

**TESTIMONY OF
CYNTHIA C. DOUGHERTY
DIRECTOR, OFFICE OF GROUND WATER AND DRINKING WATER
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE**

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Thank you for the invitation to appear here today. I am pleased to discuss the activities that EPA is undertaking to address environmental issues associated with methyl tertiary-butyl ether (MtBE).

MtBE has been detected at elevated concentrations in groundwater near leaking fuel tanks throughout California, and this has raised concerns regarding the occurrence of MtBE in drinking water supplies. The federal government is addressing questions about MtBE on many fronts, and is working to accurately understand and characterize the scientific and policy issues. With respect to drinking water, this work will substantially improve our knowledge of the occurrence, potential for human exposure, and health effects of MtBE in drinking water sources across the country. We believe the data obtained from these activities should help increase our understanding of MtBE and other potential fuel oxygenates to better inform our decisions. In addition, yesterday EPA made available a Drinking Water Advisory on MtBE to provide guidance and information to States and local communities as they make important water supply and management decisions if MtBE is detected in a drinking water supply.

CLEAN AIR ACT

As you know, in the 1990 amendments to the Clean Air Act (CAA), Congress mandated the use of reformulated gasoline (RFG) in those areas of the country with the worst ozone or smog problems. The RFG program, which began January 1, 1995, is currently required in ten areas and voluntarily implemented in another twenty-two (these thirty-two areas are in a total of eighteen States and the District of Columbia). As directed in the CAA, RFG must contain a minimum oxygen content of 2 percent by weight, a maximum benzene content of 1 percent, and no lead, manganese, or other heavy metals. In June 1996, California required statewide use of its Phase II RFG, the

“cleaner burning gasoline,” which has stricter standards than the federal RFG requirements. RFG accounts for about 30 percent of the gasoline nationwide.

RFG is required to reduce the emissions of both ozone-forming volatile organic compounds (VOCs) and toxic pollutants by 15 percent with no nitrogen oxide (NOx) increase. The refiners' 1995/96 fuel data submitted to EPA indicate that the emissions benefits exceed the required reductions. EPA's 1996 Air Quality Trends Report showed that various toxic air pollutants, such as benzene, a known carcinogen, declined significantly between 1994 and 1995. Analysis indicates that this progress may be attributable to the use of RFG. Starting in the year 2000, the required emission reductions are substantially greater, at about 27 percent for VOCs, 22 percent for toxics, and 7 percent for NOx.

Ethanol and MtBE are the primary oxygenates used in the RFG program to meet the oxygen content requirement. MtBE is not subsidized and is used in about 84 percent of RFG supplies because of economic reasons and its blending characteristics. MtBE is also often used in gasoline at lower concentrations as an octane enhancer in place of lead to reduce engine knocking.

On November 21 of this year, Charles Freed, Director of EPA's Fuels and Energy Division, testified before the Assembly Natural Resources Committee of the California Legislature on the winter oxygenated gasoline program and its environmental benefits and issues. I would like to repeat his testimony that it is EPA's position that the oxygenated fuels program and the reformulated gasoline program have resulted in large emission reductions, boosted the use of nonpetroleum and renewable fuel components, and improved air quality in our cities.

RESEARCH

EPA and other federal agencies have been conducting research to improve our knowledge of the issues related to MtBE. The White House Office of Science and Technology Policy (OSTP) convened an Interagency Oxygenated Fuels Assessment Steering Committee in May 1995 upon EPA's request. In February 1996, OSTP released its draft assessment of the wintertime oxygenated fuels program which looked at a broad range of issues related to the use of oxygenates in gasoline, including water quality impacts. The National Academy of Sciences (NAS), an independent body of

scientists, was then asked by EPA to evaluate and peer-review OSTP's draft Oxygenated Fuels Assessment Report. NAS's comments were used by the Committee in developing the final document that was released in June 1997, entitled "Interagency Assessment of Oxygenated Fuels." As a result, this document is a thorough, comprehensive analysis of issues related to oxygenates in gasoline, including health effects, vehicle performance, water quality, and air quality benefits.

