

ATTACHMENT A

STATE OF NEW HAMPSHIRE
Department of Environmental Services

Internal Memorandum

TO: Robert W. Varney
Commissioner

FROM: Kenneth A. Colburn, Director
Air Resources Division

DATE: March 8, 2001

RE: State Level Regulation of Ethers in Gasoline

Purpose

As you know, legislation is proposed this session in New Hampshire to restrict the use of gasoline ethers such as methyl tertiary-butyl ether (MTBE) in the State (i.e., HB 755, HB 758). The purpose of this memo is to examine the implications of regulating the total ether content of gasoline at the state level.

During the last three years, there have been significant efforts in New Hampshire's Legislature to reduce and/or phase-out the use of MTBE as a gasoline additive because of its negative impact on the State's water resources. Specifically, MTBE, when introduced into the environment, travels much more readily in groundwater than gasoline, and is not broken down (biodegraded) as rapidly as most other components of gasoline. Although the legislative focus has generally been on MTBE, its negative characteristics are believed to be shared by other gasoline ethers, including tertiary-amyl methyl ether (TAME), ethyl tertiary-butyl ether (ETBE), and di-isopropyl ether (DIPE). Because of their favorable blending characteristics (e.g., relatively high octane, low vapor pressure), ethers have been used in gasoline for over 20 years. However, the use of ethers, and MTBE in particular, was dramatically increased in 1995 with the introduction of federal reformulated gasoline (RFG) requirements as part of the 1990 Amendments to the federal Clean Air Act (CAA).

DES's own efforts to monitor the presence of ethers in gasoline, and to track the presence and treatment of ethers in ground and surface water supplies, show that removing ethers from gasoline could reduce contamination of New Hampshire's water resources resulting from gasoline spills and leaks. However, state legislation to control individual fuel components conflicts with federal statutory and regulatory requirements relative to fuel formulation, and may have significant environmental, regulatory, and economic ramifications.

Background

MTBE was first introduced in the 1970s to help replace lead in gasoline. MTBE's desirable blending characteristics, its relatively low cost, and its favorable impact on octane rating made it an attractive gasoline additive. As a result, it was mixed with conventional gasoline at concentrations of approximately 2% by volume in regular grades to 9% in premium grades. In addition, because its high oxygen content enables more complete combustion (reducing CO emissions, particularly in carbureted engines), and its relatively low vapor pressure reduces evaporative emissions (reducing VOC and air toxics emissions), MTBE was chosen by most refiners to meet the federal oxygenate requirement (minimum 2% oxygen by weight) for RFG when it was mandated in the CAA. The CAA requires the use of RFG in certain ozone nonattainment areas, and RFG was adopted for use in New Hampshire's ozone nonattainment areas (i.e., the State's four southeastern counties) in 1991 to help meet New Hampshire's emission reduction obligations under the CAA. The presence of MTBE (and other ethers) in RFG also dilutes the concentration of more harmful toxics and carcinogens that are normally present in gasoline, such as benzene.

It is not clear when other ethers (TAME, ETBE, DIPE) were introduced into gasoline, but DES studies have shown that they are often present in both conventional gasoline and RFG. Although commissioned for the purpose of studying the volume of RFG that is delivered outside areas where it is required, DES's *Study of Reformulated Gasoline Distributed Outside of New Hampshire's Four County Nonattainment Area*,¹ published in December 2000, revealed that other ethers are used in gasoline supplied in New Hampshire. Out of 180 samples tested, 162 were found to contain TAME, in concentrations varying from 0.2% to 5.5% by volume. ETBE and DIPE were found in only a few samples, generally in low concentrations. These findings do, however, indicate that efforts to reduce MTBE contamination in water resources should include consideration of all gasoline ethers (TAME, ETBE, DIPE).

Control of Gasoline Additives

Designed to maintain consistent national fuel specifications, the language of Section 211(c) of the CAA leaves little flexibility for states to regulate fuels and fuel additives. Section 211(c)(4)(A) of the CAA specifically prohibits states from prescribing or attempting to enforce any control or prohibition of a fuel or fuel additive.

