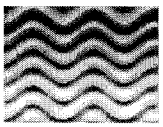

Scott Bohning/R9/USEPA/US
10/09/2007 02:30 PM

To Mary Blevins/R9/USEPA/US@EPA
cc
bcc
Subject AERMOD vs. ISCST3

Mary -

Here is URL ro EPA's recommended models for various Clean Air Act regulatory programs
http://www.epa.gov/scram001/dispersion_prefrec.htm

1. The attached model evaluation, June 2003, is from that web page; see pages 8-9 for a table comparing of features of AERMOD and ISCST3

2. The attached AERMOD-ISC prediction comparison, June 2003, is also from that web page; I have excerpted its key conclusion page.

3. Also attached are some graphs from Karen Wesson of OAQPS, June 2005, showing sensitvity of AERMOD to various surface parameters, starting at page 18. The parameters examined are Albedo (surface reflectivity), Bowen Ratio (ratio of the sensible heat flux to the latent heat flux, an indicator of surface moisture), Surface Roughness (related to obstacle heights as they affect vertical profile of wind speed); these are not used in ISCST3.

None of this really addresses deposition. However, higher predicted concentration will also lead to higher deposition, other things being equal. (But since the deposition algorithms differe between the two models, other things are NOT equal... some differences between the two lead to higher deposition, others to lower deposition.)

- Scott B.

"Comparison of Regulatory Design Concentrations AERMOD vs ISCST3, CTDMPLUS, ISC-PRIME",
EPA-454/R-03-002, June 2003
Page 36:

6. GENERAL CONCLUSIONS

The following general conclusions are made.

1) For non-downwash settings in flat and simple terrain, the current version of AERMOD (version 02222): a) on average, tends to predict maximum concentrations that are similar to ISCST3; b) , on average, tends to predict concentrations closer to ISCST3 than the proposed version of AERMOD; and, c) predicts maximum concentrations which are not as extreme in their differences from ISCST3 as those seen when applying the proposed version of AERMOD; and, on average, tends to predict urban maximum concentrations that are lower than the proposed version of AERMOD.

2) Where building downwash is a significant factor in the air dispersion analysis, the current version of AERMOD predicts maximum concentrations and maximum cavity concentrations that are very similar to ISC-PRIME.

3) In general, the consequences from using the current version of AERMOD instead of ISCST3 in complex terrain are significant, the current version of AERMOD produces much lower maximum concentrations than the screening technique in ISCST3. Also, the current version of AERMOD produced results that are essentially unchanged from the results reported using the proposed version of AERMOD. When compared to CTDMPLUS, AERMOD tends to predict somewhat lower maximum concentrations with examples of AERMOD predictions being higher and lower than the CTDMPLUS predictions.

4) Where data are available, the model evaluation results support the differences identified in this report when comparing the proposed version of AERMOD to ISCST3 and when comparing the current version of AERMOD to the proposed version of AERMOD. . The model evaluation report indicates that the current version of AERMOD outperforms all the other four models (ISCST3, ISC-PRIME, CDTMPLUS and the proposed version of AERMOD).

5) Because of the stability of AERMOD model throughout the consequence analysis and because the model evaluation study supports AERMOD (02222) when significant differences occur between the current version of AERMOD and ISCST3 or the earlier version of AERMOD, it is appropriate for the Agency to adopt the current version of AERMOD (02222) as a regulatory model and is a suitable replacement for ISCST3 for many regulatory applications.


aermod_mep.pdf


AERMOD-ISC_compar.pdf


AERSURFACE_Wesson.pdf