MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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To: Board of Directors (Engineering and Operations Committee--Information) (Water Planning and Resources Committee--Information) (Special Committee on Water Quality, Desalination, and Environmental Compliance--Information)

From: for General Manager

Submitted by: Mark D. Beuhler
Director of Water Quality

Subject: Methyl Tert-Butyl Ether (MTBE) in Groundwater and Surface Water

RECOMMENDATION

For information only.

EXECUTIVE SUMMARY

Methyl tert-butyl ether (MTBE) is a major component in gasoline. Its use is mandated by the United States Environmental Protection Agency (USEPA) and the California Air Resources Control Board to reduce air pollution emissions. Both groundwater and surface drinking water sources have been impacted by MTBE contamination from leaking underground fuel tanks (LUFTs) or by motorized water craft on surface water reservoirs. Importantly, the extent of contamination is not fully known and may be a more significant issue in the future. To address MTBE contamination issues, Metropolitan is implementing an aggressive MTBE action plan to identify vulnerable sites and potential treatment technologies, and to provide input into the regulatory process. The attached fact sheet outlines pertinent information on MTBE.

DETAILED REPORT

MTBE has been used in gasoline since 1979 as an antiknock agent, and more recently, its use has been mandated by the USEPA and the California Air Resources Control Board at higher concentrations in gasoline to control carbon monoxide and ozone levels in air. The use of MTBE in gasoline improves air quality, but MTBE chemical properties also provide a potential contamination threat to drinking water supplies. Because MTBE is highly soluble in

water, does not adsorb well to soil particles, and does not readily biodegrade, it can percolate through the ground into underground aquifers at rates similar to that of water. From data obtained to date, both groundwater and surface water are vulnerable to MTBE contamination.

The current USEPA draft drinking water health advisory for MTBE is within the range of 20 to 200 ug/L. The health advisory addresses the maximum concentration in drinking water that is not expected to cause any adverse effects over a lifetime of exposure, with a margin of safety. This health advisory is expected to be updated early this year. The California Department of Health Services (CDHS) has an interim action level of 35 ug/L, but CDHS is considering adjusting its action level based upon reassessment of the USEPA's health advisory. Overall, in order to determine the risk to human health, more health effects research is needed.

MTBE contamination affects both surface water and groundwater. Groundwater contamination is most commonly associated with releases from LUFTs and leaks from petroleum product pipelines. Considerable groundwater contamination has been detected from LUFTs and MTBE monitoring has been requested by the State Water Resources Control Board. Surface water contamination is attributed to exhaust emissions from recreational water craft and poor fuel handling practices. Other sources include extraction of MTBE from gas-phase concentrations in air by precipitation and storm runoff that can impact both groundwater and surface water.

Locally, the most serious groundwater contamination of MTBE observed to date has occurred in the City of Santa Monica's (City) groundwater supplies. Seven of the City's production wells have been closed due to MTBE contamination with levels as high as 610 ug/L. The impacts of this contamination are substantial and represent an annual cost of over $3,000,000 for replacement water. Moreover, the City has recently had to increase water rates to its consumers by 25%. Metropolitan recently received a letter from the City requesting assistance in evaluating different treatment alternatives to remove MTBE from drinking water.

As part of our proactive water quality activities, Metropolitan started monitoring local surface water supplies for MTBE in June 1996. MTBE levels at Lake Perris have reached 25 ug/L near the surface, and levels at other Metropolitan source water effluents have ranged from nondetect (reporting limit is 1.0 ug/L) to 2.8 ug/L. The surface water monitoring program will continue through 1997 to better characterize MTBE concentrations in surface water reservoirs.

Given the potential regional impacts and current local concerns regarding MTBE contamination, Metropolitan is currently finalizing an aggressive MTBE action plan. A copy of the action plan will be available at Board committee meetings. However, specific elements of the plan include:

- Determination of the taste and odor thresholds
- Evaluation of treatment alternatives
- Assistance to member agencies

- Assessment of impacts on reservoir recreation
- Input to regulatory agencies
- Assessment of potential impacts on groundwater resources

In summary, Metropolitan is strongly committed to protecting the public health and the aesthetic quality of water. Assisting the City would provide valuable information that could be used by our member agencies and their agencies, particularly as other regional groundwater and surface water supplies become threatened with MTBE contamination. Staff has begun working with the City to discuss joint participation opportunities, and will be reporting back to your Board on the progress.

MKD/MDB/LA/ly

Attachment

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MTBE Fact Sheet

- Second most manufactured organic chemical
  18 billion pounds per year
- 11% (by volume) in gasoline
- Use mandated by USEPA and California Air Resources Control Board
- Current USEPA Health Advisory is 20 to 200 ug/L
- Current CDHS action level is 35 ug/L
- Highly soluble in water
- Resistant to biodegradation
- Poorly adsorbed to soil particles
- Treatment remediation in drinking water not well developed