



**Minnesota Pollution
Control Agency**

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

MPCA Mercury Risk Estimation Method (MMREM)

AERA-27

Protocol Form

Air Emissions Risk Analysis (AERA)

Doc Type: Air Emissions Risk Assessment – External Documentation

Instructions on Page 4

Purpose: This form is **required** for AERAs that include a Minnesota Pollution Control Agency (MPCA) Mercury Risk Estimation Method (MMREM) analysis. This form serves both as the MMREM analysis protocol and later describes the MMREM analysis. This form also documents the MMREM protocol and analysis review. It must be submitted electronically, with the other AERA forms and supporting documents listed on the AERA-01 form, and be approved before an air permit application is submitted. ***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. Please consult the MMREM guidance at <http://www.pca.state.mn.us/yhiz431>, AERA website <http://www.pca.state.mn.us/tchy42b>, and Air Dispersion Modeling website <http://www.pca.state.mn.us/nwqh421> when filling out this form.

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: <u>MN</u> Zip code: _____ County: _____	
7. Proposer: _____	Phone: _____ E-mail: _____
8. AERA Preparer: _____	Phone: _____ E-mail: _____

Are there differences between the MMREM analysis materials submitted pre-app and those submitted post-app?

☐ Yes ☐ No ☐ NA

If yes, please explain the differences (especially changes in methodology):

MPCA Review Question: Are there differences between the MMREM Analysis materials submitted pre-app and those submitted post-app?

☐ Yes ☐ No ☐ NA

If yes, please explain the differences (especially changes in methodology):

MPCA Overall Summary of MMREM Analysis Review

Names of MPCA AERA reviewer(s): _____

Submittal date (mm/dd/yyyy)	Pre-app review date (mm/dd/yyyy)	Overall pre-app MMREM analysis determination (Select Yes for adequate, No for deficient, and enter reviewer's initials)	Post-app completeness review date (mm/dd/yyyy)	Overall post-app MMREM analysis 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 Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____

MPCA Overall pre-app MMREM analysis review notes including comments on deficiencies and how they can be remedied:

MPCA Overall post-app MMREM analysis review notes including comments on deficiencies and how they can be remedied:

MPCA overall MMREM analysis technical accuracy review notes including comments on deficiencies and how they can be remedied:

General Submittal Information

This form is being submitted as: **(mark as many as are relevant to this submittal; keep dates of other submittals in the chart as a log)**

Submittal date
(mm/dd/yyyy)

- ☐ MMREM analysis protocol
- ☐ Explanation of MMREM analysis results in a pre-air permit application submittal (pre-app)*
- ☐ Explanation of MMREM analysis results in an air permit application (post-app)*

*If applicable, please explain any differences in methodologies between the approved protocol and the modeled results:

The MPCA MMREM guidance at <http://www.pca.state.mn.us/yhiz431> and modeling guidance will be/was followed?

☐ Yes ☐ No

If no, describe any deviations from the MPCA recommended guidance:

MMREM Spreadsheet Inputs

1. What will be/were the percent of each Mercury species (e.g., gaseous divalent mercury (HgII), elemental mercury (Hg0), and particle-bound divalent mercury (Hg_p)) used in form Hg-01 and in the MMREM spreadsheet?

Hg species	Percent of total Hg
Hg(II)	
Hg(0)	
Hg-p	

2. Where did the percent of each Hg species come from?

- ☐ EPA 's National Emission Inventory Hg speciation factors. What year (e.g., 2005): _____
- ☐ Stack testing, if so please provide a copy of the test(s) or indicate the facility and year if in Minnesota: _____
- ☐ Control efficiencies. Explain: _____
- ☐ Other. Explain: _____

3. Which of the following emission factors will be/were used in calculating the modeled increment to mean air concentration over the water body and watershed?

