

State of California
AIR RESOURCES BOARD

Updated Informative Digest

**PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE CALIFORNIA
REFORMULATED GASOLINE REGULATIONS INCLUDING REFINEMENTS TO THE
PROHIBITIONS OF MTBE AND OTHER OXYGENATES**

Sections Affected: Amendments to sections 2260, 2261, 2262.6, 2263, 2266.5, 2272, 2273, and adoption of section 2273.5, of title 13, California Code of Regulations (CCR).

Background

The California Air Resources Board (ARB or Board) administers the Phase 2 California Reformulated Gasoline (CaRFG2) regulations, which have applied to all California gasoline since March 1996. The regulations establish standards for the following eight gasoline properties: sulfur, benzene, olefin, aromatic hydrocarbon, and oxygen contents, the 50 percent distillation temperature, (T50), the 90 percent distillation temperature, (T90), and summertime Reid vapor pressure (RVP).

The CaRFG regulations allow refiners to use a “Predictive Model” to specify alternative formulations. The Predictive Model is a set of mathematical equations that relate emissions rates of exhaust hydrocarbons, oxides of nitrogen (NOx), and potency weighted toxics for four toxic air contaminants (benzene, 1,3-butadiene, formaldehyde, and acetaldehyde) to the values of the eight regulated gasoline properties. An alternative gasoline formulation is acceptable if emissions of hydrocarbons, NOx, and potency-weighted toxics resulting from this formulation are no greater than emissions from gasoline having the specifications set forth in the CaRFG2 standards. Currently, most of the gasoline sold in California complies with the CaRFG2 regulations through the use of the Predictive Model.

Since 1995, most of the state’s gasoline has contained about 11 percent methyl tertiary-butyl ether (MTBE), which, along with ethanol, is an oxygenate that is used to introduce oxygen into gasoline and to improve octane. The widespread use of MTBE has primarily resulted from two programs mandated by the federal Clean Air Act (CAA) – the federal reformulated gasoline (RFG) program administered directly by the U.S. Environmental Protection Agency (U.S. EPA), and the wintertime oxygenates program which is ultimately administered in California by ARB. In areas in California not subject to the federal RFG or the CO wintertime oxygen requirements, the Predictive Model may be used to reduce or eliminate oxygen in California gasoline.

One of the requirements for federal RFG is that all gasoline sold for use in on-road vehicles in severe and extreme non-attainment areas for ozone contain at least 2.0 weight % oxygen year-round. The federal RFG requirements now apply in San Diego

County, the greater Los Angeles area (Los Angeles, Orange and Ventura Counties, and parts of Riverside and San Bernardino Counties), the greater Sacramento area (Sacramento County and parts of Yolo, Solano, Sutter, Placer, and El Dorado Counties), and the San Joaquin Valley Air Basin. Together, these areas account for about 80 percent of the gasoline sold in California. California has asked U.S. EPA to exercise its authority to waive the minimum oxygen requirement, but in June 2001 the agency denied the state's request. A lawsuit challenging the denial is currently pending in the U.S. Court of Appeals for the Ninth Circuit.

California's wintertime oxygenates requirements have resulted from requirements in the federal CAA that states mandate the use of oxygenated gasoline during the winter in most areas that are in nonattainment of the National Ambient Air Quality Standard (NAAQS) for carbon monoxide (CO). The use of oxygen in gasoline reduces emissions of CO from the existing vehicle fleet, and ambient CO concentrations are the highest in the winter. As ambient CO concentrations have declined in California as a result of its mobile source emissions reduction programs, the ARB has been able to eliminate the winter oxygen requirement in areas where it is no longer necessary for attainment and maintenance of the NAAQS for CO. At present, the ARB requires a wintertime minimum oxygen content of 1.8 wt.% only in Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial counties.

Several years ago, concerns began to increase about adverse environmental impacts from the use of MTBE in the state's gasoline. The main concern with the continued use of MTBE is the potential for contamination of California's groundwater, surface water, and drinking water systems. MTBE is very soluble in water and will transfer to groundwater faster, and will travel farther and more easily than other gasoline constituents when gasoline leaks from underground storage tanks or pipelines.

The California MTBE Public Health and Environmental Protection Act of 1997 directed the University of California (U.C.) to conduct research on the effects of MTBE. The legislation also required the Governor to take appropriate action based on the U.C. findings and information from public hearings conducted on the U.C. report. On March 25, 1999, Governor Davis signed Executive Order D-5-99, in which he found that, on balance, there is a significant risk to the environment from using MTBE in gasoline in California. The Executive Order directed the California Energy Commission (CEC) to issue a timetable for the removal of MTBE from gasoline at the earliest possible date, but not later than December 31, 2002. It also directed the ARB to adopt Phase 3 CaRFG (CaRFG3) regulations that will provide additional flexibility in lowering or removing the oxygen content requirement while maintaining current emissions and air quality benefits and ensuring compliance with the State Implementation Plan (SIP).

