No-Fault Remediation of MTBE

Daniel Velez

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DANIEL VELEZ*

I. INTRODUCTION

In 1970, Congress amended the Clean Air Act ("CAA") to more effectively counteract air pollution. Included in the amendments were provisions designed to address the mounting problem of mobile source air pollution and, in particular, air pollution stemming from automobiles.\(^1\) Automobile pollution was primarily handled on two fronts: (1) requiring new automobiles to run cleaner; and (2) requiring automobiles to use cleaner fuel.\(^2\)

In 1995, the Federal Reformulated Gasoline Program mandated the creation of reformulated gasoline ("RFG")—a fuel that would burn cleaner.\(^3\) One avenue for designing a cleaner burning fuel is to use additives that enhance the burning quality of the fuel. The most widely used reformulated gasoline additive is methyl tertiary butyl ether ("MTBE").\(^4\) MTBE proved to be a very effective means for controlling

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\(^*\) Mr. Velez received his B.S. from California Institute of Technology in 1998 and his J.D. from William and Mary School of Law in May 2001. Mr. Velez is as an associate with the law firm of Frommer Lawrence & Haug LLP, in New York, New York.


\(^2\) See id. §§ 201, 209, 213, 250 (codified as amended at 42 U.S.C. §§ 7521, 7543, 7547, 7590 (1994)) (emission standards for new motor vehicles or new motor vehicle engines); id. § 211 (codified as amended at 42 U.S.C. § 7545) (fuel and fuel additives). The amendments also sought to control mobile source air pollution through transportation planning. See id. § 176(c) (codified as amended at 42 U.S.C. § 7506(c)). The CAA has been subsequently amended several times after 1970, including a significant tailoring in 1990. See Arnold W. Reitze, Jr., Mobile Source Air Pollution Control, 6 ENVTL. LAW 309, 313-14 (2000). The basic control strategy of the CAA, including the implementation of a fuel reformulation program, has remained intact. See id.

\(^3\) Under section 211 of the 1990 CAA, Congress provided the EPA with the authority to regulate fuel formulation to improve air quality. The current CAA requires 2% oxygen by weight in reformulated gasoline. Clean Fuels Program, 42 U.S.C. §§ 7581-90 (1994).

\(^4\) MTBE has been used for blending into unleaded gasoline as an octane enhancer since 1979. See U.S. ENVTL. PROT. AGENCY, MTBE FACT SHEET #2: REMEDIATION OF MTBE CONTAMINATED SOIL AND GROUNDWATER 510-F-97-015 (Jan. 1998) at http://www.epa.gov/swerustl/mtbe/mtbefs2.pdf (last visited Dec. 1, 2001) [hereinafter MTBE FACT
the amount of auto combustion pollution, and in some cases, surpassing Environmental Protection Agency ("EPA") targets for pollution abatement.5

Unfortunately, MTBE did not come without considerable unforeseen costs. In the late 1990s, MTBE was detected6 in drinking water supplies of communities throughout the United States.7 Although not yet proven in court, causation was clear—MTBE was seeping into water supplies from leaking underground storage tanks.8

Several municipalities throughout the United States have already commenced or are contemplating some form of tort action against a combination of oil companies, MTBE producers, and gas station owners in

5See infra note 27.

6As of June 1999, 3.7% of California's drinking water systems have detected MTBE. See David Littell, MTBE or Not MTBE—Why is That the Question?, 14 NAT. RES. & ENV'T 247 (2000). In a 1998 study conducted by the State of Maine, 1.1% of Maine's private water supplies exceeded Maine's 35 parts per billion ("ppb") maximum containment level. See id. It has been suggested that MTBE could have been leaking into water tables as early as 1980. See Chris Bowman & Patrick Hoge, MTBE Risk to Drinking Water Was Known for Years, GARDEN STATE ENVIRONET (Mar. 1999) at http://www.gs enet.org/library/04chm/m theknwn.txt (last visited Dec. 1, 2001). Sixteen years before MTBE-rich gasoline was approved for statewide use in California to combat air pollution, oil companies knew from their first experience with the fuel additive in New England how quickly methyl tertiary butyl ether can migrate from leaking storage tanks to drinking water wells, as company records and technical journals show. Id. In 1980, MTBE was found in Rockaway, NJ, groundwater near a Shell service station. Id.

7"The use of MTBE in the [Federal Reformulated Gasoline] program has resulted in growing detections of MTBE in drinking water, with between 5% and 10% of community drinking water supplies in high oxygenate use areas showing at least detectable amounts of MTBE." U.S. ENVTL. PROT. AGENCY, ACHIEVING CLEAN AIR AND WATER: THE REPORT OF THE BLUE RIBBON PANEL ON OXYGENATES IN GASOLINE EPA420-R-99-021, at 13 (1999) (citation omitted) [hereinafter BLUE RIBBON PANEL]. In 1999, the majority of these detections did not, in the opinion of the EPA, pose a public health concern (between 0.3% and 1.5% rising to levels above 20 ppb). However the EPA also stated that the absence of long term monitoring data make the total extent of ground and surface water contamination unknown. See id. at 14.

order to redress MTBE contamination. This Note suggests that the most just and efficient means for handling MTBE contamination claims is for Congress to legislate a remedy.

The first part of this Note analyzes air pollution aspects of MTBE, illustrating why MTBE was a necessary and highly beneficial means in which to reduce smog in critical non-attainment zones, including many metropolitan areas in California. The second part discusses the water pollution problems that were encountered with the adoption of MTBE as a gas additive. Particular focus is placed upon the unfortunate tenacity of MTBE as a water pollutant and the difficulties associated with its remediation. The third part of this Note addresses several of the problems associated with a judicial resolution of MTBE contamination claims. The fourth part of this Note considers why a complete phase-out of MTBE in the near future is an unrealistic option. The fifth part suggests that in light of the inadequacy of a judicial resolution and the probable continued use

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9 The following is a state-by-state list of MTBE related lawsuits:

(1) California:
- City of Dinuba v. Unocal Corp., No. 305450 (Cal. Super. Ct.).

(2) Maine:
- Millet v. Atlantic Richfield Co., No. CV-98-555 (Me. Super Ct.).

(3) North Carolina:

(4) New York:

(5) Connecticut:
- Martin v. Shell Oil Co., 198 F.R.D. 580 (D. Conn. 2000) (Class of surrounding property owners allegedly affected by gasoline station's groundwater contamination was insufficiently numerous to warrant class certification. There was evidence that station had contaminated only limited portion of presumed area, and no evidence that proposed class members, other than named plaintiffs, were interested in litigating issue.).

(6) Florida:
- Chasnoff v. Chevron U.S.A., Inc., No. CV-99-0727 (Fla. Cir. Ct.).

of MTBE, the most efficient solution for all parties concerned is a legislative resolution. Particular focus is placed on both economic and constitutional dimensions of such an approach.

MTBE policy is a nasty game with many players, including oil producers, station owners, the EPA, the states, ethanol producers, environmentalists, consumers, automakers, and so forth. The list involves countless groups that are intricately woven into one of the most important features of our society and economy—gasoline. While these groups haggle with each other either in court or in Congress, or perhaps even in the media, the nation’s water supply is not being cleaned. Therefore, the main reason for the appropriateness of a legislative solution is time. The judicial process cannot provide the speedy recovery needed to ensure that no one drinks contaminated water.

II. MTBE

A. Air Pollution

Combustion is a reaction whereby a substance is converted into energy. Typical combustion involves the burning of wood in the presence of air to produce heat. A basic combustion reaction involving a hydrocarbon proceeds as follows:

\[ C_xH_y + AO_2 + [modicum \ of \ energy] \rightarrow BCO_2 + DH_2O + [energy], \]

where the coefficients A, B, and D would depend upon X and Y.11 A combustion reaction such as this, producing no other carbon based products other than carbon dioxide, is deemed complete combustion. For most processes such perfect or complete combustion is a theoretical upper limit and by-products are often created. The creation of unwanted by-products may contribute to pollution and decrease the amount of usable

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11 Id. at 89–90, 369. This is the complete combustion reaction in the presence of oxygen alone. Id. In the presence of air, nitrogen would be added to both sides of the equation. Id. The nitrogen and other gases in the air merely dilute the concentration of oxygen and usually appear in the products unchanged in form. Id. However, in high temperatures encountered during the auto combustion process, dissociated (free-form radical) species such as OH, H, O, and N (as opposed to N2) appear, as do endothermically (cooling the system) formed species such as NO also. Id. Following the expansion (explosion of the gasoline), the temperature falls, and the free species should recombine. Id. However the expansion process is not in stable equilibrium and as a consequence a variety of nitrogen oxides persist and are formed—an air pollution consequence. Id.
energy produced by the reaction. One means of “pushing” a generic combustion reaction to completion is to saturate the process with a constant supply of fresh oxygen. Another means of approaching complete combustion is to select a “chemically simple” fuel—a fuel that can be easily broken down.\footnote{12}

In automobiles, a mixture of gasoline and air is ignited to produce the energy necessary to propel an automobile. Essentially, this gas-air mixture explodes, creating the force necessary to drive an engine’s pistons.\footnote{13} Automobile combustion produces contaminants that result from the nature of combustion itself and the inability of engines to attain perfect or complete combustion.\footnote{14} Chief among these pollutants is carbon monoxide.\footnote{15}

To force cleaner or more complete combustion, the Clean Fuels Program of the CAA allowed the use of fuel additives that would essentially increase the power output present in the generic reaction shown above.\footnote{16} Additives such as these are referred to as oxygenates, and the two most common of which are MTBE and ethanol.\footnote{17}

\footnote{12} Alternative fuels such as methanol, ethanol, and others are “chemically simple” and burn much cleaner than gasoline. \textit{See infra} note 93.
\footnote{13} The four-stroke spark-ignition cycle. \textit{Id.} at 3.
\footnote{14} \textit{Id.} at 367-79. Primary mobile source air pollution problems arise from hydrocarbons and nitrogen oxides. \textit{Id.} at 367. The catalytic converter changes some amount of harmful pollution gases such as hydrocarbons, carbon monoxide, and nitrogen oxide into harmless emissions of carbon dioxide and water vapor.
\footnote{15} Gasoline designed to reduce the amount of carbon monoxide produced contains as much as 11% MTBE. \textit{See} Ben Thomas, \textit{History of MTBE and Survey of Scientific Literature}, \textit{9 KAN. J.L. \\& PUB. POL’Y} 166, 167 (1999).

