



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
RESEARCH TRIANGLE PARK, NC 27711

MAY 06 2011

OFFICE OF  
AIR QUALITY PLANNING  
AND STANDARDS

**MEMORANDUM**

SUBJECT: Model Clearinghouse Review of AERMOD-COARE as an Alternative Model for Application in an Arctic Marine Ice Free Environment

FROM: George Bridgers, Environmental Scientist  
Model Clearinghouse Director, C439-01

A handwritten signature in dark ink, appearing to read "George M. Bridgers".

TO: Herman Wong, Regional Atmospheric Scientist  
Office of Environmental Assessment, OEA-095, EPA Region 10

Ann Williamson, Associate Director  
Office of Environmental Assessment, OEA-095, EPA Region 10

**INTRODUCTION**

In response to your memorandum of April 01, 2011, the Model Clearinghouse has reviewed Region 10's proposed decision to approve the incorporation of the Coupled Ocean-Atmospheric Response Experiment (COARE) bulk flux algorithm as an alternative to the AERMET meteorological processor within the EPA's preferred near-field plume dispersion modeling system, AERMOD. The application of an AERMOD-COARE coupling in this specific case is to account for the influences of overwater transport on plume dispersion in the assessment of ambient impacts from offshore operations in the Arctic marine ice free environment of the Beaufort and Chukchi Seas.

In this memorandum, Region 10 assumes responsibility for the approval of AERMOD-COARE as an alternative refined model pursuant to Section 3.0.b and Section 3.2.2.a of Appendix W to 40 CFR 51. Section 3.2.2.b subsequently details three separate conditions under which an alternative model may normally be approved by the Regional Administrator for regulatory use. In support of the proposed approval of AERMOD-COARE, Region 10 reviewed and determined that the information and materials provided by the applicant and their contractors adequately addressed the five elements associated with Condition 3 as listed in Section 3.2.2.e. Given the potential broader implications and in the spirit of maintaining national consistency, Region 10 is asking for concurrence from the Model Clearinghouse for this proposed alternative model approval.

**MODEL CLEARINGHOUSE RESPONSE**

We concur with Region 10's decision to approve the use of COARE as an alternative to the AERMET meteorological processor for application of the AERMOD model for assessing ambient impacts from offshore operations in the Arctic marine environment of the Beaufort and Chukchi Seas during ice free

conditions. We also agree with Region 10's assessment that approval of AERMOD-COARE for these applications falls under Condition 3 of Section 3.2.2.b of Appendix W regarding the use of alternative models since the preferred model, i.e., AERMOD with AERMET-derived meteorological inputs, has not been demonstrated to be appropriate for overwater dispersion applications.

The documentation submitted by Region 10 in support of this application of AERMOD-COARE has adequately addressed the five elements listed in Section 3.2.2.e of Appendix W to support the use of an alternative model under Condition 3, namely:

1. The model has received scientific peer review;
2. The model can be demonstrated to be applicable to the problem on a theoretical basis;
3. The data bases which are necessary to perform the analysis are available and adequate;
4. Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates; and
5. A protocol on methods and procedures to be followed has been established.

Model Clearinghouse concurrence on the use of AERMOD-COARE is specific to the applications covered under Region 10's approval for ice free environments of the Beaufort and Chukchi Seas. As noted in Region 10's memorandum, should a project proponent desire to use AERMOD-COARE in another Arctic marine ice free environment, a request must be made to Region 10 prior to the submission of an ambient air quality impact analysis that includes the appropriate references and additional technical justifications.

This Model Clearinghouse concurrence does not constitute a generic approval of AERMOD-COARE for other applications elsewhere. However, the scope of the assessment submitted with the Region 10 Model Clearinghouse request provides a good basis for consideration of AERMOD-COARE for other applications, subject to Regional Office approval based on an assessment of the appropriateness of the performance evaluations (element 4) and the availability of the necessary data bases (element 3) on a case-by-case basis.

cc: Mahbubul Islam, R10  
Doug Hardesty, R10  
Richard Wayland, C304-02  
Scott Mathias, C504-01  
Tyler Fox, C439-01  
Raj Rao, C504-01  
Roger Brode, C439-01  
EPA Air Program Managers  
EPA Regional Modeling Contacts