State of California
AIR RESOURCES BOARD

Final Statement of Reasons for Rulemaking
Including Summary of Comments and Agency Responses

PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE CALIFORNIA CLEANER-BURNING GASOLINE REGULATIONS (INCREASING THE OXYGEN CONTENT CAP)

Public Hearing Dates: August 27, 1998;
December 11, 1998
Agenda Item No.: 98-9-2

I. GENERAL

This rulemaking was initiated by the publication on July 10, 1998 of a notice for an August 27, 1998 public hearing to consider amendments to the California Phase 2 Reformulated Gasoline (CaRFG) regulations, also known as the "cleaner burning gasoline" regulations. A Staff Report: Initial Statement of Reasons for Proposed Rulemaking was also made available for public review and comment on July 10, 1998. The Staff Report, which is incorporated by reference herein, contained the text of the regulatory amendments as initially proposed by the staff, along with an extensive description of the rationale for the proposal. As discussed below, this Final Statement of Reasons addresses only the amendments that increase the oxygen content cap in the CaRFG regulations.

The August 27, 1998 hearing. The staff proposal consisted of three elements: (1) elimination in most of the state of the requirement for at least 1.8 percent by weight (wt.%) oxygen in gasoline sold in the wintertime, so that the requirement would remain permanently only in the counties of Los Angeles, Orange, Riverside, San Bernardino, Ventura and Imperial, and would remain through January 31, 2000, only in Fresno and Madera counties and the Lake Tahoe Air Basin; (2) an increase of the year-round maximum oxygen content "cap" limit from 2.7 to 3.5 wt.%; and (3) several minor technical amendments. These changes were to be effected by amendments to California Code of Regulations (CCR), title 13, sections 2260-2262.7 and 2265, and to the "California Procedures for Evaluating Alternative Specifications for Phase 2 Reformulated Gasoline Using the California Predictive Model" (the "Predictive Model Procedures"), which is incorporated by reference in section 2265(a)(2). The amendment to the Predictive Model Procedures simply revised the list of cap limits to reflect the proposed amendment to section 2262.5(b) increasing the maximum oxygen cap limit from 2.7 to 3.5 wt.%.

Most of the discussion at the August 27, 1998 hearing involved the proposal to raise the oxygen cap limit from 2.7 to 3.5 wt.%. Under U.S. Environmental Protection Agency

(U.S. EPA) regulations, ethanol is the only oxygenate allowed in gasoline at levels that add more than 2.7 wt.% oxygen. A 3.5 wt.% maximum oxygen content limit would permit the use of up to 10 percent by volume (vol.%) ethanol. One of the effects of using ethanol in gasoline is that the presence of more than about 2 to 3 percent ethanol will raise the Reid vapor pressure (RVP) of the gasoline by about 1 pound per square inch (psi). A higher RVP value means the gasoline has a greater propensity to evaporate. Health and Safety Code section 43830(g) exempts gasoline containing at least 10 vol.% ethanol from the ARB's summertime RVP standard unless the Board determines that a blend of gasoline oxygenated with 10 vol.% ethanol under the RVP exemption and otherwise meeting the CaRFG standards will result in a net increase in the ozone forming potential of the total emissions, excluding emissions of NOx, from motor vehicles compared to the total emissions excluding emissions of NOx from the same vehicles operating on fully complying CaRFG that contains 2.0 wt.% oxygen from an oxygenate other than ethanol. This determination is to be based on independently verifiable automobile exhaust and evaporative emission tests performed on a representative fleet of automobiles.

Some Board members expressed concern about triggering the RVP exemption for gasoline containing 10 vol.% ethanol, with the resulting increase in mass evaporative emissions, before having the opportunity to consider whether to make the Health and Safety Code section 43830(g) finding that would eliminate the RVP exemption. The staff had indicated that it was evaluating the results of a recently completed 12-car test program (the "ARB Ethanol Test Program") comparing the exhaust and evaporative emissions from vehicles operating on 10 vol.% ethanol with an RVP exemption and the emissions from the same vehicles operating on fully complying CaRFG with 2.0 vol.% oxygen from MTBE, along with other emission test data. There had been insufficient time following completion of the ARB Ethanol Test Program for staff to provide a full report at the August 27, 1998 Board meeting on its evaluation of the test data relevant to the emissions associated with the RVP exemption. However, the staff advised that it planned to report at the Board's December 10-11, 1998 meeting on the emissions impact of the RVP exemption, and to recommend whether the Board should at that time make the Health and Safety Code section 43830(g) finding.