The final OSTP report stated that, "MtBE has been detected in 51 public drinking water systems to date based on limited monitoring in 5 States, however, when detected, the concentrations of MtBE were for the most part below the lower limit of the current EPA health advisory. This indicates that the consumption of drinking water was not a major route of exposure for these few systems." The OSTP report also noted that, "Because of the very limited data set for fuel oxygenates in drinking water, it is not possible to describe for the Nation MtBE's occurrence in drinking water nor to characterize human exposure from consumption of contaminated drinking water." The OSTP report concluded that more monitoring and research would be needed to better characterize major sources of MtBE to the environment and to enable an exposure assessment for MtBE and drinking water. The report also addressed the comparative risks of MtBE to gasoline, and stated that "the estimated upper-bound inhalation cancer unit risks for MtBE are similar to or slightly less than those for fully vaporized conventional gasoline; substantially less than that for benzene, a constituent of gasoline that is classified as a known human carcinogen; and more than 100 times less than that for 1,3-butadiene, a carcinogenic emission product of incomplete fuel combustion."

EPA's Air program, pursuant to section 211 of the Clean Air Act, recently notified the fuels industry of the health effects testing it is required to perform for conventional and oxygenated gasoline (including MtBE). This exposure assessment and toxicology testing will commence shortly after the public comment period and will result in a greater understanding of the comparative risks associated with inhalation exposures to conventional and oxygenated gasoline fuels. The results of this research effort also may be helpful in characterizing risk in water by extrapolating the data to oral ingestion risk. Once this research is completed, the Agency-directed peer review will determine whether these fuels have been adequately tested or if more research will be required.

EPA is also focusing research on drinking water issues related to MtBE. As a result of the OSTP recommendation for additional information, an Agency-wide task force has been formed to develop a "Research Strategy for Oxygenates in Water." Building upon the findings of the OSTP report, the Strategy will identify key issues and describe a strategy to obtain information to support health risk assessment and risk management in the areas of environmental occurrence, source characterization, transport and transformation, exposure, toxicity, and remediation. The identified research will build a stronger database to better assess the potential health risks related to oxygenates in water, and further our knowledge on occurrence, mitigation and remediation.

On October 7, 1997, EPA convened a day-long meeting of over 50 experts -- including representatives from industry, academia, consultants, and other government agencies -- to review a draft of the Strategy. The information produced in this workshop is being used to help finalize the research strategy for fuel oxygenates, that we hope will serve to coordinate efforts by various organizations, public and private, to address the issues related to oxygenates in water. The strategy will go out for public comment in January. I know the research that is being developed in the research partnership between some members of the Association of California Water Agencies (ACWA) and MtBE producers is being coordinated with the research strategy to prevent duplication and ensure effective coverage of needed subjects.

THE RESOURCE CONSERVATION AND RECOVERY ACT

Underground Storage Tanks Program

In addition to research, EPA has several programs that address MtBE. The primary source of MtBE detections at high concentrations is leaking underground fuel storage tanks, and possibly transmission facilities. About one million underground storage tanks (USTs) are in use in the United States that are subject to regulation under RCRA Subtitle I. About 76,000 of them are in California. Most of them are used for motor vehicle fuels--either by gasoline stations or by non-marketers having on-site refueling facilities for their own car, truck, or bus fleets. States report that USTs are the

most common source of groundwater contamination and that petroleum is the most common contaminant.

EPA's ongoing efforts under our Underground Storage Tank (UST) Program are designed to prevent further contamination of water supplies by petroleum, including gasoline containing MtBE. Existing tanks are required to be upgraded, replaced, or closed by December 1998 to meet the spill, overfill, and corrosion requirements of federal law, and in California are also required to be lined or double-walled. EPA regulations have required leak detection methods to be in place for all USTs since 1993. Both EPA and the States have the authority to enforce these regulations. In addition, EPA's UST Office is working closely with States to assist them in addressing MtBE when petroleum leaks are remediated. The Agency is also coordinating with the U.S. Department of Transportation on its pipeline leak prevention program.

States have the primary responsibility for implementation and enforcement of the UST regulations although EPA also maintains authority to enforce these regulations. EPA recognizes that, because of the size and diversity of the regulated community, State and local governments are in the best position to oversee USTs. Subtitle I of RCRA allows State UST programs approved by EPA to operate in lieu of the federal program.

EPA has focused on helping State and local governments build programs capable of ensuring that USTs do not threaten human health or the environment. EPA provides financial assistance to States through cooperative agreements, as well as providing technical and regulatory assistance for the purpose of building State programs. For instance, in a joint undertaking in May 1997, States and EPA inspected about 10,000 UST facilities, primarily to check on compliance with release detection requirements that have been in effect since December 1993. State and EPA inspectors found that about 68 percent of UST facilities were in full compliance. In addition, through data collected during this undertaking as well as data that EPA has begun collecting from States, EPA estimates that about half of UST facilities are now in compliance with the 1998 requirements. EPA Regional Offices are working with States to develop State-specific plans for increasing the compliance rate and for taking post-deadline enforcement action. Where States cannot or will not enforce the requirements,

EPA can do so. The Agency is developing a plan for federal action to support and augment State enforcement.

