DRAFT
MTBE BLUE RIBBON PANEL
Meeting Minutes
April 29-30, 1999
Sheraton Crystal City
Arlington, Virginia

OPENING REMARKS

The fourth meeting of the Blue Ribbon Panel to review the use of Methyl Tertiary Butyl Ether (MTBE) and oxygenates in gasoline was held April 29-30, 1999, at the Sheraton, Crystal City, Virginia. Dan Greenbaum, Health Effects Institute, welcomed the Panel members and brief introductions were conducted by the Panel members and the audience. It was noted that Dr. Anne Happel, Lawrence Livermore, National Laboratory (LLNL), would be participating via telephone. Mr. Greenbaum gave an overview of the meeting agenda, and explained that the Blue Ribbon Panel members will begin to spend more time in Panel discussions and less time hearing presentations. However, presentations will be given as needed. The issue summaries prepared by the Environmental Protection Agency (EPA) will be reviewed by the Panel during the meeting. Breakout sessions will be held on the second day of the Panel meeting to discuss the individual issues in more detail (air quality, prevention and remediation, comparing fuel additives, water contamination, and fuel supply and price).

Mr. Greenbaum explained that the goal is to produce a brief concise report (40-50 pages) including an executive summary, background, a set of options for air and water programs, and a set of recommendations about those options. Mr. Greenbaum sketched a list of options for the Panel to review for completeness and accuracy. There were two issues noted that may need further clarification at the May meeting. The issues include alkylates, air quality, and water characteristics of ethanol. The goal of the Panel is to have a set of draft recommendations by the May meeting, and spend most of the last meeting finding agreement on the set of options. Finally, a report would be issued to the Clean Air Act Advisory Committee and EPA Administrator, Carol Browner, in July. Mr. Greenbaum noted the growing activity regarding MTBE and oxygenates that is occurring in Congress, and underlined the opportunity for the Panel to provide useful information to the Legislature. There were discussions regarding the need for a process to gather consensus from the Panel.

Two issue areas that required additional information included: further explanation regarding the detection frequency and concentration levels of MTBE in ambient groundwater and MTBE detections in drinking water; and, ethanol supply issues.

OPTIONS

Mr. Greenbaum discussed with the Panel whether the list he created is the correct list of options to consider. Feedback was received from the Panel regarding the Option listed below.

Option 1 - Status Quo

Option 2 - Enhance Existing Program to Improve Water Protection

Option 3 - Increase RFG Oxygenate Flexibility and Enhance Water Protection

Option 4 - Increase flexibility, Phase-out MTBE, and Enhance Water Protection

Option 5 - Increase RFG Flexibility, Encourage/Require Some Ethanol Use, and Enhance Water Protection

Other possible option elements suggested by the Panel included:

- Develop an alternative "cleaner burning fuel" (e.g. low-RVP)
- Allow regions/states to opt for California RFG or federal RFG
- Adopt one national set of RFG fuel parameter performance requirements (based on the California program?)
- Incorporate added protections in the RFG program to ensure low ozone reactivity (e.g. testing programs to deal with commingling)

The Panel members were asked to comment on the Options and provide suggestions on the Option list. The Panel's additional comments, queries, and options are listed below:

- Regulatory/statutory authority related to implementation of these options
- Policy questions regarding the consistency, boundaries, and regionalism of the issues
- Flexibility and Phase-out - At the state or federal level
- Add option - use of no oxygenates
- Surface water impacts on reservoirs
- Determine the baseline - the statutory air quality requirements or the actual benefits the program achieves
- Effect of each option on groundwater and surface water
- Add option - phase-out ethers and maintain oxygenate standard
- Fuel performance standards rather than a specific fuel formula (define performance)
- RFG versus oxygenated gasoline (use of octane enhancers)
- Need for more research and development of MTBE removal technologies (remediation and drinking water treatment)
- Financing mechanism for clean up
- Do not trade known for unknown - should be included in each option
- Environmental fate and transport should be included in addition to health

- Define MTBE phase-out (at any level or only zero?)
- Federal tanks not in compliance with the program (discuss universe of storage tanks)
- Remediation and prevention need to be included more explicitly (not just funding)
- Spill and leak prevention will not solve the problem

Sammy Ng, EPA OUST, gave a brief summary of the state trust funds that were set up in 30-40 states to provide tank owners with a means of complying with the financial responsibility requirements of underground storage tank regulations (UST) and to clean up releases from the USTs. The federal leaking underground storage tanks (LUST) fund can be used to clean up the source but, may not be used for treatment.

Mr. Greenbaum discussed the matrix he created and explained its intended use as a mechanism to begin crafting and refining policy options. The Panel was encouraged to contribute their thoughts in a simplified ranking system in order to show obvious uncertainties and recognize commonalities among the Panel and positive and negative aspects of each option. It was suggested that the Panel look to more performance driven options, and further define "performance." Because some level of fuel will inevitably enter the soil and water, an answer was requested as to the level of MTBE that would be tolerated. There were lengthy discussions regarding other contaminants that exist and whether the level of concern is similar to MTBE or different. It was noted that MTBE is different because of the low taste and odor threshold, as well as the difficulty and costs related to removing MTBE because it is not a naturally occurring chemical. Further, it was asked if it is unacceptable to have any impurities in the water, or is it just MTBE that the public is concerned with? In resolution, it was noted that if the material is man made and there is public sensitivity (such as MTBE), the utilities have decided not to use those water sources. In closing, it was noted that issues of perception of risk should not be raised only in relation to MTBE, but other contaminants as well. There was discussion regarding the reporting levels (MCL, detect, and reporting) that are required by both the state and Federal government.