At a December 9, 1999, hearing, the Board approved the CaRFG3 regulations consistent with the Governor's directive and the subsequent CEC recommendation that December 31, 2002 was the earliest feasible date for a ban on MTBE. The CaRFG3 regulations prohibited California gasoline produced with MTBE and other specified

oxygenates starting December 31, 2002, established CaRFG3 standards applicable the same date, established a CaRFG3 Predictive Model, and made various other changes.

To address the question of trace amounts of MTBE that may be present as contamination, the CaRFG3 regulations establish a three-stage schedule for reducing residual levels of MTBE in CaRFG3 in the distribution system. The regulations require that the concentration of MTBE in distributed CaRFG3 not exceed 0.3 percent by volume beginning December 31, 2002. This level must be reduced to 0.15 percent by volume starting December 31, 2003 and 0.05 percent by volume starting December 31, 2004.

On March 14, 2002, Governor Davis issued Executive Order D-52-02, which directed the ARB to take the necessary actions, by July 31, 2002, to postpone for one year the prohibitions of the use of MTBE and other specified oxygenates in California gasoline, and the related requirements for California Phase 3 reformulated gasoline. The Governor found that it is not possible to eliminate use of MTBE on January 1, 2003 without significantly risking disruption of the availability of gasoline in California.

In response to Governor Davis's 2002 Executive Order, the Board, at a July 25, 2002 hearing, approved amendments to the CaRFG3 regulations postponing by one year the dates in the original CaRFG3 regulations. These amendments became operative December 24, 2002. The CaRFG3 regulations now in effect ban gasoline produced with the use of MTBE for all California gasoline supplied from production and import facilities starting December 31, 2003. This prohibition is phased in for most deliveries of gasoline to retail outlets occurring after February 13, 2004, and for gasoline throughout the distribution system starting March 31, 2004.

Other amendments necessary to implement the postponement of the MTBE ban were also approved at the July 2002 hearing, including the one-year postponement of the deadlines for reducing residual levels of MTBE in CaRFG3 after the addition of MTBE is banned. The amended regulations require that the concentration of MTBE in distributed CaRFG3 not exceed 0.3 percent, by volume, beginning December 31, 2003. This level is reduced to 0.15 percent by volume starting December 31, 2004 and 0.05 percent by volume starting December 31, 2005.

The CaRFG3 regulations also impose a conditional ban on the use of any oxygenate other than ethanol as a replacement for MTBE in California gasoline. Under the amendments that became operative in December, the ban is phased in starting December 31, 2003 on the same schedule as the ban on gasoline produced with the use of MTBE. Such oxygenates may not be used to produce California gasoline unless a multimedia evaluation of the use of the oxygenate in California gasoline has been conducted, and the California Environmental Policy Council (CEPC) has determined that its use will not have a significant adverse impact on the public health or the environment. The current CaRFG3 regulations do not set a prohibition level for these oxygenates.

The New Amendments

The intent of the CaRFG3 oxygenate prohibitions is to prohibit the intentional blending of MTBE or other prohibited oxygenates into California gasoline and to control the amount of these prohibited oxygenates present in California gasoline because of contamination or because they are unavoidable byproducts of the production process. When the Board in 1999 approved the implementation schedule for the limits on residual levels of MTBE, it directed the Executive Officer to evaluate the practicality of the specified MTBE residual limits and report back to the Board with a recommendation on whether the limits should be revised. This evaluation is necessary because if MTBE continues to be used outside California in significant quantities, MTBE could find its way into California as a contaminant in imported fuel. Also, MTBE can be formed as a contaminant in various refining and production facilities.

Data collected by ARB staff suggest that it may require more time than is currently allowed in the regulation to reduce residual MTBE levels to the specified levels – even in an MTBE-free gasoline distribution system. Staff also considered the impact of gasoline produced in California for export to Arizona and Nevada. Eighty percent of Nevada's gasoline and 60 percent of Arizona's is produced in California. Nevada has not banned MTBE and Arizona's MTBE ban does not become effective until 180 days after California's. Therefore, MTBE-containing gasoline may still be produced in California and transported through the California distribution system after California's MTBE ban is implemented.

Under the new amendments adopted in this rulemaking, the initial limit on residual MTBE is 0.60 volume percent MTBE, which is the MTBE de minimis level adopted by the ARB in September 1999 for labeling retail pumps dispensing gasoline that is not intentionally blended with MTBE. This level is also the same as the EPA's MTBE de minimis level for identifying RFG not blended with MTBE. This concentration of 0.60 volume percent is sufficiently low to prevent gasoline intentionally blended with MTBE from being labeled as non-MTBE, but it is high enough to allow gasoline blended without MTBE to be shipped within the current gasoline distribution system during the first six months of the phase-out.

The new amendments also delay the implementation dates for the other phased residual limits to allow sufficient time for the residual levels of MTBE to decline without interfering with the supply and availability of gasoline in California. The additional time will also allow staff time to collect more data on residual MTBE levels in California gasoline. Staff can then determine whether the newly adopted levels and timetable are practical and propose changes if necessary.

In addition, the new amendments establish allowable residual levels for oxygenates other than MTBE or ethanol to improve the enforceability of the regulation and allow the differentiation between commonly occurring trace contaminants and deliberately added oxygenates.

