UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

May 29, 1987

MEMORANDUM

SUBJECT: UNAMAP 6 Dispersion Modeling with Building Wake Effects

FROM: Joseph A. Tikvart, Chief
Source Receptor Analysis Branch (MD-14)

TO: Bruce P. Miller, Chief
Air Programs Branch, Region IV

In response to your request, the Model Clearinghouse has reviewed Region IV's position with respect to modeling downwash for primary and background sources. We also discussed this issue as part of the broader problem of modeling background sources at the Regional/State Modelers Workshop, May 12-15, 1987. The position of the Regional/State Modelers was that all sources which are explicitly modeled should be modeled according to current guidance, e.g. model for downwash if the stack is lower than GEP. The Clearinghouse concurs with this consensus.

Considerable discussion took place at the Workshop on how to decide which background (off-site) sources should be explicitly modeled in a regulatory analysis. We found that it was difficult to establish any more specific criteria for deciding which sources to model beyond those general criteria already in the Guideline on Air Quality Models. The Guideline (Section 9.2.3) essentially recommends limiting the number of explicitly modeled background sources to those sources expected to cause a "significant concentration gradient" in the vicinity of the primary source(s). Thus it is left up to the Regional Offices to exercise good defensible judgment on a case-by-case basis in making such choices; the number of such sources is expected to be small except in unusual situations.

However, if PSD increment consumption is involved then all increment consuming sources, including non-PSD sources and growth emissions, must be explicitly modeled to calculate increment consumption in any area where the baseline date has been established. This analysis may require the calculation of increment consumption within the baseline area from sources located outside of the area.

Specific answers to your four questions are as follows:

1. Should all such sources which may experience downwash be modeled utilizing the downwash algorithm?

We agree with your position that primary sources should be modeled for downwash if their stack(s) are below GEP.

2. Is it necessary to perform downwash analyses on off-site sources when evaluating the impact of another source?

Based on the Workshop discussion we also agree with your position that off-site sources, selected for modeling based on Regional Office judgment, should be modeled for downwash. However, if an off-site source is located outside of the receptor area selected by Regional Office judgment for consideration, then only concentrations for the receptor area need to be calculated.

3. If downwash is required, how should the States address the expected region-wide impact?

It is our position, for SIP analyses, that all "incidental" problems should be corrected as part of the SIP or SIP revision. This is because the SIP is the basic tool defined by the Clean Air Act for ensuring that standards/PSD increments are attained/maintained everywhere. The "region-wide" problem you speak of may not be as serious as you envision if the modeling guideline is followed in selecting the background sources and the receptor area, as discussed above.

4. What experience with this problem has been noted by EPA during PSD reviews?

Although we have not been made aware of any specific cases, we understand that Region V has had some issues where incidental problems from background sources were uncovered during a PSD analysis. Given the PSD regulations and requirements we see no other alternative than to deal with these problems when they come up. When an incidental problem is uncovered during the analysis to which the PSD source contributes significantly, the problem should be corrected before the permit is issued.

If you have any questions please contact me. If further discussion is needed on Questions 3 or 4 it is best that you contact the Control Programs Operation Branch (Tom Helms or Sharon Reinders).

cc: T. Helms
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