PROPOSED REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE 24-HOUR FINE PARTICULATE MATTER NATIONAL AMBIENT AIR QUALITY STANDARD

FOR THE

MILWAUKEE-RACINE 3-COUNTY NONATTAINMENT AREA

WISCONSIN

Developed By:
The Wisconsin Department of Natural Resources

April 2012

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[1] Note: Non-certified, quality-assured 2011 $PM_{2.5}$ monitoring data became available after this draft was completed. However, this data is included as an appendix to show the continued decrease in $PM_{2.5}$ concentrations.

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1.0 INTRODUCTION

1.1 Background

The federal Clean Air Act (CAA) requires areas failing to attain a National Ambient Air Quality Standard (NAAQS) for a specified criteria pollutant to develop or revise its State Implementation Plan (SIP) for that criteria pollutant to expeditiously attain and maintain the violated NAAQS in the area where the air quality nonattainment has occurred. When attainment of a NAAQS in a nonattainment area has been achieved, Section 107(d)(3)(E) of the CAA allows states to request the nonattainment area to be redesignated to attainment provided that certain criteria are met.

In October 2006, the U.S. EPA promulgated a revision to the 24-hour fine particulate ($PM_{2.5}$) NAAQS, based upon available health studies (*71 FR 61144*). The updated (i.e.,"2006") 24-hour $PM_{2.5}$ NAAQS was made more restrictive - 35 $\mu g/m^3$, reduced from the 1997 standard of 65 $\mu g/m^3$. In this action the U.S. Environmental Protection Agency (EPA) retained the original annual $PM_{2.5}$ standard at15.0 $\mu g/m^3$.

On November 13, 2009 the U.S. EPA published final rulemaking that established initial air quality designations for the 2006 $PM_{2.5}$ NAAQS (*74 FR 58688*). This rulemaking, which was done in accordance with Section 107(d) of the CAA, was based upon the Agency's review of $PM_{2.5}$ measurements collected during the 3-year period 2006 - 2008. This rulemaking included the designation that the counties of Milwaukee, Racine, and Waukesha were in nonattainment of the 2006 24-hour $PM_{2.5}$ NAAQS.

Based on supporting information provided in this document, the Wisconsin Department of Natural Resources (WDNR) asks the U.S. EPA to redesignate the counties of Milwaukee, Racine, and Waukesha to attainment for the 2006 24-hour $PM_{2.5}$ NAAQS.

1.2 Geographical Description

The counties of Milwaukee, Racine, and Waukesha are located in southeastern Wisconsin (Figure 1). Milwaukee and Racine Counties border along the western shoreline of Lake Michigan. The topography of Milwaukee, Racine and Waukesha Counties is predominantly flat.

Milwaukee County is a relatively small county in area (242 square miles, [NACO, 2011]) – but is significantly urbanized. Its official year 2010 U.S. Census population of 947,735 (U.S. Census, 2011) makes it the State's most populous county. The city of Milwaukee had an estimated year 2010 population of 594,833 (U.S. Census, 2011), which is the most populous city in Wisconsin.

The counties of Waukesha and Racine are both adjacent to the heavily-urbanized Milwaukee County. Consequently, these counties also have fairly substantial populations according to the U.S. Census (2011): Waukesha County: 389,891, Racine County: 195,408. However, both Racine County (333 square miles, [NACO, 2011]) and Waukesha County (556 square miles, [NACO, 2011]) are noticeably larger in area than Milwaukee County. These two counties, relative to Milwaukee County, have more of a mixture of suburban and rural areas – as well as some urban areas. The cities of Waukesha and Racine are the largest cities in their respective counties.

1.3 Status of $PM_{2.5}$ Air Quality

For Milwaukee, Racine, and Waukesha Counties, the fully-validated federal reference method (FRM)-derived $PM_{2.5}$ monitoring data for the most recent three years, 2008 - 2010, demonstrate that air quality levels have attained the NAAQS for 24-hour $PM_{2.5}$. A more complete discussion of these monitoring data is contained in Section 3 of this document.

The monitoring data, accompanied by the decrease in estimated emission totals of those air pollutants that contribute to $PM_{2.5}$ levels, help justify a redesignation to attainment for these counties based on Section 107(d)(3)(D) of the CAA.

1.4 Redesignation Requirements

Once attainment has been achieved for a $PM_{2.5}$ nonattainment area, Section 107(d)(3)(E) of the CAA establishes that the following criteria must be met in order for an area to be considered for redesignation from nonattainment to attainment:

1. A determination by the U.S. EPA that the area has attained the NAAQS.

2. A fully approved SIP under CAA Section 110(k).

3. A determination by the U.S. EPA that the improvement in air quality is due to permanent and enforceable reductions in emissions.

4. A determination that all applicable requirements for the area under Section 110 and Part D of the CAA have been met.

5. A fully approved maintenance plan, including a contingency plan, for the area under Section 175(A) of the CAA.

This document addresses each of these criteria in providing technical support to the WDNR's request that the counties of Milwaukee, Racine, and Waukesha be redesignated from nonattainment to attainment of the 2006 24-hour $PM_{2.5}$ NAAQS. Additional information to support continued compliance (i.e., maintenance) with respect to the 2006 24-hour $PM_{2.5}$ NAAQS is also provided.

2.0 FEDERAL CAA REQUIREMENTS

As a precondition to redesignating a nonattainment area to attainment, the CAA requires the U.S. EPA to determine that the state has met all applicable requirements under section 110 and part D of Title I of the CAA (per CAA Section 107(d)(3)(E)(v)) and that the state has a fully approved SIP under Section 110(k) for the area (per CAA Section 107(d)(3)(E)(ii)).

2.1 Satisfying CAA Section 110(a) General SIP Requirements

Section 110(a) of the CAA contains the general requirements for a SIP. Section 110(a)(2) provides that the implementation plan submitted by a state must have been adopted by the state after reasonable public notice and hearing, and, among other things, must:

- Include enforceable emission limitations and other control measures, means or techniques necessary to meet the requirements of the CAA;
- Provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to monitor ambient air quality;
- Provide for implementation of a source permit program to regulate the modification and construction of any stationary source within the areas covered by the plan;
- Include provisions for the implementation of part C, Prevention of Significant Deterioration (PSD), and part D, New Source Review (NSR) permit programs;
- Include criteria for stationary source emission control measures, monitoring, and reporting; and
- Include provisions for air quality modeling; and provide for public and local agency participation in planning and emission control rule development.

Wisconsin submitted an "infrastructure SIP" for the 2006 24-hour $PM_{2.5}$ NAAQS to the U.S. EPA on January 24, 2011, with a supplemental submittal on March 28, 2011, demonstrating compliance with the CAA Section 110 requirements. This prior submittal is included in Appendix 1.

2.2 Satisfying CAA Part D Requirements

CAA Title I, Part D, Subpart 1 sets forth the basic nonattainment requirements applicable to all nonattainment areas. For the 2006 $PM_{2.5}$ NAAQS, these requirements are due to be met by December 2012. However, as stipulated in 40 CFR 51.1004(c), a "clean data finding" by the U.S. EPA suspends the requirements to submit an attainment demonstration and associated reasonably available control measures (RACM) (CAA Section 172(c)(1) and (c)(6)), reasonable further progress (RFP) requirements (CAA Section 172(c)(2)), contingency measures (CAA Section 172(c)(9)), and other planning SIP elements related to attainment for so long as the area continues to attain the NAAQS.

Wisconsin submitted a clean data finding to the U.S. EPA on March 7, 2011. On December 15, 2011, the U.S. EPA notified the WDNR of their intention of proposing approval of the clean data finding in the Federal Register. As of March 29, 2012, the U.S. EPA had still not published the proposal. Wisconsin's $PM_{2.5}$ clean data finding and the U.S. EPA's preliminary indication of approval is included in Appendix 2. The WDNR expects approval of this finding before December 2012. Furthermore, the WDNR anticipates approval of this redesignation request before that date as well.

Section 172(c)(4) requires the identification and quantification of allowable emissions for major new and modified stationary sources in an area, and section 172(c)(5) requires source permits for the construction and operation of new and modified major stationary sources in the nonattainment area. Wisconsin has an approved new source review (NSR) program that meets these requirements. Furthermore, after redesignation, prevention of significant deterioration (PSD) requirements will apply and Wisconsin has an approved PSD program.

Section 172(c)(7) requires the SIP to meet the applicable provisions of CAA Section 110(a)(2). As noted in the previous section, Wisconsin submitted an affirmation of meeting the Section 110(a) requirements to the U.S. EPA on January 24, 2011, with a supplemental submittal on March 28, 2011.

