Association of State and Territorial

ASTSWMO

Solid Waste Management Officials

1999 State Symposium on MTBE and Fuel Oxygenates: Remediation Solutions

Session Highlights

Sponsored by the ASTSWMO MTBE Workgroup

July 26 - 27, 1999
Washington Court Hotel, Washington, D.C. 20001

State Symposium on MTBE and Fuel Oxygenates: *Remediation Solutions*

Sponsored by the ASTSWMO MTBE Workgroup

July 26 and 27th, 1999

AGENDA

Monday, July 26

7:30 a.m. - 8:15 p.m.	Registration - *Atrium Foyer*
8:15 a.m. - 8:30 a.m.	Welcome and Introductions - Jeff Kuhn, Montana DEQ Petroleum Release Section, ASTSWMO MTBE Workgroup - *Atrium Ballroom*
8:30 a.m. - 9:00 a.m.	Dr. John Zogorski , USGS - “USGS Research Findings, Fate and Occurrence Issues”
9:00 a.m. - 10:00 a.m.	Dr. Arturo Keller - University of California - “The UC Davis Report” - Significant Conclusions
10:00 a.m. - 10:30 a.m.	Refreshment Break - *Atrium Foyer*
10:30 a.m. - 11:30 a.m.	Dr. J. Michael Davis - US EPA Office of Research and Development (ORD) - “An Overview of Health Issues for Fuel Oxygenates”
11:30 a.m. - 1:00 a.m.	Luncheon - Speaker - Cynthia Dougherty - EPA Office of Groundwater and Drinking Water - *Ballroom 3 (Lower Level)*
1:00 p.m. - 1:30 p.m.	Dr. Jim Landmeyer, USGS - “Natural Attenuation Processes as Sinks for MTBE Contamination"”
1:30 p.m. - 2:00 p.m.	Mike Martinson, Delta Environmental Consultants/Rachael Sakata, US EPA Office of Groundwater and Drinking Water -“ State Regulatory Standards for MTBE”
2:00 p.m. - 2:30 p.m.	Krista Clark - Association of California Water Agencies (ACWA) - “MTBE Impacts to Drinking Water Municipalities in California”
2:30 p.m. - 3:00 p.m.	Tom Peargin - Chevron Research and Technology Company - “MTBE Remediation Options”

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Monday, July 26 (Cont.)

3:00 p.m. - 3:30 p.m.	Refreshment Break - *Atrium Foyer*
3:30 p.m. - 4:00 p.m.	Dr. John Zogorski, USGS/ Dr. Patricia Ellis, Delaware DNREC UST Branch - Summary Findings of the EPA Blue Ribbon Panel on MTBE
4:00 p.m. - 5:00 p.m.	Open Forum - Panel Discussion With Speakers
5:30 p.m. - 6:30 p.m.	Welcoming Reception - *Executive Room (Lower Level)*

Tuesday, July 27

8:00 a.m. - 9:15 a.m.	State Perspectives - *Atrium Ballroom*
8:00 a.m. - 8:15 a.m.	Fred McGarry - State of New Hampshire
8:15 a.m. - 8:30 a.m.	Ron Kern - State of Arizona
8:30 a.m. - 8:45 a.m.	Merlyn Hough - State of Oregon
8:45 a.m. - 9:00 a.m.	Greg Hatten - State of Kansas
9:00 a.m. - 9:15 a.m.	Steve Ales - State of Wisconsin
9:15 a.m. - 10:00 a.m.	Break Out Groups - Discussion - *Atrium Ballroom and Ballroom 3*
10:00 a.m. - 10:30 a.m.	Refreshment Break - *Outside Atrium Ballroom and Ballroom 3*
10:30 a.m. - 11:15 a.m.	Break Out Groups - Discussion
11:15 a.m. - 11:45 a.m.	Group Presentations and Discussion - *Atrium Ballroom*
11:45 a.m. - 12:00 p.m.	Closing Comments - Jeff Kuhn, State of Montana - ASTSWMO MTBE Workgroup

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SESSION HIGHLIGHTS

Monday, July 26

1. Dr. John Zogorski (USGS), "USGS Research Findings, Fate and Occurrence Issues"
(Refer also to the speaker handouts in the following section.)

