



Review of NYSDEC Modeling Study for NESCAUM Model Rule and NAAQS Compliance Evaluation for EPA Voluntary Phase 1 Compliant Outdoor Hydronic Heaters

Executive Summary

Atmospheric dispersion models are often used in the industrial permitting arena to assess compliance with the National Ambient Air Quality Standards (NAAQS), which specify ground-level concentration limits for pollutants (e.g., PM_{2.5}) that will protect public health and welfare, with an adequate margin of safety. Dispersion modeling uses mathematical formulations to characterize the atmospheric processes that disperse a pollutant emitted by a source. Based on emissions and meteorological inputs, a dispersion model can be used to predict concentrations at selected downwind locations.

The Hearth, Patio & Barbecue Association (“HPBA”) retained RTP Environmental (“RTP”) to review the January 26, 2007 air dispersion modeling study and report prepared by the New York State Department of Environmental Conservation (“NYSDEC”), which describes the results of an evaluation conducted in support of the NESCAUM model rule (“Model Rule”) for outdoor wood-fired hydronic heaters (“OWHH”). RTP was also retained to model a large OWHH with PM_{2.5} mass emissions that are compliant with the 0.60 lb/MMBtu emission level of EPA’s Voluntary Phase 1 Partnership Agreement to assess compliance with the revised PM_{2.5} NAAQS of 35 µg/m³.

RTP determined that the NYSDEC model approach and procedures were consistent with common industry practice. However, the NYSDEC model input data pertaining to stack and building configurations deviated from expected OWHH manufacturer installation recommendations for Phase 1 units which state that the OWHH stack should be constructed at a height of at least two feet taller than the tallest adjacent structure. In addition, RTP determined that the modeled mass emissions were overstated for the heater sizes evaluated by the NYSDEC and were in excess of the emissions anticipated from a large OWHH. Based upon these discrepancies, RTP did not agree with one of the NYSDEC’s principal conclusions that the majority of impacts associated with Model Rule Phase 1 compliant OWHHs exceed the PM_{2.5} NAAQS. In fact, RTP determined through its modeling that OWHHs that are installed according to manufacturer installation requirements for Phase I units comply with the PM_{2.5} NAAQS.

RTP found that the building wake effects, or the atmospheric turbulence caused by nearby structures, play a very important role in the calculation of ground level concentrations for the OWHHs. In the case of the NYSDEC modeling, this turbulence was found to have a more pronounced affect on the ground level concentration than did the mass emission rate.



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RTP modeled several different OWHH stacks using the NYSDEC model as the basis for all inputs. Only the OWHH stack heights, building heights, and OWHH mass emission rates were altered. In each of RTP's model runs, the height of the OWHH stack was assumed to be two feet taller than the tallest nearby structure. In contrast, the NYSDEC's modeling generally assumed that the OWHH stack was shorter than the nearby structures. RTP's modeling demonstrates that OWHH stacks constructed at a height of two feet taller than the tallest nearby structure are compliant with the revised PM_{2.5} NAAQS under both the EPA voluntary emission level of 0.60 lb/MMBtu and the NESCAUM model rule Phase 1 standard of 0.44 lb/MMBtu. Compliance was demonstrated at a distance of 30 feet from the base of the stack.