



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
RESEARCH TRIANGLE PARK, NC 27711

December 13, 2022

OFFICE OF  
AIR QUALITY PLANNING  
AND STANDARDS

**MEMORANDUM**

**SUBJECT:** Model Clearinghouse review of an alternative model application of Alternative Model AERCOARE in Conjunction with AERMOD in Support of Outer Continental Shelf PSD air permitting of the Mayflower Wind Project

**FROM:** George Bridgers, Model Clearinghouse Director  
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**INTRODUCTION**

Mayflower Wind, LLC (Mayflower Wind) has proposed the construction of an offshore wind renewable energy generation project on the Outer Continental Shelf (OCS) off the southern coast of Massachusetts (Lease Area OCS-A 0521). The Mayflower Wind project triggers the requirements for Prevention of Significant Deterioration (PSD) review as a major source with anticipated significant emissions of sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), volatile organic compounds (VOCs), particulate matter (PM) with diameter 10 microns or less (PM<sub>10</sub>), PM with diameter 2.5 microns or less (PM<sub>2.5</sub>), and Greenhouse Gases (GHG). As a result, air quality modeling will be conducted for SO<sub>2</sub>, CO, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and appropriate PSD Increments. Additionally, the Mayflower Wind project will trigger Nonattainment New Source Review (NNSR) for the O<sub>3</sub> precursors NO<sub>x</sub> and VOCs.

Mayflower Wind has requested to use an alternative model, as provided in Section 3.2 of the *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W), to conduct its PSD air quality modeling analysis.<sup>1</sup> Specifically, Mayflower has requested to use the Coupled Ocean-

<sup>1</sup> [https://gaftp.epa.gov/Air/aqmg/SCRAM/mchisrs/22-I-03\\_MayFlower\\_AERMOD\\_AlternativeModelRequest\\_10-17-22.pdf](https://gaftp.epa.gov/Air/aqmg/SCRAM/mchisrs/22-I-03_MayFlower_AERMOD_AlternativeModelRequest_10-17-22.pdf).

Atmosphere Response Experiment (COARE) bulk flux algorithm, as implemented in the AERCOARE meteorological data preprocessor program, to prepare meteorological data for use in the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) dispersion program over the preferred Offshore and Coastal Dispersion (OCD) model to assess ambient impacts in a marine environment.<sup>2</sup>

## REGIONAL OFFICE REVIEW

The U.S. Environmental Protection Agency (EPA) Region 1 seeks concurrence from the EPA's Model Clearinghouse (Model Clearinghouse or MCH) regarding the prospective EPA Region 1 approval of an alternative model for the Mayflower Wind project air permitting effort. The AERCOARE meteorological data preprocessor program will be used in conjunction with AERMOD (AERCOARE-AERMOD) to conduct the PSD air quality modeling analysis as part of the OCS air permit application. Mayflower Wind is seeking approval to allow the use of the coupled AERCOARE-AERMOD model methodology or approach for their air quality modeling analysis, under the *Guideline*, Section 3.2.2(b), Condition (3).

EPA Region 1 has conducted a thorough review of the Mayflower Wind request and intends to approve the use of proposed coupled AERCOARE-AERMOD approach as an alternative model to conduct the air quality modeling analysis as part of Mayflower Wind OCS air permit application. Based on their review, EPA Region 1 has found the proposed application of the model is satisfactory and addresses the requirements of the *Guideline*, Section 3.2.2(b), Condition (3) and the subsequent five elements contained in Section 3.2.2(e). As such, pursuant to Sections 3.0(b) and 3.2.2(a), EPA Region 1 currently intends to approve the use of AERCOARE-AERMOD as an acceptable alternative model for the Mayflower Wind project.

