

Analysis of and Action on State of Connecticut Department of Environmental Protection's Request for a Waiver of the Oxygen Content Requirement in Federal Reformulated Gasoline

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Transportation and Regional Programs Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

**ANALYSIS OF AND ACTION ON
STATE OF CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION'S
REQUEST FOR A WAIVER OF THE OXYGEN CONTENT REQUIREMENT
IN FEDERAL REFORMULATED GASOLINE**

I. INTRODUCTION

The Connecticut reformulated gasoline (RFG) area is required under the Clean Air Act to use RFG containing 2% oxygen by weight, unless that oxygen content requirement is waived by EPA. Connecticut has requested a waiver of the RFG oxygen content requirement for the Connecticut RFG area.¹ This document discusses the Clean Air Act oxygen content requirement for RFG, EPA's authority to waive that requirement, the basis for Connecticut's request for a waiver, and the basis for EPA's determination to deny Connecticut's request. Additional information is available in an accompanying Technical Support Document.

A. The RFG Oxygen Content Requirement and EPA's Waiver Authority

Under the Clean Air Act ("CAA" or "the Act"), 42 U.S.C. § 7545(k)(2)(B), nine geographic areas in non-attainment for the ozone National Ambient Air Quality Standards (NAAQS), as well as other areas that subsequently are reclassified as severe ozone nonattainment areas, are required to use reformulated gasoline. CAA §§ 211(k)(10)(D), 211(k)(5). Certain other ozone non-attainment areas may "opt-in" to the RFG program as a means of addressing their ozone non-attainment problems. CAA §211(k)(6). The Act specifies certain gasoline content requirements for RFG. CAA § 211(k)(2). Of particular importance for Connecticut's request is the Act's requirement concerning the oxygen content of RFG and EPA's authority to waive that requirement.

Section 211(k)(2)(B) of the Act provides:

The oxygen content of the [reformulated] gasoline shall equal or exceed 2.0 percent by weight (subject to a testing tolerance established by the Administrator) except as otherwise required by this Act. The Administrator may waive, in whole or in part, the application of this subparagraph for any ozone nonattainment area upon a determination by the Administrator that compliance with such requirement would prevent or interfere with

¹ The term "Connecticut RFG area" as it is used in this document means the entire State of Connecticut and includes the Connecticut State portion of the Hartford-New Haven-Springfield Consolidated Metropolitan Statistical Area (CMSA), the Connecticut State portion of the New York City CMSA, and the opt-in areas of Litchfield, Hartford, Middlesex, New London, Tolland, and Windham Counties, Connecticut.

attainment by the area of a national primary ambient air quality standard.

Thus, EPA has discretion under this section to waive the oxygen content requirement if it determines that compliance with the oxygen content requirement would prevent or interfere with attainment of a primary National Ambient Air Quality Standard (NAAQS) in an ozone nonattainment area. This section requires, at a minimum, that an applicant seeking a waiver must clearly demonstrate the impact of a waiver for each applicable NAAQS. *See Davis v. EPA*, 348 F.3d 772, 779-80 (9th Cir. 2003)(affirming EPA's evidentiary standard in the context of EPA's denial of California's waiver request.)² EPA may take into consideration other available information in evaluating a request for a waiver.³

A key threshold question before the Agency when considering such a request is whether there has been a clear demonstration of the air quality impacts of a waiver of the RFG oxygen content requirement. To address the air quality impacts of a waiver, one must, as a technical matter, consider the gasoline fuel properties of the RFG that would likely be sold in the area with and without an oxygen content waiver. From this information, one must then evaluate the impact that a change in fuel properties would produce on emissions of pollutants. The expected change in emissions of pollutants associated with those different RFG blends is needed to evaluate the impact of a waiver on attainment of a NAAQS. All relevant categories of emissions need to be considered.

EPA cannot make a determination of interference with or prevention of attainment of any NAAQS due to compliance with the oxygen content requirement unless the projected emission impacts of a waiver are analyzed for each applicable NAAQS. Absent such an analysis, EPA is not able to determine whether a waiver would aid, hinder, or have no effect on attainment of a NAAQS.