Section 176(c) of the CAA requires states to establish criteria and procedures to ensure that federally supported or funded activities, including highway projects, conform to the air quality planning goals in the applicable SIPs. The requirement to determine conformity applies to transportation plans, programs, and projects developed, funded, or approved under Title 23 of the U.S. Code and the Federal Transit Act (transportation conformity) as well as to all other federally-supported or funded projects (general conformity). EPA interprets the conformity SIP requirements as not applying for purposes of evaluating a redesignation request under Section 107(d) because state conformity rules are still required after redesignation and federal conformity rules apply where state rules have not been approved. Section 5.0 of this document includes transportation conformity budgets that, upon approval by the U.S. EPA, will be required for use in future transportation planning efforts.

The only remaining Part D, Subpart 1 element that must be addressed for the 24-hour $PM_{2.5}$ NAAQS is the CAA Section 172(c)(3) requirement for an inventory of actual emissions for the area. An emissions inventory is presented in Section 4.0 of this redesignation request. When the U.S. EPA approves this inventory, Wisconsin will meet all of the applicable SIP requirements for the purposes of redesignation.

2.3 Fully Approved SIP Under Section 110(k)

Consistent with the previous U.S. EPA rulemakings, when the U.S. EPA issues final approval of this redesignation request, Wisconsin will have a fully approved SIP under CAA Section 110(k) for all requirements applicable for purposes of redesignation.

3.0 WISCONSIN $PM_{2.5}$ MONITORING DATA

3.1 Deriving $PM_{2.5}$ Attainment / Nonattainment

The U.S. EPA's requirements for $PM_{2.5}$ air monitoring data are contained in Appendix N to 40 CFR Part 50 ("Interpretation of the National Ambient Air Quality Standards for $PM_{2.5}$"). An FRM $PM_{2.5}$ monitoring site that meets the data completeness requirements for the most recent three calendar years is considered to have attained the 24-hour $PM_{2.5}$ NAAQS when the site's most current 24-hour PM2.5 design value (DV) concentration is less than or equal to 35 $\mu g/m^3$.

The ambient $PM_{2.5}$ concentrations used to determine attainment/nonattainment status are daily, integrated 24-hour (calendar day) measurements of $PM_{2.5}$ mass collected on Teflon filters. The $PM_{2.5}$ mass is weighed and validated in accordance with the FRM requirements established by the U.S. EPA.

The WDNR commits to operating a federally-approved FRM $PM_{2.5}$ monitoring network to ensure that the $PM_{2.5}$ NAAQS is maintained in all of Wisconsin.

3.2 Nonattainment Area FRM $PM_{2.5}$ Monitoring Network

There were a total of five FRM $PM_{2.5}$ monitoring sites operated by the WDNR in the $PM_{2.5}$ nonattainment counties during the 2008 - 2010 period (Table 1, Figure 1). Each of these sites, individually or combined, met the completeness requirements detailed in Appendix N to 40 CFR Part 50 during this period.

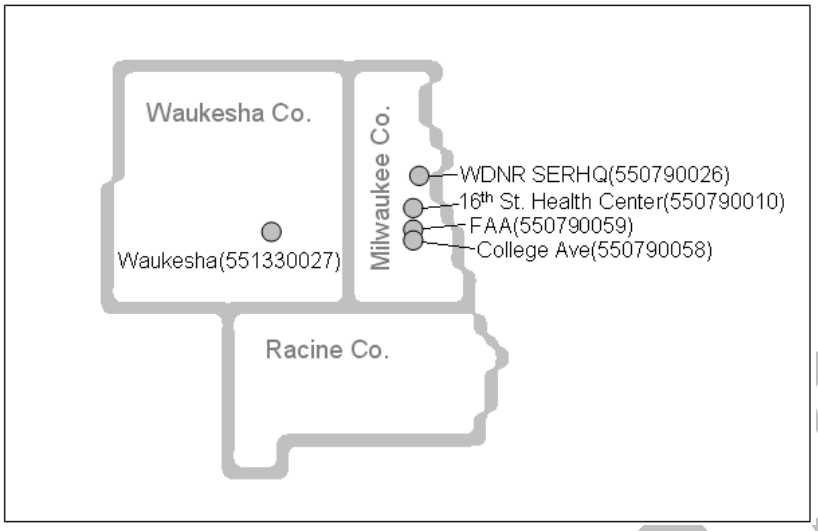
Table 1 - FRM $PM_{2.5}$ Monitors – Milwaukee, Racine, and Waukesha Counties

County	AQS #	Site Name	Start Date
Milwaukee	550790010	Milw-16th St. Health Ctr	05-Jan-1999
Milwaukee	550790026	Milw-SER HQ	01-Jan-1999
Milwaukee	550790058	Milw-College Ave	4 Nov 2009
Milwaukee	550790059	Milw-FAA	3 Jan 1999
Waukesha	551330027	Waukesha-Cleveland St.	03-Jan-1999

The Milw-FAA site ceased operation on October 28, 2009. However, a week later, on November 4, 2009, the Milw-College Ave site commenced monitoring. The College Ave site began collecting $PM_{2.5}$ data on the first scheduled sampling date after the FAA site took its final $PM_{2.5}$ measurement. The College Ave site is located approximately 2 miles directly south of the now-discontinued FAA site. Both locations are situated east of and within a couple hundred meters of the heavily-traveled north-south I-94 corridor. Both sites are also located very close to Milwaukee's Mitchell Field Airport and about 3 miles west of the Lake Michigan shoreline. Based upon this information, the U.S. EPA has approved the WDNR's May 25, 2010 request that it be allowed to combine the FRM $PM_{2.5}$ data from the Milwaukee-FAA and Milwaukee-College Ave sites for purposes of deriving a combined-site 24-hour $PM_{2.5}$ design value for the 2008-10 period.

The Milw-16th St. Health Ctr site is located in a mixed commercial-residential neighborhood near the southern edge of the industrialized Menomonee River Valley, approximately 2 miles south-southwest of Milwaukee's downtown area and 3 miles west of Lake Michigan's shoreline. The Milw-SER HQ (DNR Southeast Region Headquarters) site is situated in a mixed residential-commercial neighborhood approximately one mile north of Milwaukee's downtown area 1.5 miles west of Lake Michigan. The Waukesha-Cleveland St. site is located in a mixed industrial and residential setting approximately 15 miles west of Lake Michigan and 14 miles west of downtown Milwaukee.

Figure 1 - FRM $PM_{2.5}$ Monitors – Milwaukee, Racine, and Waukesha Counties



3.3 Quality Assurance

WDNR follows the fully-approved Wisconsin $PM_{2.5}$ Quality Assurance Plan in accordance with 40 CFR 58.10, to assure that the quality of the FRM $PM_{2.5}$ monitoring data submitted to the U.S. EPA's Air Quality System (AQS) met federal criteria. All validated FRM $PM_{2.5}$ measurement data collected during 2008 - 2010 for the nonattainment sites listed in Table 1 have been archived in U.S. EPA's AQS. In addition, these full data sets have been certified and are available to the public.

3.4 Data Completeness

Table 2 shows that the annual percentage of FRM $PM_{2.5}$ sampling success for each site-year in Wisconsin's $PM_{2.5}$ nonattainment area during 2008 - 2010. The data completeness at these FRM $PM_{2.5}$ monitoring sites easily meet the U.S. EPA data completeness requirement (minimum acceptable: 75%) that is listed in Appendix N to 40 CFR Part 50.

Table 2 - Percentage Completeness

Site Name:	16th St. Health Ctr	SER HQ	College Ave / FAA	Cleveland St.
County:	Milwaukee	Milwaukee	Milwaukee	Waukesha
Site ID #:	550790010	550790026	550790058/59	551330027
FRM $PM_{2.5}$ sample schedule	Every 3rd day	Every 3rd day	Every 6th day	Every 3rd day
2008 # of valid samples	119	119	60	117
2008 % FRM $PM_{2.5}$ Data Completeness	98%	98%	98%	96%
2009 # of valid samples	115	120	61	115
2009 % FRM $PM_{2.5}$ Data Completeness	94%	98%	100%	94%
2010 # of valid samples	112	171	57	121
2010 % FRM $PM_{2.5}$ Data Completeness	92%	100%	93%	99%

3.5 24-Hour $PM_{2.5}$ 98th Percentile and Design Value Concentrations

Table 3 displays the final-validated 24-hour $PM_{2.5}$ 98th percentile and subsequent design value concentrations for the FRM $PM_{2.5}$ sites in the nonattainment area during 2008 - 2010. All of the sites have 24-hour $PM_{2.5}$ design values that are 2-3 $\mu g/m^3$ below the 24-hour $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$ during this period.