- ☐ Long term permit emission limits.
- ☐ AP-42 emission factors.
- ☐ Stack testing, if so please provide a copy of the test(s) or indicate the facility and year if in Minnesota: _____
- ☐ Other. Explain: _____

4. Which of the following modeling methods will be/were used in calculating the modeled increment to mean air concentration over the water body and watershed?
 - ☐ The same unitized emissions modeling used in other parts of the AERA.
 - ☐ MMREM specific AERMOD modeling. Explain:
 - ☐ Other. Explain:
5. Which water bodies will be/ were analyzed? Please include Minnesota Department of Natural Resources (DNR) lake numbers if available.

Please note that any fishable water body² occurring at the area of maximum deposition should be evaluated. If the area of maximum deposition does not fall on a fishable waterbody, consider all water bodies in the specified range around the facility to determine which water body is nearest the area of maximum deposition. This may be the water body to evaluate for worst-case impacts at the screening level. However, it may not be clear whether the water body nearest the site of maximum deposition is the water body that is most highly impacted. There may be a water body with more impact because it has less dilution from its watershed, more fishing, etc. If it is not clear which water bodies should be evaluated, MPCA staff should be contacted.

² The AERA definition of a fishable water body is: "A water body may be considered "fishable" if it typically contains water year-round in a year that receives at least 75 percent of the normal annual precipitation for that area. For facilities with stack heights less than 100 meters, a map should be provided showing lakes, rivers and streams within a 3 km radius (approx. 2 miles). For facilities with stack heights greater than 100 meters, show lakes, rivers and streams for the area within a 10 km radius (6 miles). Also show water bodies outside the specified area that may be fed by rivers and streams lying within the radius of interest. The length of the reach of river or stream (or extent of a lake) outside the radius that must be shown will be determined case-by-case based on local data and conditions."

6. Please describe any additional selection methods or criteria used to select the water bodies other than what was described above? ☐ NA
7. What will be/was the source of the watershed information (e.g., DNR catchment tool, Total Maximum Daily Load [TMDL] report, DNR Lakefinder, MPCA map)?
8. Which existing ambient fish tissue concentration(s) will be/were used:

Which fish species:

What is the source of this fish tissue value:

Is it the 95 percent upper confidence limit of the arithmetic mean (UCL-AM)? ☐ Yes ☐ No ☐ NA

Please note the MPCA risk assessors can provide Minnesota specific fish tissue data from U. S. Environmental Protection Agency's (EPA) 2002-2006 National Fish Survey.

Due to the uncertainty associated with estimating the true average mercury fish tissue concentration, the 95 percent UCL of the arithmetic mean should be used because it provides reasonable confidence that the true average fish tissue concentration will not be underestimated. For purposes of cancer and chronic noncancer risk assessment, the 95 percent UCL-AM of fish tissue data should be used. The EPA has formulated guidance for calculating the UCL-AM: USEPA, OSWER, 2002, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* (<http://www.hanford.gov/dgo/training/ucl.pdf>). The guidance has been implemented in the EPA ProUCL software (<http://www.epa.gov/nerlesd1/tsc/form.htm>). This software may be downloaded and run to obtain UCL-AM values from fish tissue data.

9. Will/were any additional refinements or additional scenarios used beyond assuming the standard MPCA fish consumption rates for both a recreational and subsistence fisher (e.g., Native American consumption rates)? ☐ Yes ☐ No
- Explain:

MPCA Summary of MMREM Review

Names of MPCA AERA reviewers: _____

Question #	Submittal date (mm/dd/yyyy)	Pre-app review date (mm/dd/yyyy)	Overall pre-app Hg 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 Hg 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
1			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
2			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
3			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
4			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
5			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
6			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
7			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
8			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____
9			<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Int: _____

MPCA MMREM review notes:

Proposer/Preparer Instructions

Boxes can be checked by right clicking on them, selecting properties, and selecting the desired choice. Response areas may be expanded as necessary to include the complete response. All 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.