Dr. Zogorski outlined four water quality issues as follows:

1. Low concentrations (< 20 ppb) of MTBE are found regionally in many areas of the US,
2. Some water supplies have had to be removed from service,
3. A variety of sources are responsible for groundwater impacts, and
4. Active remediation will be required at many sites.

In his conclusions, Dr. Zogorski stated that more education was needed, wellhead protection programs needed to consider MTBE, and that more extensive monitoring is required at sites. Dr. Zogorski also suggested that well purveyors develop short-term emergency plans, and long-term management strategies to deal with potential oxygenate impacts. Dr. Zogorski emphasized that depth-discrete sampling and monitoring at deeper depths is needed. The USGS would like regional studies to be undertaken for fate and transport and water quality. Finally, Dr. Zogorski encouraged all States to keep informed on ongoing activities and research.

2. Dr. Arturo Keller - University of California - "The UC Davis Report - Significant Conclusions"
(Refer also to the speaker handouts in the following section.)

Dr. Keller provided an overview of the UC Davis report and reported out on the following issues: air quality benefits, human health effects, ecological effects, fate and transport, extent of contamination of drinking water supplies in CA, urban air exposure, cost elements, and cost-benefit analysis. Dr. Keller emphasized that this was a low budget effort which had a rapid completion time. During the question and answer session, many States agreed that it was very important to understand water supply vulnerability.

3. Dr. J. Michael Davis - US EPA Office of Research and Development (ORD) - "An Overview of Health Issues for Fuel Oxygenates"

Dr. Davis stated that it is important to focus on all oxygenates. After providing an overview of some basic toxicology principles related to oxygenates, Dr. Davis stated that it was currently very difficult to develop health-based numbers for MTBE. Dr. Davis said that at a minimum, it may take five more years to complete laboratory studies. Dr. Davis then provided an overview of various national and international efforts in evaluating the toxicity of MTBE and other oxygenates. In his conclusions, Dr. Davis stated that it is very difficult to characterize health risks for MTBE. He also stated that sensory properties may override health concerns. Dr. Davis stated that adequate scientific data is needed.

4. Dr. Jim Landmeyer, USGS - "Natural Attenuation Processes as Sinks for MTBE Contamination"

Dr. Landmeyer discussed the natural biodegradation potential for MTBE. His studies in South Carolina have shown that MTBE can be affected (in one case) by phytoremediation. Dr. Landmeyer has seen a long, shallow plume begin to show reduced mobility and he has attributed this to the trees overlying the plume. In addition, Dr. Landmeyer has seen biodegradation take place in the soil zone where groundwater discharges to surface water. This discussion also helped to focus the States on biological processes.

5. Mike Martinson, Delta Environmental Consultants/Rachael Sakata, US EPA Office of Groundwater and Drinking Water - "State Regulatory Standards for MTBE"
(Refer also to the speaker handouts in the following section.)

While many UST programs are developing cleanup criteria for MTBE, there is still a lack of drinking water and health-based criteria from agencies charged with developing health-based standards. The group agreed that UST agencies need to work much more closely with federal and state drinking water programs. Ms. Sakata also stated that the EPA was going to collect much more health and occurrence data in an effort to develop a health-based standard.

6. Krista Clark - Association of California Water Agencies (ACWA) - "MTBE Impacts to Drinking Water Municipalities in California"
(Refer also to the speaker handouts in the following section.)

Ms. Clark provided a historical overview of well impacts in CA. She said that the well purveyors were seen as heroes by the public for taking on the "big bad oil companies" on groundwater issues, but were perceived by boaters in a very negative light for preventing their recreational use of lakes. Ms. Clark said that the well purveyors had done such a good job of educating the public and making MTBE look bad that the public is now at a state where they do not want any MTBE in their water. The well purveyors are now concerned that after companies have paid to cleanup to 5 ppb, that the well purveyors may have to continue cleanup towards non-detect at their cost. The water purveyors have to maintain the public's trust.