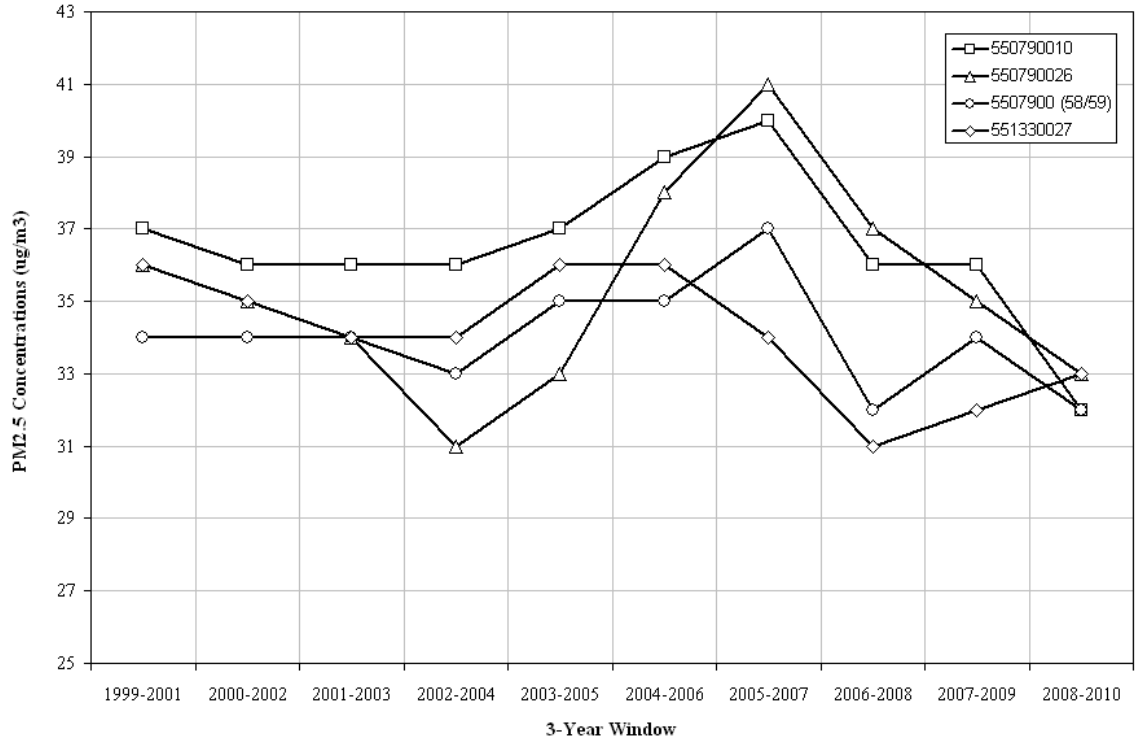
Table 3 - Annual 98th Percentile FRM $PM_{2.5}$ Concentrations and 24-Hour $PM_{2.5}$ Design Values

Site Name:	16th St. Health Ctr	SER HQ	College Ave / FAA	Cleveland St.
County:	Milwaukee	Milwaukee	Milwaukee	Waukesha
Site ID #:	550790010	550790026	550790058/59	551330027
2008 98th%-ile Conc.:	27.3	27.5	26.9	29.9
2009 98th%-ile Conc.:	39.1	39.0	33.0	32.0
2010 98th%-ile Conc.:	30.9	31.9	35.3	35.9
2008 – 2010 Design Value	32	33	32	33

3.6 Nonattainment Area FRM $PM_{2.5}$ Trends (1999 – 2010)

For the FRM $PM_{2.5}$ sites that operated in the nonattainment area during 2008 - 2010, the following figure shows their design value trends from 2001 through 2010. All sites, excluding the Waukesha site, have been witnessing decreasing 24-hour $PM_{2.5}$ design values beginning with the 3-year period 2006 - 2008.

Figure 2 – Design Value Trends



4.0 EMISSIONS INVENTORY

4.1 Overview

The CAA requires the submittal of a comprehensive inventory of actual emissions that contribute to levels of $PM_{2.5}$. The WDNR must demonstrate that the improvement in $PM_{2.5}$ air quality between the year that violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions. The U.S. EPA requires that the base year (nonattainment year) emissions be used to construct the following other required emission inventory projections:

1. a year in which the standard was attained;
2. a year at least 10 years beyond the attainment year to demonstrate maintenance; and
3. an intermediate year between the attainment year and maintenance year.

4.2 Years of Inventoried Emissions

The U.S. EPA allows some discretion regarding the exact year for which each of the emission inventories can be constructed. After some discussion with the U.S. EPA – Region V, the following inventory years were developed for this redesignation request:

- Base Year (Nonattainment Year) Inventory: 2006
- Attainment Year Inventory: 2010
- Interim Year Inventory: 2020
- Maintenance Year Inventory: 2025

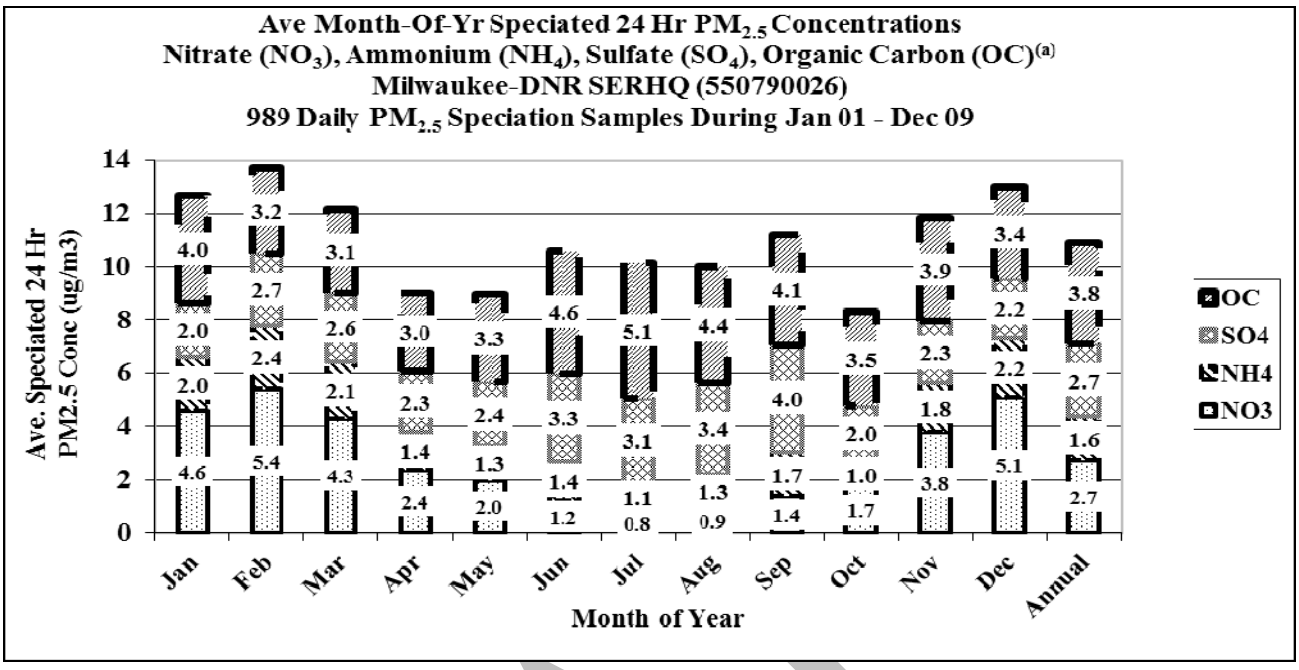
The WDNR has constructed emission inventories that pertain to direct (primary) $PM_{2.5}$ and three gaseous precursors to secondary $PM_{2.5}$ formation, as follows:

1. Oxides of nitrogen (NO_x), which is a precursor to nitrate (NO_3) $PM_{2.5}$;
2. Sulfur dioxide (SO_2), which is a precursor to sulfate (SO_4) $PM_{2.5}$;and
3. Volatile organic compounds (VOCs) which are a precursor to organic carbon (OC) $PM_{2.5}$.

The emissions inventory for direct $PM_{2.5}$ and SO_2 are automatically required under 40 CFR 51.1004(c) ("Pollutants contributing to fine particle concentrations").

