the final nonattainment area TSD, the emissions cut to anthropogenic emissions (including on-road sources) in the sensitivity modeling described is likely closer to a 6-8% emissions reduction.

how emissions reductions might impact ozone in the modeling domain. This can also provide a sense of whether the ozone in the area is more sensitive to changes in NO_x or changes in VOC and provide meaningful information about the potential impact of emissions reductions and, therefore, be useful for decision-making regarding control strategies. The only scenario submitted for the 10-county area is a 10% reduction in both NO_x and VOC excluding the on-road sector. The designations are meant to consider whether total emissions contribute to nonattainment, not whether 10% of a subset of emissions contribute to nonattainment. The 10-county 10% emissions reduction scenario could have included all anthropogenic sources and looked at reducing each precursor pollutant individually, not both in the same model run. Oftentimes it is necessary to reduce emissions in the context of a modeling scenario by more than 10% to see an impact. In addition, it is inappropriate to exclude on-road emissions since designations determinations consider contributions from all anthropogenic sources in the area of interest. EPA has consistently considered vehicle emissions as part of the emissions factor in ozone designations through the evaluation of VMT patterns as part of the weight of evidence for determining boundaries for nonattainment areas.²¹

It is unclear why only Sheboygan was chosen for the zero-out run. EPA's designation of Sheboygan is primarily based on the presence of a violating monitor, and EPA's geographic extent of the nonattainment area for Sheboygan County is primarily based on the location of the attaining monitor in conjunction with WDNR's lake breeze inland penetration distance specifically with respect to the two monitors in Sheboygan County. EPA acknowledges the Sheboygan County zero-out modeling results in its TSD as part of additional information in the factor analysis for the Sheboygan County area only. However, with respect to the other areas, Sheboygan County is not the county with the largest local emissions sources. Similar zero-out runs for each county in the areas of analyses (i.e. in the Milwaukee area) could potentially have ruled out specific contributing counties. If there were minimal impacts from individual counties, then the argument that emissions in, for example, Waukesha County, do not impact the Milwaukee-area violating monitors might be convincing. In addition, a zero-out run could have been conducted for the 10-county area and include on-road mobile sources. If there were still only small impacts in a 10-county zero-out simulation, then the argument that in-state emissions do not impact the violating monitors might be convincing. In addition, the emissions sensitivity results (~0.1 ppb response) seem to contradict the source apportionment modeling results which show contributions of 7-15% (5-10 ppb) from Wisconsin. This may be due to the choice of emissions reductions scenarios and to nonlinear chemistry making it inappropriate to extrapolate a 10% partial emissions reduction to estimate total contribution. At any rate, the results of the 10-county sensitivity scenario are not useful in terms of supporting its request for attainment for the entire state or, barring that, narrow parcels of nonattainment areas near the Lake Michigan shoreline around the violating monitors.

Comment: WDNR commented that EPA did not include or reference WDNR's wind rose analyses, which more accurately reflect the complex lakeshore environment than does the HYSPLIT back trajectory model relied upon by EPA, and which confirms that ozone concentrations exceeding 70 ppb occur when winds originate offshore. EPA inappropriately relied on HYSPLIT back trajectories to make a connection between local emissions and locally-monitored ozone levels. WDNR believes that only the 100 m HYSPLIT back trajectories are potentially relevant when considering associations with ground-level monitored ozone levels. Most traveled over the lake (high level trajectories represent synoptic and not local flow). In contrast, direct measurements at these monitors found that, for virtually every single hour with ozone concentrations above 70 ppb, the air masses came from over the lake: from 155-185 degrees for the Harrington Beach monitor and 135-175 degrees for the Grafton monitor. The wind roses from the other lakeshore monitors showed similar results: ozone-rich air was delivered to the monitors

²¹ The EPA issued guidance on February 25, 2016 that identified important factors that the EPA intends to evaluate in determining appropriate area designations and nonattainment boundaries for the 2015 ozone NAAQS. Available at <https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs>

almost exclusively from over Lake Michigan. This comparison conclusively shows that HYSPLIT underestimates the role of the lake in delivering ozone-rich air to this monitor and overestimates the impact of emissions from inland portions of the counties under discussion.

Some commenters believed there is no meaningful contribution from Racine, Washington, and Waukesha counties. Several of these commenters cited the wind roses in WDNR's April 2017, submittal, specifically the ones from the Harrington Beach and Grafton monitoring sites which show winds from the south-southeast during days in 2014-2016 with 1-hour ozone values greater than 70 ppb. These commenters also cited an April 17, 2016, HYSPLIT 48-hour back trajectory from the Bayside monitor in WDNR's submittal, showing air parcels traveling from the southeast and over the lake. Other commenters believed that the EPA HYSPLIT back trajectories support excluding Wisconsin counties since the lowest altitude trajectories are from over the lake. Specifically, one commenter believed meteorological data do not support the finding that Racine County emissions contribute (e.g. low level trajectories are mainly coming from over the lake and even on days that surface or mid to upper level air masses cross over Racine County, these air masses have crossed over the greater Chicago area with its significantly greater contribution of ozone precursors prior to crossing over Racine County. One commenter seemed to believe the location of where the back trajectories originate is indicative of where the emissions are coming from.) Another commenter stated that exceedances have only occurred on days and times when wind is carrying ozone from over Lake Michigan (and that EPA ignored this fact in its TSD). This commenter indicated that the Racine County population has declined and less than one quarter of Racine County residents commute to or through Milwaukee or Ozaukee counties, so the population and activity data indicate minimal contribution. Another commenter believed that the Milwaukee area monitors have never exceeded a standard when monitoring air coming from these counties, rather, the monitors are measuring ozone produced from precursor emissions generated elsewhere.