7. Tom Peargin (Chevron Research and Technology Company), "MTBE Remediation Options"
(Refer also to the speaker handouts in the following section.)

Mr. Peargin provided a basic overview of remediation options. These options are focused around 1) plume containment, and 2) source removal. In his presentation, Mr. Peargin explained that pump and treat may be a good plume containment technology but that it was relatively ineffective for

source zone remediation in many cases except for very coarse sands and gravels. Mr. Peargin also said that air sparging for remediation of the source zone may be effective in very homogeneous sites but was likely to be severely influenced by site heterogeneities. Finally, Mr. Peargin advocated use of hydraulic extraction and vapor extraction (HEVE) for remediation of residual hydrocarbons in the source (smear) zone.

8. Dr. John Zogorski, USGS/ Dr. Patricia Ellis, Delaware DNREC UST Branch - "Summary Findings of the EPA Blue Ribbon Panel on MTBE"
(Refer also to the speaker handouts in the following section.)

Dr. Zorgorski and Dr. Ellis presented highlights from the Summary Findings of the EPA Blue Ribbon Panel on MTBE.

9. Luncheon Speaker: Cynthia Dougherty - EPA Office of Groundwater and Drinking Water

Ms. Dougherty presented a detailed description of the rulemaking process for developing a Federal health based drinking water standard for MTBE. Ms. Dougherty discussed the laboratory cancer bioassays and the application of those studies to drinking water standards. Ms. Dougherty stated that the EPA Office of Groundwater and Drinking water has published a taste and odor health advisory for MTBE of 20 - 40 ppm, and has begun the process for developing a drinking water standard that, with current scientific evidence, could be developed by 2010 or, if expedited, by 2005.

Tuesday - July 27

State Perspectives:

State speakers present answers to a series of standard questions.

1. Fred McGarry - State of New Hampshire

1. Is MTBE an issue in your State?

Yes

2. At what percentage of your groundwater impacted LUST sites has MTBE been detected?

100%

3. Is MTBE driving groundwater cleanups in your state?

Yes, at some sites. Most cleanups are still driven by benzene.

4. What specific groundwater and drinking water standards has your state adopted for MTBE and why have you adopted these standards?

70 ppb in groundwater and drinking water. Standards were adopted in response to long-term exposure to MTBE and the potential health effects of that exposure. The standard is not based on MTBE being considered a carcinogen.

The Department also has an "action level" of 15 ppb. Drinking water wells with a concentration exceeding this level are watched closely to determine if an increasing trend is present. Where it is shown that the trend is increasing and can be expected to reach or exceed half the drinking water standard, i.e., 35 ppb, in the foreseeable future, a point-of-entry treatment system will be installed for that well.

5. Are you incorporating MTBE into a RBCA approach and if so, how are you doing it? Yes, MTBE is included in both soil and groundwater cleanup standards. Those standards are as follows:

GW-1 - 70 ppb
GW-2 - 50,000 ppb (Used to screen sites for the potential for migration of VOCs from groundwater to indoor air.)
S-1, S-2, and S-3 - 2 mg/ kg (based on MTBE's high solubility and ability to impact groundwater)

6. In your opinion, which remediation technologies appear to hold the most promise for cleaning up MTBE impacted sites?

Groundwater (overburden) - air sparging/soil vapor extraction
Groundwater (bedrock) - groundwater recovery, air stripping, and activated carbon adsorption
Soil - soil vapor extraction with or without air venting

7. Are you treating MTBE impacted sites differently from other petroleum release sites?

Yes. We are beginning to require well couplets at down-gradient sentry locations at sites where the MTBE concentration is above our drinking water standard. One well is designed with the well screen at the water table to permit sampling in the upper region of the water table. The second well, depending upon the depth of bedrock, will have the well screen placed at or near the bedrock surface.

8. Does you State have proposed legislation that addresses MTBE in gasoline or proposes changes to your Petroleum Fund to increase coverage for MTBE impacted sites?