## MODEL CLEARINGHOUSE REVIEW

The specifics of the EPA Region 1 review and the basis for their intention to approve the proposed AERCOARE-AERMOD alternative modeling approach for the Mayflower Wind project are logically outlined in the EPA Region 1 alternative model concurrence request memorandum submitted to the Model Clearinghouse on November 18, 2022.<sup>3</sup> Given the similarities to several recent Model Clearinghouse actions regarding the use of the coupled AERCOARE-AERMOD approach in EPA Regions 1, 2, 3, and 6, we will not reiterate each aspect of the Regional Office review in this concurrence response memorandum.<sup>4</sup>

In short, the circumstances surrounding and the alternative model approach sought with respect to the Mayflower Wind project closely align with that of these other recent alternative model reviews and approvals. EPA Region 1 has confirmed that the project occurs in the same general

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<sup>2</sup> The OCD dispersion model is listed in Section 4.2.2.3 of the *Guideline* as the Environmental Protection Agency's preferred model for over-water modeling.

<sup>3</sup> [https://gaftp.epa.gov/Air/aqmg/SCRAM/mchisrs/22-I-03\\_Region3\\_MCHRequest\\_Mayflower.pdf](https://gaftp.epa.gov/Air/aqmg/SCRAM/mchisrs/22-I-03_Region3_MCHRequest_Mayflower.pdf).

<sup>4</sup> Please reference the EPA Model Clearinghouse Information Storage and Retrieval System (MCHISRS) database for more information regarding recent AERCOARE-AERMOD alternative model reviews and approvals. Use the Text Search term "AERCOARE" on the MCHISRS search page:

<https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.search>.

geographic area with representative climatic conditions and that key model settings, methodology, and conditions-of-use specified by Mayflower Wind in their alternative model request and justification package follow a nearly identical pathway or flow to these other successful Regional Office approvals of the AERCOARE-AERMOD alternative modeling approach.

The Model Clearinghouse continues to agree with the technical merits of this common themed alternative model justification for the coupled AERCOARE-AERMOD approach as long as there is an appropriate level of consultation with the Regional Office on the manner in which the alternative model will be applied in the air quality modeling analysis for the project's OCS air permit application, including an assessment of potential concerns with platform downwash and shoreline fumigation. The Model Clearinghouse encourages reviewers of this alternative model concurrence to reference the EPA Region 1 alternative model concurrence memorandum for specific details of EPA Region 1's review of the Mayflower Wind alternative model request and justification.

## CONCURRENCE SUMMARY

The Model Clearinghouse concurs with EPA Region 1's proposed approval of a coupled AERCOARE-AERMOD alternative modeling approach for the air quality modeling analysis required in the Mayflower Wind project based the alternative model justification package provided by Mayflower Wind, LLC and the review documentation in the alternative model concurrence request memorandum provided by EPA Region 1. The Model Clearinghouse encourages EPA Region 1 to respond to Mayflower Wind, LLC and to the docket for federal permitting actions related to the Mayflower Wind project with a letter of alternative model approval, as appropriate. The information associated with the EPA Region 1 alternative model approval and the Model Clearinghouse concurrence should be available for comment during the appropriate public comment period(s).

Given the possible importance of platform downwash and shoreline fumigation, the Model Clearinghouse continues to recommend caution and careful review before additional alternative model considerations of the coupled AERCOARE-AERMOD model methodology in other projects. This case-specific Model Clearinghouse concurrence does not constitute a generic approval of a coupled AERCOARE-AERMOD approach for other applications elsewhere. However, the scope of the technical assessment submitted here and with similar AERCOARE-AERMOD alternative model requests continue to provide a good basis for such considerations.

For any future projects considering the use of a coupled AERCOARE-AERMOD approach, including differing phases of a project to which those phases were not considered as part of a previous EPA alternative model approval, EPA Regional Office approval with Model Clearinghouse concurrence is required per the *Guideline*, Section 3.2. Early consultation with the appropriate reviewing authority and EPA Regional Office is always strongly recommended for any alternative model application other than the preferred OCD model approach for overwater or OCS sources.

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