EPA Response: WDNR seems to use its wind roses to conclude that since the hours of high ozone typically occur when the local wind direction at the monitors is generally (but not at all times) coming from over the lake, that the ozone is coming from precursor emissions originating out-of-state. WDNR's wind rose data represents the hours of the day when ozone was above the standard. Ozone is typically highest in the afternoon. This is also the time of day that the localized lake breeze typically occurs. Therefore, it is not surprising that monitor-site specific wind direction data show this. As explained previously, precursor emissions from Wisconsin (e.g. from the high emitting Milwaukee/Waukesha urban area) can travel over land and/or flow offshore with the morning land breeze, combine with out-of-state emissions, form ozone during the day, and flow back onshore with the afternoon/evening lake breeze. In other words, that the wind roses show the wind direction was oftentimes predominately from over the lake during afternoon/evening hours of high hourly ozone detected at the monitors, does not necessarily mean the precursor emissions originated from out-of-state. Hourly afternoon exceedance day wind rose data cannot be relied upon to provide evidence about where ozone precursor emissions originate. EPA's monitor-specific exceedance day 24-hour HYSPLIT back trajectories provide evidence about the general locations of precursor emissions sources, whereas WDNR's wind direction data essentially only indicates the local wind direction during times of high hourly ozone. Since the HYSPLIT back trajectories represent the past 24 hours from midnight on exceedance days, and ozone takes time to form, the 24-hour HYSPLIT back trajectories represent a sufficient temporal and spatial scale from which to glean evidence not only of the direction from which the ozone air mass came but also evidence pertaining to the general locations of the precursor emissions sources.

WDNR's wind roses show that the wind direction for most of the near lakeshore monitors during the 2013-2016 hours of high ozone (>70 ppb) was predominately from the southeast quadrant, except as follows. For the two Sheboygan sites, the predominant wind direction was from directly south or slightly south southwest (e.g. from the direction of the Milwaukee area). For the Milwaukee Health Center site, the wind direction was often from the south southeast, but also often from the southwest. For the Door County (Newport) site, the wind direction was often from the southwest/south southwest. WDNR seemed

to use the wind roses to conclude that since the hours of high ozone typically occur when the local wind direction at the monitors is generally (but not at all times) coming from over the lake, that the ozone is coming from precursor emissions originating out-of-state. Wind roses that depict wind speed and direction reported in surface observations can be used to estimate wind speed and frequency for the immediate area of the observation, in this case the ozone monitor site, but that representativeness diminishes with distance from the site. Extrapolating the wind pattern depicted in a wind rose to a larger area affords a great deal of influence to the wind measured at that one site, ten meters above the ground, and to any small-scale geographic influences that may affect wind at that site. The HYSPLIT trajectories used in EPA's analyses were determined by the Eta Data Assimilation System (EDAS), an archive of meteorological parameters across a nationwide grid at many vertical levels and incorporating surface and upper-air observations as well as wind profiler, radar, and aircraft data. Unlike wind roses, HYSPLIT backward trajectories are just as representative of atmospheric conditions at a distance from the trajectory starting point as they are at the starting point. HYSPLIT trajectories based upon EDAS more accurately reflect the pertinent meteorological influences in the area under examination than does a wind rose based upon single-point observations. HYSPLIT back trajectories at starting heights 100, 500, and 1000 meters above ground level represent levels typically within the atmosphere's mixed layer at the monitor, yet above the influence of local terrain. Land-water interfaces like these Wisconsin areas are particularly susceptible to shallow mixed layers in which high ozone can form from photochemical reactions of precursor emissions, and yet can also be susceptible to ozone transport associated with the influence of large-scale high-pressure systems.²² Trajectories at these three starting heights are relevant in assessing transport of air parcels for potential contribution to ozone concentrations at the trajectory starting points. For the locations in this comment, trajectories at all three heights, including the lower level (100 m) trajectories, transited the areas that EPA is designating as nonattainment of the 2015 ozone NAAQS. The lower level (100 m) trajectories do not exclusively occur over the lake.

Comment: WDNR commented that despite many lines of credible evidence provided by WDNR showing that local emissions have little to no impact on areas of Wisconsin where ozone levels exceed 70 ppb, EPA's intended nonattainment areas appear designed to include as many local sources of these emissions as possible. WDNR comments that local precursor emissions do not meaningfully impact the ozone levels at the violating monitors, and therefore EPA should not consider in-state emissions contributions. WDNR also commented that in-state emissions reductions would not meaningfully impact the ozone levels at the violating monitors. For example, WDNR indicates that NO_x and VOCs from the 5-county Milwaukee area decreased by 25% and 33%, respectively, from 2008 to 2014, however, ozone design values in the Milwaukee area remained relatively flat during this period. With respect to Manitowoc County, WDNR believed that EPA should not consider emissions sources located in the county since WDNR believes emissions are low and ozone-rich air reaches the Manitowoc County monitor exclusively from over Lake Michigan (as discussed in the wind rose section above). WDNR indicated that Manitowoc County emissions are similar in magnitude to those of Ozaukee County and Door County, which, with respect to Door County, EPA concluded "do not significantly contribute to ozone concentrations in the area itself or to other areas."

EPA Response: EPA notes that any emissions of NO_x and VOC have the potential to photochemically react to form ozone. Studies show that single sources of ozone precursor emissions can have measurable nearby downwind ozone impacts.^{23,24} Maximum impacts typically occur within 50-100 km (31-62 miles)

²² Dye, T. S., Roberts, P. T., and Korc, M. E.: Observations of transport processes for ozone and ozone precursors during the 1991 Lake Michigan Ozone Study, *J. Appl. Meteorol.*, 34, 1877-1889, 1995.

²³ Baker, K. R. and Kelly, J. T.: Single source impacts estimated with photochemical model source sensitivity and apportionment approaches, *Atmospheric Environment* 96, 266-274, 2014.

²⁴ Baker, K. R., Kotchenruther, R. A., and Hudman, R. C.: Estimating ozone and secondary PM_{2.5} impacts from hypothetical single source emissions in the central and eastern United States, *Atmospheric Pollution Research*, 7, 122-133, 2016.

from the source and can occur up to 200 km (124 miles) away from the source. Actual sources¹⁶ and hypothetical single sources¹⁷ have been analyzed for their potential downwind ozone impacts. As a high-end example, a hypothetical source in northern Illinois emitting 500 tpy of NO_x can have a maximum 8-hour downwind ozone impact of 3.88 ppb.²⁵ As a lower end example, a hypothetical source in northwest Indiana emitting 500 tpy of NO_x can have a maximum 8-hour downwind ozone impact of 1.15 ppb.²⁶ Therefore, it is important to evaluate nearby sources of potentially contributing precursor emissions.

