RULE HEARING

Exhibits List

February 27, 2025

The Minnesota Pollution Control Agency places the exhibits required under Minnesota Rules, part 1400.2220, items A to K into the hearing record for Proposed Amendments to Rules Governing Air Quality, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019; Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850 (Air Toxics Emissions Reporting Rule). Exhibits A to K of this index are keyed to items A to K of part 1400.2220. Unless otherwise stated, the document is enclosed.

(Revisor's ID No. R-4599) (OAH Docket No. 71-9003-39354)

A. Enclosed:

A-1. the Request for Comments as published in the *State Register* on July 24, 2023.

A-2. the second Request for Comments as published in the *State Register* on April 1, 2024.

B. Not enclosed: a petition for rulemaking because no petition was filed on the rules.

C. Enclosed: the proposed rules dated October 2, 2024, with the Revisor's approval.

D. Enclosed:

D-1. the Statement of Need and Reasonableness

D-2. the SONAR Exhibit 1: Proposed Air Toxics Reporting List.

E. Enclosed: a copy of the transmittal letter showing that the Pollution Control Agency sent the Statement of Need and Reasonableness to the Legislative Reference Library.

F. Enclosed: the Dual Notice of Intent to Adopt Rules, as sent and published in the *State Register* on November 25, 2024.

G. Enclosed:

G-1. the Certificate of Mailing the Notice of Intent to Adopt Rules to the Rulemaking Mailing List.

G-2. the GovDelivery bulletin with recipient count.

G-3. the Certificate of Accuracy of the Mailing List.

H. Enclosed: the Certificate of Additional Notice.

I. Enclosed:

I-1. all written comments and submissions on the proposed rules that the Agency received during the comment period, requests for hearing, and withdrawals of requests for hearing, except those that only requested copies of documents.

I-2. the Agency's response to comments received.

J. Not Enclosed: a copy of the document from the chief judge authorizing the agency to omit the text of any proposed rule from the notice of hearing published in the State Register because the proposed rule was published in the State Register.

K. Enclosed: any other document or evidence to show compliance with any other law or rule that the Pollution Control Agency must follow to adopt the rules.

K-1. a certificate of Sending the Notice and the Statement of Need and Reasonableness to Legislators and the Legislative Coordinating Commission.

K-2. a copy of the transmittal letter showing the agency sent notice to Legislators per Minnesota Statutes, section 14.116.

K-3. a copy of the transmittal letter showing the agency consulted with MMB per Minnesota Statutes, section 14.131, and MMB's memo dated October 21, 2024, in response.

Exhibit A

A. Enclosed:

A-1. the Request for Comments as published in the *State Register* on July 24, 2023.

A-2. the second Request for Comments as published in the *State Register* on April 1, 2024.

Minnesota State Register

Published every Monday (Tuesday when Monday is a holiday)

Proposed, Adopted, Emergency, Expedited, Withdrawn, Vetoed Rules; Executive Orders; Appointments; Commissioners' Orders; Revenue Notices; Official Notices; State Grants & Loans; State Contracts; Non-State Public Bids, Contracts and Grants

Monday 24 July 2023

Volume 48, Number 4

Pages 77 - 106

Celeste Marin
Minnesota Department of Health
PO Box 64900, St. Paul, MN 55164-0900
Email: ***Celeste.marin@state.mn.us***
Phone: 651-201-4849

Alternative Format. Upon request, this information can be made available in an alternative format, such as large print, braille, or audio. To make such a request, please contact the agency contact person at the address or telephone number listed above.

NOTE: Comments received in response to this notice will not necessarily be included in the formal rulemaking record submitted to the administrative law judge if and when a proceeding to adopt rules is started. The agency is required to submit to the judge only those written comments received in response to the rules after they are proposed. If you submitted comments during the development of the rules and you want to ensure that the Administrative Law Judge reviews the comments, you should resubmit the comments after the rules are formally proposed.

Dated: July 10, 2023

Dr. Brooke Cunningham MD, PhD
Commissioner
P.O. Box 64975
St. Paul, MN 55164-0975

Minnesota Pollution Control Agency

Environmental Analysis and Outcomes Division

REQUEST FOR COMMENTS for Planned Amendments to Rules Governing Air Quality, *Minnesota Rules*, chapters 7002, 7005, 7007, 7008, 7011, 7017, and 7019, Revisor's ID Number R-4599

NOTICE IS HEREBY GIVEN that the Minnesota Pollution Control Agency (MPCA) is requesting comments on planned amendments to air quality rules, *Minnesota Rules* Chapters 7002 (Permit Fees), 7005 (Definitions and Abbreviations), 7007 (Permits and Offsets), 7008 (Conditionally Exempt Stationary Sources and Conditionally Insignificant Activities), and 7019 (Emission Inventory Requirements). This rulemaking is referred to as the **Air Toxics Emissions Reporting Rule**. The main purpose of this rulemaking is to establish new rules for air toxics emissions reporting requirements as directed by Minnesota Session Law – 2023. The MPCA may make rule changes in some or all of these rule chapters. Comments are requested from affected or interested parties. Comments should be submitted writing as describe in the **Comments** section below.

This Request for Comments is the MPCA's legal notice of its intent to begin rulemaking. This is an opportunity to provide comments on the MPCA's concepts to amend the rules and also an opportunity to provide information or comment on any relevant issues related to this rulemaking that we need to consider. For example, we recognize that costs to regulated parties can be a concern with rulemaking. If you have cost information or data related to this rulemaking that you wish to share with us to inform our decisions, please submit that information. Draft rule language is not available at this time. We want your written comments on the Subject of Rules and the concepts, which are summarized in the Subject of Rules section below and found in the concept document available on the rulemaking webpage at ***https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting***.

Submitting your ideas and information at this early stage in rulemaking allows us more time to address issues that may come up and helps to ensure informed decision-making on our part. If the proposed rules affect you in any way, the MPCA encourages you to participate in the rulemaking process.

Alternative Format/Accommodation. Upon request, this information can be made available in an alternative format, such as large print, braille, or audio. To make such a request, please contact the **MPCA Contact Person**.

Statutory Authority. *Minnesota Statutes,* section 116.07, subdivision 4 authorizes the MPCA to adopt rules for prevention, abatement, or control of air pollution, and *Minnesota Statutes,* section 116.062 Air Toxics Emissions Reporting (Minnesota Session Law – 2023, Chapter 60, H.F. No. 2310).

Subject of Rules. The MPCA is planning rule amendments to require annual reporting on air toxics emissions from permitted facilities (except those with Option B registration permits) located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties. "Air toxics" refers to air contaminants that have a toxic effect and are not subject to a state or federal ambient air quality standard. The MPCA currently maintains an inventory of air toxics emissions, which relies on voluntary emissions reporting from most permitted air emission sources throughout Minnesota once every three years.

While ambient air monitoring data show that air quality in Minnesota is generally good, this is not true for all Minnesotans. Some people have more exposure to more or multiple kinds of pollution. Some people are more vulnerable to the health impacts of pollution. These groups of people are more likely to be impacted by air pollution, and many may live in identified areas of concern for environmental justice[1]. Information from mandatory air toxics emissions reporting would ensure that MPCA programs to address the disproportionate exposure to air toxics in certain communities can be effective and based on correct and complete information. However, the MPCA acknowledges that the emissions inventory will continue to be incomplete because the legislation authorizing this rulemaking prevents statewide collection of this information.

While this is an initial request for comments, and the elements of this rulemaking may change based on comments received or other information, the MPCA has three main goals for these rule amendments as directed by Minnesota Session Law – 2023:

1. Establish the requirements for air toxics emissions reporting for permitted facilities on an annual basis (Minn. R. 7019.3000 and 7019.3020).

2. Identify the air toxics to be reported (Minn. R. ch. 7019).

3. Amend permit and reporting processes to align with annual air toxics emissions reporting (Minn. R. ch. 7002; Minn. R. 7007.1300, subps. 3 and 4; and Minn. R. ch. 7008).

Where to Get More Information. The concept document which includes a detailed explanation about the planned rule amendments, and other information about this rulemaking is available on the rulemaking webpage at ***https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting***.

Persons Affected. The amendments to the rules would likely affect regulated air permittees by changing their reporting from voluntary to mandatory. Additionally, in the long-term, these amendments would affect those who live in environmental justice areas of concern, by allowing the MPCA to address the disproportionate impacts of pollution in those areas.

Comments. Interested persons or groups may submit written comments or information on these possible rules in writing until **4:30 p.m. on Friday, September 8, 2023**. Submit written comments or information to the Office of Administrative Hearings Rulemaking e-Comments website at ***https://minnesotaoah.granicusideas.com/discussions***. Any questions about submitting comments via the Rulemaking e-Comments website should be directed to William Moore, Office of Administrative Hearings, telephone 651-361-7893, ***William.T.Moore@state.mn.us***. You may view frequently asked questions about the OAH Rulemaking eComments website at ***https://mn.gov/oah/assets/ecomments-faq_tcm19-82012.pdf***. Comments received are public and will be available for review at the OAH Rulemaking eComments website at ***https://minnesotaoah.granicusideas.com/discussions*** and at the Office of Administrative Hearings, 600 North Robert Street, P.O. Box 64620, St. Paul, Minnesota 55164-0620.

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1 ***https://www.pca.state.mn.us/about-mpca/mpca-and-environmental-justice***

The MPCA will not publish a notice of intent to adopt the rules until more than 60 days have elapsed from the date of this request for comments. The MPCA does not plan to appoint an advisory committee to comment on the planned rule amendments.

The MPCA does not anticipate that the rule amendments will require a local government to adopt or amend an ordinance or other regulation under *Minnesota Statutes,* section 14.128. Local governments may submit written information to the contrary.

The MPCA requests any information pertaining to the cumulative effect of the rule amendments with other federal and state regulations related to the specific purpose of the rule. Cumulative effect means the impact that results from incremental impact of the proposed rule in addition to other rules, regardless of what state or federal agency has adopted the other rules.

NOTE: Comments received in response to this notice will not necessarily be included in the formal rulemaking record submitted to the Administrative Law Judge (ALJ) if and when a proceeding to adopt rules is started. The MPCA is required to submit to the ALJ only those written comments received in response to the draft rules after they are proposed. If you submit comments during the development of the rules and want to ensure that the ALJ reviews your comments, you should resubmit the comments after the rules are formally proposed.

Rules Drafts. As stated above, draft rule language is not available at this time. If you are interested in being notified when a draft of the rules is available and of other activities relating to this rulemaking, please register for GovDelivery email updates at ***https://public.govdelivery.com/accounts/MNPCA/subscriber/new?qsp=MNPCA_1***

MPCA Contact Person. The MPCA contact person is Mary H. Lynn, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194; telephone: 651-757-2439, email: ***mary.lynn@state.mn.us***. Technical questions on the planned rule amendments should be directed to Hassan Bouchareb, 651-757-2653, email: ***hassan.bouchareb@state.mn.us***. You may also call the MPCA at 651-296-6300 or 1-800-657-3864; use your preferred relay service.

Date: June 27, 2023

Katrina Kessler, Commissioner
Minnesota Pollution Control Agency

Minnesota Pollution Control Agency

Environmental Analysis and Outcomes Division

REQUEST FOR COMMENTS for Planned New Rules Governing Air Quality, *Minnesota Rules*, chapters 7002, 7005, 7007, 7008, 7011, 7017, and 7019, Revisor's ID Number R-4808

NOTICE IS HEREBY GIVEN that the Minnesota Pollution Control Agency (MPCA) is requesting comments on planned new rules governing air quality. This rulemaking is referred to as the **Odor Management Rule**. The main purpose of this rulemaking is to establish new rules for odor management plan requirements as directed by Minnesota Session Law – 2023. The MPCA may make rule changes in some or all of these rule chapters. Comments are requested from affected or interested parties and should be submitted in writing as described in the **Comments** section below.

This Request for Comments is the MPCA's legal notice of its intent to begin rulemaking. This is an opportunity to provide comments on the MPCA's planned new rules for odor management, and an opportunity to provide information or comment on any relevant issues related to this rulemaking that we need to consider. For example, we recognize that costs to regulated parties can be a concern with rulemaking, and so can costs to non-regulated parties and the public of not conducting this rulemaking. If you have cost information or data related to this rulemaking that you wish to share with us to inform our decisions, please submit that information. Draft rule language is not available at this time. We want your written comments on the planned new rules, which are summarized in the **Subject of Rules** section below.

Submitting your ideas and information at this early stage in rulemaking allows us more time to address issues that may come up and helps to ensure informed decision-making on our part. If the proposed rules affect you in any way, the

Exhibit A-2

MINNESOTA STATE REGISTER

MONDAY, APRIL 1, 2024

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PAGES 917 - 934

Official Notices

Minnesota Joint Underwriting Association
12400 Portland Ave. South, Suite 190
Burnsville, Minnesota 55337
(952)-641-0276 or ***rick@mjua.org***.

Dated: April 1, 2024

Minnesota Department of Commerce

Insurance Division

Notice of Opportunity for Public Comment on a Mandated Health Benefit

Request for Information

The Minnesota Department of Commerce is seeking public input on the costs and benefits of a health insurance mandate that requires coverage of three-dimensional (3D) mammograms for individuals at risk of developing breast cancer. The mandate went into effect in January 2020.

The Minnesota Legislature in 2023 directed Commerce to conduct an evaluation of the economic cost and health benefits of one state-required health benefit mandate annually until 2028. This year Commerce is seeking input from stakeholders on the fiscal, economic, and public health impacts of the 3D mammography mandate.

Input may be provided via responses to a Request for Information (RFI) posted on Commerce's website. The evaluation is conducted in coordination with the Department of Health and the Department of Management and Budget.

The Department of Commerce invites responses from individuals, organizations, and other interested audiences. Responses to the RFI will inform evaluation reports submitted by Commerce to the Legislature. To review the RFI and submit comments, visit ***mn.gov/commerce/insurance/industry/policy-data-reports/62j-reports/annual-evaluation.jsp***. The deadline for submitting comments for this evaluation is **May 9, 2024**.

Questions about the RFI can be submitted to ***HealthInsurance.DivisionRequests@state.mn.us***

Minnesota Pollution Control Agency (MPCA)

Environmental Analysis and Outcomes Division

REQUEST FOR COMMENTS for Planned Amendments to Rules Governing Air Quality, *Minnesota Rules*, chapters 7002, 7005, 7007, 7008, 7011, 7017, and 7019, Revisor's ID Number R-4599

NOTICE IS HEREBY GIVEN that the Minnesota Pollution Control Agency (MPCA) is requesting comments on planned amendments to air quality rules, *Minnesota Rules* Chapters 7002 (Permit Fees), 7005 (Definitions and Abbreviations), 7007 (Permits and Offsets), 7008 (Conditionally Exempt Stationary Sources and Conditionally Insignificant Activities), and 7019 (Emission Inventory Requirements). This rulemaking is referred to as the **Air Toxics Emissions Reporting Rule**. The main purpose of this rulemaking is to establish new rules for air toxics emissions reporting requirements as directed by *Minnesota Statutes,* section 116.062. The MPCA may make rule changes in some or all of these rule chapters. Comments are requested from affected or interested parties. Comments should be submitted writing as describe in the **Comments** section below. Comments that were submitted for the original notice are still being considered and will continue to be part of the rulemaking record.

This second request for comments (RFC) is the MPCA's legal notice of its intent to begin rulemaking. This is the first of several opportunities for public comment and input on this rulemaking. At this stage, we do not have a draft rule; we want your feedback to inform us about the ideas described under the Subject of Rules section. Additional information is

available on the rulemaking webpage at ***https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting***.

Submitting your ideas and information at this early stage in rulemaking allows us more time to address issues that may come up and helps to ensure informed decision-making on our part. If the proposed rules affect you in any way, the MPCA encourages you to participate in the rulemaking process.

Alternative Format/Accommodation. Upon request, this information can be made available in an alternative format, such as large print, braille, or audio. To make such a request, please contact the **MPCA Contact Person**.

Statutory Authority. *Minnesota Statutes,* section 116.07, subdivision 4 authorizes the MPCA to adopt rules for prevention, abatement, or control of air pollution, and *Minnesota Statutes,* section 116.062 Air Toxics Emissions Reporting authorizes the MPCA to adopt rules to require facilities to submit air toxics emissions reports.

Subject of Rules. The MPCA published a Request for Comments on July 24, 2023, (***48 SR 79***) regarding planned rule amendments to require annual reporting on air toxics emissions from permitted facilities (except those with Option B registration permits) located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties. Comments that were submitted for the original notice are still being considered and will continue to be part of the rulemaking record.

In that request, the MPCA outlined three main goals for these rule amendments:

1. Establish the requirements for air toxics emissions reporting for permitted facilities on an annual basis (Minn. R. 7019.3000 and 7019.3020).
2. Identify the air toxics to be reported (Minn. R. ch. 7019).
3. Amend permit and reporting processes to align with annual air toxics emissions reporting (Minn. R. ch. 7002; Minn. R. 7007.1300, subps. 3 and 4; and Minn. R. ch. 7008).

The main purpose of this second Request for Comments is to provide notice of intent to repeal certain sections of chapter 7007 that allow a Title V air permittee to assert emergency affirmative defense. This amendment is in response to the EPA's final rule effective August 8, 2023, that removed emergency affirmative defense provisions from the Clean Air Act Title V operating permit program regulations. The EPA determined that the emergency affirmative defense provisions are inconsistent with the Clean Air Act. The EPA set a deadline for states to remove this language from state rules by August 21, 2024, or to seek an extension and remove the language as soon as practicable. The repeal of this language is proposed in this rulemaking because it involves amendments that effect permitted air emission facilities and is an upcoming permanent air rulemaking.

Where to Get More Information. The concept document which includes a detailed explanation about the planned rule amendments, and other information about this rulemaking is available on the rulemaking webpage at |***https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting***.

Persons Affected. The amendments to the rules would likely affect regulated air permittees by changing their reporting from voluntary to mandatory. Additionally, in the long-term, these amendments would affect those who live in environmental justice areas of concern, by allowing the MPCA to address the disproportionate impacts of pollution in those areas. A limited number of facilities issued a Title V permit may be affected by the emergency affirmative defense repeal.

Comments. Interested persons or groups may submit written comments or information on these possible rules in writing until **4:30 p.m. on May 1, 2024.** Submit written comments or information to the Office of Administrative Hearings Rulemaking e-Comments website at ***https://minnesotaoah.granicusideas.com/discussions***. Any questions about submitting comments via the Rulemaking e-Comments website should be directed to William Moore, Office of Administrative Hearings, telephone 651-361-7893, ***william.t.moore@state.mn.us***. You may view frequently asked questions about the OAH Rulemaking eComments website at ***https://mn.gov/oah/assets/ecomments-faq_tcm19-82012.pdf***. Comments received are public and will be available for review at the OAH Rulemaking eComments website at ***https://minnesotaoah.granicusideas.com/discussions*** and at the Office of Administrative Hearings, 600 North Robert

Street, P.O. Box 64620, St. Paul, Minnesota 55164-0620.

The MPCA will not publish a notice of intent to adopt the rules until more than 60 days have elapsed from the date of this request for comments. The MPCA does not plan to appoint an advisory committee to comment on the planned rule amendments.

The MPCA does not anticipate that the rule amendments will require a local government to adopt or amend an ordinance or other regulation under *Minnesota Statutes,* section 14.128. Local governments may submit written information to the contrary.

The MPCA requests any information pertaining to the cumulative effect of the rule amendments with other federal and state regulations related to the specific purpose of the rule. Cumulative effect means the impact that results from incremental impact of the proposed rule in addition to other rules, regardless of what state or federal agency has adopted the other rules.

NOTE: Comments received in response to this notice will not necessarily be included in the formal rulemaking record submitted to the Administrative Law Judge (ALJ) if and when a proceeding to adopt rules is started. The MPCA is required to submit to the ALJ only those written comments received in response to the draft rules after they are proposed. If you submit comments during the development of the rules and want to ensure that the ALJ reviews your comments, you should resubmit the comments after the rules are formally proposed.

Rules Drafts. As stated above, draft rule language is not available at this time. If you are interested in being notified when a draft of the rules is available and of other activities relating to this rulemaking, please register for GovDelivery email updates at ***https://public.govdelivery.com/accounts/MNPCA/subscriber/new?qsp=MNPCA_1***

MPCA Contact Person. The MPCA contact person is Addison Otto, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194; telephone: 651-757-2754, email: ***addison.otto@state.mn.us***. Technical questions on the planned rule amendments should be directed to Hassan Bouchareb, 651-757-2653, email: ***hassan.bouchareb@state.mn.us***. You may also call the MPCA at 651-296-6300 or 1-800-657-3864; use your preferred relay service.

Date: March 25, 2024

Katrina Kessler, P.E.
Commissioner
Minnesota Pollution Control Agency

State Grants & Loans

In addition to requests by state agencies for technical/professional services (published in the State Contracts Section), the *State Register* also publishes notices about grants and loans available through any agency or branch of state government. Although some grant and loan programs specifically require printing in a statewide publication such as the State Register, there is no requirement for publication in the *State Register* itself. Agencies are encouraged to publish grant and loan notices, and to provide financial estimates as well as sufficient time for interested parties to respond.

SEE ALSO: Office of Grants Management (OGM) at: *https://mn.gov/admin/citizen/grants/*

Department of Employment and Economic Development (DEED)

Notice of Grant Opportunity

NOTICE IS HEREBY GIVEN that the Minnesota Department of Employment and Economic Development (DEED) places notice of any available grant opportunities online at ***https://mn.gov/deed/about/contracts/open-rfp.jsp***

Exhibit B

B. Not enclosed: a petition for rulemaking because no petition was filed on the rules.

Exhibit C

Office of the Revisor of Statutes
Administrative Rules

TITLE: Proposed Permanent Rules Relating to Air Toxics Reporting

AGENCY: Minnesota Pollution Control Agency

REVISOR ID: R-4599

MINNESOTA RULES: Chapters 7002, 7005, 7007, and 7019

INCORPORATIONS BY REFERENCE:

Part 7019.3110, subpart 3: *Report on Carcinogens*, National Toxicology Program, United States Department of Health and Human Services (15th edition and subsequent editions). The report is not subject to frequent change and is available on the website of the National Institute of Environmental Health Sciences (https://www.niehs.nih.gov).

Part 7019.3110, subpart 3: *IARC Monographs on the Identification of Carcinogenic Hazards to Humans*, International Agency for Research on Cancer (volumes 1 to 134 and as subsequently added). The monographs are subject to frequent change and are available on the website of the International Agency for Research on Cancer (https://monographs.iarc.who.int/monographs-available).

The attached rules are approved for
publication in the State Register

Cindy K. Maxwell

Cindy K. Maxwell
Assistant Deputy Revisor

aq-rule2-02g

Minnesota Pollution Control Agency

Proposed Permanent Rules Relating to Air Toxics Reporting

7002.0015 DEFINITIONS.

[For text of subparts 1 and 2, see Minnesota Rules]

Subp. 2a. **Chargeable pollutant.** "Chargeable pollutant" means a pollutant that is assessed a fee and includes the following:

[For text of items A and B, see Minnesota Rules]

[For text of subparts 2b to 4, see Minnesota Rules]

7005.0100 DEFINITIONS.

[For text of subparts 1 to 2b, see Minnesota Rules]

Subp. 2c. **Air toxics.** "Air toxics" means pollutants, except for criteria pollutants, that are known or suspected to cause cancer or other serious health effects or adverse environmental and ecological effects. Air toxics includes the pollutants listed under part 7019.3110, subpart 2.

Subp. 2d. **Air toxics reporting facility.** "Air toxics reporting facility" means a facility in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington County for which the owner or operator of the facility must obtain an air emission permit under chapter 7007, but does not include a facility permitted under part 7007.1120, registration permit option B.

[For text of subparts 3 to 44a, see Minnesota Rules]

Subp. 44b. **Toxic release inventory list.** "Toxic release inventory list" or "TRI list" means the list of chemicals and chemical categories adopted by the Environmental Protection Agency under Code of Federal Regulations, title 40, section 372.65, according to the federal Emergency Planning and Community Right-to-Know Act, United States Code, title 42, section 11023.

[For text of subpart 45, see Minnesota Rules]

7007.0800 PERMIT CONTENT.

[For text of subparts 1 to 5, see Minnesota Rules]

Subp. 6. **Reporting.**

[For text of items A to E, see Minnesota Rules]

~~F. For deviations caused by emergencies, as defined in part 7007.1850, the permittee may assert an affirmative defense only if it meets all the requirements of part 7007.1850.~~

[For text of subparts 7 to 16, see Minnesota Rules]

7007.1146 CAPPED PERMIT; COMPLIANCE REQUIREMENTS.

[For text of subparts 1 to 4, see Minnesota Rules]

Subp. 5. **Reporting.** An owner or operator of a source with a capped permit must submit to the ~~agency~~ commissioner the reports described under items A to E. All reports required under a capped permit ~~shall~~ must be certified by a responsible official consistent with part 7007.1143, subpart 1.

A. Deviation reporting time frames as described in subitems (1) and (2).

(1) For deviations that endanger human health or the environment, the permittee ~~shall~~ must notify the commissioner as required in part 7019.1000, subpart 1. ~~The permittee may assert the affirmative defense of emergency only if it meets all the requirements of part 7007.1850, which includes notifying the agency within two working days of when the emission limitations were exceeded due to the emergency.~~

[For text of subitem (2), see Minnesota Rules]

[For text of items B to E, see Minnesota Rules]

7019.3000 EMISSION INVENTORY.

Subpart 1. **Emission inventory required.**

A. All owners or operators of emission reporting facilities, as defined in part 7002.0015, subpart 3a, ~~shall~~ and air toxics reporting facilities, as defined in part 7005.0100, subpart 2d, must submit an annual emission inventory report to the ~~agency,~~ commissioner.

B. The report under item A must meet the following criteria:

(1) the owner or operator of an emission reporting facility must submit the report in a format specified by the commissioner, relating to ammonia, carbon monoxide, particulate matter, and all chargeable pollutants as defined in part 7002.0015, subpart 2a~~.~~;

(2) the owner or operator of an air toxics reporting facility must submit the report in a format specified by the commissioner, relating to air toxics according to part 7019.3110;

(3) ~~The report shall be submitted~~ the owner or operator of an emission reporting facility or air toxics reporting facility must submit the report on or before April 1 of the year following the calendar year being reported~~.~~; and

(4) the responsible official, as defined in part 7007.0100, subpart 21, must sign the report and ~~shall~~ make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision by qualified personnel. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that the data provided in this document will be used by the MPCA to calculate a fee~~,~~ ~~which~~ that the facility will be required to pay under Minnesota Rules, part 7002.0065, based on the tons of pollution emitted by the facility."

~~B.~~ C. (1) All owners or operators of facilities issued option B registration permits under part 7007.1120 ~~shall~~ must submit either an emission inventory using methods described

under subitem (3) and parts 7019.3020 to 7019.3100 or the certification and VOC-containing material report in subitem (2). The report ~~shall~~ must be submitted on or before ~~the~~ April 1 following the calendar year being reported.

(2) All owners or operators that choose to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (2), ~~shall~~ must submit a report and certification to the ~~agency~~ commissioner. The responsible official, as defined in part 7007.0100, subpart 2, must sign the report and ~~shall~~ make the following certification:

"I certify under penalty of law that the facility described in registration permit number .... is eligible for the option B registration permit that it was issued and holds and that the facility purchased or used (as stated in the permit application) .... gallons of VOC-containing materials in the 12-month reporting period. I further certify that the eligibility of the facility and the quantity of material reported herein were determined under my direction or supervision by qualified personnel. The information used to determine eligibility and the quantity of material reported herein for the registration permit is, to the best of my knowledge and belief, true and accurate. I understand that the information provided in this certification will be used by the MPCA to assess a fee under Minnesota Rules, part 7002.0025, subpart 1, item C, ~~which~~ that the facility will be required to pay under Minnesota Rules, part 7002.0065."

(3) All owners and operators that choose to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), ~~shall~~ must submit an emission inventory report to the ~~agency~~ commissioner, in a format specified by the commissioner, relating to emissions from the use of VOC-containing materials using methods described in part 7019.3030, ~~item B~~ subpart 2, and the certification in subitem (2). The certification and emission inventory ~~shall~~ must be signed by the responsible official, as defined in part 7007.0100, subpart 2.

Subp. 2. **Owner or operator error in reporting data.** If an owner or operator discovers an error in the data after having submitted it to the ~~agency~~ commissioner, the

owner or operator ~~shall~~ must submit corrected data, with a written explanation of the mistake and why it occurred. If the commissioner agrees that the correction is appropriate, the commissioner ~~shall~~ must correct the data in the inventory. However, for purposes of assessing the emission fee under part 7002.0025, the commissioner ~~shall~~ must not accept any correction submitted by an owner or operator ~~which~~ that would result in a reduction of tons emitted if the correction is submitted more than 45 days after the mailing date of the previous calendar year's air emissions summary.

Subp. 3. **Mercury emission sources.**

A. Owners or operators of a mercury emission source as defined in part 7005.0100, subpart 23b, must submit an annual emission inventory report of the mercury emissions to the commissioner in a format specified by the commissioner. The report must be submitted on or before April 1 of the year following the calendar year being reported. ~~The initial report must cover the first full calendar year following September 29, 2014.~~

B. Owners or operators of stationary sources that have air emissions of mercury but that are not mercury emission sources must report every three years.

C. Owners or operators of stationary sources that are air toxics reporting facilities must report mercury emissions as provided under part 7019.3110.

Subp. 4. **Possible mercury emission sources.** If the commissioner determines that a stationary source has activity levels or emission factors that indicate that the source may be a mercury emission source, the commissioner may request that the owners or operators quantify the source's mercury emissions using the methods listed in part 7019.3030, ~~item A~~ subpart 1. The owners or operators must complete the quantification and submit a report to the commissioner within 120 days of the commissioner's request.

7019.3020 CALCULATING ACTUAL EMISSIONS FOR EMISSION INVENTORY.

Subpart 1. **Scope.** ~~A.~~ Emissions from all emissions units must be reported in the annual emissions inventory report in a format specified by the commissioner.

Subp. 2. **Insignificant activities.** ~~Emissions from insignificant activities listed in part 7007.1300, subpart 2, must not be reported. Emissions~~ Emission reporting facilities and air toxics reporting facilities are not required to report emissions from insignificant activities listed in part 7007.1300~~, subparts 3 and 4,~~ and conditionally insignificant activities listed in part 7008.4000 ~~must be reported if~~ unless:

A. the commissioner or owner or operator has determined that emissions from those activities are not insignificant for purposes of permitting under parts 7007.0100 to ~~7007.1850~~ 7007.1800 or for those activities required to be quantified by a facility issued a capped permit option 1~~. Notwithstanding the previous sentence,~~; or

B. the commissioner ~~may request~~ requests an inventory of fugitive emissions from roads and parking lots, defined as insignificant under part 7007.1300, subpart 3, item G, upon determining that emissions from these sources represent a substantial portion of the facility's total emissions.

Subp. 3. **Calculating emissions.** ~~B.~~ Except as provided in subparts 4 to 7, all owners or operators of emission reporting facilities, as defined in part 7002.0015, subpart 3a, or facilities issued option B registration permits under part 7007.1120 that choose to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), ~~shall~~ must calculate emissions based on parts 7019.3030 to 7019.3100, except for any facility ~~which~~ that has obtained an option A, C, or D registration permit under part 7007.1115, 7007.1125, or 7007.1130 or a capped permit under parts 7007.1140 to 7007.1148.

Subp. 4. **Calculating emissions for option A permits.** ~~C.~~ Owners or operators of emission reporting facilities that hold an air emission permit under part 7007.1115, registration permit option A, must report actual emissions calculated for the calendar year

for which emissions are being reported in a format specified by the commissioner. The owners or operators of a facility issued an option A registration permit under part 7007.1115 must calculate emissions for all emission units using the methods listed in parts 7019.3030 to 7019.3100.

Subp. 5. **Calculating emissions for option C permits.** ~~D.~~ All owners or operators of emission reporting facilities ~~which~~ that have obtained an air emission permit under part 7007.1125, registration permit option C, ~~shall~~ must report the quantity of each fuel purchased or used (whichever was stated in the facility's registration permit application) in the calendar year for which emissions are being calculated. The report ~~shall~~ must apportion the quantity of fuel burned with the type of combustion unit (indirect heating units or internal combustion engines) ~~in which~~ that it was burned in. The owner or operator ~~shall~~ must report the quantity of VOC-containing materials purchased or used (whichever is stated in the facility's registration permit application) in the calendar year for which emissions are being calculated and air toxics emissions using the method listed in part 7019.3060. The owners or operators reporting VOC-containing materials purchases or usage ~~shall~~ must also report the weight factor (WF) of the VOC and air toxics in the materials (weight of VOC per weight of VOC-containing materials) and the density of the materials. ~~The actual emissions shall be calculated by the commissioner.~~

Subp. 6. **Calculating emissions for option D permits.** ~~E.~~ All owners or operators of emission reporting facilities ~~which~~ that have obtained an air emission permit under part 7007.1130, registration permit option D, ~~shall~~ must report the actual emissions calculated for purposes of compliance demonstration required in part 7007.1130, subpart 3, item E, for the calendar year for which emissions are being reported in a format specified by the commissioner.

Subp. 7. **Calculating emissions for capped permits.** ~~F.~~ All owners or operators of emission reporting facilities ~~which~~ that have obtained an air emission permit under parts

7007.1140 to 7007.1148, capped permit, ~~shall~~ must report the actual emissions calculated for purposes of compliance demonstration required in part 7007.1146, subpart 2, item H, for the calendar year for which emissions are being reported for all emission units in a format specified by the commissioner.

Subp. 8. **Material balance.** ~~G.~~ All owners or operators of an emission reporting facility submitting an emission inventory based in whole, or in part, on a material balance calculation ~~shall~~ must submit a sample material balance calculation with the emission inventory. Such facilities ~~shall~~ must also maintain a record of the ~~material~~ safety data sheets or vendor certification of the VOC, air toxics, mercury, or sulfur content of the material for each material or fuel used and the material balance calculations for ~~a period of~~ five years after the date ~~of submittal of~~ the emission inventory is submitted.

Subp. 9. **Control equipment.** ~~H. The~~ An emission inventory may be based on the use of control equipment only if the use of the specific control equipment is required under conditions of a permit or applicable requirement as defined in part 7007.0100, subpart 7, or is included in a notification received by the ~~agency~~ commissioner under part 7007.1150, item C. This ~~item~~ subpart applies upon issuance under chapter 7007 of a registration, state, capped, general, or part 70 permit to a stationary source ~~but no earlier than the date three years after EPA grants full program approval of the agency's permit program under Title 5 of the Clean Air Act~~.

Subp. 10. **Control efficiency factors.** An owner or operator submitting the emission inventory must apply control efficiency factors, as defined under part 7005.0100, subpart 9b, to air toxics emissions calculations according to items A and B, unless the control efficiency factor for the pollutant is identified in the permit. The owner or operator must:

A. use the VOC control efficiency factor for volatile air toxics; and

B. use the PM10 control efficiency factor for particulate air toxics.

7019.3030 METHOD OF CALCULATION.

Subpart 1. **Method hierarchy.** ~~A.~~ The owner or operator of an emission reporting facility, except one issued an option C or D registration permit under part 7007.1125 or 7007.1130 or a capped permit under parts 7007.1140 to 7007.1148, ~~shall~~ must calculate the facility's actual emissions using the methods listed in ~~subitems (1) to (4)~~ items A to D. The owner or operator of an air toxics reporting facility issued an option D registration permit or a capped permit must calculate air toxics emissions for each emission unit using the methods listed in items A to D, except that similar emission units may be aggregated. The methods are listed in a hierarchy of the most preferred method to the least preferred method. The most preferred method available ~~shall~~ must be used. Where more than one method is listed in the ~~subitem~~ item, they are considered to be equal in the hierarchy and any can be used:

A. ~~(1)~~ part 7019.3040 (continuous emission monitor data);

B. ~~(2)~~ part 7019.3050~~, item B~~ (performance test data);

C. ~~(3)~~ part 7019.3060 (VOC and air toxics material balance), 7019.3065 (mercury material balance), 7019.3070 (~~$S0_2$~~ SO_2 material balance), 7019.3080 (emission factor), or 7019.3090 (enforceable limitations), as applicable; or

D. ~~(4)~~ part 7019.3100 (facility proposal).

Subp. 2. **Option B permit fees.** ~~B.~~ The owner or operator of a facility issued an option B registration permit under part 7007.1120 that chooses to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1)~~, shall~~:

A. must calculate the facility's actual emissions using the methods listed in part 7019.3060~~.~~; and

~~The owner or operator of a facility issued an option B registration permit under part 7007.1120 that chooses to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), shall~~

B. must not consider the effects of pollution control equipment on emissions from the use of VOC-containing materials when calculating actual emissions for an emissions inventory.

Subp. 3. **Selecting calculation method.** ~~C.~~ For purposes of selecting a calculation method, a method is considered available if the conditions associated with the method in parts 7019.3040 to 7019.3100 are met. The method described in part 7019.3100 may be used~~, provided that~~ if the proposal is submitted to the commissioner by September 1 of the first calendar year for which the emissions are being calculated. The commissioner must reject data submitted using the methods described in parts 7019.3040 to 7019.3090 if the conditions for the method are not fully met.

Subp. 4. **Reporting individual pollutants.** An owner or operator of a facility must report individual pollutants to the maximum extent feasible. If the owner or operator cannot report individual pollutants within a group, such as lead compounds or nickel compounds, the owner or operator must report total emissions as a group.

7019.3060 VOLATILE ORGANIC COMPOUND (VOC) AND AIR TOXICS MATERIAL BALANCE.

If the methods in part 7019.3040 or 7019.3050 are unavailable to the owner or operator of an emission reporting facility or a facility issued an option B registration permit under part 7007.1120 that chooses to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), the facility may calculate VOC and air toxics emissions using the material balance method described in this part. This method may be used in conjunction with or instead of emission factors and enforceable limitations methods described in parts 7019.3080 and 7019.3090, where applicable. A person using material balance to calculate VOC and

air toxics emissions must determine the total VOC emissions and air toxics emissions (E) as follows:

$$E = (A - B - C) * (1 - CE)$$

where:

A = the amount of VOC and air toxics entering the process. The amount of VOC used in this calculation must be the amount certified by the supplier, the maximum amount stated on the material safety data sheet, or the amount determined by reference method 24.

B = the amount of VOC and air toxics incorporated into the product. This includes VOCs chemically transformed in production. An explanation of this calculation must also be submitted.

C = the amount of VOC and air toxics, if any, leaving the process as waste, or otherwise not incorporated into the product and not emitted to the air. If the actual VOC and air toxics content of the waste is unknown, then C = 0.

CE = the control efficiency, or the product of capture efficiency and collection or destruction efficiency, of any device used to capture and/or control VOC and air toxics emissions, expressed as a decimal fraction of 1.00. The control efficiency must be based on efficiency factors, as defined in part 7005.0100, subpart 9b, including air toxics, or must be based on the control efficiency verified by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050. The overall efficiency of a pollution control system that uses a hood, as defined in part 7011.0060, subpart 2, as the emission capture device must be based on a capture efficiency of 60 percent. If an alternative capture efficiency has been determined by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050, that capture efficiency must be used in the calculation of actual emissions.

7019.3080 EMISSION FACTORS.

[For text of item A, see Minnesota Rules]

B. Control equipment efficiency must be based on efficiency factors as defined in part 7005.0100, subpart 9b, including air toxics, or on the efficiency verified by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050. Calculations of actual emissions from an emission unit through a pollution control system that uses a hood, as defined in part 7011.0060, subpart 2, as the emission capture device must be based on a capture efficiency of 80 percent. If an alternative capture efficiency has been determined by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050, the owner or operator must use that capture efficiency in the calculation of actual emissions.

7019.3110 AIR TOXICS EMISSION INVENTORY AND EMISSIONS REPORTING.

Subpart 1. **Inventory required.** An owner or operator of an air toxics reporting facility, as defined in part 7005.0100, subpart 2d, must include the air toxics emissions under subpart 2 in the annual air toxics emission inventory according to part 7019.3000.

Subp. 2. **Air toxics to be reported.**

A. An owner or operator of an air toxics reporting facility must include HAPs as defined in part 7007.0100, subpart 12a.

B. An owner or operator of an air toxics reporting facility must include PFAS as defined in Minnesota Statutes, section 116.943, subdivision 1, paragraph (p), that are listed on the TRI list defined in part 7005.0100. An owner or operator must also include the following PFAS:

Chemical Abstracts Service (CAS) number	Pollutant
(1) 375-61-1	1,1,1,2,2,3,3,4,4,5,5-Undecafluoropentane
(2) 811-97-2	1,1,1,2-Tetrafluoroethane

(3) 420-46-2	1,1,1-Trifluoroethane
(4) 209482-18-8	1-(4-Butoxynaphthyl)tetrahydrothiophenium perfluorobutanesulfonate
(5) 120226-60-0	10:2 Fluorotelomer sulfonic acid
(6) 763051-92-9	11-Chloroperfluoro-3-oxaundecanesulfonic acid
(7) 2252-84-8	1H-Heptafluoropropane
(8) 375-17-7	1H-Nonafluorobutane
(9) 355-37-3	1H-Perfluorohexane
(10) 375-83-7	1-Hydroperfluoroheptane
(11) 2991-50-6	2-(N-Ethylperfluorooctanesulfonamido)acetic acid
(12) 2355-31-9	2-(N-Methylperfluorooctanesulfonamido)acetic acid
(13) 53826-13-4	2-(Perfluorodecyl)ethanoic acid
(14) 53826-12-3	2-(Perfluorohexyl)ethanoic acid
(15) 27854-31-5	2-(Perfluorooctyl)ethanoic acid
(16) 359-49-9	2,3,3,3-Tetrafluoropropanoic acid
(17) 914637-49-3	2H,2H,3H,3H-Perfluorooctanoic acid
(18) 70887-84-2	2H-Perfluoro-2-decenoic acid
(19) 3330-14-1	2H-Perfluoro-5-methyl-3,6-dioxanonane
(20) 812-70-4	3-(Perfluoroheptyl)propanoic acid
(21) 70887-88-6	3-(Perfluoropentyl)-3-fluoro-2-propenoic acid
(22) 356-02-5	3:3 Fluorotelomer carboxylic acid
(23) 919005-14-4	4,8-Dioxa-3H-perfluorononanoic acid
(24) 27619-93-8	4:2 Fluorotelomer sulfonate sodium
(25) 757124-72-4	4:2 Fluorotelomer sulfonic acid
(26) 27619-94-9	6:2 Fluorotelomer sulfonate sodium salt
(27) 27619-97-2	6:2 Fluorotelomer sulfonic acid
(28) 27619-96-1	8:2 Fluorotelomer sulfonate sodium salt

(29) 39108-34-4 8:2 Fluorotelomer sulfonic acid

(30) 335-65-9 8H-Perfluorooctane

(31) 1478-61-1 Bisphenol AF

(32) 75-73-0 Carbon tetrafluoride

(33) 75-45-6 Chlorodifluoromethane

(34) 75-72-9 Chlorotrifluoromethane

(35) 75-10-5 Difluoromethane

(36) 593-53-3 Fluoromethane

(37) 116-15-4 Hexafluoropropene

(38) 115-25-3 Octafluorocyclobutane

(39) 559-40-0 Octafluorocyclopentene

(40) 354-33-6 Pentafluoroethane

(41) 678-26-2 Perflenapent

(42) 756426-58-1 Perfluoro(2-((6-chlorohexyl)oxy)ethanesulfonic acid)

(43) 863090-89-5 Perfluoro(4-methoxybutanoic acid)

(44) 428-59-1 Perfluoro(methyloxirane)

(45) 113507-82-7 Perfluoro-2-ethoxyethanesulfonic acid

(46) 3330-15-2 Perfluoro-3-(1H-perfluoroethoxy)propane

(47) 151772-58-6 Perfluoro-3,6-dioxaheptanoic acid

(48) 377-73-1 Perfluoro-3-methoxypropanoic acid

(49) 355-25-9 Perfluorobutane

(50) 335-77-3 Perfluorodecanesulfonic acid

(51) 79780-39-5 Perfluorododecanesulfonic acid

(52) 76-16-4 Perfluoroethane

(53) 335-57-9 Perfluoroheptane

(54) 375-92-8 Perfluoroheptanesulfonic acid

(55) 375-85-9 Perfluoroheptanoic acid

(56) 355-42-0 Perfluorohexane

(57) 68259-12-1	Perfluorononanesulfonic acid
(58) 307-34-6	Perfluorooctane
(59) 754-91-6	Perfluorooctanesulfonamide
(60) 2706-91-4	Perfluoropentanesulfonic acid
(61) 2706-90-3	Perfluoropentanoic acid
(62) 76-19-7	Perfluoropropane
(63) 365971-87-5	Perfluorotetradecanoate
(64) 72629-94-8	Perfluorotridecanoic acid
(65) 2058-94-8	Perfluoroundecanoic acid,
(66) 83329-89-9	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate
(67) 335-24-0	Potassium perfluoro-4-ethylcyclohexanesulfonate
(68) 2923-16-2	Potassium trifluoroacetate
(69) 2250081-67-3	Sodium 4,8-dioxa-3H-perfluorononanoate
(70) 2806-15-7	Sodium perfluorodecanesulfonate
(71) 1260224-54-1	Sodium perfluorododecanesulfonate
(72) 21934-50-9	Sodium perfluoroheptanesulfonate
(73) 4021-47-0	Sodium perfluorooctanesulfonate
(74) 116-14-3	Tetrafluoroethylene
(75) 75-69-4	Trichlorofluoromethane
(76) 75-46-7	Trifluoromethane
(77) 1493-13-6	Trifluoromethanesulfonic acid
(78) 144317-44-2	Triphenylsulfonium nonafluorobutanesulfonate

C. An owner or operator of an air toxics reporting facility must include the air toxics included in subitems (1) to (66). For all pollutant names that contain the word "compounds," any chemical substance that contains the named chemical as part of that chemical's infrastructure is included.

Chemical Abstracts Service (CAS) number	**Pollutant**
(1) 540-59-0	1,2-Dichloroethylene
(2) 5131-66-8	1-Butoxy-2-propanol
(3) 563-47-3	3-Chloro-2-methyl-1-propene
(4) 67-64-1	Acetone
(5)	Aldehyde
(6) 309-00-2	Aldrin
(7)	Aluminum compounds
(8) 140-57-8	Aramite
(9) 12674-11-2	Aroclor 1016
(10) 12672-29-6	Aroclor 1248
(11) 11097-69-1	Aroclor 1254
(12) 1912-24-9	Atrazine
(13) 103-33-3	Azobenzene
(14) 100-52-7	Benzaldehyde
(15) 108-86-1	Bromobenzene
(16) 85-68-7	Benzyl butyl phthalate
(17) 105-60-2	Caprolactam
(18) 1306-38-3	Ceric oxide
(19) 12789-03-6	Technical chlordane
(20) 10049-04-4	Chlorine dioxide
(21) 75-68-3	1-Chloro-1,1-difluoroethane
(22) 75-45-6	Chlorodifluoromethane
(23) 10061-01-5	(Z)-Dichloropropene
(24)	Copper compounds
(25) 123-73-9	(E)-Crotonaldehyde
(26) 110-82-7	Cyclohexane
(27) 25321-22-6	Dichlorobenzene
(28) 95-50-1	1,2-Dichlorobenzene

(29) 541-73-1 1,3-Dichlorobenzene

(30) 75-71-8 Dichlorodifluoromethane

(31) 50-29-3 DDT

(32) 156-59-2 (Z)-1,2-Dichloroethylene

(33) 156-60-5 (E)-1,2-Dichloroethylene

(34) 77-73-6 Dicyclopentadiene

(35) 117-84-0 Di-n-octyl phthalate

(36) 637-92-3 Ethyl t-butyl ether

(37) 111-76-2 2-Butoxyethanol

(38) 64-18-6 Formic acid

(39) 591-78-6 2-Hexanone

(40) 7783-06-4 Hydrogen sulfide

(41) 1318-09-8 Amphibole-group minerals

(42) 78-93-3 Methyl ethyl ketone

(43) 2385-85-5 Mirex

(44) 71-36-3 1-Butanol

(45) 123-72-8 Butyraldehyde

(46) 7697-37-2 Nitric acid

(47) 55-18-5 N-Nitroso-diethylamine

(48) 924-16-3 N-Nitroso-di-butylamine

(49) 930-55-2 N-Nitroso-pyrrolidine

(50) 40487-42-1 Pendimethalin

(51) 115-07-1 1-Propene

(52) 107-98-2 1-Methoxy-2-propanol

(53) 7631-86-9 Silica

(54) 7664-93-9 Sulfuric acid

(55) 540-88-5 tert-Butyl acetate

(56) 75-65-0 tert-Butyl alcohol

(57) 109-99-9 Tetrahydrofuran

(58) 62-56-6	Thiourea
(59) 26471-62-5	Toluene diisocyanate
(60) 10061-02-6	trans-1,3-Dichloropropene
(61) 96-18-4	1,2,3-Trichloropropane
(62) 526-73-8	1,2,3-Trimethylbenzene
(63) 95-63-6	1,2,4-Trimethylbenzene
(64) 108-67-8	1,3,5-Trimethylbenzene,
(65)	Vanadium compounds
(66)	Zinc compounds

Subp. 3. **De minimis reporting; exceptions.**

A. Except as provided in item B, if a toxic chemical is present in a mixture of chemicals at an air toxics reporting facility and the toxic chemical is in a concentration in the mixture that is below one percent of the mixture according to the safety data sheet (SDS) or is below 0.1 percent of the mixture in the case of a toxic chemical that is a carcinogen or potential carcinogen, an owner or operator is not required to consider the quantity of the toxic chemical present in such mixture when calculating and reporting emissions. The sources listed in subitems (1) to (3) establish a chemical as a carcinogen or potential carcinogen and are incorporated by reference.

(1) *Report on Carcinogens*, National Toxicology Program, United States Department of Health and Human Services (15th edition and subsequent editions). The report is not subject to frequent change and is available on the website of the National Institute of Environmental Health Sciences (https://www.niehs.nih.gov);

(2) *IARC Monographs on the Identification of Carcinogenic Hazards to Humans*, International Agency for Research on Cancer (volumes 1 to 134 and as subsequently added). The monographs are subject to frequent change and are available on the website of

the International Agency for Research on Cancer (https://monographs.iarc.who.int/monographs-available); or

(3) Code of Federal Regulations, title 29, part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

B. An owner or operator of an air toxics reporting facility must report all emissions of the air toxics in subitems (1) to (20). The de minimis standard under item A does not apply. For all pollutant names that contain the word "compounds," any chemical substance that contains the named chemical as part of that chemical's infrastructure is included.

Chemical Abstracts Service (CAS) number	**Pollutant**
(1) 309-00-2	Aldrin
(2)	Arsenic compounds
(3)	Cadmium compounds
(4) 57-74-9	Chlordane
(5)	Chromium compounds
(6)	Cobalt compounds
(7)	Dioxins/furans
(8) 75-21-8	Ethylene oxide
(9) 76-44-8	Heptachlor
(10) 118-74-1	Hexachlorobenzene
(11)	Lead compounds
(12)	Mercury compounds
(13) 72-43-5	Methoxychlor
(14)	Nickel compounds
(15)	Polycyclic organic matter (POMs)
(16) 40487-42-1	Pendimethalin
(17)	PFAS under subpart 2, item B
(18)	Polychlorinated biphenyl (PCBs)

(19) 8001-35-2 Toxaphene

(20) 1582-09-8 Trifluralin

Subp. 4. **Calculating actual emissions.**

A. An owner or operator of an air toxics reporting facility, except any facility permitted under part 7007.1125, registration permit option C, must calculate actual air toxics emissions using the methods in part 7019.3030, subpart 1, for the annual air toxics emission report.

B. An owner or operator of an air toxics reporting facility permitted under part 7007.1125, registration permit option C, must calculate emissions using the methods in part 7019.3020, subpart 5.

Subp. 5. **Recordkeeping.**

A. An owner or operator of an air toxics reporting facility must maintain records according to this subpart for five years after the date the air toxics emission inventory is submitted and must provide the records, upon request, to the commissioner.

B. An owner or operator must maintain a record of the SDS or vendor certification of air toxics content for each air-toxics-containing material purchased or used.

C. If an owner or operator assumes a reduction of air toxics emissions due to recycling or disposing of material off site, the owner or operator must keep records of the amount of disposed material, the amount of material shipped off site for recycling, and the calculations done to determine the amount to subtract. Acceptable records are the SDS, invoices, shipping papers, and hazardous waste manifests.

D. An owner or operator must maintain a record of the calculation for each air toxic emitted.

REPEALER. Minnesota Rules, part 7007.1850, is repealed.

Exhibit D

D. Enclosed:

D-1. the Statement of Need and Reasonableness

D-2. the SONAR Exhibit 1: Proposed Air Toxics Reporting List.

MINNESOTA POLLUTION CONTROL AGENCY

STATEMENT OF NEED AND REASONABLENESS

In the Matter of Proposed Revisions of Minnesota Rule Chapters 7002, 7005, 7007, and 7019; Revisor ID No. RD-4599

Environmental Analysis and Outcomes Division

November 2024

General information:

1) Availability: The *State Register* notice, this Statement of Need and Reasonableness (SONAR), and the proposed rule will be available during the public comment period on the Agency's webpage for this rulemaking: https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting.

2) View older rule records at: https://www.revisor.mn.gov/rules/status/.

3) Agency contact for information, documents, or alternative formats: Upon request, this Statement of Need and Reasonableness can be made available in an alternative format, such as large print, braille, or audio. To make a request, contact Addison Otto, Rule Coordinator, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, MN 55155-4194; telephone 651-757-2754; 1-800-657-3864; email addison.otto@state.mn.us; or use your preferred telecommunications relay service.

4) How to read a sample Minnesota Statutes citation: Minn. Stat. § 116.07, subd. 2(f)(2)(ii)(A) is read as Minnesota Statutes section 116.07, subdivision 2, paragraph (f), clause (2), item (ii), subitem (A).

5) How to read a sample Minnesota Rules citation: Minn. R. §, 7150.0205, subp. 3(B)(3)(b)(i) is read as Minnesota Rules, chapter 7150, part 0205, subpart 3, item B, subitem (3), unit (b), subunit (i).

Contents

Figures and tables

Acronyms, abbreviations, or definitions

AERR – Air Emissions Reporting Requirements (40 CFR Part 51 Subpart A)
ALJ – Administrative Law Judge
AP-42 – Compilation of Air Pollutant Emissions Factors from Stationary Sources
ATSDR – Agency for Toxic Substances and Disease Registry
BIPOC – Black, indigenous, and other people of color
CAA – Clean Air Act
CAERS – Combined Air Emissions Reporting System
CALEPA-OEHHA – California Environmental Protection Agency – Office of Environmental Health Hazard Assessment
CAPs – Criteria Air Pollutants and precursors, including ammonia and VOCs
CAS – Chemical Abstracts Service
CEDR – Consolidated Emissions Data Repository
CEM – Continuous Emission Monitor
CFR – Code of Federal Regulations
CO – Carbon Monoxide
EJ – Environmental Justice
EPA – United States Environmental Protection Agency
EPCRA – Emergency Planning and Community Right-to-Know Act
GHGs – Greenhouse Gases
HAPs – Hazardous Air Pollutants listed in the CAA
HBVs – Health Based Values
IARC - International Agency for Research and Cancer
IAs – Insignificant Activities
IRIS – Integrated Risk Information System
IUR – Inhalation Unit Risk
MACT – Maximum Achievable Control Technology
MDH – Minnesota Department of Health
Minn. R. – Minnesota Rules
Minn. Stat. ch. or § – Minnesota Statutes chapter or section
MMB – Minnesota Management and Budget
MN – Minnesota
MNIT – Minnesota IT Services
MNRISKS - Minnesota air toxics risk-screening tool
MPCA or Agency – Minnesota Pollution Control Agency
NAAQS – National Ambient Air Quality Standards
NEI – National Emissions Inventory
NESHAPs – National Emission Standards for Hazardous Air Pollutants
NH_3 - Ammonia
NOIA – Notice of Intent to Adopt
NO_x – Nitrogen Oxides
NTP – National Toxicology Program
OAH – Office of Administrative Hearings
OSHA – Occupational Safety and Health Administration
OTM-45 – EPA Other Test Method 45
OTM-50 – EPA Other Test Method 50

PBTs – Persistent, Bioaccumulative, and Toxic Chemicals
PFAS – Per-and polyfluoroalkyl substances
PM – Particulate Matter
PM_{10} – Particulate Matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$ – Particulate Matter with an aerodynamic diameter less than or equal to 2.5 microns
PPRTV – Provisional Peer-Reviewed Toxicity Values
RAA – Risk Assessment Advice
RFC – Request for Comments
RfC – Reference Concentration
SBEAP – Small Business Environmental Assistance Program
SDS – Safety Data Sheet
SIP – State Implementation Plan
SO_2 – Sulfur Dioxide
SONAR – Statement of Need and Reasonableness
TCE – Trichloroethylene
Title V – Title 5 of the Clean Air Act
TRI – Toxics Release Inventory
VOCs – Volatile Organic Compounds

1. Introduction and overview

A. Introduction

The Minnesota Pollution Control Agency (MPCA or Agency) is proposing amendments to Minnesota Rules governing the administration of its air emissions reporting program in Minnesota as directed by the 2023 Minnesota Legislature in Minn. Stat. § 116.062. The primary focus of the proposed amendments includes the addition of a new section of rule governing the requirement for facilities with an air permit located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties, herein referred to as "the seven metropolitan counties", except facilities issued an option B registration permit, to report air toxics emissions on an annual basis to the MPCA. The proposed first reporting year will be the 2026 emissions inventory, with the first report due on or before April 1, 2027. An amendment is also proposed to repeal the sections of chapter 7007 that allow a Title 5 of the Clean Air Act (Title V) air permittee to assert an affirmative defense for noncompliance in case of an emergency as directed by the Environmental Protection Agency (EPA).

Current Minnesota Rules require annual emission inventory reporting for facilities statewide for criteria air pollutants (CAPs) (particulate matter, lead, nitrogen dioxide, carbon monoxide, and sulfur dioxide), ammonia, and volatile organic compounds (VOCs). Facilities that emit more than three pounds of mercury per year must report those emissions annually. Some facilities are also required to report greenhouse gas (GHG) emissions annually.

In addition, the MPCA collects voluntary air toxics emission data from facilities triennially to align with the EPA's current voluntary Hazardous Air Pollutant (HAP) emissions reporting program. The MPCA provides facilities with a list of air toxics to be included in the voluntary triennial report, including Hazardous Air Pollutants (HAPs), per- and polyfluoroalkyl substances (PFAS), and additional air toxics of concern in Minnesota.

- HAPs are a list of 188 chemicals and chemical groups identified in the Clean Air Act (CAA) amendments (United States Code, title 42, section 7412) that are known to cause or may cause cancer or other adverse health, environmental, or ecological effects.
- PFAS are defined in Minn. Stat. § 116.943 as, "a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom." PFAS are persistent, meaning they don't break down easily, and problematic chemicals that are known to bioaccumulate in the environment and living organisms. PFAS exposure has been linked to harmful health effects in humans and animals.

The CAP and air toxics emissions data collected by the MPCA is used in the Agency's air toxics risk-screening tool called "Minnesota air toxics risk-screening tool (MNRISKS)."[1] In addition, the MPCA reports this data to the EPA. The EPA uses these data for their own "Environmental Justice Screening and Mapping Tool" or "EJScreen"[2] that maps air pollution modeling as it relates to environmental justice indexes. The EPA also uses these data for their air toxics screening assessment tool called "AirToxScreen"[3] which shows communities' health risks based on air toxics emissions. The criteria and

[1]Ellickson, K., Kvale, D., Vadali, M., Freeburg, E.W., Sienko, A. (March 2023). MNRISKS: Minnesota statewide screening of health risks from air pollution. Retrieved from: *https://www.pca.state.mn.us/sites/default/files/aq9-29.pdf*

[2] EJScreen: EPA's Environmental Justice Screening and Mapping Tool (Version 2.3). (August 9, 2024). Retrieved from *https://ejscreen.epa.gov/mapper/*

[3] AirToxScreen: Air Toxics Screening Assessment. (2020). Retrieved from *https://experience.arcgis.com/experience/a0deb771dbcd40d0a46fbe83adc51747/@ra*

air toxics data the MPCA submits to EPA, including the air toxics data submitted to the toxics release inventory (TRI)[4], is also used to create the National Emission Inventory (NEI)[5], including analyses, reports, and summaries.

No National Ambient Air Quality Standards (NAAQS) for specific air toxics have been established by the EPA besides lead[6]; however, the CAA requires the EPA to develop National Emission Standards for Hazardous Air Pollutants (NESHAPs) that identify stationary source standards for HAP emissions. The intent of the program is to reduce overall emissions of HAPs.

The proposed air toxics emissions reporting rule will include the requirement that facilities with air permits in the seven metropolitan counties, except facilities issued an option B registration permit, must submit an annual emissions inventory that includes the emissions of:

1) HAPs;
2) PFAS, persistent, bioaccumulative, and toxic chemicals (PBTs), and other pollutants of concern that are on the TRI list under Code of Federal Regulations, title 40, section 372.65, as amended;
3) Chemicals and chemical groups for which the Minnesota Department of Health (MDH) has developed health-based values (HBVs) or risk assessment advice (RAA);
4) Chemicals that have been assessed for their risk to human health by the EPA's Integrated Risk Information System (IRIS) and that have an inhalation toxicity value from IRIS;
5) Chemicals previously reported to the agency in the most recent voluntary triennial emissions inventory, including some PFAS; and
6) PFAS that can be detected using Other Test Method 45 (OTM-45) or Other Test Method 50 (OTM-50);

Chapter 7007, which includes Title V emergency affirmative defense provisions, is currently open for this air toxics emissions reporting rule. The EPA determined that the emergency affirmative defense provisions are inconsistent with the CAA and set a deadline for states to remove this language from state rules by August 21, 2024, or to seek an extension and remove the language as soon as practicable. The MPCA requested and was granted an extension until August 21, 2025. The MPCA is proposing to repeal the Title V emergency affirmative defense provisions found in chapter 7007 in response to the EPA's final rule effective August 8, 2023, that removed emergency affirmative defense provisions from the CAA Title V operating permit program regulations.

Where applicable, the new and revised rules will be submitted to the EPA for inclusion in the Minnesota State Implementation Plan (SIP). The SIP is required by states, territories, or other local air districts to demonstrate compliance with the air quality standards of the CAA. The SIP contains state rules and statutes, as well as site- and area-specific plans, permits, and orders that ensure that Minnesota has the needed authorities to maintain attainment with the NAAQS as required by the CAA. Any revisions to these rules or statutes must be submitted to EPA to be approved and incorporated into the SIP. All contents of Minnesota's SIP can be found in 40 Code of Federal Regulations (CFR) Part 52, Subpart Y,

[4] Toxics Release Inventory (TRI) Program. (July 30, 2024). Retrieved from *https://www.epa.gov/toxics-release-inventory-tri-program*

[5] National Emissions Inventory (NEI). (May 6, 2024). Retrieved from *https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei*

[6] *Note that lead is both an air toxic and a CAP included in both NAAQS and air toxics provisions of the CAA. Facilities are already required to report lead emissions annually.*

and is federally enforceable.

A Request for Comments (RFC) on planned amendments to the rules governing air quality was published in the *State Register* on July 24, 2023. A second RFC was published in the *State Register* on April 1, 2024 specific to the repeal of emergency affirmative defense provisions. The MPCA considered comments received during these comment periods and all comments received during this rulemaking in developing the rule amendments.

This document fulfills the requirements of the Minnesota Administrative Procedures Act (Minn. Stat. ch. 14), which requires a Statement of Need and Reasonableness (SONAR) justifying and explaining the need for the proposed rule amendments. It also addresses the statutory requirements associated with the proposed administrative rules.

B. Statement of general need

The purpose and need of the proposed rule is to fulfill the requirements set forth by Minn. Stat. § 116.062 to require air toxics emissions reporting in the seven metropolitan counties of Minnesota. Collecting the emissions data for these pollutants will improve the MPCA's understanding of air toxics emissions within this area of the state. These data could drive future rulemaking that ensures the MPCA maintains an effective air program in Minnesota that is protective of human health and the environment. The specific reasonableness of the requirement to report each of these chemicals is listed in Section 5(B) of this SONAR.

The Agency needs these amendments to improve data collection on air toxics emissions. These data may provide the information needed to guide future regulation that is protective of Minnesota's air quality and is consistent with the MPCA's environmental justice priorities.

The intended outcome of this proposed rulemaking is to inform communities about health or environmental impacts from air toxics, and to work with air permitted facilities to understand their emissions and estimate human health risk from exposure to these air toxics. The MPCA uses the air toxics emissions data to assess risk from exposure and guide agency policy, permitting, and enforcement actions.

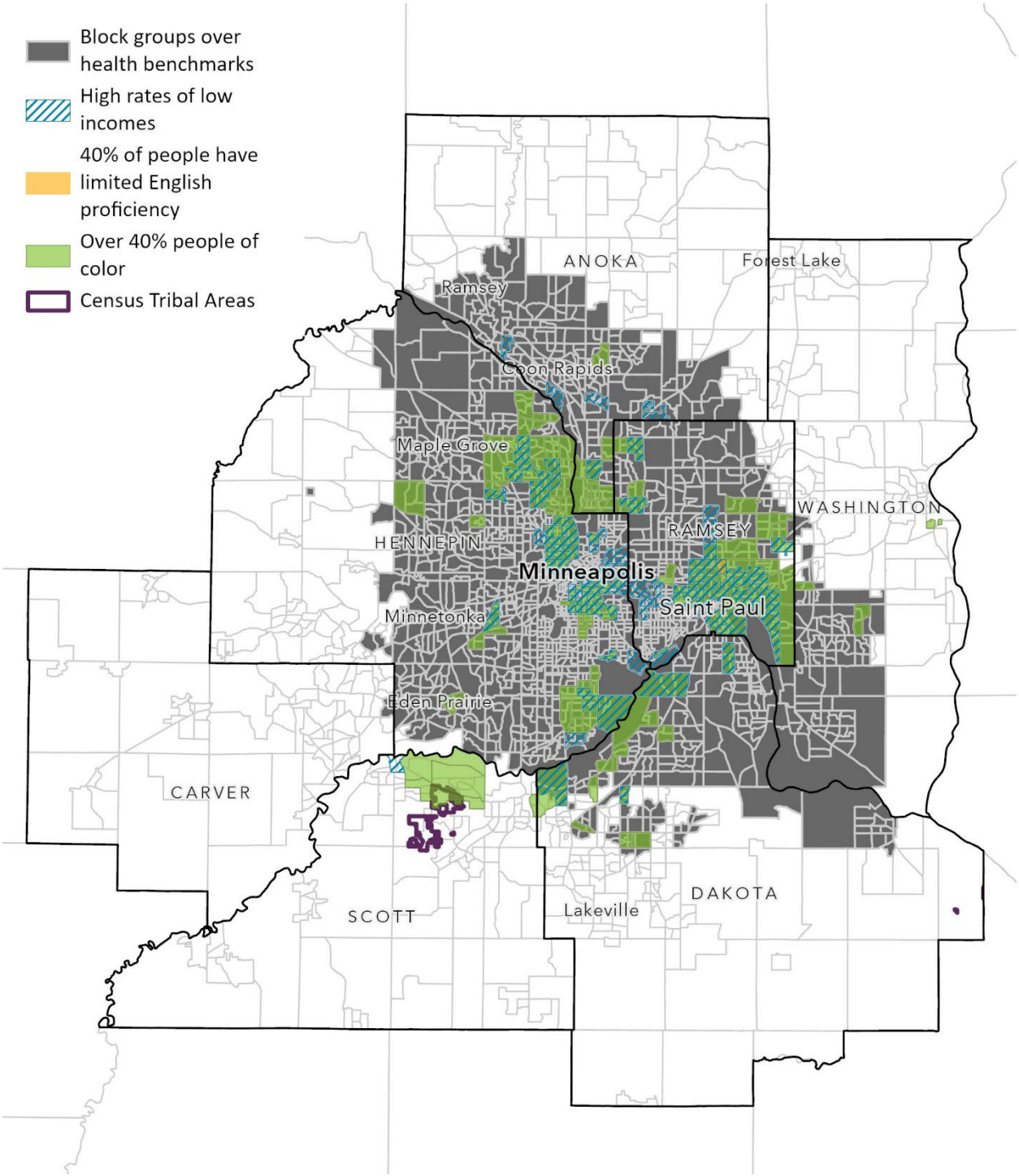
The MPCA has also been directed by the EPA to remove the sections of chapter 7007 that allow a Title V air permittee to assert emergency affirmative defense. The Agency needs this repeal to maintain a level of regulation that is protective of Minnesota's air quality and to provide consistency with federal regulations as outlined in the CAA.

Ambient air monitoring data of carbonyls, metals, and VOCs, which are HAPs under CAA, show that the average air quality across Minnesota is generally good, but not for everyone. Some people are exposed to more pollution or multiple kinds of pollution and are more vulnerable to the health impacts of exposure. These groups of people are more likely to be impacted by air pollution and located in population centers. The MPCA is initiating programs to address the disproportionate exposure to air toxics at the impacted neighborhood and community scale. A community may encompass an area such as a town, neighborhood, or a few city blocks. A community may also be a group of people who are demographically similar in some way, also known as a population, such as an age cohort or racial or ethnic group.

As depicted in Figure 1, 78% of block groups (a subset of census tracts) are above health benchmarks for air toxics pollution. A health benchmark is the amount of air pollution that is unlikely to result in health effects after a specific exposure period. Of the 78% of block groups, an estimated 29% are in areas of concern for environmental justice. The MPCA considers tribal areas and census tracts with higher

concentrations of low-income residents, people of color, or limited English proficiency as areas of increased concern for environmental justice.

Figure 1. Data from 2017 MNRISKS modeling depicts emissions from all sources including transportation, point sources, wood smoke, etc. and estimated areas of concern for environmental justice in the seven metropolitan counties.



