EQUIVALENT OR BETTER DISPERSION DEMONSTRATIONS: AN UPDATE
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EQUIVALENT OR BETTER DISPERSION

- **What** is Equivalent or Better Dispersion (EBD)?
- **Why** do I need to do this?
- **How** to conduct the EBD Demonstration
- **Administrative Process** for EBD modeling
EQUIVALENT OR BETTER DISPERSION

- **What** is Equivalent or Better Dispersion (EBD)? Hint: same or lower dispersion impacts
- **Why** do I need to do this? Hint: permit requirement
- **How** to conduct the EBD Demonstration
  Hint: strongly resembles concepts of PSD increment modeling
- **Administrative Process** for EBD modeling
  Hint: working practice memo and forms (almost done)
What are our Goals:

Goal #1: promote wise growth while improving air quality

Goal #2: avoid future non-attainment if possible

Goal #3: greater regulatory certainty with less work

Goal #4: greater business certainty with less work

Goal #5: clear “bright line” test keep it simple
EQUIVALENT OR BETTER DISPERSION

- **What are our Intentions:**
  - Intended for improvements, or...
  - Infinitesimal degradations.
  - Not intended to fully replace re-modeling!
EQUIVALENT OR BETTER DISPERSION

What are our Definitions:

“Equivalent” means “same impact”

Mathematically: net change = zero

Bright Line Test: 0.00 ug/m3

Two decimal places (tentative)
EQUIVALENT OR BETTER DISPERSION

- **What are our Definitions:**
  - "Better" means "lower impacts"
  - **Mathematically:** net change < zero
  - **Bright Line Test:** negative changes
  - **AERMOD Notes:** AERMOD does not currently display negative changes
HOW TO CONDUCT THE ANALYSIS - OVERVIEW

Overview

- Think PSD-increment modeling concepts (without baseline dates)
  - Think negative emission rates for “before case”
  - Think positive emission rates for “after case”

Set-up for the Model

- Ideally – same meteorological data as used in latest full refined modeling
- Ideally - same receptor grid
- Ideally – same buildings (unless those are part of the proposed change)
- Best of all - no background or nearby sources are required!
HOW TO CONDUCT THE ANALYSIS - EXAMPLE

Facility ABC has three stacks undergoing changes:

- ABCSV001
- ABCSV002
- ABCSV003
HOW TO CONDUCT THE ANALYSIS - EXAMPLE

ABCSV001_OLD with old (negative) emission rate
  ▪ Old Inputs

ABCSV002_OLD with old (negative) emission rate
  ▪ Old Inputs

ABCSV003_OLD with old (negative) emission rate
  ▪ Old Inputs

ABCSV001_NEW with new (positive) emission rate
  ▪ New Inputs

ABCSV002_NEW with new (positive) emission rate
  ▪ New Inputs

ABCSV003_NEW with new (positive) emission rate
  ▪ New Inputs
HOW TO CONDUCT THE ANALYSIS - EXAMPLE

ABCSV001_OLD with old (negative) emission rate
- Old Inputs: LOCATION, SRCPARAM, and if applicable:
  - BUILDHGT, BUILDWID, BUILDLEN, XBADJ, YBADJ
  - EMISFACT (or HOUREMIS)
  - NOX TIER 1 only

ABCSV002_OLD with old (negative) emission rate
- Old Inputs

ABCSV003_OLD with old (negative) emission rate
- Old Inputs

ABCSV001_NEW with new (positive) emission rate
- New Inputs

ABCSV002_NEW with new (positive) emission rate
- New Inputs

ABCSV003_NEW with new (positive) emission rate
- New Inputs

Note: Use AERMOD SRCGROUP ALL and applicable regulatory metrics (e.g., NAAQS)
HOW TO CONDUCT THE ANALYSIS - EXAMPLE

Possible Outcome1: SRCGROUP ALL (net change) = 0.00 ug/m3
- Prepare submittal (forms, files);
- Submit to: airmodeling.pca@state.mn.us
- Also submit with permit application???

Possible Outcome2: SRCGROUP ALL (net change) > 0.00 ug/m3
- Prepare submittal (forms, files); expect delays!!!
- Submit to: airmodeling.pca@state.mn.us
- Possible options:
  - Try again w/more improvements, or
  - Conduct full NAAQS re-modeling, or
  - MPCA management will decide next steps
CUMULATIVE ANALYSES SINCE LAST NAAQS RUN

EBD analyses are cumulative (good thing)

- EBD1 has a large decrease (-5 ug/m³)*
- CUMULATIVE NET CHANGE (-5 ug/m³)*
- EBD2 has a small increase (+1 ug/m³)
- CUMULATIVE NET CHANGE (-4 ug/m³)*
- EBD3 has a small increase (+2 ug/m³)
- CUMULATIVE NET CHANGE (-2 ug/m³)*
- *AERMOD displays negative impacts as zero
Figure of Previous Slide

- EBD1: Change = -5, Cumulative = -5
- EBD2: Change = 1, Cumulative = -4
- EBD3: Change = 2, Cumulative = -2

Legend:
- Change
- Cumulative
CUMULATIVE ANALYSES SINCE LAST NAAQS RUN

EBD analyses are **cumulative** (good thing)

- EBD1 has a large decrease (-5 ug/m3)
  - **CUMULATIVE NET CHANGE** (-5 ug/m3)
- EBD2 has a larger increase (+6 ug/m3)
  - **CUMULATIVE NET CHANGE** (+1 ug/m3)
- Full NAAQS remodeling is now required.
ADMINISTRATIVE PROCESS

- Need a Proposal (New form on the Modeling Website Soon)
- Final Report Form Soon
- Submit Final Report Approval with Permit Application
CONCLUSIONS

Benefits
- Refined analysis that presents a defendable demonstration
- It is “model version” neutral
- Most of the inputs already exist
- Resembles well-known PSD modeling concepts

Risks/Downsides
- May take more time in comparison to former screening approaches (e.g., SCREEN3)
- May find that a refined re-modeling is still required as a result of the EBD analysis

Final Note
- This approach is not yet in the Guidance – but will be!
  - A “Working Memorandum” on this topic will be posted to our website in the interim
BEST CONTACTS – DICK, JIM & MELISSA

When to Model (MPCA Permit Section)
- Dick Cordes

How to Model (MPCA Modeling Unit)
- Jim Sullivan
- Melissa Sheffer
- Ruth Roberson (TEMPO360 Transformation Project until mid-2015)
- Dennis Becker (probable retirement in summer or fall 2014)

Forms (MPCA Modeling Unit)
- Melissa Sheffer
QUESTIONS?

Ask now or during the break.