Regarding the comment about the magnitude of Door County emissions with respect to other individual counties, EPA's initial analysis for the full county justified reducing the extent of the nonattainment area to only the northern portion of Door County, due to violation not contribution as per the factor analysis. The emissions from this portion of the county can reasonably be estimated at about two thirds (2/3) that of the full county emissions which comes out to approximately 2,439 tpy NO_x and 1,626 tpy VOC. While these amounts of precursor emissions have the potential to form a meaningful concentration of ozone, EPA carefully considered Wisconsin's request to classify this area as a Rural Transport Area (RTA). In order to qualify as an RTA, the Administrator must find that the sources of VOC and NO_x emissions within the area do not make a significant contribution to the ozone concentrations measured in the area or in other areas.²⁷ Given that Door County is the last (northernmost) county in the series of eastern Wisconsin counties receiving transport from upwind high-emitting urban areas like Green Bay, Milwaukee, and Chicago, EPA was able to comfortably use our discretion to classify this area as an RTA. A similar analysis and determination is not appropriate for the other areas that the commenter mentioned, specifically Ozaukee County, which is part of the Milwaukee CSA or Sheboygan and Manitowoc counties which, while they are each their own area, are immediately downwind of the Milwaukee area and each are adjacent to a metropolitan statistical area (CSA/CBSA), which disqualifies them as potential RTAs, whereas the northern portion of Door County is not adjacent to a CSA/CBSA. EPA is designating the northern portion of Door County nonattainment based on the 2016 violation of the 2015 ozone NAAQS in response to the Court remand in which the D.C. Circuit found that EPA "utterly failed to explain why it believes violating design values vanish at the boundaries of a state park."

To reiterate, the fact that an area located along a land-water interface is affected by lake breeze meteorology does not mean that the precursor emissions are coming exclusively from out-of-state. It means the local meteorology has the potential to 1) transport precursor emissions offshore (from in-state, as well as out-of-state, and any emissions that are coming from other sources in the area e.g. low-flying aircraft, vessels on the water, etc.) 2) trap precursor emissions in a shallow layer of air above the surface of the water, where they can photochemically react to form ozone, and 3) transport ozone back onshore (typically in the afternoon/evening).

With respect to the comment regarding NO_x and VOCs from the 5-county Milwaukee area decreasing from 2008 to 2014, and ozone design values remaining relatively flat, a variety of factors are involved in ozone formation including magnitude of precursor emissions, NO_x-sensitive versus VOC-sensitive chemical environments, meteorology, photolysis rates, etc. Therefore, it is not surprising that ozone design values fluctuate from year to year and hover around a general value despite precursor emissions reductions, particularly if both NO_x and VOC emissions have been reduced over time. Reductions in both NO_x and VOC (as opposed to one or the other strategically chosen based on chemical environment i.e. NO_x-sensitivity or VOC-sensitivity) have the potential to result in ozone not being meaningfully reduced.

²⁵ EPA's Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program. Draft for Public Review and Comment. December 2, 2016.

²⁶ EPA's Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program. Draft for Public Review and Comment. December 2, 2016.

²⁷ Clean Air Act Section 182(h).

It is also well understood that inter-annual variation in meteorology impacts ozone concentrations from year to year making it difficult to differentiate the signal from emissions changes from the impacts of year-specific meteorology when looking only at 2 discrete years²⁸. For this reason, studies evaluating ozone trends due to emissions changes generally aim to use at least 10-years of data²⁹. In fact, ozone design values in Wisconsin have generally decreased over time when looking at a longer period of time than just 2008-2014. EPA notes that the reference in the WI TSD provided meteorology-adjusted ozone trends covering a longer time-period (2000-2015) which do show decreasing trends in Milwaukee. WDNR did not provide any information on meteorology-adjusted trends for the relatively short time-period (2008-2014) discussed in their submission or address changes in contributing sources outside of the Milwaukee area over this time-period. EPA also notes that over the 2008-2014 time period there were also reductions in NO_x and VOC emissions from upwind areas including Chicago. Using the WDNR argument, they would also have to conclude that Chicago emissions do not contribute to the ozone in Wisconsin at monitors for which ozone did not decrease over this time period. This is clearly in conflict with WDNR's own conclusions and is also not consistent with EPA's conclusions and highlights the limitations of making a contribution determination based on ozone trends over short time periods that do not account for the effects of interannual meteorological variability.

Milwaukee, WI

Comment: In addition to WDNR, several parties commented specifically on the Milwaukee intended nonattainment area. Some of their comments are addressed in the final TSD and other comments are addressed below. These commenters generally wanted EPA to designate Wisconsin as attainment or reduce the size of the intended nonattainment area(s). It should be noted that one commenter represented portions of Ozaukee, Washington, Sheboygan, Fond du Lac, and Calumet counties. Some of these commenters did not want Waukesha, Washington, and Racine County and another commenter did not want the City of Waukesha to be included in the nonattainment area. Some of these commenters believed if there is a nonattainment boundary, it should be very similar to the narrow strips of land from the shoreline inland encompassing the violating monitors per the technical analysis document submitted to EPA by WDNR on April 7, 2017. Commenter 0266 specifically requests that EPA reconsider Racine County's intended designation status or, in the alternative, reduce the geographic boundary of the proposed nonattainment zone. These commenters provided the following supporting information, which EPA addresses below along with WDNR's additional comments that were specific to the Milwaukee area.

EPA Response: EPA has revised the nonattainment area from its intended designation area and only a portion of Racine County is nonattainment as opposed to the full county. This, along with the rest of the nonattainment area, captures both the violating monitors and sources contributing to those violations (Please see the TSD for Wisconsin).