This rulemaking will affect the 3,197,231 residents who live in the seven metropolitan counties of Minnesota as of 2022 according to the Minnesota State Demographic Center's PopFinder[7]. With 5,742,036 residents living state-wide in Minnesota, this rulemaking will contribute to the MPCA's understanding of the air quality and health risks for 56% of the state's population.

The current air toxics emissions reporting is on a voluntary basis and only occurs every three years. While some facilities provide their air toxics emissions data to the MPCA when requested, there is no incentive for them to provide accurate data or confirm air toxics emissions calculations. Voluntary reporting can result in incorrect and incomplete information, leaving the Agency with gaps in the data that is needed to inform policy development and rulemaking.

This rulemaking will result in mandatory emissions reporting. Per Minn. Stat. § 116.062, the MPCA is also proposing that the frequency of reporting change from triennial to annual reporting. Receiving air toxics emissions data from facilities on a triennial basis delays the Agency's understanding of emission changes over time, and thus slows the response rate to any emission increases. By requiring air toxics emissions data on an annual basis, the MPCA will be able to provide current data that accurately represents air quality within the state. Facilities that are not located in one of the seven metropolitan counties will continue to be asked to voluntarily report air toxics emissions to the MPCA.

The current voluntary triennial air toxics reporting requests that some facilities report HAPs, certain PFAS, and other air toxics emissions of concern in Minnesota. Minn. Stat. § 116.062 has identified that the MPCA should include pollutants in the annual air toxics emissions inventory that are known to have adverse health, environmental, and ecological effects. The lists provided by statute include:

1) HAPs listed under the federal CAA, United States Code, title 42, section 7412, as amended;
2) chemicals reported as released into the atmosphere by a facility located in the state for the TRI under the federal Emergency Planning and Community Right-to-Know Act, United States Code, title 42, section 11023, as amended;
3) chemicals for which MDH has developed HBVs or RAA;
4) chemicals for which the risk to human health has been assessed by either the federal EPA's IRIS; or
5) chemicals reported by facilities in the agency's most recent triennial emissions inventory.

C. Scope of the proposed amendments

The following chapters of Minnesota rules are being affected by the proposed changes:

1) Amendments to chapter 7002 Definitions to update a definition that needed clarification.
2) Amendments to chapter 7005 Definitions to add new definitions.
3) Amendments to chapter 7007 Permit Content to repeal Title V emergency affirmative defense provisions.
4) Amendments to chapter 7007 Capped Permit: Compliance Requirements to repeal Title V emergency affirmative defense provisions.

[7] PopFinder For Minnesota, Counties, & Regions. (2022). Retrieved from *https://mn.gov/admin/demography/data-by-topic/population-data/our-estimates/pop-finder1.jsp*

5) Amendments to chapter 7019 Emission Inventory to modernize formatting and add provisions that require air toxics reporting facilities to submit an annual emissions inventory relating to air toxics.

6) Amendments to chapter 7019 Calculating Actual Emissions for Emission Inventory to modernize formatting and add language as it relates to calculating air toxics emissions and the use of control efficiency factors.

7) Amendments to chapter 7019 Method of Calculation to modernize formatting and add language as it relates to the method of calculation used for air toxics emissions and reporting individual pollutants.

8) Amendments to chapter 7019 Volatile Organic Compound (VOC) Material Balance to add language as it relates to air toxics.

9) Amendments to chapter 7019 Emission Factors to add language as it relates to air toxics.

The following new part of Minnesota Rules Chapter 7019 is proposed:

1) Chapter 7019.3110 Air Toxics Emission Inventory and Emissions Reporting establishes requirements for what must be included in the air toxics emission inventory.

2. Background

A. Current emissions and reporting

Since current reporting for air toxics is voluntary, the MPCA has no enforcement authority to require facilities to report air toxics. Facilities that voluntarily report air toxics emissions have no incentive to accurately report them. Some facilities may report more air toxic emissions than they emit. This may demonstrate compliance with their permit but does not provide the MPCA with an accurate data of air toxics emissions. High air toxics emissions reported by facilities can be cause for concern to the MPCA. Enforcement authority to ensure complete and accurate reporting of air toxics emissions is vital to assessing risk to human health for Minnesotans and prioritizing future opportunities for reducing air toxics emissions.

Air toxics emissions can fluctuate year to year due to several factors: economic conditions, contractual work, project-based operations, product availability, and alterations in product formulations. Annual reporting and analysis of these data is essential for understanding air toxics emissions from facilities. Such insights can help the Agency assess the extent of variation and guide recommendations for future reduction of air toxics emissions.

B. Pollutant lists reviewed

The MPCA was directed to review the pollutant lists found in Minn. Stat. § 116.062 that include chemicals that may or may not be important for the purposes of air toxics reporting and risks to human health and the environment. These five lists contain many chemicals, some of them overlapping and included on multiple lists. Many of these chemicals have been evaluated for risk to human health by multiple sources, including MDH, EPA, and other government agencies.

HAPs listed under the CAA

HAPs are air pollutants known to cause cancer and other serious health impacts, such as reproductive effects or birth defects, or adverse environmental effects, and are defined in the CAA. The reference concentration (RfC) and inhalation unit risk (IUR) of a pollutant are used by risk assessors to assess the

toxicity of air toxics and to estimate the risk levels associated with exposures to a given pollutant. The RfC of a pollutant is the estimate of continuous inhalation exposure to the human population without a distinguishable risk of harmful effects during a lifetime. RfCs are derived from no observed adverse effect level (NOAEL), lowest observed adverse effect level (LOAEL), and health benchmarks. IUR is an estimate of the increased cancer risk from inhalation exposure of a given pollutant at a concentration of 1 µg/m3 for a lifetime. Generally, a lower RfC or IUR will result in a higher risk. An uncertainty factor is applied to these values to account for limitations of the data used. Toxicity values (RfCs and IURs) come from a variety of sources including IRIS, California Environmental Protection Agency – Office of Environmental Health Hazard Assessment (CALEPA-OEHHA), Agency for Toxic Substances and Disease Registry (ATSDR), Provisional Peer-Reviewed Toxicity Values (PPRTV), and MDH.

Chemicals reported as released into the air by a facility located in the state for the TRI

The TRI is an annual report of certain toxic chemical releases to air, water, and land by facilities that meet chemical activity thresholds and are either in a covered industry sector and exceed the employee threshold or are specifically required to report based on determination by the EPA Administrator under the Emergency Planning and Community Right-to-Know Act (EPCRA) 313(b)(2). While the data collected under the TRI program are useful to MPCA and are used for comparison with certain voluntary emissions reporting, there are major gaps in the types of facilities that report to TRI. TRI reporting requires facilities to report total air toxics emissions as facility-wide stack and/or fugitive releases. While this information is useful, more detailed emissions information at the unit or process level is needed to accurately conduct risk assessments and to use for air quality modeling. Only a subset of facilities with air permits in Minnesota are required to report to TRI. There were 336 Minnesota facilities that reported air releases to the 2023 TRI and 145 of the facilities (43%) were located in the seven metropolitan counties.[8] As of September 23, 2024, there are 666 permitted facilities in the seven metropolitan counties that will be subject to air toxics reporting per this rule.

Chemicals assessed by EPA's IRIS for risk to human health

In 1985, IRIS was created by EPA to provide health effects of pollutants in a database accessible to other agencies. The goal of IRIS was to promote internal consistency in the EPA program office and regional health assessments. The mission of the IRIS program is to identify and characterize the health hazards of chemicals found in the environment. Across the EPA and other state agencies, IRIS is the preferred source for human health toxicity values.

Chemicals for which MDH has developed HBVs or RAA

In the early 2000s, MDH started to develop their own health-based guidance values to evaluate potential human health risks from exposure to chemicals in ambient air. These health-based guidance values are derived from values already published in other sources including IRIS, CALEPA-OEHHA, ATSDR, and PPRTV.

According to the MDH website[9]:

> *"MDH currently develops Health Based Values (HBVs) and Risk Assessment Advice (RAA) when there is a need for guidance to evaluate health risks to chemicals in air, often by request of the Minnesota Pollution Control Agency or other state agencies. HBVs are developed after undergoing a comprehensive chemical review of available toxicity studies. RAA may contain greater uncertainty*

[8] TRI Data and Tools. (August 9, 2024). Retrieved from *https://www.epa.gov/toxics-release-inventory-tri-program/tri-data-and-tools*

[9] Air Guidance Values. (May 31, 2024). Retrieved from *https://www.health.state.mn.us/communities/environment/risk/guidance/air/table.html*

than HBVs as a result of a less rigorous chemical review or because toxicity information is more limited. MDH also develops RAA on a case-by-case basis for specific conditions or specific sites. It is not appropriate to apply a site-specific RAA to other sites without consulting MDH.

HBVs and RAA have not been promulgated using a public rulemaking process. Instead, an HBV/RAA is technical guidance made available by MDH."

Chemicals reported by facilities to the agency in the most recent triennial emissions inventory

The MPCA began collecting voluntary air toxics emissions data from facilities in 2011. Early emissions inventory reports included HAPs and additional air toxics. Over time, the MPCA has added chemicals of concern and developed a growing and evolving list of pollutants for the voluntary triennial air toxics emissions inventory.

In 2020, MPCA added five PFAS pollutants that had drinking water health standards, or Maximum Contaminant Levels. The MPCA's PFAS Monitoring Plan[10] explains why these are important:

"*PFAS are contaminants that easily cross media; for example, many PFAS emitted to the atmosphere are deposited on land where they can contaminate soil, surface water, and fish. Air emissions from stationary sources have caused widespread environmental contamination of multiple media in the surrounding region.*

Single industrial facilities have the potential to cause widespread environmental impacts when PFAS is released through air emissions and is deposited in soil or groundwater offsite, or is carried offsite by water runoff. Our understanding of PFAS releases to air and subsequent impacts to other media is less advanced than our understanding of direct PFAS discharges to water; however, MPCA has traced air emissions releases of PFAS constituents to water quality impairments in the state. Incidents of cross-media PFAS impacts are being discovered nationwide. Characterizing which permitted air facilities use PFAS products and may be releasing PFAS to the air is a key first step in reducing PFAS impacts to surrounding surface water, soil, and groundwater."

After additional research and understanding of the widespread impact of PFAS in Minnesota, many more PFAS compounds were added to the 2023 voluntary air toxics reporting list. Only ten facilities reported PFAS emissions on their 2023 emissions inventory reports.

C. EPA's proposed air emissions reporting requirements

On August 9, 2023, the EPA proposed revisions to the Air Emissions Reporting Requirements (AERR), herein referred to as the "AERR proposal"[11], that would require major and minor facilities and small entities to report HAP emissions to the EPA. The comment period for the AERR proposal closed November 17, 2023. Although the EPA's AERR may intersect with the currently proposed rule changes, the MPCA has been directed by state statute to develop rules related to air toxics reporting requirements in the seven metropolitan counties and to publish its Notice of Intent to Adopt (NOIA) the proposed rules in the *State Register* by November 26, 2024. If the EPA's proposed AERR is adopted, the current proposed Minnesota rule may need to be amended to align with federal requirements. EPA's AERR rule is expected to be finalized December 2024. If the MPCA had insight into the final AERR rule, the requirements could potentially be incorporated into this rule, but since that insight has not been

[10] MPCA. PFAS Monitoring Plan. (March 2022). Retrieved from *https://www.pca.state.mn.us/sites/default/files/p-gen1-22b.pdf*

[11] Revisions to the Air Emissions Reporting Requirements. (August 9, 2023). Retrieved from *https://www.federalregister.gov/documents/2023/08/09/2023-16158/revisions-to-the-air-emissions-reporting-requirements*

provided, it is reasonable that the Agency pursue its own rule based on Minn Stat. § 116.062 to meet the timeline set forth by the Minnesota Legislature.

D. Air emissions modeling

EPA's Air Toxics Screening Assessment (AirToxScreen) is a screening tool that is updated annually for state, local, and tribal air agencies, and the public. The tool helps to identify pollutants, emission sources, and locations that an agency may wish to study further to better understand any possible risk to public health from air toxics. This tool uses air toxics emissions information that is reported; however, air toxics emissions are seldom reported annually (except for TRI facilities that are required to report annually), therefore, the EPA estimates air toxics emissions for years when reporting has not occurred.

EJScreen is EPA's environmental justice mapping and screening tool. EJScreen provides a way to display information and includes a method for combining environmental and demographic indicators into Environmental Justice (EJ) indexes.

The MPCA has created its own tool called the Minnesota air toxics risk-screening tool (MNRISKS). This tool is used to conduct risk-based prioritizations such as evaluating and comparing impacts from source types, identifying areas where specific chemicals are a concern, or comparing differences in impacts in any area of Minnesota. Additionally, this tool displays areas of concern for environmental justice. The tool is updated every three years with the voluntary reporting of air toxics emissions, and only covers the state of Minnesota. With the adoption of this rule, MNRISKS can be updated for the seven metropolitan counties annually. This will provide the most current information for this area. Furthermore, this will provide information for Minnesota before the EPA releases AirToxScreen for a given year.

E. Emergency affirmative defense provisions

The EPA's CAA Title V operating permit program regulations included provisions for which a facility can claim emergency affirmative defense. The EPA repealed this language from 40 CFR parts 70 and 71 in a final ruling effective August 8, 2023, and set a deadline for states to remove the language from their EPA-approved Title V state permitting program by August 21, 2024, or to seek an extension to remove the language as soon as practicable. Minn. R. chapter 7007 Permits and Offsets, contains the state's emergency affirmative defense provisions.

In Minnesota, there is currently only one Title V permitted facility that has emergency affirmative defense provisions in their permit. These provisions allow a facility to claim an emergency if sudden and reasonably unforeseeable events beyond the control of the owners and operators requires immediate corrective action to restore normal operation, and that causes the stationary source to exceed a technology-based emissions limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. These provisions do not, however, include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error. The existing emergency affirmative defense provisions found in Minnesota rules do not differentiate between individual Title V federal operating permits and non-Title V state operating permits. The EPA has directed states to remove these provisions from their rules, and since the rules do not differentiate between federal and state permits, the MPCA does not intend to keep this provision for use in non-Title V state operating permits. The MPCA requested an extension from the EPA's August 21, 2024 deadline to repeal the state's emergency affirmative defense provisions and was granted an extension until August 21, 2025. A second RFC was published in the *State Register* on April 1, 2024, to notify the public that the MPCA intends to repeal the necessary sections from chapter 7007 in the air toxics emissions reporting rulemaking since this chapter is already open for amendments.

3. Public participation and stakeholder involvement

The MPCA conducted several outreach activities while developing these rule amendments. This was done in part to comply with the requirements of Minnesota's rule making process, but also to notify, engage, and inform potentially interested parties about this rulemaking and solicit their input on the MPCA's proposed concepts for amending the rules. This section describes the MPCA's public outreach efforts and the steps it took to develop and solicit input on the rule amendments.

A. Webpages

The MPCA maintains the following webpages that are publicly accessible and relevant to this rulemaking:

- Air toxics emissions reporting at https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting. The MPCA updated this rule-specific webpage to reflect the legislative directive for this rulemaking on July 3, 2023, to provide the public with background and other information relevant to this rulemaking, including rulemaking documents and a target schedule for rule adoption. The air toxics emissions reporting rule webpage has been updated routinely to inform the public of stakeholder meetings and developments related to this rulemaking. The MPCA will continue to update the rule webpage to include information about the proposed rule amendments and rulemaking documents, including the proposed rule language, a final version of this SONAR, and other supporting documents. This will ensure that potentially interested parties can continue to participate in the rulemaking process after the MPCA publishes its Notice of Intent to Adopt Rules in the *State Register*.
- Minnesota Rulemaking at https://www.pca.state.mn.us/get-engaged/proposed-rules. The MPCA's rulemaking webpage provides the public with centralized information about current rulemaking projects and the rulemaking process. It also explains how the public can receive notifications about rule changes. The MPCA's "Public Rulemaking Docket," updated monthly, is located on this webpage, and includes information about current rulemaking projects such as the rule webpage, contact person, and timeline.

B. GovDelivery

The MPCA uses a self-subscription service called "GovDelivery" to provide updates and public notices electronically (via email) to interested and affected persons on a wide range of topics, including administrative rulemakings. Any person may visit the GovDelivery subscription page at http://public.govdelivery.com/accounts/MNPCA/subscriber/new to subscribe and choose the notifications they want to receive.

The MPCA lists rule projects on the "Public Rulemaking Docket" (see above). Once a rule project becomes active (meaning it is no longer listed as a future project), a GovDelivery self-subscription list for that specific rulemaking is established. GovDelivery is used to send new rule project alerts to individuals who have signed up to receive notice for all rulemakings.

On June 30, 2023, the MPCA sent a GovDelivery notice to 3,566 subscribers of all active rulemaking lists to provide a general overview of each of the current rulemakings. The air toxics emissions reporting rule was included with a link to the rule-specific webpage.

On July 24, 2023, the MPCA sent a GovDelivery notice to 1,190 subscribers of the list, "Rulemaking: Air toxics emissions reporting" for a notice of RFC. Also on the same date, the MPCA provided specific notice of the comment period for the rulemaking to the 11 federally recognized tribes in Minnesota.

Notification sent to the designated tribal contact persons for air quality contained the information in the July 24, 2023, GovDelivery notice about the new rulemaking.

On April 1, 2024, the MPCA sent a GovDelivery notice to 1,672 subscribers of the list, "Rulemaking: Air toxics emissions reporting" for a notice of a second RFC. Also on the same date, the MPCA provided specific notice of the comment period for the rulemaking to the 11 federally recognized tribes in Minnesota. Notification sent to the designated tribal contact persons for air quality contained the information in the April 1, 2024, GovDelivery notice about the new rulemaking.

On April 22, 2024, the MPCA sent a GovDelivery notice to 1,688 subscribers of the list, "Rulemaking: Air toxics emissions reporting", and 3,246 subscribers of the list, "Small Business Environmental Assistance Program" for notice of two public webinars and a SmartComment period seeking feedback on proposed rule concepts. SmartComment is the Agency's informal public comment portal that is used to solicit feedback on public notices that are not required to be published in the *State Register* nor submitted to the Office of Administrative Hearings (OAH). Subscribers of Small Business Environmental Assistance Program were notified because small businesses are likely to be impacted by this rulemaking. Also, on the same date, the MPCA provided specific notice of the comment period for the rulemaking to the 11 federally recognized tribes in Minnesota. The MPCA maintains a contact list for the federally recognized tribes and edits the list quarterly. Notification sent to the designated tribal contact persons for air quality contained the information in the April 22, 2024, GovDelivery notice about the webinars and SmartComment period.

On May 20, 2024, the MPCA sent a GovDelivery notice to 1,775 subscribers of the list, "Rulemaking: Air toxics emissions reporting" for notice that the SmartComment period seeking feedback on proposed rule concepts was closing May 22, 2024.

The MPCA also promoted the GovDelivery list for this rulemaking and encouraged interested persons to subscribe by posting a related announcement on the air toxics emissions reporting webpage. There are 1,834 persons subscribed to the GovDelivery list specific to this rulemaking as of August 14, 2024.

The MPCA will continue to send GovDelivery notice of public notices and other relevant information for this rulemaking as discussed in Section 8, Notice plan.

C. Newsletters

The MPCA also uses GovDelivery to send interested parties electronic newsletters that include updates on rulemaking. Any person may visit the GovDelivery subscription page and sign up for MPCA newsletters that they would like to receive. For this rulemaking, the MPCA included articles in the Air Mail newsletter, which provides updates on air quality issues. Air Mail is a quarterly newsletter that goes out to 3,832 subscribers as of August 14, 2024. Subscribers to this newsletter include a wide range of stakeholders, including private citizens, regulated parties, consultants, small business owners, government entities of all levels, nonprofits, and media organizations.

The MPCA published articles about this rulemaking in the following newsletters:

- On August 11, 2023, an article in the Air Mail newsletter provided an overview of four air quality rulemakings that were starting, including the air toxics emissions reporting rule. It provided links to the reporting rule webpage and the RFC webpage.
- On November 7, 2023, an article in the Air Mail newsletter reminded facilities to report their voluntary triennial air toxics emissions and included information about the proposed reporting rule, links to the reporting rule webpage, and contact information.

- On May 16, 2024, an article in the Air Mail newsletter referred subscribers to the MPCA's proposed rule concept document and the informal SmartComment period that was open until May 22, 2024.
- On August 16, 2024, an article in the Air Mail newsletter provided links to the proposed rule concept document, the recording of the air toxics emissions reporting rule webinar, and the air toxics emissions reporting rulemaking webpage. The article provided a brief overview of the structure for reporting, the methods for calculating air toxics, and the proposed de minimis for reporting.

The MPCA will continue to publish updates for this rulemaking in Air Mail newsletter, as discussed in Section 8, Notice plan.

D. Meetings

On January 10, 2024, the MPCA met with Minneapolis Health Department staff to discuss what was known about the rule and timeline.

On April 24, 2024, the MPCA sent invitations to provide feedback on the open informal SmartComment period and attend the May 1st webinars to the list of facility contacts for facilities located in the seven metropolitan counties, except option B registration permits. This list contained 527 email addresses. Note that some email addresses are associated with multiple facilities, so the total number of contacts are less than the total number of facilities impacted by this rule.

On May 1, 2024, the MPCA presented an overview of the proposed rule concepts and pollutant list, solicited input, and answered questions about the proposed concepts. The webinar presentation and recording of the meeting was made available to the public after the meeting and was uploaded to the rule webpage.

On May 14, 2024, the MPCA presented the proposed rule concepts at the Minnesota Department of Employment and Economic Development Small Business Meeting.

On June 20, 2024, the MPCA presented the proposed rule concepts at the Aggregate and Ready-Mix Association of Minnesota Environment Committee.

On July 17, 2024, the MPCA presented the proposed rule concepts at the Minnesota Asphalt Pavement Association Environmental, Health, and Safety Committee.

The MPCA also presented a brief summary of the proposed air toxics reporting rule at other stakeholder presentations including:

- November 9, 2023, at the Air and Waste Management Conference on the Environment.
- February 22, 2024, at the Minnesota Tribal Environmental Committee.

A comment was made during the first RFC period to urge the creation of an advisory committee of key stakeholders to consult with the Agency before publishing the draft rule. The MPCA considered this and the feedback that an advisory committee would offer; however, due to the limited time frame the legislation gave the Agency to publish a NOIA, the MPCA decided that an advisory committee would not be assembled for this rule. With this comment in mind, and the Agency's desire to seek input from the broader community before publishing the NOIA, the MPCA held an informal comment period from April 22, 2024 to May 22, 2024 to solicit feedback on the proposed rule concepts and Proposed Air Toxics Reporting List.

4. Statutory authority

The MPCA has a general statutory authority to adopt these rules under Minn. Stat. § 116.07, subd. 4 as follows:

> *Subd. 4. Rules and standards. (a) Pursuant and subject to the provisions of chapter 14, and the provisions hereof, the Pollution Control Agency may adopt, amend, and rescind rules and standards having the force of law relating to any purpose within the provisions of Laws 1967, chapter 882, for the prevention, abatement, or control of air pollution. Any such rule or standard may be of general application throughout the state, or may be limited as to times, places, circumstances, or conditions in order to make due allowance for variations therein. Without limitation, rules or standards may relate to sources or emissions of air contamination or air pollution, to the quality or composition of such emissions, or to the quality of or composition of the ambient air or outdoor atmosphere or to any other matter relevant to the prevention, abatement, or control of air pollution.*

In addition, the MPCA has specific statutory authority to adopt these rules under Minn. Stat. § 116.062, Minnesota Session Law – 2023, H. F. No. 2310, chapter 60, article 8, section 2 as follows:

> *Sec. 2. Air Toxics Emissions Reporting. (b) The commissioner must require owners and operators of a facility issued an air quality permit by the agency, except a facility issued an Option B registration permit under Minnesota Rules, part 7007.1120, to annually report the facility's air toxics emissions to the agency, including a facility not required as a condition of its air quality permit to keep records of air toxics emissions. The commissioner must determine the method to be used by a facility to directly measure or estimate air toxics emissions. The commissioner must amend permits and complete rulemaking, and may enter into enforceable agreements with facility owners and operators, in order to make the reporting requirements under this section enforceable.*

Under these state statutory provisions, the MPCA has the necessary statutory authority to adopt the proposed amendments into Minnesota Rules.

5. Reasonableness of the amendments

A. General reasonableness

Current reporting for air toxics emissions in Minnesota is voluntary and occurs every three years. Some facilities report air toxics emissions data, but reporting is limited and not consistent across the seven metropolitan counties. As a result, air toxics emissions information is less accurate and less complete in some communities compared to others. This makes it difficult for the MPCA to accurately identify risks to human health from air toxics exposure. While voluntary reporting results in some known information, additional data on air toxics emissions in the seven metropolitan counties of Minnesota is needed to better understand sources of air toxics emissions, what types of air toxics are emitted, and the amount of air toxics emitted. Requiring annual air toxics emissions reporting by facilities in the seven metropolitan counties is reasonable for the reasons described in this section.

This proposed rule is reasonable because the MPCA has reviewed air toxics reporting requirements in neighboring states and those in EPA's Region 5, a geographical region spanning Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. Wisconsin was one of the first states to require air toxics reporting. Their mandatory reporting rule (ch. NR 445, Wis. Admin. Code) was first adopted in 1988 and last revised in 2004. Wisconsin's rule requires facilities to identify air toxics, which include HAPS, and additional pollutants (referred to in rule as "Hazardous air contaminants"), quantify emissions, and reduce or control emissions where necessary. Illinois, Iowa, North Dakota, and South Dakota also

require HAP emission reporting for certain facilities. Indiana and Michigan request voluntary air toxics reporting from facilities. More detailed information on air toxics emissions reporting requirements of surrounding states is included in section 14 (Table 6 and Table 7).

The MPCA intends to use the data reported by facilities in their air emissions inventory reports to model air toxics emissions and the risks associated with them, understand how air toxics could be reduced through a regulatory program, and gain better knowledge of the types and quantity of air toxics emitted in the seven metropolitan counties. The MPCA will use these data for MNRISKS and will also report air toxics emissions data received from facilities to the EPA. The EPA will use these data for their own tools and modeling, including AirToxScreen, EJScreen, and the NEI analysis. The EPA also uses these data to develop regulations to limit emissions of HAPs and to periodically conduct risk and technology reviews of regulations. Air toxics emissions data is also used by EPA for air quality modeling, used in rulemaking, and for understanding and assessing risks from different chemicals. The MPCA does not wish to burden facilities but considers the benefits of air toxics emissions data from reporting to far outweigh the burden of annual reporting. The specific reasonableness of these amendments is further discussed in item B of this section.

In the seven metropolitan counties, 78% of block groups, a subset of a census tract, are above health benchmarks, and an estimated 29% (of the 78%) are in areas of concern for environmental justice (see Figure 1). The Agency has prioritized reducing the disproportionate impacts from air pollution as one of its long-term goals. Furthermore, the MPCA's 2024-2028 Strategic Plan[12] contains specific goals and strategies to identify and address areas where residents are disproportionately impacted by exposures to known pollutants. To align with the Strategic Plan, the MPCA needs more information regarding what air toxics are emitted and where they are emitted to better protect Minnesotans and the environment.

The MPCA intends for this air toxics emissions reporting rule to align with existing methods for reporting, submitting, and certifying the emissions inventory for annual CAP and GHG reporting.

Both formal comment letters received during the initial RFC period requested that the air toxics required to be reported should be listed in the rule. The MPCA has considered these comments and has listed and incorporated by reference all pollutants required to be reported in the rule. The specific reasonableness regarding each individual pollutant is detailed in item B of this section.

The two formal comment letters received during the initial RFC period also requested that the MPCA avoid duplicative reporting and align with the EPA AERR proposal. The MPCA agrees that it would be best to avoid redundant reporting. At this time, it is unclear when the EPA will finalize the AERR and what the final requirements will be in the rule. The MPCA is required to publish its NOIA the proposed rules in the *State Register* by November 26, 2024. The MPCA agrees that a single reporting process would result in consistent data across the state. Once the AERR is finalized by the EPA, the MPCA may need to re-evaluate reporting requirements, with a goal of reducing the reporting burden on facilities and ensuring consistency and quality of data reported. However, the AERR proposal will likely not address all components of the legislative mandate including facilities required to report and the pollutants considered. Because of the timing requirements, however, the MPCA is required to move forward with this rulemaking to meet the deadline dictated by the legislative language in Minn. Stat. § 116.062, promulgated by the Minnesota Legislature during the 2023 legislative session. It is reasonable to promulgate a rule based on statutes enacted by the Minnesota Legislature.

The rule chapters open for the air toxics emissions inventory includes chapter 7007 which contains the

[12] Strategic plan 2024-2028: goals and strategies. (2024). Retrieved from *https://www.pca.state.mn.us/sites/default/files/p-gen1-28.pdf*

state's emergency affirmative defense provisions. The EPA has directed states to remove affirmative defense provisions from their EPA-approved Title V programs and from individual operating permits. It is reasonable to update rule language for consistency with federal regulations. The specific reasonableness for the repeal of this language is detailed in item B of this section.

B. Specific reasonableness

Minn. Stat. ch. 14 requires the MPCA to explain the facts establishing the reasonableness of the proposed rules. "Reasonableness" means that there is a rational basis for the MPCA's proposed action. Explained in this section is the specific reasonableness of the proposed rules, together with an explanation of the need for each change. Since this rulemaking affects multiple chapters of existing air quality rules, the rule changes are grouped by rule chapter to aid the reader in reviewing this document. The proposed rule amendments include the following:

1) Amendments to chapter 7002 to clarify a definition.
2) Amendments to chapter 7005 to add definitions.
3) Amendments to chapter 7007 to repeal emergency affirmative defense provisions.
4) Amendments to chapter 7019 that affect emission inventory requirements as they relate to air toxics and a new section of chapter 7019 specific to the air toxics emission inventory and reporting requirements.

As recommended by the Office of the Revisor of Statutes, a number of existing language changes have been made as a stylistic matter to modernize the rule language where possible, for example, changing "shall" to "must." The Office of the Revisor of Statutes, "Minnesota Rules Drafting Manual," recommends using "must" not "shall" to impose duties. The existing rules are also updated to change "which" to "that", and "agency" to "commissioner" where appropriate.

The revisions to the rule parts listed below, revised by deleting "shall" and adding "must" where necessary are made without changing the applicability of the rules. These revisions are reasonable because they provide consistency and clarity to the proposed rules.

- Part 7019.3000 subpart 1 item A.
- Part 7019.3000 subpart 1 item B subitems (3) and (4).
- Part 7019.3000 subpart 1 item C subitems (1), (2), and (3).
- Part 7019.3000 subpart 2.
- Part 7019.3020 subparts 3, 5, 6, 7, and 8.
- Part 7019.3030 subparts 1 and 2.

The revisions to the rule parts listed below, revised by deleting "which" and adding "that" are made without changing the applicability of the rules.

- Part 7019.3000 subpart 1 item B subitem (4).
- Part 7019.3000 subpart 1 item C subitem (2).
- Part 7019.3000 subpart 2.
- Part 7019.3020 subparts 3, 5, 6, and 7.

The revisions to the rule parts listed below, deleting the term “agency”, and adding the term ”commissioner” do not change the effect or applicability of the rules.

- Part 7019.3000 subpart 1 item A.
- Part 7019.3000 subpart 1 item C subitems (2) and (3).
- Part 7019.3000 subpart 2.
- Part 7019.3020 subpart 9.

The specific reasonableness for each proposed amendment to existing rule language and the proposed new section of rule are detailed in the following sections.

CHAPTER 7002 PERMIT FEES

Chapter 7002 applies to all facilities required to obtain an air emission permit from the MPCA under chapter 7007.

Part 7002.0015 DEFINITIONS

Subp. 2a. **Chargeable Pollutant**. The existing definition of “chargeable pollutant” is revised to clarify that these are pollutants for which facilities are charged a fee when emitted; however, the existing definition does not include any language relating to fees. It is reasonable to clarify a definition that will not impact any other sections of rule or the way the term is already being used.

CHAPTER 7005 DEFINITIONS AND ABBREVIATIONS

Chapter 7005 provides the definitions and abbreviations used in the state air pollution control rules and the MPCA’s air program. Definitions in existing Minn. R. 7005.0100 apply to all rules related to air pollution control or air quality. New terms and definitions proposed in this rulemaking will have general applicability to the air quality program.

Part 7005.0100 DEFINITIONS

Subp. 2c. **Air toxics.** A definition of “air toxics” is added to the rule to define air toxics more broadly. The Minn. Stat. § 116.062 statutory definition of “air toxics” was explicitly defined to mean “*chemical compounds or compound classes that are emitted into the air by a permitted facility and that are:*

(1) hazardous air pollutants listed under the federal Clean Air Act, United States Code, title 42, section 7412, as amended;

(2) chemicals reported as released into the atmosphere by a facility located in the state for the Toxic Release Inventory under the federal Emergency Planning and Community Right-to-Know Act, United States Code, title 42, section 11023, as amended;

(3) chemicals for which the Department of Health has developed health-based values or risk assessment advice;

(4) chemicals for which the risk to human health has been assessed by either the federal Environmental Protection Agency's Integrated Risk Information System; or

(5) chemicals reported by facilities in the agency's most recent triennial emissions inventory.”

The MPCA evaluated the chemical compounds and compound classes from each of these lists to develop the list of air toxics in rule, but the term “air toxics” could include chemicals that are not listed on one of the five lists outlined by statute. It is reasonable to add a definition to rule to broadly define air toxics for Minnesota.

The chemicals and chemical compounds that are listed in rule have been included because they are

known or suspected to cause cancer or other serious health effects, or adverse environmental and ecological effects. This definition is similar to definitions that have been adopted in other state rules and by the EPA. This definition excludes CAPs because they are already required to be reported in rule and already have an ambient air quality standard. This definition also references the list of air toxics required to be reported, and where that list can be found within the rule. Previously, the term "air toxics" was undefined and used loosely to refer to the list of chemicals known as HAPs that are defined in the CAA and in Minnesota Rule (Minn. R. 7007.0100, subp. 12a). It is reasonable to propose a definition of air toxics that is meant to encompass a larger group of chemicals and chemical compounds that are known or suspected to cause cancer or other serious health effects, or adverse environmental and ecological effects when emitted into the air by facilities or other sources.

Subp. 2d. **Air toxics reporting facility.** A definition of "air toxics reporting facility" is proposed to define which facilities are required to report air toxics emissions. It is reasonable to include this definition because the statute specifies that reporting requirements only extend to facilities located in the seven metropolitan counties that are not registration option B permitted facilities. If, in the future, the EPA adopts revisions to the AERR rule, or the statute is amended so that air toxics emission reporting requirements become applicable statewide, this term will either need to be amended or repealed from state rule. The MPCA anticipates that the air toxics emissions reporting rule may be statewide in the future, but since the statutory language applies only to the seven metropolitan counties, it is reasonable to include this definition for clarity purposes.

Subp. 44b. **Toxic release inventory list.** A definition of "toxic release inventory list" or "TRI list" is added to reference the list of chemicals and chemical categories promulgated by the EPA under title 42, section 11023, of the Federal Emergency Planning and Community Right-to-Know act, and under Federal Code title 40 section 372.65. This term is only used in the new section of Minn. R. 7019.3110 when outlining the air toxics required to be reported. Including this definition allows the MPCA to incorporate PFAS on the TRI list by reference. The TRI list is a list of chemicals identified in US Code of Federal Regulations, so incorporating by reference allows this list to be updated by the EPA without having to open and amend the rule at the state level. It is reasonable to reference this list because many facilities are familiar with it and already report the chemicals listed to the EPA. Incorporating this list by reference is also reasonable because the EPA's and MPCA's understanding of the risks of PFAS is rapidly changing, and new PFAS pollutants are added to the TRI list each year. The MPCA believes referencing the PFAS pollutants on the TRI list will provide the best emissions information and will not delay facilities reporting new and emerging PFAS. Adding additional PFAS pollutants by rule would delay crucial PFAS emissions reporting.

CHAPTER 7007 PERMITS AND OFFSETS

Chapter 7007 provides the conditions regarding the issuance of permits to construct, modify, reconstruct, or operate emissions units, emissions facilities, or stationary sources that emit any air pollutant, and the revocation, reissuance, or amendment of those permits.

Part 7007.0800 PERMIT CONTENT

Subp. 6. **Reporting.** Subpart 6 outlines the reports that are required by a permit to be submitted to the commissioner. Subpart 6 is revised to delete existing item F because it allows permittees to assert an affirmative defense for deviations caused by emergencies. This language has been repealed from the EPA's CAA Title V permit provisions because the EPA determined that this provision is inconsistent with the intent of the CAA. It is reasonable to update rule language for consistency with federal regulations. In addition, the EPA has directed states to remove this provision from state rules.

Part 7007.1146 CAPPED PERMIT: COMPLIANCE REQUIREMENTS

Subp. 5. **Reporting.** Subpart 5 outlines the reports that an owner or operator of a source with a capped permit must submit in the annual emission inventory to the commissioner. Subpart 5, item A, subitem (1) is revised to delete reference to the ability for permittees to assert an affirmative defense for deviations that endanger human health or the environment and that are caused by emergencies. This language has been repealed from the EPA's CAA Title V permit provisions because the EPA determined that this provision is inconsistent with the intent of the CAA. It is reasonable to update rule language for consistency with federal regulations. In addition, the EPA has directed states to remove this provision from state rules.

Part 7007.1850 EMERGENCY PROVISION.

Part 7007.1850 is proposed for repeal. The EPA published the final action "Removal of Title V Emergency Affirmative Defense Provisions From State Operating Permit Programs and Federal Operating Permit Program", published July 27, 2023, at 88 FR 47029, Docket ID No. EPA-HQ-OAR-2016-0186. EPA stated that these affirmative defense provisions have never been required elements of state operating permit programs and are being removed because they are inconsistent with the EPA's interpretation of the enforcement structure of the CAA considering prior court decisions from the U.S. Court of Appeals for the D.C. Circuit. This action requires states to submit program revisions to the EPA to remove affirmative defense provisions from their EPA-approved Title V programs and from individual operating permits. Part 7007.1850 is proposed for repeal to meet this directive from EPA. It is reasonable to update rule language for consistency with federal regulations.

The MPCA received comments during the second RFC period from the Minnesota Chamber of Commerce and the American Petroleum Institute that were opposed to including the removal of these provisions in the proposed air toxics emissions reporting rule. The MPCA has considered these comments and has decided to move forward with the repeal of these provisions as required by the EPA.

While this repeal is not directly related to the proposed air toxics emissions reporting rulemaking, it is an urgent matter that EPA is requiring the MPCA and other states to act on. The proposed air toxics emissions reporting rule opens the same air chapters for revisions, and it allows the MPCA to resolve the issue as swiftly and efficiently as possible.

The comments received also urged that the MPCA maintain state-only emergency affirmative defense provisions. The MPCA does not intend to make changes to the state permit program that are inconsistent with federal rules, so the MPCA is opting not to keep this rule available for state individual permits. Furthermore, in the EPA's final action at 88 FR 47029, EPA notes that they are removing affirmative defense provisions across different CAA programs and the removal of these provisions from state and federal operating permit programs is consistent with the removal of the similar provisions in other CAA programs such as New Source Performance Standards and NESHAPs. Maintaining state-only emergency defense provisions, while EPA is actively working to remove these provisions from various CAA programs, is counter to maintaining consistency with federal rules.

Additionally, facilities are required to report deviations from permit conditions, which may or may not constitute a violation, regardless of whether the deviation occurred due to emergency factors. The MPCA's Compliance and Enforcement staff assess these deviations on an individual basis when determining enforcement follow up and have the ability to account for emergency factors that may have contributed to reported deviations.

While there is litigation pending against the EPA on this provision, there is not a stay on the action and MPCA must move forward and remove the provision from Minnesota Rules[13]. It is reasonable to repeal rules that are not used, and this provision only directly impacts the permit of one facility in the state. Any references to part 7007.1850 are also proposed to be amended. It is reasonable to amend rule language that is obsolete.

CHAPTER 7019 EMISSION INVENTORY REQUIREMENTS

Chapter 7019 provides the conditions regarding the emission inventory and calculation of actual emissions for air emission sources. Changes proposed to existing sections in this rulemaking will provide clarification for facilities reporting emissions. The new section proposed in this rulemaking will outline the requirements for facilities that must also report air toxics emissions.

Part 7019.3000 EMISSION INVENTORY

Subp. 1. **Emission inventory required.** Subpart 1 outlines the emission inventory requirements.

A new item A that consists of some existing rule language states who is required to submit an emission inventory. The existing rule language requires that emission reporting facilities submit an annual emission inventory report of CAPs. Language is added to this item that requires air toxics reporting facilities to submit an annual emission inventory of air toxics emissions. The requirements for the emission inventory that are outlined in this section for CAP and GHG emission reporting facilities are the same as what is proposed to be required for air toxics reporting facilities. The emission inventory for both types of facilities must be submitted on or before April 1 following the calendar year being reported and must include a certification signed by the responsible official. It is reasonable to update this section to include language that requires air toxics reporting facilities to submit an emission inventory. It is reasonable to require annual air toxics reporting because legislation mandated it, and air toxics emissions can cause adverse impacts to human health and the environment. Air toxics emissions can change from year to year, so reporting air toxics emissions each year is reasonable to request.

A new item B is added to clarify the criteria that the emission inventory report must meet. The criteria for the report are then broken out in subitems (1) through (4). The current rule language that outlines these criteria is in paragraph format. Restructuring these criteria into a list format is reasonable because it will provide clarity to facilities and agency staff on what criteria the emission inventory report is required to meet.

One comment received during the initial RFC period noted that MPCA should incorporate certifications for air toxics reporting. The MPCA agrees and has proceeded with the requirement that the air toxics emissions inventory report must be certified by a responsible official. This is the same process that is used for the current annual emissions inventory reporting.

Subitems (1), (3), and (4) consist of existing rule language that has been clarified. Subitem (2) has been added with similar language to subitem (1), but applies specifically to the requirements for air toxics reporting facilities and references the new proposed section of rule specific to the air toxics emission inventory (7019.3110). It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the criteria requirements for the emission inventory.

Subitem (3) is revised to simplify the rule language and add consistency with other parts of Chapter 7019. Rule language for the current emission inventory requires a report submission deadline “on or before April 1 of the year following the year being reported”. This is the same proposed report

[13] SSM Litigation Group v. EPA (United States Court of Appeals for the District of Columbia Circuit, Case number 23-1267, September 19, 2023). Retrieved from SSM Litigation Group v. EPA, No. 23-1267, D.C. Cir.

submission deadline for the air toxics emissions inventory. Facilities are already familiar with this due date, so it is reasonable to use the same due date for the air toxics emissions inventory.

The proposed revision to add the term “calendar” before the term “year” to clarify the length of time for which the report is required can also be found in subpart 1, item A, subitem (3); item C, subitem (1); and subpart 2. It is reasonable to propose rule changes that provide clarity and consistency throughout a rule chapter.

Subp. 3. **Mercury emission sources.** Subpart 3, item A consists of existing rule language which states the emission inventory requirements for mercury emission sources statewide. With the addition of the proposed air toxics emission inventory, the mercury reporting requirements for facilities located in the seven metropolitan counties will be different from the rest of the state. The last sentence of this item which states, “The initial report must cover the first full calendar year following September 29, 2014.” is proposed to be removed from the rule language because its intent during a previous rulemaking was to cover the initial implementation of the mercury reporting rule changes from voluntary triennial reporting to annual reporting. The implementation of this reporting has now been in effect for many years, so this requirement in rule is no longer relevant. It is reasonable to repeal rule language that is outdated.

A new item B is added that includes existing rule language regarding the reporting requirements for stationary sources with air emissions of mercury. No changes are proposed to this language.

A new item C is added to clarify that those stationary sources that are air toxics reporting facilities located in the seven metropolitan counties must report their air emissions of mercury as outlined in the proposed air toxics emission inventory section under part 7019.3110. It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the criteria requirements for the emission inventory.

Subp. 4. **Possible mercury emission sources.** Subpart 4 is revised to reference “subpart 1” rather than “item A” in part 7019.3030 since the formatting of 7019.3030 is proposed to be updated. It is reasonable to update references that are no longer relevant.

<u>Part 7019.3020 CALCULATING ACTUAL EMISSIONS FOR EMISSION INVENTORY</u>

The overall format of this part of rule is outdated and does not include titled subparts followed by items, subitems, units, and subunits. All the items A through H have been updated to titled subparts 1 through 9, and a new subp. 10 has been added. It is reasonable to propose changes that do not affect the intent of the rule but modernize the structure and language of the rule.

Subpart 1. **Scope.** Subp. 1 states the scope of calculating actual emissions for the emission inventory. This is the first sentence of the existing rule language found in item A and no changes are proposed.

Subp. 2. **Insignificant activities.** Subp. 2 outlines the activities that are not required to be reported for both emission reporting and air toxics reporting facilities. Similar language can be found in the existing rule language under item A but is proposed to be broken out separately from subp. 1 for clarity.

The instances in which emissions from insignificant and conditionally insignificant activities are required to be reported are further broken out in new items A and B.

A new item A is added but is comprised of existing rule language that states that emissions from activities that are not insignificant for the purposes of permitting must be reported.

A new item B is added but is comprised of existing rule language that states that the commissioner may request an inventory of fugitive emissions.

At this time, the MPCA is not requesting that facilities report air toxics emissions from insignificant activities (IAs), because if they are insignificant for the purposes of permitting, then they are insignificant for the purposes of reporting emissions as well. This is consistent with the reporting requirements for CAP and GHG emissions.

The MPCA's current emissions inventory reporting rules and requirements are directly tied to permitting rules. Facilities are not required to report emissions from IAs for CAPs or Greenhouse Gases (GHGs). IAs are addressed in the Code of Federal Regulations Permit Application Rules (Part 70.5 (c)). The EPA's rules for Part 70 permits allow states to adopt lists of IAs (40 CFR 70.5(c)). The MPCA's list includes activities that do not have to be listed in a permit application (7007.1300, subpart 2), activities that must be listed in a permit application (subpart 3), and a specific list of sources that may be listed only in a first-time Part 70 permit application (subpart 4). Per this regulation, the MPCA addresses these activities in Minn. R. Part 7007.1300 and Minn. R. Part 7008.4000. The intent of the IAs lists is to streamline the permit application process for both regulated sources and MPCA permitting and compliance activities by specifying those where emissions require minimal regulatory oversight. Additionally, adding all or some IAs for air toxics emissions reporting would require a significant amount of agency resources and would be burdensome to facilities. The Agency would need to include all IAs in the emissions reporting system, Consolidated Emissions Data Repository (CEDR), and potentially the Agency permitting database, Tempo. Furthermore, compliance and enforcement activities and reviewing emissions data would be difficult since the Agency would not be able to identify if a facility failed to report emissions for IAs. The Agency believes risk assessments, modeling, and air data analysis will be accurate and protective of human health without including the potentially diminutive emissions from IAs. Since facilities are not required to report CAP or GHGs emissions for these activities, and the administrative burden for the Agency would be large and complex, it is reasonable not to require reporting of air toxics emissions for IAs.

The Agency has latitude to change the designation of an emissions source from an IA to an emission unit that is listed in a permit. This is an action that would take place during the permit drafting process. Reasons for changing an emissions source from an IA to an emission unit include: if the equipment is newly subject to a site-specific permit condition, rule changes such that the IA no longer qualifies, if a facility's emissions are very close to a permit threshold and emissions resulting from the IA may result in exceeding that threshold, if there are a large number of IAs that when cumulated result in emissions that are no longer insignificant, and others.

The MPCA reviewed air toxics emissions reporting rules in other states and found that many do not require reporting of emissions associated with certain IAs. The states that are explicit about not reporting them include Oregon, Iowa (calling them "Exemptions"), Illinois, North Dakota, and Wisconsin. Other states are silent about them and do not address including them. Each state may have a different list and/or definition of what activities are considered insignificant.

A comment was received during the initial RFC period from American Petroleum Institute that stated the term "insignificant" should be defined. The MPCA finds the EPA's AERR proposal definition of "insignificant" lacking clarity. The MPCA has asked EPA to clearly define if air toxics emissions associated with IAs will be required to be reported when the final rule of the AERR is completed. Since the AERR is still not finalized to inform this rulemaking, the MPCA is proposing not to require facilities to report air toxics emissions from IAs.

The final revisions to the AERR rule may require reporting of emissions for certain IAs. If promulgated, this requirement would be inconsistent with emissions reporting requirements currently found in Minn.

R. part 7019.3020. The MPCA does not require reporting of IAs for CAP and GHG emissions because it would be an undue burden on facilities and the Agency. For emissions that are considered to be "insignificant" for the purpose of permitting, it is reasonable to consider these emissions insignificant for air toxics emissions reporting. The MPCA will continue to assess the list of IAs (listed in Minn. R. part 7007.1300) and conditionally IAs (listed in Minn. R. part 7008.4000) to ensure that air toxics emissions associated with these activities do not pose a significant risk to human health or the environment. If the EPA's final revisions to AERR require air toxics reporting for IAs, the MPCA will adopt the EPA's requirements for reporting IAs for air toxics reporting because the state cannot have rules that are less restrictive than federal law.

Subp. 3. **Calculating emissions.** Subp. 3 states how facilities must calculate emissions, except for facilities issued an option A, C, or D registration permit or a capped permit. The requirements for calculating emissions for option A, C, or D registration permits and capped permits are outlined in the following subparts 4 through 7, so the phrase "Except as provided in subparts 4 to 7" was added to direct those facilities to the subpart that pertains to them. It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the requirements for calculating emissions for the emission inventory.

Subp. 4. **Calculating emissions for option A permits.** Subp. 4 states how facilities issued an option A registration permit must calculate emissions. A sentence was added to the end of the existing rule language for this subpart to direct facilities to calculate emissions using the methods outlined in parts 7019.3030 to 7019.3100 in rule. This is not a new requirement for option A permitted facilities, but the reference was not specifically called out in the existing rule language. It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the requirements for calculating emissions for the emission inventory.

Subp. 5. **Calculating emissions for option C permits.** Subp. 5 states how facilities issued an option C registration permit must calculate emissions. The term "calendar" is added before the term "year" to provide clarity and consistency with other parts of Chapter 7019. Language is added to this subpart to include what methods should be used for calculating air toxics emissions for option C permitted facilities that are also air toxics reporting facilities located in one of the seven metropolitan counties. It is reasonable for air toxics reporting facilities to calculate air toxics emissions with the same approach used to calculate VOC emissions, because the calculations used for both VOC and air toxics emissions require the use of the material balance calculation method under section 7019.3060. Tracking material usage and referencing Safety Data Sheets (SDS) allows a facility to calculate both VOCs and air toxics from any given material used. Option C facilities may also have combustion processes and are required to report fuel usage or hours of operation and design capacity associated with these activities. The MPCA currently calculates emissions associated with combustion activities using the activity data reported by the facility and the best available EPA and state emission factors. The MPCA will continue to use this approach for calculating emissions associated with combustion processes, including air toxics, for option C permitted air toxics reporting facilities. It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the requirements for calculating emissions for the emission inventory. The sentence "The actual emissions shall be calculated by the commissioner" is proposed to be removed from this subpart, because the commissioner is not responsible for calculating actual emissions for option C permitted facilities. The owner or operator of the emission reporting facility submitting the report is required to calculate the emissions for their facility. Option C permitted facilities will be required to calculate VOC and air toxics emissions associated with non-combustion processes; however, as stated above, the MPCA will continue to calculate emissions associated with combustion processes. It is reasonable to remove rule language that is

inaccurate or no longer relevant.

Subp. 6. **Calculating emissions for option D permits.** Subp. 6 states how facilities issued an option D registration permit must calculate emissions. No changes other than minor housekeeping are proposed for this subpart. The methods available for option D permitted facilities to calculate air toxics emissions are included in existing rule language under section 7019.3030.

Subp. 7. **Calculating emissions for capped permits.** Subp. 7 states how facilities issued a capped permit must calculate emissions. No changes other than minor housekeeping are proposed for this subpart. The methods available for capped permits to calculate air toxics emissions are included in existing rule language under section 7019.3030.

Subp. 8. **Material balance.** Subp. 8 states what facilities submitting an emission inventory based on material balance calculations must include in their submission, and what recordkeeping is required. The word “material” in “material safety data sheets” is proposed to be removed because the term has since been updated by the Occupational Safety and Health Administration (OSHA) to “safety data sheets” OSHA oversees safety data sheets as part of their Hazard Communication Standard. The term “air toxics” is proposed to be added to clarify that facilities must also maintain a record of safety data sheets or vendor certification for material balance calculations as they pertain to air toxics emissions reporting. It is reasonable to require air toxics reporting facilities to keep records pertaining to air toxics so the Agency can verify that emission calculations are accurate. The phrase “a period of” is proposed to be removed and the phrase “of submittal of” is proposed to be substituted with “is submitted” to simplify the rule language. It is reasonable to propose changes that simplify rule language to make it easier to understand.

Subp. 9. **Control equipment.** Subp. 9 outlines the scenarios in which the emission inventory may be based on the use of control equipment. A reference to this language as an “item” is proposed to be updated to “subpart” in response to the modernization of the rule structure. A portion of the last sentence of this subpart that reads, "but no earlier than the date three years after EPA grants full program approval of the Agency's permit program under Title V of the Clean Air Act.” is proposed to be repealed. The EPA approved the MPCA’s permit program in 2001. This language was originally meant to act as an exclusion for facilities permitted before the EPA approved the state’s permit program; however, this exclusion only applies to two facilities in the state, and the repeal of this language will not affect the way they calculate their emissions for the emission inventory. It is reasonable to repeal rule language that is outdated and that will not affect the way the rule is enforced.

Subp. 10. **Control efficiency factors.** A new subp. 10 is added so that air toxics reporting facilities submitting an emission inventory can use control efficiency factors defined in rule for calculating emissions. It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the requirements for calculating emissions for the emission inventory. It is reasonable to allow facilities using control equipment under Minn. R. 7019.3020 subp. 9 to apply a control efficiency factor for calculating air toxics emissions, as outlined in the hierarchy provided in Minn. R. 7005.0100, subp. 9b. because these are the methods outlined by EPA and have been peer reviewed with historical data and engineering guidance. Emissions calculations for the emissions inventory may be based on the use of control equipment only if the use of the specific control equipment is required under conditions of a permit or applicable requirement as defined in part 7007.0100, subp. 7, or is included in a notification received by the agency under part 7007.1150, item C.

A new item A is added to direct facilities to which control efficiency factor should be used for volatile air toxics. It is reasonable for facilities to use VOC control efficiency factors for calculating air toxics emissions because the categorization of a pollutant as an air toxic does not affect the ability of a

pollutant to be controlled as a VOC.

A new item B is added to direct facilities to which control efficiency factor should be used for particulate air toxics. It is reasonable for facilities to use particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}) control efficiency factors for particulate air toxics because PM_{10} serves as a middle ground in the classification of particulate matter (PM) between PM and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$).

The MPCA has assessed that the options for control efficiency factors provided in Minn. R. 7005.0100, subp. 9b beyond a verified performance test are reasonable to use for the purposes of calculating air toxics emissions. Although these options (such as emission factors from AP-42: Compilation of Air Pollutant Emissions Factors from Stationary Sources)[14], EPA databases, and manufacturers), will not be as accurate as source-specific data from a verified performance test, when used appropriately, they will allow a facility to calculate emissions with adequately representative data. It is reasonable for air toxics reporting facilities to use a consistent approach for calculating CAP emissions and air toxics emissions. This approach will result in more realistic emissions data that will allow the Agency to create policies and prioritize air pollutant reduction efforts based on data that accurately reflect air toxics emitted from a facility. If facilities do not apply control efficiency factors to air toxics emissions calculations, emissions will be greatly overestimated. This would have adverse implications for modeling such as MNRISKS or incorrectly prioritizing facilities for agency initiatives. This would also affect the EPA's identification of high-risk facilities in tools such as AirToxScreen and EJScreen. Allowing facilities to apply the proper control efficiency factors will save the facilities and the Agency time and resources spent investigating high emissions that are not realistic because the reported emissions are not accounting for control equipment. This will allow the Agency to focus on facilities that are high emitters of air toxics and prioritize policies and future rulemaking that results in the reduction of emissions in areas that actually have high air toxics emissions that are impacting human health and the environment.

The MPCA has experience working with facilities to review and revise voluntary air toxics emissions reported to the Agency. In many instances, facilities that are operating control equipment report air toxics emissions without applying the appropriate control efficiency factor to calculate actual emissions of air toxics. As described above, this results in air toxics emissions that are greatly overestimated. For example, the hypothetical facility in Table 1 below reported over six tons more air toxics emissions when not applying the control efficiency factor of 96%. When applying the control efficiency factor, the total emissions are much lower at 0.271 tons.

Table 1. Comparison of facility calculations for emissions from painting solvents using a material balance calculation with and without applying a grouped control efficiency factor to air toxics emissions.

Pollutant	Control Efficiency Factor (96%) applied to both VOC and air toxics (tons)	Control Efficiency Factor (96%) only applied to VOC (tons)
Formaldehyde	0.034	0.850
Methanol	0.029	0.725
Phenol	0.208	5.200
VOC	0.337	0.337
Total air toxics	0.271	6.775

[14] AP-42: Compilation of Air Emissions Factors from Stationary Sources. (June 12, 2024). Retrieved from *https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources*

Part 7019.3030 METHOD OF CALCULATION

The overall format of this part of rule is outdated and does not include titled subparts followed by items, subitems, units, and subunits. Items A through C have been updated to titled subparts 1 through 3, and a new subp. 4 has been added. Subitems (1) through (4) under the previous item A have been updated to items A through D. It is reasonable to propose changes that do not affect the intent of the rule but modernize the structure and language of the rule.

Subpart 1. **Method hierarchy.** Subp. 1 states which method of calculation should be used for reporting actual emissions in a hierarchy of most preferred to least preferred methods. Language was added to specify the requirements for air toxics reporting facilities issued an option D registration permit or capped permit. Owners or operators with option D registration permits or capped permits may aggregate emissions for similar units for calculating emissions for the emission inventory. This is consistent with requirements for CAP and GHG emissions reporting per Minn. R. 7007.1130, Subp. 4 and 7007.1147, Subp. 1. It is reasonable for emissions reporting requirements to be consistent and align with existing compliance requirements. A reference to "subitems" is proposed to be updated to "item" in response to the modernization of the rule structure.

No changes are proposed to the existing rule language found in items A, B, and D, previously subitems (1), (2), and (4), other than updating their format from subitems to items.

Item C, previously subitem (3), is proposed to be updated to reference both VOC and air toxics material balance found in 7019.3060. Facilities using material balance to calculate their air toxics emissions must use the material balance calculations outlined in 7019.3060. It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the criteria requirements for the emission inventory. A typo for sulfur dioxide is also proposed to be updated. The current abbreviation for this chemical compound in this part of rule is "$S0_2$" but should be Sulfur Dioxide (SO_2) since the "O" refers to the two oxygen atoms bonded to the sulfur atom. It is reasonable to correct mistakes that do not affect the intent of the rule.

EPA guidance published in AP-42 includes a long-established hierarchy that is used by states and facilities to estimate emissions. EPA guidance acknowledges that although performance testing and continuous emission monitoring (CEM) are preferred and are the best method for estimating emissions, other methods, such as applying emission factors, may be the only method available. The Introduction to AP-42, Volume 1 includes a hierarchy of acceptable emission calculation methods that includes the cost of method compared to the reliability of the estimate.[15] The cost of using an emission factor or material balance calculation is negligible compared to the cost and burden that would be imposed by requiring all facilities to use performance testing or CEM data to estimate emissions. The technology is not available to use performance testing and CEM methods for all pollutants. For example, EPA has developed two performance tests for PFAS: OTM-45 and OTM-50. These performance tests only include analytical methodologies to test for certain PFAS compounds. There is not currently technology to complete performance testing or CEM for all PFAS compounds. It is reasonable to allow facilities to use different approaches to calculate emissions included in AP-42 because these methods are widely used and accepted for creating emissions inventories by other states and the EPA. These methods are also included as acceptable methods for facilities to use in the EPA AERR proposal.

It is also reasonable to apply the method hierarchy to air toxics reporting because facilities already use the methods outlined in the hierarchy for reporting CAP and GHG emissions. It is reasonable to apply the

[15] The Introduction to AP-42, Volume I, Fifth Edition, U.S. EPA, January 1995, Retrieved from *https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors*

same approach for air toxics emissions. Facilities also use this method hierarchy currently for voluntary air toxics emissions reporting. Emission factors, material balance calculations, or a facility proposal may be the only available and reasonable approach to calculate emissions for some air toxics.

Subp. 2. **Option B permit fees.** The language found in subp. 2 outlines the scope of this subpart which applies to option B registration permitted facilities who choose to be assessed a fee.

A new item A is proposed that consists of existing rule language regarding how actual facility emissions must be calculated. Rule language that reads “The owner or operator of a facility issued an option B registration permit under part 7007.1120 that chooses to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), shall” is proposed to be removed because it is repetitive.

A new item B is proposed that consists of existing rule language regarding the consideration of pollution control equipment effects on emissions.

It is reasonable to propose changes that do not affect the intent of the rule but modernize the structure and language of the rule.

Subp. 3. **Selecting calculation method.** Subp. 3 states how facilities should select a calculation method. The phrase “provided that” is proposed to be substituted with “if” to simplify the rule language. The term “calendar” is added before the term “year” to provide clarity and consistency with other parts of Chapter 7019. It is reasonable to propose rule changes that provide consistency throughout a rule chapter.

Subp. 4. **Reporting individual pollutants.** A new subp. 4 is added to clarify the level of detail to which pollutants must be reported. Many air toxics belong to groups of compounds, especially on the CAA HAP list. The term "compound” is defined in the CAA HAP list as “for all listings which contain the word compounds and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (i.e., antimony, arsenic, etc.) as part of that chemicals’ infrastructure.” The MPCA is proposing to use similar language in this rule because reporting individual pollutants will provide the MPCA and EPA with more accurate air toxics emissions data that will be important for assessing risk to human health. It is also likely that the EPA will require the MPCA to report emissions data this way in the future.

Based on experience working with facilities reviewing and revising voluntary air toxics emissions, the MPCA is aware that it may not be possible to always report all individual pollutants that are part of groups at the unit or process level. For example, if a facility is estimating emissions using the material balance calculation approach, detailed composition information may not be available on the SDS. There may be cases where some individual pollutants are included, but not all individual pollutants in a pollutant group can be included, or there may be cases where only the group is listed on the SDS (e.g., Glycol Ethers). In addition, the MPCA’s list of individual pollutants that belong to a group is not exhaustive, so facilities may have to report groups of pollutants in the case of rarely used pollutants that are not individually listed in the e-reporting system. Therefore, the MPCA is proposing to allow facilities different options for reporting.

Ideally, a facility would be able to report emissions of all individual pollutants associated with a group. This is possible when a facility is calculating emissions using the material balance approach and the SDS includes detailed information on every individual pollutant that is included in the material.

The MPCA expects that detailed information will usually be available when facilities are using the methods outlined in Chapter 7019.3030 to calculate emissions. For example, if a facility is calculating emissions using a material balance approach, the detailed composition of a material is typically available on the SDS.

Reporting Emissions from Processes Using Solvent Compounds:

In the example found in Table 2, since all information is available and known for every individual glycol ether pollutant, the facility must report emissions for each individual pollutants for a unit or process.

Table 2. Example of a facility reporting emissions of glycol ether compounds from a painting process where each individual pollutant is known and listed on the SDS.

Pollutant	Emissions (tons)
BUTYL CARBITOL ACETATE	1
CARBITOL ACETATE	1
CELLOSOLVE	2
CELLOSOLVE ACETATE	2

The same process might instead contain two individual glycol ether pollutants (e.g., Cellosolve and Cellosolve acetate) that are known and listed on the SDS, and other glycol ether pollutants that are not specified. In the example found in Table 3, the facility must report all individual pollutants known and the unit or process level, and account for the remaining emissions under the group (Glycol Ethers (Unspecified)).

Table 3. Example of a facility reporting emissions of glycol ether compounds from a painting process where two individual glycol ether pollutants are known and listed on the SDS, and other glycol ether pollutants are not specified.

Pollutant	Emissions (tons)
GLYCOL ETHERS *(Unspecified)*	2
CELLOSOLVE	2
CELLOSOLVE ACETATE	2

There may be a third scenario where the SDS does not include any detailed information on individual pollutants that are part of the glycol ether group. In the example found in Table 4, the facility can report all emissions at the unit or process level under the group (e.g., Glycol Ethers (Unspecified)).

Table 4. Example of a facility reporting emissions of glycol ether compounds from a painting process where none of the glycol ether pollutants are specified.

Pollutant	Emissions (Tons)
GLYCOL ETHERS *(Unspecified)*	6

In all three cases found in Tables 2, 3, and 4, all six tons of glycol ether emissions associated with the unit or process are accounted for.

For metals that are part of groups of pollutants, facilities must report emissions for the unit/process for the metal portion of the metal group when reporting emissions as the group (e.g. Nickel or Cobalt).

This reporting approach is consistent with the language in the EPA's AERR proposal. It is reasonable to request individual pollutants be reported because some individual pollutants that are part of groups of pollutants have varying levels of toxicity and different health and environmental impacts. For example, currently some facilities voluntarily report emissions of the grouped pollutant, chromium, rather than emissions for the specific chromium pollutants emitted such as hexavalent chromium and trivalent chromium. Hexavalent chromium is extremely toxic whereas trivalent chromium is much less toxic. Therefore, it is important to distinguish between the two when reporting emissions.

More detailed emissions information will support tools such as MNRISKS, AirToxScreen, and EJScreen, and will ensure that the Agency develops policies to appropriately prioritize reducing emissions and identify facilities that pose the highest risk to human health and the environment. This approach is reasonable because the MPCA needs to ensure the most accurate information is reported, while recognizing that in some cases it may not be possible for facilities to report emissions at the unit or process level for all individual pollutants that are part of grouped pollutants. The individual pollutants that belong to a group of pollutants that are required to be reported are detailed in SONAR Exhibit 1.

Part 7019.3060 VOLATILE ORGANIC COMPOUND (VOC) MATERIAL BALANCE

The term "air toxics" is added multiple times in this part of rule because facilities using material balance to calculate their VOC emissions will be using the same method of calculation for air toxics emissions. Facilities may choose to use material balance to calculate VOC or air toxics emissions because other methodologies such as CEM data (7019.3040) or performance testing (7019.3050) may not be available and may be cost prohibitive. Emission factors are also not available for every activity and pollutant, so material balance calculations may be the only method available for facilities to estimate emissions. Material balance calculations are an acceptable and low-cost methodology that utilizes records of material use that facilities may already record for other business purposes. This method may result in overreporting of emissions, but the MPCA accepts overreporting for material balance because it is often the only reporting option available to those facilities. Additionally, facilities are already required to keep records for tracking and reporting VOC emissions. It is reasonable to add rule language that assists facilities in meeting the requirements for the emission inventory.

Part 7019.3080 EMISSION FACTORS

Item B references the control efficiency factors that may be used. Emission factors are a widely used and accepted method to develop emission inventories and estimate emissions when other information is not available. An emission factor is a representative value that is based on specific activities associated with the pollutant emitted. Emission factors are developed with available source test data and typically represent long-term averages for all facilities in the source category. Emission factors are developed by the EPA (AP-42) and MPCA.

The term "air toxics" is added to clarify that these requirements also apply to air toxics emissions. It is reasonable to add rule language that assists facilities in meeting the criteria requirements for the emission inventory.

Part 7019.3110 AIR TOXICS EMISSION INVENTORY AND EMISSIONS REPORTING

Subpart 1. **Air toxics emission inventory required.** Subp. 1 identifies who is responsible for reporting air toxics emissions. It is reasonable to provide the scope of a proposed section of rule so that affected parties know whether a particular section applies to them or not.

Subp. 2. **Air toxics required to be reported.** Subp. 2 identifies what air toxics are required to be included in the annual air toxics emission inventory.

Item A references HAPs, a list of air pollutants within the CAA that is already defined in rule. It is reasonable to incorporate this list by reference because amendments to the list by the EPA will not require additional rulemaking at the state level and will ensure that the regulated parties will use the most current version of the list. HAPs are widely known by owners and operators of facilities with air permits and have been established in the CAA since the 1990s. Historically, the HAPs list has not changed significantly since it was first established.

Item B references PFAS, defined in state statute, that are on the TRI list, a federal list of specific toxic chemical listings. The EPA updates this list frequently (often annually in recent years) to add additional PFAS compounds. The science around PFAS is rapidly changing and methods to test for these chemicals are evolving and improving. While there are thousands of PFAS in existence, PFAS pollutants of concern are the most important to be reported and this list contains PFAS pollutants of widespread concern. The MPCA will maintain the complete air toxics reporting list, including all specific compounds and their corresponding Chemical Abstracts Service (CAS) numbers, for use by facilities for reporting their air toxics for the annual emissions inventory to ease the burden of reporting for facilities. It is reasonable to incorporate this list by reference because amendments to the list by the EPA will not require additional rulemaking at the state level and will ensure that the regulated parties will use the most current version of the list. It is also reasonable to use this list so Minnesotans will be able to track the latest reports of PFAS emissions by facilities as the science and methods for testing are evolving.

When assessing TRI pollutants, MPCA staff considered many aspects of this list. Emissions associated with TRI pollutants are reported to EPA by some facilities. The MPCA considered adding all the TRI pollutants because it may make reporting easier for facilities. Ultimately, the MPCA decided against adding all TRI pollutants and included only those identified as PFAS on the TRI List, those with inhalation risks or those that were reported as air releases by TRI reporting facilities in Minnesota. The TRI was developed in the 1990s and some pollutants have been on the list for decades despite their dwindling use. Similar to the IRIS list, including pollutants reported that have an inhalation risk is most important and reasonable to include for use later in risk assessment modeling.

One comment received during the initial RFC period stated that the air toxics list should be limited to the federal list of HAPs and potentially the TRI PFAS list. The MPCA considered this suggestion, but due to the legislative directive and the specific environment in Minnesota, there were additional pollutants that the MPCA needed to consider for reporting in Minnesota. It remains unclear if the TRI PFAS list will be included in the final AERR rule revisions and the MPCA determined that the TRI PFAS and other pollutants of concern specific to Minnesota must be included for reporting.

