

March 18, 2019

Ozone and Particulate Matter Advance  
c/o Laura Bunte, Mail Code C304-01  
109 TW Alexander Drive  
Research Triangle Park, NC 27711

RE: 2018 Minnesota Ozone Advance and Particulate Matter Updates

Dear Laura Bunte:

The purpose of this letter is to provide the annual update on Minnesota's participation in the U.S. Environmental Protection Agency's (EPA) voluntary Ozone Advance and Particulate Matter (PM) Advance Programs.

The Minnesota Pollution Control Agency (MPCA) submitted the Final Report: *A Collaborative Plan to Reduce Emissions* (Report) from Minnesota's Clean Air Dialogue as our path forward in May 2013. The 24 recommendations in the Report have served to direct many of the non-point air pollution emissions reduction efforts of the MPCA and our partners as part of our participation in the Ozone and PM Advance Programs. The MPCA has many projects and programs to achieve voluntary emissions reductions from non-permitted sources. This annual Advance report focus on those projects that have been part of the Clean Air Minnesota collaborative effort.

Highlights from this year's work on Ozone Advance and PM Advance projects include:

- Awarded five small businesses with grant funding to reduce volatile organic compound emissions using information to consider if businesses were in communities of concern for environmental justice.
- Parts washer partnership – 54 service providers switched solvent-based equipment for aqueous parts washers.
- Wood-stove change out program – 209 wood stoves were replaced with approved cleaning technology wood stoves.
- EPA Source Reduction Grant – 23 companies implemented the use of safer alternatives in 43 products.
- Project Green Fleet replaced four heavy-duty diesel engines and two pieces of heavy-duty diesel equipment with cleaner alternatives.

In all areas of our work, the MPCA is striving to advance environmental justice in Minnesota. We are working with our Clean Air Minnesota partners to incorporate equity considerations into our initiatives and to focus emission reductions in lower-income communities and communities of color. This effort will continue to be a focus for the MPCA and our partners in 2019 as we look to improve how we address environmental justice as part of Clean Air Minnesota's work.

Laura Bunte  
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Non-point air pollution reductions and the work we do with our Clean Air Minnesota partners are key priorities for the MPCA. In order to use plain language with the public the MPCA has been using the term "neighborhood sources" for non-point. We continue to find the Ozone Advance and PM Advance structure a useful tool as we move forward in our efforts to find new and innovative ways to achieve voluntary emissions reductions across the state. We look forward to continuing work with our partners and making further progress on our emission reduction initiatives and education efforts. If you have any questions, please contact Hannah Field of my staff at 651-757-2760 or [hannah.field@state.mn.us](mailto:hannah.field@state.mn.us).

Sincerely,



Craig McDonnell  
Assistant Commissioner

CM/HF:ds

Enclosures

# 2018 Minnesota Ozone and Particulate Matter Advance Programs Update

## Introduction

The Minnesota Pollution Control Agency (MPCA) works with its partners to ensure clean, clear air in Minnesota to support healthy communities and a strong economy. The MPCA joined the U.S. Environmental Protection Agency's (EPA) Ozone Advance and Particulate Matter (PM) Advance Programs in 2013, to continue to improve the air and protect the health of all Minnesotans. This report provides an update on the work that the MPCA and its partners are doing to progress on the goals of the Advance Program.

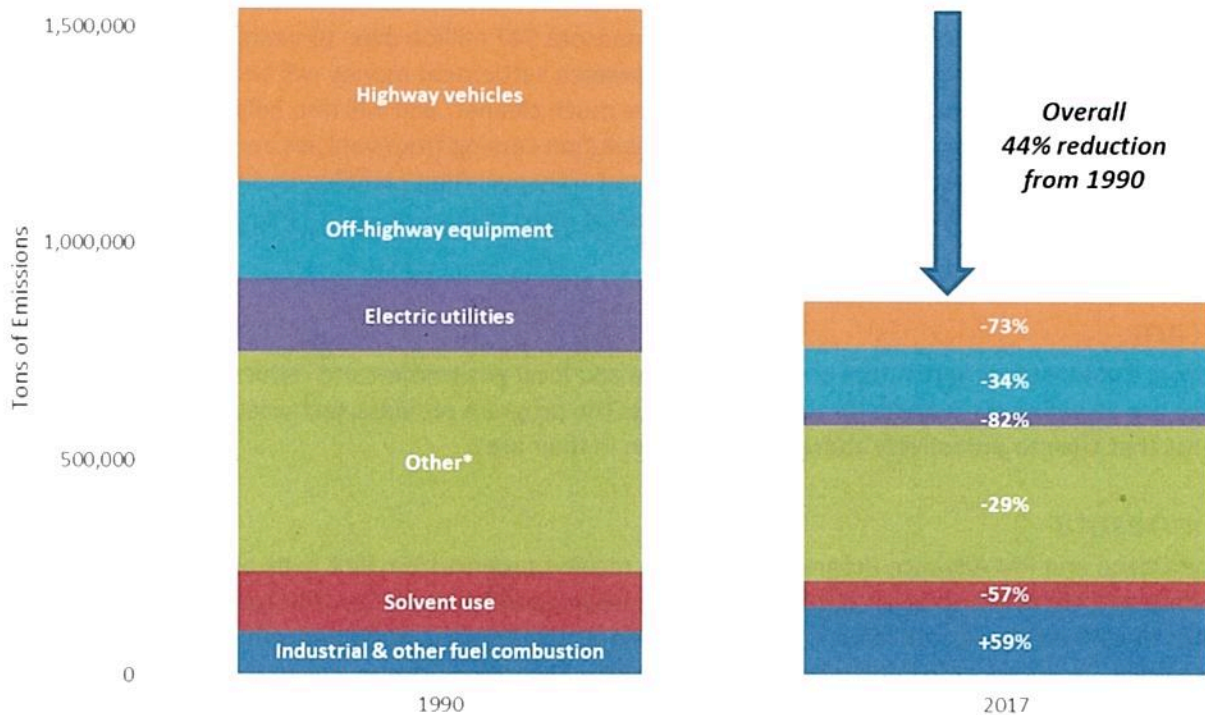
## National Ambient Air Quality Standards

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for common pollutants that are considered harmful to public health and the environment. The EPA reexamines each of the NAAQS every five years to ensure they continue to reflect the most up-to-date scientific knowledge on the health and environmental impacts of the pollutants. The latest standard to be revised was the ozone standard in 2015. The reduced limit reflects the latest scientific research that air pollutants can cause health impacts at lower and lower levels.

Each time the NAAQS are revised, the air quality across the country is reviewed to determine where the air is in compliance (attainment) with the standard and where it is not in compliance (nonattainment) with the standard. Two of these pollutants of most concern in Minnesota are ozone and PM. Minnesota is in attainment for both the ozone and PM NAAQS, but strives to continue to improve air quality in the state in order to protect the health of our most vulnerable people and to avoid the possibility of future nonattainment of the increasingly stringent NAAQS. Scientific research has found no evidence of safe thresholds (such as the NAAQS) below which health impacts should be assumed to be zero. Therefore, improvements in air quality from any level can provide significant public health benefits.

## Air pollution in Minnesota

Figure 1: Trends in air pollution emissions by source category, 1990-2017



Includes emissions of VOCs, SO<sub>2</sub>, NO<sub>x</sub>, and directly emitted fire particles (PM<sub>2.5</sub>)

Source: EPA National Emissions Inventory (2017)

\* 1990 emissions totals do not include those from prescribed fires and wildfires



Over the last 20 years, as a result of controls put in place under the Clean Air Act, annual air pollution emissions in Minnesota have decreased by almost half. Among all sources, the greatest reductions have been achieved in power plants, with emissions from these sources falling by more than 80% between 1990 and 2017.