PRESENTATIONS

United States Geological Survey (USGS)

John Zogorski, USGS, has completed an analysis related to the detection of MTBE in water. There are two ongoing activities that were presented to the Panel. The first presentation was about the "new analysis" of data sets from the National Water Quality Assessment Program and the second presentation covered a regional compilation of the drinking water analysis for the New England and the Mid-Atlantic states. The presentations differ in that the first (given by Paul Squillace, USGS Research Hydrologist) is national in scope and focused on ambient groundwater, and is intended to characterize water quality conditions in the aquifer prior to any form of drinking water treatment; the second presentation (given by Steve Grady, USGS Hydrologist) is regional in scope focusing on drinking water from ground and surface water.

Mr. Squillace presented the three major findings of the new analysis.

1) In RFG/Oxy areas, 20 million people use a vulnerable aquifer;
2) RFG/Oxy gasoline results in increased detection frequencies at or above 0.2, 5 and 20 ug/L (Note: 1 microgram/liter (ug/L) = 1 ppb for fresh water systems); and
3) MTBE generally is found with other VOCs but not BTEX compounds.

Mr. Squillace noted that groundwater is used and vulnerable in RFG/Oxy areas and that MTBE is more frequently detected in MTBE RFG/Oxy areas even at larger concentrations. Graphs illustrated examples of how MTBE in RFG/Oxy affects detection frequency. The models show that using MTBE in RFG gasoline results in a 4-6 fold increase in detection frequency of MTBE.

Mr. Grady presented information from the cooperative project by USGS and US EPA, which was a regional compilation of the drinking water analysis for the New England and Mid-Atlantic states. Mr. Grady presented the preliminary findings of the 10-State MTBE/VOC drinking retrospective, which should be published in December 1999. The focus of the study is on community water systems (CWSs). The five major points of the information are listed below.

1) MTBE detected in drinking water from:
    7 percent of CWSs at 1 ug/L
    2 percent of CWSs at 5 ug/L
    ~1 percent of CWSs at 20 ug/L

2) MTBE projected to affect:
    ~600 CWSs at 1 ug/L
    ~180 CWSs at 5 ug/L
    ~80 CWSs at 20 ug/L

3) MTBE detected in 15 percent of CWSs in RFG/Oxy areas and 3 percent outside

4) BTEX detected in ~5 percent of CWSs, but not with MTBE

5) VOCs co-occur in ~half of samples with MTBE; mostly solvents and THMs (tri-helemethane compounds).

Detections occurred in both ground and surface water samples at approximately the same frequency of detection. The ground water system detections were 7 percent, and the surface water system detections were 6.3 percent. MTBE does not co-occur with BTEX compounds; however co-occurring compounds were detected with MTBE, primarily solvents compounds. Questions were raised as to why MTBE was not found with BTEX compounds. It was noted that MTBE travels at different rates than BTEX compounds in ambient ground water.

The study found detections of 58 different VOC compounds in the drinking water samples. The

most frequently detected compounds were the THMs, and MTBE was the second most frequently detected compound. Many Panel members commented about the uncertainty of these data to draw specific conclusions. The Panel questioned what the level of public concern has been regarding water quality in areas with MTBE detections. It was noted that in Delaware, BTEX compounds have been detected in private drinking water wells. In addition, it was noted that Kansas has collected information that shows impacts from MTBE on public and private wells. The Panel asked if there are any time series data to show the level of detection over time to recognize trends in detection levels. In response, it was stated that three states have provided data from 1993-1997. Panel members asked if the hydrogeology of the area with detections is different than California, and whether there is a connection between the difference in states detection levels with the different geologies. USGS is in the process of reviewing the data by requesting comments from the individual State agencies. It was questioned if there are any studies underway to look at ethanol in relation to BTEX in different areas of the country. In response, it was stated that there is no regional effort or method to monitor ethanol. Further, the question was raised as to whether there are data showing BTEX concentration levels outside of RFG areas (e.g. Midwest), due to the possibility of rapid biodegradation of ethanol inhibiting the biodegradation of BTEX compounds.

ETHANOL AND ITS IMPLICATIONS FOR FUEL SUPPLY

United States Department of Agriculture

Roger Conway, USDA Office of Energy Policy and New Uses, presented the issues to be discussed regarding the fuel supply capability of ethanol, as well as corn supply and economic implications. Mr. Conway noted that because this information presents an MTBE phase-out scenario, USDA has issued a disclaimer that this presentation does not reflect the official position of USDA.

