UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

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OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Review of AERMOD Modeling for OWB Model Rule

FROM: Roger W. Brode, Physical Scientist
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TO: Gilbert H. Wood, Environmental Engineer
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This memorandum serves to document my review of air dispersion modeling performed by the New York State Department of Environmental Conservation (NYSDEC) in support of the NESCAUM Model Rule for Outdoor Wood Boilers (OWB). NYSDEC used the AERMOD dispersion model to conduct their modeling study. The promulgation of the AERMOD model as EPA's preferred model for near field impact assessments (for distances out to 50 kilometers) was announced in the Federal Register on November 9, 2005, with an effective date of December 9, 2005. As of December 9, 2006, the one-year transitional ("grandfather") period during which either ISC3 or AERMOD could be used, has expired, leaving AERMOD as the official EPA regulatory model replacing ISC3.

Based on AERMOD's status as the preferred model in EPA's Guideline on Air Quality Models, it was deemed to be the best tool available for the purposes of the OWB modeling analysis. Prior to commencing with the modeling, and during the course of the study, I participated in several discussions with NYSDEC modelers, especially with Mr. Leon Sedefian as the NYSDEC lead modeler. These discussions included how best to design the study to meet the needs of the NESCAUM Model Rule, review of preliminary results of the AERMOD modeling, and review of the draft modeling report.

Some of the key elements of the design of the study pertained to defining a reasonable range of scenarios regarding meteorological data inputs, proximity and orientation of nearby structures that could potentially cause building downwash, and the potential for terrain influences on the dispersion of OWB plumes. The results of the modeling study confirmed our preliminary assessment, based on the typical release heights and release parameters for OWB stacks, that building downwash would be the dominant influence on the dispersion modeling.

While it is impossible to anticipate every possible scenario for emission sources of this type, the NYSDEC modeling study did examine the sensitivity of modeled impacts to a number of key factors. These included the influence of using five years vs. one year of meteorological data, the influence on building downwash potential of varying the size of nearby structures (house vs. barn) and orientation of the structure relative to the stack, and the potential impact of nearby terrain features on modeled results. The NYSDEC report provides an excellent discussion of the results of these sensitivity tests, a detailed analysis of the controlling meteorological conditions associated with peak modeled impacts, and appropriately defines the purpose and limitations of the modeling study.

In conclusion, I believe that the modeling study conducted by NYSDEC provides a reasonable assessment of the range of likely impacts from these OWB sources for the purposes of supporting the Model Rule in terms of determining appropriate set-back distances, and for assessing the effectiveness of additional design changes and emission controls for such units in reducing impacts on air quality.

cc: Tyler Fox, AQMG (C439-01)
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