\footnote{17} MTBE was first used in 1979 as a substitute for lead in enhancing the octane rating of premium gasoline. \textit{See} MTBE FACT SHEET, \textit{supra} note 4, at 1. “MTBE provides about 76 percent of the oxygenate used in all RFG, and ethanol provides about 19 percent.” \textit{BLUE RIBBON PANEL, supra} note 7, at 26. The remaining 5% is comprised of other ethers. \textit{Id.}
MTBE is a relatively simple organic compound.\textsuperscript{18} The key to its performance as a superior oxygenate is the ether structure: a single oxygen atom bridges two hydrocarbon chains. During combustion this bridge is broken, “adding” usable energy to the combustion system.\textsuperscript{19}

The leading oxygenate alternative to MTBE is ethanol.\textsuperscript{20} Ethanol, also known as grain alcohol, is readily produced from corn or other suitable biomass.\textsuperscript{21} As a result, ethanol use has been strongly favored by Midwestern states with the farming capacity to create ethanol.\textsuperscript{22} Geography aside, compared to MTBE, ethanol has inferior oxygenating ability and energy content.\textsuperscript{23} Given these considerations and the relatively low production costs,\textsuperscript{24} the leading RFG oxygenate has consistently been MTBE.\textsuperscript{25}

Separate cost analyses conducted by the EPA and California indicate that in comparison to all other air pollution control options, RFG is a cost-effective approach to reducing ozone precursors.\textsuperscript{26} The EPA

\begin{itemize}
\item \textsuperscript{18} MTBE is an ether manufactured by reacting methanol and isobutylene. The resulting ether has high octane and low volatility. See id. MTBE FACT SHEET, supra note 4, at 1.
\item \textsuperscript{19} Breaking the molecule up, one could possibly form methane, carbon monoxide, carbon dioxide, or methanol (which may lead to the slightly toxic formaldehyde). See Thomas, supra note 15, at 166.
\item \textsuperscript{20} See infra Part IV.A.
\item \textsuperscript{21} See John Urbanchuk, Governors’ Ethanol Coalition, Ability of the U.S. Ethanol Industry to Replace MTBE (Mar. 20, 2000), available at http://www.ethanol-gec.org/index.htm (last visited Dec. 1, 2001). The Coalition supports the production of ethanol from corn or other domestic, renewable resources using sustainable agricultural methods and encourages its use in environmentally acceptable applications. Id.
\item \textsuperscript{22} Lobbying groups that represent the farming interests of states such as Nebraska and Iowa have consistently pushed for a ban on MTBE and a switch to ethanol. In response to the \textit{60 Minutes} MTBE coverage, Iowa Governor Thomas J. Vilsack, in his capacity as Chair of the Governors’ Ethanol Coalition, wrote a letter congratulating CBS on their investigative report and for suggesting ethanol as a substitute for MTBE. Letter from Thomas J. Vilsack, Governors Ethanol Coalition, to Graham Messick, \textit{60 Minutes} (Jan. 20, 2000), available at http://www.ethanol-gec.org/01202000.htm (last visited Dec. 1, 2001). Northeast states oppose a simple MTBE ban because it would force them to use ethanol in summertime RFG. This is a problem because the corn derived chemical must be transported from the Midwest. \textit{MTBE: Governors Agree on Role of Ethanol in Fuel; Committee Schedules Markup of Legislation}, \textit{Daily Env’t Rep.} (BNA), July 24, 2000.
\item \textsuperscript{23} Littell, supra note 6, at 248.
\item \textsuperscript{24} “MTBE is . . . significantly less expensive to produce [than ethanol] and is less expensive for the U.S. taxpayer because it does not receive . . . substantial tax subsidies.” Id.
\item \textsuperscript{25} Id.
\item \textsuperscript{26} Blue Ribbon Panel, supra note 7, at 22.
\end{itemize}
further concluded that the RFG program substantially reduced total emissions, exceeding preset abatement standards.\textsuperscript{27} The air quality benefits of MTBE might suggest that MTBE use is primed to continue. Apart from the statutory framework of the CAA, a network of other considerations depends upon MTBE use. The use of MTBE as a fuel additive is tightly woven into a complex relationship of octave requirements, infrastructure ability, oil production, and ultimately the pump price of gasoline.\textsuperscript{28}

B. Water Pollution

The main pathway of MTBE contamination is leakage and seepage from gasoline underground storage tanks ("UST").\textsuperscript{29} UST failure poses new concerns in relation to MTBE. The chemical structure of MTBE that enables it to be a superior oxygenate also provides for an efficient water

\textsuperscript{27} The EPA's 1995 Air Quality Trend Report showed a median reduction of 38% in ambient benzene and significant reduction in other vehicle related pollutants. \textit{Id.} The EPA concluded that no other control action could account for such a substantial reduction in pollution. \textit{Id.}

\textsuperscript{28} For instance, no matter how refiners blend fuels to meet air quality standards, fuel will still be blended to maintain the octave requirements of automobiles. To meet these requirements refiners will most likely substitute aromatics such as benzene for MTBE. Aromatics are one of the strongest contributors to the formation of toxics as determined by EPA modeling. \textit{See id.} at 27. In terms of water contamination, benzene is highly soluble in water and known to cause cancer. \textit{See MTBE FACT SHEET, supra} note 4, at 1.

\textsuperscript{29} There are several less critical pathways of MTBE contamination including direct spillage of gasoline during vehicle fueling (such MTBE may enter the ground directly or reenter the ground during the condensation cycle). The U.S. Geological Survey ("USGS") sampled storm water in sixteen cities and metropolitan areas that are required to obtain permits to discharge storm-water from their municipal storm-sewer system into surface water. Concentrations of sixty two volatile organic compounds ("VOC"), including MTBE and BTEX compounds, were measured in 592 storm-water samples collected in these cities and metropolitan areas from 1991 through 1995. Concentration data for MTBE and BTEX compounds in storm water were compiled and analyzed, and the findings are summarized in this report. MTBE was the seventh most frequently detected VOC in urban stormwater, following toluene, total xylene, chloroform, total trimethylbenzene, tetrachloroethene, and naphthalene. MTBE was detected in 6.9\% (41 of 592) of stormwater samples collected. \textit{JOHN C. DELZER ET AL., U.S. GEOLOGICAL SURVEY, OCCURRENCE OF THE GASOLINE OXYGENATE MTBE AND BTEX COMPOUNDS IN URBAN STORMWATER IN THE UNITED STATES, 1991-95, at} http://wwwsd.cr.usgs.gov/nawqa/pubs/wrir/wrir96.4145/wrir.doc.html (last visited Dec. 1, 2001). The most troubling point source of MTBE remains leaking UST. \textit{See BLUE RIBBON PANEL, supra} note 7, at 16.
When petroleum is released in the soil, "MTBE may separate from the rest of the petroleum reaching groundwater first and diffusing rapidly with it." It would therefore take much less MTBE compared to other lethal gasoline constituents to damage a water supply. As a result, UST design and regulation must ensure that very little MTBE leaks—the nature of the molecule allows little room for error.

Past USTs provided the basic protection of unprotected steel, which often corrodes when it comes into contact with ambient electrical charges in soil and groundwater. Outdated storage systems require major upgrades at a substantial investment to prevent seepage.

See MTBE Fact Sheet, supra note 4, at 5.

In formulating its analysis of the transport properties of MTBE, the EPA made several comparisons to the known properties of benzene. According to the EPA, "benzene is most often the contaminant of concern in gasoline because of its relatively high solubility and known carcinogenicity," and it therefore serves as a proper baseline to gauge MTBE. Results of the EPA's analysis indicate that: (1) MTBE is about 30 times more soluble than benzene in water; (2) MTBE is three times more volatile than benzene (capacity to move from liquid to vapor phases as a free product); (3) when moving from the dissolved phase to the vapor phase, MTBE is about ten times ten times "more difficult" than benzene to remove from water; (4) MTBE is much less likely than benzene to adsorb into soil or other organic carbon; and (5) MTBE is more resistant to biodegradation than benzene. See id. at 1. Ethanol, the other leading oxygenate, is also extremely soluble in water, but easily biodegrades (although it may hinder the biodegradation of other gas constituents). See BLUE RIBBON PANEL, supra note 7, at 79.