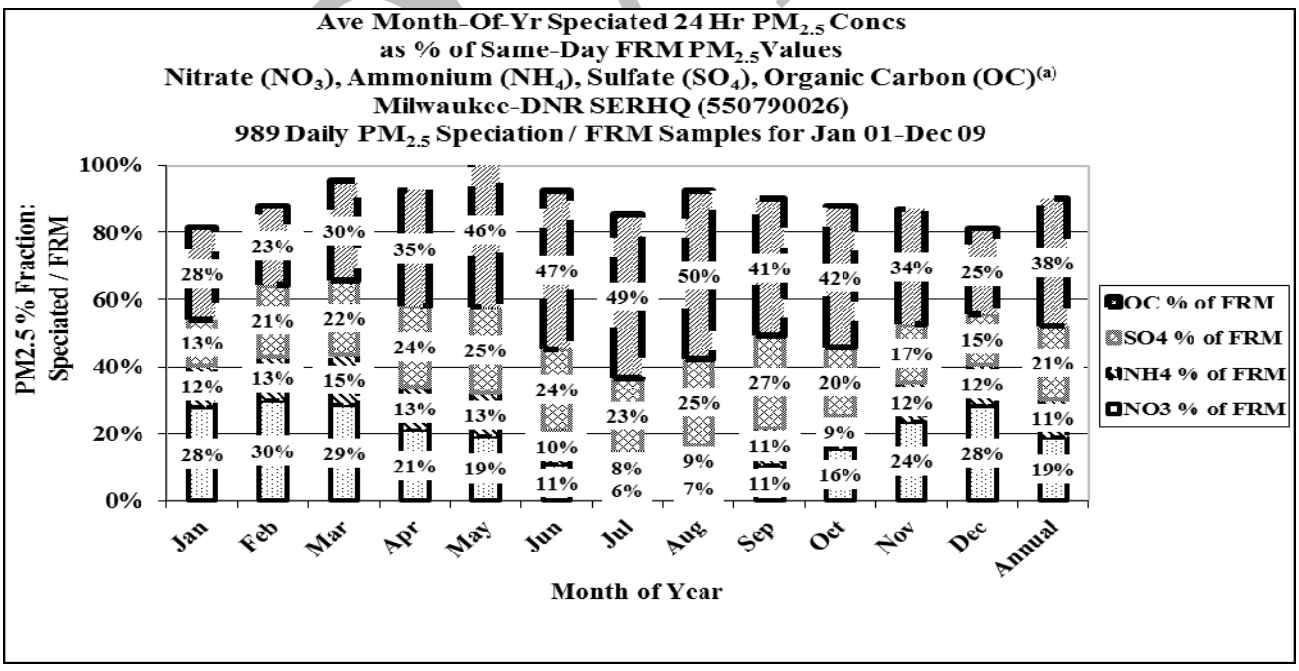
The WDNR (2011 – see Appendix 3) conducted a long-term (2001-2009) analysis to assess if emissions of NO_x and/or VOCs make a significant contribution to $PM_{2.5}$ concentrations in the nonattainment area. The assessment of the impact on $PM_{2.5}$ levels from these precursors is required under 40 CFR 51.1004(c). Figures 3 and 4, which are from the above-cited study, demonstrate that much of the $PM_{2.5}$ profile is based upon the formation of secondary aerosols formed from gaseous precursors in the atmosphere. As demonstrated in Figures 3 and 4, both nitrates (NO_3 – derived largely from NO_x precursors) and organic carbon (OC – largely derived from heavier VOCs called aromatics [Damberg, 2007]) are substantial components to the overall $PM_{2.5}$ profile in southeastern Wisconsin. Consequently, this redesignation request will also address emissions of both NO_x and VOCs. Additionally, Figures 3 and 4 show that sulfates (SO_4 – derived mostly from sulfur dioxide [SO_2]) also comprises a sizable portion of $PM_{2.5}$ levels in southeastern Wisconsin.

Figure 3



(a) All speciated $PM_{2.5}$ concentrations, including OC, are unadjusted from final validated values. Figure from WDNR $PM_{2.5}$ study (2011) - see Appendix 3.

Figure 4

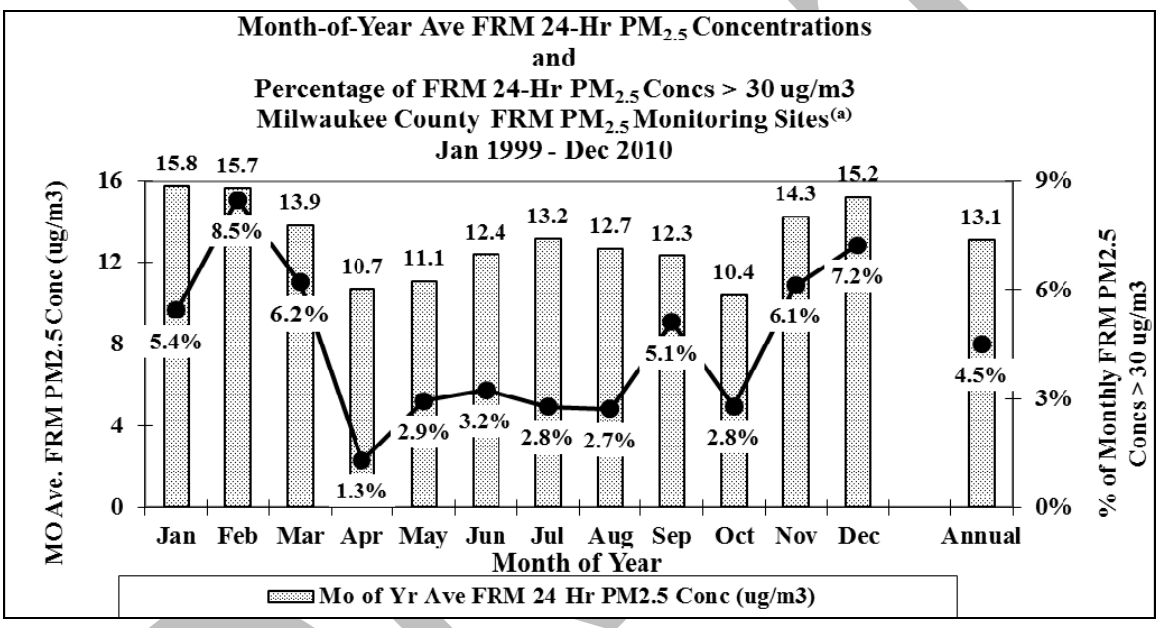


(a) All speciated $PM_{2.5}$ concentrations, including OC, are unadjusted from final validated values. Figure from WDNR $PM_{2.5}$ study (2011) - see Appendix 3.

4.3 Temporally-Resolved Emission Estimates

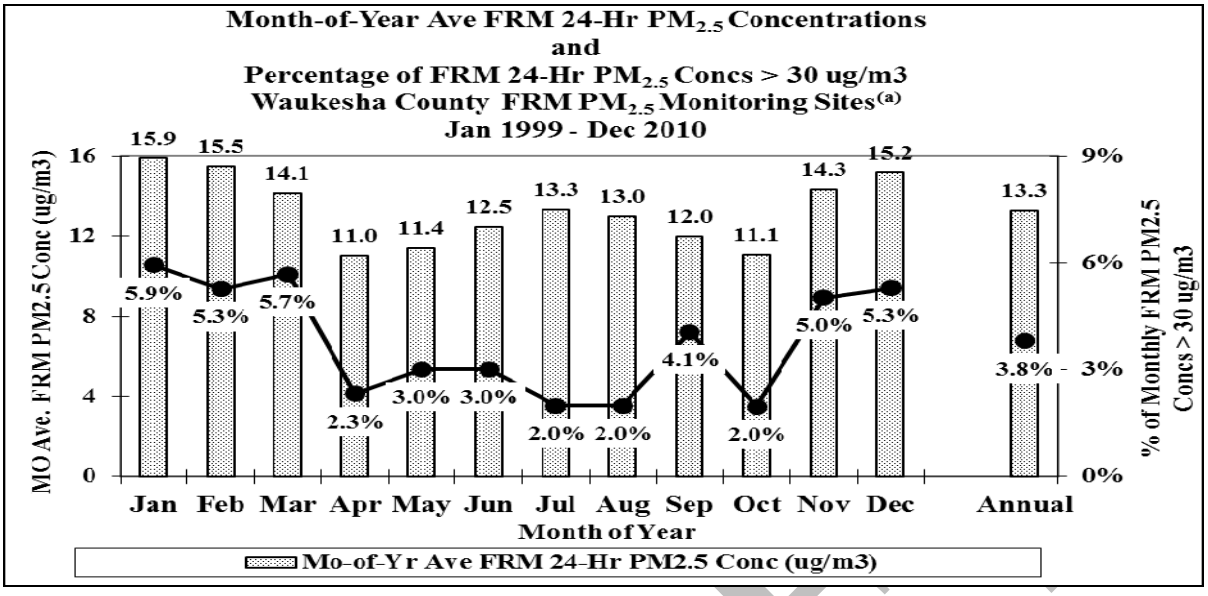
The nonattainment violations occurred for 24-hour average time periods. Therefore, it was necessary to construct emission inventories for a time period that is most associated with elevated levels of 24-hour $PM_{2.5}$ concentrations. The WDNR $PM_{2.5}$ study (2011 – see Appendix 3) also evaluated the collective month-of-year profiles of average 24-hour FRM $PM_{2.5}$ levels during 1999-2010. This assessment identified the meteorological winter months of December, January, and February as having both the highest monthly average $PM_{2.5}$ concentrations and the highest monthly percentage of site-days with 24-hour $PM_{2.5}$ concentrations greater than 30 $\mu g/m^3$ (Figures 5 and 6). Accordingly, the WDNR designed and constructed emission inventories for this $PM_{2.5}$ redesignation request to focus on pollution-related activity levels during the winter months (more specifically - for an average January weekday).