B. Connecticut's waiver request

In a letter dated April 22, 2002, from Connecticut Governor John G. Rowland to then Administrator Whitman, Connecticut expressed intent to submit a waiver request under CAA Section 211(k)(2)(B) from the federal RFG oxygen content requirement. In a letter dated September 29, 2004 from Connecticut Department of Environmental Protection (DEP) Commissioner Arthur J. Rocque, Jr., to Assistant Administrator Jeff Holmstead, Connecticut officially submitted such a request for the Connecticut RFG

² Docket A-2000-10, III-A-1.

³ For further discussion of EPA's interpretation of the authority to grant a waiver under section 211(k)(2)(B), see Appendix A of [Docket A-2000-10, II-B-1].

area.⁴ The submission stated that because MTBE was banned in the State of Connecticut beginning January 1, 2004, and because of the Act's oxygen content requirement for RFG, ethanol would be used as an oxygenate in the RFG areas in the State of Connecticut. DEP asserted that the use of ethanol as a replacement for MTBE in RFG would result in an increase in Volatile Organic Compounds (VOCs), and oxides of nitrogen (NOx) during the summer ozone season. DEP further argued that "increases in these pollutants will immediately interfere with Connecticut's ability to attain the National Ambient Air Quality Standard (NAAQS) for both one-hour and eight hour ozone...and fine particles."

II. EPA'S ANALYSIS OF THE INFORMATION THAT CONNECTICUT DEP SUBMITTED

A. Basis for DEP's request for a waiver

DEP's request for a waiver is based primarily on its contention that use of ethanol-oxygenated reformulated gasoline will interfere with attainment of the ozone and particulate matter NAAQS because:

- The NOx and VOC emissions performance of ethanol-oxygenated RFG will be worse than the emissions performance of the MTBE-oxygenated RFG supplied to Connecticut prior to its MTBE ban or to non-oxygenated fuel.
- Commingling and permeation resulting from ethanol use will increase VOC emissions compared to MTBE-oxygenated or non-oxygenated RFG.
- Ethanol-oxygenated RFG will not provide the NOx reduction benefits expected under the RFG program because the Complex Model does not fully capture the effects of oxygenates on vehicle emissions of NOx.
- The transport of ethanol into the Connecticut area would cause an increase in emissions due to additional ships and barges transporting ethanol into the Connecticut area for adding to RFG at terminals.
- Fine particulates will increase because the NOx emission performance will be worse for ethanol blended RFG as compared to the fuel under an oxygen waiver.

⁴

Docket OAR-2004-0429-0001.

B. Major limitations in the information submitted by DEP

As discussed above, a key threshold technical issue in evaluating a waiver request is to evaluate the emissions impact of a waiver. The emissions impact of a waiver is basically a comparison of emissions with a waiver (“waiver”) to emissions without a waiver (“no waiver”). This comparison is needed to clearly demonstrate whether a waiver would aid, hinder, or have no effect on attainment of a NAAQS. Certain information is required in order to make a quantitative estimate, or even a reasonably certain qualitative directional estimate, of the emissions changes that a waiver might produce. This information includes knowledge of certain emission-related properties of the reformulated gasoline that would be supplied to Connecticut with and without a waiver. Models relating these fuel properties to vehicle emissions would then be used to estimate percent differences in emissions between the “no waiver” and “waiver” conditions. Additionally, on-road and off-road gasoline emission inventory data are needed in order to convert relative (%) changes to absolute (tons/day) changes. Inventory information may be necessary even to perform a directional analysis. The need for this information is described in detail in the accompanying Technical Support Document.

