



Appendix B: Work Group Charge & Ground Rules

Work Group Charge

Members of the Work Group were invited to participate in a process in which they would:

- Identify and articulate challenges associated with potential nonattainment issues,
- Identify what will be necessary to address these challenges;
- Explore new opportunities for emissions reductions and; and
- Develop strategies to implement identified actions and lay the groundwork for future collaboration to improve air quality in Minnesota.

Work Group Membership, Expectations and Participation

Environmental Initiative, in consultation with the Planning Team, is responsible for selecting members for the Work Group. New individuals may be added to the Work Group throughout the course of the project if it is determined that there are essential stakeholder interests that are not represented by the existing participants. Environmental Initiative will make the final determination if and when new members should be added. Should a member choose to vacate their seat in the Work Group, Environmental Initiative may seek a replacement.

Work Group participants are expected to attend all Work Group meetings, make every effort to be on time, participate in conversations with Environmental Initiative staff between meetings, review documentation prior to meetings, and actively participate in the meetings. Work Group members are asked to keep their member organizations and constituencies informed about the project proceedings, and to bring views of constituent members to the Work Group discussions.

All participants agree to act in good faith in all aspects of the process. The participants are expected to present their own opinions based on their experience, perspective and training, and agree to participate actively, constructively and cooperatively in the process. Debate and discussions in the Work Group should be based on shared facts.

Facilitation and Environmental Initiative's Role

Environmental Initiative is responsible for the design, management and facilitation of the project. Environmental Initiative will schedule and convene meetings, compile members' input, and work with the Work Group to develop final project recommendations documents. Environmental Initiative will distribute correspondence regarding meeting announcements, agenda and other information related to the project via email.

Lee Paddock of Environmental Initiative will facilitate the process. He will assist in focusing discussions, assure a fair opportunity for members to participate, draw out participants' perspectives as necessary, work to resolve conflicts, and assist in designating tasks to sub-groups as needed.

Conflicts and Communications

All participants are expected to act as equals during the process and will respect the experience and perspectives of other participants. Participants should refrain from characterizing the viewpoints of others during discussions. Personal criticisms of other stakeholders will not be tolerated.

Participants agree to be forthcoming about potential conflicts with the proceedings and with decisions that are developed by the group. Disagreements should be identified and shared with the group as early as possible.

When making statements about the process or its outcomes in public, Work Group participants agree to make clear that they speak on their own behalf, and do not necessarily represent the opinions of other participants, nor Environmental Initiative. Work Group members will give at least 48 hours notice to Environmental Initiative and to other participants before communicating with the media about the process.

Decisions

Decisions of the Work Group will be made based on consensus of the group, generally defined as reaching an agreement that all participants can live with.

Technical Working Group Charge

The Technical Working Groups (TWGs) are charged with developing the full range of proposals for the Minnesota Clean Air Dialogue Work Group to discuss and debate. The TWGs are not responsible for coming to consensus on any of the proposals, rather, they are only responsible for developing the range of reasonable options based on the agreed upon evaluation criteria for how emissions from the various sources may be reduced.

Evaluation Criteria:

1. Cost
2. Benefits (reduces risk of non-attainment)
3. Co-benefits (including public health)
4. Ease of implementation
5. Political concerns/constraints
6. Upcoming regulations



Appendix C: Work Group Roster

*Denotes Planning Team members

Alternates listed in italics

American Lung Association of Minnesota

*Kelly Marczak, Director, Clean Air Choice

Bob Moffitt, Communications Director

Association of Minnesota Counties

Abbey Bryduck, Transportation & Energy Policy Analyst

Barr Engineering

*Mike Hansel, Senior Chemical Engineer & Vice President

City of Minneapolis

Dan Huff, Manager, Environmental Management and Safety

Patrick Hanlon, Environmental Services Supervisor

City of Richfield/Regional Council of Mayors

Debbie Goettel, Mayor

City of Saint Paul

Anne Hunt, Environmental Policy Director, Office of Mayor Chris Coleman

Samantha Henningson, Legislative Aide to Councilmember Russ Stark

Downtown Minneapolis Transportation Management Organization (TMO)

Dan MacLaughlin, Executive Director

Flint Hills Resources

Lucinda Legel, Environmental Director

Kari Lorch, Senior Environmental Technical Advisor - Air Regulations

Fresh Energy

J. Drake Hamilton, Science Policy Director

Hennepin County

Carl Michaud, Director, Environmental Services

Alene Tchourumoff, Director, Strategic Planning & Resources

League of Minnesota Cities

Craig Johnson, Intergovernmental Relations Representative

Mille Lacs Band of Ojibwe

*Charles Lippert, Air Quality Technician

Minnesota Center for Environmental Advocacy

Jim Erkel, Director, Land Use & Transportation Program

**Scott Strand, Executive Director*

Minnesota Department of Health

Jim Kelly, Manager, Environmental Surveillance & Assessment
Hillary Carpenter, Toxicologist