The Santa Monica Enforcement Action

In May 1996, after the City of Santa Monica had learned that its Charnock and Arcadia drinking water wellfields were contaminated with MtBE, the City of Santa Monica wrote to EPA requesting our assistance with addressing this problem. EPA staff attended Task Force meetings organized by the City to learn more about this problem that also was affecting the Southern California Water Company which delivered water to nearby Culver City. By December 1996, the City of Santa Monica's own initial efforts to obtain the cooperation of potentially responsible parties (including issuance of RCRA Section 7002 citizen suit notices) appeared to be unsuccessful. As a result, EPA decided to undertake a three-month assessment of the contamination problem including the appropriate role for the federal government.

In March 1997, after extensive consultation with the Los Angeles Regional Water Quality Control Board and the State Water Resources Control Board, EPA decided that it should play a role in addressing Santa Monica's MtBE contamination problem. EPA agreed to provide technical support and field oversight for the Arcadia wellfield investigation already being conducted by Mobil Oil Company under the supervision of the LA Regional Board. EPA also agreed to conduct a joint enforcement action with the LA Regional Board for the Charnock wellfield contamination.

In April, 1997, EPA and the LA Regional Board entered into a Memorandum of Understanding to define their relative roles and responsibilities with respect to the Arcadia and Charnock investigations. Beginning with this MOU, EPA and the Board ("the agencies") have developed a flexible and effective partnership to jointly address the two sites.

The agencies worked with the City and Southern California Water Company to develop uniform requirements for information submittal on historical fuels management practices and for the conduct of systematic field investigations. These requirements were issued to the potentially responsible parties (PRPs) on June 19, 1997. The

agencies held a meeting in Santa Monica on June 26, 1997 to discuss the requirements with the PRPs where about 80 people attended.

Site field work began at some sites in November. The agencies have completed initial reviews of workplans for all of the sites and second reviews are approximately 80 percent complete. The agencies are hopeful that all sites will have approved workplans and begin field work by the end of January 1998. All final investigation reports are expected by early April 1998. The agencies believe that this represents rapid progress in addressing a very complex hydrogeologic problem.

After the PRPs' investigation reports have been reviewed by the agencies, we will notify those PRPs who have been determined to have contributed to the Charnock Sub-Basin MTBE contamination. These notified PRPs will be required, hopefully in a settlement, but if not, through court action, to design and implement remediation which will bring the Charnock Sub-Basin back into beneficial use as a drinking water supply. EPA and the LA Regional Board plan to continue working jointly, in consultation with the impacted parties, to ensure this result.

Some interim remediation has begun at the Arcadia wellfield where a pump and treat system is operating in order to control further migration of contaminated groundwater from the site. Source control and removal is still in progress. To date, approximately 2,000 cubic yards of contaminated soil have been removed from the site.

SAFE DRINKING WATER ACT

In addition to authorities under RCRA, EPA is using authorities under the newly reauthorized Safe Drinking Water Act (SDWA) to address MtBE. The Safe Drinking Water Act Amendments of 1996 require EPA to publish a list of contaminants that may require regulation, based on their known or anticipated occurrence in public water systems. The amendments also require EPA periodically to make a determination of whether or not to develop regulations for at least five contaminants from this list (the first deadline for this determination is 2001). After consultation with the scientific community, including EPA's Science Advisory Board, the Office of Water published a

draft Contaminant Candidate List for public comment in the Federal Register on October 6, 1997 (62 FR 52194). MtBE is included on this list. If health effects and occurrence information indicates the need, EPA also has authority to issue interim regulations for any contaminant that presents an urgent threat to public health, prior to the statutory deadlines for the determination to regulate or not.

SDWA, as amended, also creates a new source water assessment program. States are required to assess the susceptibilities of each community's drinking water to sources of contamination, including a review of all potential sources of contamination such as underground storage tanks. With the results of these assessments, communities can develop measures to protect their water supply from these sources of contamination. Because these results must be reported to consumers in each community, protection measures can be tailored to address significant local concerns. The source water assessment program builds on the Wellhead Protection Program, which was created in the 1986 SDWA amendments, and is designed to protect ground water sources of drinking water. Forty-seven States and territories have Wellhead Protection Programs.

