



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

**AERA-05**

**Emissions Form**

Air Emissions Risk Analysis (AERA)

Doc Type: Air Emissions Risk Assessment – External Documentation

**Instructions on Page 8**

**Purpose:** This form describes emission rates used in an AERA submitted prior to submitting an air permit application (pre-app) or with an air permit application (post-app). This form also documents the Minnesota Pollution Control Agency (MPCA) AERA emissions review. ***MPCA staff will fill out areas in italics during their review, indicating deficiencies and advising the applicant on how they can be remedied.*** Instructions on how to fill out this form are at the end of the form. For general information on estimating emissions for an AERA, please refer to the “AERA Guidance” on the MPCA website at <http://www.pca.state.mn.us/ktqh42a> and the “Guidance on Estimating Emissions for an AERA” at <http://www.pca.state.mn.us/udgx42e>. An AERA submitted with an air permit application is not considered “substantially complete” until **all** necessary quantitative and qualitative information has been submitted and MPCA staff have determined that appropriate methods have been used. **Submitting AERA materials for review prior to submitting an air permit application is highly recommended** so that site specific suggestions from MPCA staff can be included in AERA materials submitted with an air permit application.

**Facility Information**

1. AQ Facility ID No.: \_\_\_\_\_
2. SIC Code: \_\_\_\_\_
3. Date(s) of pre-application submittal: \_\_\_\_\_  
(mm/dd/yyyy)
4. Date(s) of permit application submittal: \_\_\_\_\_  
(mm/dd/yyyy)
5. Facility name: \_\_\_\_\_
6. Facility location  
Street address: \_\_\_\_\_  
City: \_\_\_\_\_ State: MN Zip code: \_\_\_\_\_ County: \_\_\_\_\_
7. Proposer: \_\_\_\_\_ Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_
8. AERA Preparer: \_\_\_\_\_ Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Are there differences between the AERA emission estimates submitted pre-app and post-app?

☐ Yes ☐ No ☐ NA If yes please explain what and why:

**MPCA review question:** Are there differences between the AERA emission estimates submitted pre-app and post-app?

☐ Yes ☐ No ☐ NA If yes please explain what and why:

**MPCA Overall Summary of AERA Emissions Review**

**Names of MPCA AERA reviewers:** \_\_\_\_\_

Submittal date (mm/dd/yyyy)	Pre-app review date (mm/dd/yyyy)	Overall pre-app AERA emissions determination (Select Yes for adequate, No for deficient, and enter reviewer's initials)	Post-app completeness review date (mm/dd/yyyy)	Overall post-app AERA emissions completeness determination (Select Yes for substantially complete, No for incomplete, and enter reviewer's initials)	**Technical accuracy review date (mm/dd/yyyy)	**Technical accuracy determination and reviewer's initials
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA overall AERA emissions review questions:**

Do the emissions in the spreadsheet match the emissions in the risk modeling input? ☐ Yes ☐ No If the emissions used in the modeling do not match the spreadsheet, do the emissions in the risk modeling overestimate air concentrations (are the assumptions health protective)? ☐ Yes ☐ No

Do the emissions in the permit application match the emissions in the risk modeling input? ☐ Yes ☐ No If the emissions used in the permit application do not match the risk modeling input, do the emissions in the risk modeling overestimate air concentrations (are the assumptions health protective)? ☐ Yes ☐ No

Do the stack parameters in the risk modeling input match the air permit? ☐ Yes ☐ No If the stack parameters used in the risk modeling do not match the air permit, do the stack parameters in the risk modeling overestimate air concentrations (are the assumptions health protective)? ☐ Yes ☐ No

**MPCA overall AERA emissions pre-app review notes including comments on deficiencies and how they can be remedied:**

**MPCA overall AERA emissions post-app review notes including comments on deficiencies and how they can be remedied:**

**\*\*MPCA overall AERA emissions technical accuracy review notes including comments on deficiencies and how they can be remedied:**

**General Submittal Information** (Provide answers below).

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**This form covers emission calculations on Excel spreadsheet(s) named:** \_\_\_\_\_

Used in:

☐ Protocol named: \_\_\_\_\_

☐ RASS(s) named: \_\_\_\_\_

☐ Q/CHI spreadsheet(s) named: \_\_\_\_\_

☐ AERMOD modeling in/output file(s) named: \_\_\_\_\_

☐ HHRAP based refined analysis file(s) named: \_\_\_\_\_

Will there be/have there been deviations from the general "AERA Guidance" on the MPCA website at <http://www.pca.state.mn.us/ktqh42a> and the "Guidance on Estimating Emissions for an AERA" at <http://www.pca.state.mn.us/udqx42e>?