Metropolitan Council

Mark Filipi, Manager, Technical Planning Support

Minnesota Chamber of Commerce

*Mike Robertson, Consultant, Environmental Policy

Minnesota Power

*Mike Cashin, Environmental Policy Manager

Minnesota Trucking Association

*John Hausladen, President

Minnesota Department of Transportation

*Mark Nelson, Director, Office of Statewide Multimodal Planning
Marilyn Jordahl Larson, Supervisor, Environmental Modeling & Testing Unit

Minnesota Technical Assistance Program

Laura Babcock, Director

Minnesota Pollution Control Agency

*David Thornton, Assistant Commissioner for Air Policy
Catherine Neuschler, Air Policy Specialist
Mary Jean Fenske, Supervisor, Air Policy Unit

Saint Paul Port Authority

Lorrie Louder, Director of Business & Intergovernmental Affairs

Sierra Club

Karen Monahan, Community Organizer, Minnesota Environmental Justice Program
Michelle Rosier, Senior Regional Organizing Manager

Transit for Livable Communities

Barb Thoman, Executive Director
Dave van Hattum, Senior Policy Advocate

Wenck Associates

Ed Hoefs, Principal
Lori Bartels, Senior Chemical Engineer

Xcel Energy

Rick Rosvold, Manager, Air Quality

Appendix D: Technical Working Group Rosters

Area Sources:

Name	Organization
Mike Hansel	Barr Engineering
Patrick Hanlon	City of Minneapolis
Tony Hainault	Hennepin County
Charlie Lippert	Mille Lacs Band of Ojibwe
Robert Sip	Minnesota Department of Agriculture
Troy Johnson	Minnesota Pollution Control Agency
Catherine Neuschler	Minnesota Pollution Control Agency
Laura Babcock	Minnesota Technical Assistance Program
Ed Hoefs	Wenck Associates

Energy Efficiency & Renewable Energy:

Name	Organization
Nancy Lange	Center for Energy & Environment
Nick Mark	CenterPoint Energy
Brendon Slotterback	City of Minneapolis
Lissa Pawlisch	Clean Energy Resource Teams
Jessica Burdette	Department of Commerce, Division of Energy Resources
J. Drake Hamilton	Fresh Energy
Tony Hainault	Hennepin County
Eric Jensen	Izaak Walton League of America
Bill Sierks & Tim Nolan	Minnesota Pollution Control Agency
Mike Cashin	Minnesota Power
Laura Babcock	Minnesota Technical Assistance Program
Jill Curran	Minnesota Waste Wise / Minnesota Chamber of Commerce
Mary T'Kach	Ramsey County
Karen Monahan & Michelle Rosier	Sierra Club
Rick Rosvold	Xcel Energy

Mobile Diesel:

Name	Organization
Kelly Marczak	American Lung Association
Abby Ferri	Associated General Contractors of Minnesota
Abbey Bryduck	Association of Minnesota Counties
John Sharffbillig	City of Minneapolis

Lucinda Legel	Flint Hills Resources
Mike Judkins	Hennepin County
Jim Erkel	Minnesota Center for Environmental Advocacy
Mark Nelson & Marilyn Jordahl Larson	Minnesota Department of Transportation
Mark Sulzbach	Minnesota Pollution Control Agency
John Hausladen	Minnesota Trucking Association
Rick Rosvold	Xcel Energy

Point Sources:

Name	Organization
Bob Moffitt	American Lung Association
Mike Hansel	Barr Engineering
Kari Lorch	Flint Hills Resources
J. Drake Hamilton	Fresh Energy
Andy Leith	Hennepin County
Scott Strand	Minnesota Center for Environmental Advocacy
Mike Robertson	Minnesota Chamber of Commerce
Mike Nelson	Minnesota Pollution Control Agency
Mike Cashin	Minnesota Power
Ed Hoefs	Wenck Associates
Rick Rosvold	Xcel Energy

Transportation Demand Management & Light-Duty Vehicles:

Name	Organization
Kelly Marczak	American Lung Association
Abby Ferri	Associated General Contractors of Minnesota
Abbey Bryduck	Association of Minnesota Counties
Anne Hunt	City of Saint Paul
Melissa Madison	Commuter Services
Joe Gladke & Brent Rusco	Hennepin County
Mark Filipi	Metropolitan Council
Jim Erkel	Minnesota Center for Environmental Advocacy
Kevin Hennessy	Minnesota Department of Agriculture
Jim Kelly	Minnesota Department of Health
David Thornton, Innocent Eyoh, Kevin McDonald, & Mike Mondloch	Minnesota Pollution Control Agency
John Hausladen	Minnesota Trucking Association
Mark Nelson & Marilyn Jordahl Larson	Minnesota Department of Transportation
Mary T'Kach	Ramsey County
Barb Thoman	Transit for Livable Communities