Item B also lists other PFAS that owners or operators of an air toxics reporting facility must report. These PFAS are listed separately from the other individually listed pollutants because not all facilities use materials that result in PFAS emissions. Listing PFAS pollutants separately will ease the burden of reviewing the pollutants listed in rule for reporting facilities that do not emit PFAS.

PFAS Reported in the Most Recent Triennial Emissions Inventory:

Chemical Abstracts Service (CAS) number	Pollutant
209482-18-8	1-(4-Butoxynaphthyl)tetrahydrothiophenium perfluorobutanesulfonate
359-49-9	2,3,3,3-Tetrafluoropropanoic Acid
27619-93-8	4:2FTS - 4:2 Fluorotelomer sulfonate sodium
27619-94-9	6:2 Fluorotelomer sulfonate sodium salt
27619-96-1	8:2 Fluorotelomer sulfonate sodium salt
355-42-0	Perfluorohexane
365971-87-5	Perfluorotetradecanoate
335-24-0	Potassium perfluoro-4-ethylcyclohexanesulfonate

2923-16-2	Potassium trifluoroacetate
2250081-67-3	Sodium 4,8-dioxa-3H-perfluorononanoate
2806-15-7	Sodium perfluorodecanesulfonate
21934-50-9	Sodium perfluoroheptane sulfonate
4021-47-0	Sodium perfluorooctanesulfonate
1493-13-6	Trifluoromethanesulfonic acid
144317-44-2	Triphenylsulfonium nonafluorobutanesulfonate

It is reasonable to require facilities to report these air toxics emissions because these pollutants are of concern in Minnesota and have been reported or are prevalent in Minnesota. This aligns with the MPCA's PFAS Monitoring Plan to identify sources of PFAS.

PFAS that can be detected using Other Test Method 45 (OTM-45):

Chemical Abstracts Service (CAS) number	Pollutant
120226-60-0	10:2 Fluorotelomer sulfonic acid
763051-92-9	11-Chloroperfluoro-3-oxaundecanesulfonic acid
2991-50-6	2-(N-Ethylperfluorooctanesulfonamido)acetic acid
2355-31-9	2-(N-Methylperfluorooctanesulfonamido)acetic acid
53826-13-4	2-(Perfluorodecyl)ethanoic acid
53826-12-3	2-(Perfluorohexyl)ethanoic acid
27854-31-5	2-(Perfluorooctyl)ethanoic acid
914637-49-3	2H,2H,3H,3H-Perfluorooctanoic acid
70887-84-2	2H-Perfluoro-2-decenoic acid
812-70-4	3-(Perfluoroheptyl)propanoic acid
70887-88-6	3-(Perfluoropentyl)-3-fluoro-2-propenoic acid
356-02-5	3:3 Fluorotelomer carboxylic acid
919005-14-4	4,8-Dioxa-3H-perfluorononanoic acid
757124-72-4	4:2 Fluorotelomer sulfonic acid
27619-97-2	6:2 Fluorotelomer sulfonic acid
39108-34-4	8:2 Fluorotelomer sulfonic acid
756426-58-1	Perfluoro(2-((6-chlorohexyl)oxy)ethanesulfonic acid)
863090-89-5	Perfluoro(4-methoxybutanoic acid)
113507-82-7	Perfluoro-2-ethoxyethanesulfonic acid
151772-58-6	Perfluoro-3,6-dioxaheptanoic acid
377-73-1	Perfluoro-3-methoxypropanoic acid
335-77-3	Perfluorodecanesulfonic acid

79780-39-5	Perfluorododecanesulfonic acid
375-92-8	Perfluoroheptanesulfonic acid
375-85-9	Perfluoroheptanoic acid
68259-12-1	Perfluorononanesulfonic acid
754-91-6	Perfluorooctanesulfonamide
2706-91-4	Perfluoropentanesulfonic acid
2706-90-3	Perfluoropentanoic acid
72629-94-8	Perfluorotridecanoic acid
2058-94-8	Perfluoroundecanoic acid
83329-89-9	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate
1260224-54-1	Sodium perfluorododecanesulfonate

It is reasonable to require facilities to report these air toxics emissions because as more facilities perform stack testing using OTM-45, these facilities will need to be able to report chemicals that can be detected from stack test methods. Additionally, stack tests may be required in permits or other regulatory measures and those data need to be reported. These chemicals were in the most recent MPCA triennial air toxics emissions inventory.

PFAS that can be detected using Other Test Method 50 (OTM-50):

Chemical Abstracts Service (CAS) number	Pollutant
375-61-1	1,1,1,2,2,3,3,4,4,5,5-Undecafluoropentane
811-97-2	1,1,1,2-Tetrafluoroethane
420-46-2	1,1,1-Trifluoroethane
2252-84-8	1H-Heptafluoropropane
375-17-7	1H-Nonafluorobutane
355-37-3	1H-Perfluorohexane
375-83-7	1-Hydroperfluoroheptane
3330-14-1	2H-Perfluoro-5-methyl-3,6-dioxanonane
335-65-9	8H-Perfluorooctane
75-73-0	Carbon tetrafluoride
75-45-6	Chlorodifluoromethane
75-72-9	Chlorotrifluoromethane
75-10-5	Difluoromethane
593-53-3	Fluoromethane
116-15-4	Hexafluoropropene
115-25-3	Octafluorocyclobutane
559-40-0	Octafluorocyclopentene
354-33-6	Pentafluoroethane
678-26-2	Perflenapent
428-59-1	Perfluoro(methyloxirane)
3330-15-2	Perfluoro-3-(1H-perfluoroethoxy)propane
355-25-9	Perfluorobutane
76-16-4	Perfluoroethane
335-57-9	Perfluoroheptane
355-42-0	Perfluorohexane
307-34-6	Perfluorooctane
76-19-7	Perfluoropropane
116-14-3	Tetrafluoroethylene
75-69-4	Trichlorofluoromethane
75-46-7	Trifluoromethane

It is reasonable to require facilities to report these air toxics emissions because as more facilities

perform stack testing using OTM-50, facilities will need to report emissions that can be detected from stack test methods. Additionally, stack tests may be required in permits or other regulatory measures and these data need to be reported. While these chemicals are not included on any list included in the legislative statute, it is reasonable to add these chemicals because the MPCA anticipates that more facilities will be testing for these PFAS chemicals in the coming years. Furthermore, the MPCA would have added these PFAS chemicals to the next triennial air toxics reporting list after this test method was released by the EPA on January 25, 2024[16].

Additional PFAS:

Chemical Abstracts Service (CAS) number	Pollutant
1478-61-1	Bisphenol AF

Bisphenol AF (CAS # 1478-61-1) is included because it is a PFAS of high concern in Minnesota. It is reasonable to require facilities to report these emissions because this pollutant is highly toxic to human health and prevalent in Minnesota.

Item C lists out additional pollutants that must be included in the air toxics emissions inventory. It also specifies that pollutant compounds include any specific chemical that contains the named chemical within its infrastructure. For example, “aluminum compounds” include aluminum, aluminum fluoride, aluminum oxide, etc. It is reasonable to reference chemical compounds, when possible, because it simplifies the list in rule. The full list of air toxics that must be reported will be provided in guidance, including specific compounds and their corresponding CAS numbers, but the MPCA may not be aware of every specific pollutant in a group and the lists of individual pollutants included under the groups of pollutants are not comprehensive. When facilities submit their emissions inventory, if a pollutant that is part of a compound is not specifically listed or unavailable for selection in e-services, facilities must account for emissions associated with all pollutants that are part of compounds as defined by the CAA and report those emissions under the group (e.g. Cobalt compounds or Nickel compounds). Listing as compounds will provide flexibility while ensuring that facilities are reporting individual pollutants if possible. In this item, the MPCA is also proposing to use similar language to the EPA’s definition of “compounds” in the CAA.

Minn. Stat 116.062 has identified that “air toxics” are chemical compounds or compound classes that are emitted into the air by a permitted facility and include HAPs, chemicals listed on the TRI list, chemicals for which MDH has developed HBVs or RAA, chemicals for which risk to human health has been assessed by the EPA IRIS, or chemicals previously reported to the MPCA in the most recent triennial emissions inventory. The MPCA has assessed these chemicals and chemical compounds and has identified those that are reasonable to require emissions reporting for.

The specific reasonableness for each chemical and chemical compound proposed in this section of rule that is not incorporated by reference as a HAP or a TRI PFAS is included below. CAS numbers are listed for pollutants when available.

[16] Other Test Method 50 (OTM-50) Sampling and Analysis of Volatile Fluorinated Compounds from Stationary Sources Using Passivated Stainless-Steel Canisters. (August 14, 2024). Retrieved from *https://www.epa.gov/system/files/documents/2024-01/otm-50-release-1_0.pdf*

Pollutants with HBVs or RAA identified by MDH:

Chemical Abstracts Service (CAS) number	Pollutant
75-71-8	Dichlorodifluoromethane
7631-86-9	Silica

It is reasonable to require facilities to report these air toxics emissions because they all have inhalation values that can be used to estimate the exposure risk for these given pollutants.

According to the MDH website[17], *"The Minnesota Department of Health (MDH) develops health-based guidance values to evaluate potential human health risks from exposures to chemicals in ambient air. An air guidance value is a concentration of a chemical that is likely to pose little or no risk to human health.*

Air guidance values may be used by the public, industry, state and local risk managers, and other stakeholders to assist in evaluating potential health risks to people from exposures to a chemical in air. MDH does not enforce air guidance values.

Air guidance values are developed using public health protective practices that protect susceptible portions of the population (including but not limited to children, pregnant women and their fetuses, individuals compromised by pre-existing diseases, and elderly persons). However, these values may not be protective of hypersensitive individuals who may respond to low level chemical exposures. Additionally, the values do not determine health risk from exposure to several toxic chemicals at once."

There are about 90 chemicals that the MDH has developed air guidance values for. Two of those chemicals, dichlorodifluoromethane, and silica, do not appear on other lists the MPCA evaluated as directed by statute, so the MPCA added these two chemicals to the reporting list.

Pollutants that have been assessed by IRIS. The following pollutants have been assessed by EPA's IRIS and have either inhalation risks or other risks to human health associated with their emissions.

Pollutants with inhalation risks:

Chemical Abstracts Service (CAS) number	Pollutant
140-57-8	Aramite
12674-11-2	Aroclor 1016
12672-29-6	Aroclor 1248
11097-69-1	Aroclor 1254
103-33-3	Azobenzene
108-86-1	Bromobenzene
1306-38-3	Ceric oxide
12789-03-6	Technical chlordane
10049-04-4	Chlorine dioxide
75-68-3	1-Chloro-1,1-difluoroethane

[17] Air Guidance Values. (May 31, 2024). Retrieved from *https://www.health.state.mn.us/communities/environment/risk/guidance/air/table.html#:~:text=The%20Minnesota%20Department%20of%20Health,no%20risk%20to%20human%20health*

75-45-6	Chlorodifluoromethane
110-82-7	Cyclohexane
50-29-3	DDT
156-60-5	(E)-1,2-Dichloroethylene
637-92-3	Ethyl t-butyl ether
111-76-2	2-Butoxyethanol
591-78-6	2-Hexanone
7783-06-4	Hydrogen sulfide
1318-09-8	Amphibole-group minerals
78-93-3	Methyl ethyl ketone
2385-85-5	Mirex
55-18-5	N-Nitrosodiethylamine
924-16-3	N-Nitrosodibutylamine
930-55-2	N-Nitrosopyrrolidine
107-98-2	1-Methoxy-2-propanol
75-65-0	tert-Butyl alcohol
109-99-9	Tetrahydrofuran
26471-62-5	Toluene diisocyanate
96-18-4	1,2,3-Trichloropropane
526-73-8	1,2,3-Trimethylbenzene
95-63-6	1,2,4-Trimethylbenzene
108-67-8	1,3,5-Trimethylbenzene

The MPCA added all IRIS inhalation risk pollutants to the list of air toxics pollutants required to be reported. It is reasonable to require facilities to report these air toxics emissions because they all have inhalation values that can be used to estimate the exposure risk for these given pollutants.

Pollutants without inhalation risks:

Chemical Abstracts Service (CAS) number	Pollutant
10061-01-5	(Z)-Dichloropropene
85-68-7	Benzyl butyl phthalate
9016-87-9	Polymeric diphenylmethane diisocyanate

(Z)-Dichloropropene (CAS # 10061-01-5) is included because it has been identified by IRIS as a likely human carcinogen. It is reasonable to require facilities to report these emissions because this pollutant is toxic if inhaled and is also an environmental hazard.

Butyl benzyl phthalate (CAS # 85-68-7) is included because although the inhalation risk has not been assessed, it has an IRIS oral risk and is an IRIS carcinogen. The EPA also identified it as a high-priority

substance in December of 2019, and it is currently undergoing risk evaluation[18]. It is reasonable to require facilities to report these emissions because they may cause health effects and an inhalation risk may be derived in the future.

Polymeric diphenylmethane diisocyanate (CAS # 9016-87-9) is included because it has an IRIS inhalation risk. It is reasonable to require facilities to report these emissions because they can cause respiratory irritation and may cause damage to organs through prolonged exposure.

Pollutants on the TRI list: The following pollutants are on the TRI list and have either been reported by Minnesota TRI facilities or are PBTs.

Pollutants with an inhalation toxicity value:

Chemical Abstracts Service (CAS) number	Pollutant
563-47-3	3-Chloro-2-methylpropene
77-73-6	Dicyclopentadiene
7697-37-2	Nitric acid

These air toxics are included in this section of rule because they were reported by TRI facilities in Minnesota and have an inhalation toxicity value. It is reasonable to require facilities to report these emissions because at least one facility is emitting each of these pollutants in Minnesota. In addition, the MPCA has inhalation values for these pollutants, so the risks associated with these pollutants can be calculated.

Pollutants without an inhalation toxicity value:

Chemical Abstracts Service (CAS) number	Pollutant
71-36-3	1-Butanol
64-18-6	Formic acid
62-56-6	Thiourea

1-Butanol (CAS # 71-36-3) is included because it is used and emitted by many furniture manufacturers in Minnesota and surrounding areas. It is reasonable to require facilities to report these emissions because it is reported by MN TRI facilities.

Formic acid (CAS # 64-18-6) is included because it has been reported by Minnesota TRI facilities. It is reasonable to require facilities to report these emissions because this pollutant is an irritant and can be toxic if inhaled.

Thiourea (CAS # 62-56-6) is included because Minnesota TRI facilities have reported emissions of this pollutant. It is reasonable to require facilities to report these emissions because this pollutant is an irritant and can be toxic if inhaled. At least one facility in Minnesota has reported this pollutant to TRI.

[18] Risk evaluation for butyl benzyl phthalate-1,2-benzene- dicarboxylic acid, 1- butyl 2(phenylmethyl) ester. (August 14, 2024). Retrieved from *https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-evaluation-butyl-benzyl-phthalate-12-benzene*

Pollutants that are PBTs:

Chemical Abstracts Service (CAS) number	Pollutant
309-00-2	Aldrin
40487-42-1	Pendimethalin

It is reasonable to require facilities to report these air toxics emissions because these chemicals have multi-pathway concerns. If emissions of these air toxics result in deposition into water or they are otherwise consumed, they are persistent in the environment as well as toxic to humans.

Pollutants on the MPCA's most recent triennial air toxics emissions inventory list. The following pollutants are on the MPCA's most recent triennial air toxics emissions inventory list.

Pollutants with similar specific reasonableness. Pollutants with similar specific reasonableness are grouped in the section below.

Pollutants of concern identified by the Great Lake Commission (GLC):

Chemical Abstracts Service (CAS) number	Pollutant
1912-24-9	Atrazine
	Copper compounds
117-84-0	Di-n-octyl phthalate

It is reasonable to require facilities to report these air toxics emissions because these chemicals are of concern to the Great Lakes and the MPCA has tracked emissions of these chemicals in the triennial air toxics emissions inventory. They can be emitted into the air but are most concerning when they enter waterbodies through atmospheric deposition.

Pollutants that are Trichloroethylene (TCE) replacements:

Chemical Abstracts Service (CAS) number	Pollutant
540-59-0	1,2-Dichloroethylene
5131-66-8	1-Butoxy-2-propanol
10061-02-6	Trans-1,3-Dichloropropene

It is reasonable to require facilities to report these air toxics emissions because they are relevant to Minnesota due to the ban on TCE and are alternatives that have high toxicity. Additionally, these chemicals can cause irritation if inhaled and can adversely impact the environment.

Aldehyde compounds with EPA emission factors:

Chemical Abstracts Service (CAS) number	Pollutant
	Aldehyde
100-52-7	Benzaldehyde
123-73-9	(E)-Crotonaldehyde
123-72-8	Butyraldehyde

It is reasonable to require facilities to report these air toxics emissions because aldehyde compounds can cause irritation if inhaled. These chemicals have been tracked on the MPCA's triennial air toxics emissions inventory.

Pollutants known to be emitted by foundries:

Chemical Abstracts Service (CAS) number	Pollutant
	Aluminum compounds
	Vanadium compounds

It is reasonable to require facilities to report these air toxics emissions because these pollutants are voluntarily reported by some facilities and can cause irritation if inhaled. These pollutants are also known to be emitted by foundries.

Additional pollutants included on the MPCA's Triennial Air Toxics Emissions Inventory List:

Chemical Abstracts Service (CAS) number	Pollutant
95-50-1	Dichlorobenzene, 1,2-
541-73-1	Dichlorobenzene, 1,3-
156-59-2	(Z)-1,2-Dichloroethylene

It is reasonable to require facilities to report these air toxics emissions because these pollutants can cause irritation in humans and are also an environmental hazard.

Additional pollutants:

Chemical Abstracts Service (CAS) number	Pollutant
	Zinc Compounds

Zinc compounds for which the EPA has issued NESHAPs are included in this section of rule. It is reasonable to require facilities to report these air toxics emissions because these pollutants are voluntarily reported by some facilities and are tracked in the MPCA's triennial air toxics emissions inventory.

Pollutants with Individual Specific Reasonableness. Pollutants with individual specific reasonableness are listed in the section below.

Chemical Abstracts Service (CAS) number	Pollutant
115-07-1	1-Propene
67-64-1	Acetone
105-60-2	Caprolactam
25321-22-6	Dichlorobenzene
7664-93-9	Sulfuric acid
540-88-5	tert-Butyl acetate

1-Propene (CAS # 115-07-1) is included because it is tracked in the MPCA's triennial air toxics emissions inventory, and it has a chronic inhalation risk from CALEPA-OEHHA. It is reasonable to require facilities to report these emissions because this pollutant has chronic inhalation risks and guidance developed.

Acetone (CAS # 67-64-1) is included because it is reported by some facilities and tracked in the MPCA's triennial air toxics emissions inventory. It is reasonable to require facilities to report these emissions because Acetone has an inhalation toxicity value.

Caprolactam (CAS # 105-60-2) is included because it has been tracked as part of the MPCA's voluntary

air toxics emissions inventory and has an inhalation risk determined by CALEPA-OEHHA. It is reasonable to require facilities to report these emissions because this pollutant is an irritant and can cause respiratory irritation.

Dichlorobenzene (CAS # 25321-22-6) is included because it has a TRI inhalation risk value and is tracked in the MPCA's triennial air toxics emissions inventory. It is reasonable to require facilities to report these emissions because it is reported by some facilities and the inhalation risk can be calculated given the emissions.

Sulfuric acid (CAS # 7664-93-9) is included because it is tracked in the MPCA's triennial air toxics emissions inventory, it has an inhalation risk, and is considered toxic to the respiratory system according to CALEPA-OEHHA. It is reasonable to require facilities to report these emissions because this pollutant is reported by facilities in Minnesota and the inhalation risk can be calculated.

Tert-Butyl acetate (CAS # 540-88-5) is included because it is tracked in the MPCA's triennial air toxics emissions inventory, is a potential carcinogen, and has an inhalation risk according to CALEPA-OEHHA. It is reasonable to require facilities to report these emissions because at least one facility is reporting this pollutant in Minnesota.

Although Minn. Stat. § 116.062 directs that the MPCA rulemaking on air toxics reporting could require reporting for any pollutant included in the CAA HAPs list, included on the TRI list, chemicals for which MDH has developed HBVs or RAA, chemicals for which risk to human health have been assessed by the EPA IRIS, or chemicals previously reported to the MPCA in the most recent triennial emission inventory, the Agency has reviewed each of those pollutants and is not proposing to require reporting for all of them. This reasoning is based on criteria developed by MPCA to ensure chemicals of most concern are reported. Chemicals that have been banned for several years, are no longer in use, or those that do not have inhalation risks or multipathway concerns were not included. It is reasonable not to require facilities to report chemicals that are no longer used or not relevant to air pollution concerns.

In general, the MPCA did not include:

- Pollutants with only oral or other types of values other than inhalation values because the MPCA would not be able to model risks without inhalation values;
- PFAS that are not known to be present or reported in Minnesota;
- PFAS that are salt and anions of OTM-45 or OTM-50 pollutants because reporting emissions of the main pollutants is sufficient for reporting purposes;
- Pollutants with inhalation risks that are archived because the inhalation risks are no longer relevant; and
- Pollutants only reported by facilities located in other states to TRI.

Overall, it is reasonable to only include pollutants that are known to be relevant to Minnesota and to ensure that facilities are not overburdened with reporting emissions of pollutants that are not of the highest concern.

Subp. 3. **De minimis reporting; exceptions**. Subp. 3 item A outlines the minimum emissions that the MPCA requires to be reported and identifies how facilities can use a materials' SDS to determine if they need to report the emissions of an air toxic when estimating emissions with a material balance calculation. It is reasonable to base de minimis for reporting on the SDS because it is easy for facilities to reference and for agency compliance and enforcement staff to verify at the time of a facility inspection. Certain air toxics are required to be reported as low as 1%, or 0.1% if the air toxic is a carcinogen or

potential carcinogen, on an SDS. This is based on the health hazard classification of the chemical. The de minimis levels are dictated by determinations made by the National Toxicology Program (NTP), Annual Report on Carcinogens, the International Agency for Research and Cancer (IARC) Monographs, or 29 CRF Part 1910, Subpart Z, Toxic and Hazardous Substances, OSHA. Each of these documents, listed in subitems (1) through (3), have been incorporated by reference. Toxic chemicals listed as carcinogens or potential carcinogens under NTP (classified as a known or reasonable anticipated to be human carcinogens), IARC (classified as 1, 2A, or 2B), or 29 CFR Part 190, Subpart Z, have a 0.1% de minimis concentration level. These are typically referred to as "OSHA carcinogens." All other toxic chemicals have a 1% minimum concentration level for reporting on an SDS, thus the de minimis for these pollutants is 1%.

It is reasonable to use the OSHA classifications of 0.1% for human carcinogens or potential carcinogens and 1% for other toxic chemicals as the de minimis for reporting because it will simplify reporting for facilities rather than requiring different de minimis thresholds for different air toxics. In addition, a facility will not be required to complete additional calculations every year to determine if emissions need to be reported. The use of the OSHA standard of 0.1% or 1% is also reasonably low enough to ensure that facilities are reporting quantities of emissions that might adversely affect the environment or human health. Some air toxics present risk to human health at very small concentrations, so this lower reporting limit ensures that emissions of that type do not go unreported.

This approach is reasonable because the MPCA would not expect facilities to test the materials or contact the chemical manufacturer to determine what level of an air toxic is included in the material used if it is present in concentrations below 0.1% or 1%. If testing materials, concentrations below this level may be below method detection limits for the testing methodology. In addition, the Agency also does not believe that requiring testing beyond this concentration would provide additional benefit to assess risk to human health. Requiring testing of materials would also be burdensome and potentially costly to facilities.

The de minimis only applies to facilities using the material balance approach to estimate emissions. If a facility is estimating emissions using a performance test or CEM data and the air toxic is detected, even at low amounts, a facility must report emissions. Furthermore, if a facility is using an available emission factor to calculate emissions, the facility must report emissions regardless of the amount of emissions.

Many facilities that are also small businesses use the material balance approach for calculating emissions for non-combustion activities. This de minimis approach is meant to help ease some of the cost and time burden on small businesses by enabling them to use the SDS, which they are required to keep on hand, to calculate air toxics emissions. The MPCA carefully considered the impact of this de minimis approach and weighed the benefits and potential negative outcomes, but this approach is a reasonable balance of cost, convenience, and reporting air toxics to the greatest extent, especially considering small businesses and the information available to them.

The MPCA currently calculates air toxics emissions for combustion processes using representative EPA and state emission factors and fuel usage or activity data reported by facilities. The MPCA will continue to use this approach for mandatory air toxics reporting. Many facilities that have registration and general permits are only required to report emissions for combustion processes. These facilities will not be required to report anything additional than what they are currently reporting since the MPCA will calculate air toxics emissions for them.

There are no de minimis thresholds associated with current required reporting of CAP and GHG emissions. There are also no de minimis thresholds currently established for the MPCA's voluntary air toxics reporting. Furthermore, the EPA's AERR proposal does not include reporting thresholds for major

sources (Type A and Type B facilities as defined in 40 CFR Part 51, Appendix A to Subp. A), so this approach would also be fairly consistent with the AERR proposal for major sources. The AERR proposal includes risk-based reporting thresholds for non-major sources; however, due to the reasons stated above, the MPCA has decided to pursue a different approach.

One comment received during the initial RFC period stated that thresholds for reporting should be consistent with AERR. The EPA's AERR proposal would require major sources (Type A and Type B) to report all HAP emissions annually. The AERR proposal includes no minimum reporting thresholds for major sources, and risk-based thresholds for HAPs for non-Type A and B facilities (non-major sources and small entities). The MPCA considered these thresholds; however, the AERR proposal only provides thresholds for HAPs, and the MPCA is proposing facilities report additional pollutants including PFAS and others that do not have risk thresholds in the AERR proposal. Also, to reduce complexity and maintain consistency, the MPCA is proposing to use the same reporting approach for all facilities, whereas the AERR proposal includes different requirements for major and non-major sources. Furthermore, there are no reporting thresholds in rule associated with CAPs, GHGs, or mercury emissions reporting. To reduce complexity in reporting emissions, the MPCA is proposing a de minimis for reporting that is found on SDSs for some pollutants when estimating emissions using the material balance calculation method.

The MPCA will ensure that any new pollutants added or removed from the HAP or TRI PFAS list are reflected in the list of pollutants that will be provided to facilities prior to reporting. Facilities will not be required to track EPA updates to the HAP or TRI PFAS lists. MPCA will also provide facilities with the OSHA standards of 0.1% or 1% for each pollutant on the reporting list since standards are updated periodically and the MPCA does not want to add complexity or burden to facilities to track these federal standards.

Item B identifies the air toxics for which emissions of any amount are required to be reported in the annual air toxics emission inventory. Generally, these are pollutants that are highly toxic even at low emission levels. The MPCA is including a list of pollutants in which all emissions must be reported regardless of the de minimis thresholds outlined in item A. In addition, health risks for some air toxic pollutants, such as certain PFAS compounds, are unknown at this time, so requiring facilities to report all emissions will allow the MPCA to better assess and analyze these data. If health risks are established in the future, the MPCA will be able to better assess risk. If one of the pollutants that is included on the no de minimis list is included on an SDS as present in a mixture at <0.1%, the facility is required to use 0.1% to estimate emissions using a material balance approach.

This item also specifies that pollutant compounds include any specific chemical that contains the named chemical within its infrastructure. For example, "arsenic compounds" include arsenic pentoxide, arsenic acid, arsenic trioxide, arsenous acid, arsine, etc. It is reasonable to reference chemical compounds, when possible, because it simplifies the list in rule. The MPCA will maintain and provide facilities with the full list of air toxics that must be reported before the start of the reporting period, including specific individual pollutants that are part of groups and their corresponding CAS numbers.

The MPCA carefully determined the list of chemicals for which all emissions must be reported. These include the most hazardous of the HAPs and PBTs, and in small amounts can still cause harm to human health and the environment. Since the health risks associated with specific PFAS pollutants is evolving and complex, and the technology to measure PFAS is changing rapidly, the MPCA believes all PFAS emissions for the PFAS compounds listed must be reported, even if they are present in small amounts.

The TRI will no longer have a reporting exemption for facilities that use PFAS in small, or de minimis, concentrations as a result of the EPA's recently published final rule October 31, 2023 (40 CFR Part

372.28). The rule also designates the de minimis exemption unavailable for purposes of supplier notification requirements to downstream facilities for all chemicals on the list of chemicals of special concern, which also includes certain PBTs like lead, mercury, and dioxins. This change ensures that purchasers of mixtures and trade name products containing these chemicals are informed of their presence in mixtures and products they purchase. It is reasonable to require this of facilities because the EPA rule has made it possible to do so by requiring additional reporting by suppliers under 40 CFR Part 372.28.

The following chemicals are air toxics that facilities must report all emissions of.

Pollutants that are PBTs:

Chemical Abstracts Service (CAS) number	Pollutant
309-00-2	Aldrin
57-74-9 & 12789-03-6	Chlordane
	Dioxins/Furans
76-44-8	Heptachlor
118-74-1	Hexachlorobenzene
	Lead compounds
	Mercury compounds
72-43-5	Methoxychlor
40487-42-1	Pendimethalin
	Polychlorinated biphenyls (PCBs)
	Polycyclic organic matter (POM)
8001-35-2	Toxaphene
1582-09-8	Trifluralin

It is reasonable to require facilities to report these air toxics emissions because they can bioaccumulate in plants, animals, and people and cause adverse health and environmental effects. These pollutants also remain in the environment for long periods of time.

Pollutants with individual specific reasonableness. Pollutants with individual specific reasonableness are listed in the section below.

Chemical Abstracts Service (CAS) number	Pollutant
	Arsenic compounds
	Cadmium compounds
	Chromium compounds
	Cobalt compounds
75-21-8	Ethylene oxide
	Nickel compounds
	PFAS listed in subpart 2, item D
	PFAS on the TRI list

Arsenic compounds are included in this section of rule because they are all HAPs, and some of them also have MDH and IRIS inhalation risks. It is reasonable to require facilities to report all emissions of arsenic compounds because these compounds can cause cancer and other adverse health effects.

Cadmium compounds are included in this section of rule. It is reasonable to require facilities to report all emissions of cadmium compounds because it is a metal, emissions can be monitored, it has a toxicity value, is a carcinogen, and can be harmful to the environment.

Chromium compounds are included in this section of rule. It is reasonable to require facilities to report all emissions of chromium compounds because some chromium compounds, like hexavalent chromium, are very toxic and can cause adverse health effects.

Cobalt compounds are included in this section of rule. It is reasonable to require facilities to report all emissions of cobalt compounds because the EPA is investigating cobalt and has determined that it is more hazardous than originally thought. Cobalt is a carcinogen and has an inhalation value.

Ethylene oxide (CAS # 75-21-8) is included in this section of rule because it is a HAP and has an IRIS inhalation risk. It is reasonable to require facilities to report all emissions of ethylene oxide because this is a very toxic chemical that is being regulated by EPA. On March 14, 2024, EPA announced final amendments to the NESHAP for ethylene oxide commercial sterilizers. The EPA is currently working with facilities with sterilizers to reduce their ethylene oxide emissions.

Nickel compounds are included in this section of rule. It is reasonable to require facilities to report all emissions of nickel compounds because nickel is known to be a carcinogen and has an inhalation value associated with it.

PFAS listed under subp. 2 item D and PFAS on the TRI list (includes 196 PFAS pollutants as of May 17, 2024) are included in this section of rule. It is reasonable to require these PFAS emissions be reported because they are found frequently in Minnesota waters, plants, and soils. All PFAS compounds are persistent and bioaccumulative, and as Minnesota works to regulate and clean up PFAS contamination, it is important to identify sources of PFAS pollution even in very small amounts. This also aligns with the Agency's PFAS Monitoring Plan goals to gather Minnesota-specific information, identify areas of particular concern, and to gather data that supports PFAS source reduction and pollution prevention.

Subp. 4. **Calculating actual emissions.** Subp. 5 item A states which section of rule that facilities, except for option C registration permits, should reference when calculating actual air toxics emissions. It is

reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the criteria requirements for the emission inventory.

Item B specifies which section of rule those facilities issued an option C registration permit should reference when calculating actual air toxics emissions. It is reasonable to add rule language that provides clarification for what parts of rule facilities should refer to in order to meet the criteria requirements for the emission inventory.

Subp. 5. **Recordkeeping.** Subp. 6 item A states what records facilities should keep in regard to air toxics emissions and the duration of maintaining those records. It is reasonable for facilities to maintain records for a period of five years after the date of submittal because other sections of rule (Chapters 7007, 7011, 7017, and 7019) also require maintaining records for five years. It is reasonable that facilities provide these records to the commissioner at their request because it allows the MPCA to verify that the recordkeeping requirements outlined in this section are being met.

Item B states that facilities must keep record of SDS or vendor certification for any air toxics-containing materials. It is reasonable to require facilities to keep record of their SDS or vendor certification for an air toxic-containing material purchased or used because the facility or MPCA may need these records to verify that emissions reported are accurate for a period of five years, not indefinitely.

Item C states that facilities who assume a reduction of air toxics due to material disposal must keep record of the amount of that material disposed and the corresponding calculations for what they believe should be subtracted from the overall emissions of that air toxic. It is reasonable to require facilities keep records of the amount of material recycled or disposed of, and their calculations for what should be subtracted from that air toxic's emissions so MPCA staff can verify that their calculations are representative of what should be subtracted from the air toxic's emissions and ensure that the material was recycled or disposed of properly.

Item D states that facilities must maintain records of their calculations for each air toxic emitted. It is reasonable to require facilities keep records of their calculations so that MPCA staff can verify that emission inventory data reported is accurate.

6. Regulatory analysis

A. Description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule.

The purpose of the proposed amendments and new section of rule is to require air toxics emissions reporting in the seven metropolitan counties of Minnesota. This rule will allow the MPCA to inform the public and continue to pursue its mission to protect human health and the environment. The parties that will be most affected are facilities with air permits (except option B registration permits) in the seven metropolitan counties that emit toxic air pollutants, and the MPCA who will monitor and enforce the rule. The MPCA will also process and analyze the additional emissions data that will result from the rule, and potentially take further actions to respond to potential health impacts from pollution.

An indirect result of this rule is that the health of all Minnesotans living in or near the seven metropolitan counties could be better safeguarded if the MPCA is able to identify and respond to emissions that cause health impacts more quickly and effectively. In particular, overburdened metropolitan area communities that bear disproportionate impacts from air pollution may benefit from this proposed rule; including communities with higher proportions of black, indigenous, and other people of color (BIPOC) residents, lower income residents, and communities otherwise overburdened by

social determinants of health. The following are categories of affected groups. See section 6(E) for an analysis and presentation of the costs and benefits of the proposed rule to these groups.

The purpose of the proposed repeal of Title V emergency affirmative defense provisions is to align with the CAA and EPA's directive for states to remove the provisions from state rules. Only one facility in the state of Minnesota has emergency affirmative defense provisions included in its permit. The repeal of Title V emergency affirmative defense provisions will technically apply to every facility with an air permit located within Minnesota; however, to the MPCA's knowledge, this provision has never been utilized by a facility. Compliance and enforcement staff will still have the ability to use discretion in the case of emergency circumstances or equipment malfunction, so the effect of the repeal is not expected to significantly impact facilities.

i. Facilities in the seven metropolitan county area that emit toxic air pollutants

As described above, the proposed rule would require nearly all facilities in the seven metropolitan counties with an air permit to report their emissions of air toxics to the MPCA. Option B permittees are not included in this rulemaking because they have minimal air toxics emissions and are not included in the legislative directive. Based on MPCA air permit and geographic environmental justice data, there are 666 permitted facilities that will be required to report air toxics emissions, and an estimated 406 facilities are located in or within one mile of an area of concern for environmental justice.

Table 5. Facilities, listed by permit type, that would be affected by the proposed rule, and the number of estimated facilities in or within one mile of an area of concern for environmental justice.[19]

Permit type	Count	Estimated in or within one mile of an area of concern for environmental justice
Capped	19	13
General Manufacturing	2	2
General Nonmetallic	24	12
Individual Federal	65	39
Individual State	53	36
Registration Option A	5	3
Registration Option C	136	93
Registration Option D	362	208
Total	666	406 (61%)

Some facilities with air permits are portable facilities, including hot-mix asphalt and non-metallic mining facilities, such as sand and gravel mines that can change operation locations. The MPCA does not expect many of these facilities to have air toxics beyond combustion processes. Based on previous emission inventory reports, the MPCA expects facilities with a General Permit for Nonmetallic Mining (MNG490000), and some facilities with option A, option D and option C registration permits to only have air toxics emissions associated with combustion processes. The MPCA will continue to follow the current process used for voluntary reporting and calculate air toxics emissions for combustion units using activity data (fuel usage or hours of operation and design capacity) and the best available EPA and state emission factors. Facilities that only report CAP and GHG emissions for combustion units will not be required to do any additional calculations or report air toxics emissions since the MPCA will do these calculations automatically. Facilities will only need to review the calculations and adjust if needed. The

[19] Based on MPCA data as of August 27, 2024.

specific reasonableness for this is discussed in greater detail in section 5 item B of this SONAR under 7019.3020 subpart 5.

It is estimated that 18 out of 136 option C facilities and an estimated 295 out of 362 option D facilities located in the seven metropolitan counties may have additional air toxics to report that are associated with non-combustion activities. There are 144 facilities with capped, general manufacturing, option A, individual state permits, or individual federal permits (Title V permits) and it is expected that most of these facilities will be required to calculate and report air toxics emissions. There are an estimated 457 facilities that may be affected by the proposed rule. As is detailed below in Section 6(E), owners and operators of these facilities would incur costs to meet these requirements. These impacted businesses will vary in size, but all should have the capability to comply with the proposed rule without suffering a heavy financial burden. Because this rule only applies to facilities in the seven metropolitan counties, and because the markets for the products produced by these facilities are generally large, it is unlikely that these increased facility costs will be passed on to the consumers of these products in a significant way.

ii. The MPCA

The MPCA will be the sole Minnesota government agency responsible for implementing, administering, and enforcing the proposed rule. This will require additional MPCA staff time from different programs within the Agency but no other significant agency resources. The specific MPCA programs that will require additional staff and the anticipated costs for these staff are detailed below in Section 6(B).

iii. Residents of the seven metropolitan counties, especially those in communities overburdened by air pollution

Exposure to air toxic pollutants have been shown to have numerous impacts on human health. The specific health effects of the several hundred air toxics included in this rule have generally been shown to result in increased risks of cancer, harm to the nervous system and brain, birth defects, irritation to the eyes, nose and throat, coughing and wheezing, impaired lung function, and cardiovascular system harms.[20] Thus, the 3,197,231 Minnesotans living in and around the seven metropolitan counties as of 2022 according to the Minnesota State Demographic Center's PopFinder could benefit from reduced emissions of air toxic pollutants. Data from MNRISKS, presented in Figure 1, indicate that 78% of census block groups in the seven metropolitan counties exceed one or more health benchmarks for air toxics pollution from all emitting sources. While the proposed rule will not directly reduce these emissions, there are indirect and secondary benefits from the MPCA having more timely and accurate information about air toxics emissions. This information could enable the MPCA to respond more quickly and effectively to emission increases or new health-based data from pollution.

In particular, as Figure 1 and Table 5 show, the communities in the metropolitan area that bear the heaviest burdens of air pollution tend to be communities of concern for environmental justice. The MPCA defines these areas as those which have higher proportions of lower-income residents, higher proportions of BIPOC residents, high proportion of limited proficiency in English, and Tribal census areas. Table 5 shows that an estimated 61% of the facilities that emit air toxics and would be affected by the proposed rule are located in or near areas of concern for environmental justice. Of the census block groups that exceed health benchmarks for air toxics pollution shown in Figure 1, 29% are in areas of concern for environmental justice. This rule will enable the MPCA to collect accurate air toxics emissions data and identify where there is unacceptable risk. Reducing risks to metropolitan area communities,

[20] Toxic Air Pollutants. (October 25, 2023). Retrieved from *https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/toxic-air-pollutants*

especially those overburdened by air pollution, would align with MPCA's mission to protect human health. See Section 7 below for a more thorough equity analysis of the proposed rule.

B. The probable costs to the Agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues.

The MPCA will be the only Minnesota state agency with a responsibility to implement and enforce the proposed rule. Various programs within the MPCA will be involved, including air emissions inventory, compliance and enforcement, small business environmental assistance program (SBEAP), and air pollution risk assessment.

MPCA staff who review air emissions inventories will need to conduct quality assurance and quality control of the data provided by affected facilities. They will also need to update the inventory's air toxics pollutant list and database with the pollutants as well as their emission factors. This will be especially important for any new PFAS incorporated into the TRI list after rule promulgation. Because the proposed rule only applies to the seven metropolitan counties, these staff may need to maintain a separate emissions inventory database for the seven metropolitan county area compared to the rest of the state. These staff may also need to provide assistance to facilities with their air toxics reporting. Because the MPCA's emissions inventories program will need to conduct these updates to adjust to the proposed rule once it is in place, there will be a need for increased staff resources in the first year after enactment of the rule compared to subsequent years when the updates are already in place. The MPCA estimates that in total, the emission inventory program will need an additional 1.20 to 1.85 full-time equivalent staff members (FTEs) in the first year after enactment of the rule, and 0.45 to 1.15 FTEs in subsequent years to conduct this work. These estimates include staff that are directly employed with the MPCA as well as staff that work at the MPCA but are employed by Minnesota IT Services (MNIT). The current average annual cost for an FTE to the MPCA, including all overhead costs, is $175,000. Thus, the estimated total additional annual staff cost to the MPCA's emission inventory program resulting from the proposed rule is between $210,000 and $324,000 in the first year and between $79,000 and $201,000 in subsequent years.

The MPCA's compliance and enforcement program will be tasked with enforcing the proposed rule. The MPCA has estimated that the additional compliance and enforcement staff needed will be 0.5 FTE, and this will not change from year to year after the proposed rule is in place. Based on the average annual FTE cost of $175,000, this equates to an estimated $87,500 per year as a result of the proposed rule.

The MPCA's SBEAP currently assists regulated facilities throughout the state to comply with all state environmental regulations. Helping facilities comply with the proposed rule will be no exception. The MPCA has estimated that the additional small business assistance staff time resulting from the proposed rule will be around 0.2 FTEs in the first year after the rule is enacted. In subsequent years, the MPCA anticipates that reporting facilities will need less assistance with complying with the proposed rule and estimates the additional small business staff time will equate to 0.13 FTEs after the first year. Again, at an average annual FTE cost of $175,000, this equates to approximately $35,000 in costs to the Agency in the first year and around $23,000 per year in subsequent years as a result of the proposed rule.

The work of MPCA risk assessors may also be affected by the proposed rule. However, although the MPCA anticipates that the rule will provide some additional work to these staff, it will also reduce the work of these staff in other ways. The MPCA expects the additional time and time savings to roughly offset each other, so the proposed rule is cost neutral for MPCA risk assessors.

In total, summing the estimated annual costs for all MPCA programs described above that will be

impacted by the proposed rule, the estimated total annual cost to the MPCA to implement and enforce the rule will be between $333,000 to $446,000 in the first year after rule adoption and between $189,000 to $311,000 in subsequent years.

The proposed rule is not expected to have any impact on state revenues. The MPCA will not be collecting fees from permit holders as part of their reporting obligations included in this proposed rule, and there are no other elements of the proposed rule that will lead to any inflows into or outflows out of the state's coffers. The MPCA received funding from the State Legislature for the air toxics emissions reporting rule implementation.

C. A determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule.

The purpose of this rule is to require air toxics emissions reporting in the seven metropolitan counties of Minnesota. This rule will allow the MPCA to inform the public and continue to pursue its mission to protect human health and the environment. Although the MPCA considered alternative methods for achieving this purpose, including continued voluntary emissions reporting, and monitoring for toxic air pollutants at or near emissions sources instead of requiring reporting (see Section 6(D) below), the MPCA reached the conclusion that there is no other thorough and effective way to achieve this purpose and meet the legislative intent.

The MPCA considered a few methods that may have been less costly, but they did not have the same results as the proposed rule. Those methods include:

- Requiring reporting from manufacturers of air toxics sold in Minnesota. This would be less costly for the permit holders but is out of scope for what the statute required of the MPCA in this rulemaking.
- Requiring the reporting of facility-wide emissions. This would result in less precise data and not enough information for the purposes that the MPCA will use the data.

As the MPCA implements and adjusts to the rule, the MPCA will identify potential cost-savings opportunities for internal processes and for facilities with air permits.

D. A description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the Agency and the reasons why they were rejected in favor of the proposed rule.

The MPCA has examined the alternatives to this rule and has relied on them for many years with few results that meet the needs of air toxics emissions reporting. Alternatives include:

- Air toxics emissions monitoring;
- Voluntary air toxics emissions reporting; and,
- Air toxics emissions modeling.

<u>Air Toxics Emissions Monitoring</u>

With nearly 700 potential air toxics emitting facilities across the seven metropolitan counties, and limited ability for the agency to monitor for all chemical emissions requested in reporting, monitoring is not a viable alternative. The MPCA currently has 22 ambient air toxics monitoring sites in the seven metropolitan counties. The annual cost for running these sites is $20,000 per year at each site. In addition to operating costs, these sites also require lab testing for different analytes using EPA-approved methods like Toxic Organics – 15 (TO-15) analysis method. At the current rate of about 3,000 samples per year at an average cost of $130 per sample, these costs are currently close to $400,000 per year. Additionally, the MPCA has experimented with fence-line, near fence-line, and neighborhood air toxics

monitoring. Many air toxics are most important to monitor at fence-line or near fence-line for accuracy as many air toxics volatilize or change chemical composition rapidly after exiting the facility. In order to effectively assess these emissions, monitors would be needed near each air toxic emitting facility, and ultimately each stack. Cumulatively, with 666 facilities located in the seven metropolitan counties, and a cost of $20,000 per year to operate an air toxic monitoring site at each facility, this would cost the MPCA $13.78 million per year. Current air toxics monitoring sites can only monitor for 74 pollutants. At a cost of $13 million to maintain over 600 sites, that only measure 74 pollutants, plus additional lab costs (likely an additional $12 million annually), monitoring is not a viable alternative, and certainly not a cost-effective alternative to this rulemaking effort.

Voluntary Air Toxics Emissions Reporting

Over half of air toxic emitting facilities currently report air toxics in the voluntary triennial air toxics emissions inventory. Since reporting is voluntary, and accuracy is not always a priority, many facilities often overreport pollutants. These overreports are discovered when modeling is completed, and a large risk is shown to be present from that facility. When the MPCA requests confirmation on the emissions, they are often found to be overreported. The MPCA has to fill in gaps with modeled emissions at facilities based on what is known from reported emissions and some understanding of each facility based on their North American Industry Classification System (NAICS) codes. Modeling risks based on directly reported emissions is important. The MPCA could maintain voluntary reporting and modeling, but these efforts would continue to be lacking completeness and accuracy. The MPCA has applied continuous improvements to the voluntary emissions inventory to ease reporting as much as possible, but it has not resulted in all facilities reporting.

Air Toxics Emissions Modeling

The EPA maintains its own screening tool of air toxics risks called AirToxScreen. This depicts cancer risks, and chronic noncancer hazards for some pollutants, across the United States. There is usually a delay in updating AirToxScreen. For example, AirToxScreen 2020 was released in May 2024. Furthermore, for nonreporting years, some emissions are estimated based on past data. The MPCA maintains a Minnesota-wide risk map called MNRISKS. This risk map is created using data from the emissions inventory and modeling these emissions based on stack parameters given by each facility. Receiving accurate emissions information will allow the MPCA to update the MNRISKS map and provide updated cancerous and noncancerous risk data to the reporting areas.

E. The probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals.

As detailed in Section 6(A), the primary parties that will be affected and will bear the costs associated with the proposed rule will be permitted facilities in the seven metropolitan counties. Table 5 categorizes the 666 facilities that would be affected according to permit type. There may be some categorical differences in compliance costs with the proposed rule to facilities based on the type of permit held by the facility. For example, the MPCA expects registration option C facilities to have lower costs than registration option D and Individual State permittees. Costs to facilities may include internal staff costs and/or costs for hiring external consultants to complete the reporting obligations. Besides additional staff time, whether internal staff or external consultants, it is not expected that facilities affected by this rule will need any other operational or capital resources (i.e., equipment) to fulfill the reporting obligations.

To glean information and insight into how much the proposed rule will cost these facilities, the MPCA sought comments from affected facilities during an informal comment period using SmartComments

and posed the question, among others, "How much will it cost (if anything) to complete air toxics reporting for this potential rule?" Nineteen facilities responded with comments, which included registration option C permittees, registration option D permittees, Individual State permittees, and others. Of the nineteen respondents, ten provided their estimates of how much it would cost to complete their air toxics reporting requirements under the proposed rule. The MPCA can make some general inferences of probable compliance costs with the proposed rule from these comment responses, but the sample size of respondents was not large enough to extrapolate an estimate of the average compliance costs for the entire population of 671 facilities that will be affected by the proposed rule with a high degree of confidence and statistical significance. For the facilities that provided cost estimates, the average low-end cost was approximately $5,400 with a high-end average cost of approximately $8,800. The lowest cost estimate for facilities that responded with cost information was $300 and the highest was $20,000. The MPCA is interpreting these to be estimates of annual (as opposed to one-time) costs, although this was not explicitly stated in the question posed. The MPCA also believes that facilities are likely to face nominally decreasing costs from year to year as systems to comply with the proposed rule are established and entrenched. Two-thirds of respondents reported that they would likely hire an external consultant to assist with this work. The MPCA deems all these responses as reasonable and likely to be credible. Ideally, the MPCA would like to subdivide these responses according to permit type (see Table 5), but unfortunately the small sample size of respondents precludes doing this with a high level of confidence. The MPCA's *a priori* expectation that registration option C facilities would likely face lower compliance costs than registration option D and Individual State facilities was not borne out by the responses, but again, this is likely due to the small sample size of respondents.

Based on the data reported in the responses, the MPCA believes it is reasonable to estimate an average annual compliance cost per facility of around $5,000 to $9,000. For most or all facilities, the MPCA does not expect that these compliance costs will place an excessive financial hardship on them that could threaten the viability of their businesses. Based on the 458 capped, general manufacturing, registration option A, registration option C, registration option D, and individual state or federal permitted facilities located in the seven metropolitan counties that will be affected by the proposed rule, the estimated total annual compliance cost across all affected facilities would be approximately $2.2 to $3.9 million. The most recent economic data for Minnesota estimates the total state domestic product revenue to be around $470 billion[21] so the costs to comply with this rule represent between 0.0005% to 0.0008% of our total economy. Of the largest permittee types (see Table 5 and Section 6(A)), registration option D facilities (295 affected facilities) and option A, general manufacturing, Individual State, or Federal facilities (144 affected facilities) are expected to face higher compliance costs with the proposed rule than registration C facilities (18 affected facilities).

As mentioned above in Section 6(B), MPCA's SBEAP staff will work with affected facilities to help them comply with the proposed rule and may also be able to help them identify and implement cost savings measures. It is likely that facilities that responded to MPCA's SmartComment request did not take this into consideration and as a result may have overestimated the costs to comply. For example, some registration option D facilities are already required to track, but not report, much of the data that the proposed rule will require them to report. These are facilities that emit over five tons of VOCs, and based on MPCA's most recent emissions inventory data, comprise about a quarter of the registration option D facilities in the state. Presumably, the added costs to comply with the proposed rule will be

[21] Economy of Minnesota. (Accessed June 14, 2024). Retrieved from *https://usafacts.org/topics/economy/state/minnesota/*

lower for these facilities, and the MPCA can work with the regulated facilities to identify this and other cost savings measures. Additionally, as mentioned above, the MPCA expects annual compliance costs to decrease as facilities establish systems for conducting the reporting. Since the MPCA assumes the facilities who responded were estimating their compliance costs in the first year after rule adoption, it is reasonable to conclude that this also contributes to the reported cost estimates likely being overestimations of ongoing annual compliance costs.

The repeal of Title V emergency affirmative defense provisions will result in no cost to facilities to comply with the rule, and no cost to the MPCA or the public because the rule will be repealed.

F. The probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals.

The alternative to not adopting the proposed rule would result in a "business-as-usual" continuation of the current system of voluntary reporting of air toxics emissions in the seven metropolitan counties which results in insufficient data. Simply put, the cost of not adopting the proposed amendments to rules governing air toxics emissions reporting would be foregoing the benefits that the proposed rule is expected to result in. Because these benefits are largely not a direct result of adopting the rule, they can be seen as "secondary" or "indirect" benefits and are difficult to quantify. Thus, much of the following discussion of expected benefits of the proposed rule is qualitative and descriptive in nature. The direct benefit of the proposed rule would be having better information on air toxics emissions in the seven metropolitan counties that will lead to improved understanding, awareness, and decision making related to the provision and distribution of that information. Although it is difficult in this instance to place a quantitative value on this information, qualitatively this information could enable the MPCA to identify and solve air quality and exposure problems, enabling the Agency to better achieve its mission of safeguarding and improving public health in Minnesota. Better emissions data will improve the MPCA's air quality modeling efforts, which will inform policy development.

The proposed rule will increase transparency of facility emissions data. The MPCA uses a variety of avenues to communicate this information to the general public in both direct and indirect ways. These include published emissions inventories and permitted facility air emissions data available on the Agency's web site.[22] This improved and more transparent information builds public confidence and trust. This could strengthen the public's understanding of the potential harm from toxic air pollutants and provide a greater capacity for meaningful involvement in the development and implementation of local pollution management policies. The proposed rule will provide the seven metropolitan county area communities the data needed to understand significant sources of air pollution that may be impacting them and to address existing environmental justice issues.

Availability of emissions information to Minnesota's residents, corporations, and government regulators provides a better basis for future policy analysis, and this benefits society as a whole. Accurate and transparent information is necessary for the implementation of efficient approaches to air quality management that meet environmental goals with lower costs as compared to other approaches.

The air toxics emissions data that is reported as a result of this rulemaking may be used to inform policy decisions and other rulemakings including the current air toxics emissions regulations and cumulative impacts rules. Furthermore, this data will provide the MPCA with annual air toxics emissions data that

[22] Point source air emissions data by MPCA Data Services. (February 16, 2024). Retrieved from *https://public.tableau.com/app/profile/mpca.data.services/viz/Pointsourceairemissionsdata_v10_5-11130/Byfacility*

can be used to assess health risks to communities.

Not adopting the repeal of Title V emergency affirmative defense provisions will result in no cost to facilities, the MPCA or the public because to the MPCA's knowledge the provision was never utilized.

G. An assessment of any differences between the proposed rule and existing federal regulations and a specific analysis of the need for and reasonableness of each difference.

Minn. Stat. § 14.131, requires that the MPCA consider the proposed amendments in relation to any corresponding federal requirements. In addition to this requirement to benchmark with the federal program, there is an additional requirement in Minn. Stat. § 116.07, subd. 2, (f), that requires the MPCA to benchmark with the federal program and with other states bordering Minnesota and with other states within EPA Region 5. The assessment is discussed in section 14 of the SONAR.

The current AERR (40 CFR Part 51 Subpart A) requires State, local, and some tribal agencies to annually report emissions of CAPs to the EPA for Type A and Type B facilities, or major sources (these include Individual State permits and Part 70 Federal permits). Under the current rule, carbon monoxide (CO), nitrogen oxides (NO_X), VOCs, SO_2, ammonia (NH_3), $PM_{2.5}$, PM_{10}, and lead must be reported. State, local, and tribal agencies may optionally report HAP emissions and other pollutants to EPA.

On August 9, 2023, the EPA released a proposal to revise the AERR to require certain facilities to annually report HAP emissions. The proposed updates would require major sources, as defined by EPA in 40 CFR Part 51.30 (Appendix A to Subpart A[23]), to report all HAP emissions, and there are no reporting thresholds. The proposal also includes requirements for other facilities, defined by EPA as minor sources and small entities, to report HAP emissions if emissions are above a specific pollutant reporting threshold based on human health risk. The new requirements would apply statewide. There are other potential data elements some facilities would be required to report, including release point locations, control equipment information, and many others. As proposed, the new requirements could start with the 2026 emissions inventory year, with facilities reporting in 2027. MPCA staff are uncertain when the EPA rule will be finalized and what changes will be made to the requirements based on public comments submitted to EPA during the RFC period. There are many differences in the EPA AERR proposal and the MPCA's proposed air toxics emissions reporting rule. The air toxics emissions reporting rule would require facilities in the seven metropolitan counties, except for option B registration facilities, to report annual air toxics emissions, including HAP emissions as well as other pollutants of concern in Minnesota. Minnesota also has current rules that require certain facilities to report mercury and lead emissions and requires facilities other than Type A and Type B facilities to obtain air permits and report air emissions annually. This proposed air toxics emissions reporting rule would require all facilities in the seven metropolitan counties that have an active air permit, except for registration option B facilities to report air toxics emissions. Besides Type A and Type B facilities (major sources), it is unclear what facilities will be required to report under the EPA AERR proposal. It is unlikely that all facilities that would be subject to the MPCA's proposed air toxics emissions reporting rule would be included under the AERR proposal. Also, there will likely be facilities that are not required to have an air permit that will be required to report HAP emissions under the EPA AERR proposal. The AERR proposal could potentially require facilities to report HAP emissions associated with IAs, whereas the proposed air toxics emissions reporting rule is not requiring facilities to report emissions related to IAs.

The AERR proposal also includes two options for reporting: (1) Owners/operators report HAP emissions

[23] Appendix A to Subpart A of Part 51, Title 40. (December 17, 2008). Retrieved from *https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-51/subpart-A/appendix-Appendix%20A%20to%20Subpart%20A%20of%20Part%2051*

directly to EPA using EPA's reporting system, Combined Air Emissions Reporting System (CAERS) or, (2) the State reports HAP emissions to EPA on behalf of the owners/operators. The MPCA would prefer to report HAP emissions to EPA on behalf of owners/operators to avoid duplicative reporting for owners/operators, and to maintain the high-quality data of Minnesota's point source emission inventory. It is reasonable to continue to move forward with the proposed air toxics emissions reporting rule as directed by Minn Stat. § 116.062 since there is uncertainty in what will be included in the final AERR. Also, the MPCA believes that it is important to require emissions reporting of additional air toxics of concern beyond HAPs to accurately assess risk to communities and protect human health and the environment. It is reasonable to move forward with this rule since EPA's AERR will not include all air permitted facilities in the seven metropolitan counties. It is important to require reporting for facilities as directed by Minn Stat. § 116.062.

Repealing the Title V emergency affirmative defense provisions will result in no differences between state and federal regulations.

H. An assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

Minn. Stat. § 14.131 defines "cumulative effect" as "the impact that results from incremental impact of the proposed rule in addition to the other rules, regardless of what state or federal agency has adopted the other rules. Cumulative effects can result from individually minor but collectively significant rules adopted over a period of time."

The MPCA does not expect the cumulative effect of this rule or the federal AERR to be significant. As air toxics reporting is not required by the CAA, currently there is no overlap or any impact from a federal rule. If the EPA finalizes the updates to the AERR, the MPCA will evaluate the cumulative impact of aligning these rules. The EPA has finalized many NESHAPs in the recent past and these could be seen as potentially impactful relative to air toxics, and this proposed rule. However, this rule has been written for the specific natural and economic environment in Minnesota. This rule seeks to target Minnesota-specific emissions reporting. NESHAPs do not require emissions reporting to MPCA, so this rule remains necessary to achieve the goal to understand Minnesota's metropolitan air toxics emissions.

Since not all facilities report air releases to the Toxic Release Inventory, the cumulative impact for this rule and TRI reporting would be different depending on the facility. If a facility has to report to the TRI as well as the MPCA, it will be occasionally redundant. These reporting processes are required in two different quarters, so it is not overly burdensome in the same time period.

MPCA's cumulative impact of the adoption of several rules over the next three years could have an impact on facilities. The MPCA has been diligent to engage all the rule teams to coordinate and communicate about the work of each rule team and build off each of the rules so as not to be overly burdensome to facilities.

Repealing the Title V emergency affirmative defense provisions will result in no differences between state and federal regulations so there will be no cumulative effect.

7. Environmental justice policy

The MPCA's Environmental Justice Framework 2015 – 2018, on page 3, describes the MPCAs history with environmental justice:

> *"Following action on the national level, the MPCA began formally working on environmental justice in the mid-1990s. Presidential Executive Order 12898, issued in 1994, directed each federal agency to make 'achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations.'*

The Presidential Executive Order built on Title VI of the Civil Rights Act of 1964. Title VI prohibits discrimination based on race, color, or national origin. As a recipient of federal funding, the MPCA is required to comply with Title VI of the Civil Rights Act.

The MPCA developed a policy for environmental justice that closely mirrors the EPA policy. The MPCA's policy, last revised in 2022, states:

> *" The Minnesota Pollution Control Agency expects the fair treatment and meaningful involvement of communities of color, Indigenous communities, and low-income communities in agency actions and decisions that affect them. It is the policy of the MPCA that an outcome of its work, in addition to protecting and improving the environment and public health, must address environmental justice concerns.*
>
> *"Fair treatment" means no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies.*
>
> *Meaningful Involvement happens when:*
>
> *• People have an opportunity to participate in decisions about activities that may affect their environment and/or health;*
>
> *• The public's contribution can influence the regulatory agency's decision;*
>
> *• Community concerns are considered in the decision-making process; and*
>
> *• The decision makers seek out and facilitate the involvement of those potentially affected.*
>
> *• Communities of color, indigenous communities, and low-income residents have a right to live in conditions that support a healthy and fulfilling life. The MPCA is committed to using its authority and influence to identify and support opportunities that improve environmental conditions and reverse generations of environmental inequities in areas of concern, enhancing environmental quality, and providing economic opportunities for future generations of Minnesotans."*

As explained in the Environmental Justice Framework on page 7, when undertaking rulemaking the MPCA considers how the impacts of a proposed rule are distributed across Minnesota and works to actively engage all Minnesotans in rule development. This review of the impacts and meaningful involvement are provided in this section of the SONAR for ease of review with the rest of the Regulatory Analysis, though these analyses are not required under the Administrative Procedures Act (Minn. Stat. ch. 14).

The MPCA defines areas of concern for Environmental Justice as areas in Minnesota that, based on the most recent data published by the United States Census Bureau, meets one or more of the following criteria[24]:

> (1) 40 percent or more of the area's total population is nonwhite;
> (2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;
> (3) 40 percent or more of the area's residents over the age of five have limited English proficiency; or
> (4) the area is located within Indian country, which is defined as federally recognized reservations and other Indigenous lands.

The MPCA uses this definition to prioritize areas with the potential for disproportionate environmental impacts and to target its delivery of regulatory services to correct these disproportionate impacts. The MPCA's efforts to prioritize bringing regulatory services to areas of concern for environmental justice includes its rulemaking actions. This SONAR includes an equity analysis to ensure that the proposed rule will not contribute to existing inequities and, at best, will reduce these inequities by bringing increased net benefits to areas of concern for environmental justice.

Equity analysis

To implement the "fair treatment" aspect of the Environmental Justice Framework policy, the MPCA would generally complete an equity analysis considering and documenting how the proposed rule may affect low-income populations and communities of color.

The MPCA does not expect the proposed rule to have any negative environmental consequences. The MPCA expects that areas of concern for environmental justice, in general, may benefit because this rule will result in data that can drive future policy or rulemaking to protect the health and environment for residents living in and around the seven metropolitan counties. Currently, areas of concern for environmental justice in the seven metropolitan counties tend to be overburdened with air pollution and related health risks relative to other areas. These health risks are exacerbated by lack of access to quality health care services, barriers to education, poverty, racial discrimination, transportation emissions, lack of community social status, low housing quality, and other structural, social, and economic inequities. In addition, the location of pollutant emission sources and their tendency to be in closer proximity to areas of concern for environmental justice than other areas is a key factor in health risk inequities and is another reason this proposed rule seeks to obtain improved emissions data for these areas.

As depicted above in Figure 1, areas of concern for environmental justice in the seven metropolitan counties tend to bear heavier pollution burdens than other areas based on known sources of toxic air pollution. In the seven metropolitan counties, 78% of census block groups exceed health benchmarks for air toxics pollution. Of census block groups with health benchmark exceedances, an estimated 29% are in areas of concern for environmental justice. This is largely because 61% of the facilities that emit air toxics, and would be affected by the proposed rule, are in areas of concern for environmental justice (see Table 5). Thus, to the extent that this rule could enable the MPCA to better respond to emission increases and better achieve its mission to protect human health, the metropolitan area communities

[24] Understanding environmental justice in Minnesota. (Accessed August 15, 2024). *https://www.pca.state.mn.us/about-mpca/environmental-justice*

that could see the highest benefit are the areas of concern for environmental justice currently overburdened by air pollution.

Moreover, as described above in Section 6(F), providing increased and improved information on air toxics emissions could enable communities to take more actions to reduce their exposure to risk and safeguard their health as well as generally inspire higher public confidence and trust. These benefits will also largely impact areas of concern for environmental justice as they are the areas that tend to have more facilities emitting air pollutants in or near them when compared to other areas. Annual air toxic pollutant emissions data can be used to advance the MPCA's and Minnesota's environmental justice goals by increasing the understanding of potential impacts of air toxics emissions from regulated facilities in areas which have been historically burdened by undisclosed pollution. Data from the emissions inventory and MNRISKS helps us understand and demonstrate that there are disproportionate impacts of air pollution. The MPCA can then craft policy, future rulemaking, and programs to address those disproportionate impacts.

Meaningful involvement

In order to strive for "meaningful involvement," the MPCA works to seek out and facilitate the involvement of those potentially affected by the proposed rule, particularly those populations that have historically not been as engaged in the public process.

As described in Section 3, there has been stakeholder involvement during the development of the proposed rules. While there was no specific plan developed to reach out to areas of concern for environmental justice, the MPCA believes that stakeholder outreach has ensured that most affected communities are aware of the rule. Additionally, during the formal public comment period, all interested and affected parties may submit comments on the proposed rulemaking.

The air toxics emissions data will be used in future health risk modeling and assessments. The MPCA seeks to engage the community and inform the public to understand risks from reported pollutants. While this rule is not intended to directly reduce risks from emissions reductions, MPCA does encourage the public to call out areas of concern for risk based on this information. MPCA intends to share the information about reported pollutants.

Once this rule is in place and emissions data are regularly reported and updated, communities can engage with these data on an annual basis and, with the MPCA, recognize changing emissions or areas of concern.

Additionally, all emissions data are submitted to EPA and are used to develop public tools including AirToxScreen, EJScreen, and the NEI. This is important for federal grant programs as well as providing transparency across the nation.

8. Notice plan

Minn. Stat. § 14.131 requires that an agency include in its SONAR a description of its efforts to provide additional notification to persons or classes of persons who may be affected by the proposed rule or must explain why these efforts were not made.

The MPCA utilizes a self-subscription service for interested and affected persons to register to receive rule related notices. Request for US Mail service is also available. Rule projects are listed on the Agency's Public Rulemaking docket. Once projects are active (i.e., no longer listed as a future project), a self-subscription list for that specific rule is established and an electronic notice is sent to individuals who have self-subscribed to receive notice for all rulemakings. The Agency also purchases the League of Minnesota Cities' email address list on a yearly basis. The list is used to reach out to new government

officials that may not be familiar with the electronic delivery system used by the MPCA to send rule notices, public notices, and other information. Examples of the government officials are Minnesota Cities, County Chairs, Zoning and Planning, Commissioners, and Solid Waste Officers. An electronic message is sent inviting individuals to subscribe to topics that interest them. The MPCA sent an electronic message to the government officials on March 4, 2024.

A. Notice

On November 25, 2024, the MPCA published a notice requesting comments on planned rule amendments to Minnesota Rules Chapters 7002, 7005, 7007, and 7019. The notice was placed on the MPCA's rule-specific webpage at: https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting

1) Minn. Stat. § 14.14, subd. 1a. The MPCA intends to send an electronic notice with a hyperlink to electronic copies of the Notice, SONAR and the proposed rule amendments to all parties who have registered with the MPCA for the purpose of receiving notice of rule proceedings, as required by Minn. Stat. § 14.14, subd. 1a, on the date the Notice is published in the *State Register*. Parties within this group that have requested non-electronic notice will receive copies of the Notice and the proposed rule amendments in hard copy via US Mail.
2) Minn. Stat. § 14.116. The MPCA intends to send a cover letter with a hyperlink to electronic copies of the Notice, SONAR and the proposed rule amendments to the chairs and ranking minority party members of the legislative policy and budget committees with jurisdiction over the subject matter of the proposed rule amendments as required by Minn. Stat § 14.116. The timing of this notice will occur at least 33 days before the end of the comment period as it will be delivered via United States Mail. This statute also states that if the mailing of the notice is within two years of the effective date of the law granting the Agency authority to adopt the proposed rules, the Agency must make reasonable efforts to send a copy of the notice and SONAR to all sitting house and senate legislators who were chief authors of the bill granting the rulemaking. This requirement applies because a bill was authored within the past two years granting rulemaking authority.
3) Minn. Stat. § 14.111 requires an agency to provide a copy of the proposed rule changes to the Commissioner of Agriculture no later than thirty days before publication of the proposed rule in the *State Register* if the rule has an impact on agricultural land. This rule is not expected to impact agricultural land or farming operations. The Commissioner of Agriculture will not be notified of potential rule changes.

B. Additional notice

Minn. Stat. § 14.14 requires that in addition to its required notices:

> "*each agency shall make reasonable efforts to notify persons or classes of persons who may be significantly affected by the rule being proposed by giving notice of its intention in newsletters, newspapers, or other publications, or through other means of communication.*"

The MPCA considered these statutory requirements governing additional notification and as detailed in this section, intends to fully comply with them. In addition, as described in Section 3, Public participation, and stakeholder involvement, the MPCA has made reasonable efforts thus far to notify and involve the public and stakeholders in the rule process, including various meetings and publishing the RFC.