Typically, people associate air pollution with facilities that have big smokestacks, like power plants and factories. In reality, these sources make up a relatively small part of our air pollution emissions, about a fifth of overall emissions in the state. Vehicles and other mobile equipment, on the other hand, account for about half of overall emissions. The rest comes from the smaller, “neighborhood” sources such as back-yard fires and drycleaners that are in all of our communities. Individually, sources like auto body shops, gas stations, and home heating and air conditioning systems may not produce much pollution, but combined, they make up 35% of all air pollution emitted in Minnesota. These sources are difficult to regulate, so voluntary actions by businesses and individuals will be key to further improving air quality.

**Figure 2: Overall air pollution sources by type**



The national Volkswagen emissions settlement, which provides Minnesota \$47 million over 10 years to reduce diesel pollution, offers new opportunities for voluntary actions. The Volkswagen settlement money will be used to replace older, dirty diesel vehicles and equipment with new models that are much cleaner, and will also help install electric-vehicle charging stations across the state. With about half our air pollution coming from vehicles and other mobile sources, more effort will need to be directed toward supporting smart transportation planning and adopting new, cleaner technologies. Read more about Minnesota’s Settlement Plan at <https://www.pca.state.mn.us/air/volkswagen-settlement>.

## Advance Program

The Advance Program is a voluntary program that encourages state and local governments to reduce ozone and PM pollution in areas that are attaining the NAAQS for those pollutants. The program provides technical support for state and local governments that wish to proactively address air pollution in their area.

## Advance in Minnesota

Minnesota joined the Ozone and PM Advance Programs in 2013 to receive support from EPA in its efforts to reduce concentrations of ozone and PM in the state. In 2012 and 2013 the Minnesota Pollution Control Agency (MPCA) participated in a series of conversations with leaders from the business, government, and nonprofit sectors to explore opportunities for proactive, voluntary emissions reductions in the state. This collaboration, called the Clean Air Dialogue, produced the *Final Report: A Collaborative Plan to Reduce Emissions* (Report), which the MPCA submitted as our path forward in May 2013.

The 24 recommendations in the Report have served to direct many of the non-point air pollution emissions reduction efforts of the MPCA and our partners as part of our participation in the Ozone and PM Advance Programs. Clean Air

Minnesota is a collaboration among businesses, nonprofits, and governments and serves as the stakeholder group for our Ozone and PM Advance efforts. The collaboration is convened by Environmental Initiative (a 501c3 nonprofit organization) and includes 25 partner organizations. Information on the members of Clean Air Minnesota can be found in Attachment 1. Detailed information on Clean Air Minnesota; its members and projects; and agendas, notes, and materials from its meetings can be found in Attachment 2 and 3, and also on the Clean Air Minnesota website: <https://environmental-initiative.org/work/clean-air-minnesota/>.

The MPCA and our partners in the private, public, community, and governmental sectors have many voluntary emissions reduction programs across the state focused on these neighborhood emissions sources. The MPCA has chosen to limit the scope of projects tracked for the Advance Program to projects executed through Clean Air Minnesota. Projects developed and implemented through Clean Air Minnesota from June 2017 through June 2018 are the focus of this report.

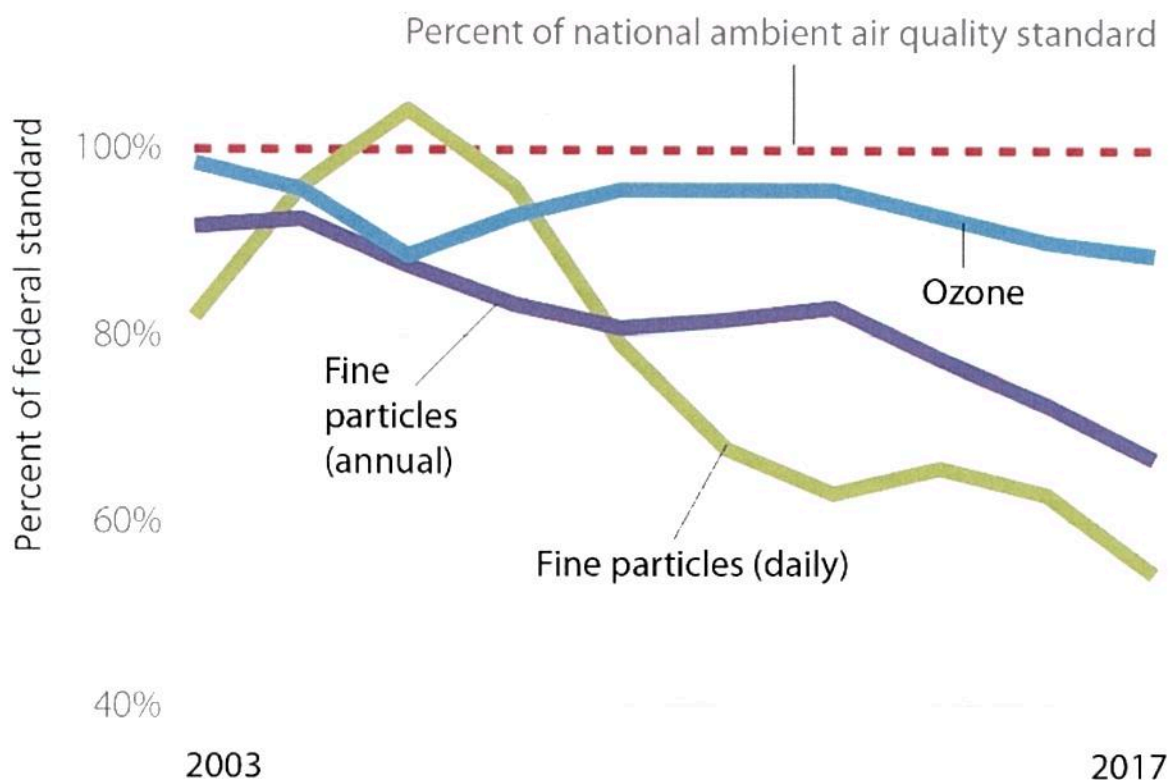
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**Clean Air Minnesota's overarching goal is to reduce emissions of certain key pollutants by 10% from 2011 levels through voluntary emission reduction efforts. CAM partners have helped small-business owners make equipment changes; replace old, dirty engines with new, cleaner versions; and replace old wood stoves with cleaner-burning technology.**

**Up to 2018, this work has reduced 530 tons of fine particles and 566 tons of VOCs.**

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**Figure 3: Trends in ozone and fine particle pollution levels (2003-2017)**



### Minnesota's air quality trends

Ozone and fine particle pollution levels in Minnesota have been steadily improving since 2003 (see Figure 3). However, progress in reducing both pollutants has been affected by year-to-year variability in the weather. Between 2009 and 2011, daily fine particle levels increased due to more frequent stagnant weather conditions caused by a southerly shift