Wood Smoke:

Name	Organization
Jon Hunter	American Lung Association
Mike Hansel	Barr Engineering
Farhiya Farah	City of Minneapolis
Hillary Carpenter	Minnesota Department of Health
Lisa Herschberger & Mary Jean Fenske	Minnesota Pollution Control Agency
Mary T'Kach	Ramsey County
Allen Frenchette	Scott County
Julie Mellum	Take Back the Air
David Huss	

Appendix E: 2008 Emissions Sources Breakdown¹¹⁶

Table 6: Statewide sources of Nitrogen Oxides, 2008

Source	NO _x (tons)	Percentage
On-road gasoline vehicles	98,262	24%
On-road diesel vehicles	70,810	18%
Electric utility fuel combustion	63,812	16%
Non-road diesel	49,372	12%
Aircraft, marine, locomotives, other	42,789	11%
Metals processing	27,242	7%
Industrial fuel combustion	19,796	5%
Other residential & commercial fuel combustion	13,188	3%
Non-road gasoline	7,409	2%
Waste disposal & recycling	3,480	1%
Other industrial processes	3,045	1%
Residential wood combustion	1,626	0%
Petroleum refining	715	0%
Solvent utilization	295	0%
Chemical manufacturing	104	0%
Storage & transport of petroleum and solvents	39	0%
Total*	401,983	100%

*Does not include "miscellaneous" (mostly agricultural, prescribed burning and wildfires)

Table 7: Statewide sources of Volatile Organic Compounds, 2008

Source	VOCs (tons)	Percentage
On-road gasoline vehicles	81,088	27%
Non-road gasoline	80,012	26%
Solvent utilization	79,857	26%
Storage & transport of petroleum and solvents	20,286	7%
Residential wood combustion	17,355	6%
Other industrial processes	5,452	2%
On-road diesel vehicles	5,402	2%
Non-road diesel	4,968	2%

¹¹⁶ MPCA. 2008 Minnesota Criteria Pollutant Emission Inventory, version 1. Data provided by the Air Data Analysis Unit on March 1, 2013.

Aircraft, marine, locomotives, other	2,869	1%
Waste disposal & recycling	1,999	1%
Industrial fuel combustion	1,208	0%
Petroleum refining	1,118	0%
Chemical manufacturing	884	0%
Other residential & commercial fuel combustion	873	0%
Electric utility fuel combustion	744	0%
Metals processing	625	0%
Total*	304,741	100%

*Does not include "miscellaneous" (mostly agricultural, prescribed burning and wildfires)

Table 8: Statewide sources of direct fine particulate (PM_{2.5}) emissions, 2008

Source	PM _{2.5} (tons)	Percentage
Fires (wildfire, agricultural, prescribed)	65,130	31%
Agricultural tilling	54,096	25%
Fugitive dust	38,243	18%
Residential wood combustion	17,255	8%
Metals processing	4,656	2%
On-road diesel vehicles	4,538	2%
Waste disposal & recycling	4,483	2%
Non-road diesel	4,216	2%
Other industrial processes	3,760	2%
Electric utility fuel combustion	3,755	2%
On-road gasoline vehicles	3,510	2%
Industrial fuel combustion	3,120	1%
Non-road gasoline	1,769	1%
Aircraft, marine, locomotives, other	1,268	1%
Other residential & commercial fuel combustion	744	0%
Storage & transport of petroleum and solvents	734	0%
Petroleum refining	506	0%
Solvent utilization	387	0%
Chemical manufacturing	15	0%
Total	212,185	100%

Table 9: Statewide sources of direct fine particulate (PM_{2.5}) emissions excluding wildfires, agricultural sources, and prescribed burning, 2008

Source	PM _{2.5} (tons)	Percentage
Residential wood combustion	17,255	34%
On-road diesel vehicles	4,538	9%
Waste disposal & recycling	4,483	9%
Non-road diesel	4,216	8%
Electric utility fuel combustion	3,755	7%
On-road gasoline vehicles	3,510	7%
Metals processing	3,210	6%
Industrial fuel combustion	3,120	6%
Other industrial processes	2,091	4%
Non-road gasoline	1,769	4%
Aircraft, marine, locomotives, other	1,268	3%
Other residential & commercial fuel combustion	744	1%
Petroleum refining	380	1%
Total	50,337	100%



Appendix F: The Six R's of Diesel Emissions Reduction¹¹⁷

Retrofit

A retrofit typically involves the addition of an after-treatment device to remove emissions from the engine exhaust. Retrofits can be very effective at reducing emissions—eliminating up to 90 percent of pollutants in some cases. Many of the effective after-treatment devices require use of ultra-low sulfur diesel (ULSD).