The MPCA intends to request that the Office of Administrative Hearings review and approve the Additional Notice Plan, pursuant to Minn. R. 1400.2060. The MPCA's plan to notify additional parties includes the following:

1) Publish its Notice of Intent to Adopt Rules on the MPCA's Public Notice webpage at: https://www.pca.state.mn.us/public-notices.

2) Provide specific notice to tribal authorities. Notably, the Shakopee Mdewakanton Sioux Community is located within the seven metropolitan county area (Scott County). The MPCA maintains a contact list for the 11 federally recognized tribes in Minnesota. The MPCA will send specific electronic notice to the designated air tribal contact person of Minnesota's tribal communities. The notice will be sent on or near the day the proposed rule amendments are published in the *State Register and* will have a hyperlink to the webpage where electronic copies of the Notice of Intent to Adopt Rules, proposed rule amendments, and SONAR can be viewed.

3) Provide specific notice to the two entities, American Petroleum Institute, and the Minnesota Chamber of Commerce, that submitted comments during both RFC public comment periods. Electronic or U.S. mail notice will be sent to these entities on or near the day the proposed rule amendments are published in the *State Register*, and will have a hyperlink to the webpage where electronic copies of the Notice, proposed rule amendments, and SONAR can be viewed.

4) Provide specific notice to associations and environmental groups. The notice will be sent to the following associations and environmental groups on or near the day the proposed rule amendments are published in the *State Register*, and will have a hyperlink to the webpage where electronic copies of the Notice, proposed rule amendments, and SONAR can be viewed.

   - Aggregate & Ready-Mix Association of Minnesota;
   - Alliance of Automotive Service Providers;
   - American Coatings Association;
   - American Forest and Paper Association;
   - American Lung Association;
   - Association of Metropolitan Municipalities;
   - Association of Minnesota Counties;
   - Association of Woodworking and Furnishing Suppliers;
   - Bottineau Neighborhood Association;
   - Center for Earth, Energy, & Democracy;
   - Chemical Coaters Association;
   - Clean Air Minnesota;
   - Clean Up the River Environment;
   - Clean Water Action;
   - Clean Water Legacy;
   - Clean Water Minnesota Isaak Walton League Minnesota Chapter;
   - Coalition of Greater Minnesota Cities;
   - Complete Health Environmental and Safety Services;

- Conservation Minnesota;
- East Philips Neighborhood Institute;
- Environmental Initiative;
- Food & Water Watch;
- Hamline Midway Coalition;
- Iron Mining Association;
- Land Stewardship Project;
- League of Minnesota Cities;
- Metro Blooms;
- Metropolitan Airport Commission;
- Metropolitan Council;
- Minnesota Asphalt Pavement Association;
- Minnesota Association of Metal Finishers;
- Minnesota Association of Small Cities;
- Minnesota Association of Townships;
- Minnesota Bio-fuels Association;
- Minnesota City/County Management Association;
- Minnesota Center for Environmental Advocacy;
- Minnesota Corn Growers Association;
- Minnesota Department of Employment and Economic Development Small Business Development Centers;
- Minnesota Environmental Partnership;
- Minnesota Environmental Science and Economic Review Board;
- Minnesota Farm Bureau;
- Minnesota Milk Producers Association;
- Minnesota Propane Association;
- Minnesota Turkey Growers Association;
- Printing Industry Midwest;
- Sierra Club North Star Chapter;
- Voyageurs Conservancy; and
- All facilities in Minnesota with an air permit except for option B registration permits.

Note that some members of these entities may already subscribe to receive GovDelivery notices.

5) Provide specific notice to EPA Region 5. The notice will be sent to EPA Region 5 on or near the day the proposed rule amendments are published in the *State Register*, and will have a hyperlink to the webpage where electronic copies of the Notice of Intent to Adopt Rules, proposed rule amendments, and SONAR can be viewed.

6) Provide notice in an electronic newsletter. The MPCA uses an electronic newsletter to provide updates and information about air-related rulemakings, as explained above in Section 3. The MPCA will provide notice in its Air Mail newsletter with a hyperlink to the

webpage where electronic copies of the Notice of Intent to Adopt Rules, proposed rule amendments, and SONAR can be viewed.

7) Post rulemaking updates and documents including the proposed rule amendments and SONAR on the Air Toxic Emissions Reporting webpage at https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting.

The MPCA believes that by following the steps of this Additional Notice Plan, and its regular means of public notice, including early development of the GovDelivery mail list for this rulemaking, publication in the *State Register*, and posting on the MPCA's webpages, the MPCA will adequately provide additional notice pursuant to Minn. Stat. § 14.14, subd. 1a.

9. Performance-based rules

Minnesota Stat. § 14.002 requires state agencies, whenever feasible, to develop rules that are not overly prescriptive and inflexible, and rules that emphasize achievement of the MPCA's regulatory objectives while allowing maximum flexibility to regulated parties and to the MPCA in meeting those objectives.

MPCA seeks to comply with Minnesota Stat. § 14.002 to develop rules that are not overly prescriptive and inflexible. Rules must also be clear and defined so as best to help facilities comply. MPCA complies with this rule through:

- Providing facilities with numerous ways to calculate air toxics emissions found in 7019.3030.
- Assistance by the SBEAP to aid with calculating air toxic emissions for small businesses.
- Allowing numerous ways to input air toxics emissions data through direct reporting in CEDR or uploading spreadsheets of information to CEDR.
- Continuing to calculate air toxics emissions for combustion processes using the most current EPA and state emission factors and fuel usage or activity data reported by facilities. This will reduce time facilities need to spend on calculations and data entry.
- Continuing to populate e-services with emissions and activity data from the previous reporting year. This will assist facilities with review and input of data and improve quality of emissions data.
- Continuing to maintain a database of emissions factors. Emission factors will also continue to be available for selection in e-services.
- Establishing an emissions reporting due date on or before April 1. Facilities have three months to compile emissions from the previous year and report them to the Agency. Facilities will continue to have a 45-day summary review period to make any necessary corrections to emissions data before it is finalized by the MPCA. This aligns with existing required reporting.
- Identifying a de minimis for reporting emissions from material balance calculations as derived from the SDS. This is consistent with OSHA standards of 0.1% for carcinogens or potential carcinogens and 1% for other pollutants. The MPCA is not requiring facilities to test materials or go beyond information available to them on SDS for emissions reporting except for materials that do not have a de minimis and must be reported.
- Maintaining consistency in reporting and regulatory programs so these data can be used for modeling, risk evaluation, and the Agency's understanding of air toxics in the seven metropolitan counties. This proposed rule seeks to balance the needs for consistent emissions reporting while offering flexibility where possible.

10. Consideration of economic factors

In exercising its powers, the MPCA is required by identical provisions in Minn. Stat. § 116.07, subdivision 6 and Minn. Stat. § 115.43, subdivision 1 to give due consideration to:

> *…the establishment, maintenance, operation and expansion of business, commerce, trade, industry, traffic, and other economic factors and other material matters affecting the feasibility and practicability of any proposed action, including, but not limited to, the burden on a municipality of any tax which may result there from, and shall take or provide for such action as may be reasonable, feasible, and practical under the circumstances…*

The MPCA considers the effects that economic factors have on the feasibility and practicability of the proposed rule when determining whether and how to adopt rules. The MPCA seeks to implement the least-cost regulatory solutions if it does not compromise environmental goals or regulatory responsibilities.

The MPCA has met the requirements of this statute by the discussions provided in Section 6 Regulatory analysis of this SONAR regarding the possible economic effect of the proposed rules.

11. Consult with MMB on local government impact

As required by Minn. Stat. § 14.131, the MPCA will consult with Minnesota Management and Budget (MMB). We will do this by sending MMB copies of the documents that we send to the Governor's office for review and approval on the same day we send them to the Governor's office. We will do this before publishing the Notice of Intent to Adopt. The documents will include: the Governor's Office Proposed Rule and SONAR Form; the proposed rules; and the SONAR. The MPCA will submit a copy of the cover correspondence and any response received from MMB to the OAH at the hearing or with the documents it submits for Administrative Law Judge (ALJ) review.

12. Impact on local government ordinances and rules

Minn. Stat. § 14.128, subd. 1, requires an agency to make a determination of whether a proposed rule will require a local government to adopt or amend any ordinances or other regulation in order to comply with the rule.

The MPCA has determined that the proposed amendments will not have any effect on local ordinances or regulations. Local governments do not oversee any air permitting or reporting in their ordinances, so there will be no additional burden or effect on them.

13. Costs of complying for small business or city

Minn. Stat. § 14.127, subds. 1 and 2 require an agency to "determine if the cost of complying with a proposed rule in the first year after the rule takes effect will exceed $25,000 for any one business that has less than 50 full-time employees, or any one statutory or home rule charter city that has less than ten full-time employees."

The MPCA has done a general analysis of how much it will cost to comply with this rule. Detailed analysis is completed in Section 6. The specific analysis for the cost of complying for small businesses determined that no one business with less than 50 full-time employees will exceed $25,000 in costs during the first year of reporting. The MPCA estimates that it would require over 50 hours of expensive consultant time to reach the cost threshold of $25,000. MPCA staff estimated that for small businesses, these efforts will take approximately 10 hours on average. Even for a small business that has never calculated their air

toxic emissions before, it should not take more than 50 hours to do so. The MPCA is confident in this analysis because feedback from facilities by permit type was requested through an informal SmartComment comment period, including how much time they anticipate it would take to calculate and report emissions to comply with this rule. While it was difficult to make clear comparisons for small businesses, the MPCA estimates, based on the responses received, that it will cost businesses between $5,000 and $9,000 to comply with this rule. Small business costs will likely fall within the lower end of this range; closer to an average of $5,000 or less. This is below the $25,000 cost threshold posed in this section.

Additionally, there is no cost to using the Agency's e-services system, CEDR, to report air toxic emissions. The MPCA has also made upgrades to the system recently to allow for input of spreadsheets that contain all emissions. While this is likely more helpful for large facilities, it demonstrates the MPCA's responsiveness to the needs of facilities. MPCA's SBEAP currently helps small businesses that are not major sources of emissions with their emission inventory for both CAPs and voluntary air toxics reporting. This service is intended to continue with the implementation of this rule. The SBEAP assists many registration and state individual permit holders with reporting their data to the CEDR air emissions reporting tool.

If cities within the seven metropolitan counties have an air permit that would be subject to this rule and would be required to report air toxics, it would also not cost more than $25,000 to comply with this rule. Most cities with air permits that would be subject to this rule have permits for their boilers or generators. The MPCA intends to continue with the practice of calculating air toxics from boilers and generators based on the input of how much fuel was used and the best available emission factors from the EPA or the state. This practice occurs now for reporting CAPs, GHGs, and with the voluntary air toxics reporting. The MPCA intends to continue to assist city permit holders with these calculations.

14. Differences with federal and other state standards

Minn. Stat. § 116.07 subd. 2 requires that for proposed rules adopting air quality, solid waste, hazardous waste, or water quality standards, the SONAR must include an assessment of any differences between the proposed rule and existing federal standards adopted under the CAA, title 42, section 7412(b)(2); Clean Water Act, United States Code, title 33, sections 1312(a) and 1313(c)(4); and the Resource Conservation and Recovery Act, United States Code, title 42, section 6921(b)(1); similar standards in states bordering Minnesota; and similar standards in states within the EPA Region 5; and a specific analysis of the need and reasonableness of each difference.

A. Differences with federal standards

The federal TRI is an annual report of certain toxic chemical releases to air, water, and land by facilities that meet chemical activity thresholds and are either in a covered industry sector and exceed the employee threshold or are specifically required to report based on determination by the Administrator under EPCRA 313(b)(2). The TRI requires facilities to report releases of chemicals as fugitive and stack totals. The TRI list of pollutants includes HAPs, many PFAS pollutants, PBTs, and other pollutants of concern to air, land, and water. The TRI does not require facilities to report detailed information on facility controls, or units and process information.

The EPA's current AERR requires states to report air emissions data for CAPs on behalf of permitted facilities, but states may optionally report HAPs and other pollutants. States must report an "every-year inventory" and a triennial inventory. The every-year inventory includes annual emissions from large point sources. The triennial inventory includes annual emissions from point sources, non-point sources, and on-road and non-road mobile sources. States may also optionally report emissions from wild and

prescribed fires to the events data category. On August 9, 2023, the EPA proposed revisions to the AERR. This has been discussed in detail in earlier sections (1, 2, 5, and 6) of this report. The MPCA awaits the final rule promulgation to determine exact differences between this proposed rule and EPA's AERR. There are several differences between the AERR proposal, TRI program, and MPCA's proposed air toxics emissions reporting rule. The AERR proposal is based on authorities in the CAA, whereas the TRI is based on the authorities of the EPCRA. The TRI collects chemicals as a facility total of all stacks and all fugitives, whereas the AERR proposal and MPCA's proposed air toxics emissions reporting rule would require stack and fugitive emissions to be reported at the process or unit level. The AERR proposal and TRI program have different emission reporting thresholds and require different pollutants to be reported at different levels of detail. There will be overlap in what facilities will be required to report under each rule, but there will also be differences as described in previous sections. More facilities would be required to report under the proposed AERR requirements compared to the TRI program. The MPCA's proposed air toxics emissions reporting rule includes the seven metropolitan counties, whereas the TRI and AERR proposal require reporting for facilities across the entire state.

B. Differences with other state standards

The MPCA has reviewed air toxics reporting requirements in neighboring states (North Dakota, South Dakota, Iowa, and Wisconsin) and those in EPA's Region 5, a geographical region spanning Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

Wisconsin was one of the first states to require air toxics reporting. Their mandatory reporting rule (ch. NR 445, Wis. Admin. Code) was first adopted in 1988 and last revised in 2004. Wisconsin's rule requires facilities to identify air toxics, which include HAPS and additional pollutants (referred to in rule as "Hazardous air contaminants"), quantify emissions, and reduce or control emissions where necessary. Illinois, Iowa, North Dakota, and South Dakota require HAP reporting for certain facilities. Indiana and Michigan request voluntary air toxics reporting from facilities. Ohio does not request voluntary air toxics reporting and does not have a mandatory reporting rule.

In general, the proposed requirements in the MPCA's air toxics emissions reporting rule do not make Minnesota's air emissions inventory reporting requirements significantly more or less stringent than air programs in neighboring states and the EPA. It is difficult to compare since each state has differences within their air toxics reporting and permitting programs including definitions, activities requiring permits, permit types, etc. Some states require certain facilities to report HAP emissions and additional air toxics, as defined by each state, whereas other states request voluntary reporting. In addition, the federal proposed AERR could result in significant changes to other states' current air programs. A summary of the air toxics reporting required in other states is included below.

Table 6. Comparison of Neighboring States' Air Toxics Reporting Rules

State	Rule	Air Toxics Reporting
Iowa	Iowa Admin. Code Rule 567	Required annual reporting of HAPs for Title V and minor sources if they meet the minimum reporting requirement of greater than 0.005 tons/yr/pollutant.
North Dakota	North Dakota Century Code, Chapter 23.1-06	Required annual reporting of HAPs for Title V, synthetic minor and selected minor source facilities if they meet the minimum reporting requirement of greater than 0.05 tons/year.
South Dakota	South Dakota, Ch. 74:37	Required annual reporting of HAPs if a specific regulation (NESHAP or Maximum Achievable Control Technology (MACT)) applies to the facility.

Table 7. Comparison of EPA Region 5 States' Air Toxics Reporting Rules

State	Rule	Air Toxics Reporting
Illinois	Ill. Admin. Code tit. 35, Part 254 – Annual Emissions Report	Required annual reporting of HAPs if a specific regulation (NESHAP or MACT) applies to the facility.
Indiana	N/A	Voluntary annual reporting of HAPs.
Michigan	N/A	Voluntary annual reporting of HAPs.
Ohio	N/A	No air toxics reporting required.
Wisconsin	Ch. NR 445, Wis. Admin. Code – Wisconsin's Air Toxics Rule Ch. NR 438, Emissions Inventory Reporting Rule	Required annual reporting of HAPs and additional air toxics if facility is above a pollutant-specific risk threshold.

Minnesota's proposed rule will differ from states that only require HAPs emissions reporting because the MPCA is proposing that the emissions of additional pollutants of concern also be reported, including PFAS pollutants. It is reasonable to include reporting of air toxics of concern in the proposed rule because it will result in rules that are more protective of human health and the environment.

Minnesota's proposed rule will differ from states that only request voluntary reporting from facilities because Minn. Stat. § 116.062 has required that the MPCA adopt rules to require air toxics emissions reporting from facilities, and the purpose of the rule itself is to make this reporting required and enforceable. It is reasonable to mandate reporting because the state has general statutory authority and legislative directive to do so.

The MPCA is also proposing different reporting thresholds compared to other states. The MPCA's de minimis approach is reasonable because it requires fewer initial calculations to determine whether a facility has to report a certain air toxic. This is intended to ease the burden of reporting for facilities.

Additionally, the MPCA's proposed rule is clear about which facilities must report air toxics depending on the type of permit they hold, not based on reporting thresholds. It is reasonable to provide clarity about which facilities must report air toxics emissions in the proposed rule.

Lastly, the MPCA's proposed rule would require annual reporting of air toxics emissions. This is the same reporting frequency found in neighboring states and other EPA Region 5 states with air toxics emissions reporting rules. It is reasonable to require a reporting frequency that aligns with other states.

15. Authors, witnesses, and SONAR exhibits

A. Authors

1) Megan Kuhl-Stennes, Air Policy Planner, Environmental Analysis and Outcomes (EAO) Division, MPCA, is the technical lead for this rulemaking.
2) Rachel Olmanson, Air Emissions Inventory Coordinator, EAO Division, MPCA, is a technical lead in air data analysis for this rulemaking.
3) David Bael, Economic Policy Analyst, EAO Division, MPCA, is the economist for this rulemaking.

B. Witnesses and other staff

1) The agency expects that the proposed amendments will be noncontroversial. In the event that a hearing is necessary, the agency anticipates having the listed authors testify as witnesses in support of the need for and reasonableness of the rules.
2) Leslie Fredrickson, MPCA. Leslie is the General Counsel to the agency and will introduce the required jurisdictional documents into the record.
3) Addison Otto, MPCA. Addison is the project rule coordinator and will testify on any Minnesota Administrative Procedures Act process questions.

C. SONAR exhibits

1) S-1: the "Proposed Air Toxics Reporting List" is located at the end of this document.

16. Conclusion

In this SONAR, the agency has established the need for and the reasonableness of each of the proposed amendments to Minn. R. Chs. 7002, 7005, 7007, and 7019. The agency has provided the necessary notifications and in this SONAR documented its compliance with all applicable administrative rulemaking requirements of Minnesota statute and rules.

Based on the forgoing, the proposed amendments are both needed and reasonable.

Katrina Kessler

_____

Katrina Kessler, Commissioner
Minnesota Pollution Control Agency

September 30, 2024_____
Date

SONAR Exhibit 1: Proposed Air Toxics Reporting List

As of 7/31/2024

This is a list of the air toxics pollutants proposed to be reported in the annual air toxics emissions inventory. This list is subject to change because some pollutants are incorporated by reference into the rule. An updated list will be provided to reporting facilities prior to each emissions inventory.

Chemical Abstracts Service (CAS) Number	Pollutant
Individual Pollutants:	
75-56-9	(+/-)-1,2-Propylene oxide
156-60-5	(E)-1,2-Dichloroethylene
123-73-9	(E)-Crotonaldehyde
156-59-2	(Z)-1,2-Dichloroethylene
10061-01-5	(Z)-Dichloropropene
71-55-6	1,1,1-Trichloroethane
79-34-5	1,1,2,2-Tetrachloroethane
79-00-5	1,1,2-Trichloroethane
75-34-3	1,1-Dichloroethane
75-35-4	1,1-Dichloroethylene
57-14-7	1,1-Dimethylhydrazine
96-18-4	1,2,3-Trichloropropane
526-73-8	1,2,3-Trimethylbenzene
120-82-1	1,2,4-Trichlorobenzene
95-63-6	1,2,4-Trimethylbenzene
120-80-9	1,2-Benzenediol
96-12-8	1,2-Dibromo-3-chloropropane
106-93-4	1,2-Dibromoethane
95-50-1	1,2-Dichlorobenzene
107-06-2	1,2-Dichloroethane
540-59-0	1,2-Dichloroethylene
122-66-7	1,2-Diphenylhydrazine
106-88-7	1,2-Epoxybutane
108-67-8	1,3,5-Trimethylbenzene
106-99-0	1,3-Butadiene
541-73-1	1,3-Dichlorobenzene
542-75-6	1,3-Dichloropropene
1120-71-4	1,3-Propane sultone
106-50-3	1,4-Benzenediamine
106-51-4	1,4-Benzoquinone
106-46-7	1,4-Dichlorobenzene
123-91-1	1,4-Dioxane
822-06-0	1,6-Diisocyanatohexane
78-87-5	1-2,Dichloropropane
106-94-5	1-Bromopropane
71-36-3	1-Butanol

CAS Number	Pollutant
5131-66-8	1-Butoxy-2-propanol
75-68-3	1-Chloro-1,1-difluoroethane
107-98-2	1-Methoxy-2-propanol
115-07-1	1-Propene
540-84-1	2,2,4-Trimethylpentane
95-95-4	2,4,5-Trichlorophenol
88-06-2	2,4,6-Trichlorophenol
95-80-7	2,4-Diaminotoluene
51-28-5	2,4-Dinitrophenol
121-14-2	2,4-Dinitrotoluene
108-31-6	2,5-Furandione
53-96-3	2-Acetylaminofluorene
90-04-0	2-Anisidine
111-76-2	2-Butoxyethanol
532-27-4	2-Chloroacetophenone
591-78-6	2-Hexanone
95-53-4	2-Methylaniline
79-46-9	2-Nitropropane
91-94-1	3,3'-Dichlorobenzidine
119-93-7	3,3'-Dimethylbenzidine
563-47-3	3-Chloro-2-methylpropene
92-87-5	4,4'-Diamino-1,1'-biphenyl
101-77-9	4,4'-Diaminobiphenyl methane
101-68-8	4,4'-Diphenylmethane diisocyanate
101-14-4	4,4'-Methylenebis(2-chloroaniline)
96-45-7	4,5-Dihydro-2-mercaptoimidazole
534-52-1	4,6-Dinitro-o-cresol (including salts)
92-67-1	4-Biphenylamine
108-10-1	4-Methyl-2-pentanone
92-93-3	4-Nitrobiphenyl
100-02-7	4-Nitrophenol
75-07-0	Acetaldehyde
60-35-5	Acetamide
67-64-1	Acetone
75-05-8	Acetonitrile
98-86-2	Acetophenone
107-02-8	Acrolein
79-06-1	Acrylamide
79-10-7	Acrylic acid
107-13-1	Acrylonitrile
	Aldehyde
309-00-2	Aldrin
107-05-1	Allyl chloride
1318-09-8	Amphibole-group minerals
62-53-3	Aniline
140-57-8	Aramite

CAS Number	Pollutant
12674-11-2	Aroclor 1016
12672-29-6	Aroclor 1248
11097-69-1	Aroclor 1254
1332-21-4	Asbestos
1912-24-9	Atrazine
103-33-3	Azobenzene
100-52-7	Benzaldehyde
71-43-2	Benzene
3547-04-4	Benzene, 1,1'-ethylidenebis(4-chloro-
98-07-7	Benzotrichloride
85-68-7	Benzyl butyl phthalate
100-44-7	Benzyl chloride
57-57-8	beta-Propiolactone
92-52-4	Biphenyl
111-44-4	Bis(chloroethyl) ether
542-88-1	bis(Chloromethyl) ether
108-86-1	Bromobenzene
75-25-2	Bromoform
123-72-8	Butyraldehyde
119-90-4	C.I. Disperse Black 6
60-11-7	C.I. Solvent Yellow 2
156-62-7	Calcium cyanamide
105-60-2	Caprolactam
133-06-2	Captan
63-25-2	Carbaryl
75-15-0	Carbon disulfide
56-23-5	Carbon tetrachloride
463-58-1	Carbonyl sulfide
1306-38-3	Ceric oxide
133-90-4	Chloramben
57-74-9	Chlordane
7782-50-5	Chlorine
10049-04-4	Chlorine dioxide
79-11-8	Chloroacetic acid
108-90-7	Chlorobenzene
510-15-6	Chlorobenzilate
75-45-6	Chlorodifluoromethane
75-00-3	Chloroethane
67-66-3	Chloroform
74-87-3	Chloromethane
107-30-2	Chloromethyl methyl ether
126-99-8	Chloroprene
98-82-8	Cumene
110-82-7	Cyclohexane
50-29-3	DDT
117-81-7	Di(2-ethylhexyl) phthalate

CAS Number	Pollutant
334-88-3	Diazomethane
132-64-9	Dibenzofuran
84-74-2	Dibutyl 1,2-benzenedicarboxylate
25321-22-6	Dichlorobenzene
75-71-8	Dichlorodifluoromethane
75-09-2	Dichloromethane
62-73-7	Dichlorvos
77-73-6	Dicyclopentadiene
111-42-2	Diethanolamine
131-11-3	Dimethyl phthalate
77-78-1	Dimethyl sulfate
79-44-7	Dimethylcarbamoyl chloride
117-84-0	Di-n-octyl phthalate
106-89-8	Epichlorohydrin
140-88-5	Ethyl acrylate
64-67-5	Ethyl sulfate (Et2SO4)
637-92-3	Ethyl t-butyl ether
100-41-4	Ethylbenzene
107-21-1	Ethylene glycol
75-21-8	Ethylene oxide
151-56-4	Ethyleneimine
82-68-8	Fartox
50-00-0	Formaldehyde
64-18-6	Formic acid
76-44-8	Heptachlor
87-68-3	Hexachloro-1,3-butadiene
118-74-1	Hexachlorobenzene
77-47-4	Hexachlorocyclopentadiene
67-72-1	Hexachloroethane
680-31-9	Hexamethylphosphoramide
302-01-2	Hydrazine
7647-01-0	Hydrochloric acid
7664-39-3	Hydrogen fluoride
7783-06-4	Hydrogen sulfide
123-31-9	Hydroquinone
78-59-1	Isophorone
67-56-1	Methanol
72-43-5	Methoxychlor
74-83-9	Methyl bromide
78-93-3	Methyl ethyl ketone
74-88-4	Methyl iodide
624-83-9	Methyl isocyanate
80-62-6	Methyl methacrylate
1634-04-4	Methyl tert butyl ether
60-34-4	Methylhydrazine
2385-85-5	Mirex

CAS Number	Pollutant
121-69-7	N,N-Dimethylaniline
68-12-2	N,N-Dimethylformamide
91-20-3	Naphthalene
110-54-3	n-Hexane
7697-37-2	Nitric acid
98-95-3	Nitrobenzene
924-16-3	N-Nitrosodibutylamine
55-18-5	N-Nitrosodiethylamine
62-75-9	N-Nitrosodimethylamine
59-89-2	N-Nitrosomorpholine
684-93-5	N-Nitroso-N-methylurea
930-55-2	N-Nitrosopyrrolidine
72-55-9	p,p'-DDE
56-38-2	Parathion
40487-42-1	Pendimethalin
87-86-5	Pentachlorophenol
108-95-2	Phenol
75-44-5	Phosgene
7803-51-2	Phosphine
7723-14-0	Phosphorus (yellow or white)
85-44-9	Phthalic anhydride
9016-87-9	Polymethylene polyphenyl polyisocyanate
123-38-6	Propanal
114-26-1	Propoxur
75-55-8	Propyleneimine
91-22-5	Quinoline
7631-86-9	Silica
100-42-5	Styrene
96-09-3	Styrene oxide
7664-93-9	Sulfuric acid
12789-03-6	Technical chlordane
540-88-5	tert-Butyl acetate
75-65-0	tert-Butyl alcohol
127-18-4	Tetrachloroethylene
109-99-9	Tetrahydrofuran
62-56-6	Thiourea
7550-45-0	Titanium tetrachloride
108-88-3	Toluene
584-84-9	Toluene 2,4-diisocyanate
26471-62-5	Toluene diisocyanate
8001-35-2	Toxaphene
10061-02-6	trans-1,3-Dichloropropene
79-01-6	Trichloroethylene
121-44-8	Triethylamine
1582-09-8	Trifluralin
51-79-6	Urethane

CAS Number	Pollutant
108-05-4	Vinyl acetate
593-60-2	Vinyl bromide
75-01-4	Vinyl chloride
2,4-D, salts and esters, including but not limited to:	
5742-19-8	(2,4-Dichlorophenoxy)acetic acid diethanolamine
2008-39-1	(2,4-Dichlorophenoxy)acetic acid dimethylamine
1320-18-9	2,4-D 2-butoxymethylethyl ester
53404-37-8	2,4-D 2-Ethyl-4-methylpentyl ester
1929-73-3	2,4-D Butotyl
94-80-4	2,4-D Butyl ester
2971-38-2	2,4-D Chlorocrotyl ester
94-11-1	2,4-D isopropyl ester
5742-17-6	2,4-D isopropylamine salt
2702-72-9	2,4-D sodium salt
32341-80-3	2,4-D Triisopropanolammonium salt
94-75-7	2,4-Dichlorophenyoxyacetic acid
1928-43-4	2-Ethylhexyl (2,4-dichlorophenoxy)acetate
Aluminum compounds, including but not limited to:	
1344-28-1	Alumina
7429-90-5	Aluminum
7784-18-1	Aluminum fluoride
Antimony compounds, including but not limited to:	
16925-25-0	Antimonate(1-), hexfluoro-, sodium (1:1), (OC-6-11)-
7440-36-0	Antimony
1327-33-9	Antimony oxide
7783-70-2	Antimony pentafluoride
10025-91-9	Antimony trichloride
1309-64-4	Antimony trioxide
1345-04-6	Antimony trisulfide colloid
Arsenic compounds, including but not limited to:	
7440-38-2	Arsenic
7778-39-4	Arsenic acid
1327-53-3	Arsenic oxide (As2O3)
1303-28-2	Arsenic(V) pentoxide
3141-12-6	Arsenous acid, triethyl ester
7784-42-1	Arsine
7784-40-9	Lead arsenate
10031-13-7	Lead arsenite
Beryllium compounds, including but not limited to:	
7440-41-7	Beryllium
7787-47-5	Beryllium chloride
7787-49-7	Beryllium fluoride
13597-99-4	Beryllium nitrate (Be(NO3)2)
1304-56-9	Beryllium oxide (BeO)
13510-49-1	Beryllium sulfate

CAS Number	Pollutant
Cadmium compounds, including but not limited to:	
7440-43-9	Cadmium
543-90-8	Cadmium acetate
7789-42-6	Cadmium bromide
10108-64-2	Cadmium chloride
10325-94-7	Cadmium dinitrate
7790-80-9	Cadmium iodide
1306-19-0	Cadmium oxide
2223-93-0	Cadmium stearate
10124-36-4	Cadmium sulfate (1:1)
1306-23-6	Cadmium sulfide
Chromium compounds, including but not limited to:	
7788-96-7	(T-4)-Difluorodioxochromium
7788-98-9	Ammonium chromate ((NH4)2CrO4)
7789-09-5	Ammonium dichromate
10294-40-3	Barium chromate
13765-19-0	Calcium monochromate
10060-12-5	Chromic chloride hexahydrate
7738-94-5	Chromic(VI) acid
7440-47-3	Chromium
16065-83-1	Chromium (III)
18540-29-9	Chromium (VI)
21679-31-2	Chromium acetylacetonate
10025-73-7	Chromium chloride (CrCl3)
10049-05-5	Chromium dichloride
12018-01-8	Chromium oxide (CrO2)
10101-53-8	Chromium sulfate (Cr2(SO4)3)
1308-14-1	Chromium trihydroxide
1333-82-0	Chromium trioxide
50922-29-7	Chromium zinc oxide
12018-19-8	Chromium zinc oxide (Cr2ZnO4)
1308-38-9	Chromium(III) oxide
14977-61-8	Chromyl chloride
13530-68-2	Dichromic acid
18454-12-1	Lead chromate oxide
7758-97-6	Lead(II) chromate
14307-35-8	Lithium chromate
7789-00-6	Potassium chromate(VI)
7778-50-9	Potassium dichromate
7775-11-3	Sodium chromate
10034-82-9	Sodium chromate tetrahydrate
10588-01-9	Sodium dichromate
7789-06-2	Strontium chromate
13530-65-9	Zinc chromate
11103-86-9	Zinc potassium chromate

CAS Number	Pollutant
Cobalt compounds, including but not limited to:	
13586-82-8	2-Ethylhexanoic acid--cobalt (1/1)
71701-14-9	Bis(3-((1-(3-chlorophenyl)-4, 5-dihydro-3-methyl-5-(oxo-kappaO)-1H-pyra
1345-16-0	C.I. Pigment Blue 28
7440-48-4	Cobalt
7542-09-8	Cobalt carbonate
16842-03-8	Cobalt hydrocarbonyl [CoH(CO)4]
1317-42-6	Cobalt monosulfide
61789-51-3	Cobalt naphthenates
27253-31-2	Cobalt neodecanoate
1308-06-1	Cobalt oxide (Co3O4)
10124-43-3	Cobalt sulfate
10141-05-6	Cobalt(II) nitrate
1307-96-6	Cobalt(II) oxide
68955-83-9	Fatty acids, C9-13-neo-, cobalt salts
136-52-7	Hexanoic acid, 2-ethyl-, cobalt(2+) salt
Copper compounds, including but not limited to:	
7440-50-8	Copper
544-92-3	Copper cyanide
7758-99-8	Copper(II) sulfate, pentahydrate
Cresols including:	
1319-77-3	Cresol
108-39-4	m-Cresol
95-48-7	o-Cresol
106-44-5	p-Cresol
Cyanide compounds, including but not limited to:	
78-82-0	2-Methylpropanenitrile
544-92-3	Copper cyanide
57-12-5	Cyanide
74-90-8	Hydrogen cyanide
151-50-8	Potassium cyanide
14220-17-8	Potassium tetracyanonickelate
506-64-9	Silver cyanide
143-33-9	Sodium cyanide (Na(CN))
557-21-1	Zinc cyanide
Dioxins/Furans, including:	
35822-46-9	1,2,3,4,6,7,8- Heptachlorodibenzodioxin
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzo[b,d]furan
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzodioxin
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
57117-41-6	1,2,3,7,8- Pentachlorodibenzofuran

CAS Number	Pollutant
40321-76-4	1,2,3,7,8- Pentachlorodibenzo-p-dioxin
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran
57117-31-4	2,3,4,7,8- Pentachlorodibenzofuran
1746-01-6	2,3,7,8-Tetrachlorodibenzo-1,4-dioxin
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran
39001-02-0	Octachlorodibenzofuran
3268-87-9	Octachlorodibenzo-p-dioxin
Fine mineral fibers including:	
	Ceramic fibers
	Fine mineral fibers
	Glasswool
	Rockwool
	Slagwool
Glycol ethers, including but not limited to:	
18912-80-6	2-(2-(2-Methylpropoxy)ethoxy)ethanol
112-34-5	2-(2-Butoxyethoxy)ethanol
111-90-0	2-(2-Ethoxyethoxy)ethanol
112-15-2	2-(2-Ethoxyethoxy)ethyl acetate
10137-96-9	2-[(2-Methylpentyl)oxy]ethan-1-ol
7795-91-7	2-[(Butan-2-yl)oxy]ethan-1-ol
143-22-6	2-[2-(2-Butoxyethoxy)ethoxy]ethanol
112-50-5	2-[2-(2-Ethoxyethoxy)ethoxy]ethanol
112-35-6	2-[2-(2-Methoxyethoxy)ethoxy]ethanol
112-59-4	2-[2-(Hexyloxy)ethoxy]ethanol
10143-56-3	2-{2-[(2-Methylpentyl)oxy]ethoxy}ethan-1-ol
112-07-2	2-Butoxyethyl acetate
110-80-5	2-Ethoxyethanol
112-25-4	2-Hexyloxyethanol
109-86-4	2-Methoxyethanol
110-49-6	2-Methoxyethyl acetate
3121-61-7	2-Methoxyethyl acrylate
122-99-6	2-Phenoxyethanol
23495-12-7	2-Phenoxyethyl propanoate
2807-30-9	2-Propoxyethanol
112-36-7	Diethylene glycol diethyl ether
111-96-6	Diethylene glycol dimethyl ether
124-17-4	Diethylene glycol monobutyl ether acetate
111-77-3	Diethylene glycol monomethyl ether
1002-67-1	Ethane, 1-ethoxy-2-(2-methoxyethoxy)-
110-71-4	Ethylene glycol demethyl ether
629-14-1	Ethylene glycol diethyl ether
111-15-9	Ethylene glycol monoethyl ether acetate
4439-24-1	Ethylene glycol monoisobutyl ether

CAS Number	Pollutant
20706-25-6	Ethylene glycol monopropyl ether acetate
112-49-2	Triethylene glycol dimethyl ether
Lead compounds, including but not limited to:	
	Alkylated lead
598-63-0	Carbonic acid, lead(2+) salt (1:1)
7439-92-1	Lead
7784-40-9	Lead arsenate
10031-13-7	Lead arsenite
18454-12-1	Lead chromate oxide
1309-60-0	Lead dioxide
13814-96-5	Lead fluoroborate
1317-36-8	Lead monoxide
61790-14-5	Lead naphthenate
10099-74-8	Lead nitrate
1335-25-7	Lead oxide
7446-27-7	Lead phosphate (3:2)
7446-14-2	Lead sulphate
1314-41-6	Lead tetroxide
12060-00-3	Lead titanium oxide (PbTiO3)
12626-81-2	Lead zirconate titanate
301-04-2	Lead(II) acetate
7758-97-6	Lead(II) chromate
1335-32-6	Monobasic lead acetate
27253-28-7	Neodecanoic acid, lead salt
7428-48-0	Octadecanoic acid, lead salt
78-00-2	Tetraethyl lead
Lindane (all isomers), including but not limited to:	
608-73-1	1,2,3,4,5,6-Hexachlorocyclohexane
319-84-6	alpha-1,2,3,4,5,6-Hexachlorocyclohexane
319-85-7	beta-Hexachlorocyclohexane
319-86-8	delta-Hexachlorocyclohexane
6108-10-7	epsilon-Hexachlorocyclohexane
6108-12-9	eta-Hexachlorocyclohexane
58-89-9	gamma-Hexachlorocyclohexane
58-89-9	Lindane (all isomers)
6108-13-0	theta-Hexachlorocyclohexane
6108-11-8	zeta-Hexachlorocyclohexane
Manganese compounds, including but not limited to:	
8030-70-4	Fatty acids, tall-oil, manganese salts
7439-96-5	Manganese
12079-65-1	Manganese cyclopentadienyl tricarbonyl
1313-13-9	Manganese dioxide
1317-35-7	Manganese oxide (Mn3O4)
1317-34-6	Manganese sesquioxide
7785-87-7	Manganese sulfate (1:1)

Service CAS Number	Pollutant
7783-16-6	Manganese(II) hypophosphite monohydrate
1336-93-2	Naphthenic acids, manganese salts
10377-66-9	Nitric acid, manganese(2+) salt (2:1)
7722-64-7	Potassium permanganate
10101-50-5	Sodium permanganate
Mercury compounds, including but not limited to:	
7487-94-7	Mercuric chloride
7439-97-6	Mercury
22967-92-6	Methyl mercury(II) cation
62-38-4	Phenylmercuric acetate
Nickel compounds, including but not limited to:	
7440-02-0	Nickel
13138-45-9	Nickel bis(nitrate)
12710-36-0	Nickel carbide
3333-67-3	Nickel carbonate
7718-54-9	Nickel chloride
6018-89-9	Nickel diacetate tetrahydrate
12054-48-7	Nickel hydroxide (Ni(OH)2)
1314-06-3	Nickel oxide (Ni2O3)
	Nickel refinery dust
12035-72-2	Nickel subsulfide
7786-81-4	Nickel sulfate
13463-39-3	Nickel tetracarbonyl
13462-88-9	Nickel(2+) bromide
373-02-4	Nickel(II) acetate
1313-99-1	Nickel(II) oxide
10101-97-0	Nickel(II) sulfate hexahydrate
1271-28-9	Nickelocene
14220-17-8	Potassium tetracyanonickelate
13770-89-3	Sulfamic acid, nickel(2+) salt (2:1)
Per-and polyfluoroalkyl substances (PFAS)	
209482-18-8	1-(4-Butoxynaphthyl)tetrahydrothiophenioum perfluorobutanesulfonate
375-61-1	1,1,1,2,2,3,3,4,4,5,5-Undecafluoropentane
811-97-2	1,1,1,2-Tetrafluoroethane
420-46-2	1,1,1-Trifluoroethane
82113-65-3	1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl] methanesulfonamide
27905-45-9	1,1,2,2-Tetrahydroperfluorodecyl acrylate
17741-60-5	1,1,2,2-Tetrahydroperfluorododecyl acrylate
34362-49-7	1,1,2,2-Tetrahydroperfluorohexadecyl acrylate
34395-24-9	1,1,2,2-Tetrahydroperfluorotetradecyl acrylate
148240-89-5	1,3-Propanediol, 2,2-bis[[(γ-ω-perfluoro-C10-20-alkyl)thio]methyl] derivs., phosphates, ammonium salts

Service CAS Number	Pollutant
148240-85-1	1,3-Propanediol, 2,2-bis[[(γ-ω-perfluoro-C4-10-alkyl)thio]methyl] derivs., phosphates, ammonium salts
148240-87-3	1,3-Propanediol, 2,2-bis[[(γ-ω-perfluoro-C6-12-alkyl)thio]methyl] derivs., phosphates, ammonium salts
1078142-10-5	1,3-Propanediol, 2,2-bis[[(γ-ω-perfluoro-C6-12-alkyl)thio]methyl] derivs., polymers with 2,2-bis[[(γ-ω-perfluoro-C10-20-alkyl)thio]methyl]-1,3-propanediol, 1,6-diisocyanato-2,2,4(or 2,4,4)-trimethylhexane, 2-heptyl-3,4-bis(9-isocyanatononyl)-1-pentylcyclohexane and 2,2'-(methylimino)bis[ethanol]
68515-62-8	1,4-Benzenedicarboxylic acid, dimethyl ester, reaction products with bis(2-hydroxyethyl)terephthalate, ethylene glycol, α-fluoro-ω-(2-hydroxyethyl)poly(difluoromethylene), hexakis(methoxymethyl)melamine and polyethylene glycol
120226-60-0	10:2 Fluorotelomer sulfonic acid
763051-92-9	11-Chloroperfluoro-3-oxaundecanesulfonic acid
67906-42-7	1-Decanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heneicosafluoro-, ammonium salt
27619-90-5	1-Decanesulfonyl chloride, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-
678-39-7	1-Decanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-
27619-91-6	1-Dodecanesulfonyl chloride, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluoro-
865-86-1	1-Dodecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluoro-
65104-65-6	1-Eicosanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,17,17,18,18,19,19,20,20,20-heptatriacontafluoro-
68555-76-0	1-Heptanesulfonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-N-(2-hydroxyethyl)-N-methyl-
68957-62-0	1-Heptanesulfonamide, N-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-
68259-07-4	1-Heptanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-, ammonium salt
70225-15-9	1-Heptanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1)
60270-55-5	1-Heptanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-, potassium salt
335-71-7	1-Heptanesulfonyl fluoride, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-

Service CAS Number	Pollutant
60699-51-6	1-Hexadecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluoro-
68555-75-9	1-Hexanesulfonamide, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-N-(2-hydroxyethyl)-N-methyl-
68259-08-5	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, ammonium salt
70225-16-0	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1)
3871-99-6	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, potassium salt
2252-84-8	1H-Heptafluoropropane
375-17-7	1H-Nonafluorobutane
355-37-3	1H-Perfluorohexane
375-83-7	1-Hydroperfluoroheptane
17202-41-4	1-Nonanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-nonadecafluoro-, ammonium salt
65104-67-8	1-Octadecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,17,17,18,18,18-tritriacontafluoro-
24448-09-7	1-Octanesulfonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-(2-hydroxyethyl)-N-methyl-
31506-32-8	1-Octanesulfonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-methyl-
178094-69-4	1-Octanesulfonamide, N-[3-(dimethyloxidoamino)propyl]-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, potassium salt
2263-09-4	1-Octanesulfonamide, N-butyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-(2-hydroxyethyl)-
67969-69-1	1-Octanesulfonamide, N-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-[2-(phosphonooxy)ethyl]-, diammonium salt
61660-12-6	1-Octanesulfonamide, N-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-[3-(trimethoxysilyl)propyl]-
29081-56-9	1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, ammonium salt
70225-14-8	1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1)
68555-74-8	1-Pentanesulfonamide, 1,1,2,2,3,3,4,4,5,5,5-undecafluoro-N-(2-hydroxyethyl)-N-methyl-
68259-09-6	1-Pentanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,5-undecafluoro-, ammonium salt
70225-17-1	1-Pentanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,5-undecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1)

CAS Number	Pollutant
3872-25-1	1-Pentanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,5-undecafluoro-, potassium salt
70983-60-7	1-Propanaminium, 2-hydroxy-N,N,N-trimethyl-, 3-[(γ-ω-perfluoro-C6-20-alkyl)thio] derivs., chlorides
38006-74-5	1-Propanaminium, 3-[[(heptadecafluorooctyl)sulfonyl]amino]-N,N,N-trimethyl-, chloride
1078715-61-3	1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-[2-[(γ-ω-perfluoro-C4-20-alkyl)thio]acetyl] derivs., inner salts
68555-81-7	1-Propanaminium, N,N,N-trimethyl-3-[[(pentadecafluoroheptyl)sulfonyl]amino]-, chloride
67584-58-1	1-Propanaminium, N,N,N-trimethyl-3-[[(pentadecafluoroheptyl)sulfonyl]amino]-, iodide
52166-82-2	1-Propanaminium, N,N,N-trimethyl-3-[[(tridecafluorohexyl)sulfonyl]amino]-, chloride
68957-58-4	1-Propanaminium, N,N,N-trimethyl-3-[[(tridecafluorohexyl)sulfonyl]amino]-, iodide
68957-55-1	1-Propanaminium, N,N,N-trimethyl-3-[[(undecafluoropentyl)sulfonyl]amino]-, chloride
68957-57-3	1-Propanaminium, N,N,N-trimethyl-3-[[(undecafluoropentyl)sulfonyl]amino]-, iodide
68187-47-3	1-Propanesulfonic acid, 2-methyl-, 2-[[1-oxo-3-[(γ-ω-perfluoro-C4-16-alkyl)thio]propyl]amino] derivs., sodium salts
68758-57-6	1-Tetradecanesulfonyl chloride, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluoro-
39239-77-5	1-Tetradecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluoro-
2991-50-6	2-(N-Ethylperfluorooctanesulfonamido)acetic acid
2355-31-9	2-(N-Methylperfluorooctanesulfonamido)acetic acid
53826-13-4	2-(Perfluorodecyl)ethanoic acid
53826-12-3	2-(Perfluorohexyl)ethanoic acid
27854-31-5	2-(Perfluorooctyl)ethanoic acid
359-49-9	2,3,3,3-Tetrafluoropropanoic Acid
25268-77-3	2-[[(Heptadecafluorooctyl)sulfonyl]methylamino]ethyl acrylate
383-07-3	2-[Butyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl acrylate
423-82-5	2-[Ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl acrylate
376-14-7	2-[Ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl methacrylate
914637-49-3	2H,2H,3H,3H-Perfluorooctanoic acid
70887-84-2	2H-Perfluoro-2-decenoic acid

CAS Number	Pollutant
3330-14-1	2H-Perfluoro-5-methyl-3,6-dioxanonane
68867-60-7	2-Propenoic acid, 2-[[(heptadecafluorooctyl)sulfonyl]methylamino]ethyl ester, polymer with 2-[methyl[(nonafluorobutyl)sulfonyl]amino]ethyl 2-propenoate, 2-[methyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl 2-propenoate, 2-[methyl[(tridecafluorohexyl)sulfonyl]amino]ethyl 2-propenoate, 2-[methyl[(undecafluoropentyl)sulfonyl]amino]ethyl 2-propenoate and α-(1-oxo-2-propenyl)-ω-methoxypoly(oxy-1,2-ethanediyl)
68298-62-4	2-Propenoic acid, 2-[butyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl ester, telomer with 2-[butyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl 2-propenoate, methyloxirane polymer with oxirane di-2-propenoate, methyloxirane polymer with oxirane mono-2-propenoate and 1-octanethiol
59071-10-2	2-Propenoic acid, 2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl ester
68084-62-8	2-Propenoic acid, 2-[methyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl ester
67584-57-0	2-Propenoic acid, 2-[methyl[(tridecafluorohexyl)sulfonyl]amino]ethyl ester
67584-56-9	2-Propenoic acid, 2-[methyl[(undecafluoropentyl)sulfonyl]amino]ethyl ester
150135-57-2	2-Propenoic acid, 2-methyl-, 2-(dimethylamino)ethyl ester, polymers with Bu acrylate, γ-ω-perfluoro-C8-14-alkyl acrylate and polyethylene glycol monomethacrylate, 2,2'-azobis[2,4-dimethylpentanenitrile]-initiated
196316-34-4	2-Propenoic acid, 2-methyl-, 2-(dimethylamino)ethyl ester, polymers with γ-ω-perfluoro-C10-16-alkyl acrylate and vinyl acetate, acetates
68555-91-9	2-Propenoic acid, 2-methyl-, 2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl ester, polymer with 2-[ethyl[(nonafluorobutyl)sulfonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl 2-methyl-2-propenoate, 2-ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl 2-methyl-2-propenoate and octadecyl 2-methyl-2-propenoate

CAS Number	Pollutant
68239-43-0	2-Propenoic acid, 2-methyl-, 2-ethylhexyl ester, polymer with α-fluoro-ω-[2-[(2-methyl-1-oxo-2-propen-1-yl)oxy]ethyl]poly(difluoromethylene), 2-hydroxyethyl 2-methyl-2-propenoate and N-(hydroxymethyl)-2-propenamide
1996-88-9	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester
2144-54-9	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester
65104-45-2	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-methyl-2-propenoate, methyl 2-methyl-2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl 2-methyl-2-propenoate and 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl 2-methyl-2-propenoate
6014-75-1	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl ester
4980-53-4	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluorohexadecyl ester
65605-59-6	2-Propenoic acid, 2-methyl-, dodecyl ester, polymer with α-fluoro-ω-[2-[(2-methyl-1-oxo-2-propen-1-yl)oxy]ethyl]poly(difluoromethylene) and N-(hydroxymethyl)-2-propenamide
203743-03-7	2-Propenoic acid, 2-methyl-, hexadecyl ester, polymers with 2-hydroxyethyl methacrylate, γ-ω-perfluoro-C10-16-alkyl acrylate and stearyl methacrylate
142636-88-2	2-Propenoic acid, 2-methyl-, octadecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl 2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2- propenoate and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl 2- propenoate
200513-42-4	2-Propenoic acid, 2-methyl-, polymer with butyl 2-methyl-2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-propenoate, 2-hydroxyethyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate

CAS Number	Pollutant
68227-96-3	2-Propenoic acid, butyl ester, telomer with 2-[[(heptadecafluorooctyl)sulfonyl]methylamino]ethyl 2-propenoate, 2-[methyl[(nonafluorobutyl)sulfonyl]amino]ethyl 2-propenoate, α-(2-methyl-1-oxo-2-propenyl)-ω-hydroxypoly(oxy-1,4-butanediyl), α-(2-methyl-1-oxo-2-propenyl)-ω-[(2-methyl-1-oxo-2-propenyl)oxy]poly(oxy-1,4-butanediyl), 2-[methyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl 2-propenoate, 2-[methyl[(tridecafluorohexyl)sulfonyl]amino]ethyl 2-propenoate, 2-[methyl[(undecafluoropentyl)sulfonyl]amino]ethyl 2-propenoate and 1-octanethiol
65605-58-5	2-Propenoic acid, esters, 2-methyl-, dodecyl ester, polymer with α-fluoro-ω-[2-[(2-methyl-1-oxo-2-propen-1-yl)oxy]ethyl]poly(difluoromethylene)
812-70-4	3-(Perfluoroheptyl)propanoic acid
70887-88-6	3-(Perfluoropentyl)-3-fluoro-2-propenoic acid
356-02-5	3:3 Fluorotelomer carboxylic acid
1652-63-7	3-[[(Heptadecafluorooctyl)sulfonyl]amino]-N,N,N-trimethyl-1-propanaminium iodide
919005-14-4	4,8-Dioxa-3H-perfluorononanoic acid
27619-93-8	4:2 Fluorotelomer sulfonate sodium
757124-72-4	4:2 Fluorotelomer sulfonic acid
27619-94-9	6:2 Fluorotelomer sulfonate sodium salt
27619-97-2	6:2 Fluorotelomer sulfonic acid
27619-96-1	8:2 Fluorotelomer sulfonate sodium salt
39108-34-4	8:2 Fluorotelomer sulfonic acid
335-65-9	8H-Perfluorooctane
2742694-36-4	Acetamide, N-(2-aminoethyl)-, 2-[(γ-ω-perfluoro-C4-20-alkyl)thio] derivs., polymers with N1,N1-dimethyl-1,3-propanediamine, epichlorohydrin and ethylenediamine, oxidized
2738952-61-7	Acetamide, N-[3-(dimethylamino)propyl]-, 2-[(γ-ω-perfluoro-C4-20-alkyl)thio] derivs.
2744262-09-5	Acetic acid, 2-[(γ-ω-perfluoro-C4-20-alkyl)thio] derivs., 2-hydroxypropyl esters
68391-08-2	Alcohols, C8-14, γ-ω-perfluoro
2728655-42-1	Alcohols, C8-16, γ-ω-perfluoro, reaction products with 1,6-diisocyanatohexane, glycidol and stearyl alc.
97659-47-7	Alkenes, C8-14 α-, δ-ω-perfluoro
68188-12-5	Alkyl iodides, C4-20, γ-ω-perfluoro
10495-86-0	Ammonium perfluorobutanoate
21615-47-4	Ammonium perfluorohexanoate
3825-26-1	Ammonium perfluorooctanoate
2816091-53-7	Betaines, dimethyl(.gamma.-.omega.-perfluoro-.gamma.-hydro-C8-18-alkyl)
1478-61-1	Bisphenol AF

CAS Number	Pollutant
68187-25-7	Butanoic acid, 4-[[3-(dimethylamino)propyl]amino]-4-oxo-, 2(or 3)-[(γ-ω-perfluoro-C6-20-alkyl)thio] derivs.
75-73-0	Carbon tetrafluoride
75-45-6	Chlorodifluoromethane
75-72-9	Chlorotrifluoromethane
68141-02-6	Chromium(III) perfluorooctanoate
67584-42-3	Cyclohexanesulfonic acid, decafluoro(pentafluoroethyl)-, potassium salt
68156-07-0	Cyclohexanesulfonic acid, decafluoro(trifluoromethyl)-, potassium salt
68156-01-4	Cyclohexanesulfonic acid, nonafluorobis(trifluoromethyl)-, potassium salt
3107-18-4	Cyclohexanesulfonic acid, undecafluoro-, potassium salt
2043-53-0	Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-iodo-
75-10-5	Difluoromethane
118400-71-8	Disulfides, bis(γ-ω-perfluoro-C6-20-alkyl)
2043-54-1	Dodecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-12-iodo-
56773-42-3	Ethanaminium, N,N,N-triethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonic acid (1:1)
65636-35-3	Ethanaminium, N,N-diethyl-N-methyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]-, methyl sulfate, polymer with 2-ethylhexyl 2-methyl-2-propenoate, α-fluoro-ω-[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl]poly(difluoromethylene), 2-hydroxyethyl 2-methyl-2-propenoate and N-(hydroxymethyl)-2-propenamide
182176-52-9	Ethaneperoxoic acid, reaction products with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl thiocyanate and 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl thiocyanate
65530-64-5	Ethanol, 2,2'-iminobis-, compd. with α,α'-[phosphinicobis(oxy-2,1-ethanediyl)]bis[ω-fluoropoly(difluoromethylene)] (1:1)
65530-74-7	Ethanol, 2,2'-iminobis-, compd. with α-fluoro-ω-[2-(phosphonooxy)ethyl]poly(difluoromethylene) (1:1)
65530-63-4	Ethanol, 2,2'-iminobis-, compd. with α-fluoro-ω-[2-(phosphonooxy)ethyl]poly(difluoromethylene) (2:1)
72623-77-9	Fatty acids, C6-18, perfluoro, ammonium salts
72968-38-8	Fatty acids, C7-13, perfluoro, ammonium salts
178535-23-4	Fatty acids, linseed-oil, γ-ω-perfluoro-C8-14-alkyl esters
593-53-3	Fluoromethane
55910-10-6	Glycine, N-[(heptadecafluorooctyl)sulfonyl]-N-propyl-, potassium salt
2991-51-7	Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt

CAS Number	Pollutant
67584-62-7	Glycine, N-ethyl-N-[(pentadecafluoroheptyl)sulfonyl]-, potassium salt
67584-53-6	Glycine, N-ethyl-N-[(tridecafluorohexyl)sulfonyl]-, potassium salt
67584-52-5	Glycine, N-ethyl-N-[(undecafluoropentyl)sulfonyl]-, potassium salt
65510-55-6	Hexadecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14-nonacosafluoro-16-iodo-
116-15-4	Hexafluoropropene
13252-13-6	Hexafluoropropylene oxide dimer acid
62037-80-3	Hexafluoropropylene oxide dimer acid ammonium salt
135228-60-3	Hexane, 1,6-diisocyanato-, homopolymer, γ-ω-perfluoro-C6-20-alc.-blocked
29457-72-5	Lithium (perfluorooctane)sulfonate
90076-65-6	Lithium bis[(trifluoromethyl)sulfonyl] azanide
376-27-2	Methyl perfluorooctanoate
1691-99-2	N-Ethyl-N-(2-hydroxyethyl)perfluorooctanesulfonamide
16517-11-6	Octadecanoic acid, pentatriacontafluoro-
115-25-3	Octafluorocyclobutane
559-40-0	Octafluorocyclopentene
335-66-0	Octanoyl fluoride, pentadecafluoro-
354-33-6	Pentafluoroethane
71608-60-1	Pentanoic acid, 4,4-bis[(γ-ω-perfluoro-C8-20-alkyl)thio] derivs.
678-26-2	Perflenapent
756426-58-1	Perfluoro(2-((6-chlorohexyl)oxy)ethanesulfonic acid)
863090-89-5	Perfluoro(4-methoxybutanoic acid)
428-59-1	Perfluoro(methyloxirane)
113507-82-7	Perfluoro-2-ethoxyethanesulfonic acid
3330-15-2	Perfluoro-3-(1H-perfluoroethoxy)propane
151772-58-6	Perfluoro-3,6-dioxaheptanoic acid
377-73-1	Perfluoro-3-methoxypropanoic acid
355-25-9	Perfluorobutane
375-73-5	Perfluorobutane sulfonic acid
45187-15-3	Perfluorobutanesulfonate
45048-62-2	Perfluorobutanoate
375-22-4	Perfluorobutanoic acid
335-77-3	Perfluorodecanesulfonic acid
335-76-2	Perfluorodecanoic acid
79780-39-5	Perfluorododecanesulfonic acid
307-55-1	Perfluorododecanoic acid
76-16-4	Perfluoroethane
335-57-9	Perfluoroheptane
375-92-8	Perfluoroheptanesulfonic acid
375-85-9	Perfluoroheptanoic acid
355-42-0	Perfluorohexane

CAS Number	Pollutant
355-46-4	Perfluorohexanesulfonic acid
307-24-4	Perfluorohexanoic acid
68259-12-1	Perfluorononanesulfonic acid
375-95-1	Perfluorononanoic acid
307-34-6	Perfluorooctane
1763-23-1	Perfluorooctane sulfonic acid
754-91-6	Perfluorooctanesulfonamide
335-67-1	Perfluorooctanoic acid
21652-58-4	Perfluorooctyl Ethylene
507-63-1	Perfluorooctyl iodide
307-35-7	Perfluorooctylsulfonyl fluoride
67905-19-5	Perfluoropalmitic acid
2706-91-4	Perfluoropentanesulfonic acid
2706-90-3	Perfluoropentanoic acid
76-19-7	Perfluoropropane
422-64-0	Perfluoropropanoic acid
365971-87-5	Perfluorotetradecanoate
376-06-7	Perfluorotetradecanoic acid
72629-94-8	Perfluorotridecanoic acid
2058-94-8	Perfluoroundecanoic acid
68412-69-1	Phosphinic acid, bis(perfluoro-C6-12-alkyl) derivs.
68412-68-0	Phosphonic acid, perfluoro-C6-12-alkyl derivs.
74499-44-8	Phosphoric acid, γ-ω-perfluoro-C8-16-alkyl esters, compds. with diethanolamine
65530-62-3	Poly(difluoromethylene), α,α'-[phosphinicobis(oxy-2,1-ethanediyl)]bis[ω-fluoro-
65530-70-3	Poly(difluoromethylene), α,α'-[phosphinicobis(oxy-2,1-ethanediyl)]bis[ω-fluoro-, ammonium salt
123171-68-6	Poly(difluoromethylene), α-[2-(acetyloxy)-3-[(carboxymethyl)dimethylammonio]propyl]-ω-fluoro-, inner salt
65530-83-8	Poly(difluoromethylene), α-[2-[(2-carboxyethyl)thio]ethyl]-ω-fluoro-
65530-69-0	Poly(difluoromethylene), α-[2-[(2-carboxyethyl)thio]ethyl]-ω-fluoro-, lithium salt
65530-59-8	Poly(difluoromethylene), α-fluoro-ω-(2-hydroxyethyl)-, 2-hydroxy-1,2,3-propanetricarboxylate (3:1)
65605-56-3	Poly(difluoromethylene), α-fluoro-ω-(2-hydroxyethyl)-, dihydrogen 2-hydroxy-1,2,3-propanetricarboxylate
65605-57-4	Poly(difluoromethylene), α-fluoro-ω-(2-hydroxyethyl)-, hydrogen 2-hydroxy-1,2,3-propanetricarboxylate
65530-61-2	Poly(difluoromethylene), α-fluoro-ω-[2-(phosphonooxy)ethyl]-
95144-12-0	Poly(difluoromethylene), α-fluoro-ω-[2-(phosphonooxy)ethyl]-, ammonium salt
65530-72-5	Poly(difluoromethylene), α-fluoro-ω-[2-(phosphonooxy)ethyl]-, diammonium salt

CAS Number	Pollutant
65530-71-4	Poly(difluoromethylene), α-fluoro-ω-[2-(phosphonooxy)ethyl]-, monoammonium salt
65605-73-4	Poly(difluoromethylene), α-fluoro-ω-[2-[(1-oxo-2-propenyl)oxy]ethyl]-, homopolymer
65530-65-6	Poly(difluoromethylene), α-fluoro-ω-[2-[(1-oxooctadecyl)oxy]ethyl]-
65530-66-7	Poly(difluoromethylene), α-fluoro-ω-[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl]-
80010-37-3	Poly(difluoromethylene), α-fluoro-ω-[2-sulphoethyl)-
29117-08-6	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl]-ω-hydroxy-
68958-61-2	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl]-ω-methoxy-
68298-81-7	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-ω-hydroxy-
68958-60-1	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-ω-methoxy-
56372-23-7	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl]-ω-hydroxy-
68298-80-6	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl]-ω-hydroxy-
65545-80-4	Poly(oxy-1,2-ethanediyl), α-hydro-ω-hydroxy-, ether with α-fluoro-ω-(2-hydroxyethyl)poly(difluoromethylene)(1:1)
70983-59-4	Poly(oxy-1,2-ethanediyl), α-methyl-ω-hydroxy-, 2-hydroxy-3-[(γ-ω-perfluoro-C6-20-alkyl)thio]propyl ethers
37338-48-0	Poly[oxy(methyl-1,2-ethanediyl)], α-[2-[ethyl[(heptadecafluorooctyl)sulfonyl]amino]ethyl]-ω-hydroxy
68259-39-2	Poly[oxy(methyl-1,2-ethanediyl)], α-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-ω-hydroxy-
68259-38-1	Poly[oxy(methyl-1,2-ethanediyl)], α-[2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl]-ω-hydroxy-
68310-17-8	Poly[oxy(methyl-1,2-ethanediyl)], α-[2-[ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl]-ω-hydroxy-
83329-89-9	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate
2966-54-3	Potassium heptafluorobutanoate
335-24-0	Potassium perfluoro-4-ethylcyclohexanesulfonate
29420-49-3	Potassium perfluorobutane sulfonate
2795-39-3	Potassium perfluorooctanesulfonate
2395-00-8	Potassium perfluorooctanoate
2923-16-2	Potassium trifluoroacetate
238420-80-9	Propanedioic acid, mono(γ-ω-perfluoro-C8-12-alkyl) derivs., bis[4-(ethenyloxy)butyl] esters
238420-68-3	Propanedioic acid, mono(γ-ω-perfluoro-C8-12-alkyl) derivs., di-me esters
61798-68-3	Pyridinium, 1-(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)-, salt with 4-methylbenzenesulfonic acid (1:1)

CAS Number	Pollutant
83048-65-1	Silane, (3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)trimethoxy-
78560-44-8	Silane, trichloro(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)-
125476-71-3	Silicic acid (H4SiO4), disodium salt, reaction products with chlorotrimethylsilane and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-1-decanol
143372-54-7	Siloxanes and Silicones, (3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)oxy Me, hydroxy Me, Me octyl, ethers with polyethylene glycol mono-Me ether
335-93-3	Silver(I) perfluorooctanoate
2250081-67-3	Sodium 4,8-dioxa-3H-perfluorononanoate
2218-54-4	Sodium perfluorobutanoate
2806-15-7	Sodium perfluorodecanesulfonate
1260224-54-1	Sodium perfluorododecanesulfonate
21934-50-9	Sodium perfluoroheptane sulfonate
2923-26-4	Sodium perfluorohexanoate
4021-47-0	Sodium perfluorooctanesulfonate
335-95-5	Sodium perfluorooctanoate
4151-50-2	Sulfluramid
180582-79-0	Sulfonic acids, C6-12-alkane, γ-ω-perfluoro, ammonium salts
30046-31-2	Tetradecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12-pentacosafluoro-14-iodo-
116-14-3	Tetrafluoroethylene
97553-95-2	Thiocyanic acid, γ-ω-perfluoro-C4-20-alkyl esters
68140-21-6	Thiols, C10-20, γ-ω-perfluoro
68140-18-1	Thiols, C4-10, γ-ω-perfluoro
1078712-88-5	Thiols, C4-20, γ-ω-perfluoro, telomers with acrylamide and acrylic acid, sodium salts
68140-20-5	Thiols, C6-12, γ-ω-perfluoro
70969-47-0	Thiols, C8-20, γ-ω-perfluoro, telomers with acrylamide
75-69-4	Trichlorofluoromethane
75-46-7	Trifluoromethane
1493-13-6	Trifluoromethanesulfonic acid
144317-44-2	Triphenylsulfonium nonafluorobutanesulfonate
Phosphorus compounds, including but not limited to:	
7664-38-2	Phosphoric acid
10025-87-3	Phosphoric trichloride
Polychlorinated biphenyls, including but not limited to:	
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB-189)
38380-08-4	2,3,3',4,4',5/2,3,3',4,4',5-Hexachlorobiphenyl (PCBs 156/157)
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB-105)
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl (PCB-167)
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl (PCB-114)

CAS Number	Pollutant
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PCB-118)
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl (PCB-123)
7012-37-5	2,4,4'-Trichlorobiphenyl
2051-60-7	2-Chlorobiphenyl
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl (PCB-169)
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl (PCB-126)
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (PCB-77)
70362-50-4	3,4,4',5-Tetrachlorobiphenyl (PCB-81)
2050-68-2	4,4'-Dichlorobiphenyl (PCB-15)
2051-24-3	Decachlorobiphenyl (PCB-209)
28655-71-2	Heptachlorobiphenyls
26601-64-9	Hexachlorobiphenyls
53742-07-7	Nonachlorobiphenyls
55722-26-4	Octachlorobiphenyls
25429-29-2	Pentachlorobiphenyls
1336-36-3	Polychlorinated biphenyls
26914-33-0	Tetrachlorobiphenyls
Polycyclic organic mater, including but not limited to:	
51338-27-3	(+-)-Diclofop-methyl
64969-34-2	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-, sulfate (1:2)
42397-64-8	1,6-Dinitropyrene
42397-65-9	1,8-Dinitropyrene
2422-79-9	12-Methylbenz[a]anthracene
81-49-2	1-Amino-2,4-dibromoanthraquinone
82-28-0	1-Amino-2-methylanthraquinone
832-69-9	1-Methyl phenanthrene
90-12-0	1-Methylnaphthalene
2381-21-7	1-Methylpyrene
134-32-7	1-Naphthylamine
5522-43-0	1-Nitropyrene
1163-19-5	2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether
117-79-3	2-Aminoanthraquinone
91-58-7	2-Chloronaphthalene
26914-18-1	2-Methylanthracene
91-57-6	2-Methylnaphthalene
2531-84-2	2-Methylphenanthrene
91-59-8	2-Naphthylamine
607-57-8	2-Nitrofluorene
90-43-7	2-Phenylphenol
79-94-7	3,3',5,5'-Tetrabromobisphenol A
612-83-9	3,3'-Dichlorobenzidine dihydrochloride
111984-09-9	3,3'-Dimethoxybenzidine hydrochloride
612-82-8	3,3'-Dimethylbenzidine dihydrochloride
56-49-5	3-Methylcholanthrene
101-61-1	4,4'-Methylenebis(N,N-dimethylaniline)
101-80-4	4,4'-Oxydianiline

CAS Number	Pollutant
139-65-1	4,4'-Thiodianiline
57835-92-4	4-Nitropyrene
156-10-5	4-Nitrosodiphenylamine
57-41-0	5-5-Diphenylhydantoin
3697-24-3	5-Methylchrysene
602-87-9	5-Nitroacenaphthene
41637-90-5	6-Methylchrysene
7496-02-8	6-Nitrochrysene
57-97-6	7,12-Dimethylbenz(a)anthracene
194-59-2	7H-Dibenzo[c,g]carbazole
779-02-2	9-Methylanthracene
83-32-9	Acenaphthene
208-96-8	Acenaphthylene
3761-53-3	Acid Red 26
62476-59-9	Acifluorfen sodium
68085-85-8	alpha-Cyhalothrin
33089-61-1	Amitraz
120-12-7	Anthracene
492-80-8	Auramine
56-55-3	Benz(a)anthracene
205-99-2	Benzo(b)fluoranthene
205-82-3	Benzo(j)fluoranthene
203-33-8	Benzo[a]fluoranthene
50-32-8	Benzo[a]pyrene
195-19-7	Benzo[c]phenanthrene
192-97-2	Benzo[e]pyrene
203-12-3	Benzo[g,h,i]fluoranthene
191-24-2	Benzo[g,h,i]perylene
207-08-9	Benzo[k]fluoranthene
56832-73-6	Benzofluoranthene
94-36-0	Benzoyl peroxide
82657-04-3	Bifenthrin
80-05-7	Bisphenol A
6459-94-5	C.I. Acid Red 114
1937-37-7	C.I. Direct Black 38
72-57-1	C.I. Direct Blue 14
28407-37-6	C.I. Direct Blue 218
2602-46-2	C.I. Direct Blue 6
16071-86-6	C.I. Direct Brown 95
20325-40-0	C.I. Disperse Black 6 dihydrochloride
2832-40-8	C.I. Disperse Yellow 3
3118-97-6	C.I. Solvent Orange 7
60-09-3	C.I. Solvent Yellow 1
842-07-9	C.I. Solvent Yellow 14
128-66-5	C.I. Vat Yellow 4
86-74-8	Carbazole

CAS Number	Pollutant
218-01-9	Chrysene
	Coal tar
68359-37-5	Cyfluthrin
13684-56-5	Desmedipham
226-36-8	Dibenz[a,h]acridine
53-70-3	Dibenz[a,h]anthracene
224-42-0	Dibenz[a,j]acridine
192-65-4	Dibenzo(a,e)pyrene
5385-75-1	Dibenzo[a,e]fluoranthene
189-64-0	Dibenzo[a,h]pyrene
189-55-9	Dibenzo[a,i]pyrene
191-30-0	Dibenzo[a,l]pyrene
97-23-4	Dichlorophen
115-32-2	Dicofol
35367-38-5	Diflubenzuron
957-51-7	Diphenamid
122-39-4	Diphenylamine
4680-78-8	FD&C Green No. 1
60168-88-9	Fenarimol
13356-08-6	Fenbutatin oxide
66441-23-4	Fenoxaprop-ethyl
72490-01-8	Fenoxycarb
39515-41-8	Fenpropathrin
51630-58-1	Fenvalerate
206-44-0	Fluoranthene
86-73-7	Fluorene
69409-94-5	Fluvalinate
72178-02-0	Fomesafen
1335-87-1	Hexachloronaphthalene
70-30-4	Hexachlorophene
67485-29-4	Hydramethylnon
193-39-5	Indeno[1,2,3-cd]pyrene
77501-63-4	Lactofen
569-64-2	Malachite green
65357-69-9	Methylbenzopyrene
90-94-8	Michler's ketone
1836-75-5	Nitrofen
86-30-6	N-Nitrosodiphenylamine
97-56-3	o-Aminoazotoluene
2234-13-1	Octachloronaphthalene
41766-75-0	o-Tolidine dihydrofluoride
42874-03-3	Oxyfluorfen
52645-53-1	Permethrin
198-55-0	Perylene
85-01-8	Phenanthrene
77-09-8	Phenolphthalein

CAS Number	Pollutant
26002-80-2	Phenothrin
	Polybrominated biphenyls
130498-29-2	Polycyclic aromatic hydrocarbons
	Polycyclic aromatic hydrocarbons/Polycyclic organic matter - unspecified
129-00-0	Pyrene
76578-14-8	Quizalofop-ethyl
989-38-8	Rhodamine 6G
81-88-9	Rhodamine B
132-27-4	Sodium 2-phenylphenate
3383-96-8	Temephos
639-58-7	Triphenyltin chloride
76-87-9	Triphenyltin hydroxide
Warfarin and salts	
Selenium compounds, including but not limited to:	
7783-07-5	Hydrogen selenide
7783-00-8	Selenious acid
7782-49-2	Selenium
7446-08-4	Selenium dioxide
7488-56-4	Selenium disulfide
7783-79-1	Selenium hexafluoride
12640-89-0	Selenium oxide
7446-34-6	Selenium sulfide (SeS)
Vanadium compounds, including but not limited to:	
12604-58-9	Ferrovanadium
7440-62-2	Vanadium
1314-62-1	Vanadium oxide (V2O5)
Xylenes including:	
108-38-3	m-Xylene
95-47-6	o-Xylene
106-42-3	p-Xylene
1330-20-7	Xylenes (mixed isomers)
Zinc compounds, including but not limited to:	
50922-29-7	Chromium zinc oxide
12018-19-8	Chromium zinc oxide (Cr2ZnO4)
7440-66-6	Zinc
13530-65-9	Zinc chromate
557-21-1	Zinc cyanide
1314-13-2	Zinc oxide
11103-86-9	Zinc potassium chromate

Exhibit E

Otto, Addison (She/Her/Hers) (MPCA)

From: Otto, Addison (She/Her/Hers) (MPCA)
Sent: Monday, January 27, 2025 11:32 AM
To: Otto, Addison (She/Her/Hers) (MPCA)
Subject: FW: Air toxics reporting rule SONAR
Attachments: lrl.pdf; aq-rule2-02h.pdf; aq-rule2-02j.pdf

From: Otto, Addison (She/Her/Hers) (MPCA)
Sent: Tuesday, December 10, 2024 9:46 AM
To: sonars@lrl.leg.mn
Subject: Air toxics reporting rule SONAR

Good morning,

Please see the attached cover letter, SONAR, and SONAR exhibit 1 for the MPCA's air toxics emissions reporting rule. Let me know if you have any questions!

