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

June 28, 1989

MEMORANDUM

SUBJECT: Clarification of Stack-Structure Relationships

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

TO: Regional Modeling Contacts
Regions I-X

Recently there have been inquiries from a few Regional Modelers and the private sector concerning a specific aspect of implementing the wind direction specific downwash algorithm in the ISC Model. A letter from Trinity Consultants, Incorporated to Russell Lee, of my staff, is attached which describes the question.

Our guidance on determining the area of building wake influence for direction-dependent wake calculations (the 5L/2L/0.5L scheme described in the Model Clearinghouse memo and attachment dated May 11, 1988) was meant to be as simple as possible while accounting more realistically for building edge effects assumed to occur within roughly 0.5L crosswind. The simplest approach was to assume a rectangular area, even though cavity and wake regions do not have "corners".

The definition of and procedure for determining when a stack will be within the wake region of a nearby structure is contained in the GEP stack height guideline. There is no intention that any procedure in that guideline should be modified or expanded by the procedure in the revised ISC user's guide. The application of the GEP guidance should come first, i.e., is the stack within the area of influence of the structure in question where the area is based on five times the lesser of the height or width dimension downwind from the trailing edge of the structure? If the stack is not within this area of influence, one would probably not proceed with any downwash modeling analysis. So as not to preclude elimination of adjacent wind direction sectors from the analysis that accounts for the edge effects of structures, our guidance does imply that a dimension 0.5L be added laterally to include these wind directions. However, this should not be used to extend the area of influence beyond the GEP stack height definition.

If you have further questions, please contact Jim Dicke (FTS 629-5682).

Attachments

cc: R. Lee, SRAB/TSD (MD-14)
J. Dicke, SRAB/TSD (MD-14)
D. Wilson, SRAB/TSD (MD-14)

FY 89 MODEL CLEARINGHOUSE MEMORANDA

Date	Region	Subject
10/11/88	VI	Use of ISC UNAMAP 6, Change 7
11/07/88	VI	Compilation of Most Recent, Available 5-Year Meteorological Data By Texas
11/08/88	V	State of Indiana Meteorological Preprocessor Program
11/09/88	VI	Information Regarding Refinery Tank Farms and Their Rural/Urban Designation
11/09/88	VI	Request for Use of ISC 6.2
11/21/88	VI	Request for Use of ISCST and ISCLT Version 6.2 in Twin Oak Steam Electric Station PSD Application
11/28/88	VI	Request for Use of ISCST and ISCLT Version 6.2 in Formosa Plastics PSD Application
01/30/89	VIII	E. Helena Lead SIP
02/08/89	IV	Yates Power Plant GEP SIP
02/10/89	VIII	Denver PM_{10} SIP
02/27/89	IV	Paradise Power Plant
02/28/89	III	Martins Creek -- Regulations for Redesignation
03/20/89	VI	Proposed Region VI Responses to Louisiana About Modeling Issues
03/20/89	III & VI	Use of Allowable Emissions for National Ambient Air Quality Standards (NAAQS) Impact Analyses Under the Requirements for Prevention of Significant Deterioration (PSD)
03/23/89	X	Model Clearinghouse Review of Outline for PM_{10} SIP Modeling Protocol
04/06/89	I	"Connecticut Ambient Impact Analysis Guideline"

4/25/89	I	MassPower PSD -- Urban vs Rural for Background Source
5/11/89	I - X	Issues Associated with Modeling Background Sources
6/8/89	III	Policy Interpretation - Modeling for Intermediate Terrain
6/28/89	I - X	Clarification of Stack-Structure Relationships
6/28/89	IV	Response to Region VI Position on PSD Modeling Issue