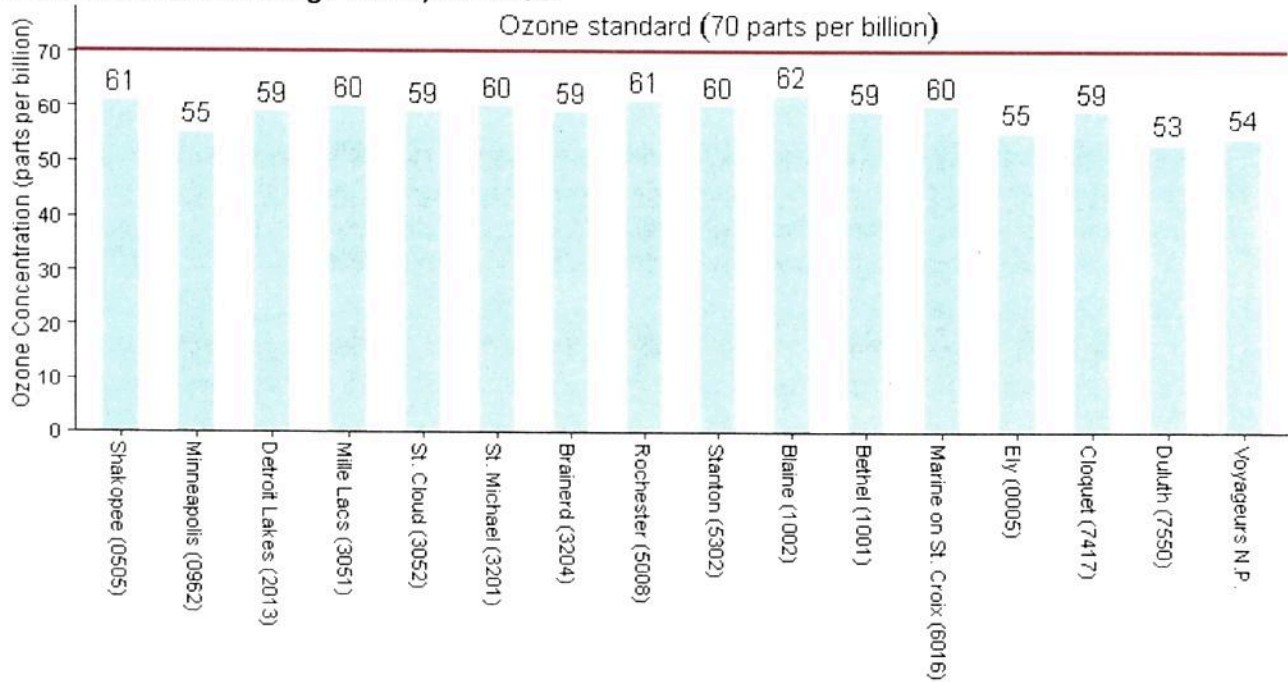


of the jet stream. In recent years, with a more northerly jet stream, daily fine particle levels have fallen dramatically. Since 2011, there has been little improvement in ozone pollution. Hot temperatures and sunshine are key ingredients in the formation of ozone. The summers of 2012 and 2013 both had more than 20 days with temperatures greater than 90°F. In comparison, the summers of 2016 and 2017 had fewer high heat days, resulting in lower levels of ozone.

### Ozone

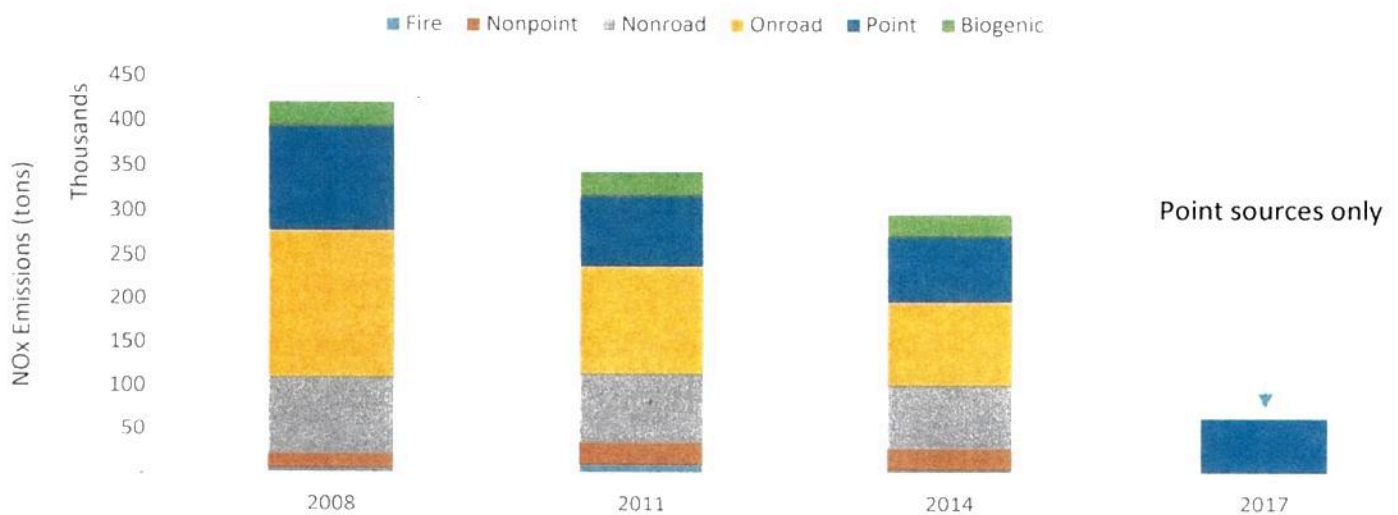
Minnesota has 17 regulatory monitors around the state for ozone. As of 2018, all monitors in the state were demonstrating compliance with the most recent and most stringent ozone NAAQS of 70 parts per billion (ppb).

**Figure 4: Monitored ozone design values, 2015-2017**

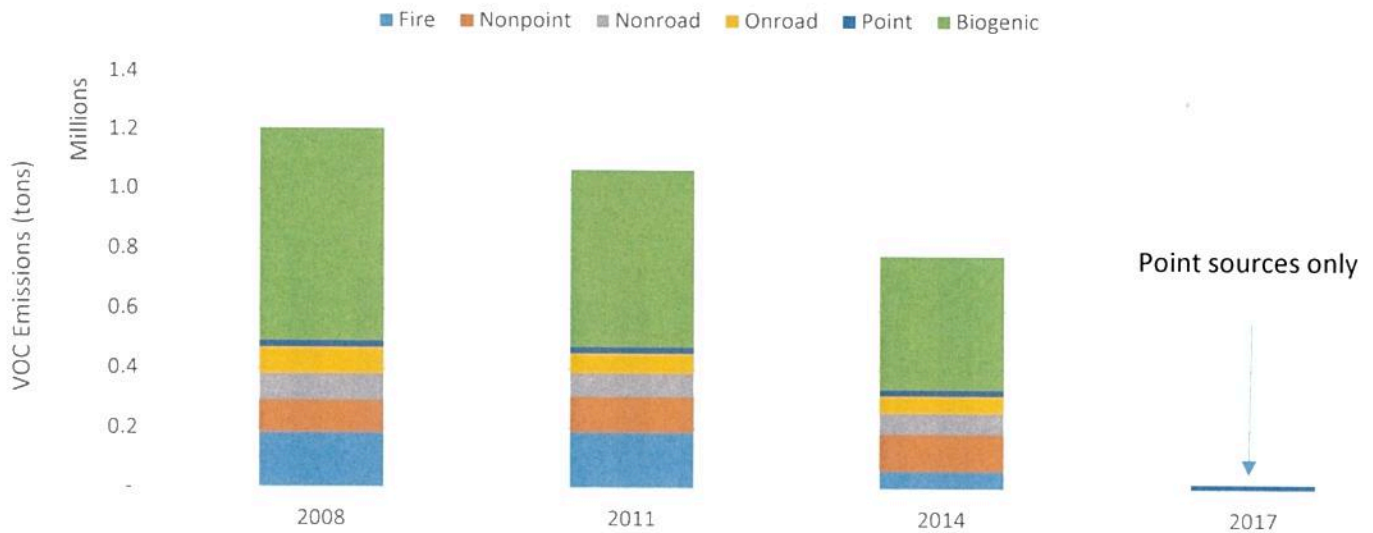


Emissions of ozone precursor pollutants – nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs) – have been decreasing in recent years, indicating that Minnesota will continue to attain the 2015 ozone standard. Figures 5 and 6 show the most recent emissions data for NO<sub>x</sub> and VOCs in Minnesota. The figures show emissions from years when the National Emissions Inventory is conducted. 2017 data only includes point source emissions.