The phase-out scenario assumptions include:

- 2 percent RFG oxygen mandate continues
- Ethers and heavy alcohols are phased out
- Ethanol is the only oxygenate
- California is fully phased-out in 2002
- 49 States are fully phase-out in 2004

There is not a one to one displacement between ethanol and MTBE for RFG oxygen - 0.52 units of ethanol replace one unit of MTBE (5.7 percent ethanol RFG contains 2 percent oxygen, and 11 percent MTBE RFG contains 2 percent oxygen). An issue of concern is the annual ethanol capacity and production there would be if there were an expanded need for ethanol. Fuel production and capacity data is available to show how the agricultural sector would be influenced and the capability of the ethanol industry to meet new capacity requirements. It is important to consider how the corn sector is being utilized now prior to an increased demand for ethanol. The forecasting model used to estimate the effects on the agricultural sector is Food and Agricultural

Policy Simulation (FAPSIM). The ethanol cost of production was based on certain assumptions. Focus was on the change in net corn cost equal to the cost of corn minus the value of coproducts. For the year 2004, the conclusion is:

- Ethanol production increases to 3.3 billion gallons (doubles);
- Ethanol satisfies U.S. oxygen demand;
- Ethanol will remain available for octane markets;
- Corn price rise $0.20 per bushel from $2.50;
- Ethanol cost of production increased by $0.10 cents per gallon; and
- Net Corn Cost effect on RFG cost is $0.6 cents per gallon.

Williams Ethanol

Jack Huggins, Williams Ethanol, discussed the capability of the ethanol industry and the ability for structural expansion. Mr. Huggins began his presentation by providing a brief history on the use of ethanol to improve air quality, and the impact of the Clean Air Act on ethanol use. The capacity for ethanol production capacity today is 1.8 billion gallons, but the demand is only 1.4 billion gallons. The ethanol industry would expand to meet the California opportunity, but California is blending little ethanol. Mr. Huggins expressed the view that even if MTBE were banned, the regulatory uncertainty would cause difficulties in obtaining financing for new ethanol plants.

Mr. Huggins stated that ethanol supply is not a problem, and noted the fifty ethanol plants that currently exist, as well as the ability for plant expansion (12-18 months) to produce an additional 600 million gallons of production capacity. In addition, new ethanol plants could be built, and on-line, in 24-30 months to provide another 400 million gallons of ethanol production capacity (given regulatory certainty). With the assurance of demand, production capacity will be identified.

United States Department of Energy (DOE), Office of Fuels Development

Roger Legassie, TMS, Inc., presented material on behalf of DOE regarding the cellulosic based capability for transportation fuel use. The cellulosic ethanol industry is still emerging; however, it may offer longer term, larger scale capability to supply market increases beyond the near term. Risk management and cost reduction are essential to the effective development of the cellulosic ethanol industry. An extensive number of peer reviews have been conducted in order to obtain independent external views of the program projections. Near term commercial activity is underway. There is a viable and diverse feedstock base, need for cost reduction (detailed and technical pathway to achieve that), and analytic capability in place to see how industry can evolve over time with connections between the near and long term. It was emphasized that risk management and cost reduction are essential to the effective development of this industry. There is no single technology used at this time (hydrolysis, enzymatic, etc.). The feedstock base for cellulosic ethanol has been studied and supply curves are being developed for various feedstocks.

A significant portion of the feedstocks are from urban, forest and agricultural wastes. Cellulosic feedstocks can also provide significant benefits in greenhouse gas mitigation, reduction in transportation fuel imports, and development of a new domestic industry.

The conversion technology used to produce ethanol from cellulosic feedstock is the most costly portion of the process. There is a detailed technology plan to achieve a cost reduction factor of two, meaning this technology should not require any kind of economic marketplace incentive, and should be able to operate fully on a market basis. The purpose of this was to perform sensitivity analysis to guide the RD program to speculate possible outcomes overtime. There are alternative depictions of possible futures.

In summary, there is credible evidence that the cellulosic industry can join the existing grain based industry in order to meet longer-term needs for ethanol as an oxygenate or octane enhancer in the transportation fuels industry. There is: near-term commercial activity, a viable and diverse feedstock base, a technology pathway plan for cost reduction, an analytical capability to understand key parameters of the potential market-based growth of the industry, and an initial exploration of how the near-term might be connected to the long-term.

A brief discussion period was held in order to make some clarifications to the presentations. Topics included:

- Current prices of each fuel type.
  - One gallon of ethanol would cost $1.00 ($0.54 cent federal excise tax) making the net cost $0.46. One gallon of MTBE would cost $0.70 cents.
- Market demand caused MTBE to grow to the third largest used petrochemical in the world.
- There are major reasons why ethanol is not used in the Northeast. It is not just a matter of building plants.
- Many issues are involved regarding the large use of MTBE versus ethanol and include:
  1) Ethanol is used in Midwest because it is a farmbelt area and it is publicly accepted.
  2) Ethanol is not used in the Northeast because of major issues with the need for a lower RVP blendstock (removal of clean burning compounds).
  3) Public perception that alcohol in gasoline is a low quality gasoline.
  4) Distribution - getting the ethanol from mid-America to the Northeast. The current pipeline system cannot be used; adjustments must be made at the terminals.

- There is tremendous consumer acceptance of ethanol in Phoenix, Arizona. Sunoco in Canada has a major drive to use ethanol in all of their fuel.

- What are the effects that the analysis presumes about competition among ethanol producers as the market increases? It was stated that ADM occupies 70 percent of the market - what if the volume doubles? In response, it was noted that many farmer

cooperatives look at this as a way to get value added for their crops, which will decrease ADM's share of the ethanol market.

- Was there any analysis completed looking at the ethanol implications for fuel supply if the oxygenate mandate were to be removed? In response it was noted that the ethanol analysis was completed assuming current requirements; the change is cost projections would change slightly.