-Addison

Addison Otto (she/her/hers)
Rule Coordinator Principal
addison.otto@state.mn.us
651-757-2754
MINNESOTA POLLUTION CONTROL AGENCY

MINNESOTA POLLUTION CONTROL AGENCY

VIA EMAIL
December 10, 2024

Legislative Reference Library
sonars@lrl.leg.mn

In the Matter of the Proposed Amendments to MPCA Rules Governing Air Quality – Air Toxics Emissions Reporting Rule; Revisor's ID Number Revisor's ID Number R-4599; OAH Docket No. 71-9003-39354

Dear Legislative Reference Library:

The Minnesota Pollution Control Agency intends to adopt rules relating to air quality – air toxics emissions reporting. We published a Dual Notice in the November 25, 2024, *State Register*.

We have prepared a Statement of Need and Reasonableness. As required under Minnesota Statutes, sections 14.131 and 14.23, we are sending the library an electronic copy of the Statement of Need and Reasonableness at the same time that we are sending our Notice of Intent to Adopt Rules.

If you have any questions or concerns, please contact me at addison.otto@state.mn.us or 651-757-2754.

Sincerely,

Addison Otto
MPCA Rule Coordinator

Enclosure: Statement of Need and Reasonableness

Exhibit F

MINNESOTA STATE REGISTER

MONDAY, NOVEMBER 25, 2024
VOLUME 49, NUMBER 22
PAGES 559 - 600

Proposed Rules

Comments on Planned Rules or Rule Amendments. An agency must first solicit Comments on Planned Rules or Comments on Planned Rule Amendments from the public on the subject matter of a possible rulemaking proposal under active consideration within the agency (*Minnesota Statutes* §§ 14.101). It does this by publishing a notice in the *State Register* at least 60 days before publication of a notice to adopt or a notice of hearing, and within 60 days of the effective date of any new statutory grant of required rulemaking.

Rules to be Adopted After a Hearing. After receiving comments and deciding to hold a public hearing on the rule, an agency drafts its rule. It then publishes its rules with a notice of hearing. All persons wishing to make a statement must register at the hearing. Anyone who wishes to submit written comments may do so at the hearing, or within five working days of the close of the hearing. Administrative law judges may, during the hearing, extend the period for receiving comments up to 20 calendar days. For five business days after the submission period the agency and interested persons may respond to any new information submitted during the written submission period and the record then is closed. The administrative law judge prepares a report within 30 days, stating findings of fact, conclusions and recommendations. After receiving the report, the agency decides whether to adopt, withdraw or modify the proposed rule based on consideration of the comments made during the rule hearing procedure and the report of the administrative law judge. The agency must wait five days after receiving the report before taking any action.

Rules to be Adopted Without a Hearing. Pursuant to *Minnesota Statutes* § 14.22, an agency may propose to adopt, amend, suspend or repeal rules without first holding a public hearing. An agency must first solicit **Comments on Planned Rules** or **Comments on Planned Rule Amendments** from the public. The agency then publishes a notice of intent to adopt rules without a public hearing, together with the proposed rules, in the *State Register.* If, during the 30-day comment period, 25 or more persons submit to the agency a written request for a hearing of the proposed rules, the agency must proceed under the provisions of §§ 14.1414.20, which state that if an agency decides to hold a public hearing, it must publish a notice of intent in the *State Register.*

KEY: Proposed Rules - Underlining indicates additions to existing rule language. ~~Strikeouts~~ indicate deletions from existing rule language. If a proposed rule is totally new, it is designated "all new material." **Adopted Rules** - Underlining indicates additions to proposed rule language. ~~Strikeout~~ indicates deletions from proposed rule language.

Minnesota Pollution Control Agency

Environmental Analysis and Outcomes Division

Proposed Permanent Rules Relating to Air Toxics Reporting; DUAL NOTICE: Notice of Intent to Adopt Rules Without a Public Hearing Unless 25 or More Parties Request a Hearing, and Notice of Hearing if 25 or More Requests for Hearing Are Received; Revisor's ID Number R-4599

Proposed Amendment to Rules Governing Air Quality, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019.

Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850.

Overview. This notice is the Minnesota Pollution Control Agency's (MPCA) legal notice of its intent to adopt air quality rules. The purpose of these rules, known as the "Air toxics emissions reporting rule," is to establish new rules for air toxics emissions reporting requirements as directed by *Minnesota Statutes,* section 116.062, and to repeal emergency affirmative defense provisions as directed by the Environmental Protection Agency (EPA).

This notice provides an opportunity for public comment and input on the proposed rules. Anyone who would like to comment on the proposed rule language must submit written comment or a written request for a hearing on the proposed rules by the deadline identified below. The **Subject of Rules** section provides further description of these proposed rules.

If the proposed rules affect you in any way, the MPCA encourages you to participate in the rulemaking process.

View the **Alternative Format/Accommodation** and **MPCA Contact Person** sections of this notice for information on requesting this document in an alternative format.

Introduction. The MPCA intends to adopt rules without a public hearing following the procedures in the rules of the Office of Administrative Hearings (OAH), *Minnesota Rules* parts 1400.2300 to 1400.2310, and the Administrative Procedure Act*, Minnesota Statutes*, sections 14.22 to 14.28. However, if 25 or more parties submit a written request for a hearing on the rules by 4:30 p.m. on January 15, 2025, the MPCA will hold a public hearing. View the **Request a Hearing** section of this notice for information on requesting a hearing.

Subject of Rules. The MPCA proposes to amend several chapters of Minnesota's air quality rules.

Air Toxics Emissions Reporting

Minnesota Rules require that air permitted facilities submit an annual air emissions inventory for criteria air pollutants including particulate matter, ammonia, volatile organic compounds (VOCs), lead, nitrogen dioxide, carbon monoxide, and sulfur dioxide. The MPCA collects voluntary air toxics emissions data from facilities every three years for hazardous air pollutants (HAPs), per-and polyfluoroalkyl substances (PFAS), and additional air toxics of concern in Minnesota. The criteria pollutant and air toxics emissions data collected are used by the MPCA and EPA to assess community health risks.

The proposed rules would require air permitted facilities located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties (except those with Option B registration permits) to annually report air toxics emissions, as directed by Minn. Stat. § 116.062. The proposed rules will help identify and prioritize areas of concern. However, the air toxics emissions data will be incomplete because the statute authorizing this rulemaking does not apply to air permitted facilities statewide.

Proposed amendments or additions of the following chapters are described below.

- **Chapter 7002.0015.** Changes to an existing definition of "Chargeable pollutant," to clarify that these are emissions that facilities are assessed a fee to emit.
- **Chapter 7005.0100.** Changes to add a definition of "Air toxics," "Air toxics reporting facility," and "Toxics release inventory (TRI) list".
- **Chapter 7019.3000.** Changes to include requirements for annual air toxics air emissions inventory report submittals to be consistent with criteria air pollutant emissions inventory reports. Changes to include language to clarify mercury emissions reporting.
- **Chapter 7019.3020.** Changes to include requirements for calculating air toxics emissions as directed by Minn. Stat. § 166.062(b).
- **Chapters 7019.3030, 7019.3060, and 7019.3080.** Changes to include the methods for calculating air toxics emissions that are consistent with the existing methods for criteria air pollutant emissions. Changes to include requirements for reporting air toxics emissions.
- **Chapter 7019.3110.** Changes to add a new section, "Air Toxics Emission Inventory and Emissions Reporting" requirements. The new section includes:
    - The list of air toxics required to be reported. To address Minn. Stat. § 116.062 (c), a definition of "Air toxics" is proposed to include, by reference, HAPs and PFAS included on the TRI list. Additional pollutants of concern that have inhalation risks, are persistent, bioaccumulative, and toxic chemicals (PBTs), or have known health, environmental, or ecological effects are included in this section. Some additional PFAS pollutants are also included that can be detected with performance testing.
    - A de minimis for reporting when the material balance method of calculation is used for calculating air

toxics emissions. There are several pollutants that do not have a de minimis and all emissions must be reported.

- Calculation methods that must be used to estimate emissions.
- Recordkeeping requirements related to air toxics emissions calculations.

Emergency Affirmative Defense Provisions

The MPCA is proposing to repeal certain sections of chapter 7007 that allow a Title V air permittee to assert emergency affirmative defense. This amendment is in response to the EPA's final rule effective August 8, 2023, that removed emergency affirmative defense provisions from the Clean Air Act Title V operating permit program regulations. The EPA determined that the emergency affirmative defense provisions are inconsistent with the Clean Air Act. The EPA set a deadline for states to remove this language from state rules by August 21, 2024, or to seek an extension and remove the language as soon as practicable. The MPCA requested and was granted an extension until August 21, 2025. The repeal of this language is proposed in this rulemaking because it involves amendments that effect permitted air emission facilities and is an upcoming permanent air rulemaking.

Proposed repeals were made to certain subparts within Chapter 7007.0800 and 7007.1146, and all of Chapter 7007.1850.

Where rule chapters are open for this rulemaking, minor housekeeping edits to modernize rule language and format that do not change the intent of existing rule language are also proposed.

Comments. You have until 4:30 p.m. on January 15, 2025, to submit written comment in support of or in opposition to the proposed rules or any part or subpart of the rules.

Submit written comments to the:

1) Office of Administrative Hearings (OAH) Rulemaking eComments website at ***https://minnesotaoah.granicusideas.com***; or

2) OAH attn: William Moore, OAH, 600 North Robert Street, P.O. Box 64620, St. Paul, Minnesota 55164-0620 or fax 651-539-0310.

You may view frequently asked questions about the OAH Rulemaking eComments website at ***https://mn.gov/oah/assets/ecomments-faq_tcm19-82012.pdf***. Any questions about submitting comments via the Rulemaking eComments website should be directed to William Moore of the OAH at 651-361-7900 or by email at ***william.t.moore@state.mn.us***; please note that you may not submit rulemaking comments by phone or email.

Comments received are public and will be available for review at the OAH Rulemaking eComments website at ***https://minnesotaoah.granicusideas.com/discussions*** and at the OAH, 600 North Robert Street, P.O. Box 64620, St. Paul, Minnesota 55164-0620.

The MPCA encourages comments. Your comments should identify the portion of the proposed rules addressed, the reason for the comment, and any change proposed. You are encouraged to propose any change that you desire. Any comments that you have about the legality of the proposed rules must also be made during this comment period.

Request for a Hearing. In addition to submitting comments, you may also request that the MPCA hold a hearing on the rules. You have until **4:30 p.m. on January 15, 2025,** to submit your written request for a hearing to the:

1) Office of Administrative Hearings (OAH) Rulemaking eComments website at ***https://minnesotaoah.granicusideas.com***; or

2) OAH attn: William Moore, OAH, 600 North Robert Street, P.O. Box 64620, St. Paul, Minnesota 55164-0620 or fax 651-539-0310.

You must include your name and address in your written request. In addition, you must identify the portion of the proposed rules that you object to or state that you oppose the entire set of rules. Any request that does not comply with these requirements is not valid and the MPCA cannot count it when determining whether to hold a public hearing. You are also encouraged to state the reason for the request and any changes you want made to the proposed rules.

You may also direct questions on the use of the OAH's Rulemaking eComments website to William Moore at 651-361-7900 or by email at ***william.t.moore@state.mn.us***; please note that you may not submit rulemaking comments by phone or email.

Withdrawal of Requests. If 25 or more parties submit a valid written request for a hearing, the MPCA will hold a public hearing unless a sufficient number of parties withdraw their requests in writing. If a public hearing is required, the MPCA will follow the procedures in *Minnesota Statutes,* sections 14.131 to 14.20. The MPCA reserves the option to remove any section of the rule that may be controversial and to proceed without a hearing on the noncontroversial parts of the proposed rules.

Modifications. The MPCA might modify the proposed rules, either as a result of public comment or as a result of the rule hearing process. It must support modifications by data and views submitted to the MPCA or presented at the hearing. The adopted rules may not be substantially different than these proposed rules unless the MPCA follows the procedure under *Minnesota Rules*, part 1400.2110. The public is also advised that depending upon the comments received the MPCA may withdraw the proposed changes.

Cancellation of Hearing. The MPCA will cancel the hearing scheduled for February 27, 2025, if the MPCA does not receive requests for a hearing from 25 or more parties. If you requested a public hearing, the MPCA will notify you before the scheduled hearing whether it will be held. You may also call the MPCA contact person at 651-757-2754 after January 15, 2025, to find out whether the hearing will be held.

Notice of Hearing. If 25 or more parties submit valid written requests for a public hearing on the rules, the MPCA will hold a hearing following the procedures in *Minnesota Statutes,* sections 14.131 to 14.20. The MPCA will hold the hearing on the date and at the time and place listed below. The hearing will continue until all interested people have been heard. Administrative Law Judge Jessica Palmer-Denig is assigned to conduct the hearing. Judge Palmer-Denig's Legal Assistant William Moore can be reached at OAH, 600 North Robert Street, P.O. Box 64620, St. Paul, Minnesota 55164-0620, telephone 651-361-7900, and fax 651-539-0310 or ***william.t.moore@state.mn.us***.

If 25 or more parties submit a written request for a hearing, the ALJ will conduct the hearing on **February 27, 2025**, by WebEx beginning at **3:00 pm.**

Hearing link: ***Webex Meeting Link***

Meeting number: 2499 766 4902
Meeting password: yGaMJiPA342

For audio connection, join the hearing by phone:

Call: 1-415-655-0003 (US Toll)
Access code: 2499 766 4902

The hearing continues until all parties are heard, or until the ALJ adjourns the hearing (no earlier than 6:00 pm). The MPCA may schedule additional days of hearing if necessary. All interested or affected parties will have an opportunity to participate by submitting either oral or written data, statements, or arguments. You may submit a statement without appearing at the hearing. To find out whether the MPCA will adopt the rules without a hearing or if it will hold the hearing, you should contact the **MPCA contact person** after January 15, 2025 and before February 27, 2025.

Hearing Procedure. If the MPCA holds a hearing, you and all interested or affected people, including representatives of associations or other interested groups, will have an opportunity to participate. You may present your

views either orally at the hearing or in writing at any time before the hearing record closes. All evidence presented should relate to the proposed rules. You may also submit written material to the ALJ to be recorded in the hearing record for five working days after the public hearing ends. At the hearing the ALJ may order that this five-day comment period is extended for a longer period but not more than 20 calendar days. After the comment period, there is a five-working-day rebuttal period when the MPCA and any interested person may respond in writing to any new information submitted. No one may submit additional evidence during the five-day rebuttal period. The OAH must receive all comments and responses submitted to the ALJ via the OAH Rulemaking eComments website at ***https://minnesotaoah.granicusideas.com/discussions*** no later than 4:30 p.m. on the due date. All comments or responses received will be available for review at the OAH Rulemaking eComments website at ***https://minnesotaoah.granicusideas.com/discussions*** and at the OAH, 600 North Robert Street, P.O. Box 64620, St. Paul, Minnesota 55164-0620 [OAH]. This rule hearing procedure is governed by *Minnesota Rules*, parts 1400.2000 to 1400.2240, and *Minnesota Statutes,* section 14.131 to 14.20. You may direct questions about the procedure to the ALJ.

The MPCA requests that any person submitting written views or data to the ALJ before the hearing or during the comment or rebuttal period also submit a copy of the written views or data to the MPCA contact person.

MPCA Contact Person. The MPCA contact person is Addison Otto at the MPCA, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194; telephone 651-757-2754; and addison.otto@state.mn.us. You may also call the MPCA at 651-296-6300 or 1-800-657-3864; use your preferred relay service. Please note that you may not submit rulemaking comments by phone or email.

Availability of Rules. A copy of the proposed rules is published in the *State Register* after this notice, or they can be viewed on the rule webpage at ***https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting***. A free copy of the proposed rules is also available upon request by contacting the **MPCA contact person**. One copy per request will be sent.

Availability of Statement of Need and Reasonableness. The statement of need and reasonableness (SONAR) summarizes the justification for the proposed rules, including a description of who will be affected by the proposed rules and an estimate of the probable cost of the proposed rules. It is now available from the MPCA contact person. You may review or obtain copies for the cost of reproduction by contacting the **MPCA contact person**. A copy of the SONAR is available during the public comment period at ***https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting***.

Alternative Format/Accommodation. Upon request, the information in this notice can be made available in an alternative format, such as large print, braille, or audio. To make such a request or if you need an accommodation to make this hearing accessible, please contact the **MPCA contact person**.

Lobbyist Registration. *Minnesota Statutes,* chapter 10A, requires each lobbyist to register with the State Campaign Finance and Public Disclosure Board. You should direct questions regarding this requirement to the Campaign Finance and Public Disclosure Board at Suite #190, Centennial Building, 658 Cedar Street, St. Paul, Minnesota 55155, telephone 651-539-1180 or 1-800-657-3889.

Statutory Authority. The statutory authority to adopt the rules is *Minnesota Statutes,* section 116.07, subdivision 4 which authorizes the MPCA to adopt rules for prevention, abatement, or control of air pollution, and *Minnesota Statutes,* section 116.062 Air Toxics Emissions Reporting which authorizes the MPCA to adopt rules to require facilities to submit air toxics emissions reports.

Adoption Procedure if No Hearing. If no hearing is required, the ALJ will issue a report on the proposed rules and the MPCA may adopt the rules after the end of the comment period. The MPCA will submit the rules and supporting documents to the OAH for a legal review. You may ask to be notified of the date the rules are submitted to the office. If you want either to receive notice of this, to receive a copy of the adopted rules, or to register with the MPCA to receive notice of future rule proceedings, submit your request to the **MPCA contact person**.

Adoption Procedure after a Hearing. If a hearing is held, the ALJ will issue a report on the proposed rules. You may ask to be notified of the date that the ALJ's report will become available and can make this request at the hearing or

in writing to the ALJ. You may also ask to be notified of the date that the MPCA adopts the rules and the rules are filed with the Secretary of State by requesting this at the hearing or by writing to the **MPCA contact person**.

Order. I order that the rulemaking hearing be held at the date, time, and location listed above.

Date signed: September 30, 2024

Katrina Kessler, P.E.
Commissioner
Minnesota Pollution Control Agency

7002.0015 DEFINITIONS.

[For text of subparts 1 and 2, see Minnesota Rules]

Subp. 2a. **Chargeable pollutant.** "Chargeable pollutant" means a pollutant that is assessed a fee and includes the following:

[For text of items A and B, see Minnesota Rules]
[For text of subparts 2b to 4, see Minnesota Rules]

7005.0100 DEFINITIONS.

[For text of subparts 1 to 2b, see Minnesota Rules]

Subp. 2c. **Air toxics.** "Air toxics" means pollutants, except for criteria pollutants, that are known or suspected to cause cancer or other serious health effects or adverse environmental and ecological effects. Air toxics includes the pollutants listed under part 7019.3110, subpart 2.

Subp. 2d. **Air toxics reporting facility.** "Air toxics reporting facility" means a facility in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington County for which the owner or operator of the facility must obtain an air emission permit under chapter 7007, but does not include a facility permitted under part 7007.1120, registration permit option B.

[For text of subparts 3 to 44a, see Minnesota Rules]

Subp. 44b. **Toxic release inventory list.** "Toxic release inventory list" or "TRI list" means the list of chemicals and chemical categories adopted by the Environmental Protection Agency under Code of Federal Regulations, title 40, section 372.65, according to the federal Emergency Planning and Community Right-to-Know Act, United States Code, title 42, section 11023.

[For text of subpart 45, see Minnesota Rules]

7007.0800 PERMIT CONTENT.

[For text of subparts 1 to 5, see Minnesota Rules]

Subp. 6. **Reporting.**

[For text of items A to E, see Minnesota Rules]

~~F. For deviations caused by emergencies, as defined in part 7007.1850, the permittee may assert an affirmative defense only if it meets all the requirements of part 7007.1850.~~

[For text of subparts 7 to 16, see Minnesota Rules]

7007.1146 CAPPED PERMIT; COMPLIANCE REQUIREMENTS.

[For text of subparts 1 to 4, see Minnesota Rules]

Subp. 5. **Reporting.** An owner or operator of a source with a capped permit must submit to the ~~agency~~ commissioner the reports described under items A to E. All reports required under a capped permit ~~shall~~ must be certified by a responsible official consistent with part 7007.1143, subpart 1.

A. Deviation reporting time frames as described in subitems (1) and (2).

(1) For deviations that endanger human health or the environment, the permittee ~~shall~~ must notify the commissioner as required in part 7019.1000, subpart 1. ~~The permittee may assert the affirmative defense of emergency only if it meets all the requirements of part 7007.1850, which includes notifying the agency within two working days of when the emission limitations were exceeded due to the emergency.~~

[For text of subitem (2), see Minnesota Rules]

[For text of items B to E, see Minnesota Rules]

7019.3000 EMISSION INVENTORY.

Subpart 1. **Emission inventory required.**

A. All owners or operators of emission reporting facilities, as defined in part 7002.0015, subpart 3a, ~~shall~~ and air toxics reporting facilities, as defined in part 7005.0100, subpart 2d, must submit an annual emission inventory report to the ~~agency,~~ commissioner.

B. The report under item A must meet the following criteria:

(1) the owner or operator of an emission reporting facility must submit the report in a format specified by the commissioner, relating to ammonia, carbon monoxide, particulate matter, and all chargeable pollutants as defined in part 7002.0015, subpart 2a~~.~~;

(2) the owner or operator of an air toxics reporting facility must submit the report in a format specified by the commissioner, relating to air toxics according to part 7019.3110;

(3) ~~The report shall be submitted~~ the owner or operator of an emission reporting facility or air toxics reporting facility must submit the report on or before April 1 of the year following the calendar year being reported~~.~~; and

(4) the responsible official, as defined in part 7007.0100, subpart 21, must sign the report and ~~shall~~ make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision by qualified personnel. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that the data provided in this document will be used by the MPCA to calculate a fee~~, which~~ that the facility will be required to pay under Minnesota Rules, part 7002.0065, based on the tons of pollution emitted by the facility."

~~B.~~ C. (1) All owners or operators of facilities issued option B registration permits under part 7007.1120 ~~shall~~ must submit either an emission inventory using methods described under subitem (3) and parts 7019.3020 to 7019.3100 or the certification and VOC-containing material report in subitem (2). The report ~~shall~~ must be submitted on or before ~~the~~ April 1 following the calendar year being reported.

(2) All owners or operators that choose to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (2), ~~shall~~ must submit a report and certification to the ~~agency~~ commissioner. The responsible official, as defined in part 7007.0100, subpart 2, must sign the report and ~~shall~~ make the following certification:

"I certify under penalty of law that the facility described in registration permit number .... is eligible for the option B registration permit that it was issued and holds and that the facility purchased or used (as stated in the permit application) .... gallons of VOC-containing materials in the 12-month reporting period. I further certify that the eligibility of the facility and the quantity of material reported herein were determined under my direction or supervision by qualified personnel. The information used to determine eligibility and the quantity of material reported herein for the registration permit is, to the best of my knowledge and belief, true and accurate. I understand that the information provided in this certification will be used by the MPCA to assess a fee under Minnesota Rules, part 7002.0025, subpart 1, item C, ~~which~~ that the facility will be required to pay under Minnesota Rules, part 7002.0065."

(3) All owners and operators that choose to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), ~~shall~~ must submit an emission inventory report to the ~~agency~~ commissioner, in a format specified by the commissioner, relating to emissions from the use of VOC-containing materials using methods described in part 7019.3030, ~~item B~~ subpart 2, and the certification in subitem (2). The certification and emission inventory ~~shall~~ must be signed by the responsible official, as defined in part 7007.0100, subpart 2.

Subp. 2. **Owner or operator error in reporting data.** If an owner or operator discovers an error in the data after having submitted it to the ~~agency~~ commissioner, the owner or operator ~~shall~~ must submit corrected data, with a written explanation of the mistake and why it occurred. If the commissioner agrees that the correction is appropriate, the commissioner ~~shall~~ must correct the data in the inventory. However, for purposes of assessing the emission fee under part 7002.0025, the commissioner ~~shall~~ must not accept any correction submitted by an owner or operator ~~which~~ that would result in a reduction of tons emitted if the correction is submitted more than 45 days after the mailing date of the previous calendar year's air emissions summary.

Subp. 3. **Mercury emission sources.**

A. Owners or operators of a mercury emission source as defined in part 7005.0100, subpart 23b, must submit an annual emission inventory report of the mercury emissions to the commissioner in a format specified by the commissioner. The report must be submitted on or before April 1 of the year following the calendar year being reported. ~~The initial report must cover the first full calendar year following September 29, 2014.~~

B. Owners or operators of stationary sources that have air emissions of mercury but that are not mercury emission sources must report every three years.

C. Owners or operators of stationary sources that are air toxics reporting facilities must report mercury emissions as provided under part 7019.3110.

Subp. 4. **Possible mercury emission sources.** If the commissioner determines that a stationary source has activity levels or emission factors that indicate that the source may be a mercury emission source, the commissioner may request that the owners or operators quantify the source's mercury emissions using the methods listed in part 7019.3030, ~~item A~~ subpart 1. The owners or operators must complete the quantification and submit a report to the commissioner within 120 days of the commissioner's request.

7019.3020 CALCULATING ACTUAL EMISSIONS FOR EMISSION INVENTORY.

Subpart 1. **Scope.**

~~A.~~ Emissions from all emissions units must be reported in the annual emissions inventory report in a format specified by the commissioner.

Subp. 2. **Insignificant activities.** ~~Emissions from insignificant activities listed in part 7007.1300, subpart 2, must not be reported. Emissions~~ Emission reporting facilities and air toxics reporting facilities are not required to report emissions from insignificant activities listed in part 7007.1300~~, subparts 3 and 4,~~ and conditionally insignificant activities listed in part 7008.4000 ~~must be reported if~~ unless:

A. the commissioner or owner or operator has determined that emissions from those activities are not insignificant for purposes of permitting under parts 7007.0100 to ~~7007.1850~~ 7007.1800 or for those activities required to be quantified by a facility issued a capped permit option 1~~. Notwithstanding the previous sentence,~~; or

B. the commissioner ~~may request~~ requests an inventory of fugitive emissions from roads and parking lots, defined as insignificant under part 7007.1300, subpart 3, item G, upon determining that emissions from these sources represent a substantial portion of the facility's total emissions.

Subp. 3. **Calculating emissions.**

~~B.~~ Except as provided in subparts 4 to 7, all owners or operators of emission reporting facilities, as defined in part 7002.0015, subpart 3a, or facilities issued option B registration permits under part 7007.1120 that choose to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), ~~shall~~ must calculate emissions based on parts 7019.3030 to 7019.3100, except for any facility ~~which~~ that has obtained an option A, C, or D registration permit under part 7007.1115, 7007.1125, or 7007.1130 or a capped permit under parts 7007.1140 to 7007.1148.

Subp. 4. **Calculating emissions for option A permits.**

~~C.~~ Owners or operators of emission reporting facilities that hold an air emission permit under part 7007.1115, registration permit option A, must report actual emissions calculated for the calendar year for which emissions are being reported in a format specified by the commissioner. The owners or operators of a facility issued an option A registration permit under part 7007.1115 must calculate emissions for all emission units using the methods listed in parts 7019.3030 to 7019.3100.

Subp. 5. **Calculating emissions for option C permits.**

~~D.~~ All owners or operators of emission reporting facilities ~~which~~ that have obtained an air emission permit under part 7007.1125, registration permit option C, ~~shall~~ must report the quantity of each fuel purchased or used (whichever was stated in the facility's registration permit application) in the calendar year for which emissions are being calculated. The report ~~shall~~ must apportion the quantity of fuel burned with the type of combustion unit (indirect heating units or internal combustion engines) ~~in which~~ that it was burned in. The owner or operator ~~shall~~ must report the quantity of VOC-containing materials purchased or used (whichever is stated in the facility's registration permit application) in the calendar year for which emissions are being calculated and air toxics emissions using the method listed in part 7019.3060. The owners or operators reporting VOC-containing materials purchases or usage ~~shall~~ must also report the weight factor (WF) of the VOC and air toxics in the materials (weight of VOC per weight of VOC-containing materials) and the density of the materials. ~~The actual emissions shall be calculated by the commissioner.~~

Subp. 6. **Calculating emissions for option D permits.**

~~E.~~ All owners or operators of emission reporting facilities ~~which~~ that have obtained an air emission permit under part 7007.1130, registration permit option D, ~~shall~~ must report the actual emissions calculated for purposes of compliance demonstration required in part 7007.1130, subpart 3, item E, for the calendar year for which emissions are being reported in a format specified by the commissioner.

Subp. 7. **Calculating emissions for capped permits.**

~~F.~~ All owners or operators of emission reporting facilities ~~which~~ that have obtained an air emission permit under parts 7007.1140 to 7007.1148, capped permit, ~~shall~~ must report the actual emissions calculated for purposes of compliance demonstration required in part 7007.1146, subpart 2, item H, for the calendar year for which emissions are being reported for all emission units in a format specified by the commissioner.

Subp. 8. **Material balance.**

~~G.~~ All owners or operators of an emission reporting facility submitting an emission inventory based in whole, or in part, on a material balance calculation ~~shall~~ must submit a sample material balance calculation with the emission inventory. Such facilities ~~shall~~ must also maintain a record of the ~~material~~ safety data sheets or vendor certification of the VOC, air toxics, mercury, or sulfur content of the material for each material or fuel used and the material balance calculations for ~~a period of~~ five years after the date ~~of submittal of~~ the emission inventory is submitted.

Subp. 9. **Control equipment.**

~~H.~~ ~~The~~ An emission inventory may be based on the use of control equipment only if the use of the specific control

equipment is required under conditions of a permit or applicable requirement as defined in part 7007.0100, subpart 7, or is included in a notification received by the ~~agency~~ commissioner under part 7007.1150, item C.
This ~~item~~ subpart applies upon issuance under chapter 7007 of a registration, state, capped, general, or part 70 permit to a stationary source ~~but no earlier than the date three years after EPA grants full program approval of the agency's permit program under Title 5 of the Clean Air Act~~.

Subp. 10. **Control efficiency factors.** An owner or operator submitting the emission inventory must apply control efficiency factors, as defined under part 7005.0100, subpart 9b, to air toxics emissions calculations according to items A and B, unless the control efficiency factor for the pollutant is identified in the permit. The owner or operator must:

A. use the VOC control efficiency factor for volatile air toxics; and

B. use the PM10 control efficiency factor for particulate air toxics.

7019.3030 METHOD OF CALCULATION.

Subpart 1. **Method hierarchy.**

~~A.~~ The owner or operator of an emission reporting facility, except one issued an option C or D registration permit under part 7007.1125 or 7007.1130 or a capped permit under parts 7007.1140 to 7007.1148, ~~shall~~ must calculate the facility's actual emissions using the methods listed in ~~subitems (1) to (4)~~ items A to D. The owner or operator of an air toxics reporting facility issued an option D registration permit or a capped permit must calculate air toxics emissions for each emission unit using the methods listed in items A to D, except that similar emission units may be aggregated. The methods are listed in a hierarchy of the most preferred method to the least preferred method. The most preferred method available ~~shall~~ must be used. Where more than one method is listed in the ~~subitem~~ item, they are considered to be equal in the hierarchy and any can be used:

A. ~~(1)~~ part 7019.3040 (continuous emission monitor data);

B. ~~(2)~~ part 7019.3050~~, item B~~ (performance test data);

C. ~~(3)~~ part 7019.3060 (VOC and air toxics material balance), 7019.3065 (mercury material balance), 7019.3070 (~~S0~~$_2$ SO_2 material balance), 7019.3080 (emission factor), or 7019.3090 (enforceable limitations), as applicable; or

D. ~~(4)~~ part 7019.3100 (facility proposal).

Subp. 2. **Option B permit fees.**

~~B.~~ The owner or operator of a facility issued an option B registration permit under part 7007.1120 that chooses to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1)~~, shall~~:

A. must calculate the facility's actual emissions using the methods listed in part 7019.3060~~.~~; and

~~The owner or operator of a facility issued an option B registration permit under part 7007.1120 that chooses to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), shall~~

B. must not consider the effects of pollution control equipment on emissions from the use of VOC-containing materials when calculating actual emissions for an emissions inventory.

Subp. 3. **Selecting calculation method.**

~~C.~~ For purposes of selecting a calculation method, a method is considered available if the conditions associated with the method in parts 7019.3040 to 7019.3100 are met. The method described in part 7019.3100 may be used~~, provided that~~ if the proposal is submitted to the commissioner by September 1 of the first calendar year for which the

emissions are being calculated. The commissioner must reject data submitted using the methods described in parts 7019.3040 to 7019.3090 if the conditions for the method are not fully met.

Subp. 4. **Reporting individual pollutants.** An owner or operator of a facility must report individual pollutants to the maximum extent feasible. If the owner or operator cannot report individual pollutants within a group, such as lead compounds or nickel compounds, the owner or operator must report total emissions as a group.

7019.3060 VOLATILE ORGANIC COMPOUND (VOC) AND AIR TOXICS MATERIAL BALANCE.

If the methods in part 7019.3040 or 7019.3050 are unavailable to the owner or operator of an emission reporting facility or a facility issued an option B registration permit under part 7007.1120 that chooses to be assessed a fee under part 7002.0025, subpart 1, item C, subitem (1), the facility may calculate VOC and air toxics emissions using the material balance method described in this part. This method may be used in conjunction with or instead of emission factors and enforceable limitations methods described in parts 7019.3080 and 7019.3090, where applicable. A person using material balance to calculate VOC and air toxics emissions must determine the total VOC emissions and air toxics emissions (E) as follows:

$$E = (A - B - C) * (1 - CE)$$

where:

A = the amount of VOC and air toxics entering the process. The amount of VOC used in this calculation must be the amount certified by the supplier, the maximum amount stated on the material safety data sheet, or the amount determined by reference method 24.

B = the amount of VOC and air toxics incorporated into the product. This includes VOCs chemically transformed in production. An explanation of this calculation must also be submitted.

C = the amount of VOC and air toxics, if any, leaving the process as waste, or otherwise not incorporated into the product and not emitted to the air. If the actual VOC and air toxics content of the waste is unknown, then C = 0.

CE = the control efficiency, or the product of capture efficiency and collection or destruction efficiency, of any device used to capture and/or control VOC and air toxics emissions, expressed as a decimal fraction of 1.00. The control efficiency must be based on efficiency factors, as defined in part 7005.0100, subpart 9b, including air toxics, or must be based on the control efficiency verified by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050. The overall efficiency of a pollution control system that uses a hood, as defined in part 7011.0060, subpart 2, as the emission capture device must be based on a capture efficiency of 60 percent. If an alternative capture efficiency has been determined by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050, that capture efficiency must be used in the calculation of actual emissions.

7019.3080 EMISSION FACTORS.

[For text of item A, see Minnesota Rules]

B. Control equipment efficiency must be based on efficiency factors as defined in part 7005.0100, subpart 9b, including air toxics, or on the efficiency verified by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050. Calculations of actual emissions from an emission unit through a pollution control system that uses a hood, as defined in part 7011.0060, subpart 2, as the emission capture device must be based on a capture efficiency of 80 percent. If an alternative capture efficiency has been determined by a performance test conducted according to parts 7017.2001 to 7017.2060 and 7019.3050, the owner or operator must use that capture efficiency in the calculation of actual emissions.

7019.3110 AIR TOXICS EMISSION INVENTORY AND EMISSIONS REPORTING.

Subpart 1. **Inventory required.** An owner or operator of an air toxics reporting facility, as defined in part 7005.0100, subpart 2d, must include the air toxics emissions under subpart 2 in the annual air toxics emission inventory according to part 7019.3000.

Subp. 2. **Air toxics to be reported.**

A. An owner or operator of an air toxics reporting facility must include HAPs as defined in part 7007.0100, subpart 12a.

B. An owner or operator of an air toxics reporting facility must include PFAS as defined in Minnesota Statutes, section 116.943, subdivision 1, paragraph (p), that are listed on the TRI list defined in part 7005.0100. An owner or operator must also include the following PFAS:

Chemical Abstracts Service (CAS) number	**Pollutant**
(1) 375-61-1	1,1,1,2,2,3,3,4,4,5,5-Undecafluoropentane
(2) 811-97-2	1,1,1,2-Tetrafluoroethane
(3) 420-46-2	1,1,1-Trifluoroethane
(4) 209482-18-8	1-(4-Butoxynaphthyl) tetrahydrothiophenium perfluorobutanesulfonate
(5) 120226-60-0	10:2 Fluorotelomer sulfonic acid
(6) 763051-92-9	11-Chloroperfluoro-3-oxaundecanesulfonic acid
(7) 2252-84-8	1H-Heptafluoropropane
(8) 375-17-7	1H-Nonafluorobutane
(9) 355-37-3	1H-Perfluorohexane
(10) 375-83-7	1-Hydroperfluoroheptane
(11) 2991-50-6	2-(N-Ethylperfluorooctanesulfonamido)acetic acid
(12) 2355-31-9	2-(N-Methylperfluorooctanesulfonamido)acetic acid
(13) 53826-13-4	2-(Perfluorodecyl)ethanoic acid
(14) 53826-12-3	2-(Perfluorohexyl)ethanoic acid
(15) 27854-31-5	2-(Perfluorooctyl)ethanoic acid
(16) 359-49-9	2,3,3,3-Tetrafluoropropanoic acid
(17) 914637-49-3	2H,2H,3H,3H-Perfluorooctanoic acid
(18) 70887-84-2	2H-Perfluoro-2-decenoic acid
(19) 3330-14-1	2H-Perfluoro-5-methyl-3,6-dioxanonane
(20) 812-70-4	3-(Perfluoroheptyl)propanoic acid
(21) 70887-88-6	3-(Perfluoropentyl)-3-fluoro-2-propenoic acid
(22) 356-02-5	3:3 Fluorotelomer carboxylic acid
(23) 919005-14-4	4,8-Dioxa-3H-perfluorononanoic acid
(24) 27619-93-8	4:2 Fluorotelomer sulfonate sodium
(25) 757124-72-4	4:2 Fluorotelomer sulfonic acid
(26) 27619-94-9	6:2 Fluorotelomer sulfonate sodium salt
(27) 27619-97-2	6:2 Fluorotelomer sulfonic acid
(28) 27619-96-1	8:2 Fluorotelomer sulfonate sodium salt
(29) 39108-34-4	8:2 Fluorotelomer sulfonic acid
(30) 335-65-9	8H-Perfluorooctane
(31) 1478-61-1	Bisphenol AF
(32) 75-73-0	Carbon tetrafluoride

Chemical Abstracts Service (CAS) number	Pollutant
(33) 75-45-6	Chlorodifluoromethane
(34) 75-72-9	Chlorotrifluoromethane
(35) 75-10-5	Difluoromethane
(36) 593-53-3	Fluoromethane
(37) 116-15-4	Hexafluoropropene
(38) 115-25-3	Octafluorocyclobutane
(39) 559-40-0	Octafluorocyclopentene
(40) 354-33-6	Pentafluoroethane
(41) 678-26-2	Perflenapent
(42) 756426-58-1	Perfluoro(2-((6-chlorohexyl)oxy)ethanesulfonic acid)
(43) 863090-89-5	Perfluoro(4-methoxybutanoic acid)
(44) 428-59-1	Perfluoro(methyloxirane)
(45) 113507-82-7	Perfluoro-2-ethoxyethanesulfonic acid
(46) 3330-15-2	Perfluoro-3-(1H-perfluoroethoxy)propane
(47) 151772-58-6	Perfluoro-3,6-dioxaheptanoic acid
(48) 377-73-1	Perfluoro-3-methoxypropanoic acid
(49) 355-25-9	Perfluorobutane
(50) 335-77-3	Perfluorodecanesulfonic acid
(51) 79780-39-5	Perfluorododecanesulfonic acid
(52) 76-16-4	Perfluoroethane
(53) 335-57-9	Perfluoroheptane
(54) 375-92-8	Perfluoroheptanesulfonic acid
(55) 375-85-9	Perfluoroheptanoic acid
(56) 355-42-0	Perfluorohexane
(57) 68259-12-1	Perfluorononanesulfonic acid
(58) 307-34-6	Perfluorooctane
(59) 754-91-6	Perfluorooctanesulfonamide
(60) 2706-91-4	Perfluoropentanesulfonic acid
(61) 2706-90-3	Perfluoropentanoic acid
(62) 76-19-7	Perfluoropropane
(63) 365971-87-5	Perfluorotetradecanoate
(64) 72629-94-8	Perfluorotridecanoic acid
(65) 2058-94-8	Perfluoroundecanoic acid,
(66) 83329-89-9	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate
(67) 335-24-0	Potassium perfluoro-4-ethylcyclohexanesulfonate
(68) 2923-16-2	Potassium trifluoroacetate
(69) 2250081-67-3	Sodium 4,8-dioxa-3H-perfluorononanoate
(70) 2806-15-7	Sodium perfluorodecanesulfonate
(71) 1260224-54-1	Sodium perfluorododecanesulfonate
(72) 21934-50-9	Sodium perfluoroheptanesulfonate
(73) 4021-47-0	Sodium perfluorooctanesulfonate

Chemical Abstracts Service (CAS) number	Pollutant
(74) 116-14-3	Tetrafluoroethylene
(75) 75-69-4	Trichlorofluoromethane
(76) 75-46-7	Trifluoromethane
(77) 1493-13-6	Trifluoromethanesulfonic acid
(78) 144317-44-2	Triphenylsulfonium nonafluorobutanesulfonate

C. An owner or operator of an air toxics reporting facility must include the air toxics included in subitems (1) to (66). For all pollutant names that contain the word "compounds," any chemical substance that contains the named chemical as part of that chemical's infrastructure is included.

Chemical Abstracts Service (CAS) number	Pollutant
(1) 540-59-0	1,2-Dichloroethylene
(2) 5131-66-8	1-Butoxy-2-propanol
(3) 563-47-3	3-Chloro-2-methyl-1-propene
(4) 67-64-1	Acetone
(5)	Aldehyde
(6) 309-00-2	Aldrin
(7)	Aluminum compounds
(8) 140-57-8	Aramite
(9) 12674-11-2	Aroclor 1016
(10) 12672-29-6	Aroclor 1248
(11) 11097-69-1	Aroclor 1254
(12) 1912-24-9	Atrazine
(13) 103-33-3	Azobenzene
(14) 100-52-7	Benzaldehyde
(15) 108-86-1	Bromobenzene
(16) 85-68-7	Benzyl butyl phthalate
(17) 105-60-2	Caprolactam
(18) 1306-38-3	Ceric oxide
(19) 12789-03-6	Technical chlordane
(20) 10049-04-4	Chlorine dioxide
(21) 75-68-3	1-Chloro-1,1-difluoroethane
(22) 75-45-6	Chlorodifluoromethane
(23) 10061-01-5	(Z)-Dichloropropene
(24)	Copper compounds
(25) 123-73-9	(E)-Crotonaldehyde
(26) 110-82-7	Cyclohexane
(27) 25321-22-6	Dichlorobenzene
(28) 95-50-1	1,2-Dichlorobenzene
(29) 541-73-1	1,3-Dichlorobenzene
(30) 75-71-8	Dichlorodifluoromethane
(31) 50-29-3	DDT

Chemical Abstracts Service (CAS) number	Pollutant
(32) 156-59-2	(Z)-1,2-Dichloroethylene
(33) 156-60-5	(E)-1,2-Dichloroethylene
(34) 77-73-6	Dicyclopentadiene
(35) 117-84-0	Di-n-octyl phthalate
(36) 637-92-3	Ethyl t-butyl ether
(37) 111-76-2	2-Butoxyethanol
(38) 64-18-6	Formic acid
(39) 591-78-6	2-Hexanone
(40) 7783-06-4	Hydrogen sulfide
(41) 1318-09-8	Amphibole-group minerals
(42) 78-93-3	Methyl ethyl ketone
(43) 2385-85-5	Mirex
(44) 71-36-3	1-Butanol
(45) 123-72-8	Butyraldehyde
(46) 7697-37-2	Nitric acid
(47) 55-18-5	N-Nitroso-diethylamine
(48) 924-16-3	N-Nitroso-di-butylamine
(49) 930-55-2	N-Nitroso-pyrrolidine
(50) 40487-42-1	Pendimethalin
(51) 115-07-1	1-Propene
(52) 107-98-2	1-Methoxy-2-propanol
(53) 7631-86-9	Silica
(54) 7664-93-9	Sulfuric acid
(55) 540-88-5	tert-Butyl acetate
(56) 75-65-0	tert-Butyl alcohol
(57) 109-99-9	Tetrahydrofuran
(58) 62-56-6	Thiourea
(59) 26471-62-5	Toluene diisocyanate
(60) 10061-02-6	trans-1,3-Dichloropropene
(61) 96-18-4	1,2,3-Trichloropropane
(62) 526-73-8	1,2,3-Trimethylbenzene
(63) 95-63-6	1,2,4-Trimethylbenzene
(64) 108-67-8	1,3,5-Trimethylbenzene,
(65)	Vanadium compounds
(66)	Zinc compounds

Subp. 3. **De minimis reporting; exceptions.**

A. Except as provided in item B, if a toxic chemical is present in a mixture of chemicals at an air toxics reporting facility and the toxic chemical is in a concentration in the mixture that is below one percent of the mixture according to the safety data sheet (SDS) or is below 0.1 percent of the mixture in the case of a toxic chemical that is a carcinogen or potential carcinogen, an owner or operator is not required to consider the quantity of the toxic chemical present in such mixture when calculating and reporting emissions. The sources listed in subitems (1) to (3) establish a chemical as a carcinogen or potential carcinogen and are incorporated by reference.

(1) *Report on Carcinogens*, National Toxicology Program, United States Department of Health and Human Services (15th edition and subsequent editions). The report is not subject to frequent change and is available on the website of the National Institute of Environmental Health Sciences (https://www.niehs.nih.gov);

(2) *IARC Monographs on the Identification of Carcinogenic Hazards to Humans*, International Agency for Research on Cancer (volumes 1 to 134 and as subsequently added). The monographs are subject to frequent change and are available on the website of the International Agency for Research on Cancer (https://monographs.iarc.who.int/monographs-available); or

(3) Code of Federal Regulations, title 29, part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

B. An owner or operator of an air toxics reporting facility must report all emissions of the air toxics in subitems (1) to (20). The de minimis standard under item A does not apply. For all pollutant names that contain the word "compounds," any chemical substance that contains the named chemical as part of that chemical's infrastructure is included.

Chemical Abstracts Service (CAS) number	**Pollutant**
(1) 309-00-2	Aldrin
(2)	Arsenic compounds
(3)	Cadmium compounds
(4) 57-74-9	Chlordane
(5)	Chromium compounds
(6)	Cobalt compounds
(7)	Dioxins/furans
(8) 75-21-8	Ethylene oxide
(9) 76-44-8	Heptachlor
(10) 118-74-1	Hexachlorobenzene
(11)	Lead compounds
(12)	Mercury compounds
(13) 72-43-5	Methoxychlor
(14)	Nickel compounds
(15)	Polycyclic organic matter (POMs)
(16) 40487-42-1	Pendimethalin
(17)	PFAS under subpart 2, item B
(18)	Polychlorinated biphenyl (PCBs)
(19) 8001-35-2	Toxaphene
(20) 1582-09-8	Trifluralin

Subp. 4. **Calculating actual emissions.**

A. An owner or operator of an air toxics reporting facility, except any facility permitted under part 7007.1125, registration permit option C, must calculate actual air toxics emissions using the methods in part 7019.3030, subpart 1, for the annual air toxics emission report.

B. An owner or operator of an air toxics reporting facility permitted under part 7007.1125, registration permit option C, must calculate emissions using the methods in part 7019.3020, subpart 5.

Subp. 5. **Recordkeeping.**

A. An owner or operator of an air toxics reporting facility must maintain records according to this subpart for five years after the date the air toxics emission inventory is submitted and must provide the records, upon request, to the commissioner.

B. An owner or operator must maintain a record of the SDS or vendor certification of air toxics content for each air-toxics-containing material purchased or used.

C. If an owner or operator assumes a reduction of air toxics emissions due to recycling or disposing of material off site, the owner or operator must keep records of the amount of disposed material, the amount of material shipped off site for recycling, and the calculations done to determine the amount to subtract. Acceptable records are the SDS, invoices, shipping papers, and hazardous waste manifests.

D. An owner or operator must maintain a record of the calculation for each air toxic emitted.

REPEALER. Minnesota Rules, part 7007.1850, is repealed.

Expedited Rules

Provisions exist for the Commissioners of some state agencies to adopt expedited rules when conditions exist that do not allow the Commissioner to comply with the requirements for normal rules. The Commissioner must submit the rule to the attorney general for review and must publish a notice of adoption that includes a copy of the rule and the conditions. Expedited rules are effective upon publication in the State Register, and may be effective up to seven days before
publication under certain conditions.

Expedited rules are effective for the period stated or up to 18 months. Specific *Minnesota Statute* citations accompanying these expedited rules detail the agency's rulemaking authority.

KEY: Proposed Rules - Underlining indicates additions to existing rule language. ~~Strikeouts~~ indicate deletions from existing rule language. If a proposed rule is totally new, it is designated "all new material." **Adopted Rules** - Underlining indicates additions to proposed rule language. ~~Strikeout~~ indicates deletions from proposed rule language.

Department of Employment and Economic Development (DEED)

Proposed Expedited Permanent Rules Regulating Paid Leave; Notice of Intent to Adopt Expedited Rules Without A Public Hearing

Proposed Rules Governing Minnesota Family and Medical Benefit Insurance Program, Minnesota Rules, Chapter 3317; Revisor's ID Number R-04846

Introduction. The Minnesota Department of Employment and Economic Development intends to adopt rules under the expedited rulemaking process following the rules of the Office of Administrative Hearings, *Minnesota Rules*, part 1400.2410, and the Administrative Procedure Act, *Minnesota Statutes*, section 14.389. You may submit written comments on the proposed expedited rules until January 3, 2025.

Department Contact Person. Submit clarification questions and requests for additional information to Greg Norfleet:

Exhibit G

G. Enclosed:

G-1. the Certificate of Mailing the Notice of Intent to Adopt Rules to the Rulemaking Mailing List.

G-2. the GovDelivery bulletin with recipient count.

G-3. the Certificate of Accuracy of the Mailing List.

Exhibit G-1

Minnesota Pollution Control Agency

CERTIFICATE OF MAILING THE DUAL NOTICE OF INTENT TO ADOPT RULES WITHOUT A PUBLIC HEARING UNLESS 25 OR MORE PARTIES REQUEST A HEARING, AND NOTICE OF HEARING IF 25 OR MORE REQUESTS FOR HEARING ARE RECEIVED, TO THE RULEMAKING MAILING LIST

Proposed Amendments to MPCA Rules Governing Air Quality – Air Toxics Emissions Reporting Rule, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019; Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850; Revisor's ID Number R-4599; OAH docket number 71-9003-39354

I certify that on Monday, November 25, 2024, at least 33 days before the end of the comment period, at Saint Paul, Ramsey County, Minnesota, I delivered the Dual Notice of Intent To Adopt Rules Without a Public Hearing Unless 25 or More Parties Request a Hearing, and Notice of Hearing if 25 or More Requests for Hearing are Received to all persons and associations on the rulemaking mailing list established by Minnesota Statutes, section 14.14, subdivision 1a, by sending electronic notification using the GovDelivery system or depositing the notice in the State of Minnesota's central mail system for United States mail with postage prepaid, according to subscriber preferences. A copy of the GovDelivery bulletin is attached to this Certificate.

Date: 11/25/2024

Addison Otto; Rule Coordinator
Minnesota Pollution Control Agency

Exhibit G-2

Otto, Addison (She/Her/Hers) (MPCA)

From: Otto, Addison (She/Her/Hers) (MPCA)
Sent: Monday, January 27, 2025 9:55 AM
To: Otto, Addison (She/Her/Hers) (MPCA)
Subject: RE: Courtesy Copy: Dual Notice of Intent to Adopt Rules - Air Toxics Emissions Reporting Rule

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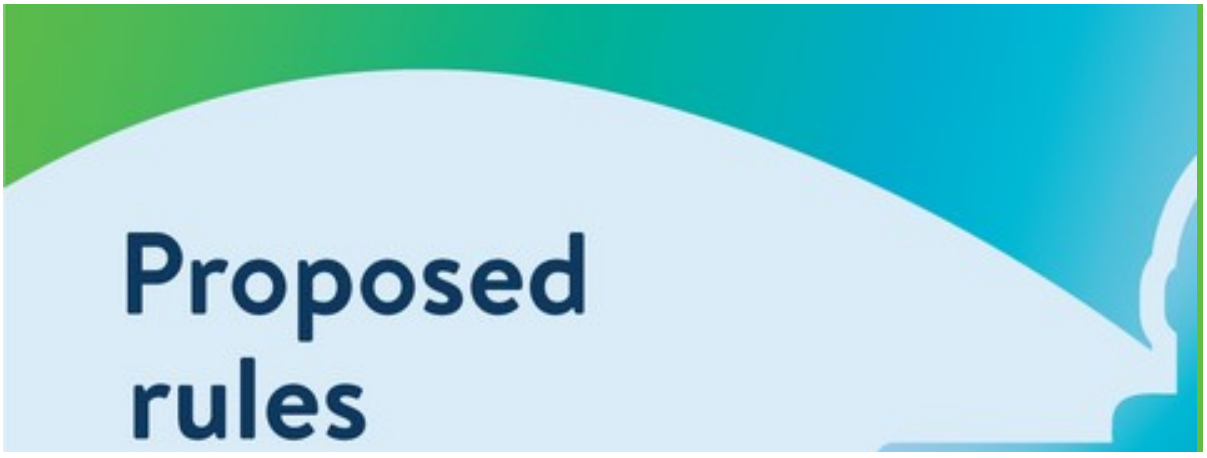
From: Minnesota Pollution Control Agency <mpca@public.govdelivery.com>
Sent: Monday, November 25, 2024 10:14 AM
To: Otto, Addison (She/Her/Hers) (MPCA) <Addison.Otto@state.mn.us>
Subject: Courtesy Copy: Dual Notice of Intent to Adopt Rules - Air Toxics Emissions Reporting Rule

This is a courtesy copy of an email bulletin sent by Addison Otto.

This bulletin was sent to the following groups of people:

Subscribers of Rulemaking: Air toxics emissions reporting (2258 recipients)

MINNESOTA POLLUTION CONTROL AGENCY



Dual Notice of Intent to Adopt Rules - Air Toxics Emissions Reporting Rule

MPCA's legal notice of its intent to adopt air quality rules

The Minnesota Pollution Control Agency (MPCA) has issued a Notice of Intent to Adopt Rules Without a Public Hearing Unless 25 or More Parties Request a Hearing, and Notice of Hearing if 25 or More Requests for Hearing Are Received; Revisor's ID R-4599, OAH docket number 71-9003-39354, for the Air Toxics Emissions Reporting rulemaking:

- Proposed Amendment to Rules Governing Air Quality, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019; and
- Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850.

The MPCA published this notice in the November 25, 2025, edition of the *State Register*. The notice is also available on the MPCA's website: Air toxics emissions reporting.

What this means

The proposed rules will require air permitted facilities located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties (except those with Option B registration permits) to annually report air toxics emissions, as directed by Minn. Stat. § 116.062.

The MPCA is also proposing to repeal certain sections of chapter 7007 that allow a Title V air permittee to assert emergency affirmative defense. This amendment is in response to the EPA's final rule effective August 8, 2023, that removed emergency affirmative defense provisions from the Clean Air Act Title V operating permit program regulations, and the deadline for states to remove this language from state rules by August 21, 2024. The MPCA requested and was granted an extension until August 21, 2025.

Next steps

As a result of this notice, a new comment period has opened. You can submit your questions, comments, and feedback on the proposed rule to the administrative law judge (ALJ) assigned to this rulemaking. You can also submit a request for a hearing as part of your comment or separately. Please submit your written comments to the ALJ online, using the Office of Administrative Hearings' rulemaking e-comments website.

The comment period and the opportunity to request a hearing closes at 4:30 p.m. on January 15, 2025.

Comment here!

Information Session

The MPCA will hold an information session on the proposed Air Toxics Emissions Reporting Rule and how you can participate in the rulemaking process. The information session will be recorded and available on our website.

Tuesday, December 10, 2024

3:00 p.m. Central Time

https://www.zoomgov.com/j/1602868372

Meeting ID: 160 286 8372

You can find more information on this rulemaking at MPCA's Air Toxics Emissions Reporting Webpage.

The Minnesota Pollution Control Agency is a state agency committed to ensuring that every Minnesotan has healthy air, sustainable lands, clean water, and a better climate.

Exhibit G-3

Minnesota Pollution Control Agency

CERTIFICATE OF ACCURACY OF THE MAILING LIST

Proposed Amendments to MPCA Rules Governing Air Quality – Air Toxics Emissions Reporting Rule, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019; Proposed Repeal to Rules Governing Air Quality, Minnesota Rules, chapter 7007.1850; Revisor's ID Number R-4599; OAH docket number 71-9003-39354

I certify that the list of persons and associations who have requested under Minnesota Statutes, section 14.14, subdivision 1a, that their names be placed on the Pollution Control Agency rulemaking mailing list is accurate, complete, and current as of November 25, 2024.

Date: 11/25/2024

Addison Otto; Rule Coordinator
Minnesota Pollution Control Agency

Exhibit H

Minnesota Pollution Control Agency

CERTIFICATE OF GIVING ADDITIONAL NOTICE UNDER THE ADDITIONAL NOTICE PLAN

Proposed Amendments to MPCA Rules Governing Air Quality – Air Toxics Emissions Reporting Rule, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019; Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850; Revisor's ID Number R-4599; OAH docket number 71-9003-39354

I certify that at least 33 days before the end of the comment period, at Saint Paul, Ramsey County, Minnesota, I gave notice according to the Additional Notice Plan approved by the Office of Administrative Hearings on October 15, 2024. Specifically, I met the components of the approved Additional Notice Plan through the following actions:

On Friday, November 22, 2024;

1. Provided notice to MPCA Air Mail electronic newsletter subscribers via email with a hyperlink to the webpage where electronic copies of the Notice, SONAR, and proposed rule amendments can be viewed.

On Monday, November 25, 2024;

1. Published the Notice of Intent to Adopt Rules on the MPCA's public notice webpage at: https://www.pca.state.mn.us/public-notices.
2. Provided specific notice to tribal authorities via email with a hyperlink to electronic copies of the Notice, Statement of Need and Reasonableness (SONAR), and proposed rule amendments to the 11 federally recognized tribes in Minnesota.
3. Provided specific notice to the two entities, American Petroleum Institute and the Minnesota Chamber of Commerce, via email with a hyperlink to electronic copies of the Notice, Statement of Need and Reasonableness (SONAR), and proposed rule amendments.
4. Provided specific notice to associations, environmental groups, and other entities identified in the Additional Notice Plan section of the SONAR via email with a hyperlink to electronic copies of the Notice, SONAR, and proposed rule amendments.
5. Posted relevant rulemaking updates and associated documents including the Notice, SONAR, and proposed rule on the Air Toxic Emissions Reporting webpage at https://www.pca.state.mn.us/get-engaged/air-toxics-emissions-reporting.

On Tuesday, December 10, 2024;

1. Provided specific notice to EPA Region 5 with a hyperlink to electronic copies of the Notice, Statement of Need and Reasonableness (SONAR), and proposed rule amendments.

Date: 12/10/2024

Addison Otto; Rule Coordinator
Minnesota Pollution Control Agency

Exhibit I

I. Enclosed:

I-1. all written comments and submissions on the proposed rules that the Agency received during the comment period, requests for hearing, and withdrawals of requests for hearing, except those that only requested copies of documents.

I-2. the Agency's response to comments received.

Exhibit I-1

This document contains the comments the MPCA received during the Dual Notice of Intent to Adopt Rules public comment period November 25, 2024, through January 15, 2025, for the planned amendments to rules governing Air Quality (Air Toxics Emissions Reporting Rule), Revisor ID # R-4599.

39354 Minnesota Pollution Control Agency Dual Notice of Intent to Adopt Rules

Closed Jan 15, 2025 · Discussion · 4 Participants · 1 Topics · 7 Answers · 0 Replies · 0 Votes

4	1	7	0	0
PARTICIPANTS	TOPICS	ANSWERS	REPLIES	VOTES

SUMMARY OF TOPICS

SUBMIT A COMMENT

7 Answers · 0 Replies

Important: All comments will be made available to the public. Please only submit information that you wish to make available publicly. The Office of Administrative Hearings does not edit or delete submissions that include personal information. We reserve the right to remove any comments we deem offensive, intimidating, belligerent, harassing, or bullying, or that contain any other inappropriate or aggressive behavior without prior notification.

Andrew Morley · Citizen · (Postal Code: unknown) · Jan 15, 2025 10:09 am
0 Votes

Please see the attached letter from the Minnesota Chamber of Commerce.

Andrew Morley · Citizen · (Postal Code: unknown) · Jan 15, 2025 10:23 am
0 Votes

Please find the attached petition to hold a public hearing.

Shalini Gupta · Citizen · (Postal Code: unknown) · Jan 15, 2025 11:19 am
0 Votes

Please see attached comment to require reporting of sulfuryl fluoride as an air toxic.

Andrew Morley · Citizen · (Postal Code: unknown) · Jan 15, 2025 1:58 pm
0 Votes

Please find the updated petition to hold a public hearing.

Andrew Morley · Citizen · (Postal Code: unknown) · Jan 15, 2025 2:15 pm
0 Votes

39354 Minnesota Pollution Control Agency Dual Notice of Intent to Adopt Rules

Closed Jan 15, 2025 · Discussion · 4 Participants · 1 Topics · 7 Answers · 0 Replies · 0 Votes

Please find an addendum to the Chamber's initial comments, originally posted at 10:23 AM CT.

Jill Van Noord · Citizen · (Postal Code: unknown) · Jan 15, 2025 3:13 pm
0 Votes

Please see the attached comments from Northern States Power Company - Minnesota

Brendan Mascarenhas · Citizen · (Postal Code: unknown) · Jan 15, 2025 4:29 pm
0 Votes

Please see the attached comments from the American Chemistry Council.

RECEIVED
By: OAH on 1/15/2025
Andrew Morley Attachment 1

MINNESOTA CHAMBER OF COMMERCE
GROWING MINNESOTA

January 15, 2025

Administrative Law Judge Jessica Palmer-Denig
Minnesota Office of Administrative Hearings
600 N. Robert Street
St. Paul, Minnesota 55101
OAH Docket No. 71-9003-39354

Comments submitted electronically through OAH's website
https://minnesotaoah.granicusideas.com/discussions/39354-minnesota-pollution-control-agency-dual-notice-of-intent-to-adopt-rules

Your Honor:

On behalf of the Minnesota Chamber of Commerce (Chamber), a statewide organization representing 6,300 businesses and more than half a million employees throughout Minnesota, we appreciate the opportunity to comment in response to the Minnesota Pollution Control Agency's (MPCA or "Agency") dual notice of intent to adopt rules related to air toxics emissions reporting in Minnesota Rules (Minn. R.) chapters 7002, 7005, 7007, and 7019, and to repeal the emergency affirmative defense provisions in Minn. R. 7007.1850.

Proposed Air Toxics Emissions Reporting Rules

MPCA cites its "specific statutory authority to adopt these rules under Minn. Stat. § 116.062, Minnesota Session Law – 2023, H. F. No. 2310, chapter 60, article 8, section 2 as follows: Sec. 2. Air Toxics Emissions Reporting. (b) The commissioner must require owners and operators of a facility issued an air quality permit by the agency, except a facility issued an Option B registration permit under Minnesota Rules, part 7007.1120, to annually report the facility's air toxics emissions to the agency, including a facility not required as a condition of its air quality permit to keep records of air toxics emissions."

In general, MPCA's Statement of Need and Reasonableness (SONAR) includes speculative rationale that does not support its specific rule proposals. The following list is not all inclusive:

- Figure 1 in the SONAR includes MNRISKS data for all sources. To justify increased reporting for a subset of sources, MPCA should present total MNRISKS data and then data for only the sources to be covered by the rulemaking. That demonstration may illustrate that the covered sources are important for risk reduction. However, MPCA data released in various reports in the past have shown the opposite; namely, that regulated facilities are a small part of the overall air toxics emissions inventory and related risks.
- MPCA claims that sources have no incentive to report accurately in the current voluntary system. Yet the Agency fails to demonstrate or explain how 30+ years of voluntary reporting and detailed analysis show current data are inaccurate or otherwise incomplete in a way that impacts MPCA's related policy and regulatory work.