Comment: WDNR commented that EPA's inclusion of counties with attaining monitors (e.g. Waukesha County) as part of intended nonattainment areas was inappropriate. Some commenters indicated that one or more of the following counties did not have violating monitors: Washington, Waukesha, and Racine. (See EPA Response below)

Comment: WDNR notes that EPA is considering partial county designations of Grundy and Kendall counties in Illinois under circumstances that compare favorably to Milwaukee area. Despite being part of the Chicago IL-IN-WI CSA, only the parts of Grundy and Kendall counties most contiguous to the urban area of the CSA are proposed by EPA to be designated nonattainment of the 2015 ozone NAAQS; EPA

²⁸ Cox, W.M., and Chu, S.-H. (1993) Meteorologically Adjusted Ozone Trends in Urban Areas: A Probabilistic Approach, *Atmospheric Environment*, 27B (4), 425-434.

²⁹ Fleming, ZL, et al. 2018 Tropospheric Ozone Assessment Report: Present-day ozone distribution and trends relevant to human health. *Elem Sci Anth*, 6: 12. DOI: <https://doi.org/10.1525/elementa.273>

explains that this is due to their low emissions relative to other areas. Without explanation, EPA failed to consider this approach in the Milwaukee area. (See EPA Response below)

EPA Response: Per the CAA, EPA must designate an area nonattainment if it has an air quality monitor that is violating the standard and/or if it has sources of emissions that have the potential to contribute to a violation of the NAAQS in a nearby area. As described in more detail below, the mere fact that a county contains an attaining monitor is not sufficient evidence on its own that the county should not be designated attainment. Therefore, as explained in previous responses, the WDNR-calculated 70-ppb contour is not a valid tool for delineating nonattainment areas. As is also explained in previous responses, there is no basis for the idea that Wisconsin ozone is exclusively formed from precursor emissions originating out-of-state. Additionally, it is inappropriate to analyze Ozaukee County in a similar fashion to that of Door County, since Ozaukee County is not a single county area, nor is it a candidate for classification as an RTA. Ozaukee County is part of the Milwaukee CSA, which is a relatively large urban area.

Waukesha, Washington, and Racine counties were not included in the Milwaukee nonattainment area based on monitoring data. These counties, like other counties with attaining monitors (in other nonattainment areas) across the country (see Table 2, below, for a few examples), were included based on a contribution analysis as described in EPA's TSD. EPA determines nonattainment areas based on violating monitors and nearby areas that may be contributing based on a 5-factor "weight of evidence" analysis. EPA's TSD goes into detail on the contribution analysis, which is why Waukesha, Washington, and Racine counties are included in the nonattainment area.

At the time of designations in April of 2018, valid, certified monitoring data in Racine County were unavailable and, thus, not used in designations decisions. Racine County did not have a 2014-2016 design value because, in 2013, EPA allowed WDNR to shut down the Racine County monitor, which was located in a dilapidated building presenting unsafe working conditions, and move it to a new location approximately 5 miles north of its original location where it had been located since 1977. The monitor was not installed and operational at its new location prior to the start of the 2014 ozone season resulting in a gap in continuous ozone monitoring and an invalid 2014-2016 DV. Further, in April 2018, 2017 monitoring data were preliminary (i.e., not yet certified). Data indicated a preliminary 2017 DV of 74 ppb (with truncation), which was the result of averaging the preliminary 2017 4th high of 80 ppb with a 2015 4th high of 68 and a 2016 4th high of 76.³⁰

The Milwaukee area, like all of the eastern Wisconsin shoreline, is subject to lake breeze meteorology. As explained in EPA's TSD, the meteorology factor in conjunction with the emissions and emissions-related data factor, are the most relevant factors in determining the contributing counties to include in the Milwaukee nonattainment area. The Milwaukee emissions by county are listed below in Table 1, and, to put it in perspective, Table 2 shows emissions from contributing counties without violating monitors at the time of designation in other nonattainment areas in other parts of the region. These counties, like the Milwaukee counties, were also included as contributing counties based on meteorology and emissions. The emissions for each of these counties is on the order of magnitude of the emissions in the Milwaukee counties, and in some cases (e.g. Waukesha County), the Milwaukee area county emissions are greater than the contributing counties in other nonattainment areas listed, for perspective, in Table 2. In some cases, these Table 2 counties had fewer trajectories passing through them than the Milwaukee counties (see EPA's TSDs associated with each nonattainment area for the HYSPLIT trajectory maps for the counties in Table 2). The precursor emissions from each of the five Milwaukee area counties are substantial enough to contribute to the nearby violating ozone monitors, and the meteorology is such that the ozone exceedance day back trajectories (at each of the three levels, including 100 m, 500 m, and 1000

³⁰ The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50, appendix U.

m) traveled over these counties (including Racine, Waukesha, and Washington), prior to reaching the violating monitors in Milwaukee and Ozaukee counties. That alone is enough to designate these Milwaukee counties as nonattainment based on the violating monitors and contribution analysis. Additionally, since Milwaukee is located along a land-water interface and is sometimes impacted by lake breeze meteorology, which can result in lower atmospheric mixing heights, which can trap the precursor pollutants and thus concentrate the photochemical reaction product (ozone), the Milwaukee area is thus potentially even more susceptible to ozone pollution than say the areas listed in Table 2, which are not located by land-water interfaces (with the exceptions of Cleveland and Detroit, which are also located along the Great Lakes). Therefore, as explained in EPA's TSD, the nearby contributing counties and the violating counties are both included in the overall Milwaukee nonattainment area.