The total federal excise tax amount supplemented is 1.4 billion gallons times the $0.54. The cost to the government should also include as an offset the (study by Michael Evans) $5.5 billion the government gains from increased farmer income and increased employment in the United States.

PERSPECTIVES OF ETHANOL SUPPLY

BC International

Steve Gatto, President BC International (BCI), presented the perspective of a biomass ethanol producer, and provided an update on the cellulosic ethanol efforts in Louisiana. BCI focuses on the breakdown of low cost sugars from renewables and converts them into ethanol fuels, electricity and other products turning biomass wastes into biomass resources. The supply opportunities include forest thinnings, bagasse, rice hulls, corn stover, corn fiber, municipal wastes, and industrial wastes. There is a 23 million gallons per year (gpy) rice straw facility in Gridley, California; and a 20 million gallon per year wood thinnings facility in Chester, California. Each plant has expansion capacity. BCI supports the programs that are in place and want to prevent backsliding of air quality benefits. If it is determined that there is a water contamination problem from MTBE, then there needs to be an environmental and economically sound substitute to maintain the standards. As the Panel moves forward in the search for an MTBE substitute, any question asked of one additive should be asked of all additives because each has the potential to be a very large new entry into the environment.

Panel comments included the benefits of oxygenates in California if the State can meet or exceed the RFG standards with no oxygenate. In response, it was noted that in terms of air quality, the life cycle analysis (reduction of emissions from agricultural burning, landfill dumping, leachate collection) of ethanol production can be large. The distinction was noted between a fuel without an oxygen mandate and a fuel without oxygenates. In California, if the oxygenate mandate were to be removed and MTBE phased-out, oxygenates (specifically increased ethanol) would still be used for emissions performance for the auto fuel system. However, it should be decided whether the increased use of ethanol would be due to the need for emission reductions or because of farm income, and reduced agricultural burning. It was noted that at this time, there are no other facilities producing biomass ethanol on a commercial scale.

National Petroleum Refiners Association

Linda Stuntz, Stuntz, Davis & Staffier, P.C., presented information on behalf of the National Petroleum Refiners Association (NPRA). NPRA represents virtually all U.S. refiners and most manufacturers of petrochemicals including MTBE and ethanol. NPRA does not advocate a ban or phase-out of MTBE at this time. NPRA calls for analysis and assessment of any potential decision, and encourages the enforcement of the existing underground storage tank laws and regulations.

The President of NPRA wrote a letter to California Governor Davis asking for support to repeal the 2 percent oxygen by weight requirement for RFG if he decided that a phase-out of MTBE was necessary. NPRA advocates that a reasonable time frame, and maximum flexibility are needed in order for the industry to implement the Governor's decision. It was noted that elimination of the mandate would not indicate elimination of oxygenate use. NPRA looked at the ability of ethanol to replace MTBE, and noted a gap in volume that would be required by the industry to replace MTBE, which may require increased imports. The increased use of akylates will require increased crude feedstock. The logistical challenges include that ethanol can not be transported via pipeline because of its affinity for water, and must be splash blended at the terminal. Phase I to Phase II RFG will also have an effect on supply shortages and price spikes. In conclusion, there are generous assumptions about the ability to replace MTBE, and the use of biomass to produce ethanol, which is not commercially available.

Comments from the Panel involve replacing the lost volume if oxygenates are removed from the fuel. Concerns were raised about replacing the lost volume with what was in fuel before oxygenates were mandated. It was noted that under any flexibility scenario chosen, there is a volume issue that must be dealt with. There were many comments regarding fuel blending. It was stated that the Panel needs to determine whether or not oxygenates are required for emissions and performance, and that the volume issue will be resolved over time. Ethanol use requires an adjusted blendstock (lower RVP) which is achieved by removing the cleaner burning hydrocarbons, which pulls out compounds in addition to MTBE. The importance was stressed on the need for flexibility and time, and determining the reason for use of products in the fuel (help farmers, energy security, required for emissions performance and clean air, etc). In contrast to the comments that volume is not an issue and will be dealt with, it was stated that DOE is very concerned about volume. The charge of the Panel is to deal with MTBE and water contamination, and debating the oxygenate mandate must be a secondary issue. Other Panel members expressed the view that the oxygenate mandate is a critical factor to the decision making process. Questions were raised about the conflicting statements regarding ethanol distribution. In response, it was noted that it is possible build a dedicated pipeline system to transport ethanol; however, it is not feasible at this time. Further, the opportunity exists for each state to create it's own source of ethanol through existing resources. It was questioned whether there rail and barge capacity if the Northeast needs to be supported by ethanol. Over a period of time they can be built and deployed. The impact on rail system needs to be considered.

PANEL WORKING SESSION ON ISSUE SUMMARIES

Air Quality Benefits

The working session discussion will include the issues addressed in the summaries, and conduct a broad ranging discussion on the air quality issues. Questions that need to be addressed include: (1) What is the baseline to evaluate any alternative; and (2) if a shift is made in the process for mixing fuel, what are the implications for air quality benefits?

[Note: Charts attached to the air quality section are from RFG survey association, which is an independent association funded by refineries in the program, mandated to provide that each city gets the necessary benefits from the RFG program. The retail station survey consists of many samples tested for properties that are fed into the federal complex model and then averages the emission reductions on a city by city basis. Actual emissions of vehicles are based on a model based on data points from various tests. Benefits are a combination exhaust and evaporative emissions.]