Five bills dealing with MTBE were introduced into the legislature during the past legislative session. Three of those bills were passed.

HJR 9 -
The bill presents a resolution urging the United States Congress and the US EPA to eliminate the federal requirements for oxygenate additives for gasoline.

SB 70 -
Requires the commissioner of the Department of Environmental Services (Department) to adopt primary and secondary drinking water and ambient groundwater quality standards for MTBE. The review of the information shall include the scientific record that led California to adopt a public health goal for drinking water of 13 ppb and a secondary drinking water standard of 5 ppb.

The Department shall complete its review by January 1, 2000 and begin rulemaking for these standards by that date.

The commissioner of the Department shall seek all necessary waivers from EPA so that conventional gasoline may replace reformulated gasoline in the state.

The commissioner shall have the authority to require gasoline with lower MTBE concentration if such formulations are less hazardous to humans and the environment, those additives are approved by EPA, and the substitute gasoline is readily available and reasonably priced.

Any public water system delivering water with a concentration of MTBE greater than 5 ppb shall notify its customers of this fact.

HB 592 -
This bill establishes a legislative study committee to investigate requirements for and the usage of MTBE. The committee must provide a report on its findings by November 1, 1999.

2. Ron Kern - State of Arizona

1. Is MTBE an issue in your State?

Yes. Arizona recognized that MTBE was becoming a significant issue throughout the country and established an internal, cross-programmatic work group to research the issues and concerns. The Arizona Department of Environmental Quality (ADEQ) prepared a draft MTBE Report and made it public on 2/26/99, and then held public meetings in May to solicit comments from the public regarding the draft report and concerns in general regarding MTBE. The public has generally welcomed the report and ADEQ's efforts at working with the public on issues related to MTBE. Public concerns about MTBE relate primarily to air quality-health type issues and to whether Arizona will establish cleanup criteria for MTBE in groundwater and provide access to the State petroleum cleanup fund.

2. At what percentage of your groundwater impacted LUST sites has MTBE been detected?

Unknown. There is no compliance standard for MTBE in groundwater in Arizona and, therefore, no requirement for owners/operators to evaluate or report on MTBE at their LUST sites. Nevertheless, a preliminary review of ADEQs LUST files indicates that at least 10% of LUST sites have reported MTBE occurrences in groundwater; these data occur at sites throughout the state--even where there has never been any clean air RFG requirements for the gasoline

3. Is MTBE driving groundwater cleanups in your State?

No, because there are no groundwater cleanup standards for MTBE in Arizona.

4. What specific groundwater and drinking standards has your state adopted for MTBE and why have you adopted these standards?

None. Arizona's statutes require a federal MCL for any particular regulated substance prior to development of a numeric groundwater or drinking water standard. Arizona does have the potential to develop site-specific narrative standards for MTBE, but that has not been done to date. All groundwater in Arizona is classified currently as drinking water. Arizona does have a health-based guidance level for MTBE in groundwater (35 ug/L0, but this is not an enforceable compliance standard.

5. Are you incorporating MTBE into a RBCA approach, and if so, how are you doing it?

The UST Program is currently seeking a legal opinion from the Attorney General's Office to determine whether statutes are sufficiently flexible to allow inclusion of MTBE as a constituent of

concern in Tier 2/Tier 3 evaluations and then to what extent remediation can be conducted for a constituent without a Tier I groundwater standard. Arizona is not currently using a RBCA approach but is working toward adoption of LUST Corrective Action Rules by the end of 1999, which will incorporate a RBCA approach.

6. In your opinion which remediation technologies appear to hold the most promise for cleaning up MTBE impacted sites?

No first hand knowledge at ADEQ because Arizona cannot require cleanup of MTBE at groundwater-impacted sites. Arizona's soil rules do provide standards for cleanups in soil at residential land-use (320 mg/kg) and non-residential land-use (3,300 mg/kg) sites. Anecdotal information from UST consultants indicates preliminarily that soil vapor extraction (SVE) works well if MTBE is still present in the soil column.