Table 1: Milwaukee Area Emissions by County

| Milwaukee Area | NO_x (tpy) | VOC (tpy) |
|--------------------------------------|-----------------------------|------------------|
| Milwaukee (violating & contributing) | 22,012 | 17,016 |
| Waukesha (contributing) | 9,685 | 10,526 |
| Racine (contributing) | 4,153 | 4,296 |
| Washington (contributing) | 3,543 | 3,625 |
| Ozaukee (violating & contributing) | 3,107 | 2,003 |

Table 2: Contributing Emissions by County of other Nonattainment Areas in the Region

| Contributing counties without violating monitors at the time of designation | NO_x (tpy) | VOC (tpy) |
|--|-----------------------------|------------------|
| Washtenaw, MI (Detroit) | 9,682 | 9,304 |
| Livingston MI (Detroit) | 5,662 | 5,508 |
| Delaware OH (Columbus) | 4,908 | 4,838 |
| Fairfield OH (Columbus) | 4,360 | 3,741 |
| Licking OH (Columbus) | 4,285 | 4,733 |
| Clark, IN (Louisville) | 4,157 | 4,253 |
| Medina OH (Cleveland) | 3,750 | 4,646 |
| Floyd, IN (Louisville) | 3,686 | 2,572 |
| Monroe IL (St. Louis) | 2,682 | 1,171 |

With respect to the comment regarding the partial counties of Kendall and Grundy included in the Chicago nonattainment area, this would be analogous to going back and grabbing additional emissions sources in the outer or "collar" counties of the Milwaukee CSA, for example there is a large point source in the southeast corner of Jefferson County, WI. There also appears to be a large point source in Dodge County near the border of Washington County based on the 2014 NEI. In its analysis for the Milwaukee area contained in the Wisconsin TSD, EPA eliminated Dodge, Jefferson, and Walworth counties from the initial area of analysis due to the results of the 5-factor analysis.

Comment: To one commenter it appeared EPA proposed to include the 5-county area because EPA considered the 5 counties collectively to be one statistical area. Commenter pointed to EPA designations guidance explaining that EPA methodology typically starts with a CSA or CBSA but that each area is analyzed on a case-by-case basis and asks that EPA use its discretion to designate a smaller area for the Milwaukee nonattainment area based on supporting info (see other comments and responses with respect to the supporting info from this commenter).

EPA Response: As per our long-standing practice, EPA typically starts with the larger of the CSA or the CBSA as the area of analysis for ozone nonattainment area designations.³¹ The Milwaukee CSA is an 8-county area. EPA’s final TSD addresses why the final nonattainment area is smaller than the CSA.

Comment: A couple of commenters noted that the Milwaukee area experiences lake breeze meteorology just like Sheboygan and Manitowoc counties and commenter did not think that EPA addressed the lake breeze meteorology with respect to the Milwaukee area. One commenter indicated, “It is WDNR’s opinion that because pollutants travel exclusively on coastal breezes and are detected by monitors in close proximity to the coastline, it is unfair to use data from these monitors as justification for county-wide non-attainment designations. This is an assessment shared by the EPA regarding the Sheboygan County coastal air monitor. Because the EPA has already demonstrated agreement with this justification for Sheboygan County, it should apply that same determination to Ozaukee County air monitors.”

EPA Response: That the Milwaukee area experiences lake breeze meteorology is addressed in EPA’s final TSD for the nonattainment area. EPA’s 5-factor contribution analysis, which included consideration of lake breeze meteorology and local precursor emissions, started with the 8-county Milwaukee CSA. That an area experiences lake breeze meteorology is alone not mutually exclusive with a determination that an area may also contribute to its own ozone violations. Sheboygan and Manitowoc are separate areas. For each area (Sheboygan and Manitowoc), the initial area of analysis was the full county. For each, the 5-factor contribution analysis included consideration of lake breeze meteorology and local precursor emissions. EPA notes that a reason EPA was able to justify honoring Wisconsin’s request to reduce the size of the Sheboygan County area from a full county to a partial county area is the existence of the second ozone monitor in Sheboygan county which is attaining the standard coupled with WDNR’s lake breeze inland penetration distance analysis specific to the two Sheboygan County monitors. EPA extended that reasoning to Manitowoc County (despite Manitowoc not having an inland attaining monitor), since Manitowoc County is adjacent to and immediately north of Sheboygan County. EPA’s approximately 3.2-mile inland from the shoreline areas for Manitowoc and Sheboygan are fundamentally different than the approach that WDNR used to develop its WDNR-calculated 70-ppb contour line. EPA’s roughly 3.2-mile approach is more appropriate since it is based purely on measured data within these locations (specifically, Sheboygan) rather than a model fit (the WDNR-calculated 70-ppb contour) based on data points selectively chosen to achieve a desired and unsupportable outcome. The 3.2-mile approach is not relevant to the Milwaukee area.

Comment: Some commenters claimed that the LADCO source apportionment modeling in the WDNR submittal shows approximately 20% contribution from international transport and commenter indicated that photochemical modeling from the Midwest Ozone Group shows this as well. Two commenters stated the following: “Notwithstanding any other provision of law, any State that establishes to the satisfaction of the Administrator that, with respect to an ozone nonattainment area in such State, such State would have attained the national ambient air quality standard for ozone by the applicable attainment date, but for emissions emanating from outside of the United States, shall not be subject to the provisions of section 7511(a)(2) or (5) of this title or section 7511d of this title [of the CAA, and] since Wisconsin has shown, clearly, that more than 20% of the ozone concentration at violating monitors is from sources outside of the United States, our state qualifies for this relief. As a result, U.S. EPA should make clear that those provisions of the Clean Air Act will not apply to the proposed nonattainment zones in any final action on this matter.” One commenter believed the EPA should find that Wisconsin qualifies for the exemptions set forth in Section 179B of the CAA related to areas impacted by international emissions.