The charts show a sizeable overcompliance of the fuel exceeding specifications (benefits). Toxics are the area with greatest concern of potential lost benefits based on degree of overcompliance presently versus Phase II. Two points were made regarding mass toxic emission reductions (noting factors that should be considered).

1) MTBE is not accounted for in the MOBILE model because MTBE was not a requirement of the Clean Air Act, which presumes there are no toxic emissions from MTBE. If MTBE is added to the model, there was still a 12 percent reduction of toxics.

2) Prior to establishing a baseline, specifications need to be discussed. It was suggested to use potency weighted specification for performance, which should include the constituents being used (e.g., MTBE).

The fuel certification tools (models) are being used to analyze situations they were not designed to analyze. It was noted that there needs to be further discussion on whether the goal is to match minimum statutory emission requirements or in-use levels.

Questions were asked about the difference between Phase I and Phase II benefits. It appears that Phase I benefits almost reach the Phase II requirements, so the question becomes, will Phase II add any benefit or just add to the overcompliance? In response it was noted that the Phase II model is different than Phase I, so they are not comparable. The NOx requirement is the largest change in Phase II RFG, which increases to a 7 percent reduction (also reduces sulfur and olefins).

Nick Economides, Oxygenated Fuels Association, presented information (chart) on matching the actual in-use emissions with non-oxygenated gasoline. It was explained that the Phase I and Phase II models were different. Further, Mr. Economides explained what produces the overcompliance (2/3 oxygenate, 1/3 fuel changes NOx, VOC reductions). The main issue was

whether to settle for the statutory requirements or achieve overcompliance, and he conveyed the difficulty in making the blend of fuel.

There are many unintended consequences that may come from fuel changes. It was suggested that setting the specifications for the fuel blends would be better then specifying what to use in the fuel. A question was asked regarding the level of air toxics exposure per person that is attributable to gasoline in the environment. In response, mobile sources are the dominant pollution source in the Northeast. As the fleets turn over, it changes the level of air toxics.

Regarding flexibility, a question was raised involving whether it is best for the refining industry to give a performance standard or a specific menu with caps at certain levels. In response, Mr. Campbell of Sunoco stated that the industry prefers a performance standard and the flexibility to work toward achieving that.

What was the rational used behind CARB's decision to specify certain fuel parameters rather than performance standards? CARB tried to reduce the toxic loading and reducing NOx and VOCs - CARB developed a set of parameters to have the best chance of achieving the objectives, and then provided the predictive model to provide flexibility to the refiners to achieve compliance.

A question was raised about looking at the proposed California fuel (to be used in parts of California that do not have an oxygenate mandate), and how that would look if it was run through the complex model.

A Panel member raised the concern that MTBE is not included in the complex model, and therefore, the outcome from the model does not incorporate the compound that is the focus of this discussion. It was requested that the Panel make a decision whether to address this issue or not. The Panel was requested to decide if MTBE needs to be included in this analysis, and if so how? These terms have a significant impact on the outcome of these numbers. It was noted that there is a need to deal with potency of MTBE.

Issues that need to be discussed in the future include: air quality aspects of ethanol and the oxyfuel program. The oxyfuel program mainly uses ethanol (approximately 80 percent-90 percent). There are data on the areas that overlap between the RFG program and the oxyfuel program. Mr. Greenbaum asked the Panel if the oxyfuel program should be addressed. It was noted that if the Panel looks at the oxyfuel program, they should also look at the conventional gasoline anti-dumping program with another major change in the fuel. It is unresolved whether there are still questions from the Panel regarding issues with ethanol in water.

Prevention and Remediation

Mr. Ng stated that EPA Office of Underground Storage Tanks (OUST) regulates preventing releases, detecting releases as soon as possible, and providing timely and cost effective clean up

actions when releases occur. There are two million regulated UST's spread throughout the United States owned by oil companies, "mom and pop businesses," state governments, etc. Therefore, EPA could not implement a program to regulate every situation, and therefore, prevention must go beyond EPA. The program has been designed to be implemented by the States, and the States have enforced above and beyond what EPA can do. The regulatory framework was phased in over time. By the end of 1993, leak detections systems were in place. In 1988, it was decided that the best framework for the regulation was single walled, corrosion protected, leak detection, overfill and spill protection systems. The situation has been improved, and many of the leaks detected now are from old tanks that need to be upgraded. There is a lot of work to be done in the future. Many of the problems are from poor maintenance and installation of the upgraded systems. EPA has no authority to mandate proper maintenance and operation of the systems. The current number of EPA regulated UST's is less than 900,000. There are millions of UST's that were exempted by congress (residential, farm, heating oil, etc.), and are not regulated by EPA. Aboveground storage tanks (ASTs) have increased because they are not regulated, and do not require the same leak detection and prevention systems. Preventing leaks from products from the petroleum storage systems goes far beyond EPA's regulated universe.

Lois Epstein, Environmental Defense Fund, presented information on petroleum infrastructure, leaks, and improvements. She stated that the issue is not just leaking UST's. Further comments by Ms. Epstein include:

1) When the final UST regulations were finalized by EPA, there was a prediction that there would be $2.1 billion of damages to the environment.