7. Specific cases where MTBE remediation is occurring...general level of success..other significant results/conclusions from your experience at remediating MTBE? Are you treating MTBE impacted sites differently from other petroleum release - sites e.g., different investigation approach, more extensive monitoring, or looking further downgradient?

Unknown.

8. Does your State have proposed legislation that addresses MTBE in gasoline or proposes changes to your Petroleum Fund to increase coverage for MTBE impacted sites? Other legislative issues or significant State concerns?

There is no legislation currently proposed. Nevertheless, Arizona has a Governor appointed UST Policy Commission, which is evaluating MTBE issues, such as studying the "extent" of MTBE contamination in the State, evaluating the need for groundwater cleanup standards, and State Petroleum Fund access. The Commission's findings may provide for recommendations requiring MTBE-related legislation in the next session.

3. Henning Larson - State of Oregon

1. Is MTBE an issue in your State?

Yes, an issue growing rapidly in importance. The State of Oregon has been requiring analysis for MTBE for approximately 2 years. Although, we were initially told MTBE-laden fuel was not used in the State, our sampling of LUST sites indicated it had been used throughout the State. In addition to discovering numerous sites with MTBE contaminated groundwater, we have also identified two communities with area-wide MTBE contamination that has affected several public water supplies and numerous domestic wells. Our biggest issue with MTBE at this time is the need to establish the nature and magnitude of its human health toxicity and to develop standards accordingly.

2. At what percentage of your groundwater impacted LUST sites has MTBE been detected?

It's estimated to be 10-20% of all LUST sites. Generally, the higher the levels of BTEX groundwater contamination, the more likely MTBE will be detected at a site. However less than 10% of Oregon LUST groundwater sites have been sampled for MTBE, we are only requiring analysis for post-1975 gasoline releases, and we are excluding diesel and heating oil releases.

3. Is MTBE driving groundwater cleanups in your State?

An informal survey of staff found only one known LUST site where MTBE is the cleanup driver. MTBE concentrations in groundwater at this site have ranged as high as 250 ppm. However, Oregon has two LUST sites with areawide contamination problems where MTBE has been detected in numerous domestic and public water supply wells at concentrations ranging from 10-100 ppb. Depending, on what standard our State chooses, MTBE could become the cleanup driver at these sites.

4. What specific groundwater and drinking standards has your state adopted for MTBE and why have adopted these standards?

At this time, Oregon has chosen to adopt the EPA aesthetic (taste & odor) advisory level of 20-40ppb. We have chosen it primarily based on our wish to set standards in a consistent fashion. For all other contaminants that we regulate, with the exception of lead, we develop standards based on slope factor and reference dose values listed in IRIS. At this time IRIS does not have the slope factor and reference dose values necessary to develop risk-based standards, therefore we defer to an aesthetic standard. There was internal discussion of adopting the CAL-EPA value of 13 ppb, however, our toxicologists have not reviewed the study upon which the standard was based, and prefer to rely on the EPA for an evaluation of the study's merits.

5. Are you incorporating MTBE into a RBCA approach, if so, how are you doing it?

Yes, we list it as a contaminant of concern in our cleanup regulations and guidance documents. Oregon is requiring all post-1975 gasoline releases with groundwater contamination to have some initial screening for the presence of MTBE. At a minimum, this involves analyzing a groundwater sample drawn from the most contaminated well or well point at the site. If it is not detected in the initial screening, it is dropped as an analyte in future sampling events. We have not consistently requested soil analysis for MTBE.

6. In your opinion, which remediation technologies appear to hold the most promise for cleaning MTBE impacted sites?

Due to MTBE's high solubility, moderate volatility, and low biodegradability, "pump and treat" systems seem to hold promise. MTBE's chemical and physical characteristics pose problems for air sparging and in-situ bioremediation technologies. Treatment of recovered water would consist of air stripping then polishing with activated carbon.

7. Specific cases where MTBE remediation is occurring... general level of success... other significant results/conclusions from your experience remediating MTBE?