As used here, damage refers to the very presence of a molecule in a water supply. Since MTBE can so effortlessly move through water (high solubility and resistance to biodegradation) it is less likely to be impeded in an aquifer. Thus, given equal amounts of gas constituents, more MTBE is likely to enter a water supply. Or, in other words, it would take less MTBE than other constituents to pollute. However no comparisons based on the relative toxicity of MTBE as compared to other gas constituents is made.

Federal UST regulations currently require that all UST systems be designed, constructed, and protected from corrosion in accordance with a code of practice developed by nationally recognized associations and testing laboratories. Advanced protection systems include cathodic protection, fiberglass reinforced tanks, composite steel, underground monitoring systems, and multi-hulled vessels. See OFFICE OF UNDERGROUND STORAGE TANKS, U.S. ENVTL. PROT. AGENCY, INDUSTRY CODES AND STANDARDS FOR UST SYSTEMS, at http://www.epa.gov/swerust1/cmplastc/st andard.htm (last visited Dec. 1, 2001).


According to the EPA, there are an estimated 825,000 regulated USTs at approximately 400,000 facilities. See BLUE RIBBON PANEL, supra note 7, at 42. In California, the EPA estimated that the minimum number of point sources from leaking USTs is estimated at greater than 10,000. Id. Maximum concentrations of MTBE at
However, the best technology available, using combinations of different systems at great cost, cannot guarantee complete safety. The EPA admits that fundamental problems remain in assessing the science of storing gasoline underground. The problem of USTs is one that is new to many in the field, possessing difficult challenges for direct experimentation. Barring any fundamental changes in the manner in which gasoline is transported, stored, and sold, leaks will continue, and MTBE will likely remain in water supplies.

Remediation of MTBE contaminated soil and ground water is both difficult and costly. MTBE can be removed from soil fairly easily, but its removal from groundwater requires involved and expensive removal measures. Available measures include pump and treat, air sparging, these sites range from several ppb to concentrations greater than 100,000 ppb. In addition to commercial gasoline tanks, state and federal authorities maintain nearly 1.3 million USTs, some of which are exempt from EPA regulation. However, many of these are scheduled to be closed, have been closed, or are now compliant. There is also a category of agricultural and personal use USTs that remains exempt from Federal regulation. The EPA admits that no single set of regulations can prevent all releases, and there will continue to be some equipment failures and installation mistakes that result in releases. See U.S. ENVTL. PROT. AGENCY, MTBE: UNDERGROUND STORAGE TANKS, at http://www.epa.gov/storage.htm (last visited Dec. 1, 2001). The science underlying storing gasoline underground is still developing. See ERIC M. NICHOLS ET AL., AMERICAN PETROLEUM INSTITUTE, STRATEGIES FOR CHARACTERIZING SUBSURFACE RELEASES OF GASOLINE CONTAINING MTBE (Aug. 2000), available at http://api-ec.api.org/filelibrary/bulletin11.pdf. (last visited Dec. 1, 2001). New guidelines and evaluations were discussed by the American Petroleum Institute soil and groundwater technical task force. Id.

MTBE does not have a high affinity for soil or other carbon based materials and can therefore be removed from the ground without much additional time or expense. MTBE FACT SHEET, supra note 4, at 5. The most common method of removing MTBE from soil is known as soil vapor extraction (air is pulled through the soil vaporizing (volatilizing) MTBE). BLUE RIBBON PANEL, supra note 7, at 54.

Groundwater is pumped to the surface for subsequent treatment and discharge. Once pumped to the surface the contaminated water must be treated by some other means such as air stripping, advanced oxidation, or a bioreactor. Id. at 53.

Air is injected below the water table to volatilize contaminants from ground water. Compared to other gas constituents, a much greater volume of air is required to volatilize MTBE. See supra note 38. Because air sparging depends to some extent on biodegradation, it is believed that air sparging is less effective and more costly for MTBE remediation. BLUE RIBBON PANEL, supra note 7, at 54.
dual phase extraction, bioremediation, and in-situ oxidation. Another route of MTBE remediation is to directly treat municipal water prior to its use. The EPA estimated costs for direct remediation by pricing the clean-up in terms of cost per year per family of four. The worst-case scenario shows that a family of four would need to pay $391 a year for the best possible remediation available—advanced oxidation. However, when it comes to cost, there is not much of a consensus among interested parties. Most agree that MTBE remediation is expensive, but precise figures can vary greatly depending upon what is being measured and who is being asked. For instance, the University of California ("UC") conducted an inter-disciplinary, multi-campus study of MTBE and estimated the cost of MTBE remediation to be between $250 million and $1 billion in California alone.

The EPA contends that the primary source of funding for UST (presumably MTBE) remediation is state UST cleanup funds. As of 1999, state cleanup funds raised and expended about $1 billion annually.

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41 Involves vapor extraction and ground water extraction in the same well. It is believed to be most effective when the water table can be lowered. BLUE RIBBON PANEL, supra note 7, at 54.

42 The biodegradability of MTBE is considered to be much slower relative to the prodigious natural bioremediation of other gasoline constituents in the subsurface. Id. The EPA contends that further research is being conducted into the bioremediation of MTBE. Id.

43 It uses the capacity of certain chemical mixtures to rapidly oxidize organic molecules such as MTBE. Id. at 55.

44 Air stripping (limited success), activated carbon (limited success), and advanced oxidation (moderate success) are typically used here. Id. at 50.

45 These are costs for cleaning water just before it comes out of the tap. Under this method of remediation, MTBE would remain in groundwater supplies. Id.

46 Cost associated with direct treatment options were analyzed for the EPA by the MTBE Research Partnership. Three different methods (i.e., air stripping, activated carbon, and advanced oxidation) across three different levels of contamination were analyzed. Id. at 51.

47 In 1998, the EPA concluded that MTBE contaminated soil does not necessarily pose any additional concerns in terms of process or expense. The EPA went on to admit that cleaning MTBE contaminated water may be highly problematic (and expensive) but did not provide any exact figures. See MTBE FACT SHEET, supra note 4, at 5.


49 Lumping MTBE remediation in the general category of "UST Remediation" is sloppy. The unique features of MTBE perhaps make it the most expensive constituent of gasoline to clean up. BLUE RIBBON PANEL, supra note 7, at 58.

50 Id. at 58.
Depending upon exactly how costly MTBE remediation really is, this figure is either barely adequate or grossly inadequate. More likely than not, the UC study more closely approximates actual costs than the EPA estimates; therefore, state clean-up funds would be inadequate. The future adequacy of state UST funds is also doubtful given that many states are considering opting out of the funds.

According to the EPA, the second largest source of funding for MTBE remediation is private insurance. As of 1999, roughly ten to fifteen percent of USTs are currently covered by private insurance, with numbers expected to increase as more states opt out of state UST funds. Insured USTs essentially provide nothing. At best it demonstrates that certain UST owners are willing to pay a premium to shift liability to another party—the insurance company. The insurance company would naturally retain the right to withhold payment, possibly litigating liability in court. Insurance funds do not provide the type of quick relief necessary to provide a rapid response to a public health concern.

The federal government also maintains a 0.1 cent per gallon tax on gasoline to support a Federal Leaking Underground Storage Trust Fund ("Federal LUST Fund"). In fiscal year 1998, the trust fund was worth approximately $1.2 billion. Approximately eighty-five percent of the Federal LUST Funds are given to the states to pay for remediation of "eligible releases." Roughly "one-third of the funds are used to pay for cleanups in which the owner and operator are unknown, unwilling, or

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51 Roughly half of the nation's water supply is derived from sources that interact with the water table. Oshinskie, supra note 34, at 7. As of 1999, there were approximately 1.2 million petroleum USTs. Id. at 2. With water clean up costs per site estimated in the millions of dollars, a one billion dollar state fund does not seem adequate.

52 Blue Ribbon Panel, supra note 7, at 58.

53 Id.

54 Id.

55 Barring a completely frivolous defense there is no reason to assume that insurance companies will easily pay for MTBE remediation. An extreme example of this situation might involve multiple gas stations within the same vicinity of the water table. Id. If only one station is insured litigation is all but inevitable. One could argue that in any situation involving multiple stations' litigation is a certainty as long as plaintiffs cannot determine with certainty which station is leaking (unless the court uses a market share responsibility theory over direct causation).

56 Id. at 58. Funds are raised through taxation and interest earned on the account. In FY 1999, new receipts were expected to increase to $278 million ($212 million from the tax and $66 million in interest), raising the funds balance to approximately $1.4 billion. Id.

57 Id.
financially unable to undertake and to complete cleanup." Operators using these funds must meet certain strict eligibility requirements and accept clear responsibility for the UST leak.