Connecticut’s submissions included essentially no information or analysis of the expected fuel properties of RFG with and without a waiver. Connecticut did not provide sufficient information or analysis to show either quantitative or directional estimates of the emissions differences between “no waiver” and a “waiver,” for the pollutants contributing to ozone formation, NO_x, VOCs and carbon monoxide (CO) or subsequent conversion of NO_x to particulates. NO_x, VOCs, and CO each affect ozone to a varying degree, and their emissions rates could be altered by a waiver. Changes in VOC, NO_x, and CO emissions were not quantified, and the lack of adequate information and analysis means that even the direction of any change in NO_x and VOC is not clear. Changes in CO emissions were not addressed.

If Connecticut had provided information and analysis on the change in fuel properties and associated emissions that a waiver would be expected to produce, and the resulting impact on ozone and particulate matter, EPA would be in a position to thoroughly review the basis for these estimates (fuel property estimation and emission modeling methodology), and evaluate the estimated impact a waiver might have on ambient ozone and particulate matter.

DEP’s original “intent to submit” letter indicated that they planned to provide this information. Consequently, EPA responded that we were awaiting Connecticut’s documentation in support of Connecticut’s plan to request a waiver. DEP did not provide the information in their official request.

EPA has considered the information that Connecticut has provided which may be relevant to an analysis of Connecticut's waiver request. EPA has determined as described in the Technical Support Document, that the relevant no-waiver to waiver comparison cannot be made either qualitatively or quantitatively. In making this evaluation, EPA has considered the information provided by Connecticut with regard to the potential effect of a waiver on each of the pollutants, NO_x, VOC and CO, for both on-road and off-road gasoline vehicles and engines.

In order to evaluate the adequacy of the information submitted by Connecticut, we have identified the information on fuel properties, vehicle fleets (e.g., on-road versus off-road, older technology vehicles versus newer technology, etc.), and emission sources (e.g., exhaust, "as blended" evaporative, commingling and permeation-related) that would need to be provided to conduct an adequate waiver/no-waiver analysis. We have also identified emissions models and other information necessary to make the relevant emission estimates that could be utilized to make a waiver/no-waiver comparison.

Based on the available information, EPA has concluded that neither the magnitude nor even the direction of the NO_x and VOC changes that would occur with a waiver can be determined using the information provided. Although a gross directional determination for CO emissions can be made, the change in CO likewise cannot be quantified with the information provided by DEP.⁵

III. CONCLUSION

The information that DEP has provided fails to demonstrate what effect a waiver would have on ozone or particulate matter levels in Connecticut. This is because: 1) there are three pollutants whose emission rates could be altered by a waiver (NO_x, VOC and CO) and all three affect ozone formation to varying degrees; 2) the lack of information on fuel qualities with and without a waiver and the lack of other relevant and necessary information precludes even a directional estimate of the impact of a waiver on NO_x and VOC emissions; 3) the best estimate of the net impact of a waiver on CO emissions is that CO emissions would be greater with a waiver than without, but the difference cannot be quantified; 4) no analysis has been provided or performed, and the information before the agency does not allow an analysis to be performed, on the combined effect of these emissions changes on ozone.

In addition, (1) NO_x emissions affect PM, (2) the lack of information on fuel qualities with and without a waiver and the lack of other relevant and necessary information precludes even a directional estimate of the impact of a waiver on NO_x, (3)

⁵ CO plays a far less important role in ozone formation than NO_x or VOC. Thus, even though a gross directional determination can be made, such a determination provides little useful information in making a judgement about the net impact on ozone formation from a waiver.

no analysis has been provided or performed, and the information before the agency does not allow an analysis to be performed, on the effect of any NOx emissions changes on particulate matter.

Since no determination can be made regarding the overall effect of a waiver on emissions related to ozone and particulate matter, the information that DEP has provided fails to clearly demonstrate what effect a waiver would have on ozone or particulate matter. Since this threshold demonstration has not been made, EPA is not able to determine whether a waiver would aid, hinder, or have no effect on the attainment of the ozone or particulate matter NAAQS, and therefore cannot determine whether compliance with the oxygen requirement for RFG prevents or interferes with attainment of the ozone or particulate matter NAAQS in the Connecticut RFG area. EPA concludes that Connecticut's request therefore should be denied.