Section 211(c)(4)(C) describes how a state can petition EPA, via a revision of its State Implementation Plan (SIP), to allow it to regulate a fuel additive (a process referred to as "securing a Section 211(c) waiver"). However, EPA is authorized to approve such requests only if it determines that state regulation is necessary to achieve or maintain a national ambient air quality standard (NAAQS). MTBE is used a component of gasoline

¹ The *Study of Reformulated Gasoline Distributed Outside of New Hampshire's Four County Nonattainment Area* is available on the DES web site. See <http://www.des.state.nh.us/ard/rfgstudy>.

by refiners and is not required to be a part of either conventional gasoline or RFG. The performance requirements of gasoline do not change whether MTBE is used or not. In addition, as an oxygenate, MTBE is considered to be helpful in reducing carbon monoxide (CO) emissions from vehicles.² Thus, it would be extremely difficult to make a case that reductions in the use of MTBE in New Hampshire would contribute to attainment or maintenance of a NAAQS.

The Administrator of the US Environmental Protection Agency (EPA) has the authority to control or prohibit fuel additives, but only if an acceptable justification for the action is provided, including consideration of all available relevant medical and scientific data. In response to the growing concerns regarding MTBE in water, EPA appointed an independent Blue Ribbon Panel of experts to investigate the use of oxygen additives in gasoline. In the final report, entitled *Blue Ribbon Panel Findings and Recommendations on the Use of Oxygenates in Gasoline*,³ the Panel called for a significant reduction in the use of MTBE in gasoline, and recommended that Congress and EPA take action to lift the oxygen mandate. EPA has shown support for the Panel recommendations and has encouraged Congress to pass legislation that responded to the Panel's recommendations. To date, legislation that would solve this problem has not moved forward. EPA is also taking action to control MTBE under the Toxic Substances Control Act (TSCA) as a backup to the needed Congressional action. However, a TSCA rulemaking is procedurally burdensome and may take several years to complete.⁴

Some states have adopted rules to regulate MTBE. However, in the absence of an approved Section 211(c) waiver, a state may not be able to defend enforcement of such a rule, and could be subject to litigation for implementation of a rule that conflicts with federal law. Regardless, EPA would continue to enforce RFG in New Hampshire as it has traditionally done. If gasoline supplied to an RFG area continues to meet the RFG specifications, EPA probably won't take any action. However, if a state rule on gasoline resulted in deliveries that did not meet RFG specification, a supplier/distributor who delivered such fuel (or a retailer who sells it) could be subject to federal fines of \$25,000 per day. Given the alternative between meeting the intent of a state rule that is not enforceable and complying with federal requirement that is, suppliers would almost certainly choose the latter.

Two notable instances where states have proposed restricting or banning the use of MTBE and been challenged are California and New York. In both cases, the Oxygenated Fuels Association (OFA, which represents MTBE manufacturers) has filed complaints against the states for controlling of a fuel additive in violation of Section 211(c)(4)(A).

² Oxygenated fuels were introduced in the late 1980s as a mitigation strategy for CO nonattainment areas (e.g., Denver, New York City). The presence of oxygenates, such as MTBE, in gasoline helps promote more complete combustion of the fuel, which reduces CO emissions, particularly in older technology vehicles. However, the CO benefit of oxygenates in gasoline is negligible in today's cars, and the CO benefit in the overall fleet is reduced as older vehicles are replaced by new vehicles.

³ Report of EPA's National Blue Ribbon Panel on MTBE, see <http://www.epa.gov/otaq/consumer/fuels/oxypanel/rec721.pdf>.

⁴ See also <http://www.epa.gov/otaq/consumer/fuels/mtbe/f00010.htm>.

Neither suit has yet been resolved, but it does appear that OFA has a strong case in both states based on Section 211(c) of the CAA and federal supremacy.

Some states that have implemented rules to regulate fuel characteristics and/or components have not been challenged. The State of Minnesota adopted a rule that effectively bans MTBE as a gasoline additive. The state did not seek a Section 211(c) waiver. The State has not been challenged on this rule, in part because there is a ready supply of ethanol (and political support for its use) to meet the oxygen requirements of RFG where it is required. The State of Maine has implemented a rule which controls the vapor pressure of gasoline in certain parts of the state. Even though this rule is not technically enforceable under Section 211(c), the gasoline industry has complied voluntarily with the rule. In addition, Maine represents only a small portion of the regional gasoline market, and any party who might be inclined to challenge the rule has thus far chosen not to do so.⁵

Potential Economic Impacts

When DES studied the distribution of RFG in New Hampshire last fall,⁶ some combination of ethers was found in all 180 samples analyzed. Of the 140 samples taken from areas outside where RFG is required,⁷ all contained some concentration of MTBE and/or other ethers, although only seven of the samples contained enough oxygen (2% by weight) to possibly certify as RFG. The gasoline supply and distribution industry has testified that virtually all gasoline (both RFG and conventional) currently supplied to New Hampshire, and the region, contains some concentration of MTBE. Thus, a state prohibition on gasoline ethers would in effect require a boutique fuel that is not currently available in this region, making it more likely that such a rule, or its enforcement, would be challenged.