**Figure 5: NO<sub>x</sub> annual anthropogenic emissions in Minnesota from 2008 to 2017**



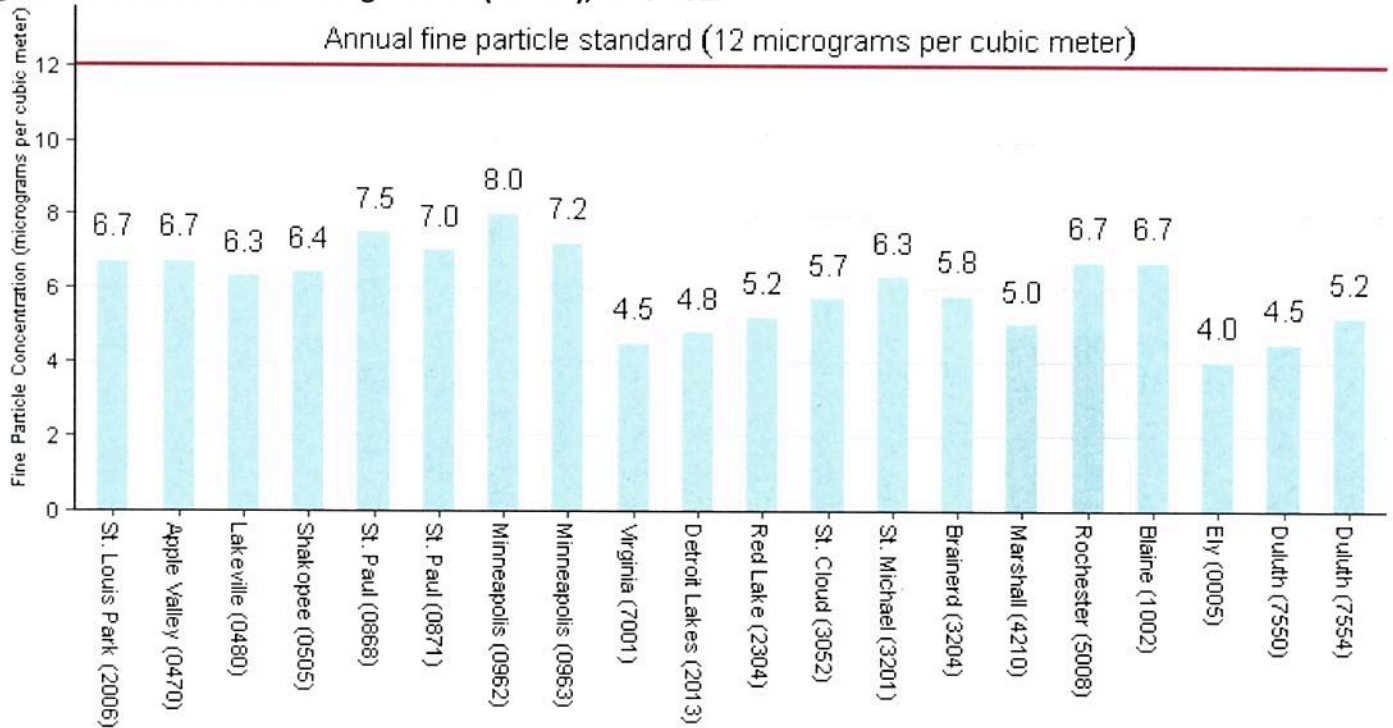
**Figure 6: VOC annual anthropogenic emissions in Minnesota from 2008 to 2017**



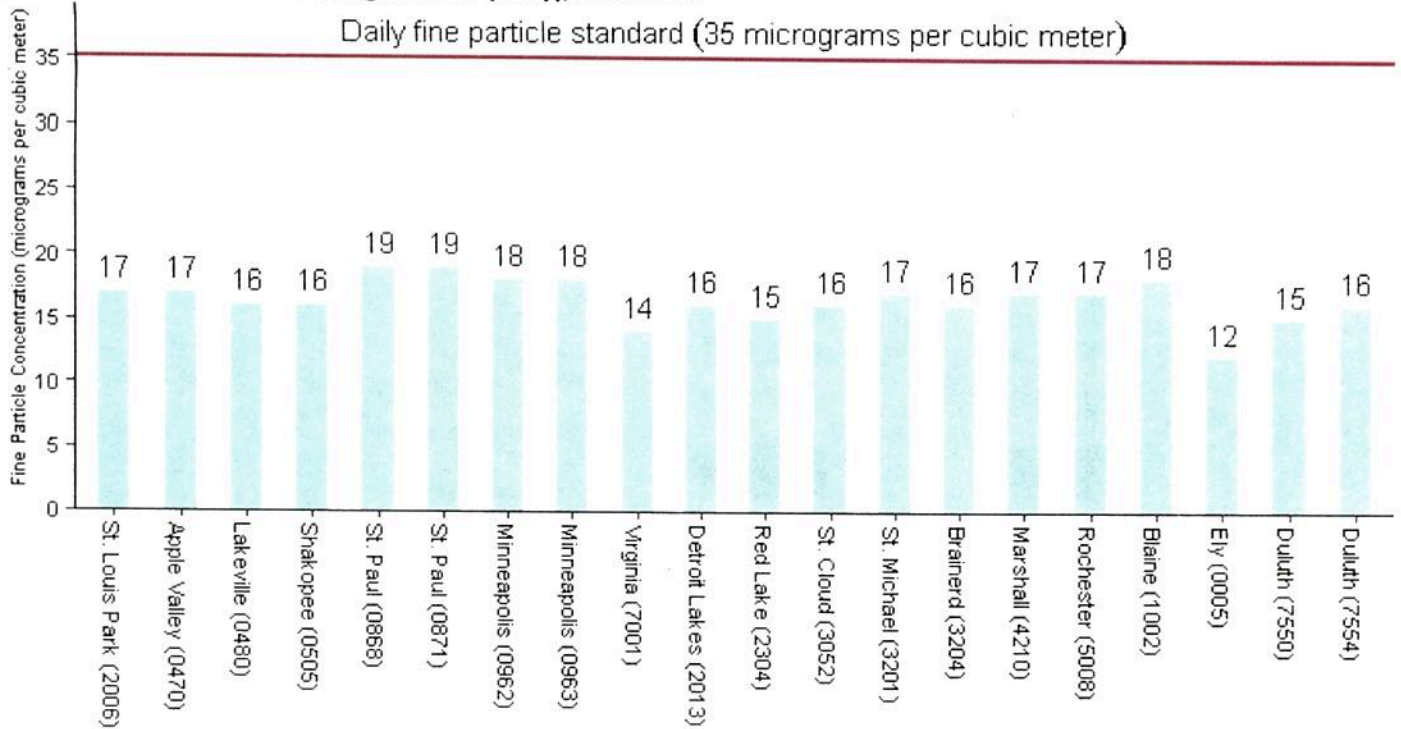
**Particulate matter**

Minnesota has 20 regulatory monitors around the state monitoring PM<sub>2.5</sub>. Figures 7 and 8 show the most recent monitoring data from all of the PM<sub>2.5</sub> monitors across the state for both the annual (Figure 7) and the daily (Figure 8) standards.