- MPCA points to possible year-to-year variability in emissions as a reason for increasing the frequency of reporting from every-three-years to annually. Again, MPCA provides no data that shows air toxics emissions and concentrations fluctuate significantly that justifies its insinuation that more frequent data collection is necessary to close important gaps in knowledge.

MPCA says it will use the data from the rule to feed modeling and risk assessments at MPCA and US EPA. Further, it says "the MPCA does not wish to burden facilities but considers the benefits of air toxics emissions data from reporting to far outweigh the burden of annual reporting." These modeling and risk analysis activities are already happening, and it is misleading to use them as justification for new reporting with specific context.

Page 15 of MPCA's SONAR states that MPCA began collecting air toxics data from facilities in 2011. That is incorrect. MPCA has been collecting air toxics emissions data from facilities since at least the mid-1990s and was part of a US EPA Region 5 collaborative effort related to emissions and databases from at least the 1990s through the early 2000s. It is important that the record accurately reflect the duration of data collection efforts because having data for such a long period of time is important information against which to judge MPCA assertions and insinuations regarding the need for additional data collection.

The Chamber understands the Legislature has required MPCA to conduct rulemaking to make annual air toxics reporting mandatory. The points above, however, are examples of MPCA's failure to present a case for how the rules it has proposed will provide any real value for public health or air pollution understanding. If there is no real value, MPCA should approach the rulemaking effort with a targeted and flexible approach. Its proposed rule is not targeted and pulls in an expansive list of materials with minimal off-ramps. The end result will require a significant effort from regulated facilities for negligible benefit in the real world.

We attached a copy of the Chamber's September 21, 2023, comment letter on this planned rulemaking and the Chamber's August 6, 2020 letter requesting information on at the outset of potential changes to air toxics reporting. The Chamber and its members have been talking to MPCA about air toxics reporting and the possibility for increased reporting frequency since at least 2020. Chamber members offered to meet with MPCA staff to work on potential policy or rules that met the agency's data needs without broad new mandates. Despite the offers, MPCA never convened a stakeholder group of regulated parties. The proposed rule takes a maximalist approach with broad requirements, few off-ramps, and a very long list of reportable materials without any specific support for that approach. A more targeted approach would achieve any related public policy or health outcomes without the significant reporting burden on regulated facilities. A refined approach should be pursued instead of the rule as proposed.

In addition to our comments above, we note the following:

- MPCA references U.S. Environmental Protection Agency (EPA) Air Emissions Reporting Requirements (AERR) alignment. It should update the draft rule before final publication to match the AERR to the maximum extent possible.
- The proposed language in Minn. R. 7019.3020, subps. 9 and 10, add new requirements for the use of specific control efficiencies. Current voluntary submittals likely use control efficiencies determined by regulated facilities. MPCA-specified efficiencies are less likely to represent specific equipment and operations than facility data. MPCA's rule should allow for facility specific control efficiencies. These data will better represent real world emissions. Outside of the scope of this rule, some regulatory applicability analyses may require conservative assumptions as a factor of safety. This reporting rule is

intended to represent actual emissions. Conservative assumptions that lead to higher emission estimates would not serve the purpose of the rule.

- MPCA includes some de minimis allowances based on material safety data sheets. That is positive.
- With an expanded list of reportable materials, MPCA should clarify its expectations for pollutant testing and certifications of submittals. For example, many facilities do not add per-or polyfluoroalkyl substances (PFAS) materials to their processes, but there may be trace amounts in raw materials or incoming water. MPCA must clarify whether companies will be expected to test for PFAS or other materials that are not part of their process or otherwise expected to be present. Are other speciation methods (e.g., safety data sheet information) subject to the requirements of the calculation hierarchy available for toxics reporting instead of testing?

Repeal of the Emergency Affirmative Defense Provisions

The Chamber incorporates and reasserts its May 1, 2024, comments to the MPCA regarding its proposed repeal of the emergency affirmative defense provisions in Minn. R. 7007.1850 and the referencing conditions to the air permit program in Minn. R. 7007.0800, subp. 6, item F, and Minn. R. 7007.1146, subp. 5, item A, subitem (1).[1] The MPCA states that the proposal to repeal the emergency affirmative defense provisions is in response to the EPA's July 21, 2023, final rule that removed emergency affirmative defense provisions from the Clean Air Act Title V operating permit program regulations, herein referred to as the "T5-AD rule change."[2]

The Title V affirmative defense is important for subject facilities in Minnesota. In Minn. R. 7007.1850, an "emergency" is defined as "any situation arising from sudden and reasonably unforeseeable events beyond the control of the owners and operators of the stationary source, including an act of God, that requires immediate corrective action to restore normal operation, and that causes the stationary source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency." A facility must demonstrate an affirmative defense of emergency by satisfying several conditions listed in item C of the rule with corresponding evidence. The Chamber believes retaining these provisions to the extent practical and legal is imperative. Sources should not be held liable for emissions noncompliance resulting from an emergency situation beyond their control.

The Chamber continues to recommend not proceeding with the notice of intent to repeal the emergency affirmative defense provisions in chapter 7007. The proposed repeal should be delayed until active litigation between intervenors and the US EPA is concluded.[3] Final briefs on this litigation were submitted to the court in November 2024, and oral arguments are scheduled for January 14, 2025. A court decision on the issue is expected before August 21, 2025, which is MPCA's current EPA-approved deadline to remove the T5-AD rule change language from the state rules. Because the outcome of this litigation—which could include a potential stay or vacatur–may impact the disposition of the T5-AD rule change, the Chamber reiterates that the only prudent thing to do is for MPCA to await final disposition of this challenge. If necessary, MPCA should seek another extension to the current repeal deadline to allow for both parties to adhere to the court's decision rather than risk actions that may run afoul of that decision.

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[1] May 1, 2024, letter, from Tony Kwilas of the Minnesota Chamber of Commerce to Administrative Law Judge Jessica Palmer-Denig, OAH Docket No. 71-9003-39354.

[2] 88 Fed. Reg. 47029 (July 21, 2023).

[3] *SSM Litigation Group v. EPA*, filed September 19, 2023, in the United States Court of Appeals for the District Of Columbia Circuit, case number 23-1267.

As noted in the Chamber's May 1, 2024, comments, waiting for the outcome of active litigation on this matter may avoid a repeat of the 2015 startup, shutdown, and malfunction (SSM) State Implementation Plan (SIP) "call." In that case, EPA ordered a number of states—including Minnesota—to revise those parts of their SIPs that included defenses or exemptions related to emission exceedances during SSM events. The MPCA repealed Minn. R. 7011.1415 shortly thereafter. The D.C. Circuit Court of Appeals overturned most of the bases for the EPA's 2015 SIP call.[4] Had the MPCA not rushed to repeal its SSM rule, it may have avoided the need to do so. The 2015 SIP call underscores the need for slower and more careful consideration, particularly given that the litigation regarding the T5-AD rule change is still ongoing. Accordingly, if the MPCA preemptively repeals the rule and the litigation on the T5-AD rule change results in a stay or vacatur of the repeal, the MPCA should immediately reinstate the emergency affirmative defense provisions to be consistent with the Clean Air Act. MPCA (and EPA) would be better advised to wait for a final resolution this time before proceeding prematurely, as was the case with the 2015 SIP call. EPA would surely appreciate the prudence of such a position, if MPCA does find it necessary to seek another extension of its repeal deadline.

The MPCA also asserts that repealing the emergency affirmative defense provision would directly impact only one facility's permit and that "it is reasonable to repeal rules that are not used."

If or when the MPCA decides to repeal these provisions, it should retain them for air permits not issued pursuant to the Clean Air Act Title V operating permit program regulations. Since the MPCA permitting rules combine both the non-Title V and Title V operating permit programs, it is unclear how the removal or modification of the affirmative defense provisions will affect non-Title V facilities or why such a repeal would even be necessary. Minn. R. 7007.1850 does not disassociate the use of the affirmative defense between these types of permitted facilities, but the EPA's rule revoking the affirmative defense applies only to Title V permits. There is no basis for removing this provision for non-Title V permitted facilities.

Thank you for the opportunity to provide comments and participate in this rulemaking.

Sincerely,

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Director, Environmental Policy
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763-221-7523

[4] *Environmental Committee of the Florida Electric Power Coordinating Group, Inc. v. Environmental Protection Agency*, 94 F. 4th 77 (D.C. Cir. 2024).

September 21, 2023

Administrative Law Judge James Mortenson
Minnesota Office of Administrative Hearings

Comments submitted electronically through OAH's website

The Minnesota Chamber of Commerce (Chamber) submits these comments in response to the Minnesota Pollution Control Agency's (MPCA or Agency) request for comments (RFC) on the Agency's planned rulemaking for air toxics emissions reporting for facilities that emit air toxics and are located in the counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. The Chamber represents members that the rulemaking will impact.

The Chamber welcomes this opportunity to share its point of view regarding the proposed regulations. The Chamber recognizes that these rules, in conjunction with associated rules for air toxics regulation and cumulative impacts analysis, pose the possibility of a significant impact on the economic vitality of the areas subject to the rules. We believe that the MPCA also recognizes this concern. As such, the Chamber urges the MPCA to be deliberative and consultative in its approach.

Toward that end, and as a preliminary matter, the Chamber urges creating an advisory committee of key stakeholders to consult with the Agency before publishing draft rules. These stakeholders should include significant representation from parties that will be subject to new legal requirements under this rule. Such a process would help drive consensus around key issues and help the MPCA avoid (or at least narrow the scope of) potential rule challenges.

In its initial RFC, the MPCA referenced enabling legislation from the 2023 Minnesota legislative session that directs the MPCA to develop and issue rules that will:

1. Establish the requirements for air toxics emissions reporting for permitted facilities on an annual basis.
2. Identify the air toxics to be reported.
3. Amend permit and reporting processes to align with annual air toxics emissions reporting.

The Chamber's comments follow those elements and reference the Chamber's comments submitted for other planned rulemakings (attached below).

1. Establish the requirements for air toxics emissions reporting for permitted facilities on an annual basis.

The Chamber generally believes any new requirements for reporting should be aligned with existing data and conclusions. New or expanded reporting requirements should address specific public health priorities supported by the data. Please see the sections on "Data Utility" and "Reporting Burden" in the attached Chamber letter from August 6, 2020.

2. Identify the air toxics to be reported.

If air toxics will be further regulated and additional reporting required, the Chamber supports the MPCA's adoption of a list of air toxics in a rule. The list may be modified, as needed, through rulemaking and public comment in the future. Please see the section on "Guideposts for a Regulatory Program" in the attached Chamber letter dated September 21, 2023.

3. Amend permit and reporting processes to align with annual air toxics emissions reporting.

In line with our comments under item 1 above, the MPCA should only amend permits for facilities emitting priority pollutants or in designated areas. The MPCA should establish reporting thresholds and practical ways for potential reporters to determine applicability. Please see the "Streamlining Reporting" section in the attached Chamber letter from August 6, 2020.

The attached Chamber letters include additional policy and technical suggestions that go beyond the three issues the MPCA listed in the request for comments on the rule. Please consider those elements as the MPCA develops initial rulemaking.

In July 2023, the United States Environmental Protection Agency (US EPA) proposed updates to its Air Emissions Reporting Requirements (AERR). These changes would allow US EPA to collect annual hazardous air pollutant (HAP) emissions data starting in 2027. The MPCA should align any Minnesota rulemaking on air toxics / HAPs with US EPA requirements to avoid redundant reporting in multiple systems or to multiple government agencies.

Thank you for the opportunity to provide comments and participate in this rulemaking. As the rulemaking process proceeds, the Chamber and its members are available for further consultation.

Sincerely,

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MINNESOTA CHAMBER OF COMMERCE

GROWING MINNESOTA

August 6, 2020

Dear Ms. Maggie Wenger:

On July 16th, 2020, the Minnesota Pollution Control Agency (MPCA) organized an online meeting to discuss potential changes to air toxics reporting, primarily an agency interest in making emissions reporting mandatory. The Minnesota Chamber of Commerce (Chamber) has members across the state, many of whom hold air quality permits or are subject to air quality rules. This letter contains the Chamber's initial comments and questions on the issue of air toxics emissions reporting.

MPCA asked the following questions. We will organize our comments around them.

- Would you use the information we collect? How?
- Do you have concerns or questions about reporting burden? How does this reporting burden change when the inventory is not voluntary but mandatory?
- What would help simplify reporting?
- How should MPCA create the list of Air Toxics and maintain it over time? How to balance emerging pollutants of concern with a fixed list of air toxics in a rule? What should be the process for adding a pollutant to the list?
- What other states' toxics inventory and/or control programs should the MPCA look at?

Data Utility

MPCA's existing suite of air pollution-focused online tools and databases provide useful information for the public to understand trends and relative concentrations across geographies. As MPCA points out, the data fidelity is limited for determining neighborhood-scale concentrations and changes over time.

If MPCA's goal is to better understand community level emissions trends and potential health impacts, it seems unlikely that an incremental improvement in one sector's data would help with that goal. The emissions data from "point sources," while voluntary, have historically been of higher quality than the data for distributed, smaller sources or mobile sources of air pollution. Emissions from some categories of small sources were calculated using population-based emission factors at the county level. Improvements in calculations for those sources probably would bring more "bang for the buck" than additional requirements for industrial sources.

MPCA may also consider targeted air quality monitoring to better understand local conditions or specific pollutant concentrations. According to section 5.2 of the MPCA's 2021 Air Monitoring Network Plan for Minnesota, the MPCA monitors 10 metals at 18 TSP sites, and 7 carbonyls and 58 individual VOCs at 19 sites. The MPCA then converts these monitored concentrations into risk values and reports them online.

These efforts cannot answer every question but they seem to be better and more focused than mandatory reporting for the entire regulated community.

Even neighborhood-scale monitors may not completely characterize public health risks. Retired MPCA research scientist Greg Pratt collaborated with other researchers on many papers related to human exposure to air pollution. Two are attached. In these studies, comparisons of monitoring data at various scales showed that people's real exposures were driven by the micro-environments they experienced throughout their days.

We encourage MPCA to broadly consider potential efforts to understand concentrations of air toxics and weigh their relative effectiveness. If the goal is to provide useful data for policymakers and citizens, improvements to the most uncertain data that feed our inventories and models are likely the best path. In addition, studies that compare modeled NATA results to monitoring data may provide better targets for data improvements.

Reporting Burden

Some facilities are already required to calculate emissions of hazardous air pollutants (HAPs) or air toxics. For these facilities, a routine, voluntary submittal can be manageable. For facilities that are not required to calculate and track emissions, the reporting burden can be significant.

- The number of pollutants is large (187 HAPs plus numerous air toxics).
- Calculation methods are not always available.
- Facilities may not have information necessary to calculate such emissions. For example, the information on Safety Data Sheets may not provide information at the desired level of detail (compositional data can be (i) missing, especially if below de minimus levels, (ii) conservatively high, (iii) expressed as a wide range, and/or (iv) not identified by CAS number (which can make it difficult to identify HAPs).
- Adding air toxics reporting in the Q1 timeframe is especially challenging because this is already a very busy time for reporting under other programs.

A mandatory program may increase the burden in ways that are difficult to predict. Under a voluntary program, a facility may submit available data in good faith. Once the program becomes mandatory, we are concerned with new requirements that could impose regulatory penalties for reporting errors or require analytical testing to characterize specific emissions. A stack test may cost $5,000 to $10,000 per pollutant per stack.

Increasing the reporting frequency from every three years to every year would also increase the burden for all affected facilities, including those already submitting emissions information for HAPs and air toxics, due to the effort spent entering data into MPCA's CEDR / e-Services system. Chamber members would prefer to keep the current triennial frequency to minimize this burden.

Any increases in reporting rigor or frequency would be associated with costs for staff time to research and calculate emissions. If MPCA intends to process these emissions estimates and enter them into dispersion modeling analyses every year instead of every three years that would also lead to increased program costs that would likely be passed along to fee-paying permit holders.

Before proceeding with any related rulemaking, the Chamber requests that MPCA conduct a cost analysis for the proposed rule. The analysis should consider the likely data collection costs for regulated facilities and the staff costs for MPCA to administer the program and process the data. MPCA could look at various scenarios, from an "everybody reports" option to a targeted program that focused on geographies or pollutants. However, as noted above, a targeted analysis may be better completed by conducting ambient monitoring than an emissions-modeling-risk assessment approach.

In general, Chamber members believe that it is in the best interests of companies to report accurate data and that a shift to mandatory reporting may have a minimal effect on the overall public health information available. Before embarking on a new rule, MPCA should better characterize the expected improvements and the related costs.

Streamlining Reporting

For many facilities, compiling and submitting data for the current voluntary effort may take a week or more of real working time. A significant amount of that time is spent hard-keying the information into MPCA's CEDR / e-Services system. Many states, including Minnesota, have improved systems for uploading water quality discharge monitoring reports. An improved interface that allowed direct import of data would simplify reporting and improve accuracy.
Reporting could also be streamlined by maintaining consistency on reporting requirements over time.

Pollutant Lists

Any rule requiring reporting should establish clear guidelines on relevant compounds, *de minimis* reporting thresholds, and applicable sources. As described above, a rule could start with a limited set of sources and compounds in order to target the most important public health issues. Such an approach would add predictability and reduce the overall reporting burden.

The establishment of *de minimis* levels is not straightforward. If a facility does not have available emissions data, there may be no simple way to demonstrate that a particular compound is emitted below relevant thresholds. Facilities would be stuck in a chicken-and-egg scenario for small sources or compounds unlikely to be emitted.

MPCA should consider how to treat unique sources in any future program. Exemptions for research and development or temporary sources would be useful for permit holders and avoid extensive work to characterize sources that may not be significant.
The provision of detailed lists of compounds at a process level also creates challenges for the protection of confidential business information. MPCA should include provisions that allow sources to protect sensitive, process-specific data and formulations.

Relevant program details, including lists of compounds, should be explicitly listed in any rule and require notice-and-comment rulemaking to modify the list. In states where lists may be changed without notice, new compounds create unexpected technical challenges for regulated facilities.

State Examples

Each state's air toxics program is unique. For US EPA Region 5 states, Wisconsin is one example of a well-defined program, with pollutants and screening modeling thresholds included in rule. There are limitations to that program but it has the advantage of being predictable.

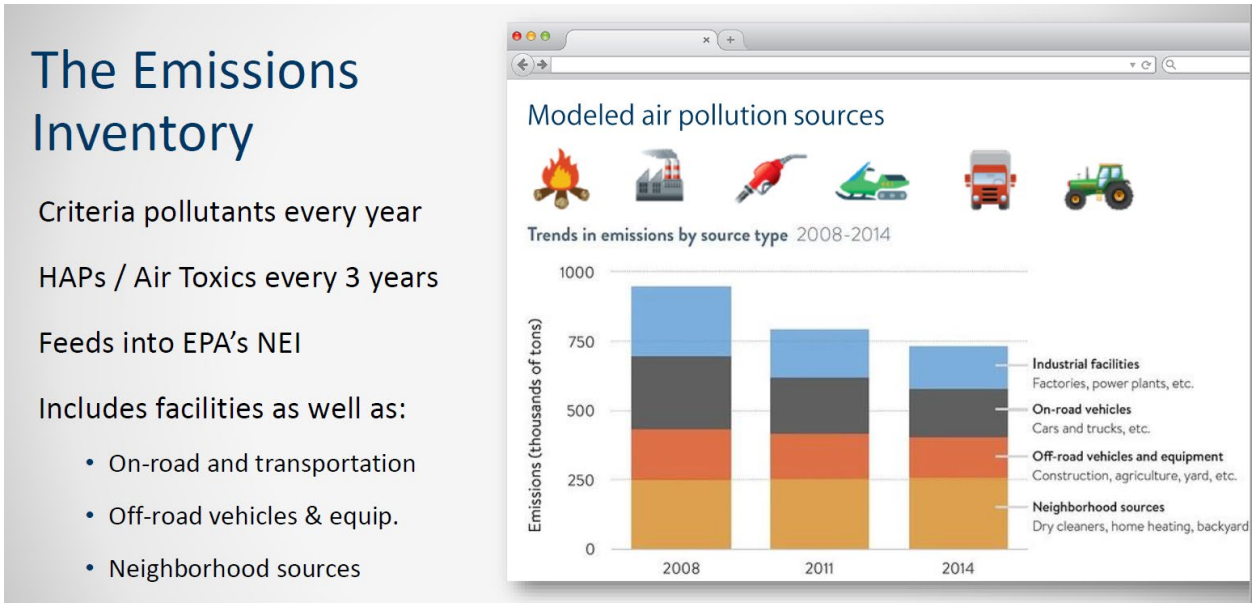
Many other states have policy-based programs, with minimal details included in rule. These programs are difficult for permit holders to manage during specific projects. We are not aware of examples of easily identified improvements to local pollutant concentrations or public health outcomes that can be attributed to these programs.

Other Comments

Chamber members are generally against increased reporting requirements as part of the MPCA's air toxics emissions inventory. Many of the most significant sources are regulated by federal NESHAPs. A number of the NESHAPs have recently undergone or will be subject to Residual Risk and Technology (RTR) reviews, which are required to demonstrate that facilities' HAP emission limits are protective of human health and the environment, with an adequate margin of safety.

Many of the MPCA's own reports state that emissions from industrial sources, both as a percent of total pollution and in absolute terms, are decreasing. A recent MPCA presentation on online air pollution tools showed this point.

MINNESOTA CHAMBER OF COMMERCE
GROWING MINNESOTA



MPCA highlighted several improvements that would potentially result from mandatory reporting, including better data quality and useful information for future program changes. However, more information is needed that links the specific proposal to these outcomes. Better data is a means to an end and a more targeted approach for certain sources or compounds may accomplish the same goal with reduced effort.

Chamber members continue to be frustrated with the timeliness of MPCA approval of permits and environmental review submittals. Reporting changes would increase the work required from key staff (e.g., dispersion modelers, risk assessors, possibly stack test coordinators) who are already in high demand. It is not a good trade off to reduce staff assigned to core regulatory programs to marginally improve data quality for emissions inventories.

Finally, as MPCA considers how to leverage existing programs to better serve communities and reduce exposure to air pollution, the Chamber reiterates its support for Clean Air Minnesota (CAM) programs and outcomes. While incremental data improvements are good, the overarching goal should be real improvements for real people, and that is where CAM excels. MPCA is already very involved with CAM and the Chamber appreciates MPCA's strong engagement and direct support for the collaborative effort. Further ramping up MPCA support for CAM projects related to clean cars, wood-burning stoves, diesel engines, and community businesses would lead to direct improvements in the air people breathe and may be a better way to spend our collective time on air quality issues.

Thank you for the opportunity to comment on the MPCA's potential changes to air toxics emissions reporting. The Chamber and its members are available for further consultation as these efforts proceed.

Respectfully submitted,

Tony Kwilas
Director, Environmental Policy
Minnesota Chamber of Commerce

Enclosures: 2
Evaluating Differences between Measured Personal Exposures to Volatile Organic Compounds and Concentrations in Outdoor and Indoor Air
Comparison of Personal, Indoor, and Outdoor Exposures to Hazardous Air Pollutants in Three Urban Communities

Environ. Sci. Technol. **2004**, *38,* 423−430

Comparison of Personal, Indoor, and Outdoor Exposures to Hazardous Air Pollutants in Three Urban Communities

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Two-day average concentrations of 15 individual volatile organic compounds (VOCs) were measured concurrently in (a) ambient air in three urban neighborhoods, (b) air inside residences of participants, and (c) personal air near the breathing zone of 71 healthy, nonsmoking adults. The outdoor (O), indoor (I), and personal (P) samples were collected in the Minneapolis/St. Paul metropolitan area over three seasons (spring, summer, and fall) in 1999 using charcoal-based passive air samplers (3M model 3500 organic vapor monitors). A hierarchical, mixed-effects statistical model was used to estimate the mutually adjusted effects of monitor location, community, and season while accounting for within-subject and within-time-index (monitoring period) correlation. Outdoor VOC concentrations were relatively low compared to many other urban areas, and only minor seasonal differences were observed. A consistent pattern of P > I > O was observed across both communities and seasons for 13 of 15 individual VOCs (exceptions were carbon tetrachloride and chloroform). Results indicate that ambient VOC measurements at central monitoring sites can seriously underestimate actual exposures for urban residents, even when the outdoor measurements are taken in their own neighborhoods.

Introduction

Volatile organic compounds (VOCs) are common constituents of urban air (*1*−*4*), and many, such as benzene, styrene, and toluene, are known or suspected to cause chronic adverse health effects in exposed populations (*5*). Many VOCs are designated as "hazardous air pollutants" under Title III, Section 112 of the 1990 Clean Air Act Amendments, and manufacturers are required to provide emissions data for numerous VOCs as part of the Toxics Release Inventory (TRI), which is mandated under Title III (Community-Right-to-Know provisions) of the Superfund Amendments and Reauthorization Act (SARA).

Regulatory agencies typically maintain information about ambient, outdoor levels of VOCs (including emissions data, modeling results, and measured concentrations) for most major urban areas. There is, however, a scarcity of data on indoor VOC concentrations in nonoccupational environments (e.g., residences, offices, vehicles), where people tend to spend most of their time. Even less is known about VOC levels that people actually breathe as they move through a variety of indoor and outdoor microenvironments during their normal daily activities (*6*−*8*). The relatively few studies that have been conducted suggest that both indoor and personal exposures are typically higher than matched outdoor concentrations measured at central monitoring sites (*9*−*11*). Consequently, more and better data on real-world VOC exposures are needed to improve the quality of health risk assessments and to evaluate the efficacy of risk management decisions. This article reports data on concurrent outdoor, indoor residential, and personal measurements of 15 individual VOCs over three seasons in three urban neighborhoods.

Study Design

The study was designed primarily to measure exposures to VOCs experienced by healthy, nonsmoking adults, and to compare results with concurrent measurements inside their residences and outside in their neighborhoods. A secondary objective was to measure $PM_{2.5}$ exposures for a subset of the subjects, results of which have been published previously (*12*−*15*). As part of the process for selecting study communities, the Minnesota Pollution Control Agency (MPCA) compiled emission rates for eight VOCs from three source categories—industrial point (e.g., manufacturing facility), mobile (e.g., motor vehicles on an interstate), and area (e.g., sum for all dry cleaners in a particular community)—for the seven-county Minneapolis/St. Paul metropolitan area. A Gaussian plume air dispersion model (Industrial Source Complex 3 or ISCST3) was used to estimate maximum 24-hour concentrations for three individual compounds (benzene, toluene, and 1,3-butadiene), as well as for the sum of all eight compounds (the initial three plus carbon tetrachloride, chloroform, methyl chloride, styrene, and tetrachloroethylene). On the basis of those results, three urban neighborhoods (Phillips, East St. Paul, and Battle Creek) with different outdoor VOC concentration profiles (*16*) were selected for the exposure monitoring study.

Phillips (PHI) is an economically disadvantaged, predominantly minority, inner-city neighborhood in south central Minneapolis. It encompasses an area of approximately 2.8 km^2 with a population density of 2000−8000 per km^2. Outdoor VOC concentrations in PHI were predicted to be relatively high because of contributions from multiple sources. East St. Paul (ESP) is a blue-collar, racially mixed neighborhood in St. Paul. It has an area of approximately 18.2 km^2 and a population density of 1000−4000 per km^2. VOC concentrations were predicted to be relatively high, primarily as a result of emissions from a large nearby manufacturing plant. Battle Creek (BCK) is a predominantly white, affluent neighborhood on the eastern edge of St. Paul. It includes an area of 9.8 km^2 and has a population density of 500−2000 per km^2. Predicted VOC concentrations were relatively low compared to those of the other two neighborhoods.

A centralized outdoor monitoring site (community site) was established by the MPCA in each neighborhood. Approximately 25 healthy, nonsmoking adults were recruited

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TABLE 1. Summary of Valid, Matched, VOC Samples[a] by Community, Season, and Monitor Location

	community	spring	summer	fall	all seasons
outdoor	Battle Creek	18	11	15	44
	East St. Paul	18	11	14	43
	Phillips	15	13	17	45
	all communities	51	35	46	132
indoor	Battle Creek	41	28	35	104
	East. St. Paul	45	22	33	100
	Phillips	30	28	30	88
	all communities	116	78	98	292
personal	Battle Creek	39	29	34	102
	East St. Paul	43	20	32	95
	Phillips	29	29	33	91
	all communities	111	78	99	288

[a] Without duplicates.

from each neighborhood using house-to-house canvassing and direct solicitation. Time-activity diaries and questionnaires indicate that participants were exposed to little or no environmental tobacco smoke inside their residences. Participants tended to be female (77%), 18−65 years of age, and with some college education. Minorities in East St. Paul were under-represented. However, participants' household incomes spanned a relatively wide range, ages from 20 to 60 were well represented, and minorities accounted for nearly half of the Phillips participants. Future papers will explore the effects of sociodemographic characteristics on VOC exposures.

Matched 2-day samples were collected outdoors at the three community monitoring sites, indoors in participants' residences, and near participants' breathing zones using passive dosimeters. All outdoor community-site (O), indoor residential (I), and personal (P) samples were collected during three monitoring sessions in 1999: spring (April 26−June 20), summer (June 21−August 11), and fall (September 23−November 21). During the spring monitoring session, average daytime temperature was 16 °C (SD = 4.1), average daytime wind speed was 4.2 m/s (SD = 1.4), and average daytime mixing height was 1055 m (SD = 315). Corresponding values for the summer monitoring session were average temperature 23.7 °C (SD = 3.2), average wind speed 3.9 m/s (SD = 1.1), and average mixing height 1132 m (SD = 260), and, for fall the average temperature was 8.7 °C (SD = 4.1), average wind speed was 4.3 m/s (SD = 1.1), and average mixing height was 708 m (SD = 334). The number of matched VOC samples by community, season, and monitor location is provided in Table 1.

Methods

All VOC concentrations (O, I, and P) were 2-day (approximately 48-hour) average values obtained with 3M model 3500 organic vapor monitors (3500 OVMs), which are charcoal-based passive air samplers. The suitability of these VOC badges for outdoor, indoor, and personal sampling has been demonstrated by Chung et al. (*17*, *18*). These investigators have also described the determination of extraction efficiencies and the calculation of method detection limits. Valid analytical results were obtained for 15 VOCs (Table 2). The extraction solvent consisted of a 2:1 v/v mix of acetone and carbon disulfide, which provided a very low background for target analytes. All extracts were analyzed by GC/MS with a Hewlett-Packard 5890 series II Plus GC with an HP 5972 MS detector, HP 18593B autosampler, Vectra 486 computer with EnvironQuant ChemStation Software and NBS75K Spectra Library, using an RTX-1/60-m/0.25-mm i.d./1-mm film thickness capillary column. Analytical and internal standards were prepared, and VOC concentrations were calculated as described previously (*18*). Duplicate O, I, and P badges were collected periodically during the study (total $n = 80$), and correlation coefficients were >0.95 for all individual VOCs except styrene (0.90), carbon tetrachloride (0.93), and chloroform (0.94).

Statistical analyses were performed using SAS (*19*) and S-plus (20). Concentrations less than the analytical detection limit were included in calculations. Nondetectable measurements (i.e., samples with no analytical response or those with values of ≤0 after blank subtraction) were assigned a value of one-half the analytical detection limit. As with most measurements of concentrations spanning multiple orders of magnitude, these values exhibit heterogeneity of variance across the range of concentrations; larger values tend to vary more than smaller ones. Without transformation, for estimation of mean relative concentrations the fit of regression models will be biased toward the behavior represented by these larger values. To stabilize the variance and thereby minimize this source of bias, estimated relative concentrations (ERCs: P/O, I/O) were calculated by computing the differences in log concentrations between P and O, and between I and O, for each combination of subject and time-index (the time marking the beginning of a monitoring period). Anti-logs of the estimated differences in the log scale arising from the regressions were taken and used to present the results in a ratio scale.

A central aim of this study was to estimate the effects of three factors, monitor location (personal, indoor, and outdoor), community, and season, on the concentrations of

TABLE 2. Summary Statistics for Outdoor, Indoor, and Personal Locations, for Matched, VOC Sampling Periods

	outdoor (ug/m³)						indoor (ug/m³)						personal (ug/m³)					
VOC	*n*	%det[b]	mean	median	Q10	Q90	*n*	%det[b]	mean	median	Q10	Q90	*n*	%det[b]	mean	median	Q10	Q90
benzene	132	100.0	1.6	1.3	0.6	3.3	292	99.7	5.8	1.9	0.8	15.3	288	100.0	7.6	3.2	1.4	18.3
carbon tetrachloride	132	99.2	0.6	0.6	0.5	0.9	292	99.7	0.6	0.5	0.4	0.9	288	99.7	0.6	0.6	0.4	0.9
chloroform	132	25.8	0.1	0.1	0.1	0.2	292	75.3	1.5	0.9	0.1	3.4	288	79.2	1.5	1.0	0.1	3.9
p-dichlorobenzene	132	58.3	0.1	0.1	0.1	0.2	292	72.6	1.2	0.2	0.1	1.5	288	83.3	3.2	0.4	0.1	5.1
ethyl benzene	132	98.5	0.7	0.5	0.2	1.4	292	99.0	3.9	1.4	0.5	8.9	288	100.0	5.6	2.2	0.9	11.8
d-limonene	121[a]	86.8	0.3	0.2	0.1	0.6	262[a]	99.6	16.1	9.0	2.2	30.7	258[a]	100.0	23.4	11.9	4.1	52.6
methylene chloride	132	80.3	0.4	0.4	0.1	0.8	292	97.9	7.8	1.1	0.2	11.5	288	100.0	6.2	1.4	0.4	12.1
a-pinene	121[a]	74.4	0.2	0.2	0.1	0.4	262[a]	99.6	6.7	2.5	0.7	12.4	258[a]	99.6	6.6	2.7	0.9	14.6
b-pinene	121[a]	9.1	0.1	0.1	0.1	0.1	262[a]	71.0	3.3	1.2	0.1	5.2	258[a]	77.5	4.5	1.6	0.1	7.1
styrene	132	43.2	0.2	0.1	0.1	0.4	292	74.3	0.8	0.5	0.1	1.4	288	85.4	1.1	0.7	0.1	2.0
tetrachloroethylene	132	98.5	0.4	0.3	0.1	0.7	292	97.6	2.9	0.6	0.2	3.8	288	100.0	31.8	0.9	0.2	7.0
toluene	132	82.6	4.8	3.0	0.1	11.5	292	97.9	22.4	12.3	2.4	53.8	288	99.3	30.3	17.1	5.1	62.9
trichloroethylene	132	73.5	0.2	0.1	0.0	0.3	292	83.9	0.5	0.2	0.0	0.8	288	91.7	1.0	0.2	0.0	1.4
o-xylene	132	97.0	0.8	0.7	0.2	1.7	292	99.7	4.7	1.6	0.5	11.4	288	100.0	6.8	2.3	1.1	15.6
m-/*p*-xylene	132	98.5	2.5	2.0	0.6	5.5	292	99.7	14.5	4.8	1.7	36.9	288	100.0	21.0	7.4	3.3	48.6

[a] Fewer valid samples were available because of calibration problems. [b] Percentage of samples with instrument readings above zero.

15 VOCs. Rather than present all 405 combinations ($3 \times 3 \times 3 \times 15$) with inferential statements about each, key marginal distributions are examined ("marginal" here referring to the margins of this $3 \times 3 \times 3 \times 15$ table). These include VOCs by each of the following: (a) monitor location, (b) monitor location and season, and (c) monitor location and community. In the statistical modeling of these factors for the outdoor concentrations, conditional on season and community, the outdoor measurements were treated as independent. Duplicate outdoor measurements for a subset of samples were processed by taking their geometric mean as a single measurement, and using inverse-variance reweighting to account for the greater precision that results for these cases. Accordingly, the mutually adjusted effects of community and season were estimated by a fixed-effects, analysis of variance (ANOVA)-type model, which was applied to each VOC.

The incorporation of monitor location effects calls for a more sophisticated approach than fixed-effects ANOVA. This study has a "hub-and-spoke" design, with four levels of potentially high correlation: (1) multiple subjects associated with each neighborhood-specific outdoor measurement, (2) multiple monitoring periods associated with each subject over time, (3) duplicate measurements taken from some subjects in some monitoring periods, and (4) duplicate measurements taken outdoors for some monitoring periods.To estimate the difference between, for example, the personal and outdoor levels of a VOC, standard *t*-statistics or fixed-effects ANOVAs do not account for this correlation and therefore could produce biased estimates as well as under-sized confidence intervals. To address this problem, for each VOC a hierarchical, mixed-effects statistical model (*21*, *22*) was used to estimate the mutually adjusted effects of monitor location, community, and season while accounting for all four sources of correlation. Fixed effects were modeled for log P/O, log I/O, and for the additive effects of community and season on each of these log relative concentrations. Random effects were modeled for study subjects ($n = 71$), for common O measurements at each sampling time-index, and for subject-time-index combinations with repeated measures. For the 12 O monitoring periods with duplicate measurements, the geometric mean of each duplicate was used with inverse variance reweighting to account for their higher precision. Exponentiation of these estimated effects yields P/O and I/O as relative concentrations, and the effects of community and season as multipliers of these relative concentrations.

Results

A community- and time-index-matched sample refers to either an I or P sample for which there was at least one corresponding O measurement in the same community and over the same period of time. The number of valid, community- and time-index-matched, 2-day VOC samples is shown in Table 1 by monitor location (O, I, P), community (BCK, ESP, PHI), and season, spring (SPRG), summer (SUMR), fall (FALL)). There were 132 O samples, 292 I samples, and 288 P samples available for analysis. Sampling spanned a total of 110 days (55 2-day VOC monitoring periods), with 40 in SPRG, 30 in SUMR, and 40 in FALL. Comparable numbers of valid samples were collected for each community. The I and P samples represent data from 71 subjects, 25 in BCK (2−17 P samples per subject), 22 in ESP (5−18 P samples per subject), and 24 in PHI (2−15 P samples per subject).

A summary of measured concentrations for all 15 VOCs is provided in Table 2. Percentage of samples above the analytical detection limit tended to be highest for P samples (77.5−100%), intermediate for I samples (71−99.7%), and lowest for O samples (9.1−100%). The compound least often detected in O (9.1%), I (71%), and P (77.5%) air was b-pinene. In contrast, benzene, carbon tetrachloride, ethyl benzene, tetrachloroehylene, *o*-xylene, and *m*-/*p*-xylene were detected in more than 97% of all O, I, and P samples. Median and 90th percentile values for all compounds, except carbon tetrachloride, were highest in P samples, intermediate in I samples, and lowest in O samples.

A comparison of distributions of all VOCs by monitor location (O, I, P) is displayed in Figure 1. The VOCs are ordered by their median O concentrations. The same four compounds, chloroform, *p*-dichlorobenzene, styrene, and trichloroethylene, tended to be found in the lowest absolute concentrations for all sample types. Similarly, toluene, *m*-/*p*-xylene, and benzene tended to be found in the highest absolute concentrations for all sample types. Both *a*-pinene and *d*-limonene were consistently found in relatively high concentrations for I and P samples.

Comparisons of distributions of all VOCs and monitor locations (P, I, O) are provided in Figure 2 by season and in Figure 3 by community. The VOCs are ordered as in Figure 1. The same general patterns (e.g., P > I > O) observed in the overall data (Figure 1) were also apparent within each season and within each community. In general, the same compounds as before were found in either relatively high or relatively low absolute concentrations across both seasons and communities.

The effects of community and season on outdoor concentrations alone are summarized in Table 3. The statistical model in this case comprises fixed effects only, and was fitted by maximum likelihood with software from SAS (*19*) and S-plus (*20*). The estimates in Table 3 are the anti-logs of the estimated fixed effects in the model, including 95% confidence intervals where appropriate (confidence intervals were not available for some VOCs with low detection rates).

The estimated outdoor VOC concentrations ($\mu g/m^3$) in BCK in SPRG (referent values) are based on the fitted regression model. The effects of the other two communities (ESP, PHI) and the other two seasons (SUMR, FALL) are represented in terms of multiplicative factors (or "effect modifiers") on the estimated concentrations in BCK in SPRG. For example, averaged across all three seasons, the ESP outdoor site has twice the level of benzene as BCK. The model estimated concentration of benzene for ESP in FALL is 2.0 ug/m^3, which is derived from 0.7 ug/m^3 (for BCK in SPRG) $\times$ 2.0 (effect modifier for ESP) $\times$ 1.4 (effect modifier for FALL).

The data indicate that estimated outdoor concentrations tended to be lower in BCK compared to ESP and PHI for most of the 15 VOCs (except carbon tetrachloride, *a*-pinene in PHI, *b*-pinene, and trichloroethylene in ESP). Estimated outdoor concentrations tended to be lower in SPRG compared to both SUMR and FALL for benzene, *p*-dichlorobenzene, ethyl benzene, styrene, *o*-xylene, and *m*-/*p*-xylene. On the other hand, estimated outdoor concentrations in SPRG tended to be higher than both SUMR and FALL for carbon tetrachloride, *d*-limonene, methylene chloride, toluene, and trichloroethylene.

The estimated relative concentrations (ERCs) for matched P/O, I/O, and P/I samples in BCK in SPRG (referent values), including 95% confidence intervals, are presented in Table 4, columns 3−5. Columns 6−9 show the estimated effects of the other two communities and seasons on the P/O ERCs in BCK in SPRG, while columns 10−13 show the estimated effects of the other two communities and seasons on the I/O ERCs in BCK in SPRG. The estimated community and seasonal effect modifiers represent the multiplicative effect, beyond that of the referent community (BCK) and season (SPRG), on either P/O or I/O. The data in Table 4 can also be used to derive approximate values for VOC-specific ERCs by community and season. For example, the P/O ERC for benzene in ESP during FALL is approximately 1.9, which is

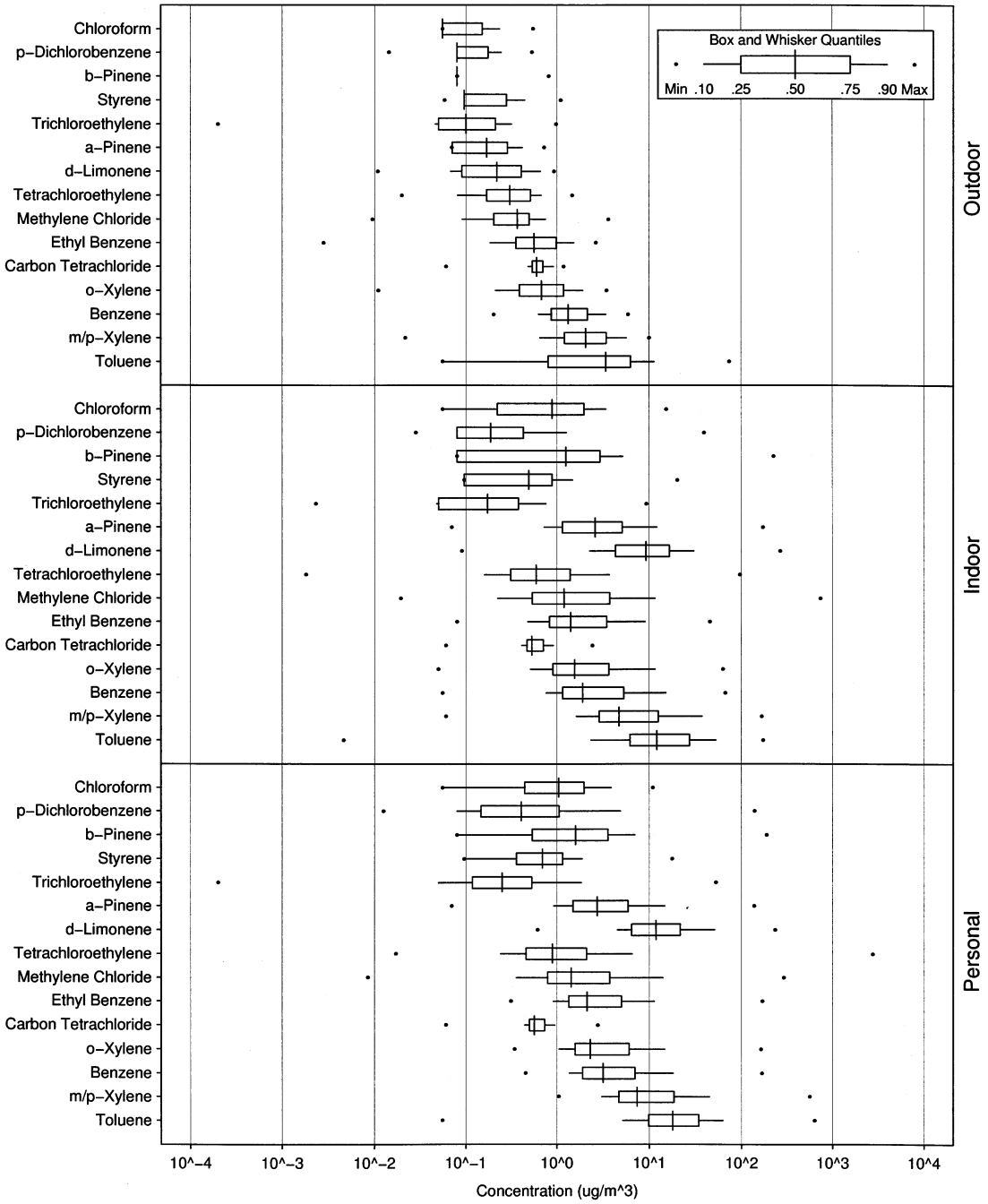

FIGURE 1. Distributions of all valid, matched VOC concentrations for outdoor, indoor, and personal samples

derived by multiplying 6.9 (P/O ERC for benzene in BCK in SPRG) × 0.3 (ESP effect modifier) × 0.9 (FALL effect modifier).

Consistent with previous analyses, concentrations of carbon tetrachloride are relatively constant for O, I, and P samples, and vary little across season and community (ERCs ≅ 1). There is substantial variability, however, in ERCs for the other VOCs. For example, the P/O ERCs in BCK in SPRG ranged from 3.0 (trichloroethylene) to 73.8 (*d*-limonene), I/O ERCs ranged from 1.6 (trichloroethylene) to 54.8 (*d*-limonene), and P/I ERCs ranged from 0.8 (chloroform) to 2.3 (*p*-dichlorobenzene). P/O ERCs were 3 or greater for 14 compounds, and I/O values were 3 or greater for 12 compounds. Eleven compounds had P/I ERCs >1, 3 compounds had P/I ERCs approximately equal to 1, and only chloroform (0.8) had a P/I ERC <1. For all measured VOCs in BCK in SPRG, except chloroform, mean P concentrations were ≥ matched I concentrations, and, except for carbon tetrachloride, mean I concentrations were > matched O concentrations.

The data indicate that for 11 of 15 VOCs, relative P/O concentrations tended to be lower in ESP and PHI as compared to BCK (effect modifiers < 1.0), with carbon tetrachloride, chloroform, *b*-pinene, and trichloroethylene in ESP being the exceptions. For example, the P/O ERC for benzene in ESP or PHI was only 30% of the comparable value for BCK. The data also show that there is relatively little seasonal effect on P/O for most compounds, except for methylene chloride (twice as high in the summer and fall) and toluene (1.5 times higher in the summer and 2.0 times higher in the fall).

The situation is similar for I/O comparisons, with ERCs in ESP and PHI tending, on average, to be lower than those in BCK (effect modifiers < 1.0), except for carbon tetrachloride, *p*-dichlorobenzene in PHI, and *b*-pinene, in ESP, and

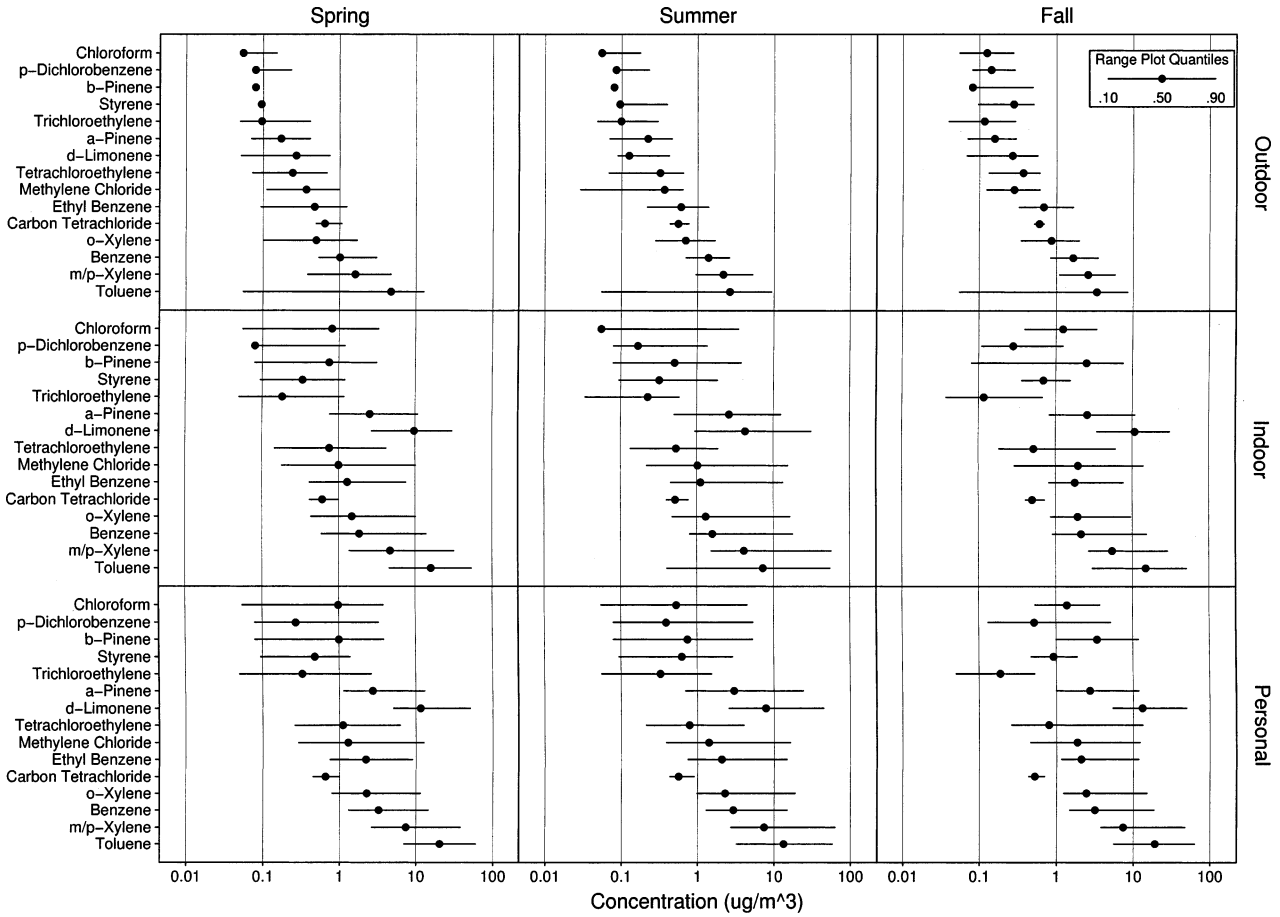

FIGURE 2. Distributions of all valid, matched VOC concentrations by monitor location and season

trichloroethylene in ESP. The I/O ERCs for benzene in ESP and PHI, for example, are only 30% that of BCK. The I/O ERCs were similar across seasons for most VOCs (effect modifiers ≅ 1.0), except for chloroform in summer (0.6 compared to spring), methylene chloride (twice as high in summer and fall compared to spring), *b*-pinene in fall (2.7 times higher than spring), and toluene in the fall (1.9 times higher than spring). Both P/O and I/O ERCs for BCK generally exceed one, several of these by a factor of 10. The P/O and I/O ERCs for ESP and PHI are generally lower, but still exceed one in all but a few cases.

Discussion

For 14 of the 15 VOCs measured in this study, 2-day average concentrations were highest for personal samples, intermediate for indoor residential samples, and lowest for outdoor community air samples. Carbon tetrachloride was the exception (P ≅ I ≅ O) because airborne concentrations appeared to be relatively uniform indoors and out. This finding is consistent with the fact that carbon tetrachloride is banned and no longer produced so that measured ambient levels represent global background values. It also indicates that carbon tetrachloride is equilibrated in the indoor environment within the time scale of our measurements. The P > I > O pattern, which is consistent with previous studies (*9*−*11*), persisted across all three urban neighborhoods and for all three seasons.

While accommodating the three-way interaction of monitor location, season, and community for each of these 15 VOCs would produce different estimates, this was not our aim. We believe it is important and relevant to estimate the overall effects in each of these three categories, for example, the overall effect of East St. Paul, across all three seasons. Comparing all 15 VOCs in this way alone creates a great deal of information by itself, and keeps the focus on overall effects. The addition of all three-way interactions would create many more tables of output, while not contributing substantially to our understanding of these overall effects.

Outdoor VOC concentrations were relatively low compared to those in other metropolitan areas, primarily because the Minneapolis-St. Paul metro area is (a) predominantly downwind of rural areas in the U. S. and Canada that tend to have low VOC emissions, (b) well ventilated by consistent winds, and (c) not situated in a valley that could trap pollutants. Although outdoor concentrations were similar in the three neighborhoods, levels in BCK tended to be marginally lower than those in ESP and PHI (in agreement with model predictions). No important seasonal differences were identified. The 2-day sampling time allowed for enough material to be collected so that the percentage of samples above the analytical detection limit was reasonably good for most compounds (all exceeded 70% detection except the O samples of *b*-pinene (9%), chloroform (26%), styrene (43%), and *p*-dichlorobenzene (58%)).

Indoor residential VOC concentrations are a function of both outdoor sources (such as automotive exhaust and smokestack emissions) and indoor sources (as for example environmental tobacco smoke, consumer products, and cooking emissions). In addition, indoor concentrations can also be influenced by factors such as ventilation rates, chemical reactions, and sorption to surfaces. Of the 15 VOCs measured in this study, one (carbon tetrachloride) originates exclusively outdoors, five (chloroform, *p*-dichlorobenzene, *d*-limonene, and *a*- and *b*-pinene) are almost soley from indoor sources, and nine (benzene, ethyl benzene, methylene chloride, styrene, toluene, trichloroethylene, tetrachloro-

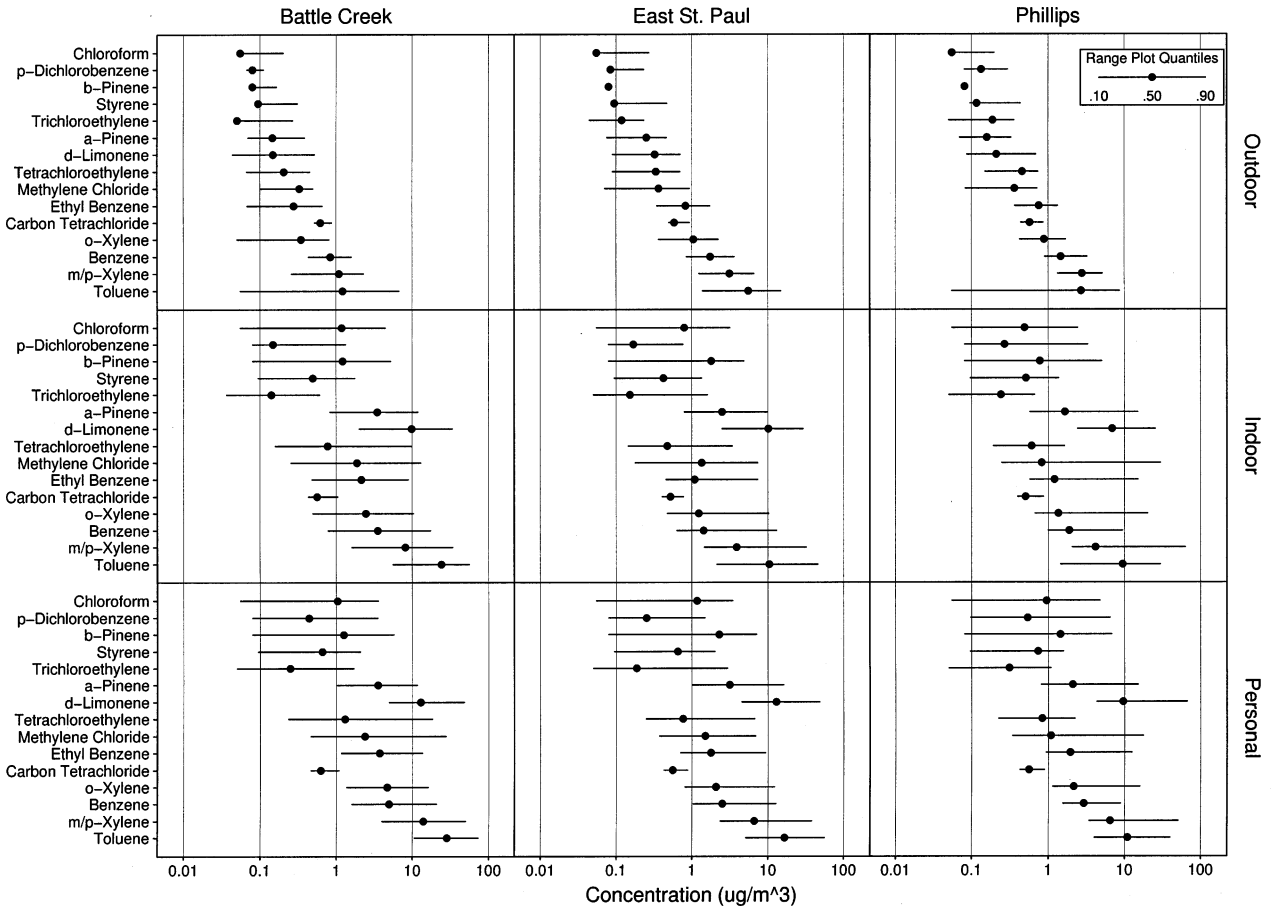

FIGURE 3. Distributions of all valid, matched VOC concentrations by monitor location and community

TABLE 3. Modeling Results for Comparison of Outdoor VOC Concentrations by Community and Season

VOC	*n*	est. (ug/m³) for BCK in SPRG	community and season effect modifiers (relative to BCK in SPRG)			
			ESP	PHI	SUMR	FALL
benzene	132	0.7 (0.6, 0.9)	2.0 (1.6, 2.6)	1.9 (1.5, 2.4)	1.1 (0.9, 1.4)	1.4 (1.1, 1.7)
carbon tetrachloride	132	0.7 (0.6, 0.8)	1.0 (0.9, 1.1)	0.9 (0.8,1.0)	0.9 (0.8,1.0)	0.9 (0.8,1.0)
chloroform	132	0.1 (NA[b], NA)	1.1 (NA, NA)	1.2 (NA, NA)	1.0 (NA, NA)	1.7 (NA, NA)
p-dichlorobenzene	132	0.1 (NA, NA)	1.3 (NA, NA)	1.7 (NA, NA)	1.1 (NA, NA)	1.5 (NA, NA)
ethyl benzene	132	0.2 (0.1, 0.2)	3.6 (2.5, 5.0)	3.1 (2.2, 4.4)	1.2 (0.9,1.7)	1.7 (1.2, 2.4)
d-limonene	121[a]	0.2 (0.1,0.2)	1.7 (1.1,2.5)	1.3 (0.9,2.0)	0.7 (0.5,1.1)	0.9 (0.6, 1.3)
methylene chloride	132	0.3 (0.2, 0.5)	1.2 (0.8, 1.7)	1.1 (0.8,1.7)	0.6 (0.4, 0.9)	0.8 (0.5, 1.1)
a-pinene	121[a]	0.1 (0.1, 0.2)	1.4 (1.1, 1.9)	1.0 (0.8,1.4)	1.2 (0.9,1.7)	0.9 (0.7,1.2)
b-pinene	121[a]	0.1 (NA, NA)	0.9 (NA, NA)	1.0 (NA, NA)	1.0 (NA, NA)	1.4 (NA, NA)
styrene	132	0.1 (NA, NA)	1.3 (NA, NA)	1.2 (NA, NA)	1.4 (NA, NA)	2.1 (NA, NA)
tetrachloroethylene	132	0.2 (0.1, 0.2)	1.5 (1.1, 2.1)	2.0 (1.4, 2.8)	1.0 (0.7,1.4)	1.3 (0.9,1.8)
toluene	132	1.0 (0.5, 1.8)	7.2 (3.6,14.4)	2.4 (1.2, 4.8)	0.5 (0.2, 0.9)	0.6 (0.3, 1.2)
trichloroethylene	132	0.1 (0.1, 0.1)	1.0 (0.7, 1.6)	1.6 (1.0, 2.4)	0.8 (0.5, 1.3)	0.8 (0.6, 1.3)
o-xylene	132	0.2 (0.2, 0.3)	3.4 (2.5, 4.6)	2.9 (2.1, 4.0)	1.4 (1.0, 1.9)	1.7 (1.3, 2.3)
m-/*p*-xylene	132	0.6 (0.5, 0.8)	3.6 (2.6, 5.0)	3.1 (2.3, 4.3)	1.3 (0.9, 1.9)	1.6 (1.2, 2.2)

[a] Fewer valid samples were available because of calibration problems. [b] NA = not available due to low outdoor detection rates.

ethylene, *o*-xylene, and *m*-/*p*-xylene) are emitted by both indoor and outdoor sources. Previous studies suggest that levels of many VOCs are typically higher inside residences than matched outdoor concentrations (*9*−*11*). In this study, for instance, in BCK in SPRG *d*-limonene, which is primarily from indoor sources such as room deodorizers, furniture

TABLE 4. Comparison of Estimated Relative Concentrations (ERCs) for VOCs (P/O, I/O, P/I) Based on a Mixed-Effects Model Fitted for Each VOC

					community and season ERC effect modifiers (relative to BCK in SPRG)							
		ERC for BCK in SPRG			P/O				I/O			
VOC	*n*	P/O	I/O	P/I	ESP	PHI	SUMR	FALL	ESP	PHI	SUMR	FALL
benzene	636	6.9 (4.8, 10.0)	4.4 (3.1, 6.4)	1.6 (1.3, 1.9)	0.3 (0.2, 0.4)	0.3 (0.2, 0.5)	1.0 (0.8, 1.2)	0.9 (0.7, 1.1)	0.3 (0.2, 0.4)	0.3 (0.2, 0.6)	0.9 (0.7, 1.2)	1.0 (0.8, 1.2)
carbon tetrachloride	636	1.0 (0.9, 1.1)	1.0 (0.9, 1.1)	1.0 (1.0, 1.1)	0.9 (0.8, 1.0)	1.0 (0.9, 1.1)	1.1 (1.0, 1.3)	0.9 (0.8, 1.0)	0.9 (0.8, 1.0)	1.0 (0.9, 1.1)	1.1 (1.0, 1.2)	0.9 (0.8, 1.0)
chloroform	636	9.5 (5.9, 15.2)	11.6 (7.2, 18.5)	0.8 (0.6, 1.1)	1.0 (0.6, 1.9)	1.1 (0.6, 2.0)	0.7 (0.4, 1.1)	1.3 (0.9, 1.9)	0.8 (0.4, 1.5)	0.6 (0.3, 1.0)	0.6 (0.4, 0.9)	1.2 (0.8, 1.8)
p-dichlorobenzene	636	5.6 (3.3, 9.4)	2.4 (1.4, 4.1)	2.3 (1.7, 3.1)	0.5 (0.2, 1.0)	0.8 (0.4, 1.7)	1.0 (0.7, 1.5)	1.1 (0.8, 1.6)	0.6 (0.3, 1.2)	1.0 (0.5, 1.9)	1.2 (0.8, 1.8)	1.2 (0.8, 1.7)
ethylbenzene	636	18.8 (12.1,29.1)	12.1 (7.8,18.7)	1.6 (1.3,1.9)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0.9 (0.6, 1.2)	0.7 (0.5, 1.0)	0.2 (0.1, 0.3)	0.2 (0.1, 0.4)	0.8 (0.6, 1.2)	0.8 (0.6, 1.1)
d-limonene	570[a]	73.8 (45.0, 121.0)	54.8 (33.5, 89.8)	1.3 (1.1, 1.6)	0.6 (0.3, 1.2)	0.8 (0.4, 1.5)	1.0 (0.6, 1.7)	1.2 (0.8, 2.0)	0.6 (0.3, 1.2)	0.7 (0.4, 1.2)	0.9 (0.5, 1.5)	1.3 (0.8, 2.0)
methylene chloride	636	5.8 (3.1,10.8)	4.4 (2.4, 8.2)	1.3 (1.1, 1.6)	0.5 (0.2, 1.3)	0.4 (0.2, 1.0)	2.0 (1.2, 3.1)	2.0 (1.3, 3.0)	0.5 (0.2, 1.2)	0.5 (0.2, 1.0)	2.0 (1.3, 3.2)	2.3 (1.5, 3.5)
a-pinene	570[a]	20.5 (12.9,32.5)	20.2 (12.8,32.1)	1.0 (0.9,1.2)	0.7 (0.4, 1.3)	0.7 (0.4, 1.3)	0.9 (0.6, 1.4)	1.3 (0.9, 1.8)	0.6 (0.3, 1.2)	0.6 (0.3, 1.1)	0.9 (0.6, 1.3)	1.3 (0.9, 1.9)
b-pinene	570[a]	6.5 (4.0, 10.5)	6.4 (4.0, 10.4)	1.0 (0.7, 1.4)	1.8 (1.0, 3.4)	1.0 (0.5, 1.9)	0.8 (0.5, 1.4)	3.0 (2.0, 4.5)	1.2 (0.7, 2.3)	0.6 (0.3, 1.2)	0.9 (0.5, 1.4)	2.7 (1.8, 4.1)
styrene	636	4.3 (2.9, 6.2)	3.2 (2.2, 4.6)	1.3 (1.1, 1.7)	0.9 (0.6, 1.5)	0.8 (0.5, 1.3)	1.1 (0.8, 1.5)	1.1 (0.8, 1.4)	0.8 (0.5, 1.2)	0.8 (0.5, 1.4)	1.0 (0.7, 1.3)	1.1 (0.9, 1.5)
tetrachloroethylene	636	9.4 (5.5, 16.3)	5.5 (3.2, 9.4)	1.7 (1.4, 2.2)	0.4 (0.2, 0.8)	0.3 (0.1, 0.6)	0.7 (0.5, 1.1)	0.7 (0.5, 1.1)	0.4 (0.2, 0.9)	0.3 (0.2, 0.7)	0.7 (0.5, 1.0)	0.8 (0.5, 1.1)
toluene	636	27.1 (13.1,56.4)	20.8 (10.0,43.2)	1.3 (1.0,1.6)	0.1 (0.0, 0.2)	0.1 (0.1, 0.3)	1.5 (0.7, 3.4)	2.0 (1.0, 4.2)	0.1 (0.0, 0.2)	0.1 (0.1, 0.4)	1.0 (0.4, 2.1)	1.9 (0.9, 3.9)
trichloroethylene	636	3.0 (1.8, 5.2)	1.6 (0.9, 2.8)	1.9 (1.4, 2.5)	1.0 (0.5, 1.9)	0.6 (0.3, 1.3)	1.1 (0.6, 1.9)	0.8 (0.5, 1.3)	1.1 (0.6, 2.2)	0.9 (0.4, 1.7)	1.1 (0.6, 1.9)	1.0 (0.6, 1.6)
o-xylene	636	18.0 (11.7,27.8)	11.0 (7.2,17.0)	1.6 (1.4,2.0)	0.2 (0.1, 0.3)	0.2 (0.1, 0.4)	0.8 (0.6, 1.1)	0.7 (0.5, 1.0)	0.2 (0.1, 0.3)	0.2 (0.1, 0.4)	0.7 (0.5, 1.0)	0.8 (0.6, 1.1)
m-/*p*-xylene	636	19.2 (12.5,29.7)	12.4 (8.1,19.2)	1.5 (1.3,1.9)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0.8 (0.6, 1.1)	0.8 (0.6, 1.0)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0.7 (0.5, 1.0)	0.8 (0.6, 1.1)

[a] Fewer valid samples were available because of calibration problems.

TABLE 5. Comparison of Benchmarks for Acceptable Lifetime Cancer Risk and Measured Personal, Indoor, and Outdoor VOC Concentrations (in $\mu g/m^3$)

volatile organic chemical (CAS no.)	concentration for benchmark cancer risk[a]	personal		indoor		outdoor	
		median	90th percentile	median	90th percentile	median	90th percentile
benzene (71-43-2)	1.3[b]	3.2	18.3	1.9	15.3	1.3	3.3
carbon tetrachloride (56-23-5)	0.7[c]	0.6	0.9	0.5	0.9	0.6	0.9
chloroform (67-66-3)	0.4[c]	1.0	3.9	0.9	3.4	0.1	0.2
p-dichlorobenzene (106-46-7)	0.9[d]	0.4	5.1	0.2	1.5	0.1	0.2
methylene chloride (75-09-2)	20[b]	1.4	12.1	1.1	11.5	0.4	0.8
trichloroethylene (79-01-6)	5[d]	0.2	1.4	0.2	0.8	0.1	0.3

[a] Estimated lifetime excess cancer risk (95th percentile upper-bound) of 1×10^{-5} (1 in 100 000) for an individual exposed to this concentration for a 70-year lifetime. [b] Minnesota Health Risk Value (HRV). [c] U. S. Environmental Protection Agency IRIS (Integrated Risk Information System) Value. [d] California Environmental Protection Agency Value.

polishes, and household cleaners, had an I/O ERC of 54.8 (95% CI: 33.5, 89.8). The VOC that was most often found in the highest absolute concentrations in O, I, and P samples was toluene, which has many outdoor and indoor sources. It had an I/O ERC of 20.8 (95% CI: 10.0, 43.2) in BCK in SPRG.