Unlike other systems, the federal program is willing to clean sites that are potentially troublesome, and sites where a problem exists, but owners for a variety of reasons cannot or will not pay for remediation. This problem is particularly acute given that major oil companies have divested many gas stations across the United States. Many independent or semi-independent station owners (85% of whom were not insured in 1999) cannot realistically pay clean-up costs alone. However, as with the equivalent state fund, the federal fund seems to suffer from lack of appropriate funding and sufficient application. None of the funds discussed here were specifically designed to handle the particular problem of MTBE. Moreover, despite whatever monies are set aside for MTBE from these “general funds,” other forms of water pollution will still need to be remedied.

III. INADEQUACY OF THE JUDICIAL PROCESS

A. Causation

In order to prevail at trial, a plaintiff must establish a causal chain between MTBE contamination and damages suffered. Where the action

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38 **BLUE RIBBON PANEL**, *supra* note 7, at 58
39 *Id.* at 59.
60 *See id.* Besides the State LUST Fund and private insurance, other potential funding sources include the Clean Water State Revolving Fund (“CWSRF”) and the Drinking Water State Revolving Fund (“DWSRF”). *Id.* These two funds were designed to handle a spectrum of water pollution problems and cannot be entirely shifted to handle MTBE pollution. *See id.* These two funds are also relatively small (In 1999, Delaware, Nebraska, and Wyoming managed to raise $48 million in CWSRF loans for 1,200 UST cleanup sites). *See id.*
61 *See id.* After many service stations were divested, quasi-independent station owners were faced with the prospect of paying for clean-up themselves. *See infra* text accompanying notes 79-82.
62 *See Oshinskie, supra* note 34, at 7-8.
63 *See Julie Wilson & Elizabeth A. Meinicke, The High-Tech Defense to Toxic Tort Claims, in* TOXIC TORT CASE ESSENTIALS: STRATEGIES, EXPERTS, MOTIONS, AND ADR 49 (Practicing L. Inst. 1992). Plaintiffs generally bring toxic tort cases under one of the following theories: negligence; breach of warranty; and strict liability. *Id.* Additional theories include abnormally dangerous conditions, statutory violations, violations of federal common law or federal laws such as Comprehensive Environmental Response,
constitutes the sheer presence of MTBE in groundwater, plaintiffs usually have to show by a preponderance of the evidence that the UST in question: (1) has leaked and (2) is situated such that MTBE could flow into the water table. If there is any question as to causation, defendants will require plaintiffs to show, typically through expert geological testimony, that defendant's UST is responsible. A battle of experts may thus ensue, wasting valuable time and money. There will be situations in which causation is clear—the one UST in town has leaked and MTBE is present in the water table. The situation is made considerably worse when multiple USTs—multiple point sources—could

Compensation, and Liability Act ("CERCLA"), conspiracy, fraud, and misrepresentation, nuisance, or trespass. *Id.*

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64 *See Cooper v. United States,* 37 Fed. Cl. 28 (1996). Plaintiff brought an action against the United States, arguing that a water spillway managed by the federal government has caused flooding and that plaintiff was entitled to compensation. *Id.* "In order to establish that the Government [had] taken an easement by flooding, a plaintiff" was required to show "by a preponderance of the evidence that (1) the flooding was intermittent, frequent and inevitably recurring; (2) the flooding was the natural and probable consequence of government action; and (3) the flooding resulted in substantial damage to the plaintiff's property." *Id.* at 36. Although an action for eminent domain (forced flooding easement) is not completely analogous to the typical toxic tort, *Cooper* remains instructive in demonstrating the unusual features of causation in the geological context. In particular, plaintiff was required to show how the lay of the land would have allowed water to flow from the government project to plaintiff's property. *Id.* at 39. Geological causation may be significant in the MTBE setting particularly when it is unclear which UST has leaked. *Cooper* may be distinguished from the typical MTBE tort in that "[p]roof of damage alone does not [constitute] a taking." *Id.* at 36.

65 Common law trespass can occur by causing some tangible thing (MTBE) to be projected onto property without attendant damage. *RESTATEMENT (SECOND) OF TORTS* § 158 (1977). *See also Martin v. Reynolds Metals Co.,* 342 P.2d 790 (Or. 1959) (holding the projection of fluoride compounds in the form of gases and particulates onto the land of the plaintiff was trespass). Cases requiring harm have been considered actions in nuisance or negligence. *See, e.g., Gregg v. Delhi Taylor Oil Corp.,* 344 S.W.2d 411 (Tex. 1961).

66 *See Cooper, 37 Fed. Cl. at 41.* Plaintiff argued various theories of causation—most notably, that excess sediment on the river bed in combination with the government's water release forced the easement. *Id.* at 36. However, plaintiff could offer no credible testimony, either lay or expert, on how exactly the riverbed was situated to direct such a result. *Id.* The Court explained "that proof of causation in flood and erosion cases is a complex issue best addressed by experts." *Id.* at 41. While the court did "not penalize the plaintiff for not utilizing an expert on the subject of sedimentation, [it explained that] parties in a position similar to plaintiff would be well-advised to recognize the complexity of proving causation in a flood case and seek the assistance of witnesses with special expertise." *Id.*
be responsible. Somehow plaintiffs must show which station’s UST is leaking and allowing MTBE to enter the water table. In at least one MTBE case, *Martin v. Shell Oil Co.*, defendants were allowed contest causation for each specific contaminated site.

Evolutions in tort theory, particularly with respect to the containment of hazardous materials, may control against such drawn out causation battles. The innovation of market share liability may also serve to prevent difficult multi-source causation questions. Under such an approach, multiple UST owners might share liability based on how modern each of their containment systems are or how much business they handle.

The situation is likely to be more complex when plaintiffs claim that ingesting water containing MTBE has physically harmed them. The

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67 198 F.R.D. 580, 592 (D. Conn. 2000). Connecticut authorities had administratively determined that plaintiffs’ property had been contaminated by defendant gasoline producers. *Id.* at 589. This previous determination did not serve to estop the defendants and they were entitled to have a full and fair opportunity to litigate this issue in court. *Id.* Having found that the state orders did not collaterally estop Shell from contesting the issue of causation, the court denied plaintiffs’ motion for partial summary judgment. *Id.*

68 See infra note 69.

69 In *New Jersey Turnpike Authority v. PPG Indus.*, 197 F.3d 96 (3d Cir. 1999), the New Jersey Turnpike Authority (“Turnpike”) owned and operated sites contaminated by chromite ore processing residue (with no clear culprit but several likely ones), and brought suit against PPG Industries alleging generators of hazardous substances and seeking to recover the cost of investigating and remediating contamination pursuant to the CERCLA, the New Jersey Spill Act, and the common law of New Jersey. The Turnpike argued “for the application of alternative liability to both the New Jersey Spill Act claim and its CERCLA claims.” *Id.* at 107. New Jersey courts did not unequivocally recognize “wide-ranging alternative liability or other collective liability theories,” however, “they have not have not been entirely hostile” to them either. *Id.* at 107. The court explained that alternative theories are permissible but do “not eliminate the requirement that a plaintiff establish some ‘reasonable connection’ between a defendant and the ultimate harm that a plaintiff suffers, and that all culpable actors be joined as defendants.” *Id.* See also *James v. Bessemer Processing Co.*, 714 A.2d 898, 908-10 (N.J. 1998) (discussing difficulties of proving medical causation in toxic tort cases, and the caution New Jersey courts have utilized in analyzing novel models of causation).

70 Where damages involve bodily injuries, it must be shown to a reasonable medical certainty that contaminated water was the cause of the injury. *Thompson v. Underwood*, 407 F.2d 994 (6th Cir. 1969). This standard implicates the qualifications of the witness testifying, the acceptance in the scientific community of their theories, and the degree of certainty as to their conclusions. This is particularly true when dealing with injuries or diseases of a type that may be the product of a variety of causes and inflict society at random, often with no specific origin. To this extent damages must not be speculative or conjectural.
EPA has yet to classify MTBE as a carcinogen or as harmful.\textsuperscript{71} Anecdotal accounts reveal that MTBE has a turpentine-like odor and distinctive taste when present in sufficient quantities.\textsuperscript{72} The EPA has acknowledged that MTBE may affect the taste qualities of water, and is currently conducting further tests to evaluate the human health effects.\textsuperscript{73} The scientific community is currently split as to the potential health effects of MTBE. The controversy is due in large part to various animal studies that may indicate cause for concern.\textsuperscript{74} Detractors of such studies argue that they apply in a very narrow way to certain animals, and that any analogy to

Conclusions based upon a "probability," a likelihood," an "educated guess"... do not constitute the requisite level of proof as a conclusion to a "reasonable medical certainty."


\textsuperscript{71} "The EPA . . . has categorized MTBE as a \textit{probable} human carcinogen (Group B2). Nevertheless, EPA concluded in 1994, when the RFG program began, that there is no basis to expect the use of MTBE-oxygenated gasoline or MTBE-reformulated gasoline to pose a greater public health risk than conventional gasoline." Little, \textit{supra} note 6, at 250 (emphasis added).