**Figure 7: Monitored PM2.5 design values (annual), 2015-2017**

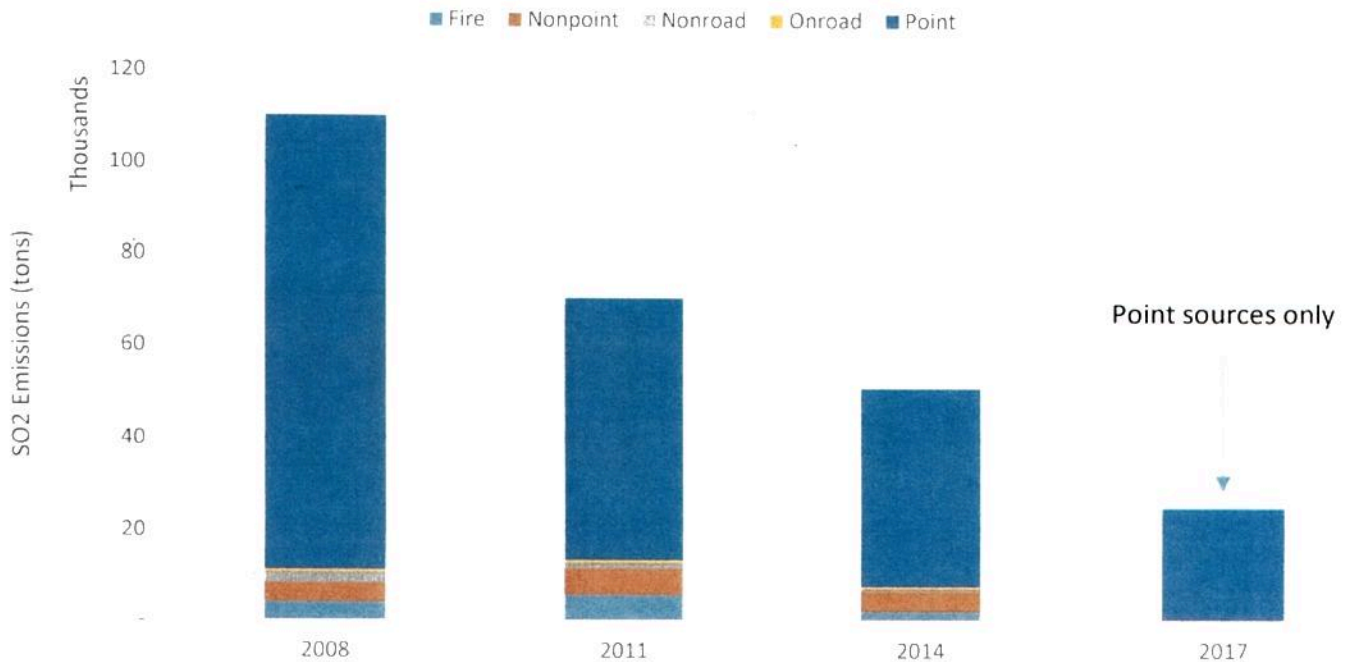


**Figure 8: Monitored PM2.5 design values (daily), 2015-2017**



In the final implementation rule for the 2012 PM<sub>2.5</sub> NAAQS, EPA identifies sulfur dioxide (SO<sub>2</sub>), NO<sub>x</sub>, VOCs, and ammonia as PM<sub>2.5</sub> precursors. Figures 5 and 6 show the downward trend in NO<sub>x</sub> and VOC emissions. The following graphs show a downward trend in emissions for SO<sub>2</sub> and directly-emitted PM<sub>2.5</sub>. The figures show emissions from years when the National Emissions Inventory is conducted. 2017 data only includes point source emissions.

**Figure 9: SO<sub>2</sub> anthropogenic emissions in Minnesota from 2008 to 2017**





**Figure 10: PM<sub>2.5</sub> anthropogenic emissions in Minnesota 2008 to 2017**

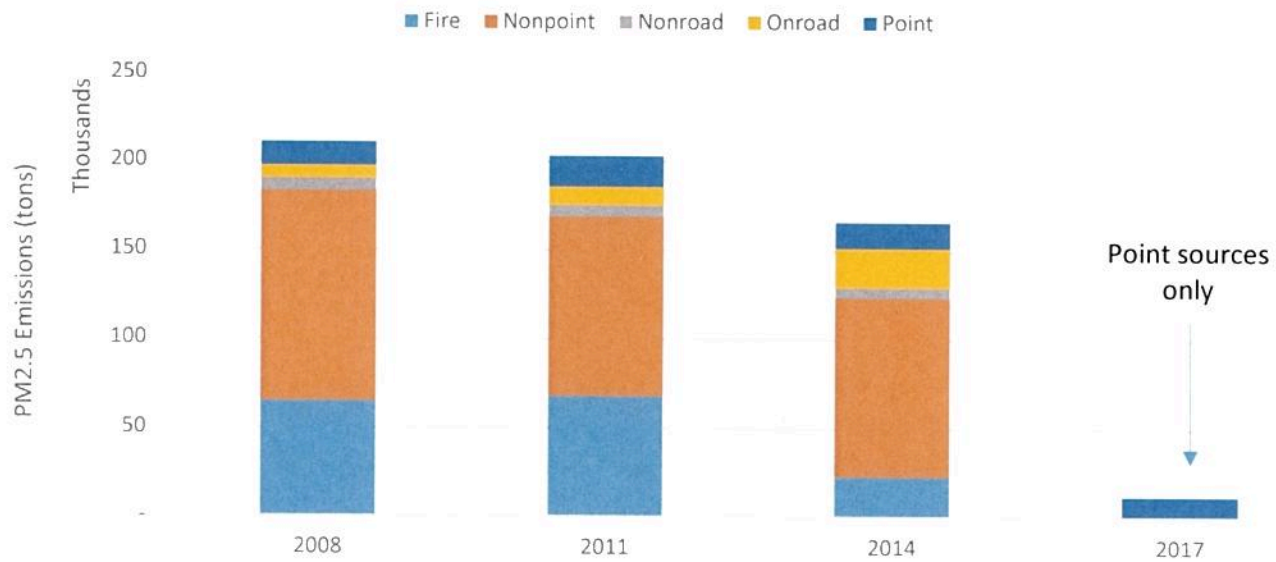


Figure 11 breaks out the direct PM<sub>2.5</sub> emissions from point sources into more specific categories to make it more legible, since point sources are a small contributor to overall direct PM<sub>2.5</sub> emissions.