After considering the testimony from interested parties at the August 27, 1998 hearing, the Board unanimously approved Resolution 98-37, in which the Board adopted all of the amendments proposed by staff, except for the increase of the maximum oxygen cap in section 2262.5(b), title 13, CCR and the conforming amendment to the Predictive Model Procedures reflecting the change in the oxygen cap. The Board continued consideration of the amendment raising the maximum oxygen content cap to the Board's December 10-11, 1998 meeting, at which time the public would be afforded an additional opportunity to comment. The amendments other than the increase in the oxygen content cap were filed with the Office of Administrative Law (OAL) September 4, 1998. They were approved by OAL September 21, 1998, and became effective the same day.

The December 11, 1998 hearing. On November 16, 1998, the ARB issued a notice announcing that the public hearing to consider raising the oxygen cap from 2.7 to 3.5 wt.% would be continued at the Board's two-day meeting scheduled for December 10 and 11, 1998. This notice, and an attached copy of the original notice for the August 27, 1998 hearing, were mailed

to the ARB's list of persons interested in ARB fuels regulations. The ARB also issued a separate notice that the Board would consider, at its December 10-11, 1998 meeting, a staff recommendation that the Board make the Health and Safety Code section 43830(g) determination.

At its December 11, 1998 meeting, the Board first considered the staff's recommendation that the Board make the Health and Safety Code section 43830(g) determination on the comparative ozone-forming potential of elevated-RVP gasoline containing 10 vol.% ethanol. This recommendation was based on the results of the ARB Ethanol Test Program, which compared the emissions from the same motor vehicles operating on two fuels blended from the same base gasoline — one blend fully complying with the CaRFG regulations and oxygenated with 11 vol.% methyl tertiary butyl ether (MTBE) to achieve an oxygen content of about 2.0 wt.%, and the other oxygenated with 10 vol.% ethanol, resulting in an elevated RVP.

In the ARB Ethanol Test Program, the elevated RVP gasoline containing 10 vol.% ethanol resulted in overall exhaust and evaporative emissions (excluding NOx) that had an ozone-forming potential about 17 percent higher than the ozone-forming potential of the emissions from the fully complying CaRFG, when the reactivity of CO emissions is accounted for and running loss evaporative emissions are estimated. These results are consistent with other test programs that have shown that the substantial increase in mass evaporative emissions from the 1 psi increase in RVP caused by the addition of 10 vol.% ethanol will overwhelm the mass exhaust emission reductions due to the higher oxygen content of such a fuel. The other test programs have also shown that the difference in the reactivity of evaporative and exhaust emissions is not substantially affected by the use of oxygenates and the type of oxygenate. After considering the staff presentation and public comment, the Board adopted Resolution 98-78, in which it made the comparative ozone-forming determination identified in Health and Safety Code section 43830(g) and accordingly eliminated the statutory exemption from the Board's RVP standard for gasoline containing 10 vol.% ethanol.[1]

The Board then turned to the hearing on the proposal to amend the CaRFG regulations by raising the oxygen content cap. After considering the staff presentation, written submissions and oral comment from the one party wishing to testify, the Board unanimously passed Resolution 98-79, in which to Board adopted the amendments increasing the oxygen content cap from 2.7 to 3.5 wt.%.

The CaRFG regulations are part of California's State Implementation Plan (SIP) approved by U.S. EPA pursuant to Clean Air Act section 110 (42 U.S.C. §7410). For all state law purposes, the amendments increasing the oxygen content cap will become effective 30 days after filing with the Secretary of State or such earlier date specified by the Office of Administrative Law (OAL) at the ARB's request on a showing of good cause. In Resolution 98-79 the Board directed the Executive Officer to submit the amendments to U.S. EPA as a revision to the

[1] The hearing on the Health and Safety Code section 43830(g) determination was not part of the rulemaking to amend the CaRFG regulations, and the material from that hearing is accordingly not included in the rulemaking file.

California SIP, and to take whatever actions are necessary to assure prompt approval of the SIP revision by U.S. EPA.

Fiscal Impacts. The Board has determined that the amendments raising the oxygen content cap will not result in a mandate to any local agency or school district, the costs of which are reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code.