Keizer, Oregon - MTBE detected in treatment area at 0.5 - 1.5 ppm with total BTEX approximately 50 ppm. Although air stripping is successfully reducing BTEX to regulatory standards, pilot testing of the system indicated an MTBE reduction of around 75-80%. This is still leaving 100 - 375 ppb in effluent discharged under NPDS permit.

Keno, and Spray, Oregon - These two communities have had areawide groundwater impacts from LUST releases. Benzene and MTBE have both been detected in numerous wells in the 10-100 ppb range. Activated carbon treatment of the water at well head has been successful for benzene, however, concentrations of MTBE have been unaffected by treatment.

8. Are you treating MTBE impacted sites differently from other petroleum release sites (e.g. different investigation approach, more extensive monitoring, or looking further downgradient?

For groundwater sites with MTBE releases, more extensive monitoring well networks have been necessary to delineate entire plume. In addition, the use of the EPA Method 8260 to analyze for MTBE is resulting in more detections of chlorinated solvents and petroleum constituents not typically monitored such as trimethylbenzenes and iso-propylbenzene.

9. Does your State have proposed legislation that addresses MTBE in gasoline or proposes changes to your Petroleum Fund to increase coverage for MTBE impacted sites? Other legislative issues or significant State concerns?

No.

4. Greg Hatten - State of Kansas

1. Is MTBE an issue in your State?

1. Yes, MTBE is an issue in the State of Kansas. The KDHE has been analyzing for MTBE since 1991.

2. At what percentage of your groundwater impacted LUST sites has MTBE been detected?

A survey conducted by NIPER indicated that the percent by volume of MTBE in the gasoline delivered to Wichita ranged from 0-3% in 1991 to 0-13% in 1998. The oldest confirmed site with MTBE dates to 1989. We are not yet an R-FG state, but of the 800 sites in monitoring, 86% have MTBE contamination. Of the 120 sites in remediation, 89% have MTBE contamination.

3. Is MTBE driving groundwater cleanups in your State?

Although BTEX is the driving force for most of our source remedial efforts, MTBE is the driving force for several point-of-use and point-of-supply remedial systems. The first public well with confirmed MTBE contamination was shut down in 1994. Of the 31 public water supply wells impacted by gasoline constituents, six have been impacted by MTBE. KDHE has provided an extension of public water systems to residences on four occasions to alleviate MTBE impacted private water wells and has provided home GAC units for several residences where public water was not available. We have one point-of-supply remedial system treating two impacted public wells, and three additional systems in the design phase.

MTBE has required considerable effort but we have been dealing with (and in most cases, solving) the problems as they occur. To date, the problems have been manageable.

4. What specific groundwater and drinking standards has your State adopted for MTBE and why have adopted these standards?

The State of Kansas has not adopted a formal public water standard for MTBE. The UST program has adopted 20 ug/l as an informal standard. The informal standard was based on the most conservative number in the EPA Health Advisory. It was decided that it would be much easier to raise the standard if MTBE is found to not be a health concern or carcinogen rather than have to lower it if it is found to be a major health issue. The goal of the UST program in general is that the

public should not be exposed to any contamination and we address each impact regardless of the concentration.

5. Are you incorporating MTBE into a RBCA approach, if so, how are you doing it?

Yes, KDHE uses 20 ug/l for the back calculations and for the tables established for drinking water standards.

6. In your opinion, which remediation technologies appear to hold the most promise for cleaning MTBE impacted sites?

Most of our experience is from SVE/AS source remediation systems and we have seen a general lowering of levels once the remedial system is installed and operated.. It is difficult to determine the exact success because we have seen a wide fluctuation of contaminate levels and we cannot be sure if the lowering levels are due to the remedial effort or if the rising levels are due to influx of new contamination. We have confirmed MTBE in our effluent stream on SVE/AS systems so we can be certain that the remedial effort is positive.

We have seen some indications of attenuation/natural attenuation on most of monitoring sites. Nearly half of the 188 sites with initial concentrations less that 50 ug/l have gone to non-detect over the course of monitoring period. Nearly 66% of the sites in remediation have gone to nondetect over the course of the remedial effort but many of these had initial concentrations of less than 50 ug/l.

