

## Updates to the "Air Dispersion Modelling Guideline for Ontario" (ADMGO)

<http://www.ene.gov.on.ca/en/air/ministry/index.php>

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## Purpose of Presentation

The purpose of this presentation is to:

- Provide overview of recent updates to Guideline A-11: "Air Dispersion Modelling Guideline for Ontario" (ADMGO) (PIBs# 5165e02)

**IMPORTANT NOTE:** These slides are intended to be a brief summary of some of the amendments to Ontario Regulation 419/05. Information contained in this presentation is only for information purposes. Interested parties must refer to Regulation 419/05 for a comprehensive understanding of the legal requirements of facilities. Ontario Regulation 419/05 as amended will take precedence in the event of a conflict between the Regulation and this document. The Regulation 419/05 web-site contains comprehensive information and a link to the Regulation.  
<http://www.ene.gov.on.ca/en/air/ministry/index.php>.

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## Rationale for Updating Guidance Document

- On August 31, 2007, the Ministry of the Environment (MOE) announced decisions on amendments to Ontario Regulation 419/05: Air Pollution – Local Air Quality.
- These regulatory amendments triggered the need to update the 2005 version of the ADMGO.
- Some of the excerpts from the regulation itself, which can be found throughout the ADMGO, had to be updated to reflect the regulatory amendments.

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## Key Revisions by Sections

### Chapter 1.0 – Introduction

- New definition of “approved dispersion model” was discussed (inclusion of ASHRAE and removal of ISCST3)
- Clarified that any of the “approved dispersion models” may be used to assess compliance with the half-hour average standards listed in Schedules 1 and 2 of Regulation (after appropriate conversion of time averaging periods is made as per section 17 of the Regulation).
- Clarified which “approved dispersion models” may be used to assess compliance with Schedule 2 and 3 standards after the different phase-in dates, depending on whether a facility is a new facility or is listed in Schedule 4 or 5 of the Regulation or not.
- Clarified that the ASHRAE method may be used by any facility in advance of the mandatory phase in dates of the Schedule 3 standards to assess same structure contamination using the applicable Schedule 1 or Schedule 2 half hour standards.

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## Key Revisions by Sections

### Chapter 2.0 – Overview of the Approved Dispersion Models

- Clarified that when assessing same structure contamination with Schedule 1 or 2 standards, a person may choose to use ASHRAE (with appropriate time averaging under s.17, if necessary) as the approved dispersion model or the Scorer and Barrett calculation in the Appendix to Regulation 346. However, when s.20 begins to apply either ASHRAE or an alternative model approved by the Director under section 7 of the Regulation must be used.

### Chapter 3.0 – A Tiered Approach.....

- Clarified that any of the “approved dispersion models” may be used with Schedule 1 and 2 standards (after appropriate time averaging conversion).
  - A section 20(4) notice is required to have Schedule 3 standards apply in advance of the phase-in date
- Clarified that facilities with multiple sources may use ISCPRIME with a screening meteorological data set (provided by EMRB) instead of SCREEN3 in a Tier 1 assessment

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## Key Revisions by Sections

### Chapter 4.0 – Model Input Data

- Clarified the use of some “Regulatory” and “non-Regulatory” model options available in Tier 2 and 3 modelling assessments
  - Plume depletion
- Provided additional details on the calculations for Open Flare Sources when using AERMOD or ISCPRIME
- Provided additional guidance on modelling releases from capped and horizontal discharge stacks
  - support of BETA module in AERMOD
  - use of previous (manual) methodology for ISCPRIME

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## Key Revisions by Sections

### Chapter 5.0 – Geographical Information Inputs

- Section 5.4: Land Use Characterization was rewritten to include a description of the AERSURFACE tool released by the US EPA in 2008 which can be used in conjunction with the AERMOD modelling system.
  - Uses US Geological Survey (USGS) National Land Cover Data 1992 (NLCD92)
  - Has 21 land cover categories which can be used to describe land use
- Use of AERSURFACE is optional, and users may specify land use characteristics manually (based on the 21 NLCD categories)
  - Issue with data format and availability for use in Ontario
    - MOE is in process of developing this data, which will be available upon request from EMRB
    - May not cover all areas of the province
- Clarified that MOE will continue to use the traditional 4 seasons when determining seasonal variations in surface characteristics rather than the 5 categories outlined in the US EPA User's Guides.

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## Key Revisions by Sections

### Chapter 5.0 – Geographical Information Inputs (continued)

- Clarified that when using directionally dependent surface characteristics the MOE will use the land use information in the vicinity of the facility, rather than the meteorological tower site
- Clarified that when specifying directionally dependant surface characteristics the MOE will continue to use a 3 km radius surrounding the facility, unless it is located in an urban environment
- Clarified that when using ISCPRIME in a Tier 3 assessment the MOE may consider adjustments to some of the parameters in the meteorological data file to reflect site specific land use, such as surface roughness length, friction velocity and Monin-Obukhov Length, which affect deposition and depletion (which require MOE approval for use).

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## Key Revisions by Sections

### Chapter 6.0 – Meteorological Data

- Provided some additional details on the screening level meteorology that is available from EMRB for use in Tier 1 assessments with ISCPRIME instead of SCREEN3 (i.e. at facilities that have multiple sources)
- Updated and expanded Chapter 6.3 on the MOE Regional meteorological data
  - Provided additional details on data processing, interpolation, treatment of calms and missing conditions
  - Clarified when pre-processed Regional data files should be used and requirements regarding adjustment of surface characteristics in the Regional data to consider local land use conditions
- Clarified requirements regarding use of local meteorological data

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## Key Revisions by Sections

### Chapter 8.0 – Other Modelling Considerations

- Added a section to clarify the use of the ASHRAE approach for some structure contamination
  - Clarified that ASHRAE must be used in combination with another “approved dispersion model” to calculate POI concentrations at other locations
- Provided some additional details and MOE requirements/expectations regarding the use of Alternate models
- Provided additional details regarding the use of model results in combination with monitored data
  - Note: Appendix E in the ESDM Procedure Document was also updated and expanded to include additional details on how to conduct a Combined Assessment of Modelling & Monitoring (CAMM) Analysis
- Added a section to clarify calculations of Frequency of Exceedence
- Clarified requirements for modelling adjacent properties

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## Key Revisions by Sections

### Appendix E – Combined Modelling & Monitoring Analyses (CAMMs)

- Clarified that the purpose of a CAMM analysis is to refine emission rates, and is a requirement of a “fully refined” ESDM report
- Provided additional details regarding meteorological data, locations and number of monitors to be used, and factors considered to mitigate potential uncertainties in such assessments
- Clarified the required elements of the necessary Pre-Test Plans
- Expanded the sections on monitoring approaches
  - Separated into “Fixed” and “Variable” location approaches
  - Provided additional details on data analysis, screening and “hits”
- Expanded the sections on air dispersion modelling and provided additional details

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## Key Revisions by Sections

### Appendix E – Combined Modelling & Monitoring Analyses (CAMMs) (continued)

- Added a new section on Bias Analyses and Emissions Refinement
  - Provided additional details on initial screening of the modelled/monitored comparisons and potential sources of uncertainty and/or errors
  - Provided a Step by Step procedure to outline how the analyses should be completed and how to select the final emission rate(s) for the ESDM (i.e. refined maximum scenario)
    - Paired analysis is **key** for emissions adjustment/refinement
    - Can be very complex, depending on the number of target sources
    - **Ministry will re-do/re-run the modelling to ensure agreement with emissions adjustment**

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Questions?

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