Consideration of Alternatives. The Board has determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed or would be as effective and less burdensome to affected private persons than the action taken by the Board.

II. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES

During the original 45-day public comment period, the Board received written comments from the American Methanol Institute (AMI), the Western States Petroleum Association (WSPA), and Chevron Products Company (Chevron); written comments in connection with the continued December 11, 1998 hearing were also received from AMI and WSPA. At the initial public hearing on August 27, 1998, oral comments were provided by AMI, WSPA, Chevron, the National Resources Defense Counsel (NRDC), the Coalition for Clean Air, and Tom Koehler representing the ethanol industry. The only person who testified at the December 11, 1998 hearing was Neil Koehler.

Set forth below is a summary of each objection or recommendation specifically directed at the proposed amendments increasing the oxygen content cap or to the procedures followed by the ARB in proposing or adopting the amendments, together with the agency response. Comments in connection with the August 27, 1998 hearing on amendments other than the increase of the oxygen content cap were summarized and addressed in the Final Statement of Reasons for the amendments adopted at that hearing, and are not included in this document.

1. Comment: We are concerned by the proposal to raise the maximum oxygen cap to 3.5 wt.% at the August 1998 hearing because such a change would trigger a statutory RVP exemption for ethanol blends created in 1991 but made inapplicable by the existing predictive model. This outcome is not consistent with the ARB's pledge to maintain "emissions equivalence" in the CaRFG flexibility process. Nor is it sound economic or regulatory practice, since no single oxygenate or gasoline formulation should be exempt from California's clean air standards. It is also unnecessary. Because of these considerations, we propose that the Board should continue this hearing until staff is prepared to make the necessary finding on the RVP exemption. (AMI)

Immediate action in August on raising the maximum oxygen content prior to considering the RVP exemption finding would be premature. (Coalition for Clean Air)

The Board should hold off on increasing the maximum oxygen content cap in August, and take it up again in December. (NRDC)

Agency Response: As discussed above, the Board decided to postpone consideration of the proposal to raise the maximum oxygen content cap until the December Board meeting, when it could be considered after the Board considered and made the Health and Safety Code section 43830(g) determination eliminating the RVP exemption for 10 vol.% ethanol blends.

2. Comment: Regarding other environmental effects of 3.5 wt.% oxygen (10 vol.% ethanol) blends, we would like to submit the attached Malcolm Pirnie report on "The Fate and Transport of Ethanol in the Environment," for your information. While not directly related to the oxygen cap, it may bear on your CEQA analysis for the proposed regulation. Much of the current debate over oxygenates revolves around water quality impacts and concerns. This report (one in a series, the next one concerning methanol) suggests that ethanol causes toxic components of gasoline spills (benzene, toluene, ethylbenzene and xylenes — "the BETX plume") to migrate 27 percent further because of the preferential biodegradation of ethanol near the gasoline spill location. In short, some of the problematic aspects of MTBE in groundwater are also present with ethanol blends. Of course, that also underscores the continuing need to prevent, contain and clean-up gasoline spills regardless of oxygenate type. (AMI)

Agency Response: The amendments change the maximum amount of ethanol that may be used in a batch of CaRFG using the predictive model from about 7.4 vol.% ethanol to 10 vol.% ethanol. While the amendments give refiners additional flexibility in meeting the CaRFG requirements, we do not expect them to appreciably increase the amount of gasoline that is oxygenated with ethanol. Further, to the extent the amendments could result in such an increase, the ethanol would most likely be replacing MTBE and the commenter does not indicate that the groundwater risks with ethanol are greater than those with MTBE.

3. Comment: While we support raising the oxygen cap in the CaRFG regulations, it is very important to note that lifting the oxygen content cap in itself does nothing to aid in the introduction of ethanol into California gasoline. It is economically impossible to produce enough sub-grade RVP gasoline to add ethanol to. Thus the role of ethanol in California gasoline is totally contingent upon RVP flexibility, which can be accomplished without degrading the environment. (Neil Koehler)

Agency Response: The staff plans to evaluate further changes to the CaRFG regulations with the objective of making it easier to produce complying nonoxygenated fuel, and also providing a greater emphasis for using ethanol as an oxygenate by recognizing and accounting for any emission benefits. But the adverse impact on ozone-forming potential from a 1 psi RVP waiver for gasoline blended with ethanol is clear, and we do not expect that the Board's determination in this regard will change.