**Figure 11: PM<sub>2.5</sub> point-source anthropogenic emissions in Minnesota 2008 to 2017**

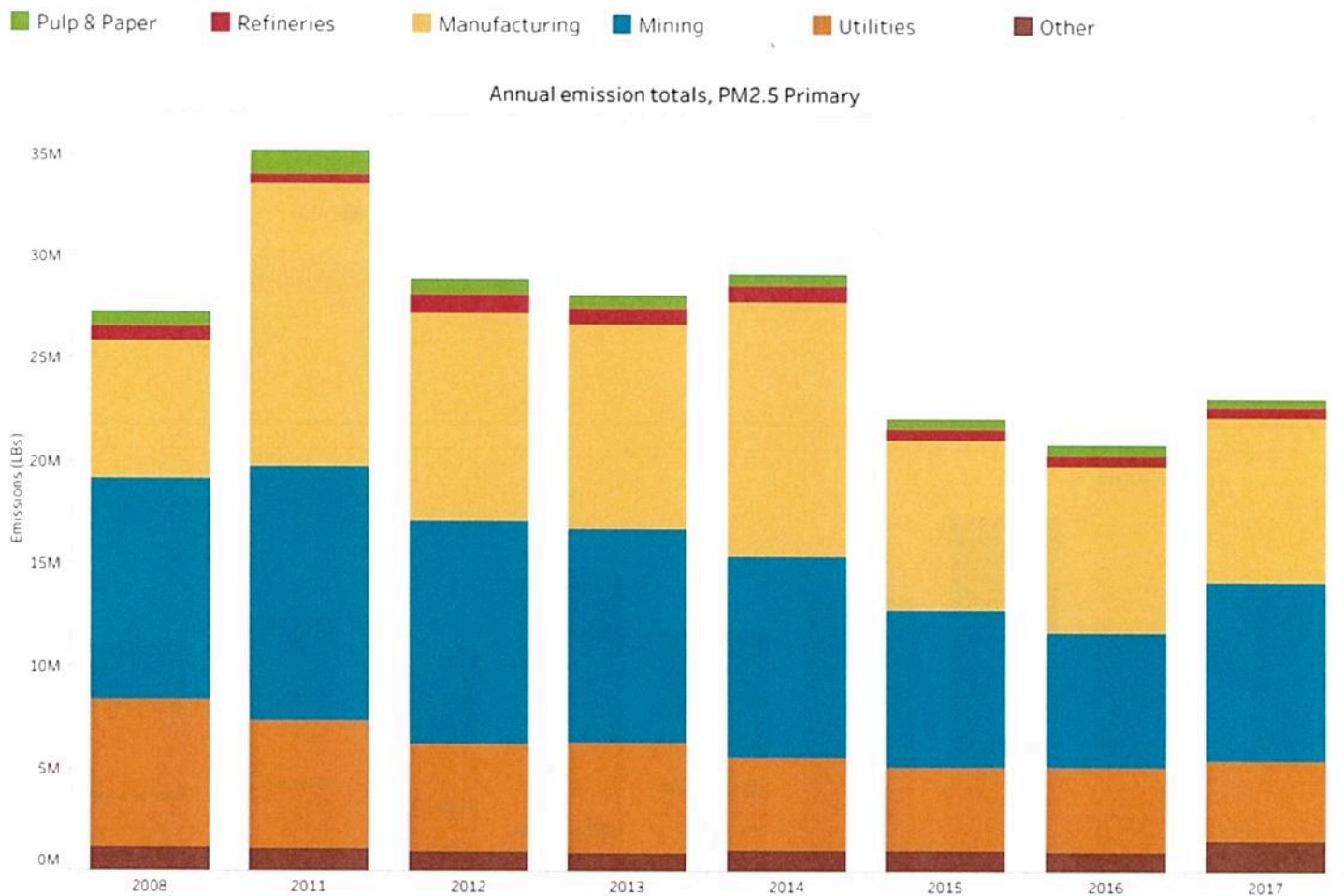
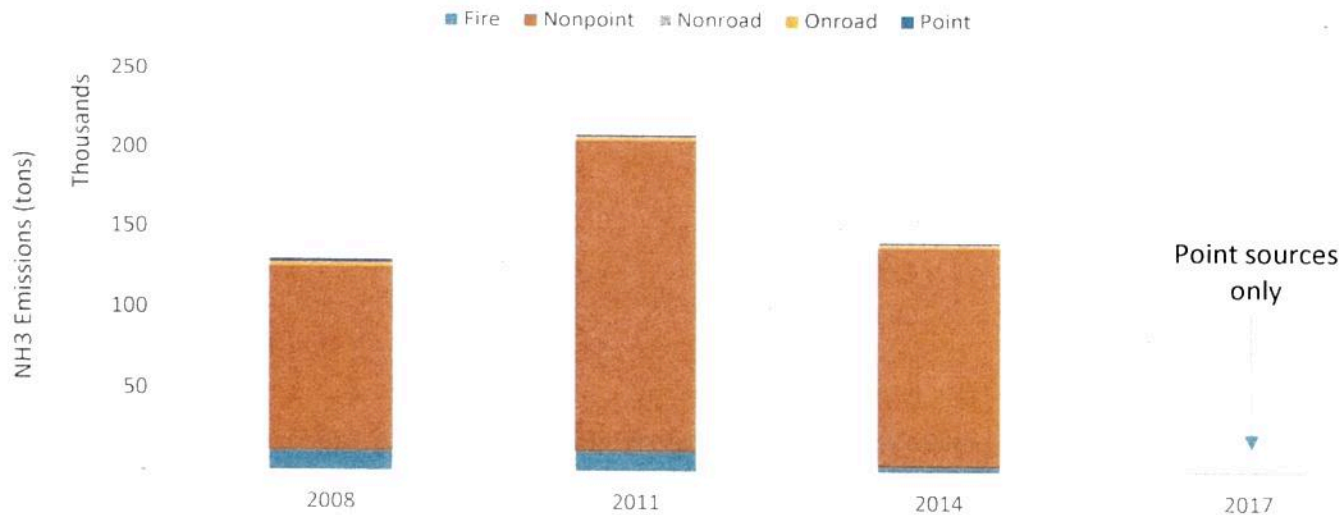