Given a reasonable amount of time to respond, it may be possible that conventional gasoline (which has no specific requirement relative to the oxygen content) without ethers can be supplied to New Hampshire. However, because RFG is presently required to contain 2% oxygen by weight, the supply of gasoline that meets the standards for RFG without any ether additives is much more in question. In addition, MTBE is used as an octane enhancer in gasoline. The extent to which there may be a problem for refiners to meet their octane goals in gasoline without the option of ethers is unknown.

The two major reports completed to date which assessed alternative gasoline formulations and oxygenate options are NESCAUM's *RFG/MTBE Findings and*

⁵ Maine's unique status with respect to policy and fuels is discussed further in a separate memorandum.

⁶ The *Study of Reformulated Gasoline Distributed Outside of New Hampshire's Four County Nonattainment Area* is available on the DES web site. See <http://www.des.state.nh.us/ard/rfgstudy>

⁷ RFG is presently required to be sold in Hillsborough, Merrimack, Rockingham, and Strafford Counties, also referred to the State Implementation Plan as New Hampshire's "four county area." The four county area includes all of New Hampshire's classified 1-hour ozone nonattainment areas. This area represents roughly 70% of the State's gasoline consumption.

*Recommendations*⁸ and EPA's *Blue Ribbon Panel Findings and Recommendations on the Use of Oxygenates in Gasoline*⁹. Both reports concluded that MTBE and ethanol are the only practical alternatives for meeting the oxygenate mandate in the short term (2-4 years). Unless the oxygenate mandate in RFG is relaxed through Congressional action, a prohibition or control on ethers in gasoline would effectively create an ethanol mandate. Because of its alcohol characteristics (e.g., affinity for water, increased evaporability), ethanol must be transported and stored separately from other products, and requires a specially refined base gasoline product, known as RBOB,¹⁰ for blending. In addition, a terminal operator must modify the facility (i.e., install additional plumbing) to allow blending of the ethanol.

In the summer, the vapor pressure (measure of evaporability relative to temperature) of gasoline is required by EPA to be lower than in the winter to help limit evaporative emissions of volatile organic compounds (VOC) from gasoline. Ethanol tends to raise the overall vapor pressure when blended with gasoline, thus RBOB must have a lower base vapor pressure than comparable feedstock gasoline used for MTBE blending. RBOB can be produced cost-effectively for wintertime blending with ethanol because the vapor pressure requirements are not as restrictive. However, the cost of producing RBOB for summertime blending (when the vapor pressure of gasoline is required to be lower) has made ethanol use in the summer economically infeasible in the Northeast because it cannot compete with MTBE/ether blends.

Ethanol is used predominantly in areas where it is produced, such as in the Midwest, where ethanol is in ready supply, support for its use is strong, and the oil industry has responded to the demand for RBOB. At the present time, the only supplier using ethanol in the Northeast is Getty, who made a commitment over ten years ago to use ethanol in wintertime gasoline blends in some areas along the east coast. Getty originally made the commitment because its projections suggested that they could supply ethanol blends cost effectively. Getty's supplier of ethanol is Archer-Daniels-Midland, which transports it by both rail and barge to Getty terminals. The RBOB necessary to blend with the ethanol is supplied via special contract with a single refinery in Lyndon, New Jersey, and thus ethanol blending is limited to areas proximal to that particular refinery. Conversations with officials from Getty indicate that none of the gasoline distributed to its facilities in New Hampshire contains any ethanol. DES testing of gasoline samples this past fall (see footnote 1) supports that conclusion. An additional downside to ethanol blending from the standpoint of terminal operations is that separate storage must be dedicated to ethanol at a time (winter) when extra storage for heating oil would be extremely useful.

⁸ Prepared by NESCAUM at the request of New Hampshire Governor Jeanne Shaheen in her capacity as Chair of the New England Governor's Conference, see <http://www.nescaum.org/RFG/RFGPh2.shtml>.

⁹ Report of EPA's National Blue Ribbon Panel on MTBE, see <http://www.epa.gov/otaq/consumer/fuels/oxypanel/rec721.pdf>.