7. Specific cases where MTBE remediation is occurring...general level of success...other significant results/conclusions from your experience remediating MTBE?

We have had success with our point-of-use and point-of-supply remedial systems. We do have one point-of-supply system at a water treatment plant that is successful in reducing a 250-400 gpm influent stream with initial MTBE concentration of 400-500 ug/l by approximately 94%. This system is comprised of two 35ft x 6ft packed towers run in series, with an air to water ratio of 150:1. Each of the towers is capable of reducing the levels to below 20 ug/l, but the series provides redundancy as a safety measure and allows constant flow during repairs. We currently have three point-of-supply systems in the design stage. The point-of-use systems have typically been GAC units for individual residences and have been successful in removing low levels of MTBE. On four occasions it was more cost effective to extend existing city water to neighborhoods where private wells had been impacted by MTBE plumes.

8. Are you treating MTBE impacted sites differently from other petroleum release sites (e.g. different investigation approach, more extensive monitoring, or looking further downgradient?

The KDHE is now treating impacted sites from UST sites differently than we did in the past. Since most of our sites do have MTBE contamination, we initially do not make the distinction.

We have confirmed the "diving plume" theory on at least two sites and have initiated a program to add down-gradient monitoring wells that are screened at the base of the aquifer. From initial results it appears that the "diving" plume is the exception rather than the rule, but if there is a downward component to the aquifer, either natural or induced, the MTBE will migrate through the more permeable part of the aquifer. In Kansas, it is usually at the base.

KDHE ranks its sites on proximity to a receptor. We formerly used 1/4 mile as our safe distance or maximum extent to potential impact of a receptor. Those sites located more than a 1/4 mile from a receptor were not initially considered for remediation unless an emergency condition existed. In certain instances, such as a potential for induced gradient, we now may look up to a mile for a receptor.

In an effort to determine the reliability of 8020/8021 as a analytical method for MTBE, split samples are taken during the investigation phase and several are analyzed at random using method 8260. To date, we have not had any false positives with 8020/8021, and this method appears to be as reliable as 8260.

9. Does your State have proposed legislation that addresses MTBE in gasoline or proposes changes to your Petroleum Fund to increase coverage for MTBE impacted sites? Other legislative issues or significant State concerns?

To my knowledge, there is no pending legislation that addresses MTBE in Kansas.

5. Steve Ales - State of Wisconsin

1. Is MTBE an issue in your State?

MTBE is starting to become an issue in Wisconsin. We have been looking for MTBE for a number of years now. MTBE is starting to be detected in municipal and private wells around the State. I would estimate that in 50-60% of our sites where groundwater has been impacted from a petroleum release we are finding MTBE in the groundwater. At this point, MTBE is not a driving force in remediation in our State.

4. What specific groundwater and drinking standards has your State adopted for MTBE and why have adopted these standards?

In Wisconsin we have a groundwater quality standard of 60 ug/l. This was developed by our Division of Health.

5. Are you incorporating MTBE into a RBCA approach, if so, how are you doing it?

No, at this point we aren't incorporating MTBE into a RBCA approach. However, in Wisconsin we utilize risk based decision making by allowing sites to close prior to meeting the standard once they have defined the extent of the contaminant plume and have demonstrated that the plume is stable or receding.

6. In your opinion, which remediation technologies appear to hold the most promise for cleaning MTBE impacted sites?

We haven't implemented too many remedial actions specifically for MTBE. However, a good source control such as excavating the contaminated soil is proving to be the most beneficial remedial action.

9. Does your State have proposed legislation that addresses MTBE in gasoline or proposes changes to your Petroleum Fund to increase coverage for MTBE impacted sites? Other Legislative issues or significant state concerns?

Wisconsin doesn't have proposed legislation that would address removing MTBE from gasoline nor are there any changes proposed for increasing funding of sites impacted by MTBE.