Personal exposures (P samples in this study) are a function of VOC concentrations in the various microenvironments through which people move during their normal daily activities, and the time they spend in those microenvironments. Past research indicates that P concentrations tend to be higher than matched I residential concentrations (as well as outdoor levels) for many VOCs (*9*−*11*). This is because most people spend more than 90% of their time indoors (home, work, school, restaurants, inside vehicles) where VOC concentrations are often relatively high. For the majority of people, highest personal VOC exposures are likely to occur away from home (for example, filling the car at a self-service station, working in a poorly ventilated office, sitting next to an active smoker at dinner, commuting in heavy traffic, visiting a dry cleaner). Some people, however, live in homes with significant indoor VOC sources (for example, VOC-intensive hobbies, occupants who smoke, VOC contamination from an attached garage, high-VOC-emission products, furnishings, or materials), which can be a major determinant of their personal exposure. The P/I ERCs were predominantly greater than 1 across all communities and seasons in this study, with most P concentrations exceeding matched I concentrations by 30% or more.

To put measured values in the context of related health effects, observed P, I, and O concentrations are compared in Table 5 to acceptable risk limits for the six VOCs in this

study that are designated human carcinogens (*5*, *23*, *24*). The established risk threshold in Minnesota (*24*) is the airborne concentration ($\mu g/m^3$), which, if breathed over a 70-year lifetime, is estimated (using a 95th percentile upper-bound estimate) to increase an exposed individual's lifetime cancer risk by 1×10^{-5} (1 in 100 000). All median and 90th percentile concentrations in P, I, and O samples were below the acceptable risk level for methylene chloride and trichloroethylene. All measured concentrations of carbon tetrachloride, which were relatively constant across O, I, and P samples, were at or near the risk threshold value (0.7 ug/m^3). For chloroform and *p*-dichlorobenzene, median and 90th percentile concentrations in outdoor air were below acceptable risk limits. However, in I and P samples, 90th percentile values for *p*-dichlorobenzene and both median and 90th percentile values for chloroform exceeded the applicable reference levels. For benzene, the median and 90th percentile concentrations exceeded the acceptable risk value in O, I, and P samples.

Further research is needed to better understand the significance of these results for health risk assessments and related risk management decisions. It is especially important to gain insight into how outdoor concentrations affect indoor levels in buildings and vehicles, and how outdoor and indoor levels in important microenvironments affect personal exposures. It is also crucial to learn more about indoor sources and to better understand the nature and magnitude of indoor emissions. Subsequent analyses of this data set will investigate inter-individual and intra-individual variability in VOC exposures over time, and examine cross-sectional and longitudinal correlations between outdoor and personal measurements.

In summary, it is common for regulatory agencies to rely on ambient air measurements at central monitoring sites as a proxy for human exposures to hazardous air pollutants in urban areas (*25*, *26*). Often this approach is used as part of a screening risk assessment, which aims to make conservative estimates of potential health risks (e.g., use assumptions that tend to over-estimate risk with an appropriate margin of safety or uncertainty). But the data presented here suggest that outdoor measurements at central neighborhood sites can substantially under-estimate actual exposures (and associated health risks) for local residents.

The evidence, which is consistent with previous studies, suggests that people typically encountered substantially higher VOC concentrations during their normal daily activities compared to ambient VOC levels recorded at central monitoring sites. It is worth noting that observed differences between indoor and outdoor concentrations may be less in urban areas with higher ambient VOC levels (lower I/O ERCs even if indoor residential VOC levels are similar because outdoor values may be higher). Results suggest that other indoor (e.g., inside vehicles, inside at work) and outdoor (e.g., walking on a busy street) microenvironments beyond those measured in this study are also important determinants of real-world VOC exposures.

Acknowledgments

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Evaluating Differences between Measured Personal Exposures to Volatile Organic Compounds and Concentrations in Outdoor and Indoor Air

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Accurate estimation of human exposures to volatile organic compounds (VOCs) is a key element of strategies designed to protect public health from the adverse effects of hazardous air pollutants. The focus here is on examining the capability of three different exposure metrics (outdoor community concentrations, indoor residential concentrations, and a simple time-weighted model) to estimate observed personal exposures to 14 VOCs. The analysis is based on 2-day average concentrations of individual VOCs measured concurrently in outdoor (O) air in three urban neighborhoods, indoor (I) air in participant's residences, and personal (P) air near the breathing zone of 71 healthy, nonsmoking adults. A median of four matched P−I−O samples was collected for each study participant in Minneapolis/St. Paul over three seasons (spring, summer, and fall) in 1999 using charcoal-based passive air samplers (3M model 3500 organic vapor monitors). Results show a clear pattern for the 14 VOCs, with P > I > O concentrations. Intra-individual variability typically spanned at least an order of magnitude, and inter-individual variability spanned 2 or more orders of magnitude for each of the 14 VOCs. Although both O and I concentrations generally underestimated personal exposures, I concentrations provided a substantially better estimate of measured P concentrations. Mean squared error (MSE) as well as correlation measures were used to assess estimator performance at the subject-specific level, and hierarchical, mixed effects models were used to estimate the bias and variance components of MSE by tertile of personal exposure. Bias and variance both tended to increase in the upper third of the P exposure distribution for O versus P and I versus P. A simple time-weighted model incorporating measured concentrations in both outdoor community air and indoor residential air provided no improvement over I concentration alone for the estimation of P exposure.

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Introduction

Concentrations of hazardous air pollutants in a person's breathing zone for a defined period of time are typically referred to as *personal* exposures (*1*, *2*). An individual's personal exposure for a particular time period (e.g., 48 h) depends on pollutant concentrations in the indoor and outdoor microenvironments through which he or she moves during routine daily activities and on the time spent in each of these locations. From a public health perspective, it is often important to estimate the distribution of personal exposures in a population or to distinguish between individuals with high versus low exposure. But measuring personal exposures for a large number of people (including potentially vulnerable groups such as the young, the elderly, and the infirm) can be burdensome, time-consuming, expensive, and, in many cases, impractical. It is imperative, therefore, to gain a clear understanding of the value of more easily obtained metrics, such as measurements at outdoor community sites or indoor residential locations, for estimating personal exposures.

Although volatile organic compounds (VOCs) are common constituents of outdoor (*3*−*6*) and indoor (*7*−*9*) air, comparatively little is known about personal exposures. The relatively few personal monitoring studies that have been conducted suggest that personal exposures tend generally to be higher than indoor residential concentrations, which tend typically to be higher than outdoor community concentrations (*10*−*15*). Other personal exposure studies have concentrated on exposure of specific subpopulations to one or few individual VOCs, with many focused on exposure to benzene. This paper examines the ability of fixed indoor residential and outdoor monitors, in combination with time−activity data, to estimate personal exposures to 14 individual VOCs for 71 nonsmoking adults in three urban neighborhoods.

Study Design

The study was designed primarily to measure exposures to VOCs experienced by healthy, nonsmoking adults and to compare results with concurrent measurements inside their residences and outside in their neighborhoods (*13*). A secondary objective was to measure $PM_{2.5}$ exposures for a subset of the subjects, results of which have been published previously (*16*−*19*). Three urban neighborhoods (Phillips, East St. Paul, and Battle Creek) with different outdoor VOC concentration profiles based on modeling results (*13*, *20*, *21*) were selected for the exposure monitoring study.

Phillips (PHI) is an economically disadvantaged, predominantly minority inner-city neighborhood in south central Minneapolis. Outdoor VOC concentrations in PHI were predicted to be relatively high because of contributions from multiple sources. East St. Paul (ESP) is a blue-collar, racially mixed neighborhood in St. Paul. VOC concentrations were predicted to be relatively high, primarily as a result of emissions from nearby manufacturing plants. Battle Creek (BCK) is a predominantly white, affluent neighborhood on the eastern edge of St. Paul. Predicted VOC concentrations were relatively low as compared to the other two neighborhoods.

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A centralized outdoor monitoring site (community site) was established in each neighborhood. Approximately 25 healthy, nonsmoking adults were recruited from each neighborhood using house-to-house canvassing and direct solicitation (informed consent was obtained). Matched 2-day samples were collected outdoors at the three community monitoring sites, indoors in participants' residences (room where they spent most of their waking hours), and near participants' breathing zones, all using passive dosimeters. Participants also completed time−activity logs recording the time they spent in seven microenvironments (indoors at home, work, other; outdoors at home, work, other; in transit) and the time they were in close proximity to environmental tobacco smoke. All outdoor community site (O), indoor residential (I), and personal (P) samples were collected during three monitoring sessions in 1999: spring (April 26−June 20); summer (June 21−August 11); and fall (September 23−November 21).

Methods

VOC Collection and Analysis. All VOC concentrations (O, I, and P) were 2-day (approximately 48-h) average values obtained with 3M model 3500 organic vapor monitors (3500 OVMs), which are charcoal-based passive air samplers. The suitability of these VOC badges for outdoor, indoor, and personal sampling has been demonstrated by Chung et al. (*22*, *23*). These investigators have also described the determination of extraction efficiencies and the calculation of method detection limits. The extraction solvent consisted of a 2:1 v/v mix of acetone and carbon disulfide, which provided a very low background for target analytes. All extracts were analyzed by GC/MS with a Hewlett-Packard 5890 series II Plus GC with an HP 5972 MS detector, HP 18593B autosampler, and Vectra 486 computer with EnvironQuant ChemStation Software and NBS75K Spectra Library, using an RTX-1/60 m/0.25 mm i.d./1 mm film thickness capillary column. Analytical and internal standards were prepared, and VOC concentrations were calculated as described previously (*23*). Duplicate O, I, and P badges were collected periodically during the study (total $n = 80$), and correlation coefficients for the positive measurements were >0.95 for all individual VOCs except styrene (0.94) and chloroform (0.95). We define the median relative absolute difference (MRAD) as the median of the ratios of within-pair absolute differences divided by the within-pair mean. MRAD was <0.18 for all VOCs except trichloroethylene (0.44).

Statistical Analyses. All statistical analyses were performed using SAS (*24*) and S-plus (*25*). Concentrations less than the method detection limit (MDL) were included in the calculations. "Nondetectable" measurements (i.e., samples with no analytical response or those with values ≤0 after blank subtraction) were assigned a value of one-half the analytical detection limit (ADL).

Three estimators of personal exposure are evaluated:

$$\hat{P}_{[O]ij} = O_{ij} \quad (1)$$

$$\hat{P}_{[I]ij} = I_{ij} \quad (2)$$

$$\hat{P}_{[OI]ij} = O_{ij}t_{[O]ij} + I_{ij}t_{[I]ij} \quad (3)$$

where O_{ij} and I_{ij} denote the observed concentration for the ith subject on the jth occasion, from O and I, respectively; $t_{[O]ij}$ and $t_{[I]ij}$ represent the (time) fraction of the 2-day monitoring period spent in the O and I environments, respectively. For the purposes of this analysis, we let $\hat{P}_{[O]}$, $\hat{P}_{[I]}$, and $\hat{P}_{[OI]}$ represent $\hat{P}_{[O]ij}$, $\hat{P}_{[I]ij}$, and $\hat{P}_{[OI]ij}$ for all subjects and all times. In the simple time-weighted model (eq 3), the proportion of time in O was defined to be the complement of the proportion of time in I (i.e., $t_{[O]ij} = 1 - t_{[I]ij}$). Thus, the model implicitly assumes that individuals not in their homes are exposed uniformly to the measured O concentration regardless of whether they are indoors or out (a likely underestimate of actual exposures).

The mean squared error (MSE) was computed for each estimator of P (see Discussion). To maintain the original scale of measurement, the root mean squared error (RMSE) is reported instead of the MSE, and the variance is represented by its square root as the standard deviation (SD). For $\hat{P}_{[O]}$ and $\hat{P}_{[I]}$, both RMSE and longitudinal correlations are first presented, based on estimation of each statistic for each subject. Geometric means of all duplicate samples are used to facilitate comparison with previous studies. To maximize the information available from our sample, no lower limit on the number of repeated measurements was applied in the calculation of these subject-specific RMSEs or longitudinal correlations (R) except for the mathematical limit imposed by the statistics themselves. For example, a longitudinal correlation cannot be calculated for subjects with only one data point. We report medians with upper and lower deciles to illustrate the inter-subject distributions of RMSE and R and to give a sense of their inherent variation.

To further analyze the MSE by its component bias and variance, mixed effects models were used (*26*, *27*). These models accommodate duplicate data explicitly, making use of information on measurement error, and obviating the need to take means of duplicates. Moreover, mixed effects models handle variation in numbers of measurements across subjects by downweighting those with fewer measurements. To allow for heterogeneity of variance and to more flexibly model bias, the range of all P exposures was divided into its three tertiles, and a separate model was fitted for each.

Results

Selected sociodemographic characteristics and exposure-related attributes for the 71 participants in the study are summarized in Table 1. Seventy-seven percent were female, and more than half (56%) were between the ages of 40−65 years. Only one person had less than a high school education, while 37% had some college, 18% were college graduates, and 34% reported some post-graduate education. More than half (51%) had an annual household income of $40 000 or more, with 8% earning between $75 000 and $100 000, and 3% earning more than $100 000. Eighty-five percent were white, 7% were African American, 3% were Native American, 1% was Asian/Pacific Islander, and 3% were other. Most participants (69%) worked outside the home, only 7% lived with a smoker, and 34% had attached garages. Overall, the participants were predominantly white, female, well-educated, relatively affluent, and unlikely to be exposed to environmental tobacco smoke at home. As expected, participants from PHI had the highest percentage of minorities and the lowest household incomes.

A total of 284 valid, matched P and O sample sets with time−activity diaries were obtained from the 71 participants. The number collected for each participant varied from 1 (2 people) to 11 (1 person), with a median of 4 (Q25 = 3 and Q75 = 6). This variability in the number of P samples for each individual results from the fact that some participants dropped out of the study early, while others continued to participate. Furthermore, some of the P samples were invalid because of protocol errors, monitor malfunctions, or analytical problems. The range of P VOC concentrations for each participant is displayed graphically in Figure 1, and the range of I VOC concentrations for each participant is presented in Figure 2. For individual VOCs, each line in these range plots represents one of the 71 participants and spans the range of concentrations measured for that person. Within each VOC, the line segments are ordered by maximum concentration, and the vertical ordering of the VOCs themselves is deter-

TABLE 1. Summary of Sociodemographic Information for Participants in the Study

	n (%)			
parameter	Battle Creek	East St. Paul	Phillips	all communities
no. of participants	25 (35%)	22 (31%)	24 (34%)	71 (100%)
gender				
male	7 (10%)	2 (3%)	7 (10%)	16 (23%)
female	18 (25%)	20 (28%)	17 (24%)	55 (77%)
age				
18−39 yr	6 (8%)	12 (17%)	11 (15%)	29 (41%)
40−65 yr	17 (24%)	10 (14%)	13 (18%)	40 (56%)
>65 yr	1 (1%)	0 (0%)	0 (0%)	1 (1%)
missing	1 (1%)	0 (0%)	0 (0%)	1 (1%)
education				
less than high school	0 (0%)	1 (1%)	0 (0%)	1 (1%)
high school	2 (3%)	2 (3%)	3 (4%)	7 (10%)
some college	7 (10%)	13 (18%)	6 (8%)	26 (37%)
college graduate	6 (8%)	2 (3%)	5 (7%)	13 (18%)
post-graduate education	10 (14%)	4 (6%)	10 (14%)	24 (34%)
annual household income				
$10 000−$19 999	2 (3%)	1 (1%)	3 (4%)	6 (8%)
$20 000−$29 999	0 (0%)	4 (6%)	9 (13%)	13 (18%)
$30 000−$39 999	4 (6%)	3 (4%)	3 (4%)	10 (14%)
$40 000−$49 999	2 (3%)	6 (8%)	1 (1%)	9 (13%)
$50 000−$74 999	9 (13%)	5 (7%)	5 (7%)	19 (27%)
$75 000−$99 999	2 (3%)	3 (4%)	1 (1%)	6 (8%)
≥$100 000	2 (3%)	0 (0%)	0 (0%)	2 (3%)
refused or missing	4 (6%)	0 (0%)	2 (3%)	6 (8%)
race				
white	24 (34%)	22 (31%)	14 (20%)	60 (85%)
African American	1 (1%)	0 (0%)	4 (6%)	5 (7%)
Native American	0 (0%)	0 (0%)	2 (3%)	2 (3%)
Asian/Pacific Islander	0 (0%)	0 (0%)	1 (1%)	1 (1%)
other	0 (0%)	0 (0%)	2 (3%)	2 (3%)
refused	0 (0%)	0 (0%)	1 (1%)	1 (1%)
work outside the home				
yes	17 (24%)	13 (18%)	19 (27%)	49 (69%)
no	8 (11%)	9 (13%)	5 (7%)	22 (31%)
live with a smoker				
yes	1 (1%)	3 (4%)	1 (1%)	5 (7%)
no	24 (34%)	19 (27%)	23 (32%)	66 (93%)
attached garage				
yes	18 (25%)	3 (4%)	3 (4%)	24 (34%)
no	7 (10%)	19 (27%)	21 (30%)	47 (66%)

mined by the median of these maximum values. Minimum values appear to be truncated in some cases (for example, β-pinene, chloroform, and styrene in Figure 1) because many samples were zero or below.

As shown in Figure 1, a participant's P exposure to individual VOCs over multiple monitoring periods (within-person variability) often spanned 1 or more orders of magnitude. Moreover, the difference between participants' with the lowest maximum P values and those with the highest (between-person variability) often spanned 2 or more orders of magnitude. This same pattern also held true for participants' I concentrations (Figure 2), which were generally lower than matched P exposures. The evidence indicates that for these 14 VOCs there was substantial within-person variability and between-person variability for both P exposures and I concentrations.

Two subject-level criteria for characterizing the performance of $\hat{P}_{[O]}$ are provided in Table 2. The RMSE and *R* were calculated for each subject with a sufficient number of samples for each measure (≥1 for RMSE, ≥2 for *R*). RMSE is a measure of the magnitude and variation of the difference ($\mu g/m^3$) between measured O concentrations and P exposures, while *R* is a measure of the linear association between O and P. Compared to *R* and for the aims of this study, RMSE is a more direct measure of performance of these estimators (see Discussion); however, we present both to facilitate their comparison. The median value for RMSE and *R* across all subjects along with 10th and 90th percentiles are presented.

Looking at the overall results, the median RMSE for $\hat{P}_{[O]}$ was between 0.2 and 1.8 $\mu g/m^3$ for 9 VOCs, between 2.5 and 4.8 $\mu g/m^3$ for 3 VOCs (α-pinene, β-pinene, and *m*-/*p*-xylene), 13.4 $\mu g/m^3$ for D-limonene, and 16.3 $\mu g/m^3$ for toluene. It should be noted that RMSE is expected to be elevated for those VOCs found at higher concentrations, since their variance is usually higher as well. For all 14 VOCs, $\hat{P}_{[O]}$ underestimated P exposure. The RMSE of $\hat{P}_{[O]}$ for 6 VOCs (benzene, ethyl benzene, methylene chloride, toluene, *o*-xylene, *m*-/*p*-xylene) was substantially higher in BCK than in ESP and PHI. This is not surprising given that O concentrations in BCK tended to be slightly but consistently lower than in the other two neighborhoods, while P exposures tended to be slightly higher (hence a greater underestimation of P exposures in BCK). Overall, correlation coefficients were generally unremarkable, with median *R* for 9 VOCs between −0.08 and 0.24 and between 0.43 and 0.59 for the other 5 VOCs (benzene, ethyl benzene, styrene, *o*-xylene, *m*-/*p*-xylene). With the exceptions of D-limonene and tetrachloroethylene in ESP and benzene, styrene, and *m*-/*p*-xylene in BCK, *R* values were generally comparable across the three neighborhoods.

Analogous performance measures for $\hat{P}_{[I]}$ by neighborhood are provided in Table 3. Comparing $\hat{P}_{[I]}$ to $\hat{P}_{[O]}$ overall, there was a reduction in RMSE for 13 of the 14 VOCs (trichloroethylene remained unchanged). The most dramatic reductions were observed for D-limonene (from 13.4 to 4.7 $\mu g/m^3$) and toluene (from 16.3 to 8.3 $\mu g/m^3$). Generally, $\hat{P}_{[I]}$ also

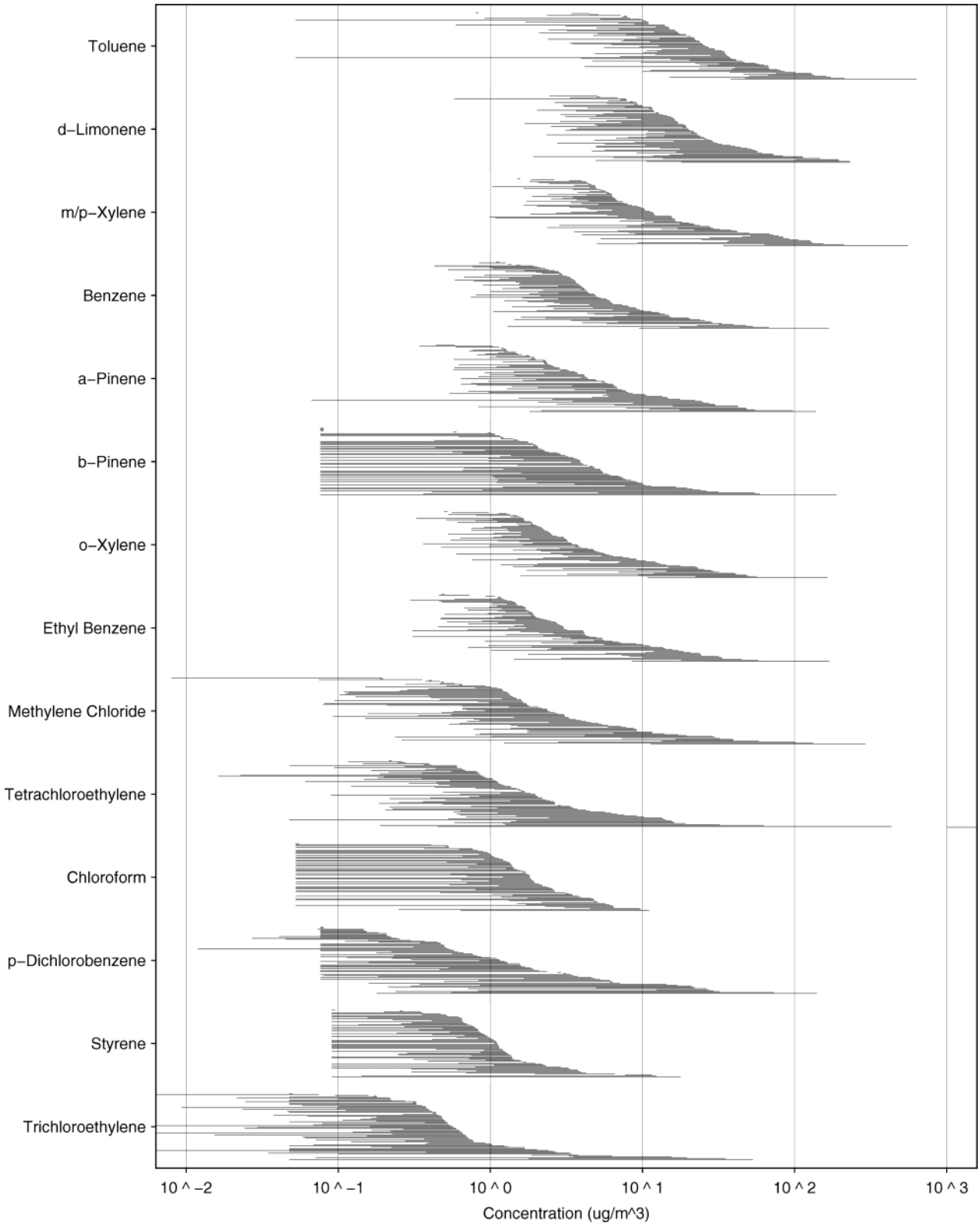

FIGURE 1. Range plot of measured personal VOC exposures for each study participant.

tended to underestimate P exposures, but not as much or as consistently as $\hat{P}_{[O]}$. Compared to $\hat{P}_{[O]}$, reduced RMSE occurred similarly across neighborhoods, and for benzene, toluene, *o*-xylene, and *m*-/*p*-xylene remained higher in BCK as compared to ESP and PHI (similar to the pattern observed for $\hat{P}_{[O]}$). Correlation coefficients improved dramatically for all VOCs, with $R > 0.85$ for 8 VOCs (benzene, chloroform, D-limonene, methylene chloride, α-pinene, β-pinene, *o*-xylene, *m*-/*p*-xylene), and $0.57 \leq R \leq 0.83$ for the remaining 6 VOCs. Relatively consistent R values for individual VOCs were observed across neighborhoods, with the exception of *p*-dichlorobenzene (0.16) in BCK and trichloroethylene (0.40) in PHI.

The improved performance of I over O concentrations is illustrated graphically in Figure 3 using three VOCs as examples. It is clear from the scatter plots that O concentra-

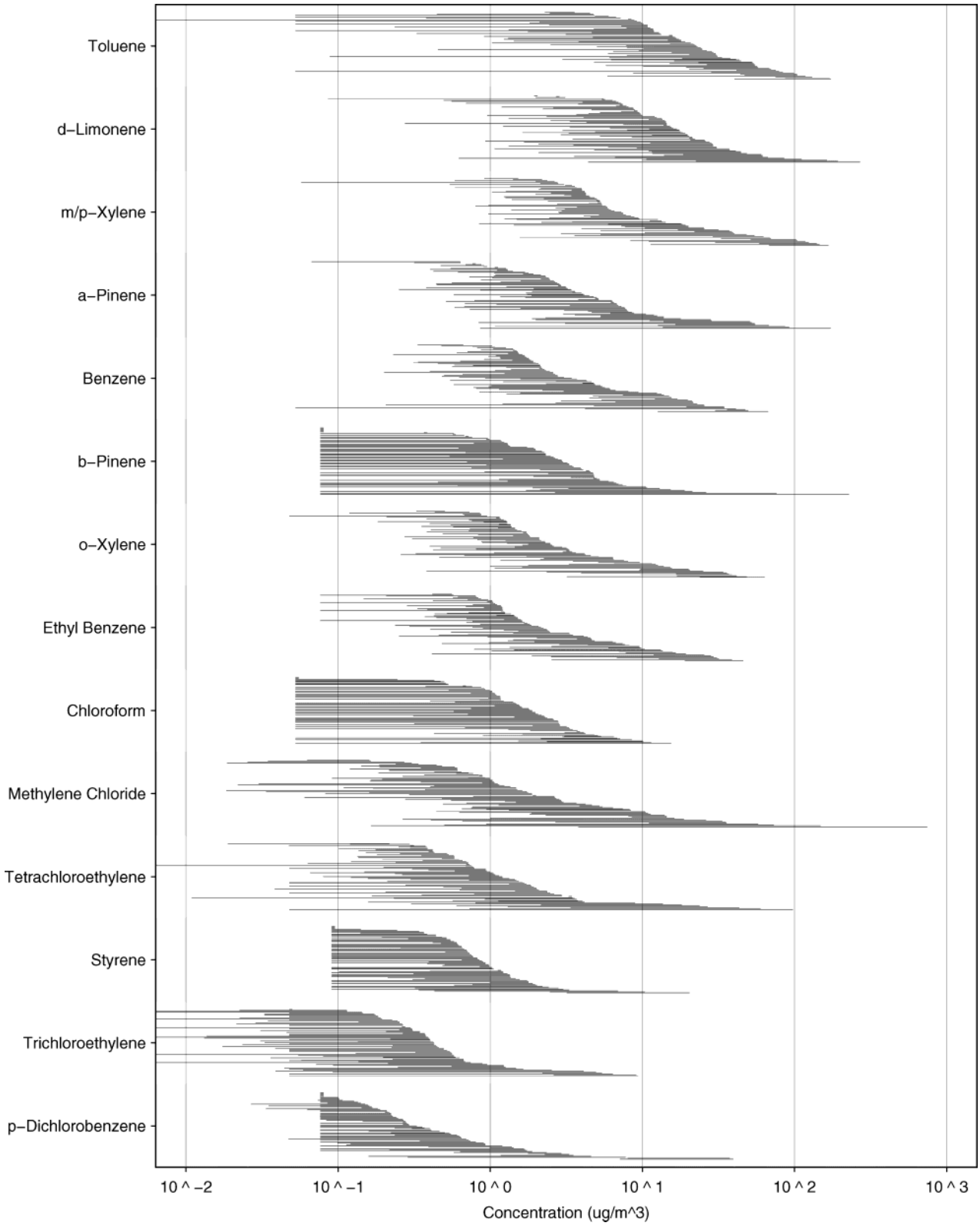

FIGURE 2. Range plot of measured indoor residential VOC concentrations for each study participant.

tions underestimate P exposure in the majority of cases for benzene, methylene chloride, and toluene. I concentrations, on the other hand, provide a noticeable improvement in estimating P exposure, although the tendency is still to underestimate. Overall, for this population and under the conditions of the study, matched I concentrations provided a substantially better estimate of personal VOC exposure than matched O concentrations for all 14 VOCs measured.

To further investigate the nature of RMSE for $\hat{P}_{[O]}$ and $\hat{P}_{[I]}$, we divided the domains of measured P exposures into lower, middle, and upper tertiles and then estimated the two components of MSE, bias (squared) and variance, using the mixed effects model. We distinguish the vector of all numerical observations of personal exposures by **P**. An estimate of bias is obtained for each tertile by estimating the mean of $\hat{P}_{[O]} - \mathbf{P}$ (Table 4) or the mean of $\hat{P}_{[I]} - \mathbf{P}$ (Table 5).

TABLE 2. Comparison of Matched (Outdoor Community, Personal) VOC Concentrations for Individual Participants in the Study

	Battle Creek		East St. Paul		Phillips		all communities	
compound	RMSE[a]	*R*[b]	RMSE	*R*	RMSE	*R*	RMSE	*R*
benzene	4.9	0.02	1.4	0.79	1.5	0.68	1.8	0.59
	(0.9, 19.4)[c]	(−0.92, 0.89)[c]	(0.9, 7.8)	(−0.37, 1.00)	(0.7, 8.5)	(−0.92, 1.00)	(0.7, 16.3)	(−0.85, 1.00)
chloroform	1.1	0.00	1.4	0.31	1.5	0.00	1.8	0.00
	(0.3, 3.3)	(−0.51, 1.00)	(0.6, 4.6)	(−0.16, 0.92)	(0.5, 4.2)	(−0.54, 0.98)	(0.5, 3.9)	(−0.50, 0.99)
p-dichlorobenzene	0.6	0.00	0.3	0.15	0.9	−0.01	0.7	0.00
	(0.1, 9.5)	(−0.54, 0.58)	(0.1, 8.4)	(−0.73, 0.82)	(0.1, 13.5)	(−0.78, 1.00)	(0.1, 9.8)	(−0.72, 0.98)
ethyl benzene	3.7	0.41	1.1	0.51	1.1	0.65	1.5	0.53
	(1.0, 14.3)	(−0.47, 1.00)	(0.5, 13.4)	(−0.76, 1.00)	(0.6, 12.3)	(0.01, 1.00)	(0.5, 14.3)	(−0.52, 1.00)
D-limonene	12.7	0.43	17.5	−0.31	12.2	0.34	13.4	0.15
	(6.3, 36.2)	(−0.64, 1.00)	(7.6, 86.5)	(−0.97, 1.00)	(6.9, 40.6)	(−1.00, 1.00)	(7.0, 57.2)	(−1.00, 1.00)
methylene chloride	3.3	0.14	1.5	0.11	0.8	0.38	1.3	0.14
	(0.2, 32.0)	(−0.93, 0.96)	(0.4, 8.3)	(−0.90, 0.84)	(0.4, 8.3)	(−0.76, 1.00)	(0.3, 12.4)	(−0.86, 1.00)
α-pinene	3.6	−0.04	3.6	0.12	2.0	−0.17	3.0	−0.08
	(1.2, 17.9)	(−0.93, 0.95)	(1.1, 15.4)	(−0.87, 0.96)	(1.2, 14.6)	(−1.00, 0.75)	(1.2, 17.3)	(−1.00, 0.95)
β-pinene	1.8	0.00	3.6	0.00	1.9	0.28	2.5	0.00
	(0.1, 8.8)	(−0.13, 0.98)	(1.5, 9.5)	(−0.40, 0.87)	(0.8, 7.2)	(0.00, 1.00)	(0.8, 9.4)	(−0.16, 0.99)
styrene	0.6	0.08	0.5	0.74	0.6	0.40	0.6	0.55
	(0.2, 2.1)	(−0.20, 0.99)	(0.2, 2.3)	(0.20, 0.98)	(0.4, 1.7)	(−0.82, 0.90)	(0.2, 2.0)	(−0.23, 0.98)
tetrachloroethylene	1.3	−0.15	1.0	0.62	0.6	0.17	0.9	0.24
	(0.2, 25.3)	(−0.75, 1.00)	(0.1, 8.7)	(−0.64, 0.99)	(0.2, 3.7)	(−1.00, 0.98)	(0.2, 8.9)	(−0.91, 1.00)
toluene	29.9	−0.11	13.8	0.06	10.0	0.33	16.3	0.02
	(9.6, 85.2)	(−0.99, 1.00)	(7.4, 50.4)	(−0.65, 0.87)	(5.1, 19.3)	(−0.49, 1.00)	(6.1, 64.5)	(−0.90, 0.99)
trichloroethylene	0.2	0.16	0.2	0.43	0.2	0.20	0.2	0.24
	(0.1, 1.1)	(−0.65, 1.00)	(0.1, 1.5)	(−0.16, 0.98)	(0.1, 0.5)	(−0.92, 0.98)	(0.1, 1.3)	(−0.79, 0.99)
o-xylene	4.2	0.26	1.3	0.44	1.3	0.67	1.6	0.43
	(1.2, 17.3)	(−0.94, 0.96)	(0.5, 16.5)	(−0.78, 0.97)	(0.6, 16.3)	(0.13, 1.00)	(0.6, 19.0)	(−0.72, 1.00)
m-/*p*-xylene	14.1	0.19	3.8	0.50	3.7	0.70	4.8	0.47
	(3.4, 57.4)	(−0.75, 0.98)	(1.5, 51.9)	(−0.76, 0.99)	(1.8, 54.0)	(0.08, 1.00)	(2.0, 63.4)	(−0.69, 1.00)

[a] Median root mean squared error (μg/m³); *n* for number of research subjects = 25 for Battle Creek, 22 for East St. Paul, and 24 for Phillips. [b] Median correlation coefficient; *n* for number of research subjects varies from 20 to 23 for Battle Creek, *n* = 22 for East St. Paul, and *n* varies from 21 to 22 for Phillips. [c] 10th and 90th percentiles.

In addition, an estimate of standard deviation (SD) is obtained from the square root of the variance resulting from application of the same mixed model.

The results from Table 4 show that both the bias and the SD of $\hat{P}_{[O]}$ tend to increase from the lower to the middle and from the middle to the upper tertile of the distribution of P exposures. For example, in the lower tertile the range of $\hat{P}_{[O]} - \mathbf{P}$ values for individual VOCs is between −1.9 and 0.0; in the middle tertile it is between −13.2 and −0.1; and in the upper tertile it is between −62.7 and −2.0. These data suggest that $\hat{P}_{[O]}$ typically underestimates P exposures in all cases and that the magnitude of this underestimation increases with higher P exposures. In terms of variance, the range of SDs for individual VOCs in the lower tertile is 0.1−9.9, 0.2−6.4 in the middle tertile, and 1.9−360 in the upper-tertile. Again, the data indicate that the variance of $\hat{P}_{[O]}$ generally increases with higher P exposures.

The pattern is similar for I versus P in Table 5, with both bias and variance of $\hat{P}_{[I]}$ increasing from lower to middle to higher tertiles of P exposures. For example, the range of $\hat{P}_{[I]} - \mathbf{P}$ values for the 14 individual VOCs is −0.9 to 0.4 in the lower tertile, −3.3 to 1.1 in the middle tertile, and −55.8 to 3.9 in the upper tertile. The evidence suggests that $\hat{P}_{[I]}$ tends to underestimate P exposures for 12 of the 14 VOCs, especially in upper tertile of the distribution of P exposures. $\hat{P}_{[I]}$ tends to overestimate, particularly in the upper tertile, for methylene chloride and α-pinene. Similarly, the range of SDs for individual VOCs increases from 0.1 to 5.2 in the lower tertile, from 0.2 to 10.2 in the middle tertile, and from 1.7 to 351 in the upper tertile, which suggests that variance in $\hat{P}_{[I]}$ also tends to increase with higher P exposures.

We investigated the time-weighted estimator $\hat{P}_{[OI]}$ by examining the RMSE for the model where P exposure equals the time fraction of the 2-day monitoring period spent indoors at home ($t_{[I]}$) times the measured I concentration plus the complement of the time fraction indoors at home ($1 - t_{[I]}$) times the measured O concentration (see eq 3). Because the measured O concentration is likely to be less than or equal to unmeasured concentrations in the other microenvironments, it represents quasi-baseline conditions (i.e., minimal exposures) when participants were not inside their homes. In Table 6, the RMSE for this model is apportioned into bias and SD using the same approach as for $\hat{P}_{[O]}$ and $\hat{P}_{[I]}$ (Tables 4 and 5).

As found for $\hat{P}_{[O]}$ and $\hat{P}_{[I]}$, the bias (the expected difference between the estimator and P exposure) to noise (SD) ratio for $\hat{P}_{[OI]}$ in Table 6 is relatively low. Nevertheless, it is apparent that the estimated bias of $\hat{P}_{[OI]}$ was similar to that for $\hat{P}_{[I]}$ (Table 5) in the lower and middle tertiles. At the higher tertile, the bias was greater for the time-weighted estimator in every instance except methylene chloride. The SD was generally similar between $\hat{P}_{[I]}$ and the time-weighted model across all three tertiles.

Discussion

Chronic exposure to relatively low levels of airborne VOCs is an inescapable reality for residents of the United States. This class of chemicals is ubiquitous in occupational and nonoccupational settings, including both indoor and outdoor environments. Not only are VOCs released into the air from industrial processes, internal combustion engines, cigarette smoking, and bathing or showering in chlorinated water, they are also common constituents in cleaning and degreasing agents, deordorizers, dry-cleaning processes, paints, pesticides, personal care products, and solvents (*2*, *7*−*15*). Of the 14 VOCs measured in this study, five originate from primarily indoor sources (chloroform, *p*-dichlorobenzene, D-limonene, and α- and β-pinene), while nine are emitted by a combination of indoor and outdoor sources (benzene,

TABLE 3. Comparison of Matched (Indoor Residential, Personal) VOC Concentrations for Individual Participants in the Study

	Battle Creek		East St. Paul		Phillips		all communities	
compound	RMSE[a]	*R*[b]	RMSE	*R*	RMSE	*R*	RMSE	*R*
benzene	2.5	0.86	1.6	0.89	1.1	0.78	1.7	0.86
	(0.5, 9.7)[c]	(0.12, 1.00)[c]	(0.4, 6.0)	(0.10, 1.00)	(0.6, 4.4)	(−0.98, 1.00)	(0.4, 8.1)	(−0.26, 1.00)
chloroform	0.4	0.89	0.6	0.90	0.5	0.70	0.5	0.88
	(0.2, 1.5)	(0.06, 1.00)	(0.3, 1.7)	(−0.19, 0.99)	(0.3, 2.7)	(−0.32, 1.00)	(0.2, 1.7)	(−0.05, 1.00)
p-dichlorobenzene	0.5	0.16	0.2	0.64	0.5	0.62	0.3	0.57
	(0.1, 9.0)	(−0.42, 0.99)	(0.1, 8.3)	(−0.48, 0.99)	(0.1, 6.8)	(−0.88, 1.00)	(0.0, 9.0)	(−0.54, 1.00)
ethyl benzene	1.4	0.69	0.8	0.85	0.8	0.73	1.0	0.75
	(0.3, 11.0)	(−0.94, 0.99)	(0.2, 3.0)	(−0.26, 1.00)	(0.3, 15.6)	(−0.13, 1.00)	(0.3, 11.1)	(−0.39, 1.00)
D-limonene	4.2	0.96	5.8	0.98	4.7	0.94	4.7	0.96
	(2.1, 18.9)	(0.34, 1.00)	(2.5, 36.3)	(0.26, 1.00)	(1.8, 45.0)	(−0.84, 1.00)	(2.1, 36.4)	(0.11, 1.00)
methylene chloride	1.3	0.95	0.6	0.93	0.8	0.81	0.8	0.90
	(0.3, 26.2)	(−0.37, 1.00)	(0.2, 1.8)	(0.37, 1.00)	(0.2, 5.7)	(−0.09, 1.00)	(0.2, 8.7)	(−0.04, 1.00)
α-pinene	1.3	0.98	0.8	0.92	1.0	0.92	1.0	0.95
	(0.3, 7.2)	(0.34, 1.00)	(0.3, 6.3)	(0.61, 1.00)	(0.2, 14.0)	(−0.51, 1.00)	(0.2, 7.6)	(−0.42, 1.00)
β-pinene	0.9	0.98	1.2	0.96	1.1	0.97	1.0	0.97
	(0.1, 2.8)	(0.00, 1.00)	(0.3, 4.9)	(0.15, 1.00)	(0.4, 2.9)	(0.00, 1.00)	(0.2, 4.1)	(0.00, 1.00)
styrene	0.4	0.65	0.3	0.70	0.4	0.77	0.4	0.71
	(0.1, 1.2)	(−0.19, 1.00)	(0.2, 1.3)	(0.01, 0.99)	(0.2, 1.1)	(0.01, 1.00)	(0.2, 1.2)	(−0.12, 1.00)
tetrachloroethylene	0.8	0.83	0.6	0.90	0.4	0.77	0.7	0.83
	(0.2, 25.1)	(−0.32, 1.00)	(0.1, 6.4)	(−0.19, 1.00)	(0.2, 3.0)	(−0.12, 1.00)	(0.2, 6.5)	(−0.30, 1.00)
toluene	12.5	0.65	7.3	0.86	7.5	0.83	8.3	0.77
	(2.3, 43.4)	(−0.98, 0.98)	(1.8, 18.5)	(0.22, 0.99)	(3.3, 23.8)	(−0.25, 1.00)	(2.7, 26.9)	(−0.67, 1.00)
trichloroethylene	0.2	0.88	0.2	0.88	0.2	0.40	0.2	0.69
	(0.0, 2.5)	(0.23, 1.00)	(0.1, 2.5)	(−0.17, 1.00)	(0.1, 0.5)	(−0.64, 0.99)	(0.1, 1.0)	(−0.26, 1.00)
o-xylene	2.0	0.92	0.9	0.92	0.7	0.82	1.1	0.90
	(0.4, 12.5)	(−0.09, 1.00)	(0.3, 4.0)	(−0.17, 1.00)	(0.4, 16.0)	(−0.24, 1.00)	(0.4, 12.9)	(−0.20, 1.00)
m-/*p*-xylene	5.6	0.90	3.1	0.93	2.2	0.71	3.5	0.86
	(0.9, 40.1)	(−0.16, 1.00)	(0.6, 11.8)	(−0.40, 1.00)	(1.3, 58.3)	(−0.26, 1.00)	(1.0, 40.1)	(−0.30, 1.00)

[a] Median root mean squared error (μg/m^3); *n* for number of research subjects = 25 for Battle Creek, 22 for East St. Paul, and 24 for Phillips. [b] Median correlation coefficient; *n* for number of research subjects varies from 20 to 23 for Battle Creek, *n* = 22 for East St. Paul, and *n* varies from 21 to 22 for Phillips. [c] 10th and 90th percentiles.

ethyl benzene, methylene chloride, styrene, toluene, trichloroethylene, tetrachloroethylene, *o*-xylene, and *m*-/*p*-xylene).

Measuring P exposures is the only way to determine unequivocally the magnitude, duration, and frequency of actual exposures experienced by people as they move through a variety of indoor and outdoor locations during their normal daily activities (*1*, *2*). Consequently, P exposure is the de facto "gold standard" for assessment of individual and population exposures to VOCs. But because it is usually impractical and prohibitively expensive to measure P VOC exposures for everyone (or even a large sample of the population of interest), there is a continuing need to develop and validate practical and cost-effective surrogate estimators that are suitably accurate and precise. In this paper, we have examined the performance of three candidate estimators of P exposure: outdoor community concentration, indoor residential concentration, and a simple time-weighted model.

The evidence indicates that, consistent with previous studies in urban areas (*10*−*15*), P exposures tended to be higher than measured indoor concentrations, which tended to be higher than measured outdoor concentrations. The data for P and I concentrations also show that within-person variability for the 14 VOCs measured in this study typically spanned 1 or more orders of magnitude, while between-person variability usually spanned 2 or more orders of magnitude. These findings suggest that a substantial number of people and a substantial number of P and I measurements for each person may be necessary to adequately characterize VOC exposures for a particular population.

One of the novel aspects of this study was the use of MSE as well as correlation measures to assess the performance of multiple estimators (O, I, simple time-weighted model) for P exposure. To appreciate the value of MSE as a comparison metric at the subject-specific level, it is important to recognize the inherent limitations of *R*, a more traditional means of comparing exposure estimators.

To examine and compare estimators of P exposures, we assumed a set of measured P concentrations from a group of *m* subjects represented their actual exposures to an individual VOC. The vector of these observations is denoted as

$$\mathbf{P} = [p_{11} \cdots p_{1n_1}, p_{21} \cdots p_{2n_2}, \ldots, p_{m1} \cdots p_{mn_m}]$$

where p_{ij} gives the observed P exposure for the *i*th subject on the *j*th occasion. A candidate estimator of **P**, denoted as $\hat{\mathbf{P}}_*$, is a vector of the same structure as **P** but with some function of the data at element $\hat{p}_{*ij}$. Metrics for assessing the ability of $\hat{\mathbf{P}}_*$ to estimate **P** traditionally include the sample correlation coefficient, *R* (*28*), which may be estimated for each subject over time or jointly for all subjects, where *R* takes values within the interval [−1, +1].

Although *R* is a common metric for analyzing associations between P exposures and O or I concentrations, it is only a measure of the linear association between $\hat{\mathbf{P}}_*$ and **P** (*29*). To the extent that $\hat{\mathbf{P}}_*$ is an unbiased and precise estimator of **P**, *R* approaches +1. However, *R* also approaches +1 in many other cases. For example, if $\hat{p}_{*ij} = (1/2)p_{ij}$ for all *j*, then $R_i = +1$ despite the fact that $\hat{\mathbf{P}}_*$ underestimates **P** by a factor of 2.

Another problem with *R* is its dependence on the distribution of **P** values. Despite having the same MSE in estimating **P**, it can be shown that an estimator $\hat{\mathbf{P}}_*$ will yield potentially very different values of *R*, depending on the distribution of values of **P** that are sampled or selected for the study. Thus it is not possible to compare an estimator from one study with one from a different study, unless the sets of **P** measurements are the same or at least have similar distributions. Absent these common features, therefore, we cannot answer the question of which estimator is better.

In the calculation of a separate, longitudinal correlation coefficient for each subject, this dependence on the **P** distribution adversely affects the usefulness of the resulting

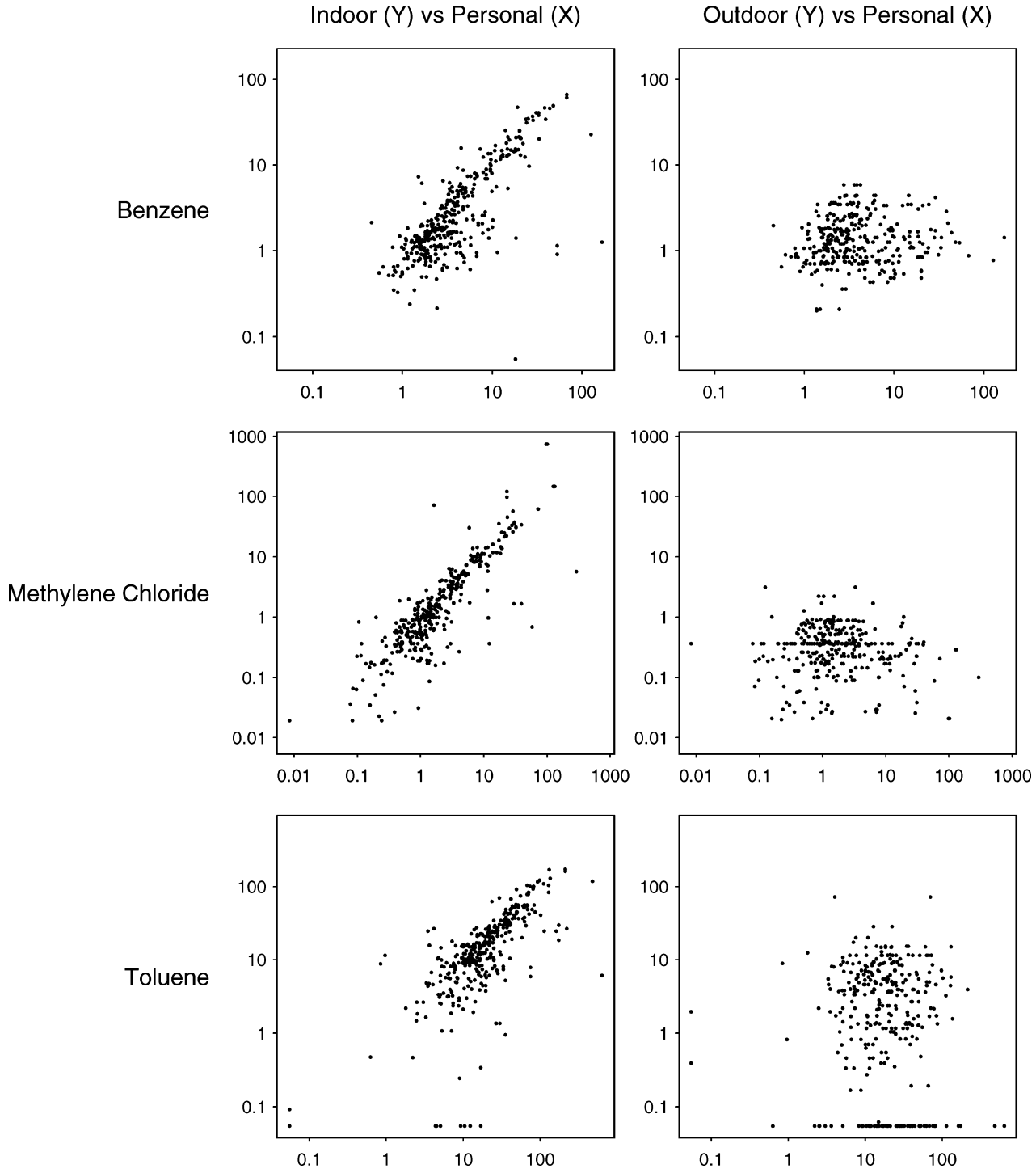

FIGURE 3. Plots of (a) indoor residential concentrations (μg/m^3) and (b) outdoor community concentrations vs personal exposures to benzene, methylene chloride, and toluene for participants in the study. As described in the text, nondetectable measurements (i.e., samples with no analytical response, or those with values $\leq$ 0 after blank subtraction) are represented with a value of half the analytical detection limit.

set of R_i values. The number and distribution of measured personal exposures will inevitably vary across subjects, but these factors should not bear on the assessment of the performance of, say, a monitor located at some central site. While the performance of this central site monitor may in fact be identical for all subjects, their own variation in personal exposure and compliance with the sampling effort can yield large differences in their longitudinal correlations. Finally, the use of longitudinal correlation as a comparison metric also means that subjects with only one measured VOC value cannot contribute an R_i. But in reality there is no reason a single observation should not add to our understanding of the ability of $\hat{\mathbf{P}}_*$ to estimate $\mathbf{P}$.

For these reasons, we also assessed estimators of $\mathbf{P}$ in terms of MSE and its constituents: bias and variance. For the estimator of a specific element p_{ij} of $\mathbf{P}$, the bias of $\hat{p}_{*ij}$ for p_{ij} is the difference between the expected value of $\hat{p}_{*ij}$ and p_{ij}, i.e.:

$$\text{bias}[\hat{p}_{*ij}:p_{ij}] = E[\hat{p}_{*ij}] - p_{ij} \qquad (4)$$

where the $E[\ ]$ denotes the expectation operator. The variance

TABLE 4. Using Outdoor Community Concentrations To Predict Measured Personal Exposures: Estimated Bias and Variance (Presented as Standard Deviation in Parentheses) for the Lower, Middle, and Upper Tertiles of the Personal Exposure Distribution[a]

	personal exposure distribution				
chemical	lower tertile	1st tertile cutpoint	middle tertile	2nd tertile cutpoint	upper tertile
benzene	−0.3[b] (0.7)[c]	2.2	−1.5 (1.4)	4.7	−14.4 (21.9)
chloroform	−0.2 (0.2)	0.7	−1.0 (0.3)	1.7	−3.2 (1.9)
p-dichlorobenzene	0.0 (0.1)	0.2	−0.3 (0.2)	0.7	−7.8 (19.2)
ethyl benzene	−0.4 (0.5)	1.6	−1.5 (0.7)	3.5	−12.2 (19.3)
D-limonene	−4.9 (1.6)	7.7	−11.5 (2.7)	16.6	−47.3 (51.1)
methylene chloride	−0.1 (0.5)	1.0	−1.2 (0.6)	2.9	−17.1 (35.7)
α-pinene	−0.9 (0.4)	1.8	−2.6 (0.8)	4.2	−15.8 (20.6)
β-pinene	−0.2 (0.3)	0.8	−1.5 (0.5)	2.7	−10.9 (23.4)
styrene	−0.1 (0.1)	0.5	−0.5 (0.2)	1.0	−2.0 (2.8)
tetrachloroethylene	0.0 (0.3)	0.6	−0.6 (0.4)	1.5	−62.7 (360.4)
toluene	−1.9 (9.9)	12.1	−13.2 (6.4)	25.1	−57.8 (79.8)
trichloroethylene	0.0 (0.1)	0.2	−0.1 (0.2)	0.4	−2.4 (7.5)
o-xylene	−0.4 (0.6)	1.7	−1.6 (0.9)	3.8	−14.5 (20.4)
m-/*p*-xylene	−1.3 (1.7)	5.4	−5.1 (2.8)	12.4	−45.9 (66.2)

[a] All estimates and cutpoints in units of μg/m³. [b] Bias estimated by the mean difference of predictor and personal exposure. [c] Variance estimated by the variance of the differences of predictor and personal exposure; with square root applied to present in terms of standard deviation (SD).

TABLE 5. Using Indoor Residential Concentrations To Predict Measured Personal Exposures: Estimated Bias and Variance (Presented as Standard Deviation in Parentheses) for the Lower, Middle, and Upper Tertiles of the Personal Exposure Distribution[a]

	personal exposure distribution				
chemical	lower tertile	1st tertile cutpoint	middle tertile	2nd tertile cutpoint	upper tertile
benzene	−0.2[b] (1.0)[c]	2.2	−0.6 (2.1)	4.7	−3.8 (20.8)
chloroform	0.4 (1.8)	0.7	−0.1 (0.6)	1.7	−0.5 (1.7)
p-dichlorobenzene	0.0 (0.2)	0.2	−0.2 (0.2)	0.7	−5.5 (19.4)
ethyl benzene	−0.2 (0.4)	1.6	−0.4 (1.1)	3.5	−4.7 (19.5)
D-limonene	−0.9 (2.0)	7.7	−1.6 (5.8)	16.6	−13.2 (50.1)
methylene chloride	0.0 (0.3)	1.0	1.1 (10.2)	2.9	3.9 (74.2)
α-pinene	0.0 (0.7)	1.8	0.0 (0.9)	4.2	0.8 (10.4)
β-pinene	0.3 (0.8)	0.8	−0.2 (0.9)	2.7	−2.1 (10.2)
styrene	0.1 (0.4)	0.5	−0.1 (0.3)	1.0	−0.8 (3.1)
tetrachloroethylene	0.0 (0.3)	0.6	−0.3 (0.4)	1.5	−55.8 (350.5)
toluene	0.2 (5.2)	12.1	−3.3 (8.2)	25.1	−19.9 (77.1)
trichloroethylene	0.0 (0.1)	0.2	0.1 (0.8)	0.4	−1.7 (7.6)
o-xylene	−0.2 (0.6)	1.7	−0.5 (1.2)	3.8	−5.3 (20.5)
m-/*p*-xylene	−0.6 (1.6)	5.4	−1.7 (3.9)	12.4	−17.0 (66.6)

[a] All estimates and cutpoints in units of μg/m³. [b] Bias estimated by the mean difference of predictor and personal exposure. [c] Variance estimated by the variance of the differences of predictor and personal exposure; with square root applied to present in terms of standard deviation (SD).

TABLE 6. Using a Simple Time-Weighted Model To Predict Measured Personal Exposures: Estimated Bias and Variance (Presented as Standard Deviation in Parentheses) for the Lower, Middle, and Upper Tertiles of the Personal Exposure Distribution[a]

	personal exposure distribution				
chemical	lower tertile	1st tertile cutpoint	middle tertile	2nd tertile cutpoint	upper tertile
benzene	−0.2[b] (0.8)[c]	2.2	−0.8 (1.4)	4.7	−7.5 (21.0)
chloroform	0.2 (1.1)	0.7	−0.4 (0.4)	1.7	−1.2 (1.5)
p-dichlorobenzene	0.0 (0.1)	0.2	−0.2 (0.2)	0.7	−6.6 (19.4)
ethyl benzene	−0.3 (0.4)	1.6	−0.7 (0.8)	3.5	−6.9 (19.4)
D-limonene	−2.1 (1.8)	7.7	−4.4 (4.6)	16.6	−20.8 (48.6)
methylene chloride	0.0 (0.3)	1.0	0.5 (7.9)	2.9	−3.3 (48.2)
α-pinene	−0.3 (0.5)	1.8	−0.7 (0.7)	4.2	−4.8 (9.4)
β-pinene	0.1 (0.6)	0.8	−0.6 (0.7)	2.7	−5.6 (12.0)
styrene	0.0 (0.3)	0.5	−0.2 (0.2)	1.0	−1.2 (2.8)
tetrachloroethylene	0.0 (0.2)	0.6	−0.4 (0.3)	1.5	−60.9 (363.5)
toluene	0.0 (5.7)	12.1	−6.2 (5.9)	25.1	−30.6 (78.6)
trichloroethylene	0.0 (0.1)	0.2	0.0 (0.6)	0.4	−2.0 (7.7)
o-xylene	−0.3 (0.5)	1.7	−0.8 (0.9)	3.8	−8.1 (20.2)
m-/*p*-xylene	−0.8 (1.6)	5.4	−2.7 (2.7)	12.4	−26.0 (66.0)

[a] All estimates and cutpoints in units of μg/m³. [b] Bias estimated by the mean difference of predictor and personal exposure. [c] Variance estimated by the variance of the differences of predictor and personal exposure; with square root applied to present in terms of standard deviation (SD).

of $\hat{p}_{*ij}$ does not depend functionally on p_{ij} and may be expressed as

$$\mathrm{var}[\hat{p}_{*ij}] = E[(\hat{p}_{*ij} - E[\hat{p}_{*ij}])^2] \quad (5)$$

The MSE is yet another linear operator comprising these constituents as

$$\mathrm{MSE}[\hat{p}_{*ij}:p_{ij}] = (\mathrm{bias}[\hat{p}_{*ij}:p_{ij}])^2 + \mathrm{var}[\hat{p}_{*ij}] \quad (6)$$

The bias and variance describe different characteristics of the estimator $\hat{p}_{*ij}$. Bias describes the extent to which $\hat{p}_{*ij}$ under- or overestimates p_{ij}. Variance conveys the precision of $\hat{p}_{*ij}$; the precision of a statistic is sometimes defined specifically as the inverse of its variance.

Based on MSE as well as *R* (Tables 2 and 3), I concentrations were a better estimator of P exposure than O concentrations for all 14 VOCs, although both consistently underestimated P exposure. There are several reasons for this. First, personal exposures tended to be higher than matched indoor residential concentrations, which tended to be higher than matched outdoor community concentrations. For example, median and 90th percentile values for benzene were 3.2 and 18.3 $\mu g/m^3$ in personal air, 1.9 and 15.3 $\mu g/m^3$ in indoor air, and 1.3 and 3.3 $\mu g/m^3$ in outdoor air (*13*). Second, most participants typically spent the majority of their time indoors at home (and relatively little outside). Results from the participants' 2-day time−activity logs show that, on average, participants spent 34 h (70.9%) indoors at home. The rest of the time was spent indoors at work or school (6 h or 12.6%), indoors in other locations (2.6 h or 5.5%), outside at home (1.7 h or 3.5%), outside at work or school (0.3 h or 0.6%), outside at other locations (1.1 h or 2.4%), and in transit (2.2 h or 4.5%). In addition, participants were in close proximity to a smoker for an average of only 0.5 h (0.9%) over a typical 2-day monitoring period. Third, the measured indoor concentrations may be an underestimate of what people were actually exposed to during their time inside at home. The monitors collected a 2-day integrated sample, but concentrations may have been highest when people were cooking and carrying on other routine activities. And fourth, it is possible that concentrations in other microenvironments through which participants moved during the 2-day monitoring period were relatively high as compared to measured I and O concentrations. Thus, although participants spent a relatively small proportion of their time indoors at work/school, indoors in other locations, outside at work/school, outside at other locations, and in transit, concentrations in these microenvironments appear to make a significant contribution to measured P exposure.

The bias and variance of all three estimators (indoor, outdoor, and time-weighted model) tended to increase in the upper third of the P exposure distribution. This means that common exposure estimators, such as measured indoor and outdoor concentrations and time-weighted models, tend to be less accurate and precise just where we need them most—for estimating exposures at the upper end of the exposure distribution. Future research should investigate whether these same patterns and relationships hold for (a) communities with higher outdoor levels of VOCs, (b) a more diverse sample of adults (race/ethnicity, socioeconomic status, occupation), and (c) vulnerable segments of the population (pregnant women and their fetuses, children, the elderly, the infirm).

Acknowledgments

This research was funded by a STAR (Science to Achieve Results) Grant (R825241) from the U.S. Environmental Protection Agency, National Center for Environmental Research. We also benefited from a grant from the Academic Health Center at the University of Minnesota. We thank the individuals who participated in the study and acknowledge the contributions of the field team. We also thank the 3M Corporation for donating some of the organic vapor monitors used in this study. The help and support provided by the Minnesota Pollution Control Agency was essential to the success of this project. K.S. was a member of the Division of Environmental and Occupational Health at the University of Minnesota School of Public Health when this study was conducted.

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Andrew Morley Attachment 2

REQUEST PUBLIC HEARING FOR REVISOR'S ID R-4599, OAH DOCKET NUMBER 71-9003-39354

1	Andrew Morley	1135 Thomas Lane, White Bear Lake 55110 763-742-7513
2	Tony Thomas	11628 Ivywood Trail Woodbury
3	Jenna Iverson	259 Point Douglas Rd N, St. Paul, MN 55106
4	Katie Klein	9000 City Place Blvd Unit 2427 Woodbury
5	Laura Klein	4026 Cedar Grove Ln Eagan 55122
6		640 Main St N #21 Stillwater, MN 55082
7	Brian Cook	1814 Oregon Ave S St. Louis Park, MN 55426
8	Laura Burgeson	1308 Highland Parkway, St. Paul, MN 55116
9	Derek Naumann	15750 Rockford Rd - A220, Plymouth MN 55446
10	Bentley Graves	5980 Charleston Cir., Excelsior, MN 55331
11	Jack Dwyer	2560 Dorothy Ave, White Bear Lake, MN 55110
12	Annette Kojetin	824 Great Oaks Trail Eagan MN 55123
13	Anne Morton	2235 Thomas Ln WBL MN 55110
14	Whitney Harvey	8207 Jergen Ave Cottage Grove 55016
15	Matt Bohm	392 Magnolia Ln, Vadnais Heights 55127
16	Sarah Erickson	3416 NE Cleveland, Minneapolis, MN
17	Megan Newlander	8930 Olive Ln N, Maple Grove, MN 55311
18	Chance Caddy	6297 Maclyan Ave NE Otsego MN 55301
19	Taylor Schmidt	345 E MAIN St, Waconia MN, 55387
20	Elizabeth Sherry	8287 Jody Lane S. Cottage Grove MN 55016
21	Selveig Erickson	4135 Quail Ave. N Robbinsdale MN 55422
22	Clarissa Tsang	2565 Franklin Ave St Paul MN 55114
23	Jennifer Munyer	14414 Evaton Ave N, Hugo, MN 55038
24	Vicki Sitek	10825 Stinson Ave. Chisago, MN 55013
25	Bayert Salverda	2202 E 32nd St MPLS, MN, 55407

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Shalini Gupta Attachment

January 15th, 2025

To: Minnesota Pollution Control Agency
From: Shalini Gupta, Environmental Justice Consultant
Re: Require Reporting of Sulfuryl Fluoride as an Air Toxic

Dear MPCA:

The MPCA should require reporting of sulfuryl fluoride as an air toxic. It can be emitted from permitted sources and it is toxic.

Sulfural fluoride is not a hazardous air pollutant under the Clean Air Act and is not a VOC. Therfore, sulfuryl fluoride emissions have not previously been reported to the MPCA.

However, it is toxic, can be used as a replacement for other fumigants that are listed as HAPs under the CAA, and may be emitted at sources that are regulated, or could reasonably be regulated, by MPCA.

The State of New Jersey determined that sulfuryl fluoride is emitted at sources that should be regulated under their air permitting program. The state of New Jersey has developed two general permits to regulate fumigants, including sulfuryl fluoride. New Jersey cites the CALEPA's review process toxicity values as their part of their reasoning for adding sulfuryl fluoride to the pollutants regulated at the state level.

New Jersey general permits:

Indoors Fumigation Operations of Cocoa Bean Products
https://dep.nj.gov/wp-content/uploads/boss/general-permits/gp-021a.pdf

Outdoor Fumigation Operation of Containerized Commodities
https://dep.nj.gov/wp-content/uploads/boss/proposed-gp-021b-03-05-24.pdf

NJ FAQ on Air Toxics Rule Implementation:

https://dep.nj.gov/wp-content/uploads/boss/permitting-guidance/fumigation-faq-2-1-2023-update.pdf

NJ Fact Sheet:

Revision to NJDEP Division of Air Quality Risk Screening Worksheet for Carcinogenic Effects and Noncarcinogenic Long-Term and Short-Term Effects (Worksheet) as Listed in Technical Manual 1003 "Guidance on Preparing a Risk Assessment for Air Contaminant Emissions"
https://www.nj.gov/dep/aqpp/archived/RSWorksheet/Risk%20Screening%20Worksheet%20Fact%20Sheet_June%202022.pdf

This fact sheet states the following.

Sulfuryl fluoride (SF) will be added to the Risk Screening Worksheet with the following reference concentrations: Averaging time of 24 hours 3,128 micrograms per cubic meter (µg/m3); and Long-term or chronic 50 µg/m3.

Sulfuryl fluoride (SF) is being proposed as an addition to the risk screening worksheet based on SF's high toxicity and its significant use in fumigation operations. The addition of SF will also

provide certainty and consistency within the permitting review process. The California Environmental Protection Agency (CalEPA) is currently in the process of reviewing a 24-hour short term reference concentration range of 0.25 - 0.75 parts per million by volume (ppmv) to identify a final Sulfuryl fluoride 24-hour reference concentration. The New Jersey Department of Environmental Protection's Division of Air Quality is proposing to use CalEPA's upper range number of 0.75ppmv (3,128 µg/m3) as a temporary short-term Reference concentration (RfC) and a long-term/chronic RfC of 0.012ppmv (50 µg/m3) until CalEPA can finalize the individual RfC's. Additional information on the previous development of these concentrations can be found at "Sulfuryl Fluoride (Vikane) Risk Characterization Document, Volume II, Exposure Assessment, June, 2006" (https://www.cdpr.ca.gov/docs/emon/pubs/tac/tacpdfs/sulfluor/final_rcd_vol2.pdf), "Establishing Sulfuryl Fluoride Uncertainty Factors for Acute and Short-term Exposures, March 3, 2017, CalEPA" (https://www.cdpr.ca.gov/docs/risk/rcd/establishing_sulfuryl_fluoride.pdf), "Addendum to the 2006 Risk Characterization Document Update of the Toxicology and Reference Concentrations, May 2020" (https://www.cdpr.ca.gov/docs/risk/rcd/sulfuryl-fluoride_addendum.pdf) and "SULFURYL FLUORIDE STRUCTURAL FUMIGATION MITIGATION SCOPING DOCUMENT", January 2021, CalDPR (https://www.cdpr.ca.gov/docs/whs/pdf/sulfuryl_fluoride_mitigation_012221.pdf).

Based on sulfuryl fluoride being toxic, having the potential to be emitted from air permitted sources, and NJ determining that an air permit is required for fumigation of specific sources in their state, the MPCA should at least require reporting of sulfuryl fluoride emissions from facilities.

As additional evidence of the reasonableness, EPA wrote this notice on their next steps to regulate sulfuryl fluoride in the fumigation of residential homes. The notice cites at least 11 deaths and two serious injuries during residential fumigation in California and Florida that have occurred since 2002, stating the deaths and serious injuries occurred after homes had been "cleared" for re-entry. https://www.epa.gov/pesticides/epa-announces-next-steps-protect-people-sulfuryl-fluoride-used-fumigate-residential

While neither MPCA nor EPA regulate sulfuryl fluoride in air permits because it is not a listed HAP and is not a VOC, this EPA notice about residential fumigation acknowledges the real risk posed by the pollutant. Again, at a minimum, MPCA should require reporting of sulfuryl fluoride emissions.

Sincerely,

Shalini Gupta
Environmental Justice Consultant
Minneapolis, MN
www.sgupta.org

RECEIVED
By: OAH on 1/15/2025

Name:
Andrew Morley

Address:
2235 Thomas Lane
White Bear Lake, MN
55110

Part of rule(s) objecting to:
I object to and request a hearing on the entirety of 39354 Minnesota Pollution Control Agency Dual Notice of Intent to Adopt Rules (Office of Administrative Hearings Docket No. 71-9003-39354), which includes:

- Proposed Amendment to Rules Governing Air Quality, *Minnesota Rules,* chapters 7002, 7005, 7007, and 7019. Revisor's ID Number R-4599
- Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850.