\textsuperscript{72} See Thomas, \textit{supra} note 15, at 168. Some accounts also hold that ingesting water allegedly containing MTBE may cause headache, nausea, vomiting, irritation of eyes, and irritation of the throat. However these reported symptoms were not believed to be persistent. \textit{Id.}

\textsuperscript{73} See \textbf{BLUE RIBBON PANEL}, \textit{supra} note 7, at 18. In 1999, the EPA's "Office of Water established a drinking water advisory level of 20 to 40 ppb as a guidance for State and local authorities based on taste and odor concerns." \textit{Id.}

\textsuperscript{74} In "MTBE and the Use of Animal Studies to Prove Causality, History of MTBE and Survey Scientific Literature," author Ben Thomas of Compliance Solutions, Inc. in Houston, Texas, discusses the human health effects of MTBE in relation to a hazard identification study conducted by the Union Carbide Corporation. \textit{Id.} Hazard identification studies first determine what is believed to be a maximum lethal dose of the agent. \textit{Id.} The maximum lethal dose is the concentration of agent that would cause a ten percent weight decrease in a test animal. \textit{Id.} After establishing what is believed to be a maximum tolerance, animals are exposed to gradually lower concentrations of the agent. \textit{Id.} After these exposures various animal organs and tissues are analyzed for signs of toxic effect. \textit{Id.} The Union Carbide study determined that male rats died early at high doses of MTBE due to kidney failure (chronic nephropathy). \textit{Id.} Kidney failure was believed to be a result of MTBE binding to particular rat protein known as alpha-2u-globulin. \textit{Id.} This protein is particular to male rats, and is used to mark their territories. \textit{Id.} Short term, high exposure to MTBE, caused crystalline masses of alpha-2u-globulin to destroy kidney cells. \textit{Id.} Researchers further concluded that lifetime exposure would cause constant cell division within kidney cells most likely leading to cancer. \textit{Id.} The EPA decided that alpha-2u-globulin is a unique male rat phenomenon and therefore does not relate to human health. \textit{Id.}
humans is without merit (proper epidemiological studies should be conducted). 75

Thus far, no claims have been brought forward alleging physical harm due to MTBE ingestion. 76 Given how little the scientific community understands the human health effects of MTBE, the possibility of such suits cannot be ruled out. The first cancer cluster 77 to appear around contaminated MTBE will certainly try to allege harm due to MTBE ingestion. 78 Given how widely MTBE is used in the United States and how under-funded remediation has been, millions of Americans could be at risk. This frightening possibility should not be left to the inherent deficiencies of the trial process—a battle of experts.

B. Duty—Divestiture

MTBE plaintiffs must establish which parties, station owners, or oil companies, have control over USTs. Beginning in the early 1980s, oil

75 See, e.g., Miller & Faulk, supra note 48, at 175-79. Richard O. Faulk, an attorney at Gardere Wynne Sewell & Riggs, L.L.P., in Houston, Texas, argues that courts should maintain their proper “gatekeeper” function excluding what he deems “unsubstantiated evidence and arguments that imperil the administration of justice.” Id. at 176-77. According to Faulk “species variation” prevent drawing toxicological conclusions from rats. Id. at 177. Faulk further criticizes animal causation studies as artificial in that they expose animals to absurd amounts of a toxin and thereby draw conclusions. Id. As an example Faulk points out that animal studies used to show causation in Bendectin litigation required animals to ingest Bendectin doses of a hundred milligrams a day, equivalent to women taking 1200 tablets a day. Id. at 178.

76 No cases alleging bodily harm have been encountered as of the publication of this Note. Id.

77 Duane Miller of the law firm of Miller, Sher & Sawyer, in Sacramento, California, discussed the implications of causation studies for MTBE plaintiffs, pointing out that epidemiological studies can be notoriously insensitive to cancer clusters. Id. at 172.

As an example, there are published articles where epidemiologists know that if you have a community of 5000 people in a cancer cluster, you can do all the epidemiological studies you want and you’ll never find a statistically significant excess of cancer, not because it isn’t there potentially, but because the numbers are too low. Id. at 174 (emphasis added).

78 See id. at 175. Miller concludes that MTBE exposure has been too short term to conduct proper epidemiological studies. Proper epidemiological studies (in place of animal causation studies) may take too long, placing many individuals at risk of developing cancer. Id. Research should be focused on those individuals that have been exposed to MTBE since its first implementation, refinery workers. Id. Miller also states that there is no inherent fallacy in animal studies conducted with appropriate scientific rigor. Id.
companies began divesting USTs to station owners. As of 1999, of the approximately 182,000 retail gasoline outlets in the United States, the major oil companies owned only 36,000 facilities, which amounts to only twenty percent. On average, each of these facilities has no less than three USTs, and therefore approximately 440,000 USTs have been divested to station owners. One obvious conclusion is that oil companies were deliberately trying to shield themselves from UST liability.

Divestiture is critical to MTBE litigation in that the average station owner does not ordinarily have the resources to pay clean-up costs. The oil companies are the "deep pockets" in this battle, and plaintiffs must try to establish their responsibility. When USTs are sold to station owners, oil companies appear to lose all responsibility for UST failure. However, appearances can be deceiving, and there are possible strategies for going after oil companies.

One strategy for including oil companies is for plaintiffs to allege a form of products liability. A plaintiff must establish that a product [UST] was defective when it left the hands of the [oil company] and that it caused injury to a reasonably foreseeable user or a third party. All parties in the chain of distribution may be responsible for damages sustained through the use of a defective product.

Oil companies may also be liable for damages that commenced when they owned the UST. This of course assumes that determining when exactly

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79 Oshinskie, supra note 34, at 4, 9.
80 BLUE RIBBON PANEL, supra note 7, at 42.
81 Id.
83 Oshinskie, supra note 34, at 24
84 Id. "Privity is not required in a products liability action," and therefore any party harmed by the failed product may assert an action against the seller. Id. A variation of the products liability approach may be design defect liability, in which case plaintiff must show that the tank design was not "reasonably fit, suitable and safe for its intended or reasonably foreseeable purposes." Id. at 26. Still another variation is to allege a form of strict liability—the product was simply defective. No issue of negligent design need be considered. "[T]he availability of a less dangerous substitute therefore becomes a crucial consideration." Id. at 28-29.
85 Id. at 9.
a tank failed is not too difficult or even possible. A number of states have also erected statutes that permit recovery from oil companies in cases where a station has been franchised out. Yet another franchise strategy would be to assert that oil companies maintain control over the station by virtue of the franchise agreement. At least one court, however, has held that such a "vicarious liability or 'deep pockets' theory" for groundwater contamination is not viable.

Plaintiffs may also try to allege that oil companies, even if not in direct control of USTs, breached a duty to properly warn station owners of the dangers attendant with UST operation and maintenance. Such a failure-to-warn action may be brought in negligence or strict liability. Under negligence, plaintiffs must establish that the oil company knew of the associated danger but did not communicate this knowledge when selling the UST. Oil companies may be strictly liable for a failure to warn when "the social utility of offering the product in [its] condition is outweighed by the magnitude of the risk involved in its use." The court must therefore make an evaluation of whether any further warnings undermine the product's utility or are necessary to ensure safety. Other possible theories of liability include fraudulent concealment, contract based actions (based on the breach of an express or implied warranty under the UCC), or actions brought under the Resource Conservation and

86 Id at 15. New Jersey’s Spill Compensation and Control Act permits recovery for damages related to UST failure against the franchiser oil company. Id. at 13-14.
87 In Bahrle v. Exxon, 678 A.2d 225 (N.J. 1996), the New Jersey Supreme Court explained that independent service stations merely sell the oil companies' products, and are themselves responsible for the manner in which the product is sold. Id. at 232. However, the Court of Appeals of Indiana in Shell v. Meyer (Meyer I), 684 N.E.2d 504 (Ind. Ct. App. 1997) disagreed with the New Jersey Supreme Court in finding that oil companies do maintain enough control over stations to constitute UST responsibility. By entering into agreements with oil companies, station owners agree to oil company set and enforced standards. The court further explained that the legislative history of the CERCLA indicated that Congress intended those parties that maintain authority or control over facilities to be liable for contamination. See Oshinskie, supra note 34, at 14-18.
88 See id. at 30.
89 Id.
90 Id. The manufacturer must disclose the full extent of the risks associated with the sale of a product. Id. at 31. Any disclaimers, such as an "as-is" provision, does not mitigate against any failure to warn. Id. a 31-32. Evidence of such negligence may be the manufacturer’s failure to provide guidance on adequate leak detection and prevention. Id. at 32.
91 Id. at 33-34.
Recovery Act ("RCRA"), which permits recovery against a party who may have been a past contributor to contamination.\textsuperscript{92}

These various strategies are certainly clever and may succeed in establishing oil company liability given divestiture, but they represent yet another difficulty in MTBE litigation. Considerable resources must be diverted to arguing what is essentially a tangential issue. Very few could seriously doubt, with or without divestiture, that oil companies are immune from liability associated with leaking USTs. However, the tort process adheres to developed principles that afford defendants an opportunity to essentially split hairs. While parties argue over the finer points of responsibility and control, the affected groundwater has not been cleaned.