Break Out Groups - Discussion

Following the State speakers, the attendees were organized into three breakout groups to develop answers to the following questions:

1. In your viewpoint, what are the four most critical MTBE issues that EPA and States must address? Rank them from most important to least important and explain your reason for each.

Group 1:

1. Toxicology studies for data to rely on.
2. Resource dollars for remediation, alternative drinking water and state staffing.
3. Pollution prevention:
   UST inspections; public outreach; wellhead protection
4. Research of other additives before a switch from MTBE.

Group 2:

1. What action level for MTBE and other oxygenates should be used in drinking water. When would a drinking water well be shut down.
2. Toxicity data is inconclusive - develop better cancer studies.
3. How much cleanup is required for remediated effluent water.
4. What remediation technologies are most cost effective.
5. What are the impacts to the LUST Trust Fund and the resources available.
6. What are the other degradation products, such as TBA.
7. Bring USTs into compliance with 1998 upgrade performance standards and expand regulatory jurisdiction.

Group 3:

1. Establishing toxicity/slope factors and reference doses for MTBE and establish toxicity for other constituents and additives of gasoline.
2. Determine appropriate substitute for MTBE that does not create a different set of problems.
3. Need refineries to disclose composition of delivered fuel additives and blending agents.
4. Education of communities, Research and Development for site characterization and remediation.

2. For each of the four critical issues identified above, explain how you as a State government agency propose to resolve each issue.

Group 1:

1. EPA to study toxicology on MTBE. Concentrate funding for studies.
2. Release LUST Trust Fund to States. Continue State programs. Improve solvency of State funds. Keep LUST Trust Fund for petroleum only.

3. Incentives for pollution prevention: Decrease financial responsibility for double walled tanks; training of operators; and BMP and past operating performance.
4. Request that EPA perform research on substitute oxygenates.

Group 2:

1. Standards: EPA should be developing standards expeditiously.
   Determinations of occurrences.
   Analytical requirements on a greater than or equal to annual basis.

2. Impacts to LUST Trust Fund:
   Raise funding caps.
   Evaluate effectiveness and cost effectiveness of remediation technologies.

3. Effectiveness of remediation technologies:
   "Quantifying" biodegredation.
   Pay for performance (to stimulate cost-effective technologies.

4. Compliance: Consolidate petroleum product jurisdiction (vs containment systems).
   Percent constituent - fuels.

Group 3:

1. Expanded State to State communications. Conduct additional symposiums in the future to discuss recent experiences.
2. Sharing of information between environmental regulatory agencies and public health agencies.
3. Pressure and track EPA's progress in establishing toxicity for MTBE.
4. Find sources of funding for additional studies.

2. For each of the four critical issues, explain how you as a federal government agency propose to resolve each issue.

Group 1:

5. EPA to study the toxicology of MTBE.
6. Educate interested parties to increase appropriations of LUST Trust Fund.
7. EPA to assist States in outreach; UST inspections and evaluation of 1998 UST upgrades.
8. Educate interested parties with including partnerships with various business groups.

Group 2:

1. Standards: Develop guidance related to evaluating occurrences nationally.
   Develop good GIS coverage for LUSTs, drinking water supply wells, etc.

2. Impacts to LUST Trust Fund:
   Divert more dollars from LUST Trust Fund Appropriations.
   Statutory changes for cost recovery.

3. Effectiveness of remediation technologies:
   Compile and evaluate the reams of data which have not been looked at.
   "Site" Superfund program (TIO) involvement.
   Continue and enhance remediation symposiums (regional and national).

4. Compliance: Re-evaluation of effectiveness of regulations.
   Divert more LUST Trust Fund dollars to States for prevention.

Closing Comments - Jeff Kuhn, State of Montana - ASTSWMO MTBE Workgroup Chair

Mr. Kuhn provided a summary of "Critical Issues" as the following:

1. Expand testing of public water supplies for MTBE.
2. Analyze for MTBE at all LUST sites.
3. Validate remedial methods for MTBE and distribute information.
4. Develop better site characterization plume definition.

Mr. Kuhn thanked the speakers for their contributions and all State participants for providing their perspectives.