Figure 5



(a) The WDNR operated seven FRM $PM_{2.5}$ monitoring sites in Milwaukee County during Jan 1999 - Dec 2010 -- collecting a total of 9065 validated FRM 24-Hr $PM_{2.5}$ samples. Figure from WDNR $PM_{2.5}$ study (2011) - see Appendix 3.

Figure 6



(a) The WDNR operated two FRM $PM_{2.5}$ monitoring sites in Waukesha County during Jan 1999 - Dec 2010 -- collecting a total of 6445 validated FRM 24-Hr $PM_{2.5}$ samples. Figure from WDNR $PM_{2.5}$ study (2011) - see Appendix 3.

4.4 Base Year Inventory (Nonattainment Year Inventory)

The WDNR has prepared a comprehensive inventory of actual emissions for Wisconsin's $PM_{2.5}$ nonattainment area (counties of Milwaukee, Racine, and Waukesha) for the base year 2006. The emission rates are set for activity levels during an average January weekday for reasons that are explained in Section 4.3. This base year inventory includes area, mobile, non-road, and point sources for direct $PM_{2.5}$, NO_x, SO_2 and VOCs for 2006. The 2006 emission inventory, which represents the base year for eventual maintenance purposes, was developed as follows:

Point Source Inventory

The 2006 point source emissions inventory was estimated using linear interpolation from 2005 and 2008 emissions inventories. The 2005 and 2008 emissions inventories were created using annually reported point source emissions, the U.S. EPA's Clean Air Markets Database (CAMD) and approved U.S. EPA techniques for emissions calculation (e.g., emission factors). Whenever feasible, federal, state and local controls were factored into the emission calculations. Emissions were estimated by collecting process-level information from each facility that qualifies for inclusion into the state's point source database. A table of the 2005 and 2008 point source emissions by county and facility id (FID) number, as well as the calculation of 2006 point source emissions is located in Appendix 4.

Area Source Inventory

The 2006 area source emissions inventory was created by backcasting the Wisconsin 2008 base year emissions inventory submitted to the U.S. EPA in 2010 for the National Emissions Inventory (NEI). This same approach was used in the WDNR's September 2009 ozone redesignation request to backcast 2005 to 2002 area source emissions and was approved by U.S. EPA on May 18, 2009. The backcasting factors were primarily based on growth factors from the Economic Growth and Analysis

System (EGAS) model. The "Default REMI 6.0 SCC Configuration" for EGAS was used. If growth factors were not available for a certain SCC, population based growth factors were derived based on the Wisconsin Department of Administration's Demographic Services Center population reports. A table of the EGAS growth factors and the 2006 area source emissions by county and SCC is located in Appendix 5.

Onroad Inventory

The 2006 onroad mobile emission estimates were created by using the U.S. EPA MOVES2010a model. All estimates were made in accordance with the Users Guide to MOVES (U.S. EPA, Office of Transportation and Air Quality, Assessment and Standards Division, August 2010, EPA 420-B-10-036) and Technical Guidance on the Use of MOVES2010 for Emission Inventory Preparation in State Implementation Plans and Transportation Conformity (U.S. EPA, Office of Transportation and Air Quality, Transportation and Regional Programs Division, April 2010, EPA-420-B-10-023).

Nonroad Inventory

The 2006 nonroad mobile emission estimates were created by using the U.S. EPA National Mobile Inventory (NMIM) model (2009/05/04 Version). The 2006 aircraft, marine and rail emissions were estimated using linear interpolation from the 2005 and 2008 emissions inventories. Pechan provided marine and rail emission estimates via the Lake Michigan Air Directors Consortium (LADCO) for Wisconsin [LADCO, 2012]. Pechan is an independent contractor, which, through contracts with LADCO, has developed state specific emission inventory data, including growth factors, for the entire LADCO region. Aircraft emissions were calculated using the Federal Aviation Administration's Emissions and Dispersion Modeling System (EDMS).

Emissions Summary

The following tables summarize the 2006 NO_x, $PM_{2.5}$ direct, SO_2 and VOC emissions.

Table 4 - Total NO_x Emissions for Nonattainment Year 2006 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	27.82	12.19	53.93	11.00	104.94
Racine County	0.78	2.25	10.48	3.18	16.69
Waukesha County	0.84	5.61	28.69	7.48	42.62
Three-County Nonattainment Area	29.44	20.05	93.10	21.66	164.25

Note: Point emissions include combined EGU and non-EGU emissions.

Table 5 - Total $PM_{2.5}$ Direct Emissions for Nonattainment Year 2006 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	0.76	9.93	2.74	0.60	14.03
Racine County	0.16	3.57	0.49	0.17	4.39
Waukesha County	0.13	5.12	1.39	0.47	7.11
Three-County Nonattainment Area	1.05	18.62	4.62	1.24	25.53

Note: Point emissions include combined EGU and non-EGU emissions.

Table 6 - Total SO_2 Emissions for Nonattainment Year 2006 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	60.63	2.62	0.88	1.00	65.13
Racine County	0.64	0.53	0.16	0.35	1.68
Waukesha County	0.16	1.41	0.45	0.63	2.65
Three-County Nonattainment Area	61.43	4.56	1.49	1.98	69.46

Note: Point emissions include combined EGU and non-EGU emissions.

Table 7 - Total VOC Emissions for Nonattainment Year 2006 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	6.76	40.73	26.68	6.04	80.21
Racine County	1.19	10.50	5.62	1.28	18.59
Waukesha County	3.41	19.35	15.26	4.81	42.83
Three-County Nonattainment Area	11.36	70.58	47.56	12.13	141.63

Note: Point emissions include combined EGU and non-EGU emissions.

4.5 Attainment Year Inventory

The 2010 emission inventory, which Wisconsin used to demonstrate attainment, was developed as follows:

Point Source Inventory

The 2010 point source emissions inventory was estimated using linear interpolation from 2005 and 2008 emissions inventories. The 2005 and 2008 emissions inventories were created using annually reported point source emissions, the U.S. EPA's Clean Air Markets Database (CAMD) and approved U.S. EPA techniques for emissions calculation (e.g., emission factors). Whenever feasible, federal, state and local controls were factored into the emission calculations. Emissions were estimated by collecting process-level information from each facility that qualifies for inclusion into the state's point source database. A table of the 2005 and 2008 point source emissions by county and facility id (FID) number, as well as the calculation of 2010 point source emissions is located in Appendix 4.

Area Source Inventory

The 2010 area source emissions inventory was created by projecting the Wisconsin 2008 base year emissions inventory submitted to the U.S. EPA in 2010 for the NEI. The forecasting factors were primarily based on growth factors from the EGAS model. The "Default REMI 6.0 SCC Configuration" for EGAS was used. If growth factors were not available for a certain SCC, population based growth factors were derived based on the Wisconsin Department of Administration's Demographic Services Center population reports. A table of the EGAS growth factors and the 2010 area source emissions by county and SCC is located in Appendix 5.

Onroad Inventory

The 2010 onroad mobile emission estimates were created by using the U.S. EPA MOVES2010a model. All estimates were made in accordance with the Users Guide to MOVES (U.S. EPA, Office of Transportation and Air Quality, Assessment and Standards Division, August 2010, EPA 420-B-10-036) and Technical Guidance on the Use of MOVES2010 for Emission Inventory Preparation in State Implementation Plans and Transportation Conformity (U.S. EPA, Office of Transportation and Air Quality, Transportation and Regional Programs Div., April 2010, EPA-420-B-10-023).

Nonroad Inventory

The 2010 nonroad mobile emission estimates were created by using the U.S. EPA NMIM model (2009/05/04 Version). The 2010 aircraft, marine and rail emissions were estimated using linear extrapolation from the 2005 and 2008 emissions inventories. Pechan, an independent contractor, provided marine and rail emission estimates via the LADCO for Wisconsin [LADCO, 2012]. Aircraft emissions were calculated using the Federal Aviation Administration's EDMS.

Emissions Summary

The following tables summarize the 2010 NO_x, $PM_{2.5}$ direct, SO_2 and VOC emissions.

Table 8 - Total NO_x Emissions for Attainment Year 2010 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	27.62	12.33	34.73	9.07	83.75
Racine County	1.19	2.30	7.96	2.53	13.98
Waukesha County	1.17	5.77	23.02	6.42	36.38
Three-County Nonattainment Area	29.98	20.40	65.71	18.02	134.11

Note: Point emissions include combined EGU and non-EGU emissions.

Table 9 - Total $PM_{2.5}$ Direct Emissions for Attainment Year 2010 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	0.02	9.94	1.86	0.65	12.47
Racine County	0.00	3.66	0.40	0.15	4.21
Waukesha County	0.00	5.29	1.19	0.43	6.91
Three-County Nonattainment Area	0.02	18.89	3.45	1.23	23.59

Note: Point emissions include combined EGU and non-EGU emissions.