IV. THE PROBABLE CONTINUED USE OF MTBE

A. Ethanol as a Substitute

As of 1999, ethanol production was estimated to be about 120,000 barrels per day ("b/d").\textsuperscript{93} According to the EPA, for ethanol alone to fulfill the nationwide oxygen requirement in RFG, about 187,000 b/d would be needed.\textsuperscript{94} The EPA contends that additional ethanol requirements (67,000 b/d) could be met by a combination of imports and the creation of additional capacity. Even though new ethanol facilities are currently being created, they will be situated where there is an abundant agriculture to create ethanol—the Midwest.\textsuperscript{95} This would no doubt be a boon to the agricultural economy of the Midwest, but implicates considerable costs for regions without sufficient agriculture. A complete switch to ethanol would mean that most Northeastern states and California (areas with some of the highest concentrations of automobiles and gasoline stations) would have to "import" ethanol.

\textsuperscript{92} Id. at 36-37.

\textsuperscript{93} Blue Ribbon Panel, supra note 7, at 63.

\textsuperscript{94} Id. ("assuming . . . no ethanol is used for economic octane blending" (perhaps a shaky assumption)).

\textsuperscript{95} Ethanol may also be prepared from biomass. The U.S. Department of Agriculture estimates that the resource base for ethanol from biomass could potentially reach 10 billion gallons annually (about 65,000 b/d) after 2025. Id. This would mean that corn is not necessarily required to create ethanol. As of 1999, ethanol production from biomass was approximately 4,000 b/d, and it appears it will take at least another 25 years to meet current demands without using corn. Id.
The situation is only worsened by the regional quality of gasoline distribution. Different areas of the country rely on completely different infrastructure frameworks to refine and deliver petroleum. These different systems are to some extent a product of history and in some cases a matter of practical necessity. However these systems came to be in place, they appear to be fairly entrenched. Complete elimination of MTBE in favor of ethanol would require substantial investments in both time and money. A decision should be made whether it is more feasible to handle the problems associated with MTBE use, or the problems associated with its non-use.

Chemically speaking, ethanol presents difficulties not encountered with MTBE use. Because ethanol is soluble in water, which may be found in gasoline pipelines and storage tanks, it tends to separate from gasoline and therefore must be blended at the distribution terminal. Therefore, a complete switch to ethanol would require infrastructure to allow ethanol blending at distribution terminals across the nation. According to the EPA, “transportation [of ethanol] from the Midwest to the Northeast and the West is challenging and will most likely be costly and transportation-facility intensive.” A complete switch to an ethanol oxygenate is certainly a viable option, but it is one that will take a substantial transition time and substantial investment. Therefore, it is highly likely that MTBE use will continue at least into the near future.

B. Alternative Fuel Vehicles

There are currently about six different forms of alternative fuel vehicle ("AFV") technologies competing to replace conventional combustion. A substantial adoption of any of these technologies (or a combination of them) might eradicate the need for oxygenates. Many of

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96 Id. at 63.
97 Id. at 64. One study estimates that it would take approximately 1,982 additional rail cars to supply California alone (assuming only rail transport). As of 1999, the existing fleet of suitable rail cars was about 9,000—all of which were unavailable for ethanol transportation due to prior leasing commitments. Id.
these technologies have the potential to either meet or exceed the demands of the CAA without reliance on RFG. 99

Some of these technologies remain in the development stage (fuel cell technology), 100 while others, including methanol, 101 ethanol, 102 propane/lpg, 103 electric, 104 have had considerable real world use. For the

99 Alternative fuels are inherently cleaner than gasoline because they are chemically less complex and burn cleaner (complete combustion). However, the typical alternative fuel has a lower energy density than gasoline and therefore provides fewer miles per gallon in comparison to gasoline. Id. at 2-3.

100 The fuel cell is a power generating system that converts the chemical energy of hydrogen (ion migration through an electrolyte) and combines it with oxygen to produce electric energy, heat, and water. Id. Typical fuel cells offer greater operating range than the standard electric vehicle. Id. Elemental hydrogen is the fuel directly used in the fuel cells, which raises safety concerns if not housed properly. Id. Fuel cell technology is not the main choice AFV, but remains interesting because of its low emissions (virtually no environmental impact) and long range. Id. European and Japanese manufacturers have accelerated their fuel cell development activities and expect to produce light duty fuel cell vehicles in the 2003-05 time frame. Id. Daimler-Chrysler, Ford, and Ballard Power Systems have formed a well publicized cooperative effort to commercialize fuel cell drive trains for cars, buses and trucks. Id. The fact remains that fuel cells will not be commercially available for several years as the technology is currently too expensive and experimental. Id. at 69-73

101 As of 1999, more than 13,000 cars, along with a small number of school and transit buses and trucks, operate on methanol in California. Since the late 1980s the “big three” automakers have introduced small scale commercial methanol lines that are typically sold to the government or other large entities with the capital to create a continual methanol fueling infrastructure. Methanol is a strong AFV with low costs and comparable performance to gasoline. Methanol is usually made from natural gas and, like gasoline, is dependent upon a fossil fuel. Id. at 41.

102 Since the mid 1990s, the “big three” have been producing a range of light duty ethanol fueled vehicles that are again primarily available to those capable of maintaining an ethanol fueling station. Id. at 35.

103 Propane and LPG have been used as fuel in the United States since 1912 and are currently the third most popular forms of fuel behind gasoline and diesel. Id. As of 1999, the number of LPG vehicles within California alone was estimated to be approximately 35,000. Id. Propane and LPG are gases (that may be liquefied by pressure or cooling) that are derived from petroleum refining and natural gas production. Thus, LPG remains a fossil fuel. Id. LPG use is relatively clean, producing small amounts of particulate and sulfur emissions. Id. LPG fueling infrastructure is highly developed with many service stations across nation offering propane fueling. Id. Additional propane supply stores exist as well. Id. Auto manufactures have consistently produced LPG vehicles or systems to convert conventional vehicles to LPG vehicles. Safety concerns primarily involve the storing of pressurized gas. Id. at 63-67.

104 Electric vehicles have instant appeal in that they produce no emissions (in the AFV lingo—Zero Emission Vehicle (“ZEV”)). CALIFORNIA ENERGY COMM’N, supra note 98. The only pollution concerns associated with electric vehicles involve the pollution
most part, all AFVs remain a small portion of the total vehicle population.¹⁰⁵ Besides statutory mandates to create cleaner vehicles,¹⁰⁶ the main power in promoting AFV technology has been the auto industry.¹⁰⁷ The auto industry will ultimately decide which AFV technology to pursue on a large scale. Thus far the auto industry has been somewhat accommodating in promoting a variety of technologies, but no auto manufacturer has committed to developing a national line-up of AFVs.¹⁰⁸ Electric and gas-electric hybrids, recently introduced in order to compete with the gasoline line up, remain oddities on the road.¹⁰⁹ However, hybrid vehicles show the kind of compromise that may just make the gas additive crisis a past concern. By still using gasoline, hybrid vehicles may provide the right amount of design flexibility to satisfy consumer demand. By still

associated with the power used to charge electric vehicles and battery disposal. However the EPA contends that including pollution associated with generating power for electric vehicles, electric vehicles still generate far less pollution than their gasoline counterparts (90% fewer emissions). Id. Advances in battery technology, material science, and aerodynamics have lead to the introduction of a commercial electric and gas-electric hybrid vehicles. The major downfall of electric vehicles (at least pure electric vehicles) is battery weight and range. Id. Infrastructure concerns surrounding the adoption of electric vehicles are not as significant as other AFV. Id. Consumers with the capacity to do so could simply set up a charging port in their garage, and such systems currently exist. Id. The CEC also claims that fitting conventional fueling stations with charging stations would not be problematic—a proposition that would only hold true if faster charging technology becomes available. Id. While commercial electric vehicles are available, they remain novelties. Id. The CEC claims that electric vehicles remain unpopular with most consumers because of their limited range and styles. Id. at 29-33

¹⁰⁵ For both light and especially heavy-duty vehicles gasoline and diesel remain the fuel of choice. This perhaps unfortunate occurrence is due to many reasons, including energy density of AFV fuels, consumer demand, infrastructure requirements, and national economic policy.

¹⁰⁶ See infra note 110.

¹⁰⁷ In the United States there are numerous statutes that serve to “push” auto makers into making cheap, consumer friendly AFVs, but the research, design and implementation of such new technology is for the most part in the hands of the automakers. CALIFORNIA ENERGY COMM’N, supra note 98.

¹⁰⁸ The auto industry must always consider market demands and the actions of their competitors. Behind all of this is consumer demand. As long as conventional vehicles are allowed, consumers tend to opt for the most spectacular gas guzzling monster they can afford. If nothing else, this can be evidenced from the long standing sport utility vehicle (“SUV”) demand in the United States. Until AFVs are strongly marketed and have adequate relative price and performance, they will not be purchased in any major way.

¹⁰⁹ Only recently have Toyota, Honda, and Chrysler introduced hybrid vehicles. See also supra note 104.
using electric technology, hybrid vehicles provide the right amount of pollution abatement that may eradicate the need for oxygenates.

With about six technologies competing to substitute the automobile, it is difficult to make infrastructure decisions. Many of these technologies will require different fueling and infrastructure needs than conventional combustion. The federal government offers incentives to corporations in order to promote the use of AFVs. These large entities are the only ones that could "showcase" an AFV and receive some tax relief or administrative compliance. Only large non-consumer entities can realistically setup a methanol or ethanol fueling pump at their service depots. In recent times it has not been uncommon to see a city bus or state agency vehicle with a sticker boasting that the vehicle is methanol or ethanol fueled. It is, however, extremely rare to see a methanol or ethanol pump conveniently located in town. One might wonder if the AFV craze is nothing more than a series of token steps carried out with the appearance of great strides in environmental awareness and conservation.