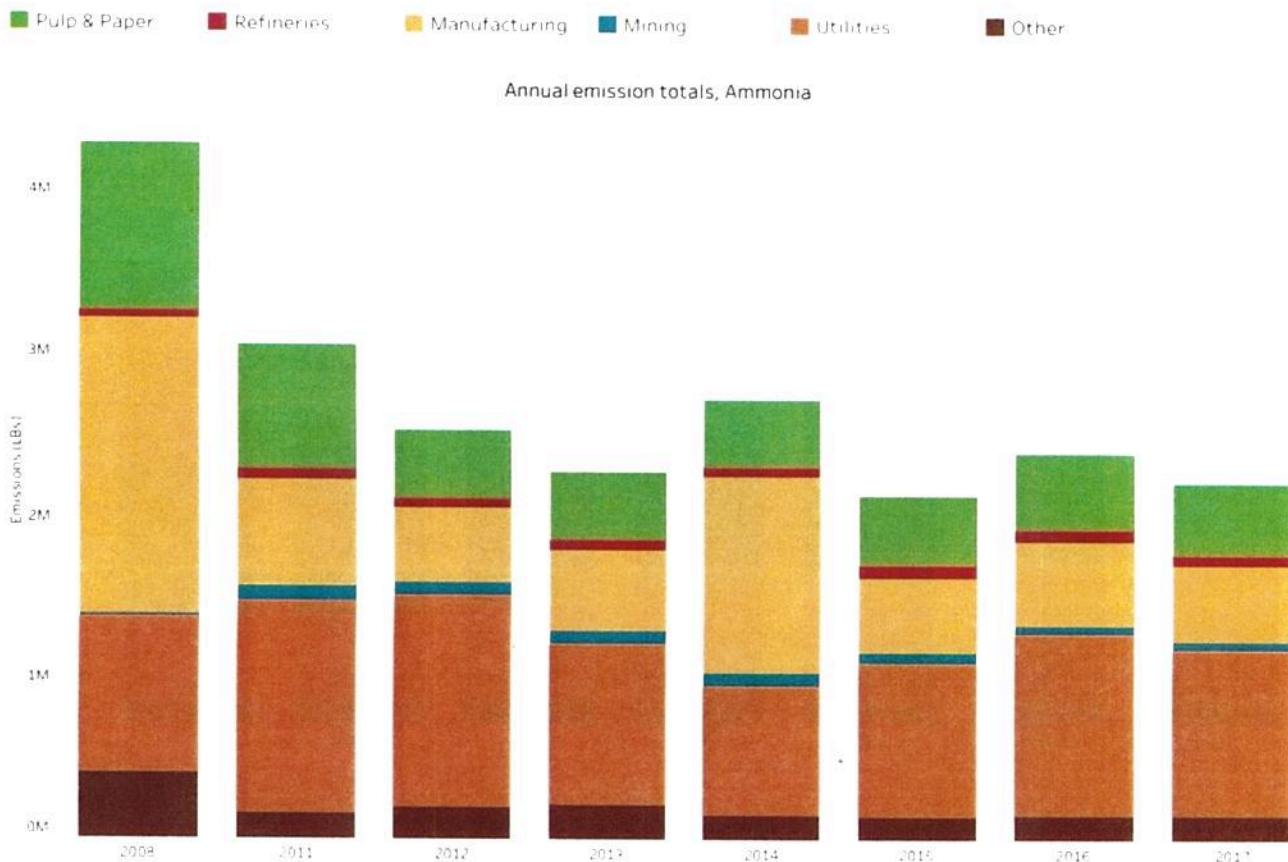
Figure 12 shows ammonia emissions from manmade sources emissions in Minnesota. Data collection methodologies for this pollutant have been changed several times in recent years, so the MPCA does not feel that it can draw any trend conclusions from this data.

**Figure 12: Ammonia anthropogenic emissions in Minnesota from 2008 to 2014**



While agricultural processes are by far the biggest emitter of ammonia in Minnesota, in 2011, the MPCA began collecting annual data on point source emissions of ammonia, shown in Figure 13. The emissions slightly increase for year 2015 due to the inclusion of additional emission factors for combustion sources.

**Figure 13: Ammonia point source anthropogenic emissions in Minnesota 2008 to 2017**





## Advance emission reduction projects

The MPCA and Clean Air Minnesota regularly revisit the original 24 Clean Air Dialogue recommendations to prioritize projects. Priority projects are those that are estimated to achieve significant, measurable emissions reductions, are cost effective, increase public awareness of air pollution and its impacts on human health, and those that will have particular benefit in communities of environmental justice concern. To help focus efforts from the larger list of recommendations, the MPCA and Clean Air Minnesota have concentrated in the following areas for voluntary air emissions reductions: mobile sources, neighborhood area sources, and wood smoke. **Attachment 3 provides a detailed description of Clean Air Minnesota emission reduction projects and their implementation status.**

## Working towards environmental justice

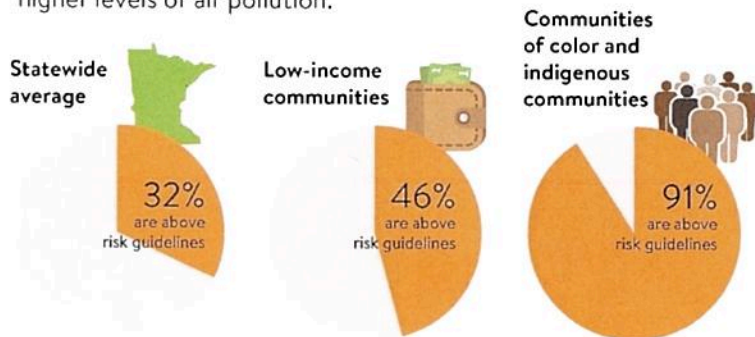
The MPCA defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental law, regulations, and policies.” This will be achieved when everyone benefits from the same degree of environmental protection and has equal access to the decision-making processes that contribute to a healthy environment. In all areas of our work, the MPCA is working to advance environmental justice in Minnesota.

Environmental justice has many layers. In addition to experiencing higher levels of pollution, some communities do not have adequate access to the conditions that support healthy living, including quality schooling, healthcare, and safe neighborhoods. When equitable access to these is limited, poor air quality often contributes to, and worsens, health disparities.

Many studies have shown that low-income communities and communities of color are often also exposed to higher levels of outdoor air pollutants or may live in areas with more pollution sources. In Minnesota, for instance, 32 percent of all communities experience air pollution-related risks above health guidelines. However, the percentages of communities of color and lower-income communities that experience air pollution exposure risks above health guidelines are far higher.

### Air quality risk

These communities are more likely to be near higher levels of air pollution.



To address disparities in exposures to air pollution and related health effects, the MPCA is placing special emphasis on areas of concern for environmental justice across the state. MPCA has identified areas with more low-income residents or people of color and tribal communities statewide because people in these communities can be more vulnerable to the effects of air pollution. Part of the MPCA’s work to address these concerns includes increased air quality monitoring, targeting grants for air quality improvement projects and assistance for small businesses and community groups, and more scrutiny of emission sources in these areas.

## Highlights from Advance 2018

### Mobile Source Team

Over the last year Project Green Fleet continued its work of retiring and/or upgrading heavy-duty diesel engines. The project completed 4 engine replacements and 2 equipment replacements, one off-road, and one on-road. Similarly the Diesel Emissions Reduction Act grants helped to replace 2 diesel trucks and 2 forklifts. Both projects prioritized reducing emissions in areas with more vulnerable populations, and will continue to do so in future projects.



### Area Source Team: VOC reduction initiatives

The area source team pulled resources together to encourage small businesses to implement cost effective VOC reductions by switching parts washer solvents with aqueous parts washers. Through the parts washer change-out pilot project 54 businesses changed equipment. In addition, the MPCA Small Business Environmental Assistance Program awarded grants to 5 businesses for VOC reduction projects; the City of Minneapolis continued to award grants to businesses for projects that reduced VOCs, NOx and SO2; the Minnesota Technical Assistance Program assisted emissions reduction projects in Minneapolis by recommending and helping to implement the use of safer chemicals in facilities and their products.

### Wood Smoke Team; Project Stove Swap

To encourage use of cleaner-burning equipment, Clean Air Minnesota partners, Environmental Initiative and Minnesota Power are coordinating with the MPCA on Project Stove Swap. The project is a wood heater change-out initiative that provides financial incentives for residents and businesses with older, dirtier wood-burning equipment to purchase new, cleaner wood-burning equipment that meets the new EPA standards, or gas equipment that is Energy Star certified. Swapping out just one old, outdated wood stove used to heat a home all winter for a new, more efficient model reduces particulate emissions by the same amount as removing over 700 cars from the road. By June of 2018, 209 appliances had been upgraded. Project Stove Swap remains a focus of Clean Air Minnesota.