Table 10 - Total SO_2 Emissions for Attainment Year 2010 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	61.20	2.58	0.25	0.31	64.34
Racine County	0.46	0.53	0.06	0.14	1.19
Waukesha County	0.16	1.42	0.16	0.05	1.79
Three-County Nonattainment Area	61.82	4.53	0.47	0.50	67.32

Note: Point emissions include combined EGU and non-EGU emissions.

Table 11 - Total VOC Emissions for Attainment Year 2010 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
Milwaukee County	4.23	41.59	19.17	4.83	69.82
Racine County	1.22	10.80	4.63	1.00	17.65
Waukesha County	2.67	19.88	13.44	3.94	39.93
Three-County Nonattainment Area	8.12	72.27	37.24	9.77	127.40

Note: Point emissions include combined EGU and non-EGU emissions.

4.6 Emission Projections and Demonstration of Maintenance

Details for the projected emission inventories for 2020 and 2025 for the nonattainment counties can be found in Section 7 (Maintenance Plan). Emission trends are an important gauge for continued compliance with the $PM_{2.5}$ NAAQS.

4.7 Permanent and Enforceable Emission Reductions

Permanent and enforceable reductions of NO_x, VOC and SO_2 have contributed to attaining the 24-hour $PM_{2.5}$ NAAQS in the nonattainment counties of Milwaukee, Racine, and Waukesha. Some of these emission reductions were due to the implementation of the NO_x SIP Call, VOC Reasonably Available Control Technology (RACT) limitations, NO_x RACT limitations, as well the application of tighter federal standards on motor vehicles and fuels.

Section 6 identifies the emission control measures specific to the Wisconsin's $PM_{2.5}$ nonattainment area, as well as the implementation status of each measure.

4.8 Provisions for Future Updates

As required by Section 175A(b) of the CAA, WDNR commits to submit to the Administrator, eight years after redesignation, an additional revision of this SIP. The revision will contain Wisconsin's plan for maintaining the $PM_{2.5}$ NAAQS for ten years beyond the first ten-year period after redesignation.

5.0 TRANSPORTATION CONFORMITY BUDGETS

U.S. EPA requirements outlined in 40 CFR 93.118(e)(4) stipulate that mobile source emission budgets for direct $PM_{2.5}$ and NO_x are established as part of a $PM_{2.5}$ SIP. Motor vehicle emission budgets (MVEBs) are necessary to demonstrate conformance of transportation plans and improvement programs with the SIP.

5.1 Motor Vehicle Emissions Model

The MOVES model is used to derive emission factors, which are the average emissions (units: grams) per mile for direct $PM_{2.5}$, and precursors NO_x, SO_2, and VOCs. Numerous variables can affect emission factors, especially vehicle-fleet (vehicles on the road), the fleet's age, and vehicle types. After emission factors are determined they are multiplied by vehicle miles traveled (VMT) to determine the quantity of vehicle-related emissions. This information is derived from a travel demand model. A summary of onroad emissions from the MOVES model can be found in Appendix 6.

5.2 Motor Vehicle Emission Budget (MVEB)

Table 12 contains the MVEB for the entire nonattainment area for the years 2015 and 2025. Margins of safety are used to accommodate the wide array of assumptions that are factored into the calculation process. Since assumptions change over time, it is necessary to have a margin of safety that will accommodate the impact of refined assumptions in the process. 40 CFR 93.101 defines safety margin as the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance. For the purposes of these emission budgets, a safety margin of 7.5 % has been applied to both 2020 and 2025.

Table 12 – MVEB for Milwaukee, Racine, and Waukesha (2020 and 2025) (*Tons per Winter Day*)

Location	NO_x	$PM_{2.5}$	SO_2	VOC
2020				
Milwaukee County	18.60	1.32	0.22	8.72
Racine County	3.91	0.28	0.05	2.01
Waukesha County	10.11	0.73	0.12	5.16
Three-County Nonattainment Area	32.62	2.33	0.39	15.89
2025				
Milwaukee County	16.32	1.22	0.21	6.63
Racine County	3.45	0.26	0.05	1.52
Waukesha County	8.92	0.68	0.12	3.83
Three-County Nonattainment Area	28.69	2.16	0.38	11.98

6.0 CONTROL MEASURES AND REGULATIONS

CAA Section 107(d)(3)(E)(iv) specifies that a nonattainment area cannot be redesignated to attainment unless the U.S. EPA determines that the improvements in air quality are due to permanent and enforceable emission reductions. This section documents that reductions in direct $PM_{2.5}$ and $PM_{2.5}$ precursor emissions (e.g., SO_2 and NO_x) have occurred in Wisconsin as a result of permanent and enforceable federal and state control measures, accounting for the significant improvements realized in measured $PM_{2.5}$ air quality. Descriptions of the federal and state measures follow.

6.1 Federal Control Measures

Improvements in Wisconsin's ambient $PM_{2.5}$ air quality are partially due to federal control programs that have reduced emissions in Wisconsin and other states. Post-2002 NO_x, SO_2 and $PM_{2.5}$ federal control measures that have resulted in improvements in ambient $PM_{2.5}$ levels are listed in Table 13.

Table 13 – Post-2002 Federal Control Programs

Control Measure	PM	NO_x	SO_2
Tier 2 Vehicle Standards and Gasoline Sulfur Standards	X	X	X
Heavy-Duty Diesel and Gasoline Highway Vehicle Standards	X	X	X
Motorcycle Exhaust Standards		X	
Large Non-road Diesel Engine Standards	X	X	X
NO_x SIP Call		X	
CAIR / CSAPR	X		X

Tier 2 Vehicle Standards and Gasoline Sulfur Standards

The federal Tier 2 rule, promulgated in February 2000, phased in more stringent vehicle emission standards between 2004 and 2009, resulting in lower emissions of NO_x, PM and sulfur compounds from new cars and light duty trucks, including large sport utility and passenger vans. The final Tier 2 standards limit NO_x levels for new vehicles to an average of 0.07 grams per mile (g/mi), requiring new vehicles to be 77% to 95% lower emitting than those on the road prior to the program. The Tier 2 standards also reduced the sulfur content of gasoline to 30 parts per million (ppm) by 2006, about an order of magnitude lower than 2002 levels. Sulfur in gasoline interferes with the operation of catalytic converters on vehicles resulting in higher NO_x emissions. In addition to facilitating lower emissions from new Tier 2 equipped vehicles, the required lower sulfur levels also produced immediate emission reductions from older pre-Tier 2 vehicles due to less poisoning of catalysts on those vehicles. Further reductions will occur through the maintenance period as vehicle turnover increases the proportion of Tier 2 vehicles in the fleet.

Heavy-Duty Diesel and Gasoline Highway Vehicle Standards

New U.S. EPA standards designed to reduce NO_x and VOC emissions from heavy-duty diesel and gasoline highway vehicles took effect in 2004 and 2005, respectively. A second phase of standards, commencing in 2007, established tighter PM and NO_x emission limits for heavy-duty diesel and gasoline highway engines and also required highway diesel fuel sulfur content to be reduced by 97% to 15 ppm to minimize potential damage to emission control devices. The U.S. EPA estimates that the total program achieves a 90% reduction in PM emissions and a 95% reduction in NO_x emissions from new engines using low sulfur diesel, compared to previous generation engines using higher sulfur content diesel. The

reduction in fuel sulfur content also provided additional immediate reductions in sulfate particle emissions from all on-road diesel vehicles. Further emission reductions will occur through the maintenance period with fleet turnover.

Motorcycle Exhaust Standards

In 2004, the U.S. EPA published a final rule to implement improved exhaust emission standards on new highway motorcycles. These exhaust emission standards apply to all 2006 model year and newer motorcycles, including scooters and mopeds. In addition, motorcycles with the largest engines are subject to more stringent NO_x and hydrocarbon standards beginning with the 2010 model year.

Large Non-road Diesel Engine Standards

In May 2004, the U.S. EPA expanded on previous requirements by adopting a new rule establishing tighter emission limits for large non-road diesel engines, such as those used in construction, agricultural, and industrial equipment, to be phased in between 2008 and 2014. The non-road diesel rule also required reductions in the sulfur content of non-road diesel fuel from pre-rule levels of approximately 3,400 ppm to 500 ppm by 2006, with a further reduction to 15 ppm by 2010, a total reduction of over 99 percent. The combined engine and fuel rules reduced NO_x and PM emissions from new large non-road diesel engines by over 90%, compared to previous generation non-road engines using higher sulfur content diesel. Given the timing of the new requirements, most of the reductions will occur during the maintenance period as the fleet of older non-road diesel engines is gradually replaced with the newer, lower emitting engines. Nonetheless, the required reduction in fuel sulfur content did yield an immediate reduction in sulfate particle emissions from all non-road diesel vehicles.

