Source Characterization Breakout Session Summary

EPA RSL Workshop

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Clint Tillerson (US EPA) and James Thurman (US EPA)

Source Characterization Breakout Summary

- **Purpose of Breakout Session:** Have an open discussion among co-regulators, related to specific challenges and needs associated with the characterization and parameterization of sources types in AERMOD.
- **Questions to jumpstart discussion:**
  - When trying to model hourly POINT source emissions without hourly temperatures and exit velocities, what are common methods for determining these parameters to ensure modeling is conservative and not biased to underpredict (e.g., using CAMD data when CEMS data are not available)?
  - What types of sources do you commonly characterize as AREA or VOLUME sources?
  - What methods are being used to determine initial dispersion parameters and release height of different types of VOLUME sources (i.e., open buildings, open storage tanks, building roof monitors, multiple vents, conveyor belts)?
  - Where is guidance lacking or what additional guidance is needed for source parameterization?

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Floating Roof Tanks Challenges

- Often characterized as area, but downwash could be an issue – but depends on how close source is to fenceline (closest receptors)
- Downwash better represented via volume sources with initial dispersion
- Suggestion to characterize as a series of point sources
- S/L reported they have seen similar impacts with volume and point sources – lower impacts with area sources
- S/L reported they model tanks as circular area sources – have a large database on tank capacities and dimensions used to parameterize the source – area sources seem to show higher impacts very near tank as expected.
- Heated tanks (e.g., asphalt and heavy fuel oil) cause additional challenges due to buoyancy – default parameterization may not be accurate
- The appropriate height of release for a tank is also an issue.

Lumber Kilns Challenge

- Suggestions requested for modeling emissions from lumber kiln door - typically modeled as volume source. How are dimensions determined
- Suggestion to calculate how far the volume would need to extend from the door before a wind at a 45-degree angle would contact the plume

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Haul Roads Challenge

- Modeling physical dust barriers (wind breaks) to reduce fugitive emissions from unpaved haul roads – wind breaks.
- Vegetative barriers are often seasonal and do not provide the same benefit all year

Offshore Construction Challenge

- Often construction projects that are multisite in nature (wind farms – construction site relocates) are modeled with all emissions from single point – how to best model to get worst case scenario but more realistic operations.

Guidance/Best Practice Documentation Needs

- Suggestion to put out “best practices” rather than “guidance,” to provide more flexibility in decision making since there is so much variation in sources and not a one-size-fits-all
- More clear guidance or best practices for determining release heights for area/volume sources – User’s Guides are not clear and do not provide enough information
- Recommendations on when to use area vs volume sources and how does release height or parameterization play into that decision
- Need capability or guidance to model slanted stacks as well as split stacks (emission are split in two directions at end of stack)

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3.3.2.2 VOLUME source inputs

The AERMOD VOLUME source algorithms are used to model releases from a variety of industrial sources, such as building roof monitors, multiple vents, and conveyor belts. The syntax, type and order for the SRCPARAM card for VOLUME sources are summarized below:

Syntax:	SO SRCPARAM Srcid Vlemis Relhgt Syinit Szinit
Type:	Mandatory, Repeatable
Order:	Must follow the LOCATION card for each source input

where the Srcid parameter is the same source ID that was entered on the LOCATION card for a particular source, and the other parameters are as follows:

Vlemis - volume emission rate in g/s,
Relhgt - release height (center of volume) above ground, in meters,
Syinit - initial lateral dimension of the volume in meters, and
Szinit - initial vertical dimension of the volume in meters.

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Table 3-2. Summary of Suggested Procedures for Estimating Initial Lateral Dimensions σyo and Initial Vertical Dimensions σzo for Volume and Line Sources

Type of Source		Procedure for Obtaining Initial Dimension
(a) Initial Lateral Dimension (σ_{yo})		
Single Volume Source	σ_{yo} =	length of side divided by 4.3
Line Source Represented by Adjacent Volume Sources (see Figure 1-8 (a) in EPA, 1995a)	σ_{yo} =	length of side divided by 2.15
Line Source Represented by Separated Volume Sources (see Figure 1-8(b) in EPA, 1995a)	σ_{yo} =	center to center distance divided by 2.15
(b) Initial Vertical Dimension (σ_{zo})		
Surface-Based Source ($h_e \sim 0$)	σ_{zo} =	vertical dimension of source divided by 2.15
Elevated Source ($h_e > 0$) on or Adjacent to a Building	σ_{zo} =	building height divided by 2.15
Elevated Source ($h_e > 0$) not on or Adjacent to a Building	σ_{zo} =	vertical dimension of source divided by 4.3