Occurrence, fate, and transport of MtBE are issues on which it is essential that we improve our current understanding. Several efforts are underway in this area. As you know, although the California Department of Health Services (DHS) advised public drinking water suppliers to monitor their sources of drinking water for MtBE in February 1996, it was not required by State regulation until February 1997. As of August 1997, 428 of 4,418 drinking water suppliers had sampled for MtBE. Fifteen suppliers have reported MtBE detections and 27 or 1.2% of the sampled sources detected MtBE. Most of the reported concentrations to date have been below the draft 1992 Health Advisory 20 to 200 micrograms per liter range.

The EPA Office of Water has also entered into a cooperative agreement with the United States Geological Survey (USGS) to conduct an assessment of the occurrence and distribution of MtBE in the 12 mid-Atlantic and Northeastern States. Like California, these States have used MtBE extensively in the RFG and Oxygenated Fuels programs. This study will supplement the data gathered in California and will indicate whether or

not MtBE has entered drinking water distribution systems or affected drinking water sources, and what types of pollutant sources are associated with detections of MtBE. We are preparing to begin data collection in early 1998.

The USGS also is continuing its National Water Quality Assessment (NWQA) program, which includes monitoring for VOCs, including MtBE, in storm water, shallow groundwater, and shallow and deeper ground water in selected areas of the country.

Finally, EPA released a Drinking Water Advisory on MtBE that will assist States and local communities in making important water supply and management decisions if MtBE is detected in a drinking water supply. This advisory is the latest of about 260 advisories issued in the twenty-year history of the advisory program. An advisory is not legally enforceable and is issued as guidance to water utilities and State and local health officials to provide them with information, when there is no standard, on chemical contaminants that can be present in drinking water.

MtBE is one of the unusual contaminants which appears to cause unpleasant taste and odor responses at concentrations in water below levels at which there is a health effects concern. The Advisory recommends that MtBE be controlled to levels in water that will protect the consumer acceptability of the water resource. The recommended levels will also provide protection of public health.

The Advisory provides an evaluation of current health hazard information and an evaluation of currently available data on taste and odor problems associated with MtBE contamination of water, as the latter affect consumer acceptance of the water resource. It does not recommend either a low-dose oral cancer risk number or a reference dose (estimated no effect dose for noncancer effects) due to certain limitations of available data for quantifying risk. Guidance is given on the concentrations at which taste and odor problems likely would be averted, and how far these are from MtBE concentrations at which toxic effects have been seen in test animals.

The Advisory recommends that keeping levels of contamination in the range of 20 to 40 : g/L or below to protect consumer acceptance of the water resource would be expected to provide a large margin of safety from any potential health effects. Taste and

odor values are presented as a range since human responses vary depending upon the sensitivities of the particular individual and the site-specific water quality conditions. These values are provided as guidance recognizing that water suppliers determine the level of treatment required for aesthetics based upon the customers they serve and the particular site-specific water quality conditions.

There are over four to five orders of magnitude between the 20 to 40 : g/L range and concentrations associated with observed cancer and noncancer effects in animals. There is little likelihood that an MtBE concentration of 20 to 40 µg/L in drinking water would cause adverse health effects in humans, recognizing that some people may detect the chemical below this range. Concentrations in the range of 20 to 40 : g/L are about 20,000 to 100,000 (or more) times lower than the range of exposure levels in which cancer or noncancer effects were observed in rodent tests. It can be noted that at this range of concentrations, the margins of safety are about 10 to 100 times greater than would be provided by an EPA reference dose (RfD) to protect from noncancer effects. Additionally, they are in the range of margins of safety typically provided by National Primary Drinking Water Standards under the federal Safe Drinking Water Act to protect people from carcinogenic contaminants.

The Advisory notes that occurrences of ground water contamination observed at or above this 20-40 µg/l taste and odor threshold -- that is, contamination at levels which may create consumer acceptability problems for water suppliers -- have to date resulted from leaks in petroleum storage tanks or pipelines, not from other sources.

Key research is anticipated to be published in 1998 that will enable EPA to utilize existing data from animal studies conducted by inhalation exposure to estimate human drinking water risk. This will address a major uncertainty and data gap that currently prevents risk estimates to be presented in the Advisory. When such data become available, the Office of Water will publish another Advisory that includes quantitative estimates for health risks.

In summary, EPA is deeply involved in a comprehensive range of activities to gather the best scientific understanding of MtBE we can, as quickly as possible, to enable us to help protect the nation's water supplies in an informed and responsible

manner. We believe this approach is faithful to the direction of Congress in the SDWA Amendments of 1996, to base our regulation of drinking water on “the best available, peer-reviewed science.” This focused and coordinated effort should assure you that EPA takes seriously the appearance of MtBE in water supplies, and that we and our partners are undertaking many activities to address concerns.

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