NO_x SIP Call

In October 1998, the U.S. EPA issued a NO_x SIP Call requiring the District of Columbia and 22 states to reduce emissions of NO_x. The program was primarily targeted at securing emission reductions from EGUs (power plants) in states that were determined to be significantly contributing to violations of the 1-hour ozone NAAQS in other, downwind states. Affected states were required to comply with Phase I of the SIP Call beginning in 2003/2004 and Phase II beginning in 2007.

CAIR / CSAPR

In order to assist states in addressing their obligations regarding regionally transported pollution, the U.S. EPA finalized the Clean Air Interstate Rule (CAIR) to reduce emissions NO_x and SO_2 from large EGUs. The WDNR has promulgated CAIR (Wis. Adm. Code NR 432). Chapter NR 432 applies to all major EGUs in Wisconsin and in upwind states. Nationwide, CAIR resulted in an estimated reduction of NO_x emissions by 53% by 2009. Sulfur dioxide emissions were reduced by 45% by 2010.

On December 23, 2008, the D.C. Circuit Court decided to remand, rather than vacate, the CAIR rule, thus leaving CAIR in place while EPA revises the rule. In response, the U.S. EPA recently promulgated the Cross-State Air Pollution Rule (CSAPR). However, due to ongoing litigation involving CAIR and CSAPR, all potential emission reductions resulting from CAIR and CSAPR have been left out of the maintenance emission inventory projections in this redesignation request, unless they are already fully committed controls.

6.2 State Control Measures

Improvements in Wisconsin's ambient $PM_{2.5}$ air quality are partially due to state control programs that have reduced emissions in Wisconsin. Post-2002 NO_x, SO_2 and $PM_{2.5}$ state control measures that have resulted in improvements in ambient $PM_{2.5}$ levels are listed in Table 14.

Table 14 – Post-2002 State Control Programs

Control Measure	PM	NO_x	SO_2
NOx RACT		X	
VOC RACT			
Mercury Multi-pollutant Rule		X	X
Best Available Retrofit Technology (BART)	X	X	X

NO_x RACT

For purposes of reducing ambient ozone levels, the WDNR promulgated NO_x RACT rules. These rules are located in Chapter NR 428 of the Wisconsin Administrative Code. An added benefit from implementing and enforcing these NO_x RACT requirements is the resulting reduction in $PM_{2.5}$.

VOC RACT

For purposes of reducing ambient ozone levels, the WDNR promulgated VOC RACT rules. The Wisconsin VOC RACT rules are codified in several chapters of the NR 400 series of the Wisconsin Administrative Code. An added benefit from implementing and enforcing these VOC RACT requirements is the reduction in VOC emissions that are precursors to organic carbon $PM_{2.5}$.

Mercury Multi-Pollutant Rule

NR 446, Wis. Adm. Code, allows large or small coal-fired electrical generating units the option to reduce NO_x, SO_2, and mercury by 2015 to the emission limitations listed in NR 446.14, Wis. Adm. Code, instead of the mercury only limitations listed in NR 446.12 and 446.13, Wis. Adm. Code.

Best Available Retrofit Technology (BART)

NR 433, Wis. Adm. Code, affects certain large sources of NO_x, SO_2, or direct particle pollution that began operation between 1962 and 1977. The main sources subject to emission reductions are boilers at electric generating power plants and pulp and paper facilities.

7.0 MAINTENANCE PLAN

Section 175A of the CAA sets forth the elements of a maintenance plan for areas seeking redesignation from nonattainment to attainment. The plan must demonstrate continued attainment of the applicable NAAQS for at least 10 years after the U.S. EPA approves a redesignation to attainment. Eight years after the redesignation, the state must submit a revised maintenance plan, which demonstrates attainment for the 10 years following the initial 10-year period.

7.1 Maintenance Inventory Methodology (2020 and 2025)

This section contains the projected emission inventories for 2020 and 2025 for the Milwaukee, Racine, and Waukesha three-county $PM_{2.5}$ nonattainment area. The WDNR performed emission projections using the following methodologies.

Point Source Inventory

Electric Generating Unit (EGU) projected 2018 emissions for NO_x, SO_2, and VOC were based on IPM3.0 and included "will do" adjustments identified by Wisconsin. These adjustments included NO_x RACT. Non-EGU projected 2018 emissions were derived by applying growth and control factors – developed by Pechan – to the 2005 base year inventory. Growth factors were initially based on EGAS and were modified for select priority categories by examining emissions activity data. Projected emissions for 2020 and 2025 were estimated using linear extrapolation from 2010 and 2018 emissions. The 2020 and 2025 point source emissions calculations are located in Appendix 7.

EGU projected 2018 emissions for $PM_{2.5}$ were not available from LADCO. Therefore, the 2020 and 2025 $PM_{2.5}$ emission inventories for the EGU source category were created by projecting forward the Wisconsin 2008 base year emissions inventory submitted to the U.S. EPA in 2010 for the NEI. This same approach was used in the WDNR's recent ozone redesignation request and proposed for approval by the U.S. EPA. The emission projections were based on growth factors from the EGAS model. The "Default REMI 6.0 SCC Configuration" for EGAS was used.

The EGAS growth factors are based on the 2004 Annual Energy Outlook (AEO) from the U.S. Department of Energy. The 2020 and 2025 growth factors were modified slightly to reflect more recent AEO reports (2008 – 2012) [EIA, 2012]. In 2020, energy consumption projections have decreased from 13.34 – 21.10% and in 2025, they have decreased from 16.08 – 24.58% compared to the 2004 AEO report. In order to reflect these reduced energy consumption projections, the 2020 and 2025 growth factors were conservatively reduced by 13% and 16%, respectively. A table of the EGAS growth factors is located in Appendix 7.

Area Source Inventory

The 2020 and 2025 area source emission inventories were created by projecting forward the Wisconsin 2008 base year emissions inventory submitted to the U.S. EPA in 2010 for the NEI. This same approach was used in the WDNR's recent ozone redesignation request and proposed for approval by the U.S. EPA. The emission projections were primarily based on growth factors from the EGAS model. The "Default REMI 6.0 SCC Configuration" for EGAS was used. If growth factors were not available for a certain SCC, population based growth factors were derived based on the Wisconsin Department of Administration's Demographic Services Center population reports.

The EGAS growth factors are based on the 2004 AEO from the U.S. Department of Energy. The 2020 and 2025 growth factors were modified slightly to reflect more recent AEO reports (2008 – 2012) [EIA,

2012]. In 2020, energy consumption projections have decreased from 13.34 – 21.10% and in 2025, they have decreased from 16.08 – 24.58% compared to the 2004 AEO report. To reflect these reduced energy consumption projections, the 2020 and 2025 growth factors were conservatively reduced by 13% and 16%, respectively. A table of the EGAS growth factors and the 2020 and 2025 area source emissions by county and SCC is located in Appendix 5.

Nonroad Inventory

The 2020 and 2025 nonroad mobile emission estimates were created by using the U.S. EPA NMIM model (2009/05/04 Version). In addition, marine and rail emissions were grown to 2018 from 2005 Pechan statewide growth factors, while EGAS growth factors were used to grow the aircraft inventory to 2018 [LADCO, 2011]. Marine, aircraft, and rail projected emissions for 2020 and 2025 were estimated using linear inter/extrapolation from 2008 and 2018 emissions. This same approach was used in the WDNR's recent ozone redesignation request and proposed for approval by the U.S. EPA.

Onroad Inventory

Emission projections were created using the U.S. EPA MOVES model. All estimates were made in accordance with the Users Guide to MOVES (U.S. EPA, Office of Transportation and Air Quality, Assessment and Standards Division, August 2010, EPA 420-B-10-036) and Technical Guidance on the Use of MOVES2010 for Emission Inventory Preparation in State Implementation Plans and Transportation Conformity (U.S. EPA, Office of Transportation and Air Quality, Transportation and Regional Programs Div., April 2010, EPA-420-B-10-023).

Emissions Summary

The following tables summarize the 2020 and 2025 NO_x, $PM_{2.5}$ direct, SO_2 and VOC emissions.

Table 15 - Total NO_x Emissions for 2020 and 2025 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
2020					
Milwaukee County	21.23	10.86	18.60	4.10	54.79
Racine County	1.16	2.07	3.91	1.13	8.27
Waukesha County	1.55	5.27	10.11	2.34	19.27
Three-County Nonattainment Area	23.94	18.20	32.62	7.57	82.33
2025					
Milwaukee County	17.08	10.59	16.32	3.00	46.99
Racine County	1.15	2.04	3.45	0.81	7.45
Waukesha County	1.74	5.24	8.92	1.84	17.74
Three-County Nonattainment Area	19.97	17.87	28.69	5.65	72.18

Note: Point emissions include combined EGU and non-EGU emissions.