REQUEST PUBLIC HEARING FOR REVISOR'S ID R-4599, OAH DOCKET NUMBER 71-9003-39354

1	Andrew Morey		735 Thomas Lane, White Bear Lake 55110 763-742-7523
2	Tony Knutas		11628 Ivywood Trail Woodbury
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25	Bayert Salverda		2202 E 32nd St MPLS, MN, 55407

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By: OAH on 1/15/2025

Andrew Morley Attachment 4

MINNESOTA CHAMBER OF COMMERCE
GROWING MINNESOTA

January 15, 2025

Administrative Law Judge Jessica Palmer-Denig
Minnesota Office of Administrative Hearings
600 N. Robert Street
St. Paul, Minnesota 55101
OAH Docket No. 71-9003-39354

Comments submitted electronically through OAH's website
https://minnesotaoah.granicusideas.com/discussions/39354-minnesota-pollution-control-agency-dual-notice-of-intent-to-adopt-rules

Your Honor:

On behalf of the Minnesota Chamber of Commerce (Chamber), a statewide organization representing 6,300 businesses and more than a half million employees throughout Minnesota, we appreciate the opportunity to submit this letter in response to the Minnesota Pollution Control Agency's (MPCA) request for comments regarding the proposed amendments to rules known as the "Air toxics emissions reporting rule", which was directed by *Minnesota Statutes*, section 116.062. The Chamber represents members that the rulemaking will impact. This letter is being submitted as a supplement to an initial comment letter submitted earlier today to provide additional comments on behalf of our members.

In general, the Chamber reiterates many of the comments and themes from the Chamber's September 21, 2023 letter and attachments submitted on the planned rulemaking at the time. That particularly includes the comments related to data utility, reporting burden, and establishing a limited set of pollutants in order to target the most important public health issues. In contrast, the November 2024 Statement of Need and Reasonableness (SONAR), Exhibit 1, proposes a 26-page list of just over 900 pollutants to be reported annually. In the SONAR, as a key point in the statement of general need, the MPCA notes with reference to Figure 1 that "78% of block groups (a subset of census tracts) are above health benchmarks for air toxics pollution." The reference appears to mean 78% of block groups within the seven metropolitan counties addressed by the proposed amendments. The header for Figure 1 reads "Data from 2017 MNRISKS modeling depicts emissions from all sources including transportation, point sources, wood smoke, etc. and estimated areas of concern for environmental justice in the seven metropolitan counties."

What neither the SONAR nor the underlying legislation acknowledges nor connects is that transportation and an extensive list of non-point sources, including wood smoke, are large drivers of human health risk in the seven metropolitan counties.

The SONAR indicates that "By requiring air toxics emissions data on an annual basis, the MPCA will be able to provide current data that accurately represents air quality within the state." In fact, unless MPCA develops an inventory of non-point and transportation sources that also accounts for the proposed list of air toxics to be reported in the SONAR Exhibit 1, MPCA will only be able to provide the contribution of permitted, or point,

sources to air quality within the state. Only accounting for the list of air toxic emissions and their associated risks from point sources will be an incomplete picture and will inaccurately bias the risk associated with point sources. This could lead to the MPCA focusing on point source risk reductions with inconsequential relative impact because those risks could be dwarfed by risks associated with transportation or non-point source contributions of the same pollutants.

If the intent is truly to address disproportionate exposure to air toxics and to improve the health impacts to more vulnerable populations, MPCA needs to acknowledge the disproportionate contribution of health impacts from transportation and non-point sources and focus characterization and reduction on those sources. Unless and until MPCA can commit to a similarly robust inventory of the Exhibit 1 pollutants from transportation and non-point sources, MPCA should not require the reporting of such an extensive list of pollutants for permitted sources.

In the SONAR section on "Pollutant lists reviewed", MPCA notes that it was "directed to review the pollutant lists found in Minn. Stat. § 116.062 that include chemicals that may or may not be important for the purpose of air toxics reporting and risks to human health and the environment." As such, MPCA acknowledges that some of the pollutants may not be important for the purpose of air toxics reporting and risks to human health. However, based on the SONAR, there appears to have been no effort to screen for the ones that are important. Therefore, there could be significant effort by permittees collectively to characterize and report emission levels that may not have consequential impacts to human health and the environment.

As noted in the SONAR section addressing "Differences with other state standards", Tables 6 and 7 indicate that most neighboring and EPA Region 5 states require annual reporting of a more limited number of hazardous air pollutants. They include the 188 Federal hazardous air pollutants (HAPs) that EPA has focused on because, as noted on EPA's website, they are "known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects." That is also the pollutant list that is addressed under EPA's 2023 proposed revisions to the Air Emissions Reporting Requirements (AERR).

In order to focus the health improvements for vulnerable communities in the seven metropolitan counties, and to be consistent with other states approaches for permitted facilities, the Chamber would support a regulation that requires annual reporting of the more concise list of air toxics pollutants in EPA's Federal HAP list. In the future, if EPA's Air Emissions Reporting Requirements include compounds beyond the list of Federal HAPs, MPCA can modify the list of pollutants to be reported by the seven metropolitan county permittees.

The Chamber appreciates the opportunity to comment on this important stage of the air toxics reporting rulemaking.

Sincerely,

Andrew Morley
Director, Environmental Policy
Minnesota Chamber of Commerce
amorley@mnchamber.com
763-221-7523

January 15, 2025

Office of Administrative Hearings
Attn: William Moore
Minnesota Pollution Control Agency
600 North Robert Street
P.O. Box 64620
St. Paul, MN 55164-0620

RE: Comments of the American Chemistry Council on Minnesota Pollution Control Proposed Amendment to Rules Governing Air Quality, Minnesota Rules, chapters 7002, 7005, 7007, and 7019; Proposed Repeal to Rules Governing Air Quality, Minnesota Rules, chapter 7007.1850.

Submitted electronically

Dear Mr. Moore,

The American Chemistry Council (ACC) appreciates the opportunity to submit comments to Minnesota Pollution Control Agency (MPCA) on its request for comments in advance of its proposed amendments to existing air quality rules chapters 7002, 7005, 7007, and 7019, and repeal of rules at chapter 7007.1850. ACC appreciates MPCA's approach to amend and introduce new potentially significant regulatory requirements that address air emissions from facilities in the state.

ACC member companies are an important part of Minnesota's broader economy, contributing to innovation, job creation, and the production of essential products that support various sectors, including agriculture, healthcare, transportation, and technology. Through several chemical manufacturing facilities located within the state, ACC and its members directly and indirectly support thousands of jobs and generate significant economic output and essential products for the state and country as a whole.

As responsible stewards of environmental health and safety, our members operate under stringent regulations and continuously improve practices to reduce emissions and mitigate environmental impacts. We demonstrate this commitment to strong sustainability goals and environmental/health and safety policies through ACC's Responsible Care® program, under which ACC members work to continually improve their systems for addressing health, safety, and environmental performance. Additionally, our members' facilities are subject to numerous existing local, state, and federal statutory and regulatory requirements, including permit conditions approved by state regulators and administered under the Clean Air Act (CAA), Clean Water Act, Resource Conservation and Recovery Act, and others. Through operating regulatory and voluntary programs, ACC members recognize the important role that industry can play in our surrounding communities as corporate stewards of the local environment.

For these reasons, ACC appreciates MPCA's overall goal to implement regulations aimed at reducing air toxic emissions. ACC believes that appropriately designed emissions requirements are an essential component for public health, and we recognize the importance of scientifically supported and technically

700 Second Street NE, Washington DC 20002 | 202.249.7000 | americanchemistry.com

feasible clear emissions standards for facility operations. As such, we submitted comments to MPCA in October 2024 on its pre-proposal for potential updates to Chapter 60 of the current air toxics regulations.[1] We continue to believe that it is crucial for any new regulatory requirements strike a balance between protecting public health and enabling the continued viability of critical industries.

As MPCA moves forward, we urge the state to consider not only existing requirements, but also the potential economic impacts of new regulations on industries that are vital to the state's economy. Regulatory certainty and a balanced approach will ensure that industries can continue to operate, innovate, and provide high-quality jobs while meeting environmental goals. Collaboration between the state, industry, and community stakeholders is key to achieving these outcomes.

A. MPCA Should Ensure that Any New Requirements Avoid Overly Burdensome Impacts on State Facilities and Duplicative Reporting Obligations.

As part of the proposed amendments, MPCA follows Minn. Stat.§ 116.062 to require annual reporting of air toxics emissions. MPCA supports this change by noting the increased frequency will "help identify and prioritize areas of concern."[2] Unfortunately, it is unclear if MPCA provides any additional rationale to support this significantly more burdensome reporting schedule.

As stated in our October 2024 comments, ACC recognizes the importance of transparency and data collection in the establishment of technically feasible and consistent monitoring and reporting requirements. ACC also cautions that requirements that are overly burdensome or duplicative may result in expensive time and personnel burdens on facility staff, hindering the ability of facilities to operate efficiently. MPCA should thoughtfully consider the creation of any new air emissions requirements and associated reporting schedules, which should be designed to provide meaningful data without imposing unnecessary administrative burdens.

ACC is concerned that MPCA's proposed shift to annual reporting requirements may impose significant administrative and operational burdens on facilities without demonstrable public health benefits. Additionally, it is unclear how MPCA will coordinate any new requirements and reporting schedules to avoid overlapping conflict and duplication with existing federal reporting frameworks, such as those under Clean Air Act (detailed further below) and the Toxics Release Inventory (TRI). Any additional state-level requirements should align with these programs to avoid redundancy, minimize operational burdens, and avoid creating unnecessary costs.

To mitigate these concerns, we believe that MPCA should clearly define the objectives and anticipated benefits of annual reporting. The state should also ensure reporting requirements are streamlined, consistent with and don't duplicate federal standards and reporting requirements. If MPCA proceeds with this reporting schedule, it will be critical to provide necessary flexibility in reporting mechanisms to accommodate varying facility sizes and operational complexities. Through a flexible and balanced approach, MPCA can help address its data collection and transparency goals while minimizing disruptions to industry operations.

As mentioned above, several current federal standards and regulatory programs provide rigorous controls of potential emissions with comprehensive monitoring and reporting requirements. Any new requirements from MPCA risk overlapping provisions that could lead to unnecessary inefficiencies, increased

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costs, and avoidable confusion for industry stakeholders, all while yielding little to no additional public health or environmental benefits.

ACC member facilities in the state already operate under many federal programs that address emissions of hazardous air pollutants (HAPs), including:

- **National Emission Standards for Hazardous Air Pollutants (NESHAPs)**: Under CAA Section 112, EPA applies NESHAPs that are designed to control emissions of HAPs from specific industrial source categories. NESHAPs establish technology-based standards for new and existing sources to ensure that emission levels reflect the best available control technologies. NESHAPs set health- and technology-based emissions standards for both major sources (stationary sources with 10 tons per year for a single HAP or 25 tons per year of any combination of HAPs) and smaller area sources.
- **Title V Operating Permits**: CAA Title V mandates that any major source of air pollution, including those with HAP emissions, obtain operating permits. These permits consolidate all applicable federal permits and ensure that facilities comply with air toxics emission standards through ongoing monitoring, recordkeeping, and reporting requirements.

Together, these federal programs regulate sources of industrial hazardous air pollutants in the state, including chemical manufacturing facilities. As such, we urge MPCA to first consider the regulatory programs that already address hazardous air pollutant emissions and avoid duplicative requirements that would result in unnecessary burdens on regulated facilities.

B. Screening Values and Regulatory Thresholds

MPCA should provide clear and science-based guidelines on emission thresholds to help ensure the rule is effective and manageable for both regulators and industry and results in an air toxics regulatory program that is grounded in sound science. Therefore, ACC recommends that new reporting requirements should apply only to pollutants with risk values that have been formally reviewed and approved through a regulatory process.

Many of the health risk benchmarks referenced in the current regulation have not been officially adopted by rule and some of the proposed additional substances do not have health risk benchmarks. If MPCA intends to rely on these benchmarks to trigger regulatory obligations, we believe they should first be adopted through a transparent rulemaking process that allows for full stakeholder input on the supporting science for each benchmark. This is particularly relevant given the proposal to utilize lists, such as the TRI, that are not intended to inform determinations of risk associated with substances but instead serve as an information collection mechanism. ACC continues to emphasize that regulatory thresholds should prioritize the principles of best available science and risk-based decision-making, using toxicological data and risk assessments to meaningfully address risk in an appropriate and technologically feasible manner.

C. Toxics Release Inventory (TRI) Substances

As noted above, to help ensure that any new requirements are effective, provide meaningful information, and are manageable for both regulators and the regulated community, the rule should focus only on substances with established risk values. This should not include TRI listed substances as these do not represent risk values.

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In addition, many of the proposed substances for addition to the MPCA reporting requirements have not been formally evaluated for consistency with the underlying criteria and listing requirements outlined in the Emergency Planning and Community Right-to-Know Act (EPCRA), which authorizes the TRI program in Section 313. These substances were added to TRI based on unique provisions outlined the Fiscal Year 2020 National Defense Authorization Act and as such are not appropriate for inclusion in the rule's separate reporting requirements. To the extent MPCA opts to consider TRI substances, any consideration should be limited to those substances that have established risk values and have been formally evaluated against the underlying EPCRA criteria.

D. De minimis Standard

The de minimis standard should be maintained. The de minimis standard is a long-standing policy that is designed to help generate meaningful information and focus on priority levels of substances. It also provides for the minimization of unreasonable burdens to quantify minute amounts of a chemical substance. MPCA's proposed elimination of these common-sense exemptions serves no purpose; quantification of individual substances would become highly impractical and compliance nearly infeasible. Elimination of the de minimis standard will make the proposed rule unworkable and undermine the objectives of providing meaningful information. In addition, in many cases, there are no approved analytical methods for measuring certain chemicals in complex mixtures, which would be required if these provisions were removed. Unfortunately, any proposed removal would only serve to create substantial uncertainty, significant burdens, and impractical compliance challenges for limited or no environmental benefit.

E. Compliance Issues

It is critical that MPCA include clear, reasonable, and achievable permit and enforcement mechanisms in any future rulemaking. Future regulatory compliance timelines must be realistic and provide sufficient time for facilities to implement the necessary control technologies. We also ask that the MPCA provide support and clear, detailed guidance during the compliance phase to facilitate smooth transitions for affected facilities.

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ACC appreciates the MPCA's efforts to address air emissions in the state and we appreciate a collaborative approach to developing regulations that protect public health and the environment while supporting a thriving economy. We encourage the MPCA to consider the importance of Minnesota's chemical manufacturing sector and to adopt regulations that are both effective and economically sustainable. We welcome further dialogue on this issue and look forward to continued participation as the regulatory process moves forward. If you have any questions, please feel free to reach to out to me at Brendan_Mascarenhas@americanchemistry.com or via phone at (202) 249-6423.

Sincerely,

Brendan Mascarenhas
Senior Director, Environment
American Chemistry Council

January 15, 2025

Submitted electronically via OAH Comment Portal at
https://minnesotaoah.granicusideas.com

Re: Minnesota Pollution Control Agency's Proposed Rule re: Proposed Amendment to Rules Governing Air Quality, Minnesota Rules, chapters 7002, 7005, 7007, and 7019 and Proposed Repeal to Rules Governing Air Quality, Minnesota Rules, chapter 7007.1850

OAH Docket No. 71-9003-39354

Northern States Power Company-Minnesota (NSPM) respectfully submits the following comments in response to the Minnesota Pollution Control Agency's (MPCA) Proposed Amendment to Rules Governing Air Quality, Minnesota Rules, chapters 7002, 7005, 7007, and 7019 and Proposed Repeal to Rules Governing Air Quality, Minnesota Rules, chapter 7007.1850 (Proposed Rules). The Proposed Rules cover both the establishment of air toxics reporting requirements and repeal of emergency affirmative defense provisions.

NSPM is a wholly owned subsidiary of Xcel Energy that provides electricity and gas to Minnesota cities and townships, as well as unincorporated communities and wholesale customers. Xcel Energy is a major U.S. energy company that provides a comprehensive portfolio of energy-related products and services to 3.8 million electricity customers and 2.2 million natural gas customers across Colorado, Michigan, Minnesota, New Mexico, North Dakota, South Dakota, Texas, and Wisconsin.

Our company is the first major U.S. energy provider to announce aggressive goals for reducing greenhouse gas emissions across three large sectors of the economy: electricity, natural gas use in buildings, and transportation. For nearly two decades, Xcel Energy has led the transition to cleaner energy sources and was the first large power provider with a vision to deliver 100% carbon-free electricity by 2050. We will fully exit from coal by the end of 2030. These efforts have significantly reduced emissions from our generating sources in Minnesota and across our fleet.

NSPM operates several generating units located in the in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington County that would be subject to the proposed air toxics reporting rule. Furthermore, NSPM's resources around the state will be impacted by the repeal of the emergency affirmative defense provisions.

NSPM provides the following comments on the Proposed Rules:

- **The Air Toxics Report Timing Should Align with TRI Reporting Requirements.**

NSPM recommends that the reporting deadline be moved back a short time to allow for better alignment with the TRI reporting requirements. The Proposed Rules set an annual reporting deadline of April 1 to report emissions from the previous calendar year. In contrast, annual TRI reports are due by July 1 following the reporting calendar year. More closely aligning these report dates will reduce undue administrative burdens and help ensure consistent reporting. Specifically, we request a July 1 reporting deadline for the air toxics.

The TRI reporting requirements follow an annual cycle that allows for development and distribution of updated reporting instructions and updates to the reporting software.[1] The reporting software reflects updates made to TRI reporting requirements, such as updated thresholds or emission factors, for that reporting year. To aid in reporting from power plants, we work with Electric Power Research Institute (EPRI) to utilize their TRI for Power Plants (TRIPP) software that incorporates the EPA-required information into a program developed specifically for utilities to estimate, track, and report releases of TRI chemicals and then allows for merging into the EPA reporting software. This software typically is released in the March to April timeframe to meet the TRI July 1 reporting deadline. With an April 1 deadline, it is unlikely that the software will be available to meet the deadline. Therefore, for the chemicals included in both reporting sets, we will need to utilize two separate mechanisms to analyze chemical amounts for the same reporting year. Under the proposed rule, with a proposed deadline of April 1 there would be no time to reconcile data reported under the two separate programs, potentially leading to inconsistent reporting. This creates unnecessary and undue burden in creating duplicative and potentially inconsistent reporting requirements.

EPA also recognized the relationship between HAP reporting and TRI in the 2023 Air Emissions Reporting Requirements proposed rule. In proposing new reporting deadlines, EPA noted the connection between the two programs and proposed a phase-in period of earlier reporting, with the reporting deadline of March 31 for the first five years. *See* 88 Fed. Reg. 54118, 54160 (Aug. 9, 2023). NSPM encourages MPCA to consider a similar approach for the air toxics reporting if it does not set a July 1 deadline.

- **The Air Toxics Reporting Regulations Should Establish Reporting Thresholds for Each Air Toxic.**

NSPM recommends that reporting thresholds be included for the air toxics. As proposed, the list of air toxics is extensive and the reporting will require a significant effort. Without reporting or de minimis thresholds, reporting entities will be attempting to quantify extremely small quantities. Reporting thresholds can – and should – be tailored to the

[1] *See* TRI Program website: https://www.epa.gov/toxics-release-inventory-tri-program/basics-tri-reporting#fourth

specific characteristics and potential human health and environmental impact of each air toxic. In addition, reporting thresholds provide context against which to compare reported emissions.

MPCA should rely on already developed reporting thresholds where available. Reporting thresholds have been established by the EPA in various contexts that can provide a basis for setting reporting thresholds on the federally regulated pollutants. In addition, EPA proposed reporting thresholds for certain pollutants in the AERR proposed rule. Other states, such as California, also have established reporting thresholds. Where thresholds have been established, MPCA can build on those efforts.

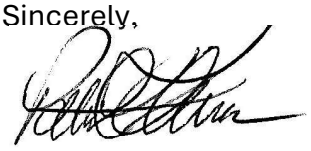
Overall, reporting thresholds provide a mechanism to focus reporting efforts on providing the most accurate and meaningful data. We encourage MPCA to establish reporting thresholds based on the best available data, building on the efforts of other states and EPA.

- **The Emergency Affirmative Defense Provisions Should be Maintained as "State-Only" Rather Than Fully Repealed.**

Rather than a complete repeal of the emergency defense provisions from Minnesota regulations, MPCA should adopt regulations that clarify that the emergency defense provisions apply to state-only provisions of permits and only apply to enforcement actions of state law only. As raised by other commenters in this rulemaking process, EPA has specifically endorsed this option as a pathway for states. *See* 88 Fed. Reg. 47029, 47049 (July 21, 2023) (EPA, Removal of Title V Emergency Affirmative Defense Provisions From State Operating Permit Programs and Federal Operating Permit Program, Final Rule). NSPM encourages MPCA to take the path laid out by EPA and retain these provisions as applied to state-only permit provisions.

Thank you for the opportunity to comment on the Proposed Rules. Please reach out if you have any questions or would like more information or clarification on these comments.

Sincerely,



Patrick Flowers
Director, Environmental Services
Xcel Energy Services Inc.
On behalf of Northern States Power Company

Exhibit I-2

Air Toxics Emissions Reporting Rule: Pre-Hearing Response to Comments

RD-4599; OAH Docket No. 71-9003-39354

Seven comments were submitted to the Office of Administrative Hearing's eComments website by January 15, 2025, in response to the Minnesota Pollution Control Agency's (MPCA's) Dual Notice of Intent to Adopt Rules published November 25, 2024. Many of the comments submitted included multiple components. The agency has provided its preliminary responses to those comments below. The MPCA will respond to comments received during the rule hearing and the posthearing comment period in a future response to comments document.

1. General Comments

The MPCA received 2 general comments which are summarized and responded to as follows.

A. Comment letters from Request for Comments (RFCs) that were resubmitted with this notice:

Andrew Morley of the Chamber of Commerce resubmitted comment letters that had previously been submitted during the RFC periods for this rulemaking. The MPCA reviewed these letters when they were received, considered them, and incorporated responses to them in the SONAR on pages 19, 21, 25, 26, 36, and 48.

B. Comments related to stakeholder engagement:

Comment (Morley-1): Andrew Morley from the Chamber of Commerce stated, "Chamber members offered to meet with MPCA staff to work on potential policy or rules that met the agency's data needs without broad new mandates. Despite the offers, MPCA never convened a stakeholder group of regulated parties."

Response: The MPCA outlined its efforts to engage stakeholders and solicit input on this rulemaking, as well as this specific comment requesting that the agency convene an advisory group, in the SONAR on pages 17 to 19. The Minnesota legislature gave the MPCA an 18-month deadline to publish the Notice of Intent to Adopt Rules. The agency provided numerous opportunities for stakeholders to provide input on the rulemaking; however, with the limited time frame and the large quantity of pollutants that the agency needed to review, it would have been difficult to assemble a formal advisory committee or stakeholder group and still abide by the legislative deadline.

2. Statement of Need and Reasonableness (SONAR)

The MPCA received 12 comments related to the content of the SONAR which are summarized and responded to as follows.

A. Comments related to human health and the risks associated with air toxics:

Comment (Morley-2): Andrew Morley of the Chamber of Commerce stated, "Figure 1 in the SONAR includes MNRISKS data for all sources. To justify increased reporting for a subset of sources, MPCA should present total MNRISKS data and then data for only the sources to be covered by the rulemaking. That demonstration may illustrate that the covered sources are important for risk reduction. However, MPCA data released in various reports in the past have shown the opposite; namely, that regulated facilities are a small part of the overall air toxics emissions inventory and related risks."

Response: The MPCA was directed by the legislature in Minn. Stat. § 116.062 to adopt rules requiring facilities with an air permit located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties, herein referred to as "the seven metropolitan counties", except for option B registration permits, to annually report air toxics emissions to the agency. The MPCA's purpose for including Figure 1 in the SONAR is to show air toxics risk in the seven metropolitan counties. The MPCA agrees that the figure does depict other sources of air toxics emissions such as transportation. The main sources of air toxics emissions in the seven metropolitan counties are transportation and permitted facilities. The figure is demonstrating that most of the block groups (a subset of census tracts) in the seven metropolitan counties have an air pollution score greater than 1, which would be above health benchmarks. The SONAR for the proposed rule states that this reporting rule will not result in direct reduction in the emissions of air toxics but will improve air toxics emissions reporting. This figure is noting that air toxics emissions are a concern for the health of residents living in the seven metropolitan counties.

The MPCA develops inventories of traffic emissions with information from the Minnesota Department of Transportation (MNDOT), surveys wood burning homes, and models emissions for these sources. The proposed reporting for facilities is to confirm what facilities are emitting so that the MPCA has more accurate information on which areas have a higher risk and are most impacted. The air toxic emissions reported by facilities proposed in this rule will provide improved information to understand sources of risk to human health and the environment and which pollutants are driving this risk.

The MPCA submitted a report to the legislature in January 2025 titled, "The air we breathe: The state of Minnesota's air quality"[1]. On page 20 of that report, the MPCA identified that, "*Permitted facilities are the third largest source of air toxics, emitting roughly one third as much air toxics pollution as neighborhood sources or transportation (13%).*" While facilities are the third largest source of emissions, they are the second largest source for risk in the seven metropolitan counties, demonstrating that the impact of those pollutants emitted could have a larger impact on human health. The report also stated, "*Even if a source ranks low for statewide contribution, it can still have a big local impact... People are exposed to myriad pollutants at varying concentrations every day, and some pollutants have a greater potential for health effects than others or can cause health effects at a lower exposure.*" Receiving air toxics emissions inventory reports from facilities on the specific pollutants they are emitting will further drive the agency's understanding of local risks to human health and the environment. This information cannot be derived without the proposed rule that requires mandatory annual reporting of air toxics emissions from facilities.

Comment (Morley-3): Andrew Morley from Chamber of Commerce stated, "MPCA's failure to present a case for how the rules it has proposed will provide any real value for public health or air pollution understanding. If there is no real value, MPCA should approach the rulemaking effort with a targeted and flexible approach. Its proposed rule is not targeted and pulls in an expansive list of materials with minimal off-ramps. The end result will require a significant effort from regulated facilities for negligible benefit in the real world… A refined approach should be pursued instead of the rule as proposed."

Response: The MPCA was directed by the legislature in Minn. Stat. § 116.062 to adopt rules requiring facilities with an air permit, except for option B registration permits, to annually report air toxics emissions to the agency. The statute directed the MPCA to collect data on a broad list of air toxics. The agency developed specific criteria to narrow this list to target air toxics that pose a risk to human health and the environment. The MPCA did not include several air toxics that were on the full lists provided in statute for review including: certain PFAS that are not present or reported in Minnesota, or are salts and anions of OTM-45 and OTM-50 pollutants; certain pollutants that only have oral or other types of risk values because they would not be as relevant to risk modeling or where the inhalation risks are no longer relevant; pollutants only reported in other states in the TRI; and pollutants that have been banned. Page 46 of the SONAR discusses more about the criteria used. It is correct that emissions reporting alone will not result in direct health benefits to residents; however, improved emissions data

[1] Swanson, A., Bouchareb, H. (January 2025) The air we breathe: The state of Minnesota's air quality. Retrieved from: https://www.pca.state.mn.us/sites/default/files/lraq-1sy25.pdf

will support agency decision-making related to air toxics. The data currently are incomplete and as the MPCA has identified in the SONAR on pages 58 and 59, "*Better emissions data will improve the MPCA's air quality modeling efforts, which will inform policy development… and can be used to assess health risks to communities*". More details are outlined in the SONAR under Section 6. Regulatory analysis, item F. Also in the SONAR, on page 67 under Section 9. Performance-based rules, the agency outlines its compliance with Minn. Stat. § 14.002 which requires state agencies, whenever feasible, to develop rules that are not overly prescriptive and inflexible.

B. Comments related to SONAR Exhibit 1: Proposed air Toxics Reporting List:

Comment (Morley-4): Andrew Morley of the Chamber of Commerce stated, "In fact, unless MPCA develops an inventory of non-point and transportation sources that also accounts for the proposed list of air toxics to be reported in the SONAR Exhibit 1, MPCA will only be able to provide the contribution of permitted or point sources to air quality within the state. Only accounting for the list of air toxic emissions and their associated risks from point sources will be an incomplete picture and will inaccurately bias the risk associated with point sources. This could lead to the MPCA focusing on point source risk reductions with inconsequential relative impact because those risks could be dwarfed by risks associated with transportation or non-point source contributions of the same pollutants... Unless and until MPCA can commit to a similarly robust inventory of the Exhibit 1 pollutants from transportation and non-point sources, MPCA should not require the reporting of such an extensive list of pollutants for permitted sources."

Response: The MPCA was directed by the legislature in Minn. Stat. § 116.062 to adopt rules requiring facilities with an air permit, except for option B registration permits, to annually report air toxics emissions to the agency. The MPCA develops a statewide emissions inventory of all sources of air pollution, including permitted facilities, non-point sources, and transportation every three years. Developing an inventory requires different methods based on the source type and the availability of data from that source. The MPCA, therefore, uses different tools and methods for non-point and transportation emissions data estimation than point source emissions estimation.

The MPCA's current statewide emissions inventory for non-point sources include emission estimates from non-HAP pollutants included in SONAR exhibit 1, similar to what is proposed to be reported by facilities in this rulemaking. All these data are available on the MPCA's Emissions

Inventory website[2]. The MPCA estimates the emissions from these non-air-permitted sources with best practices that are standard, supported, scientific, and used by EPA, other states, and academia. All air toxics emissions from these sources are accounted for and assessed in the "Minnesota air toxics risk-screening tool (MNRISKS)"[3].

Comment (Morley-5): Andrew Morley of the Chamber of Commerce stated, "In the SONAR section on 'Pollutant lists reviewed', MPCA notes that it was 'directed to review the pollutant lists found in Minn. Stat. § 116.062 that include chemicals that may or may not be important for the purpose of air toxics reporting and risks to human health and the environment.' As such, MPCA acknowledges that some of the pollutants may not be important for the purpose of air toxics reporting and risks to human health. However, based on the SONAR, there appears to have been no effort to screen for the ones that are important. Therefore, there could be significant effort by permittees collectively to characterize and report emission levels that may not have consequential impacts to human health and the environment."

Response: The commenter seems to mis-interpret the quote from the SONAR. The quoted text from the SONAR is explaining that Minn. Stat. § 116.062 would have allowed the agency to include a broader list of air toxics for reporting. Instead, the MPCA developed specific criteria for determining which air toxics to include for reporting to ensure that reporting was focused on pollutants with risks to human health and the environment, and narrowed the list based on those criteria.

The MPCA disagrees with the assertion that the agency did not screen for air toxics that are important for health risks. The agency used specific criteria to screen and develop the list of pollutants proposed to be reported. These criteria are listed on page 46 of the SONAR. The MPCA maintains that all of the pollutants listed in Exhibit 1 are important for air toxics reporting.

Comment (Mascarenhas-1): Brendan Mascarenhas from American Chemistry Council stated, "As noted above, to help ensure that any new requirements are effective, provide meaningful information, and are manageable for both regulators and the regulated community, the rule should focus only on substances with established risk values. This should not include TRI listed substances as these do not represent risk values... To the extent MPCA opts to consider TRI

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[2] Total statewide emissions by year by MPCA Data Services (February 7, 2025). Retrieved from: *https://data.pca.state.mn.us/views/Airemissions-statewide/Trends?%3Aembed=y&%3AisGuestRedirectFromVizportal=y*

[3] Ellickson, K., Kvale, D., Vadali, M., Freeburg, E.W., Sienko, A. (March 2023). MNRISKS: Minnesota statewide screening of health risks from air pollution. Retrieved from: *https://www.pca.state.mn.us/sites/default/files/aq9-29.pdf*

substances, any consideration should be limited to those substances that have established risk values and have been formally evaluated against the underlying EPCRA criteria." Mascarenhas also stated, "ACC recommends that new reporting requirements should apply only to pollutants with risk values that have been formally reviewed and approved through a regulatory process."

Response: Minn. Stat. § 116.062 did not specify that the air toxics on the Toxic Release Inventory (TRI) list were to be limited only to those with established risk values that have been formally evaluated against the underlying EPCRA criteria. The statute stated that,

> "*(C) For the purposes of this section, "air toxics" means chemical compounds or compound classes that are emitted into the air by a permitted facility and that are:*
>
> > *(2) chemicals reported as released into the atmosphere by a facility located in the state for the Toxic Release Inventory under the federal Emergency Planning and Community Right-to-Know Act, United States Code, title 42, section 11023, as amended;*"

It is reasonable to include pollutants that do not have inhalation health benchmarks (IHBs) or established risk values because the MPCA was directed by the legislature in Minn. Stat. § 116.062 to adopt rules requiring permitted facilities to annually report air toxics emissions to the agency. It was not a requirement of that statute that the pollutants would need to have an IHB or risk values determined to be included in the proposed rule. Additionally, not all Hazardous Air Pollutants (HAPs) have IHBs, and thus do not have established risk values. For example, some of the pollutants included in the rule are per-and polyfluoroalkyl substances (PFAS), many of which do not currently have IHBs or established risk values, but new information on the health impacts and risks from these chemicals continues to emerge. If emissions of these air toxics result in deposition into water or they are otherwise consumed, they are persistent in the environment as well as toxic to humans. Page 15 of the SONAR includes a citation from the MPCA's PFAS Monitoring Plan[4] that details the multipathway concerns for PFAS exposure. To limit the proposed list to only air toxics with IHBs or established risk values would not provide the full understanding of air toxics emissions in the seven metropolitan counties.

The emissions information that will be received as a result of this rulemaking in combination with inhalation health benchmarks (IHBs) allows the MPCA to assess risk (i.e. MNRISKS). IHBs are regularly updated from sources such as Integrated Risk Information System (IRIS), Agency

[4] MPCA. PFAS Monitoring Plan. (March 2022). Retrieved from *https://www.pca.state.mn.us/sites/default/files/p-gen1-22b.pdf*

for Toxic Substances and Disease Registry (ATSDR), Provisional Peer-Reviewed Toxicity Values (PPRTV), etc. If these values were included in the proposed rule, it would need to be amended anytime a value is added or updated. The frequency of updates makes it unreasonable to include these values in rule. California's rule (CCR, Title 17, Division 3, Chapter 1, Subchapter 7.7, Articles 1 and 2.) has many PFAS required to be reported and most PFAS do not have IHBs or established risk values.

The MPCA evaluated the pollutants that were included in the proposed rule and provided the specific reasonableness for them in the SONAR on pages 35 to 46.

C. Comments related to future regulations:

Comment (Mascarenhas-2): Brendan Mascarenhas from American Chemistry Council stated, "It is critical that MPCA include clear, reasonable, and achievable permit and enforcement mechanisms in any future rulemaking. Future regulatory compliance timelines must be realistic and provide sufficient time for facilities to implement the necessary control technologies. We also ask that the MPCA provide support and clear, detailed guidance during the compliance phase to facilitate smooth transitions for affected facilities."

Response: This comment is about potential future rulemaking and therefore out of scope for this rulemaking comment period. This proposed rule does not involve permit changes or implementing control technologies. As it relates to this Air Toxics Reporting Rule, the MPCA intends to provide support to facilities as well as detailed guidance about how to report during the implementation of the rule.

D. Comments related to current reporting data:

Comment (Morley-6): Andrew Morley of the Chamber of Commerce stated, "MPCA says it will use the data from the rule to feed modeling and risk assessments at MPCA and US EPA. Further, it says 'the MPCA does not wish to burden facilities but considers the benefits of air toxics emissions data from reporting to far outweigh the burden of annual reporting.' These modeling and risk analysis activities are already happening, and it is misleading to use them as justification for new reporting with specific context."

Response: The MPCA was directed by the legislature in Minn. Stat. § 116.062 to adopt rules requiring facilities with an air permit, except for option B registration permits, to annually report air toxics emissions to the agency. It is correct that the MPCA is already collecting air toxics emissions data and using it for modeling; however, the inventory and risk modeling are incomplete because reporting of air toxics emissions is currently voluntary. Since current reporting is only voluntary, the MPCA is unsure of how accurate the data is, and because not all

facilities report, the MPCA is uncertain of all emissions that are occurring at this time. Required reporting will ensure that all emissions are accounted for at facilities and provide better risk estimates for the seven metropolitan counties. The agency has identified the deficiencies of voluntary reporting in the SONAR on pages 13, 20, and 56.

Comment (Morley-7): Andrew Morley of the Chamber of Commerce stated, "MPCA claims that sources have no incentive to report accurately in the current voluntary system. Yet the Agency fails to demonstrate or explain how 30+ years of voluntary reporting and detailed analysis show current data are inaccurate or otherwise incomplete in a way that impacts MPCA's related policy and regulatory work… Page 15 of MPCA's SONAR states that MPCA began collecting air toxics data from facilities in 2011. That is incorrect. MPCA has been collecting air toxics emissions data from facilities since at least the mid-1990s and was part of a US EPA Region 5 collaborative effort related to emissions and databases from at least the 1990s through the early 2000s. It is important that the record accurately reflect the duration of data collection efforts because having data for such a long period of time is important information against which to judge MPCA assertions and insinuations regarding the need for additional data collection."

Response: In 2023, the Minnesota Legislature determined it was important for the agency to improve its collection of air toxics emissions data from facilities and adopted Minn. Stat. § 116.062 directing the MPCA to adopt rules requiring facilities with an air permit, except for option B registration permits, to annually report air toxics emissions to the agency. The MPCA would like to clarify that the agency began collecting voluntary air toxics emissions data from facilities via electronic reporting (e-Services) beginning in 2011. Prior to 2011, some facilities reported air toxics emissions voluntarily every three years, but it was not as coordinated an effort as air toxics reporting post-2011. While some facilities voluntarily report accurate and complete air toxics emissions data every three years, others provide incomplete information or have not reported air toxics emissions at all. Currently, over half of all facilities with an air permit in the seven metropolitan counties report emissions of air toxics in the voluntary triennial emissions inventory.

Comment (Morley-8): Andrew Morley of the Chamber of Commerce stated, "MPCA points to possible year-to-year variability in emissions as a reason for increasing the frequency of reporting from every-three-years to annually. Again, MPCA provides no data that shows air toxics emissions and concentrations fluctuate significantly that justifies its insinuation that more frequent data collection is necessary to close important gaps in knowledge."

Response: While some businesses have standardized production and products used, this overlooks the variability in air toxics emissions that can occur within a single year for certain

businesses. Job shops or manufacturers may frequently make different products to the specification of customer demands and production orders. This often requires the use of different paints and coatings or manufacture of products with significant variations in air toxics metals and volatiles. Changes in the types and quantity of materials used alters the volume and composition of air toxics emissions. Three-year reporting intervals may obscure these significant year-to-year variations and potentially mask periods of elevated emissions that require attention. Annual reporting will provide a more accurate understanding of these fluctuations, allowing for more informed decision-making and potentially enabling more targeted pollution prevention strategies. More about the deficiencies of voluntary reporting are in the SONAR on page 13, 20, and 56.

E. Comments related to the potential for duplicative reporting:

Comment (Morley-9): Andrew Morley from the Chamber of Commerce stated, "MPCA references U.S. Environmental Protection Agency (EPA) Air Emissions Reporting Requirements (AERR) alignment. It should update the draft rule before final publication to match the AERR to the maximum extent possible."

Response: The MPCA considered many aspects of the EPA's proposed AERR when developing this rule. The EPA received hundreds of comments on the proposed AERR, and the timeline for the final rule is uncertain. With the agency's legislative deadline to adopt a state rule in mind, the MPCA decided to move forward with the air toxics emissions reporting rule as proposed. If in the future AERR is finalized, the MPCA will reassess the need to amend the state rule. The MPCA has provided its consideration of alignment between this proposed rule and EPA's AERR throughout the SONAR on pages 15, 21, 24, 28, 29, 32, 34, 36, 47, 48, 59, 60, 69, and 70.

Comment (Mascarenhas-3): Brendan Mascarenhas from American Chemistry Council stated, "MPCA Should Ensure that Any New Requirements Avoid Overly Burdensome Impacts on State Facilities and Duplicative Reporting Obligations."[5]

Response: The MPCA will consider overlap of this rule with future federal requirements but would need to amend this rule to encompass any future changes. The EPA has not provided any updates on the proposed federal Air Emissions Reporting Rule (AERR). Although the MPCA has considered the possibility of aligning with EPA's proposed AERR, the rule has not been finalized, and the MPCA cannot align with any currently comparable federal rule. Negating duplicative reporting to the TRI is a challenge, because only a small subset of facilities with an air permit

[5] See full comment in American Chemistry Council comment letter on pages 42 and 43: https://www.pca.state.mn.us/sites/default/files/aq-rule2-02k.pdf

must report to the TRI. This proposed state rule would encompass all facilities in the seven metropolitan counties, except registration option B permits.

Mascarenhas also stated: “Unfortunately, it is unclear if MPCA provides any additional rationale to support this significantly more burdensome reporting schedule.” As stated in the earlier response to comment (Morley-8), while some businesses have standardized production and products used, some businesses change processes frequently and air toxics emissions that occur within a single year can vary. This is why annual reporting is reasonable to require to understand these variables. Additionally, this rule is not duplicative of NESHAPs and Title V Operating Permits because those do not require reporting.

Comment (Flowers-1): Patrick Flowers from Northern States Power Company stated, “The Air Toxics Report Timing Should Align with TRI Reporting Requirements. More closely aligning these report dates will reduce undue administrative burdens and help ensure consistent reporting. Specifically, we request a July 1 reporting deadline for the air toxics.”

Response: The MPCA appreciates the concern for inconsistent reporting and understands that duplicative reporting will be necessary for facilities that are required to report to both the EPA's TRI program and to MPCA. However, there are differences with the federal TRI requirements and the proposed rule as described in the SONAR on pages 69 and 70. Facilities will continue to be able to revise emissions after the April 1 deadline for the air toxics emissions inventory submittal during the 45-day summary review period per Minn. R. 7019.3000, Subp. 2. April 1 is a long-standing deadline for emissions inventory reporting in Minnesota. Facilities are therefore used to reporting by the April 1 deadline and MPCA believes it will be less burdensome for facilities to report all emissions data (including criteria pollutants and greenhouse gases) at the same time.

3. Proposed Rules

The MPCA received 10 comments related to specific rule parts which are summarized and responded to as follows.

A. Part 7007.0800 PERMIT CONTENT, Subp. 6. Reporting; Part 7007.1146 CAPPED PERMIT: COMPLIANCE REQUIREMENTS, Subp. 5 Reporting, Item A, Subitem (1); and Part 7007.1850 EMERGENCY PROVISION.

Comment (Morley-10): Andrew Morley of the Chamber of Commerce stated, “Emergency Affirmative Defense: The Chamber believes retaining these provisions to the extent practical and legal is imperative. Sources should not be held liable for emissions noncompliance resulting from an emergency situation beyond their control… The Chamber continues to recommend not

proceeding with the notice of intent to repeal the emergency affirmative defense provisions in chapter 7007. The proposed repeal should be delayed until active litigation between intervenors and the US EPA is concluded. Final briefs on this litigation were submitted to the court in November 2024, and oral arguments are scheduled for January 14, 2025. A court decision on the issue is expected before August 21, 2025, which is MPCA's current EPA-approved deadline to remove the T5-AD rule change language from the state rules. Because the outcome of this litigation—which could include a potential stay or vacatur–may impact the disposition of the T5-AD rule change, the Chamber reiterates that the only prudent thing to do is for MPCA to await final disposition of this challenge. If necessary, MPCA should seek another extension to the current repeal deadline to allow for both parties to adhere to the court's decision rather than risk actions that may run afoul of that decision."

Response: As explained in the SONAR on page 25, "*facilities are required to report deviations from permit conditions, which may or may not constitute a violation, regardless of whether the deviation occurred due to emergency factors. The MPCA's Compliance and Enforcement staff assess these deviations on an individual basis when determining enforcement follow up and have the ability to account for emergency factors that may have contributed to reported deviations.*" Regardless of whether a noncompliance results from an emergency situation, facilities are still responsible for their emissions and must report deviations, but Compliance and Enforcement staff take into account emergency situation considerations. The repeal of emergency affirmative defense provisions will not result in a change to how the MPCA responds to emissions noncompliance.

EPA's final action "Removal of Title V Emergency Affirmative Defense Provisions From State Operating Permit Programs and Federal Operating Permit Program"[6] set a deadline for states to repeal their emergency affirmative defense provisions. While there is litigation pending against this provision, the provision has not been stayed by the courts and thus the deadline is legally binding. Due to the EPA's deadline to remove Title V emergency affirmative defense provisions from state rules, the MPCA cannot wait for litigation to be complete and must move forward since there is not a stay on the requirement. The agency has addressed this comment and provided the reasonableness for this decision on page 26 of the SONAR.

Comment (Morley-11): Andrew Morley of the Chamber of Commerce stated, "If or when the MPCA decides to repeal these provisions, it should retain them for air permits not issued

[6] EPA. (August 21, 2023). Removal of Title V Emergency Affirmative Defense Provisions From State Operating Permit Programs and Federal Operating Permit Program. Retrieved from: https://www.federalregister.gov/documents/2023/07/21/2023-15067/removal-of-title-v-emergency-affirmative-defense-provisions-from-state-operating-permit-programs-and

pursuant to the Clean Air Act Title V operating permit program regulations. Since the MPCA permitting rules combine both the non-Title V and Title V operating permit programs, it is unclear how the removal or modification of the affirmative defense provisions will affect non-Title V facilities or why such a repeal would even be necessary. Minn. R. 7007.1850 does not disassociate the use of the affirmative defense between these types of permitted facilities, but the EPA's rule revoking the affirmative defense applies only to Title V permits. There is no basis for removing this provision for non-Title V permitted facilities."

Comment (Flowers-2): Patrick Flowers of Northern States Power Company stated, "The Emergency Affirmative Defense Provisions Should be Maintained as "State-Only" Rather Than Fully Repealed."

Response: The repeal of the affirmative defense provisions will apply to all Minnesota air permits; including both federal and state. As noted on page 25 of the SONAR: "*The MPCA does not intend to make changes to the state permit program that are inconsistent with federal rules, so the MPCA is opting not to keep this rule available for state individual permits.*"

In the EPA's summary of this rule to repeal Title V emergency affirmative defense provisions from the Clean Air Act (CAA) (40 CFR parts 70 and 71), they state, "*These provisions, which have never been required elements of state operating permit programs, are being removed because they are inconsistent with the EPA's interpretation of the enforcement structure of the Clean Air Act (CAA or the Act) in light of prior court decisions from the U.S. Court of Appeals for the D.C. Circuit. The removal of these provisions is also consistent with other recent EPA actions involving affirmative defenses and would harmonize the EPA's treatment of affirmative defenses across different CAA programs.*"

If the MPCA maintained a state-only provision, it would require additional rulemaking to allow this provision because the state rules currently do not differentiate with an emergency affirmative defense provision specific to state permits. The MPCA has no intention of adding a rule that would be inconsistent with the Clean Air Act.

The MPCA connected with the other states of the EPA Region 5 and all states who had the provisions (Wisconsin did not have them) are fully repealing the provision and not keeping any provisions for state-only permits or enforcement authority.

B. Part 7019.3000 EMISSION INVENTORY

Comment (Morley-12): Andrew Morley from the Chamber of Commerce stated, "With an expanded list of reportable materials, MPCA should clarify its expectations for pollutant testing and certifications of submittals. For example, many facilities do not add per- or polyfluoroalkyl

substances (PFAS) materials to their processes, but there may be trace amounts in raw materials or incoming water. MPCA must clarify whether companies will be expected to test for PFAS or other materials that are not part of their process or otherwise expected to be present. Are other speciation methods (e.g., safety data sheet information) subject to the requirements of the calculation hierarchy available for toxics reporting instead of testing?"

Response: A certification has been incorporated into the proposed rule and is included in part 7019.3000, subpart 1, item B, subitem (4) in which the responsible official must sign the report and make the certification. The proposed rule does not require testing of materials and does not require reporting air toxics that are not part of the facilities process(es). Facilities will be able to use the existing method hierarchy in part 7019.3030, subpart 1 for air toxics emissions reporting. The reasonableness for incorporating air toxics in the method hierarchy for emissions reporting calculations is included in the SONAR on pages 32 and 33 and applies to all pollutants. In the new section of rule under part 7019.3110 subpart 4, requirements for reporting individual pollutants within a group are proposed.

C. Part 7019.3020 CALCULATING ACTUAL EMISSIONS FOR EMISSION INVENTORY, Subp. 9. Control equipment and Subp. 10 Control efficiency factors.

Comment (Morley-13): Andrew Morley of the Chamber of Commerce stated, "The proposed language in Minn. R. 7019.3020, subps. 9 and 10, add new requirements for the use of specific control efficiencies. Current voluntary submittals likely use control efficiencies determined by regulated facilities. MPCA-specified efficiencies are less likely to represent specific equipment and operations than facility data. MPCA's rule should allow for facility specific control efficiencies. These data will better represent real world emissions. Outside of the scope of this rule, some regulatory applicability analyses may require conservative assumptions as a factor of safety. This reporting rule is intended to represent actual emissions. Conservative assumptions that lead to higher emission estimates would not serve the purpose of the rule."

Response: The MPCA agrees that the emissions reported should represent actual emissions. Minn. R. part 7019.3020, subp. 10 specifies the use of control efficiency factors when air toxics are included under the broader pollutant categories of volatile organic compounds or particulate matter. Facilities will be able to account for facility data when calculating air toxics. Facilities are not limited to the control efficiencies listed in Table A of Minn. R. part 7011.0070, Subp. 1a. For example, a facility may use data from a recent performance test or manufacturer data as a VOC control efficiency factor when calculating volatile air toxics. The facility may use a control efficiency factor as allowed under Minn. R. parts 7019.3060, 7019.3065, and 7019.3080. The MPCA has provided specific reasonableness for the use of control equipment and control efficiency factors in the SONAR on pages 30 and 31 and provides a comparison of facility

calculations for emissions with and without applying a grouped control efficiency factor to air toxics emissions in Table 1 on page 31.

D. Part 7019.3110 AIR TOXICS EMISSIONS INVENTORY AND EMISSIONS REPORTING, Subp. 2. Air toxics required to be reported.

Comment (Morley-14): Andrew Morley of the Chamber of Commerce stated, "In order to focus the health improvements for vulnerable communities in the seven metropolitan counties, and to be consistent with other states' approaches for permitted facilities, the Chamber would support a regulation that requires annual reporting of the more concise list of air toxics pollutants in EPA's Federal HAP list."

Response: Minn. Stat. § 116.062 directed the MPCA to consider broad categories of air toxics that go beyond the federal HAP list (see page 12 of the SONAR). The MPCA developed reasonable criteria to evaluate these broad categories and appropriately narrow the list of air toxics for reporting based on these criteria. These criteria are defined in the SONAR mostly by what was not included in the proposed rule, although the detailed specific reasonableness for each pollutant that was included can be found in the SONAR on pages 35 to 46. In general the MPCA did not include: certain PFAS that are not present or reported in Minnesota, or are salts and anions of OTM-45 and OTM-50 pollutants; certain pollutants that only have oral or other types of risk values because they would not be as relevant to risk modeling or where the inhalation risks are no longer relevant; pollutants only reported in other states in the TRI; and pollutants that have been banned. Page 46 of the SONAR discusses more about the criteria used. The MPCA did include: all HAPs, all PFAS on the TRI list, all the pollutants for which MDH has develop Health Based Values (HBVs) or Risk Assessment Advice (RAA), all pollutants on IRIS, TRI, and MPCA's emissions inventory list that had inhalation health benchmarks or multipathway concerns (including Persistent, Bioaccumulative, and Toxic – PBTs), and pollutants of concern in Minnesota – including many PFAS that are prevalent in our state specifically.

Comment (Gupta-1): Shalini Gupta stated, "The MPCA should require reporting of sulfuryl fluoride as an air toxic. It can be emitted from permitted sources and it is toxic."

Response: Thank you for this recommendation. The agency has reviewed and considered adding this pollutant to the proposed rule; however, sulfuryl fluoride does not currently meet the criteria the MPCA considered for air toxics pollutants to be reported in this rulemaking (identified on page 46 of the SONAR). The MPCA may consider adding this pollutant to the list of air toxics required to be reported in a future rulemaking.

Sulfuryl fluoride is not a HAP, is not a PFAS, the Minnesota Department of Health (MDH) has not developed a Health Based Value (HBV) or risk assessment advice (RAA) for it, it does not have an inhalation risk from any source (MDH, IRIS, or others considered in the SONAR), it has not been assessed by IRIS to have an inhalation risk value, it has not been reported to the MPCA in the voluntary triennial emissions inventory or in the years 2022 or 2023 to the TRI by any facility in Minnesota, and it has not been purchased in Minnesota since 2020. This pollutant doesn't meet these criteria as stated, but if there were new information provided about how it does meet the criteria, we could consider adding it to the list of pollutants.

E. Part 7019.3110 AIR TOXICS EMISSIONS INVENTORY AND EMISSIONS REPORTING, Subp. 3. De minimis reporting; exceptions.

Comment (Morley-15): Andrew Morley of the Chamber of Commerce stated, "MPCA includes some de minimis allowances based on material safety data sheets. That is positive."

Response: Thank you for your comment.

Comment (Mascarenhas-4): Brendan Mascarenhas from American Chemistry Council stated, "MPCA should provide clear and science-based guidelines on emission thresholds to help ensure the rule is effective and manageable for both regulators and industry and results in an air toxics regulatory program that is grounded in sound science… The de minimis standard should be maintained. The de minimis standard is a long-standing policy that is designed to help generate meaningful information and focus on priority levels of substances. It also provides for the minimization of unreasonable burdens to quantify minute amounts of a chemical substance."

Response: The MPCA has proposed a de minimis for reporting using material balance calculations in this section and has provided reasonableness in the SONAR on pages 46-50. Facilities using material balance calculations will need to calculate their emissions to determine if they need to report. For facilities that do not use material balance calculations, the MPCA will require reporting of each pollutant so that facilities do not have to determine if there is a threshold for reporting or not. This is intended to reduce the burden of reporting for facilities.

Comment (Flowers-3): Patrick Flowers from Northern States Power Company stated, "The Air Toxics Reporting Regulations Should Establish Reporting Thresholds for Each Air Toxic. Reporting thresholds can – and should – be tailored to the specific characteristics and potential human health and environmental impact of each air toxic."

Response: Using the commenter's proposed approach, facilities would need to calculate their emissions to determine if they need to report based on the threshold. Instead, to simplify

reporting, the MPCA is requiring facilities to report all air toxics emissions (except for facilities using material balance calculations) rather than having to determine an individual threshold for each air toxic they are emitting. The MPCA provided a comparison to other states on page 71 of the SONAR and stated, "*The MPCA's de minimis approach is reasonable because it requires fewer initial calculations to determine whether a facility has to report a certain air toxic. This is intended to ease the burden of reporting for facilities*."

Exhibit J

J. Not Enclosed: a copy of the document from the chief judge authorizing the agency to omit the text of any proposed rule from the notice of hearing published in the State Register because the proposed rule was published in the State Register.

Exhibit K

K. Enclosed: any other document or evidence to show compliance with any other law or rule that the Pollution Control Agency must follow to adopt the rules.

K-1. a certificate of Sending the Notice and the Statement of Need and Reasonableness to Legislators and the Legislative Coordinating Commission.

K-2. a copy of the transmittal letter showing the agency sent notice to Legislators per Minnesota Statutes, section 14.116.

K-3. a copy of the transmittal letter showing the agency consulted with MMB per Minnesota Statutes, section 14.131, and MMB's memo dated October 21, 2024, in response.

Exhibit K-1

Minnesota Pollution Control Agency

CERTIFICATE OF SENDING THE NOTICE AND THE STATEMENT OF NEED AND REASONABLENESS TO LEGISLATORS AND THE LEGISLATIVE COORDINATING COMMISSION

Proposed Amendments to MPCA Rules Governing Air Quality – Air Toxics Emissions Reporting Rule, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019; Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850; Revisor's ID Number R-4599; OAH docket number 71-9003-39354

I certify that on December 10, 2024, after the Agency published the Dual Notice of Intent to Adopt Rules under Minnesota Statutes, section 14.14 or 14.22, I sent a copy of the Notice and the Statement of Need and Reasonableness to certain Legislators and the Legislative Coordinating Commission by sending an electronic copy via email. I emailed these documents to comply with Minnesota Statutes, section 14.116. A copy of the cover letter is attached to this Certificate.

Date: 12/10/2024

Addison Otto; Rule Coordinator
Minnesota Pollution Control Agency

MINNESOTA POLLUTION CONTROL AGENCY

VIA EMAIL
December 10, 2024

Senator Aric Putnam, Chair
Senator Torrey N. Westrom, Ranking Minority Member
Senate Agriculture, Broadband, and Rural Development Finance and Policy Committee

Senator Nick A. Frentz, Chair
Senator Andrew Mathews, Ranking Minority Member
Energy, Utilities, Environment, and Climate Committee

Senator Foung Hawj, Chair
Senator Justin D. Eichorn, Ranking Minority Member
Environment, Climate, and Legacy Committee

Senator D. Scott Dibble, Chair
Senator John R. Jasinski, Ranking Minority Member
Transportation Committee

Representative Samantha Vang, Chair
Representative Paul Anderson, Republican Lead
House Agriculture Finance and Policy Committee

Representative Patty Acomb, Chair
Representative Chris Swedzinski, Republican Lead
House Climate and Energy Finance and Policy Committee

Representative Rick Hansen, Chair
Representative Josh Heintzeman, Republican Lead
House Environment and Natural Resources Finance and Policy Committee

Representative Tina Liebling, Chair
Representative Joe Schomacker, Republican Lead
House Health Finance and Policy Committee

Representative Leon Lillie, Chair
Representative Jeff Backer, Republican Lead
House Legacy Finance Committee

Representative Frank Hornstein, Chair
Representative John Petersburg, Republican Lead
House Transportation Finance and Policy Committee

Legislative Coordinating Commission
lcc@lcc.mn.gov

Senator Foung Hawj
Representative Rick Hansen
Chief Authors of Minnesota Statutes, section 116.062

In the Matter of the Proposed Amendments to MPCA Rules Governing Air Quality – Air Toxics Emissions Reporting Rule; Revisor's ID Number Revisor's ID Number R-4599; OAH Docket No. 71-9003-39354

Dear Legislators:

The Minnesota Pollution Control Agency (MPCA) intends to adopt rules relating to air quality – air toxics emissions reporting. Minnesota Rules require that air permitted facilities submit an annual air emissions inventory for criteria air pollutants including particulate matter, ammonia, volatile organic compounds (VOCs), lead, nitrogen dioxide, carbon monoxide, and sulfur dioxide. The MPCA collects voluntary air toxics emissions data from facilities every three years for hazardous air pollutants (HAPs), per-and polyfluoroalkyl substances (PFAS), and additional air toxics of concern in Minnesota. The criteria pollutant and air toxics emissions data collected are used by the MPCA and EPA to assess community health risks.

The proposed rules would require air permitted facilities located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties (except those with Option B registration permits) to annually report air toxics emissions, as directed by Minn. Stat. § 116.062. The proposed rules will help identify and prioritize areas of concern. However, the air toxics emissions data will be incomplete because the statute authorizing this rulemaking does not apply to air permitted facilities statewide.

The MPCA is proposing to repeal certain sections of chapter 7007 that allow a Title V air permittee to assert emergency affirmative defense. This amendment is in response to the EPA's final rule effective August 8, 2023, that removed emergency affirmative defense provisions from the Clean Air Act Title V operating permit program regulations. The EPA determined that the emergency affirmative defense provisions are inconsistent with the Clean Air Act. The EPA set a deadline for states to remove this language from state rules by August 21, 2024, or to seek an extension and remove the language as soon as practicable. The MPCA requested and was

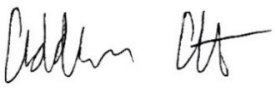
granted an extension until August 21, 2025. The repeal of this language is proposed in this rulemaking because it involves amendments that effect permitted air emission facilities and is an upcoming permanent air rulemaking.

A Dual Notice of Intent to Adopt Rules was published in the November 25, 2024, *State Register.* The MPCA is now sending the Notice under section 14.14.

As required under section 14.116, we are sending you a copy of the Notice and the Statement of Need and Reasonableness. We are also enclosing a copy of the proposed rules.

If you have any questions or concerns, please contact me at addison.otto@state.mn.us or 651-757-2754.

Sincerely,



Addison Otto
MPCA Rule Coordinator

Enclosures:

- Dual Notice of Intent to Adopt Rules
- Statement of Need and Reasonableness (SONAR)
- SONAR Exhibit 1
- Proposed Rules

cc: Legislative Coordinating Commission

From:	Otto, Addison (She/Her/Hers) (MPCA)
Cc:	lcc@lcc.mn.gov; Johnson, Tom (MPCA)
Bcc:	rep.samantha.vang@house.mn.gov; rep.paul.anderson@house.mn.gov; rep.patty.acomb@house.mn.gov; rep.chris.swedzinski@house.mn.gov; rep.rick.hansen@house.mn.gov; rep.josh.heintzeman@house.mn.gov; rep.tina.liebling@house.mn.gov; rep.joe.schomacker@house.mn.gov; rep.leon.lillie@house.mn.gov; rep.jeff.backer@house.mn.gov; rep.frank.hornstein@house.mn.gov; rep.john.petersburg@house.mn.gov; sen.aric.putnam@senate.mn; sen.torrey.westrom@senate.mn; sen.nick.frentz@senate.mn; sen.andrew.mathews@senate.mn; sen.foung.hawj@senate.mn; sen.justin.eichorn@senate.mn; sen.scott.dibble@senate.mn; sen.john.jasinski@senate.mn
Subject:	FW: Dual Notice of Intent to Adopt Rules - Air Toxics Emissions Reporting Rule
Date:	Tuesday, December 10, 2024 9:30:00 AM
Attachments:	leg.pdf image001.png aq-rule2-02i.pdf aq-rule2-02g.pdf aq-rule2-02h.pdf aq-rule2-02j.pdf

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Good morning,

Please see the notice (below) and attachments regarding Proposed Amendments to MPCA Rules Governing Air Quality – Air Toxics Emissions Reporting Rule; Revisor's ID Number Revisor's ID Number R-4599; OAH Docket No. 71-9003-39354. Please feel free to reach out to me with any questions you may have.

-Addison

Addison Otto (she/her/hers)
Rule Coordinator Principal
addison.otto@state.mn.us
651-757-2754

From: Minnesota Pollution Control Agency <mpca@public.govdelivery.com>
Sent: Monday, November 25, 2024 10:15 AM
To: Otto, Addison (She/Her/Hers) (MPCA) <Addison.Otto@state.mn.us>
Subject: Dual Notice of Intent to Adopt Rules - Air Toxics Emissions Reporting Rule

Proposed rules

Dual Notice of Intent to Adopt Rules - Air Toxics Emissions Reporting Rule

November 25, 2024

MPCA's legal notice of its intent to adopt air quality rules

The Minnesota Pollution Control Agency (MPCA) has issued a Notice of Intent to Adopt Rules Without a Public Hearing Unless 25 or More Parties Request a Hearing, and Notice of Hearing if 25 or More Requests for Hearing Are Received; Revisor's ID R-4599, OAH docket number 71-9003-39354, for the Air Toxics Emissions Reporting rulemaking:

- Proposed Amendment to Rules Governing Air Quality, *Minnesota Rules*, chapters 7002, 7005, 7007, and 7019; and
- Proposed Repeal to Rules Governing Air Quality, *Minnesota Rules*, chapter 7007.1850.

The MPCA published this notice in the November 25, 2025, edition of the *State Register*. The notice is also available on the MPCA's website: Air toxics emissions reporting.

What this means

The proposed rules will require air permitted facilities located in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, or Washington counties (except those with Option B registration permits) to annually report air toxics emissions, as directed by Minn. Stat. § 116.062.

The MPCA is also proposing to repeal certain sections of chapter 7007 that allow a Title V air permittee to assert emergency affirmative defense. This amendment is in response to the EPA's final rule effective August 8, 2023, that removed emergency affirmative defense provisions from the Clean Air Act Title V operating permit

program regulations, and the deadline for states to remove this language from state rules by August 21, 2024. The MPCA requested and was granted an extension until August 21, 2025.

Next steps

As a result of this notice, a new comment period has opened. You can submit your questions, comments, and feedback on the proposed rule to the administrative law judge (ALJ) assigned to this rulemaking. You can also submit a request for a hearing as part of your comment or separately. Please submit your written comments to the ALJ online, using the Office of Administrative Hearings' rulemaking e-comments website.

The comment period and the opportunity to request a hearing closes at 4:30 p.m. on January 15, 2025.

Comment here!

Information Session

The MPCA will hold an information session on the proposed Air Toxics Emissions Reporting Rule and how you can participate in the rulemaking process. The information session will be recorded and available on our website.

Tuesday, December 10, 2024

3:00 p.m. Central Time

https://www.zoomgov.com/j/1602868372

Meeting ID: 160 286 8372

You can find more information on this rulemaking at MPCA's Air Toxics Emissions Reporting Webpage.

Minnesotan has healthy air, sustainable lands, clean water, and a better climate.

MPCA logo

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MINNESOTA

9/30/2024

Ryan Merz
Executive Budget Officer
Minnesota Management and Budget
658 Cedar St., Suite 400
St. Paul, MN 55155

Re: In The Matter of the Proposed Amendments to MPCA Air Rules to require air toxics emissions reporting by air emissions permit holders – Air Toxics Emissions Reporting Rule; Revisor's ID Number R-4599

Dear Ryan Merz:

Minnesota Statutes, section 14.131, requires that an agency engaged in rulemaking consult with the Commissioner of Minnesota Management and Budget, "to help evaluate the fiscal impact and fiscal benefits of the proposed rule on units of local government."

Enclosed for your review are copies of the following documents on proposed MPCA rule amendments known as the Air Toxics Emissions Reporting Rule:

1. The Governor's Office Proposed Rule and SONAR Form (signed by Commissioner Kessler).
2. The 8/27/2024 Revisor's draft of the proposed rule.
3. The 9/30/2024 draft of the SONAR.

I am also delivering copies of these documents to the Governor's Office today.

If you or any other representative of the Commissioner of Minnesota Management & Budget has questions about the proposed rule, please call me at 651-757-2754. Please send any correspondence about this matter to me at the following address: Addison Otto, Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul MN 55155 or addison.otto@state.mn.us.

Yours very truly,

Addison Otto

Addison Otto
MPCA Rule Coordinator

Date: October 21, 2024

To: Addison Otto
Rule Coordinator Principal
Minnesota Pollution Control Agency

From: Ryan Merz
Executive Budget Officer
Minnesota Management & Budget

Subject: M.S. 14.131 Review of Proposed Revisions to Rules Relating to Air Toxic Emissions Reporting; Rules Chapters 7002, 7005, 7007, and 7019, Rule Draft 4599

Background

The Minnesota Pollution Control Agency (MPCA) proposes to amend Minnesota Rules, Chapters 7002, 7005, 7007, and 7019 to require facilities with an air permit (except for option B registration permits) that are located within the seven-county metropolitan area to submit an annual air toxics emissions inventory. This rulemaking is required under Minn. Stat. § 116.062, created by the 2023 Minnesota Legislature (Chapter 60, Article 8, Section 2). The MPCA is also proposing to repeal sections of Chapter 7007 that allow a Title V air permittee to assert an affirmative defense for noncompliance in case of an emergency. The US Environmental Protection Agency (EPA) has determined that this provision is inconsistent with the Clean Air Act and directed the MPCA to remove this provision by August 21, 2025.

This rulemaking is being carried out to meet statutory requirements and to improve MPCA understanding of air toxic emissions within this area of the state. Current Minnesota Rules require annual emission inventory reporting for facilities statewide for certain pollutants and MPCA collects voluntary air toxics emissions data from facilities once every three years.

Data gathered through proposed rules could drive future rulemaking and regulation to ensure effective air programs and consistency with MPCA's environmental justice priorities. This information could enable the MPCA to respond more quickly and effectively to emission increases or new health-based data from pollution. If realized, MPCA will be able to better inform communities about health or environmental impacts from air toxics and work with air permitted facilities to understand their emissions and estimate human health risk from exposure to these air toxics.

Pursuant to Minn. Stat. § 14.131, MPCA has requested Minnesota Management and Budget (MMB) evaluate the proposed amendments for fiscal impact and benefits on units of local government.

Evaluation

On behalf of the Commissioner of Minnesota Management and Budget, I have reviewed the proposed changes and the draft of the Statement of Need and Reasonableness to help evaluate the fiscal impact these rules may have on local governments.

Fiscal Impact on local governments

The proposed rulemaking does not have any identified fiscal impact on local governments. Considerations in this evaluation included impact on costs for local governments holding air permits, impact on local ordinances, and impact on costs of products consumed by local governments.

There are six cities with ten total air permits in the seven-county metropolitan area. MPCA does not anticipate any additional costs of compliance under the proposed rules because these permits are already subject to annual reporting. Under these permits, MPCA auto-calculates air toxics so no additional reporting will be required of the cities.

The proposed amendments are not anticipated to have any effect on local ordinances or regulations.

MPCA does not anticipate local governments, or consumers at large, will experience passed on cost increases for products because of the additional reporting requirements.

Other Notes on Fiscal Impacts

The proposed rule is not expected to have any impact on state revenues.

The MPCA will be the sole Minnesota government agency responsible for implementing, administering, and enforcing the proposed rule. The estimated total annual cost to the MPCA to implement and enforce the rule will be between $333,000 to $446,000 in the first year after rule adoption and between $189,000 to $311,000 in subsequent years.

This rule will have a fiscal impact for non-governmental facilities with air permits in the seven-county metropolitan area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington Counties). Of the 666 facilities that hold permits and are required to report air toxic emissions, 457 of these facilities are expected to incur costs under the proposal. MPCA estimates an average annual compliance cost per facility of around $5,000 to $9,000. The estimated total annual compliance cost across all affected non-governmental facilities would be approximately $2.2 to $3.9 million.

Sincerely,
Ryan Merz
Executive Budget Officer (MMB)

Cc: Katrina Kessler, Commissioner (MPCA)
Nick Lardinois, Budget Policy and Analysis Director (MMB)