2) It was noted that 85 percent of monitored refining and marketing ASTs reported confirmed ground water contamination. AST's do not have a federal regulatory program like USTs to prevent and remediate ground water contamination.

3) Interstate pipelines have no environmental protection regulatory requirements, including leak detection, liability, and remediation requirements.

4) Superfund has an exemption for petroleum contamination.

Questions were asked about the wide variety of gasoline mishandling as an issue to cause contamination, including what fraction of the LUST problem is associated with unregulated tanks? The home heating oil tanks and AST's are not regulated. Some states may have data.

The law does not preclude the States from adopting more stringent regulations than the federal government. Individual States have regulated a broader universe (AST's, home heating tanks, etc.). Some state laws may not allow regulations beyond the federal requirements. Only a few states mandate double walled tanks; the majority requiring only single walled tanks. Are there federal and state tanks not in compliance with the 1998 UST regulation deadline? It was noted that federal agency tanks are in compliance. It will be difficult to understand the sources of

contamination if there is vast number of underground tanks that are not regulated. Data were requested on the federal compliance rate and leak detection.

Because the resources follow slower than the plumes, the federal LUST Trust Fund is given to the states to run their clean up program. The state trust funds hire staff to oversee clean up. The federal trust fund is in good shape, but some of the state trust funds are having problems.

There were many comments related to federal and state trust funds for clean up of leaking UST's. Claims were made that the financial resources are allocated slower than the plumes grow, and water utilities have claimed that the huge costs required for clean up are detrimental to their financial health. Therefore, how do the large federal trust funds and state funds aid the water utilities? In response, it was stated that the federal LUST trust fund has strings attached to how and when it can be used (i.e., if there is no known owner). Most of the large MTBE releases have known owners, so they do not meet the criteria to use the federal trust fund. The amount given out to the states by the federal trust fund is appropriated and can be changed if Congress wants to increase the amount. The current amount of the federal trust fund is 1.2 billion, and Congress appropriates an average of 70 million annually. The state trust funds use the federal LUST trust fund to hire staff to oversee the hundreds of clean ups. It was noted that these federal funds were designed to deal with source control of the program, not fund the cost of treating the water. Originally, the state trust funds were created as a means of insurance for tank owners to comply with the financial requirements of USTs - owners are required to have a certain amount of coverage (one million cap). If there is no clear responsible party, the state can get funds for clean up. States have been proactive with ASTs, but more UST's and AST's need to be covered under the regulations (home heating tanks, etc.).

There was discussion regarding leak detection methods and needs. Leak detection has to have a 95 percent chance of detecting a leak and no more than five percent false alarms. There is a leak rate allowable up to five percent. There has been no technology improvement in the leak detection area. It was suggested that this area be improved or addressed. There is room to consider pushing the leak detection process, which does not require legislative action. The question kept arising regarding the need to determine the amount of fuel allowed to leak. Data were requested on the cause of pipeline leaks because there was conflict regarding whether the cause of leaks comes from corrosion or third party causes (pipeline punctures).

In conclusion, it was noted that there are ample opportunities to improve the LUST program and the Panel is willing to make suggestions on improvements. The question of what benefits could be obtained from potential improvements needs to be addressed. A presentation was given in California stating that upgraded tanks showed an improvement, but releases still occurred. The question remains how much improvement could be achieved.

MTBE is widely used in Europe, where the fuel is more expensive, and there is no public outcry. A Panel member questioned whether there is anything from the European experience that could be gained to help interpret what the Panel is dealing with. Other countries use different systems

(vault systems). Cost benefits and risk must be balanced for every regulation proposed. This issue needs to be addressed in the future.

PUBLIC WORKING SESSION ON SUMMARY OF ISSUES

Comparing Fuel Additives

The Panel comments regarding the Comparing Fuel Additives issue summary included:

- Factual piece about ethanol capacity to meet demand - production may not be the issue, but distribution needs to be considered
- Cost increase estimates for increased ethanol use
- The future use of RFG and opt-ins
- Commingling of products (additives) in gasoline tanks - needs to be resolved (i.e., ethanol)
- Ethanol biodegradation of BTEX compounds
- Public acceptance and concern over the fuel components
- Fuel economy comparison of additives
- Impact on maintenance issues driveability, equipment damage, etc.
- PAN - potency levels, irritant
- UST compatibility with additives (piping leaks, etc.) - ethanol, MTBE, mixture
- How much more alkylates would be needed - what are the health effects? (Alkylate is a process, not a chemical).

Mr. Greenbaum raised the question about the use of ethers. Are there comparable measures to determine whether ethers will biodegrade similarly or different? A report by OSTP stated that the alcohols behave differently from ethers; however, within the ether group they had same environmental behavior and fate. API is finishing an aquatic toxic study - preliminary results can be provided when available.

REPORT OUT FROM WORK GROUP SESSIONS

Full Panel discussions regarding the issue summaries were held after the break-out sessions. Panel comments on each summary are provided below.

Air Quality

- It would be better to have a qualitative approach to the issues.
- Key question involved "Need for oxygenates to maintain the benefits"
- Regarding feasibility, if oxygenates are not needed, what is the feasibility to go in alternative directions?