Table 16 - Total $PM_{2.5}$ Direct Emissions for 2020 and 2025 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
2020					
Milwaukee County	0.23	8.87	1.32	0.34	10.76
Racine County	0.05	3.41	0.28	0.07	3.81
Waukesha County	0.04	5.11	0.73	0.23	6.11
Three-County Nonattainment Area	0.32	17.39	2.33	0.64	20.68
2025					
Milwaukee County	0.30	8.62	1.22	0.24	10.38
Racine County	0.08	3.40	0.26	0.05	3.79
Waukesha County	0.06	5.18	0.68	0.21	6.13
Three-County Nonattainment Area	0.44	17.20	2.16	0.50	20.30

Note: Point emissions include combined EGU and non-EGU emissions.

Table 17 - Total SO_2 Emissions for 2020 and 2025 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
2020					
Milwaukee County	27.00	2.18	0.22	0.23	29.63
Racine County	0.68	0.46	0.05	0.08	1.27
Waukesha County	0.16	1.24	0.12	0.08	1.60
Three-County Nonattainment Area	27.84	3.88	0.39	0.39	32.50
2025					
Milwaukee County	9.52	2.05	0.21	0.20	11.98
Racine County	0.78	0.44	0.05	0.05	1.32
Waukesha County	0.15	1.19	0.12	0.12	1.58
Three-County Nonattainment Area	10.45	3.68	0.38	0.37	14.88

Note: Point emissions include combined EGU and non-EGU emissions.

Table 18 - Total VOC Emissions for 2020 and 2025 (*Tons per Winter Day*)

Location	Point	Area	Onroad	Nonroad	Total
2020					
Milwaukee County	5.79	41.08	8.72	3.98	59.57
Racine County	1.30	10.76	2.01	0.75	14.82
Waukesha County	3.22	19.86	5.16	3.18	31.42
Three-County Nonattainment Area	10.31	71.70	15.89	7.91	105.81
2025					
Milwaukee County	6.57	42.88	6.63	4.17	60.25
Racine County	1.34	11.29	1.52	0.77	14.92
Waukesha County	3.49	20.88	3.83	3.33	31.53
Three-County Nonattainment Area	11.40	75.05	11.98	8.27	106.70

Note: Point emissions include combined EGU and non-EGU emissions.

7.2 Demonstration of Maintenance (Comparison of Emissions)

The maintenance emission inventory estimates are presented in the tables below and demonstrate that emissions of direct $PM_{2.5}$, NO_x, SO_2, and VOC will decrease in future years. The results of this analysis show that the nonattainment area is expected to maintain the air quality standard for at least ten years into the future.

Table 19 – NO_x Emissions in the Three-County Nonattainment Area (*Tons per Winter Day*)

Sector	2010	2020	Net Change from 2010	2025	Net Change from 2010
Point	29.98	23.94	-6.04	19.97	-10.01
Area	20.40	18.20	-2.20	17.87	-2.53
Onroad	65.71	32.62	-33.09	28.69	-37.02
Nonroad	18.02	7.57	-10.45	5.65	-12.37
Total	134.11	82.33	-51.79	72.18	-61.93

Table 20 – $PM_{2.5}$ Direct Emissions in the Three-County Nonattainment Area (*Tons per Winter Day*)

Sector	2010	2020	Net Change from 2010	2025	Net Change from 2010
Point	0.02	0.32	0.30	0.44	0.42
Area	18.89	17.39	-1.50	17.20	-1.69
Onroad	3.45	2.33	-1.12	2.16	-1.29
Nonroad	1.23	0.64	-0.59	0.50	-0.73
Total	23.59	20.68	-2.91	20.30	-3.29

Table 21 – SO_2 Emissions in the Three-County Nonattainment Area (*Tons per Winter Day*)

Sector	2010	2020	Net Change from 2010	2025	Net Change from 2010
Point	61.82	27.84	-33.98	10.45	-51.37
Area	4.53	3.88	-0.65	3.68	-0.85
Onroad	0.47	0.39	-0.08	0.38	-0.09
Nonroad	0.50	0.39	-0.11	0.37	-0.13
Total	67.32	32.50	-34.82	14.88	-52.44

Table 22 – VOC Emissions in the Three-County Nonattainment Area (*Tons per Winter Day*)

Sector	2010	2020	Net Change from 2010	2025	Net Change from 2010
Point	8.12	10.31	2.19	11.40	3.28
Area	72.27	71.70	-0.57	75.05	2.78
Onroad	37.24	15.89	-21.35	11.98	-25.26
Nonroad	9.77	7.91	-1.86	8.27	-1.50
Total	127.40	105.81	-21.59	106.70	-20.70

7.3 Verification of Continued Attainment

Continued verification of attainment of the 2006 24-hour $PM_{2.5}$ NAAQS in the counties of Milwaukee, Racine, and Waukesha depends on Wisconsin's effort toward tracking indicators of continued attainment during the maintenance period. The tracking plan for these areas primarily consists of continued $PM_{2.5}$ monitoring in accordance with the requirements of 40 CFR Part 58.

7.4 Contingency Plan

Despite the best efforts to demonstrate continued compliance with the NAAQS, the ambient $PM_{2.5}$ concentrations may exceed or violate the NAAQS. Therefore, as required by section 175A of the CAA, Wisconsin has provided contingency measures to promptly correct a future $PM_{2.5}$ air quality problem. These contingency measures would be implemented if a future 24-hour $PM_{2.5}$ design value for any of the current monitors is above the $PM_{2.5}$ 24-hour NAAQS (35 $\mu g/m^3$).

Contingency Measures Approach:

1. Evaluation of Adequacy of Existing Control Measures – If a violation occurs, the first and most important step Wisconsin will take will be to evaluate the adequacy of already-adopted control measures to rectify the violation. Control measures that have already been promulgated, but not fully implemented at the time of the violation may very likely be sufficient to return the area to attainment.

   If a measure or control is already promulgated and scheduled to be implemented at the federal or state level, the state will assess whether that measure or control in combination with other existing controls will be sufficient. Wisconsin will consider existing control measures that have been adopted in Wisconsin, as well as existing measures that have already been adopted in other states or by the federal government. If existing control measures are determined to be sufficient to address the upward trend in $PM_{2.5}$ concentrations, additional local control measures will not be necessary. In that case, Wisconsin will submit to U.S. EPA an analysis to demonstrate that the

existing measures that have not been fully implemented are adequate to return the area to attainment.

2. Evaluation of Additional Control Measures – If it is demonstrated through modeling that existing and on-the-way measures are inadequate to return the area to attainment, the WDNR will identify candidate additional control measures as necessary to return the area to attainment within 18 months. The selection of candidate measures will be based upon cost-effectiveness, emission reduction potential, economic and social considerations and other appropriate factors. Before proposing any specific candidate control measures, WDNR will solicit input from all interested and affected parties.

It is important to note that adoption of any additional control measures is subject to the necessary administrative and legal process as well as required legislative oversight. This process will include publication of notices, an opportunity for public hearing, and other measures required by Wisconsin law for rule making.

7.5 List of Potential Additional Control Measures

Since it is not possible at this time to determine what control measure (if any) will be appropriate at an unspecified time in the future, the list of potential candidate contingency measures outlined below is not comprehensive nor is the list in priority order.

1. Broaden the application of the NO_x RACT program:

   - to include a larger geographic area, and/or
   - to include sources with potential emissions of 50 tons/year, and/or
   - to increase the cost-effectiveness thresholds utilized as a basis for Wisconsin's NO_x RACT Program

2. Consideration of $PM_{2.5}$ and SO_2 RACT

3. Diesel reduction emission strategies (e.g., further grant programs)

No contingency measure shall be implemented without providing the opportunity for full public participation during which the relative costs and benefits of individual measures can be fully evaluated.

7.6 Commitment to Revise Maintenance Plan

Wisconsin hereby commits to review its Maintenance Plan eight (8) years after redesignation, as required by Section 175(A) of the CAA. This revised SIP will provide for maintenance for an additional 10 years.

8.0 PUBLIC PARTICIPATION

The WDNR will publish in the State's official newspaper of record (The Wisconsin State Journal) a notice that it will hold a public hearing on this $PM_{2.5}$ redesignation request. This public hearing will take place at WDNR Southeast Regional Headquarters (2300 N. Dr. Martin Luther King Dr., Milwaukee) on Monday, May 7, 2012. Furthermore, all documentation will be posted on the WDNR website (http://dnr.wi.gov/topic/AirQuality). There will be at least a 30-day public comment period on this redesignation request. The WDNR will review and respond to all received public comments and include those responses as part of the final submittal to the U.S. EPA.

9.0 CONCLUSION

The counties of Milwaukee, Racine, and Waukesha have attained the 2006 24-hour $PM_{2.5}$ NAAQS. In addition, all applicable provisions of the CAA and $PM_{2.5}$ implementation rule regarding redesignation to attainment have been met, as described within this document. Therefore, the WDNR, on behalf of the State of Wisconsin, hereby requests that the U.S. EPA redesignate these three counties to attainment status for the 24-hour $PM_{2.5}$ NAAQS.

10.0 REFERENCES

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