Revising the prohibitions of gasoline “produced with the use of” MTBE or other oxygenates other than ethanol. The amendments refine the prohibitions to remove the ambiguities that make the prohibitions difficult to administer, and that could under some circumstances exclude imported blendstocks that contain MTBE and other prohibited oxygenates that are incidentally acquired through the production process or during transport.

A California refiner will be prohibited at the refinery from adding MTBE in neat form either to gasoline or blendstocks used to produce gasoline at the refinery. The refiner will also be prohibited from using any gasoline blendstock that contains more than 0.6 volume percent MTBE when it is supplied to the refinery. Imported California gasoline will only be subject to the allowable residual MTBE levels of the CaRFG3 regulations. Application of the allowable residual levels on MTBE in imported gasoline should be sufficient to prohibit unacceptable MTBE levels while avoiding undue constraints in gasoline imports during potential supply shortages.

The amendments to the prohibitions on gasoline "produced with the use of" any oxygenate other than ethanol or MTBE parallel those proposed for MTBE. They prohibit the addition of any oxygenate, other than ethanol or MTBE, in neat form to the California gasoline or to a blending component used to produce gasoline at the refinery. They also prohibit the use of a blending component that contains greater than 0.1 weight percent total oxygen from oxygenates other than ethanol or MTBE when it was supplied to the California production facility. Imported California gasoline will only be subject to the new total oxygen weight percent limits, because of the difficulties in monitoring the way imported gasoline has been produced at some out-of-state location.

Revisions to the schedule for implementation of allowable residual levels of MTBE. The amendments require that MTBE residual levels be reduced in four steps instead of the three steps currently required by the regulations. During the first six months after the MTBE phase-out – starting December 31, 2003 – California gasoline may not contain more than 0.60 volume percent MTBE. Starting July 1, 2004, gasoline is prohibited from containing more than 0.30 volume percent MTBE and eighteen months later, starting December 31, 2005, gasoline is prohibited from containing more than 0.15 volume percent. The residual MTBE limit is further reduced to 0.05 volume percent starting July 1, 2007. Staff will continue to evaluate the practicality of the later limits.

Establishment of allowable residual levels for oxygenates other than MTBE and ethanol. The amendments add a schedule for specifications for total oxygen content in gasoline from oxygenates other than MTBE and ethanol. During the first six months after the MTBE phase-out, starting December 31, 2003, the combined oxygen concentration due to these prohibited oxygenates may not exceed 0.10 percent by weight. This limit of 0.10 weight percent is the oxygen level equivalent to the new residual limit of 0.60 volume percent for MTBE during that period. The final prohibition level of 0.06 weight percent will apply starting July 1, 2004. American Society of Testing and Materials Test Method ASTM D 4815-99 is identified as the test method to

be used in determining the concentration of other oxygenates in California gasoline. These amendments are expected to significantly improve the enforceability of the restrictions on oxygenates both in gasoline produced in the state and imported gasoline. The prohibitions will apply unless a multimedia evaluation of the use of the oxygenate in California gasoline has been conducted, and the CEPC has determined that such use will not cause a significant adverse impact on public health or the environment.

Documentation of the presence or absence of ethanol in CaRFG delivered to retail outlets. The new amendments require any person delivering gasoline to a retail outlet to provide to the outlet operator or responsible employee, at the time of delivery of the fuel, an invoice, bill of lading, shipping paper, or other documentation which states whether the gasoline does or does not contain ethanol, and which may identify the volumetric amount of ethanol. If neither the operator nor a responsible employee is at the outlet at the time of delivery, the documentation may be left at a reasonably secure location at the outlet.

Other amendments. Additional amendments are designed to ensure that the regulations work effectively. One amendment sunsets the requirement for documentation of the presence of MTBE in the gasoline delivered to retail outlets after December 30, 2003. Another amendment replaces the recently added provision regarding oxygenates in early opt-in CaRFG3 with a requirement that early opt-in CaRFG3 meet limits of 0.60 volume percent for MTBE and 0.10 weight percent oxygen collectively from the specified oxygenates other than MTBE or ethanol when it is supplied from the production or import facility. This will provide specific standards that can be monitored by refiners and importers and be readily enforced by ARB inspectors.

Comparable Federal Regulations

As noted above, the U.S. EPA administers the federal RFG regulations, which now apply to about 80 percent of California's gasoline and are contained in 40 CFR §§ 80.40 and following. The federal RFG regulations do not prohibit the use of MTBE.

The U.S. EPA has published de minimis levels for oxygenates that are not intended by the producer to be blended into the reformulated gasoline, but are present as a result of operational necessity. The de minimis levels are specified in the U.S. EPA document, "RFG Questions and Answers, May 9, 1995," which provides guidance on compliance with the Agency's RFG regulations. For purposes of meeting the applicable oxygen requirements for a final gasoline blend, U.S. EPA will not consider the introduction of an oxygenate intentional if the amount of the oxygenate is not more than 0.4 volume percent for ethanol, or 0.6 volume percent for MTBE, ETBE, TAME or t-butanol, or 0.2 volume percent for methanol.