EPA Response: It should be noted that the commenters seem to be interpreting “BC” or “boundary conditions” as contributions from outside the U.S., in reality, boundary conditions are a mix of international and natural sources as well as some recirculation from the U.S. However,

³¹ <https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs>

as several commenters identify, the language in section 179B(b) of the CAA may provide regulatory relief “...with respect to an ozone nonattainment area...” if the affected state can establish “to the satisfaction of the Administrator” that the subject area “would have attained the [NAAQS] but for emissions emanating from outside of the United States...” While CAA section 179B recognizes the possibility that certain nonattainment areas may be impacted by ozone or ozone precursor emissions from international anthropogenic sources beyond the regulatory jurisdiction of the state, section 179B’s specific remedies only apply to designated *nonattainment* areas. Section 179B does not provide the authority to exclude monitoring data influenced by international transport from regulatory determinations related to attainment/nonattainment, including area designations for new NAAQS. Similarly, section 179B does not provide the authority to classify an area with a lower classification than indicated by actual air quality or relax any mandatory control measures associated with the area’s classification. For designated nonattainment areas, an approved “but for” analysis prepared under section 179B(a) as part of an attainment plan/demonstration provides relief from attainment plan disapproval and any accompanying sanctions or Federal Implementation Plan. An approved “but for” analysis prepared under section 179B(b)-(d), as part of an attainment determination, provides relief from a finding of failure to attain and reclassification (e.g., relief could come in the form of certain fee provisions (section 185) or relief from bump-ups).³² The EPA encourages affected air agencies to coordinate with their EPA Regional office to identify approaches to evaluate the potential impacts of international transport and to determine the most appropriate information and analytical methods for each area’s unique situation. The EPA will also work with states that are developing attainment plans for which section 179B is relevant, and ensure the states have the benefit of the EPA’s understanding of international transport of ozone and ozone precursors. To assist in this effort, EPA has developed the following implementation tools to help states assess the potential contributors to transported ozone: ozone/wildfire exceptional events implementation guidance,³³ stratospheric ozone intrusion exceptional events implementation guidance,³⁴ and technical guidance on preparing approvable demonstrations under CAA section 179B.³⁵

Comment: One commenter indicated that Racine, Waukesha, and Washington County emissions are decreasing ozone formation at the Ozaukee County monitors and commenter 0247 is concerned that EPA has not accounted for the “dis-benefit” of controlling NO_x in these three counties.

EPA Response: No evidence was submitted to support the idea that precursor emissions from Racine, Waukesha, and Washington County are responsible for reducing ozone concentrations detected at the Ozaukee County monitors. Perhaps the commenters are referring to NO_x scavenging? High NO_x concentrations found in downtown metropolitan areas, especially near busy streets and roads, and in power plant plumes, can result in scavenging (sometimes referred to as titration) of ozone by reaction with NO to form NO₂ leading to localized depletion of ozone. However, as urban plumes are transported and diluted, this NO₂ can lead to photochemical production of ozone downwind of the source areas. In addition, in areas that experience localized titration chemistry, this impact can often be reversed with

³² The regulatory relief associated with attainment plans and demonstrations and provided in CAA section 179B(a) applies to all NAAQS pollutants. Sections 179B(b)-(d) contain essentially the same regulatory relief provisions related to attainment determinations, but the sections apply to different pollutants with section 179B(b) applying to ozone, section 179B(c) applying to carbon monoxide and section 179B(d) applying to particulate matter.

³³ Currently available at <https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance>

³⁴ Currently available at <https://www.epa.gov/air-quality-analysis/guidance-preparation-exceptional-events-demonstrations-stratospheric-ozone>

³⁵ Currently available at https://www.epa.gov/sites/production/files/2020-12/documents/final_caa_179b_guidance_december_2020_with_disclaimer_ogc.pdf

large enough reductions in local NO_x emissions. Perhaps the commenters are referring to NO_x-sensitivity versus VOC-sensitivity with respect to ozone formation? After a portion of a state is designated as nonattainment, the state is responsible for attainment planning requirements including reductions in precursor emissions. The state has some discretion when meeting the CAA requirements with respect to focusing control efforts on the precursor emissions that will be most effective in reducing ozone concentrations. The state may investigate whether an area is NO_x-sensitive, VOC-sensitive, or transitional, and focus precursor emissions reductions efforts accordingly.

Comment: One commenter thought that Racine County is similar to Sheboygan, Manitowoc, and Kenosha counties with respect to emissions, population density, VMT, etc. and should be treated similarly.

EPA Response: Racine County is part of the Milwaukee CSA and therefore not a single county initial area of analysis like Sheboygan and Manitowoc. Racine County is upwind of the violating monitors in the Milwaukee area of analysis, whereas Kenosha County is the downwind-most county of the Chicago area of analysis and contains two violating monitors. The partial for Racine was determined based on spatially allocated emissions information. See other comments and responses for information on why EPA was able to propose partial county nonattainment areas for Sheboygan and Manitowoc, and why the rationale was specific to those two counties and not relevant to other areas, like the Milwaukee area counties including Racine.

Comment: One commenter who resided in Milwaukee and was affected by ozone pollution, noted that ozone pollution has a direct effect on the commenter's physical well-being and longevity. This commenter was also affected by the imposition of ozone pollution regulations by being subject to motor vehicle emissions testing. The commenter cited a news article referring to Wisconsin's request to set aside a recent federal finding that southeast Wisconsin is violating new and tougher emissions standards for smog and conclude the state is complying with the law. Short of that, the state is recommending federal officials carve out narrow strips of land of a few miles along the Lake Michigan shoreline as violating the new standard for ozone pollution and declare the rest of the state in compliance. The commenter believed that this request to weaken air pollution regulations in southeast Wisconsin should be denied. The commenter believes the citizenry of Wisconsin has paid too much of a price to attract a foreign manufacturing corporation, Foxconn, to locate in southeast Wisconsin. The commenter believed that no matter how much Wisconsin elected officials want this corporation to do business in Wisconsin, this corporation must be required to do business in the same manner as all other Wisconsin and U.S. businesses, which means its operations cannot be exempted from engaging in environmentally destructive activities. The commenter asked EPA to enforce the standards already in place and to do no more than what EPA is tasked to do and is already doing.

EPA Response: The commenter seems to be referring to Wisconsin's recommendation that EPA foremost designate the entire state as attainment of the 2015 ozone NAAQS or, barring that, only narrow parcels of nonattainment land encompassing the violating monitors near the shoreline of Lake Michigan. The commenter also seems to be referring to EPA's intent to designate some part of the Milwaukee area as nonattainment of the 2015 ozone NAAQS based on our analysis of violating monitors and nearby contributing areas. EPA acknowledges the receipt of this comment. EPA's final nonattainment area for Milwaukee is addressed in the final TSD for the Wisconsin nonattainment areas. In this analysis EPA has done no more than it is tasked with doing, which is to, in accordance with CAA section 107(d), designate as nonattainment all areas with monitor[s] that is [are] violating the 2015 ozone NAAQS and nearby areas that contribute to the violation[s].