Repower

Repowering involves replacing an existing engine with a new engine, usually an engine meeting a more stringent EPA tier emissions level. This strategy is most effective for use in equipment with a useful life longer than that of the engine. Repowering provides an opportunity to install a new engine that meets much lower emission standards than the original engine, often in conjunction with fuel economy benefits and lower maintenance costs. Repowering can also include converting diesel-powered equipment (such as port cranes) to electrical power.

Rebuild

Regular engine maintenance plays a critical role in maintaining emissions performance while engine rebuilding can upgrade emissions performance of older engines. Some engine manufacturers have EPA-approved engine rebuild “kits” that meet newer, more stringent EPA tier emission levels.

Replace

Selectively replacing older vehicles/equipment can sometimes be the most cost-effective way to reduce the emissions of a fleet. In this way, older, higher polluting equipment is retired from service before it would otherwise be retired. Newer equipment that meets more stringent emission standards is purchased to replace the retired equipment, sometimes in conjunction with retrofit devices or alternative fuels. These programs are sometimes called “scrappage” or “fleet renewal” programs. Such programs often include procedures to ensure that the retired equipment is destroyed in order to prevent re-sale and continued use. Fleet owners often benefit from improved fuel economy and performance, as well as lower maintenance costs.

Refuel

A variety of alternative fuels can be used in diesel vehicles and equipment. Some require little or no modification to the engine (such as emulsified diesel or biodiesel) while others (such as natural gas) require engine conversion or replacement. Many alternative fuels can reduce emissions from many types of diesel engines, although some come at a price of lower fuel efficiency, power, and trade-offs of higher emissions in one pollutant with lower emissions for another pollutant.

Reduce Idling

Reduced idling can be achieved by employing both technology (heaters, auxiliary power units (APUs), automatic shutoff device, etc.) and by operational strategies, which improve the use of the equipment or vehicle (idle reduction policies).

¹¹⁷ Definitions from U.S. Environmental Protection Agency and Department of Transportation



Appendix G: Index of Additional Resources

Public Health Impacts of Fine Particulates & Ground Level Ozone

- United States Environmental Protection Agency (EPA): **Particulate Matter (PM) Health Effects** »
- Minnesota Department of Health (MDH): **Particles and Your Health** »
- MDH: **Measuring Health Impacts of Fine Particles in Air Project** »
- EPA: **Ground-level Ozone Health Effects** »
- MDH: **Air Quality: Ozone** »

Federal Air Quality Standards & Regulations

- EPA: **National Ambient Air Quality Standards** »
- EPA: **The Plain English Guide to the Clean Air Act: Cleaning Up Commonly Found Air Pollutants** »
- EPA: **Particulate Matter Regulatory Actions** »
- EPA: **Ground-level Ozone Regulatory Actions** »
- EPA: **Ozone Advance** »
- EPA: **Ozone Advance introductory webinar slides (PDF)** »

Minnesota's Air: Emissions, Policies & Programs

- Minnesota Pollution Control Agency (MPCA): **Air Quality in Minnesota: 2013 Report to the Legislature** »
- MPCA: **Annual Pollution Report to the Legislature: A summary of Minnesota's air emissions & water discharges (April 2011) (PDF)** »
- MPCA: **Minnesota Criteria Air Pollutant Emission Inventory** »
- EPA: **2008 National Emissions Inventory Data** »
- Lake Michigan Air Directors Consortium (LADCO): **Preliminary Assessment of Ozone Air Quality Issues in the Minneapolis/St. Paul Region (2002) (PDF)** »
- Minnesota Chamber of Commerce: **Estimated Economic Impact of Twin Cities Ozone Nonattainment (1999) (PDF)** »
- University of Minnesota Center for Transportation Studies (CTS): **The Full Cost of Transportation in the Twin Cities Region (2000)** »
- MPCA: **Minnesota State Air Rules** »
- MPCA: **Preventing Waste and Pollution: Assistance & Resources** »

Strategies & Solutions

- EPA: **Tips to Reduce Ozone** »
- National Association of Clean Air Agencies (NACCA): **Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options (2006) (PDF)** »
- EPA: **Policy & Guidance for controlling emissions from the transportation sector** »

- LADCO: **Approaches for Attaining the PM2.5 Daily Standard White Paper (2009)** **(PDF) »**
- CTS: **Reducing Greenhouse Gas Emissions from Transportation Sources in Minnesota (2008) »**
- Minnesota Climate Change Advisory Group (MCCAG): **MCCAG Final Report Appendix H: Transportation and Land Use – Policy Recommendations (2008) (PDF) »**