☐ Yes ☐ No If yes please explain what and why:

**MPCA review questions:**

Are the changes between pre-app and post-app acceptable? ☐ Yes ☐ No ☐ NA Please explain why:

Are the deviations from the guidance acceptable? ☐ Yes ☐ No ☐ NA Please explain why:

## Emission Source Summary (See the AERA-03 Form for a summary of the source parameters used in the AERA modeling)

There are...	All will be/were quantified in the AERA	*Some will not be/were not quantified in the AERA	*None will be/were quantified in the AERA
<input type="checkbox"/> Combustion stack/vent point sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Non-combustion stack/vent point sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Onsite mobile source tail pipe emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Idling vehicle tail pipe emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Onsite fugitive emission sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> paved roads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> unpaved roads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> storage/surge piles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> material handling operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> valve, tanks, equipment leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> other, describe below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Examples of fugitive emissions include but are not limited to traffic on paved and/or unpaved roads, stockpiles of various materials, wind erosion, loadout, etc. Please describe any other fugitive emissions:

☐ Yes ☐ No

**\*Some emission sources at the facility will not be/ were not quantified in the AERA per AERA guide section 2.3. In the table below describe the emission source(s) not quantified next to the appropriate explanation.**

Source description:	The sources not quantified will be/are:
	<p>"Insignificant activities" defined in Minn. R. 7007.1300 (and its associated emissions) and only emits chemicals that are also emitted by sources/units already included in the emission inventory, and the contribution of the individual activity is less than 1% of the total emission inventory for a chemical (hourly for acute and annual for chronic).</p> <p><input type="checkbox"/> Demonstration calculations included.</p>
	Emitters of chemicals that do not have inhalation health benchmarks listed in the RASS.
	Internal combustion engines associated with an emergency generator and/or fire pump and is described in AERA-04 Emergency Internal Combustion Engine Certification Form.
	Associated only with startup, shutdown, and/or emergency situations.
	Screened out because it had total risks below risk driver levels (0.1 for non-carcinogens or 10-6 for carcinogens) using the RASS(s) named:
	Other (e.g., case by case determination on vehicle emissions):

### MPCA emission source review summary:

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	**Technical accuracy review date(s) (mm/dd/yyyy)	**Technical accuracy
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA emission source review questions:**

Did the insignificant source characterization follow the AERA guidance? ☐ Yes ☐ No

Do the stack parameters in the modeling correctly characterize the emission sources? ☐ Yes ☐ No  
(See the AERA-03 form for a summary of the source parameters used in the AERA modeling.)

\*\*Are the stack parameter characterizations technically correct? ☐ Yes ☐ No

MPCA emission sources review notes:

**Operating Scenario Summary**

The project proposer may choose to assess emissions at the facility's potential to emit (PTE) as defined by state and federal rules. Alternatively or in addition, the project proposer may estimate another future operating scenario, defined in the AERA guidance as "future estimated actual emissions". Please indicate what type of emissions will be/were assessed:

☐ Potential to emit ☐ Future estimated actual

If future estimated actual emissions will be/are used, provide business case description to support future case, three years of Toxic Release Inventory (TRI) information for existing facilities, and propose production-based permit limits (AERA Guide section 2.3.7):

☐ An operating scenario of less than 8760 hrs/day will be/was used and is reflected in a permit limit or physical limit.

Explain:

☐ Emission calculations will include/included capture and control efficiencies.

☐ Will/were different methods (be) used for the emissions that will be/were calculated for the proposed and pre-existing project calculations?

Explain:

**MPCA operating scenario summary review summary:**

<b>Submittal date(s)</b> (mm/dd/yyyy)	<b>Pre-app review date(s)</b> (mm/dd/yyyy)	<b>Pre-app adequacy</b>	<b>Post-app completeness review date(s)</b> (mm/dd/yyyy)	<b>Post-app completeness</b>	<b>**Technical accuracy review date(s)</b> (mm/dd/yyyy)	<b>**Technical accuracy</b>
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA operating scenario summary review questions:**

Was there adequate support for using future estimated actual emissions? ☐ Yes ☐ No

Does the limited operating scenario reflect a permit limit or physical limit? ☐ Yes ☐ No

Are the emissions estimates for the facility before and after the project comparable? ☐ Yes ☐ No

If no, explain:

Are the capture and control efficiencies assumed appropriate and do they correspond to the permit application information?