Sheboygan County, WI

Comment: A couple of commenters believed the entirety of Sheboygan County should be designated attainment. However, if EPA designates part of the county as nonattainment, one commenter provided a

list of roadways which create a narrower nonattainment boundary than EPA's intended boundary (see docket for specific roadways). This commenter also provided a list of roadways which create a narrower nonattainment boundary than EPA's intended boundary (see docket for specific roadways). Several commenters believed that the Kohler Andrae monitor in Sheboygan county is improperly sited. Specifically, one of these commenters indicated that this monitor is upwind of the majority of Sheboygan County sources and dominated by out-of-state transport, and a commenter indicated that it is misplaced according to a 1998 EPA document.³⁶ Two commenters indicated the Haven monitor (as opposed to the Kohler Andrae monitor) is properly sited downwind and measuring air from activity within the county. One commenter believed the Haven monitor should be the only monitor used for regulatory purposes in Sheboygan County and one commenter believed EPA should disregard the Kohler Andrae monitor. One commenter indicated that the LADCO modeling (WDNR April submittal) shows the entire state of Wisconsin contributes less than 10% of ozone measured at Kohler Andrae monitor. One commenter attached the 2017 LADCO white paper on the Lake Michigan Ozone Study³⁷ to a comment letter indicating that the commenter believes the Kohler Andrae monitor is reading 98% ozone that has been transported from outside Sheboygan County and that Sheboygan County NO_x emissions account for 2% of the total NO_x emissions in Wisconsin.

With respect to Sheboygan County, while WDNR recommended attainment for the entire state as per the Governor's recommendation, if EPA designates a portion of Sheboygan County as nonattainment, WDNR believed that the boundary should be based on the distance from shore approach and no more than 2.3 miles inland, which is a location consistent with the WDNR-calculated 70-ppb contour developed by WDNR. If EPA does not set the boundary at 2.3 miles inland, then WDNR believed it should be no more than 2.9 miles inland, which is the location determined by comparison of design values at Sheboygan's two ozone monitors as described in DNR's April 2017 TSD. Wisconsin did not want the boundary to be 3.2 miles inland (based on the location of the Haven monitor) nor based on roadways like EPA intends, since the Haven monitor has a design value of 69, indicating to Wisconsin that the attainment level air quality would be found between this monitor and the lakeshore and that that any nonattainment area boundary should be to the east of this monitor. Wisconsin also states that Sheboygan County ozone concentrations are heavily impacted by out-of-state transport and unfavorable meteorological and geographic factors and are not affected by local sources of emissions. Industrial emissions comprise less than 10% of county NO_x and VOC emissions and are already well controlled. The county's largest source of NO_x emissions (Edgewater Generating Station) has significantly reduced emissions since 2011 and forecasts more reductions in future years.

EPA Response: As explained in previous responses, the WDNR-calculated 70-ppb contour is not a valid tool for delineating nonattainment areas. As explained in EPA's TSD, the synthesis of the 5-factor analysis including the location of the attaining monitor at 3.2 miles inland in conjunction with the lake breeze inland penetration distance analysis conducted by WDNR, suggest that the nonattainment area is generally occurring east of the attaining monitor.

Regarding the comments referring to the siting of the violating monitor, 40 CFR part 58, Appendix D, provides network design criteria including site types and siting scales (Table D-1). WDNR has designated the Sheboygan-Kohler site as a regional transport/maximum ozone concentration site and the Sheboygan-Haven site as a population exposure site in both its EPA-approved annual network plan and in EPA's Air Quality System. Wisconsin's annual network plan was approved by EPA on September 1, 2017 and includes statements affirming compliance with 40 CFR part 58, Appendix E, Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring for each site in Wisconsin's ambient monitoring

³⁶ U.S. Environmental Protection Agency, "GUIDELINE ON OZONE MONITORING SITE SELECTION." EPA-454/R-9 8-002, August 1998.

³⁷ Pierce, B., Kaleel, R., Dickens, A., Bertram T., and Stanier, C., Kenski D.: White Paper: Lake Michigan Ozone Study 2017 (LMOS 2017), <http://www.ladco.org/>, 2016.

network, including the Sheboygan-Kohler monitoring site and the Sheboygan-Haven monitoring site. The upwind urban region (as described in the 1988 guidance) for the Sheboygan-Kohler regional transport/maximum ozone concentration site is not specified in the annual network plan. However, one could surmise that the urban region could be the Milwaukee area based on the following: Ozone is a secondary pollutant formed over some time and space from the sources of ozone precursor emissions. It is, therefore, likely that it is measuring ozone formed predominately from upwind precursor sources in Milwaukee, which is about 60 miles south of Sheboygan, and in the Chicago area, which is farther south. With respect to LADCO's source apportionment modeling, a 10% contribution is approximately 8 ppb of ozone.

Manitowoc County, WI

Comment: WDNR estimated the geographic extent of nonattainment is no more than 2.9 miles inland for Manitowoc County (other comments regarding Manitowoc were summarized and addressed above).

EPA Response: As explained previously, the WDNR-calculated 70-ppb contour is not an appropriate tool for determining the extent of the nonattainment area. EPA notes that a reason EPA was able to justify honoring Wisconsin's request to reduce the size of the Sheboygan County area from a full county to a partial county area is the existence of the second ozone monitor in Sheboygan county which is attaining the standard coupled with WDNR's lake breeze inland penetration distance analysis specific to the two Sheboygan County monitors. EPA extended this reasoning to Manitowoc County (despite Manitowoc not having an inland attaining monitor), since Manitowoc County is adjacent to and immediately north of Sheboygan County. EPA's approximately 3.2-mile inland from the shoreline approach for Manitowoc and Sheboygan is fundamentally different than the approach that WDNR used to develop its WDNR-calculated 70-ppb contour line. EPA's roughly 3.2-mile approach is more appropriate since it is based purely on measured data within these locations (specifically, Sheboygan) rather than a model fit (the WDNR-calculated 70-ppb contour) based on data points selectively chosen to achieve a desired and unsupportable outcome.