- Fuel additives, explain the consequences of different directions (may want to tie in fuel additives with air quality)

Water Contamination

- Provide more information in certain areas
- Add latest USGS preliminary data
- Add more information on perception of contamination - What has actually happened to the wells (how the situation has been handled in specific cases)
- Provide more examples of what has happened in terms of ground water contamination
- Properly characterize the volatility of MTBE
- Describe why states have set certain standards (primary, secondary, action levels, etc.)
- Explain where will this take us in five years - struggled with long term projection of water contamination

Prevention and Remediation

Treatment
- There is a need for national assessment of the extent of the potential problem (how large is the problem)
- There is a lack of mechanisms to get assistance/funding
- Provide a description between short-term and long-term issues
- Provide information technology for contamination clean up

Remediation
- Include information from the two studies from Chevron about remediation technologies - define gaps to establish technology
- Explain the sources of funding - Manual on State and Federal Assistance and Funding - how to access to those funds
- Include different categories of remediation (soil, ground water, treatment)

Prevention
- All systems have some degree of failure/leakage (human and mechanical failures)
- Provide a description of total universe of sources (all tanks, pipelines, outboard motors, spills)
- Material compatibility
- Provide a national assessment of education and training (public handling of gasoline)

Added comments: EPA has tools on wellhead protection programs to keep potential contamination away from wellhead. Panel agrees to recommend a series of education actions. There are more categories of sources to address under prevention.

Supply and Price

- The summary needs to be more explicit about the time line and tie the time line to the various options (not fuel supply system)
- Regarding certainty, the regulatory environment must be dealt with (costs)
- Fungibility of gasoline, and commingling (regional?)
- The cost of ethanol infrastructure needs to be reviewed

NEXT STEPS

The Panel members were asked to evaluate the different options listed. Further discussion is needed regarding how each option would be implemented. The Panel members further clarified each of the options that have been listed. The Panel members were asked to compare each of the options to the status quo, and ask the questions "Does it work, or not work," and provide comments on each option. The focus of the options exercise is to highlight where the Panel is in agreement or disagreement, and where the Panel needs to focus at the next meeting. The goal is to provide the options list to the Panel members and have the Panel returned the list to Karen Smith by May 12, 1999, for preparation to discuss the comments at the next meeting.

Issues that need further discussion and may require presentations, include; (1) Air and water issues related to ethanol (air - will be addressed by the NRC report), (2) commingling issues, and (3) better understanding of comparing the fuel additives chart - increased use of aromatics and alkylates.

The Panel noted that remediation actions (cost and alternatives) need to be more thoroughly covered, as well as the extent of the contamination problem. The winter oxyfuel program still needs to be discussed in terms of the need for the program.

Sign-In-Sheet

MTBE BLUE RIBBON PANEL
April 29-30, 1999
Arlington, Virginia

Name	Affiliation	Phone Number	Fax Number	E-Mail
Dawn Kristof	NCGA	703-444-1777	703-444-1779	wwema@erols.com
Evan Rikhye	BG&R	202-333-4936	202-833-9392	erikhye@BGRDC.com
Beth Campbell	DOE	202-586-5590		
John Hackartt	DOE	412-826-1661	412-826-1662	
Jenny Noonan	Senate EPW	202-224-6226		
Joe Marcinek	Mobil	703-849-7509	703-849-7519	
Tim Hogan	NPRA	202-457-0480	202-457-0486	Tim_Hogan@npradc.org
Marc Duncan	OEPNO	202-401-0532	202-401-0533	mduncan@oce.usda.gov
John Zogorski	USGS	605-355-4560		
Greg Krissek	KS Department	785-296-3558	785-296-8389	gkrissek@kda.state.ks.us
Merribel Agnes	Lighthouse Energy	202-822-2000	202-822-2156	magnes@LTHenergy.com
Tobyn Anderson	Lighthouse Energy	202-822-2000	202-822-2156	tanderson@LTHenergy.com
P.R. (Jeff) Miller	The Beacon Group	212-339-9103	212-339-9109	jmiller@beacongrp.com
Bob Reynolds	Downstream Alternatives Inc.	219-546-4204	219-546-5845	reynoldsatdai@compuserve.com

Name	Affiliation	Phone Number	Fax Number	E-Mail
Mike Lobue	**ARCO**	**202-879-9260**	**202-879-9287**	**mlobue@mail.arco.com**
Pam Nugent	**Dale Kardos & Associates**	**202-466-3649**		
James Kennedy	**BNA Daily**	**202-452-5362**		
Jim Taft	**USEPA**	**202-260-5519**	**202-260-3762**	
Rob Kaler	**TecaLaw**	**703-818-3262**		
Laura Catalano	**Fleischman Hillard**	**202-828-8867**		
Hosein Shapori	**USDA/OEPANU**	**202-401-0531**	**202-401-0533**	
Michelle Huffman	**USDA/OEPNU**	**202-690-0832**	**202-401-0533**	
Stephen Grady	**USGS**	**860-291-6758**	**860-291-6799**	**sgradg@usgs.gov**
John Reese	**API**	**202-682-8273**	**202-682-8033**	**reesej@api.org**
Mark Hopkins	**Chevron**	**202-408-5813**	**202-408-5845**	
Blake Early	**ALA**	**202-785-3355**	**202-452-1805**	
Jamie Burnett	**USEPA**	**202-260-7749**		
Charles Walton	**AMWA**	**202-331-2820**	**202-785-1845**	**charles@amwa-water.org**
J. Shore	**EIA**	**703-519-3740**	**703-519-3749**	**jmshore@senergy.com**
J. Felmy	**API**	**202-682-8530**	**202-682-6408**	**Felmyj@api.org**
Bob Slaughter	**NPRA**	**202-457-0480**	**202-457-0460**	

