



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

MEMORANDUM

DATE: JAN 11 1991

SUBJECT: Georgia Power Plant Yates GEP Modeling

FROM: Brenda Johnson, Meteorologist *Brenda Johnson*

TO: Dean Wilson, Meteorologist
Source Receptor Analysis Branch (MD-14)

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

This memo concerns the wind data inputs to the RTDM model as used by Georgia for the Plant Yates GEP modeling demonstration. The following are comments on (1) the need for scalar v. vector winds in regulatory air dispersion modeling and (2) the interpretation of guidance documents on this issue as related to the collection of on-site meteorological data. These issues were discussed in a past conversation between you, Jim Dicke, Lew Nagler, and myself. However, there will be a meeting on January 25, 1990, between the State of Georgia and Region IV to try to resolve the Plant Yates' issue. I would like your review of my comments prior to the meeting.

The following is a brief summary of the GEP history for Plant Yates. Georgia submitted a data collection protocol to Region IV. We reviewed the protocol and made several comments on September 18, 1986. Our response did not specifically state that scalar wind speed and direction should be used but referenced the draft chapters 6 and 8 of the "On-Site Meteorological Program Guidance for Regulatory Modeling Applications" document (On-Site). The issue was not addressed again until Georgia stated that the wind data were processed vectorially and asked if this data were acceptable or should it be reprocessed. We responded that scalar wind data should be used in the modeling analyses but did not address reprocessing the data.

Lately, differences in interpreting the recommendations given in various guidance documents have become an issue. The modeling guideline refers to the "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV" (Handbook) for on-site data collection recommendations. On page 10, 2nd column, last paragraph,

it is suggested that

"Averaging for wind speed may be done by scalar methods (dilution) or vector methods (transport) and should represent one hour. Wind direction should be averaged by obtaining the resultant vector direction for one hour."

This document suggests the collection of scalar or vector winds but scalars should be used to calculate the dilution. The use of the phrase "vector resultant winds" refers to the wind vector, a vector quantity.

The "On-Site Meteorological Instrumentation Requirements to Characterize Diffusion from Point Sources, Workshop Report" (Workshop), page 4 recommends that the harmonic wind, which is a scalar, is preferred for calculating dilution and plume rise but mean wind direction should be reported as the hourly resultant vector direction. Also, the scalar mean wind and the resultant vector mean wind should be reported for horizontal wind speed. Does this imply that the wind direction can be calculated by resultant vectors or in the use of unit vectors implied? The Workshop document is only referenced in the On-Site document and not the modeling guideline.

The On-Site document was written to consolidate guidance from the other documents and to provide a more complete and detailed guidance on the collection of on-site data. It specifically addresses the type of data needed for regulatory air dispersion modeling and justifies the use of scalar v. vectors in them. The requirement for using scalar wind speed and direction was given to Georgia (and maybe Georgia Power) in the draft chapter 6 which was submitted with our review of their data collection protocol in 1986. A question that remains outstanding is whether both scalar wind speed and direction are required as stated in the On-Site document or if scalar wind speed and vector direction are required?

I believe that I adequately answered Georgia's question of whether vectorially averaged winds would automatically invalidate the RTDM modeling results by referencing page 6-2 of the On-Site document and indicating that headquarters will not accept any regulatory modeling using this data.

Please provide your comments to this memo by January 23, 1991. We will be having a meeting with the state of Georgia on January 25, 1991. Your comments would be quite beneficial. If a signed copy of the response will not be available by that time, a fax of your comments would be appreciated. If you have any questions, please call me at FTS 257-2864.