Door County, WI

Comment: Both WDNR and the Door County Administrator agreed that the Door County area should be a rural transport area, but that the nonattainment area boundary should be the Newport State Park boundary. The Door County Administrator did not believe (based on WDNR analysis) that ozone penetrates farther inland than the Newport State Park Boundary. Commenter indicates that EPA HYSPLIT trajectories indicate all emission tracks causing the violation at the Door County monitor to be outside of the Door County land base except when the emissions reach Newport State Park. Commenter adds, "The photochemical model projections of 2017 design values along the western Lake Michigan shoreline prepared by LADCO project the entire Door County land mass to be outside of the nonattainment area. (See: Figure 4.1 at page 16 of DNR's Technical Support Document.)" This commenter was concerned about Door County economy which is heavily dependent on tourism. Commenter wants the nonattainment boundary to be the boundary of the state park. WDNR asked EPA to exclude all the offshore islands in Door County since WDNR believes there is no recognized benefit to designating them as nonattainment and indicates that EPA has similarly excluded islands from its nonattainment area designations for Ventura County, California for the 2008 ozone NAAQS. Supporting information provided by WDNR included the following: Only two of EPA's 100 m back trajectories passed over Door County, with the remainder passing over the lake indicating that the elevated ozone levels measured at the ground level at the Newport monitor result from air being transported over the lake from the south. Door County emissions are low and most of these emissions come from sources that the state cannot control: 53% of NO_x from commercial marine vessels on Lake Michigan and 61% of VOC emissions from recreational vehicles and pleasure craft. This commenter noted specific concerns about

negative public perception of poor air quality and the local economy which is heavily dependent on tourism.

EPA Response: There is no evidence to indicate the nonattainment air is limited to the boundary of the state park. EPA's HYSPLIT back trajectories provide evidence that Door County is impacted not only by over-the-lake transport but also by overland transport indicating that the entire northern portion of the county likely experiences nonattainment air, not a narrow strip along the eastern coastline of the county nor a 3.7 square mile area confined by the state park boundary. The exceedance day HYSPLIT back trajectories densely cover the northern portion of the county and to a lesser extent the southern portion of the county, indicating the entire northern portion of the county likely experiences a similar level of ozone as that which has been recorded at the monitor. The EPA addresses in the final nonattainment area TSD the conclusions reached for the final boundary for the Door County area, including EPA's determination that the area qualifies as a Rural Transport Area (RTA). EPA did include offshore islands in the nonattainment area. EPA's basis for excluding the Channel Islands from the Ventura County, California nonattainment area during the 1997, 2008, and 2015 ozone NAAQS designations was that the islands are upwind of the violating monitors, whereas the Door County offshore islands are nearby and downwind of the violating monitor. Therefore, there is no evidence to suggest these offshore islands are not experiencing the same extent of violating air masses as those impacting the rest of the northern portion of the county north of the Sturgeon Bay Canal.

3.1.2. Multi-State Areas

3.1.2.1 Chicago, IL-IN-WI

Comment: The State of Indiana and other commenters contended that Lake and Porter Counties in Indiana should be designated as attainment/unclassifiable for the 2015 ozone NAAQS. One commenter noted that these counties have not recorded a violation of the NAAQS. This commenter further contended that these counties should not be designated nonattainment on the basis of any contribution to violating monitors within the Chicago area. Another commenter endorsed the comment from the previous commenter.

EPA Response: The EPA agrees with the commenters that there are no monitors in Lake or Porter County that show a violation of the 2015 ozone NAAQS. However, areas must be designated nonattainment not only if they are violating the 2015 ozone NAAQS, but also if they contribute air quality at a monitor in a nearby area that is violating the 2015 NAAQS. As provided in the revised TSD, the EPA is designating a portion of Porter County and a portion of Lake County in Indiana as attainment/unclassifiable for the 2015 ozone NAAQS. The EPA is designating the remaining portion of Porter County and the remaining portion of Lake County in Indiana as nonattainment for the 2015 ozone NAAQS.

Comment: The mayor of the City of Kenosha requested that a smaller portion of Kenosha County, WI be designated as nonattainment, and recommends that Hwy. 31 (Green Bay Road) rather than I-94 be used as the boundary for the portion of Kenosha County included in the Chicago nonattainment area.

EPA Response: The EPA disagrees with the suggestion that Hwy 31 be used as the boundary for the portion of Kenosha County included in the Chicago nonattainment area; this boundary would capture only one of the two violating monitors in Kenosha County, WI. As provided in the revised TSD, EPA is designating the area inclusive and east of I-94 as nonattainment for the 2015 ozone NAAQS. The EPA is designating the area west of I-94 as attainment/unclassifiable.

3.1.2.2 *St. Louis, MO-IL*

Comment: A commenter urges the EPA to finalize its intended designations for the St. Louis MO-IL nonattainment area that includes Franklin, Jefferson, St. Charles, and St. Louis counties and the City of St. Louis. The commenter disagrees with Missouri Department of Natural Resources' (MDNR) proposed exclusion of Franklin and Jefferson counties as nonattainment. The commenter also believes it would be irrational for MDNR to rely upon 2015-2017 monitoring data while also using 2014 NEI data.

EPA Response: The EPA's final designation for the St. Louis MO-IL nonattainment area is based on the latest available monitoring data as of the final designation in April 2018, which was 2015-2017 data early-certified by both Missouri and Illinois. In accordance with the July 2020 D.C. Circuit Court decision and remand, EPA's re-evaluation of this information is included in the final TSD. As a result of that re-evaluation, EPA concludes that Jefferson County contains sources of emissions that contribute to the violating monitor in St. Charles County and therefore is included in the nonattainment area. EPA did not re-evaluate the portion of Franklin County (Boles Township) which was already included in the nonattainment area, as it was not challenged.

At the time of EPA's final designations in April 2018, the 2017 NEI was not yet available and the 2014v1 NEI was the most recent emissions data compiled by the EPA. Thus, it was reasonable for EPA not to use an inventory that was not yet available.