Name	Affiliation	Phone Number	Fax Number	E-Mail
Robert Tardiff	**Sapphire Group**	**301-664-8406**	**301-664-8403**	**RGT1@erols.com**
Tien Nguyen	**DOE**	**202-586-7387**	**202-586-9815**	**tien.nguyen@ee.doe.gov**
Steve Zukor	**TMS, Inc.**	**301-670-6390 x12**	**301-670-1942**	**szukor@tms-hq.com**
Maria Bellos	**New Fuels & Vehicles Report**	**703-416-8576**	**703-416-8543**	**fuelsreport@yahoo.com**
June Whelan	**NPRA**	**202-457-0480**	**202-457-0486**	**June_Whelan@npradc.org**
Mike Osinski	**USEPA Office of Water**	**202-260-6252**	**202-260-3762**	**osinski.michael@epa.gov**
Sylvia Amaya	**Texas Natural Resource Conservation Commission**	**512-239-4811**		**samaya@tnrcc.state.texas.us**
Sammy Ng	**USEPA**	**703-603-7166**		**ng.sammy@epamail.gov**
Ryan Nayar	**Information Resources**	**703-528-2500**	**703-528-1603**	
Greg Noore	**Marathon Ashland Petroleum**	**419-421-3774**	**419-421-4120**	**WGMOORE@MAPLLC.com**
Christine M. Stackpole	**Cambridge Energy Research Associates**	**617-441-2675**	**617-498-9151**	**cstackpole@cera.com**
Bruce Bauman	**API**	**202-682-8270**	**202-682-8270**	**bauman@api.org**

Name	Affiliation	Phone Number	Fax Number	E-Mail
David Andress	DOE	301-933-7589	301-933-7189	dandress@eia.doe.gov
Terry Wigglesworth	OFA	703-841-7100	703-841-7720	twiggs@bellatlantic.net
Joann Tortorice	USITC	202-205-3032	202-205-2359	jtortorice@usitc.gov
Arlene Kabei	EPA Region 9	415-744-1027	415-744-1044	
Glenda Bouth	Senator Feinstein	202-224-3841	202-228-4741	
Andy Werking	AOPA	301-695-2167		andrew.werking@aopa.org
Rachel Urdan	Inside Washington Publishers	703-416-8562	703-416-8563	riskpolicy@yahoo.com
Janice Raburn	API	202-682-8253	202-682-8088	raburnj@api.org
Bob Dinneen	RFA	202-289-3835	202-289-7519	ethanolRFA@aol.com
Don Robinson	ICF Kaiser	703-934-2512	703-791-5661	donrobinson@msn.com
Ann Farner Miller	Tosco Corp.	203-977-1016	203-326-3144	afarner@tosco.com
Nick Economides	Oxygenated Fuels Association	703-841-7100		
Edlu Thom	Lyondell	202-434-8938	202-434-4585	ejthom@cais.com
Charlie Drevna	Oxygenated Fuels Association	703-841-7100	703-841-7720	ctd@bellatlantic.net
John McClelland	National Corn Growers Association	202-628-7001	202-628-1942	mcclelland@DC.NCGA.com

Name	Affiliation	Phone Number	Fax Number	E-Mail
Mike Graboski	**Col. School of Mines USDA**	**202-694-5022**	**202-694-5665**	**msgraboski@aol.com graboski@ean.ag.gov**
Lori Stewart	**USEPA**	**202-564-9035**	**202-565-2084**	**stewart.lori@epa.gov**
Debbie Wood	**USEPA**	**202-564-8991**		
Maureen Lewison	**USEPA**	**703-603-7143**		**lewison.maureen@epa.gov**
John Brophy	**USEPA / OMS**	**202-564-9068**	**202-564-2085**	**brophy.john@epamail.epa.gov**
Glenn Giacobbe	**Lyondell**	**610-359-5799**	**610-359-2581**	**cnsgbg@arcochem.com**
Rachel Sakata	**USEPA**	**202-260-2527**		
Robert O'Keefe	**HEI**	**617-876-6700**	**617-876-6709**	**rokeef@healtheffects.org**
Kevin Anderson	**NPRA**	**202-457-0480**	**202-457-0486**	**kevin_anderson@npradc.org**
James Jones	**South Tahoe PUD**	**530-544-6474**		
Bill Piel	**Lyondell Chemical**	**610-359-5728**	**610-359-2581**	**cnswjp@areochem.com**
Fred Potter	**Information Resources**	**703-528-2500**	**703-528-1603**	**potter@MotorFuels.com**
David E. Holt	**Information Resources**	**703-528-2500**	**703-528-1603**	**david.holt@motorfuels.com**
Kerry Lenahan	**Information Resources**	**703-528-2500**	**703-528-1603**	**kerry.lenahan@motorfuels.com**

Name	Affiliation	Phone Number	Fax Number	E-Mail
Megan Smith	**American Bioenergy Assoc.**	**202-467-6540**	**202-467-6541**	**msmith2@erols.com**
Susan Field	**Toyota**	**734-995-2086**	**734-955-5971**	**field@ttc-usa/com**