If the nation somehow decided to go with ethanol as the AFV of choice, all the infrastructure problems associated with using ethanol as an oxygenate would occur, but only worse. If ethanol is to be the main component (typically 85%, known as E85) of a fuel instead of just a 15% component (as is typical in the Midwest), vast quantities would be needed across the nation. As of 1999, the United States' ethanol fueling infrastructure consisted of approximately forty refueling stations, claiming to support tens of thousands of flexible fueled vehicles. According to the National Ethanol Vehicle Coalition, the ethanol fueling infrastructure is expected to increase to 130 locations with the addition of thirty refueling facilities in the Chicago area, thirty in Minneapolis, and another thirty facilities in Colorado by the year 2000. All of these proposed increases are without accident in the Midwest, where ethanol is produced and the ethanol industry is catered to.

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110 In 1993, President Clinton issued an Executive Order requiring federal agencies to enhance alternative fuel vehicle purchases beyond the requirements of the EPA Act. The Alternative Motor Fuels Act of 1988, Pub. L. No. 100-494, 102 Stat. 2441 (1988), encourages the development, production and demonstration of alternative fuel vehicles. This law allows Corporate Average Fuel Economy ("CAFE") credits for new vehicles designed to use alternative fuels exclusively or those capable of operating on conventional and alternative fuel. Id.

111 See CALIFORNIA ENERGY COMM’N, supra note 98.

112 Id. at 36.

113 Id. at 37.
Evaluating the relative performance of different AFV technologies can be difficult. For instance, so much infrastructure has grown up around the conventional automobile that switching to methanol, or ethanol fueling stations may be difficult. There is considerable potential in many forms of AFV technology. Some resolution of the chaotic mess of the alternatives available is needed. Auto manufacturers realistically need to take steps to foster a particular technology in coordination with infrastructure planning. Until a concerted effort is made, AFVs will remain an alternative and not the main mode of transportation. Again, the most logical conclusion is that gasoline will be blended with some form of oxygenate, most likely MTBE.

C. Fuel Costs

The fuel supply system in the United States is a balanced network that depends on many factors, including crude oil supply, refinery production, unimpeded pipeline and marine movements, and strategically positioned commercial stocks to prevent against market volatility. Therefore, any change in regulatory practice will need to be sensitive to the interplay of all these demands in order to prevent any market volatility, and ultimately a downturn of the economy as a whole. A complete ban on MTBE will necessarily require careful capital investments in both refineries and infrastructure over the course of an extended period of time.

The EPA recommends that the United States' fuel system become more fungible. When small areas of the country begin demanding unique blends of fuel, the system as a whole will suffer and require inordinate extra expense to satisfy demand. The EPA further recommends the possibility of softening federal emissions guidelines, thereby allowing some flexibility during a possible MTBE phase out period. Perhaps the most important concern of the EPA is time. The EPA stresses that any phase out period must be accomplished over a significant period of time to insure market stability. Once again implying that MTBE will not disappear over night.

114 See supra text accompanying notes 101-02.
115 BLUE RIBBON PANEL, supra note 7, at 61.
116 Id.
117 Id.
118 Id.
119 Id.

According to the EPA what may be optimal for one sector may not be for another. Therefore, flexibility will be key to maintaining a smooth transition. Id.
V. THE CASE FOR A LEGISLATIVE REMEDY

Responding to the growing crisis of mine workers affected with pneumoconiosis ("Black Lung"), Congress passed legislation to extend relief to all affected workers. This remedy was to be a substitute for any private legal action against mining companies or state entities. Congress found and declared:

that there are a significant number of coal miners living today who are totally disabled due to pneumoconiosis arising out of employment in one or more of the Nation’s coal mines; that there are a number of survivors of coal miners whose deaths were due to this disease; and that few States provide benefits for death or disability due to this disease to coal miners or their surviving dependents. It is, therefore, the purpose of this subchapter to provide benefits, in cooperation with the States, to coal miners who are totally disabled due to pneumoconiosis and to the surviving dependents of miners whose death was due to such disease; and to ensure that in the future adequate benefits are provided to coal miners and their dependents in the event of their death or total disability due to pneumoconiosis.

The "Black Lung Benefits Act" ("BLBA") is one of the only Congressional attempts to legislate a remedy for a mass tort. This type of mass tort, a national, systemic crisis, is an appropriate analogy to MTBE contamination. The underlying tort addressed by BLBA should be distinguished from the category of torts associated with hotel fires or airplane crashes. These types of torts, which may indeed affect many individuals, surround a single event. When an airplane crashes, all

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122 30 U.S.C. § 901 (Congressional findings and declaration of purpose).
123 See Geoffrey C. Hazard, The Futures Problem, 148 U. PA. L. REV. 1901, 1916 n.53 (2000) (At time of publication of this Note, the only mass torts legislative resolution the author was aware of was the Black Lung Act sponsored by Senator Robert Byrd.).
124 For further discussion of differing torts in space and time, see id.
potential plaintiffs can be readily identified. More to the point, when an airplane crashes, there is virtually no possibility that all identified plaintiffs will be injured by the same airline again. That is to say Black Lung or MTBE Contamination is a problem that will not disappear after trial, and stands to injure the same plaintiffs again.\footnote{125}{The “MTBE Tort” should also be distinguished from a national product liability case or contamination associated with a point source that affects an entire community. In both of these situations the wrong is not poised to continue, and the extent of reachable damage can be halted in time.}

The realities of mining in America allowed working conditions to deteriorate to the point that thousands of miners were sick and dying. The problem was large and poised to continue—it appears that there was very little mining companies could do to prevent soot from affecting worker’s lungs. The solution could not be for miners to sue. First, a trial takes time and money—not the best course when immediate relief is needed. Second, as long as coal was needed, any court-ordered injunctions to “improve conditions” would likely be violated.

The extent of MTBE contamination has the potential to equal or exceed the size of black lung. More importantly there are no realistic indications that MTBE will be phased-out in the near future.\footnote{126}{See supra Section IV.} As long as tanks continue to fail (which the EPA admits is more than a possibility),\footnote{127}{Id.} MTBE will remain in our drinking water. The most appropriate course of action is to foster cooperation between oil companies, station owners, and state and federal governments. Together, these groups can collectively create a realistic recovery fund that will immediately begin to remove MTBE from groundwater and prevent (to the best technology offers) future UST failure.

There are several practical and theoretical problems associated with a legislative remedy. Denying an injured party their day in court has obvious constitutional implications. In \textit{Martin v. Wilks},\footnote{128}{490 U.S. 755 (1989).} the Supreme Court addressed the constitutional implications of denying a potentially aggrieved party their day in court. To remedy past discriminatory practices black firefighters entered into a consent decree with the city of Birmingham in which they would be promoted ahead of their white counterparts irrespective of relative qualification.\footnote{129}{Id. at 758.} White firefighters that were not party to the original voluntary settlement brought separate suits alleging they were being denied promotions in favor of less qualified
blacks in violation of federal law. The Court held that white firefighters who had failed to intervene in earlier employment discrimination proceedings in which consent decrees were entered could challenge employment decisions taken pursuant to those decrees.

The Court explained that a voluntary settlement in the form of a consent decree between one group of employees and their employer cannot possibly settle, voluntarily or otherwise, the conflicting claims of another group of employees who do not join in the agreement. To hold otherwise, the Court's opinion would have contravened the general rule that a person cannot be deprived of his legal rights in a proceeding to which he is not a party. This rule is part of a "deep rooted historic tradition that everyone should have his own day in court." The Court did however realize that not quite every potential claimant gets their day in court, and in particular, substantive remedial schemes may supercede or obviate the necessity of exercising such rights. Specifically, where a special remedial scheme exists expressly foreclosing successive litigation by nonlitigants, as for example in bankruptcy or probate, legal proceedings may terminate preexisting rights if the scheme is otherwise consistent with due process. This breed of exception did not apply in Martin, but it is arguably the best constitutional fit for a potential MTBE legislative remedy. The prime issue is whether the remedial scheme that serves to terminate the mysterious "day in court" right is consistent with due process and separation of powers.

The U.S. Constitution guarantees that no one shall be denied life, liberty, or property without due process of law. By substituting a legislative remedy for a privately sought one, the government has stripped away compensation an individual was entitled to, and in its place offered something approximate. In not litigating a claim, a plaintiff will never know precisely what a jury would have awarded. It therefore seems to pass constitutional muster (at least with respect to due process

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130 Id.
131 Id. at 759.
132 Id. at 789.
133 490 U.S. at 767.
134 Id. at 762 (quoting 18 WRIGHT, MILLER & COOPER, FEDERAL PRACTICE AND PROCEDURE § 4449, at 417 (1981)).
135 Id. at 418 n.2 (citing NLRB v. Bildisco & Bildisco, 465 U.S. 513, 529-530 n.10 (1984) ("[P]roof of claim must be presented to the Bankruptcy Court . . . or be lost"); Tulsa Professional Collection Services, Inc. v. Pope, 485 U.S. 478 (1988) (non-claim statute terminating unsubmitted claims against the state)).
136 U.S. CONST. amend. V.
requirements), so long as any form of legislative compensation must precisely match reliable estimates of private compensation. The question remains though whether estimates, no matter how reliable are in fact, adequate constitutional substitutes for a number determined by a jury.