## Conclusions

The MPCA and our Clean Air Minnesota partners are committed to continued efforts to reduce emissions around the state. We strive to ensure that the air is healthy for everyone to breathe, including our most vulnerable people. In the coming year we look forward to continued collaboration with our Clean Air Minnesota partners and efforts to find new and innovative ways to reduce pollution around the state. We strive to tackle the challenges of environmental justice to better address the disparities in air quality, access to decision-makers, and related health outcomes experienced across Minnesota. The MPCA looks forward to working with EPA to achieve these mutual goals through the Advance Programs.

## Appendices

Attachment 1: Clean Air Minnesota members

Attachment 2: Clean Air Minnesota meeting dates

Attachment 3: Clean Air Minnesota projects with emissions reductions



## Attachment 1 – CAM Group Rosters

### Partner Group Collaborators

*(Alternates listed in italics)*

Chris Nelson, 3M

Jon Hunter, American Lung Association

*Lisa Gebhard, American Lung Association*

Kristin Heutmayer, Andeavor

Tamara Lowney, APEX

Lisa Frenette, Associated General Contractors

Jessie Shmool, Minnesota Department of Health

Mike Hansel, Barr Engineering

Alison Ahcan, Blandin Foundation

Say Yang, Center for Earth, Energy and Democracy

Rick Kezar, Central Boiler

Patrick Hanlon, City of Minneapolis

Shane Wurst, City of St. Paul

Logan O'Grady, Clean Energy Economy Minnesota

Paul Aasen, Environmental Initiative Board

Scott Strand, Environmental Law and Policy Center

Mary Lynn Salisbury, Fireplace Lifestyles, Inc.

Heather Rein, Flint Hills Resources

*Jake Reint, Flint Hills Resources*

Joy Wiecks, Fond du Lac Band

Larry Kramka, The Foth Companies

Julie Kennedy, GRPUC

Dana Slade, HealthPartners

Bruce Forness, Hennepin County

*Rosemary Lavin, Hennepin County*

Don Hickman, Initiative Foundation

Brian Hiti, IRRRB

Kim Johnson, Itasca County Public Health

Kelly Chandler, Itasca County Public Health

Brandy Toft, Leech Lake Band of Ojibwe

Carma Huseby, Leech Lake Band of Ojibwe

Kate Lohnes, Lilja Communications

Mark Filipi, Metropolitan Council

Charlie Lippert, Mille Lacs Band of Ojibwe

Darrel Gerber, Minnesota Center for Environmental Advocacy

Tony Kwilas, Minnesota Chamber of Commerce  
*Lloyd Grooms, Minnesota Chamber of Commerce*  
Mitchell Coulter, Minnesota Corn Growers Association  
Jessica Burdette, Minnesota Department of Commerce  
Jessie Shmool, Minnesota Department of Health  
Jim Kelly, Minnesota Department of Health  
*Dale Dorschner, Minnesota Department of Health*  
Lynn Clarkowski, Minnesota Department of Transportation  
Kristen Bergstrand, MN DNR Forestry  
Abbie Plouff, Minnesota Environmental Partnership  
Rachel Peterson, Minnesota Logger Education Program  
David Benke, Minnesota Pollution Control Agency  
Mike Cashin, Minnesota Power  
*Randi Nyholm, Minnesota Power*  
Melissa Weglarz, Minnesota Power  
Karen Zumach, Minnesota Shade Tree Advisory Committee  
Laura Babcock, Minnesota Technical Assistance Program  
*Jane Paulsen, Minnesota Technical Assistance Program*  
Joe Holland, North Central Hearth, Patio and Barbecue Association  
Tim Dalsin, North Central Hearth, Patio and Barbecue Association  
Dennis Schubbe, Northeast Technical Services, Inc.  
Carie Olds, Northern Minnesota Builders Association  
Josh Tunn, Nuss Truck and Equipment  
Brad Moore, Polymet  
Michael Chaney, Project Sweetie Pie  
Dan Donkers, Ramsey County  
Jennifer Nalinski, Red Lake DNR  
Kathryn Sarnecki, Saint Paul Port Authority  
Josh Gorham, St. Louis County  
Frank Jewell, St. Louis County  
Peter Raynor, University of Minnesota School of Public Health  
Gary Johnson, University of Minnesota  
Jeff Travis, Washington County Public Health and Environment  
Richard Jackson, White Earth Reservation  
Gary Wilkening, Wilkening Fireplace Company  
Patti Leaf, Xcel Energy  
Tim Bartlett, Ziegler Cat  
*Nicky Shindele, Ziegler Cat*

#### **Core Team Members**

Chris Nelson, 3M  
Mike Hansel, Barr Engineering



Patrick Hanlon, City of Minneapolis  
Theresa Cain, Metro Transit  
Bill Droessler, Environmental Initiative  
Jessie Shmool, Minnesota Department of Health  
Paul Aasen, Environmental Initiative Board  
Heather Rein, Flint Hills Resources  
Dana Slade, HealthPartners  
Tim Bartlett, Ziegler Caterpillar  
Darrell Gerber, Minnesota Center for Environmental Advocacy  
Tony Kwilas, Minnesota Chamber of Commerce  
David Benke, Minnesota Pollution Control Agency  
*Megan Kuhl-Stennes, Minnesota Pollution Control Agency*  
Sam Grant, Higher Education Consortium on Urban Affairs  
Rachel Peterson, Minnesota Logger Education Program  
Scott Strand, Environmental Law and Policy Center  
David Patton, Minnesota Center for Environmental Advocacy

#### **Mobile Source Team Members**

Jon Hunter, American Lung Association  
Bjorn Olson, Environmental Initiative  
Peter Wasko, Minnesota Department of Transportation  
Mehjabeen Rahman, Minnesota Pollution Control Agency  
Mike Cashin, Minnesota Power  
Phil Watkins, Nuss Trucking  
Nick Martin, Xcel Energy  
Tim Bartlett, Ziegler Caterpillar

#### **Area Source Team Members**

Chris Nelson, 3M  
Patrick Hanlon, City of Minneapolis  
Bjorn Olson, Environmental Initiative  
Bruce Forness, Hennepin County  
Jeff Travis, Local Public Health Association, Washington County  
Kari Canterero, Minnesota Pollution Control Agency  
Jane Paulsen, Minnesota Technical Assistance Program  
Dan Donkers, Ramsey County

#### **Wood Smoke Team Members**

Jon Hunter, American Lung Association  
Jon Emerson-Kramer, Environmental Initiative  
Charlie Lippert, Mille Lacs Band of Ojibwe  
Kathy Norlien, Minnesota Department of Health  
Megan Kuhl-Stennes, Minnesota Pollution Control Agency

Randi Nyholm, Minnesota Power

Tim Dalsin, Dalsin Manufacturing

Joe Holland, North Central Hearth, Patio, and Barbecue Association

Pete Raynor, University of Minnesota School of Public Health

John Springman, Ramsey County

Tara Roffler, Ramsey County



## Attachment 2 – CAM meetings

July 1, 2017-June 30, 2018

### Partner meetings:

August 8, 2017, Grand Rapids, MN

February 2, 2018, Saint Paul, MN

May 4, 2018, Grand Rapids, MN

### Core Team meetings:

December 18, 2017

April 11, 2018

June 20, 2018

### Project Team meetings:

#### Wood Smoke:

March 23, 2018

April 27, 2018

June 22, 2018

#### Area Source:

February 26, 2018

April 23, 2018

June 25, 2018

#### Mobile Source:

February 20, 2018

April 17, 2018

June 19, 2018