☐ Yes ☐ No

MPCA operating scenario summary review notes:

## Emission Factor Summary

Indicate which emission factors were generated using each of the sources listed below:

Chemical(s), source type(s) or emission unit(s) (e.g. NO <sub>2</sub> , natural gas heaters, EU001)	Emission factor reference	Table number or specific reference identifier	Publication or report date	Rationale for selecting data source
	Permit Limit:			
	AP-42 Natural gas emissions factors (except those with E rated emission factors based on detection limits).	1.4-1 1.4-2 1.4-3 1.4-4	7/98	
	AP-42:			
	FIRE:			
	CaTEF:			
	Material Safety Data Sheets:			
	EPA emission models <input type="checkbox"/> TANKS <input type="checkbox"/> MOVES <input type="checkbox"/> LandGEM			
	Chemical analyses of feedstocks and products (conservation of mass calculations):			
	Trade or industry organization Emission Factor Database, reports, publications:			
	Peer-Reviewed technical literature:			
	Toxic Release Inventories:			
	Vendor provided data			
<input type="checkbox"/> Fill out table below	Facility stack tests:			
<input type="checkbox"/> Fill out table below	Similar facility stack tests:			
	Other (explain):			

Was a reasonable level of effort made to identify all COPI, i.e., was readily available information considered? ☐ Yes ☐ No

Was there conflicting information between different sources? ☐ Yes ☐ No If yes, explain why these sources were chosen:

Were additional potential sources of emissions information considered and rejected? ☐ Yes ☐ No If yes, explain why:

### MPCA emission factors summary review:

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	**Technical accuracy review date(s) (mm/dd/yyyy)	**Technical accuracy
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA emission factors review questions:**

Do you know of better emission factor sources? ☐ Yes ☐ No

If yes, how were conflicting or alternative emission sources considered:

Did the emission estimates follow the AERA guidance? ☐ Yes ☐ No

Are all of the pollutants expected from a source accounted for? ☐ Yes ☐ No

MPCA emission factors review notes:

## Summary of Emission Factors Developed from Stack Tests

Has the facility done air toxics stack testing? ☐ Yes ☐ No

If yes please list the chemicals, unit(s) or source(s) tested and test report date(s) in the table below. In addition, if stack testing results will be/were used in the AERA, indicate (by letter) which of the following preferred calculation methods will be/were used?

**Calculation methods**

Method A: The ProUCL recommended 95% upper confidence limit of the arithmetic mean (UCL-AM) will be/was used for annual (tons/yr) estimates.

☐ A copy of the ProUCL runs is/will be included.

Method B: The **highest** measured value of stack test data will be/was used for annual (tons/yr) estimates because there were not enough data points for ProUCL to recommended 95% UCL -AM.

Method C: The **highest** measured value will be/ was used for hourly (lb/hr) estimates.

☐ A copy of the ProUCL runs will be/is included.

Method D: Instrument measured values will be/were included even if below the method detection limit.

Method E: Instrument detection limit for data with no measured values will be/were used.

Method F: One-half the instrument detection limit will be/was used for acrolein.

Method G: If a chemical was not expected to be present but was tested for and assigned a zero for the risk assessment justification will be/was provided.

Method H: Other, Please describe:

Chemical(s)	Emission source type or emission unit(s)	Test report reference including date	Calculation method(s) A-H

**MPCA review of emission factors developed from stack tests**

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	Technical accuracy review date(s) (mm/dd/yyyy)	Technical accuracy
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA emission factors developed from stack tests review questions:**

Was the AERA guidance on using stack testing data followed? ☐ Yes ☐ No

Emission factors developed from stack tests review notes:

**Summary of Chemicals with Additional Considerations (AERA Guidance Section 2.6)**

Which of the following calculations will be/were done:

- ☐ Dioxins/furans will be/were estimated as individual congeners, with individual congeners/total mass ratios from submitted stack tests.
- ☐ Dioxins/furans will be/were estimated as Toxic Equivalents of 2,3,7,8 TCDD using the 2005 WHO potency factors.
- ☐ PCBs will be/were expressed as a total mass.
- ☐ PCBs will be/were expressed as Toxic Equivalents of 2,3,7,8 TCDD using the 2005 WHO potency factors.
- ☐ Aldehydes will be/were estimated as a total mass.
- ☐ Individual aldehydes will be/were estimated.
- ☐ Petroleum Hydrocarbons-Alipatic (C7-C11) will be/were estimated as a total mass.
- ☐ Hexavalent Chromium will be/was assumed to be equal to total Chromium.
- ☐ Hexavalent Chromium will be/was assumed to be 10 % of total Chromium.
- ☐ Hexavalent Chromium will be/was assumed to be a site specific \_\_\_\_\_ % of total Chromium and the stack testing used to derive this ratio was submitted or some other reference.
- ☐ Glycol ethers will be/were estimated as a total mass.
- ☐ Individual glycol ethers will be/were estimated.
- ☐ Individual PAHs will be/were estimated.
- ☐ PAHs will be/were estimated as a total mass (and will therefore be assessed as benzo(a)pyrene)
- ☐ Individual Polycyclic Organic Matter chemicals will be/were estimated.
- ☐ Polycyclic Organic Matter will be/was estimated as a total mass.
- ☐ All NOx will be/were assumed to be NO<sub>2</sub>.
- ☐ 80% of the NOx will be/was assumed to be NO<sub>2</sub> (based on EPA's ambient or equilibrium ratio)
- ☐ Asbestos-like fiber emission estimates will be/were given, modeled and compared to the current IRIS value.
- ☐ Mercury will be emitted above 1 lb/year and a Hg-01 form will be/ was submitted.
- ☐ None of the calculations listed above will be/were used.