¹⁰ RBOB is Reformulated Blend for Oxygenate Blending. It contains no oxygenate, has low octane, and is made specifically for blending with ethanol.

In recent bills proposing to control MTBE, the gasoline supply and distribution industry has testified to the operational complications of supplying gasoline blends to New Hampshire that are not presently available in this region. In addition, potential price and supply volatility increases as the number of suppliers decreases. Given New Hampshire's small share of the regional gasoline market, the number of suppliers willing to make a special "boutique" gasoline for the State is likely to be limited. It is extremely difficult to predict the impact that requiring a unique gasoline for New Hampshire would have on supply and pricing.

Potential Health and Environmental Impacts

There may also be unanticipated health and environmental impacts from regulation of gasoline ethers. NESCAUM's report (*RFG/MTBE Findings and Recommendations*, see footnote 4) found, among other things, that:

"...gasoline refiners that supply the Northeast have overcomplied with RFG toxic performance standards by more than 75 percent, in part due to the presence of MTBE. This substantial margin of overcompliance may be lost if MTBE (which is used both as an oxygenate and an octane enhancer) is reduced or eliminated from RFG."

In order to prevent increases in air toxics that are likely to accompany decreases in MTBE and other ethers, it may be necessary to seek additional controls on those components of gasoline that directly result in air toxic emissions (e.g., benzene, aromatics, and olefins). However, as mentioned previously, approval of a Section 211(c) waiver request is contingent on EPA finding that such a request is necessary to achieve attainment of a NAAQS. Since there is no NAAQS for air toxics, a Section 211(c) waiver request that includes measures designed solely to reduce emissions of air toxics is not likely to be approved by EPA.

The impacts to groundwater from spills of ethanol blend gasolines have not been fully studied. Preliminary studies by the New England Interstate Water Pollution Control Commission (NEIWPC) on the characteristics of ethanol, storage issues, and impacts resulting from releases of gasoline containing ethanol suggest that, while ethanol blends overall may be better than MTBE/ether blends from the standpoint of groundwater contamination, other toxic constituents of gasoline (e.g., benzene, toluene, ethylene, xylene) may actually travel further through the groundwater with ethanol blends. This is because organisms in the soil which break down petroleum products prefer ethanol over other components of gasoline. However, the NEIWPC report is expected to conclude that this result would still be preferable to having MTBE present in gasoline.

Conclusion

At the present time, virtually all gasoline supplied to New Hampshire contains at least some MTBE and/or other ethers.¹¹ In addition, because MTBE is the additive of choice for meeting the federal oxygenate mandate in RFG, gasoline in areas of New Hampshire where RFG was adopted (Hillsborough, Merrimack, Rockingham, Strafford counties), contain significantly higher levels of MTBE and other ethers.

Because of the potential for contamination of water resources by MTBE and other ethers from releases of gasoline into the environment, the desire to take action at the state level to ban or restrict their use is justified. However, the existing language of federal statute, specifically Section 211(c) of the federal CAA, places significant restrictions on states' ability to regulate the use of ethers in gasoline. Legally, a state can only enforce its own regulation of fuels if it has EPA's blessing (an approved waiver from Section 211(c) of the CAA). The States of New York and California have adopted state bans on MTBE, and their actions have been challenged by MTBE stakeholders, who appear to have a strong case. New Hampshire should monitor these cases closely to help assess its ability to defend potential actions to regulate ethers in gasoline and the associated legal expenses.

In addition to possible legal challenges, because virtually all gasoline supplied in this region contains some concentration of ethers (primarily MTBE), the implementation of a rule that regulates the ether content of gasoline may create a "boutique" gasoline in New Hampshire. Some states, including Minnesota and Maine, have implemented rules which regulate gasoline formulation in an effort to reduce the use MTBE as a fuel additive, and the gasoline industry has complied voluntarily. This is believed to be because, in both instances, the formulation required has been reasonably available in the region. A ban on ethers in New Hampshire would effectively be a requirement to supply a new gasoline formulation, particularly in areas where RFG is required (i.e., New Hampshire's four county area, roughly 70% of the State's gasoline consumption). Requiring a gasoline that is not commercially available may have significant impacts on the supply and pricing of gasoline, and the extent of these impacts are difficult to predict.

¹¹ See the DES special study "*Study of Reformulated Gasoline Distributed Outside of New Hampshire's Four County Nonattainment Area*", available on the DES website: <http://www.des.state.nh.us/ard/rfgstudy>.