Problems such as these—the absence of adequate jury determined compensation—surround the use of probabilities (sampling) and statistics in awarding damages in some complex litigation cases. Like the MTBE framework presented here, the issue in using sampling involves a balance between efficiency and rights (moral rights analysis). An efficiency based analysis assumes that substantive law is designed to create incentives for socially efficient behavior and that the purpose of adjudication is to enforce the substantive law. Under this reasoning it is the outcome, not the process, that is championed.

Defendants may enjoy the efficiency approach, as it may reduce the uncertainties of the trial process. On the other hand, defendants that abuse the trial process (as so many do with the expense of the pretrial process) will avoid the efficient approach as litigation no longer serves as a means to delay a final verdict. The ultimate goal would be to outspend each plaintiff and avoid the imposition of any damage award or to force settlement that may be dictated on the defendant’s terms.

However, in relation to MTBE, a substantive (efficient) framework is probably in the defendant’s best interest. Efficiency is key because of the size of the MTBE problem. Plaintiffs are most likely municipalities that will not easily buckle under typical litigation outspend and stall tactics, especially when there is so much at stake—clean water. Plaintiffs should buy into efficiency since it is the best vehicle for a quick response to a large problem that is likely to continue to grow.

The counterpart to efficiency, a moral rights based analysis, assumes that the purpose of litigation is to determine each party’s rights accurately—rights trump social utility. In times of need courts have held that certain rights are delineated by clear lines. The reality of human society and litigation is that a trial is a process involving money, people and time. It may be simply impossible to determine specific awards when

138 Id. at 595.
139 Id.
140 This is particularly true for risk adverse defendants. Id.
141 Id.
142 Id. at 598-600.
the plaintiffs, for instance number in the thousands, with no clear quantifiable pattern of damage to precisely calculate relief for each one. Such a situation was present in *Estate of Marcos*,\(^{143}\) where alleged victims of torture and victims’ representatives brought actions against the estate of the deposed President of the Republic of the Philippines. To resolve monetary damages, parties were awarded sampled or averaged calculated damages based on the type of wrong.\(^{144}\)

In issuing a legislative remedy, Congress is no doubt treading on the fuzzy line that defines separation of powers. In *Williams v. Wilson*,\(^{145}\) the Supreme Court of Kentucky struck down portions of Kentucky’s revised “punitive damages statute.”\(^{146}\) At issue was the Kentucky legislature’s attempt to limit, if not eliminate, a plaintiff’s ability to recover common law punitive damages. The legislature, in conjunction with the Kentucky Insurance Task Force, changed the requirements for alleging common law punitive damages—effectively removing such a damage action (the statute codified the limited situations where punitive damages may be awarded). The court found the new statutory requirements “to be in conflict with the jural rights doctrine (the common law right of plaintiffs to recover damages) and thus unconstitutional.”\(^{147}\)

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\(^{143}\) 103 F.3d 767, 782-86 (9th Cir. 1996) (use of statistical sample of class claims in determining compensatory damages did not violate due process).

\(^{144}\) Id.

\(^{145}\) 972 S.W.2d 260 (Ky. 1998).


\(^{147}\) Id. at 727. Kentucky’s jural rights doctrine is derived from three sections of the Kentucky Constitution:

Section 14:
All courts shall be open, and every person for an injury done him in his lands, goods, person or reputation shall have remedy by due course of law, and right and justice administered without sale denial or delay.

Section 54:
The General Assembly shall have no power to limit the amount to be recovered for injuries resulting in death, or for injuries to person or property.

Section 241:
Whenever the death of a person shall result from an injury inflicted by negligence or wrongful act, then, in every such case, damages may be recovered for such death, from the corporations and persons so causing the same. Until otherwise provided by law, the action to recover such damages shall in all cases be prosecuted by the personal representative of the deceased person. The General Assembly may provide how the recovery shall go and to whom belong; and until such provision is
The Kentucky General Assembly's expressed intent in enacting the punitive damage restriction was to create a greater degree of efficiency, predictability and cost effectiveness.\textsuperscript{148} Again social policy—efficiency—tried to trump moral rights, and in this case the Kentucky Supreme Court tipped the balance against allowing broad legislative action.\textsuperscript{149} The court made its judgment in light of whether the right was firmly established at common law, and held that it was so established.\textsuperscript{150}

A cleanup framework could be created that does not necessarily implicate a judicial power. In other words, when Congress framed the BLBA to compensate miners, no “judgments” were entered against mining companies or state entities.\textsuperscript{151} This congressional action shows the setting of a framework for a settlement rather than a judicial decision. In any event the exigency of the situation may dramatically require efficiency concerns to trump moral rights concerns. Moreover, it is not as if a resolution is being avoided—one is being imposed, and hopefully with due speed—it is simply a matter of having all relevant parties sit down and pool their resources towards a speedy recovery process. The reality of the situation is that oil companies know what MTBE can do, where it is leaking, how to fix the problem, and how much it would cost. Fairness is not thrown asunder, only the inefficiencies of litigation are.

On the practical side, Congress has been known to be notoriously slow in framing effective immediate action. If MTBE legislation festers in sub-committee, or in whatever other review process comes along, it could be years before a suitable recovery system is developed.\textsuperscript{152} On the other hand, if MTBE truly becomes a widespread environmental and political crisis, Congress will more than likely move with the speed necessary to declare war.

The substance of any potential legislation must remain balanced, even in the face of divergent political goals. Fairness dictates that all the players in the MTBE game should contribute to the establishment of a fund. This could potentially include oil companies, station owners, MTBE producers, state and federal governments, and ultimately consumers.

\textsuperscript{148} Id. at 729-30 (emphasis added).
\textsuperscript{149} Id. at 735.
\textsuperscript{150} Id. at 755-56.
\textsuperscript{151} See GELLHORN, supra note 121.
\textsuperscript{152} See generally Hazard, supra note 123, at 1901 (discussing the practical problems of Congressional resolution).
VI. CONCLUSION

Oil companies were under a regulatory directive to blend their fuels with an oxygenate, and the EPA wholeheartedly accepted MTBE as the best choice. While it remains true that oil companies have had primary responsibility for ensuring the safety of the nation’s USTs, they alone cannot be faulted for the insidiousness of MTBE. Had the EPA conducted a more thorough investigation of the potential water contamination effects of MTBE, the oil companies may have been alerted to the need for increased safety measures. Others may argue that no matter what additive was added, the oil companies should have maintained the best possible protection at all times.

The EPA has since stated that all future additive decisions will be thoroughly investigated for all possible pollution pathways. Economics would seem to dictate that oil companies will provide the best protection that will avoid noticeable injury. This may unfortunately fall below the necessary level of care. That is why it is beholden upon the government to carefully force industry to provide for society.

The government has arguably made a mistake—a well intentioned mistake—but nevertheless, MTBE contamination is not a small problem. The main reason for the appropriateness of a legislative solution is time. The judicial process cannot provide the speedy recovery needed to ensure that no one drinks contaminated water. Somewhere in the mess of finger-pointing between oil companies, station owners, the EPA, and municipalities the nation’s water supplies must be cleaned. The second reason in favor of a legislative resolution is that MTBE stands to be a mass-tort of continuing extent. While courts may establish funds for the continued events of pollution, the resultant system will be ad hoc and regional. What is required is a statutory framework whereby the federal government in coordination with state and local governments administers a fund to remedy MTBE contamination.

It makes the most sense for all parties to share responsibility in the creation of this fund—even consumers. In a certain sense, America’s long standing love affair with the automobile has contributed to the MTBE debacle. Fuel prices in the United States are considerably lower than those of the European Union or Japan, yet on average, Americans own

133 Blue Ribbon Panel, supra note 7, at 3-6.
134 See Theo Barker, The Economic and Social Effects of the Spread of Motor Vehicles (2d ed. 1987) (considering the spread of automobiles in Europe, the United
more automobiles. Americans drive more than probably any other country in the world, and these automobiles do not tend to be small economy vehicles. After a certain point one must ask how much we are willing to sacrifice for our relatively luxurious level of driving. Most Americans would certainly not agree to forgo clean water for cheaper gas or larger automobiles. Maybe it is time to realistically think about adopting alternative fuel vehicle technology or realistic plans to implement reliable and accessible mass transportation. At the very least the nation should be prepared for higher prices of gasoline. A higher pump price may be the consequence of maintaining both clean air and clean water—whether a switch to ethanol is made or realistic MTBE containment is accomplished.

States, and Japan); see also KATIE ALVORD, DIVORCE YOUR CAR!: ENDING THE LOVE AFFAIR WITH THE AUTOMOBILE (2000).

The Japanese walk and cycle more, paying only nine percent of their gross national product, compared to fifteen to eighteen percent in the United States. See BARKER, supra note 154, at 116.

Id.

Id.