**MPCA review of chemicals with additional considerations summary**

<b>Submittal date(s)</b> (mm/dd/yyyy)	<b>Pre-app review date(s)</b> (mm/dd/yyyy)	<b>Pre-app adequacy</b>	<b>Post-app completeness review date(s)</b> (mm/dd/yyyy)	<b>Post-app completeness</b>	<b>Technical accuracy review date(s)</b> (mm/dd/yyyy)	<b>Technical accuracy</b>
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA chemicals with additional considerations review questions:**

Was the special emission factor guidance for these pollutants followed? ☐ Yes ☐ No

MPCA chemicals with additional considerations review notes:

**Additional Emissions Information**

Is there additional site specific uncertainty related to the emissions beyond what is captured in the emission factor development?

☐ Yes ☐ No If yes, please explain:

Are there applicable control standards and/or NESHAPs related to toxics controls? ☐ Yes ☐ No If yes, list them:

☐ Determination of Technical and Economic Feasibility will be/was prepared because risk estimates were above risk guidelines (AERA Guide Section 3.9) Explain:

#### MPCA additional emissions information review summary

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	Technical accuracy review date(s) (mm/dd/yyyy)	Technical accuracy
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

#### MPCA additional emissions information review questions:

Describe qualitatively the uncertainty related to these emission estimates. Include how close the emission estimates are to what the facility will actually emit. What are the factors that impact this?

If risk estimates are above risk guidelines was feasible and reasonable control used? ☐ Yes ☐ No

#### MPCA additional emissions information review notes:

## Proposer/Preparer Instructions

Boxes can be checked by clicking on them. Response areas will expand as necessary to include the complete response. Multiple dates can be added by using the "Enter key" (return key) after you type the first date. All Air Emission Risk Analysis (AERA) documents must be submitted electronically whether submitted with an air permit application or alone. AERA documents submitted with an air permit application must also be submitted in a hard copy. Hard copies of spreadsheets, like the Risk Assessment Screening Spreadsheet (RASS) and lengthy modeling files should include the first summary page of the document but do not need to include subsequent pages since the electronic version will be available for review.

If **all** of the requested forms and support documents **are not included** with an air permit application needing an AERA the air permit application **will be deemed incomplete**. This includes risk estimates for pre-existing facilities. MPCA staff will return this AERA form plus any other incomplete AERA forms to the applicant with deficiencies and remedies indicated in the *italicized* MPCA review areas. If forms were submitted pre-app they should be updated and re-submitted post-app with any *italicized* MPCA comments left in and changes summarized in the appropriate areas.

**Facility Information:** Fill in the Air Quality (AQ) Facility identification (ID) No. (Number), which is the first eight digits of the permit number for all new permits issued under the new operating permit program, Standard Industrial Classification (SIC) code, facility name and location, and submittal dates. The project proposer and AERA preparer should be people that MPCA staff can contact with general and technical questions about the AERA submittal.

## MPCA Review Instructions

### Specific section/document review

MPCA staff will summarize their review of specific sections/support documents by marking either "Yes" for adequate or "No" for deficient in the pre-app sections, or "Yes" for substantially complete or "No" for incomplete in the post-app sections, along with their initials. They will add comments on deficiencies and how they can be remedied in the summary section. When there are multiple submittals, include each new submittal date in the table with the corresponding review dates and comments, thus keeping a log of submittals. \*\*Questions with two asterisks are part of the technical accuracy review.

### Overall adequacy/completeness summary

If **all** of the necessary sections/documents are present and follow the appropriate methods (i.e., follows the AERA, emissions and modeling guidance) MPCA staff will mark the appropriate overall summary section with either "Yes" for adequate in the pre-app section, or "Yes" for substantially complete in the post-app section. Otherwise they will mark "No" for deficient in the pre-app AERA submittal determination section or "No" for incomplete in the post-app AERA determination section. They will add comments on deficiencies and how they can be remedied in the overall summary section. Remember an AERA submitted with an air permit application is not considered "substantially complete" until **all** necessary quantitative and qualitative information has been submitted, and MPCA staff have determined that appropriate methods have been used. **Please summarize these results in the AERA-01 form.** The AERA-01 form will be shared with the permit engineer conducting the permit application completeness review. If deficiencies are noted in this form during the completeness review then this form should also be shared with the permit engineer who will share it with the applicant.