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ENVIRONMENTAL PROTECTION

MTBE Contamination From Underground Storage Tanks

Statement of John Stephenson
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Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss the increasing concern that our nation's waters are becoming contaminated with methyl tertiary butyl ether (MTBE). About a third of the states, in certain areas, use gasoline that contains MTBE to help them limit air pollution because it burns cleaner. However, the substance could also pose risks to human health, especially as a contaminant in drinking water wells. One of the primary ways in which the contaminant has migrated into wells and groundwater is from leaking underground tanks used to store gasoline. The Environmental Protection Agency (EPA) has the responsibility through the Underground Storage Tank Program and working primarily through the states to ensure the tanks do not leak, and if they do, that the contamination is cleaned up. However, several studies, including our own report on EPA's implementation of the tank program,[1] showed that many tanks have leaked—and continue to leak—hazardous substances, such as MTBE and benzene. These leaks, in turn, contaminate soil and groundwater, posing health risks to those who live nearby or drink the water. Such health risks can range from nausea to kidney or liver damage or even cancer. As a result, some communities have closed their drinking water wells. A recent news report illustrates the problem. A school in Roselawn, Indiana, discovered that the children had been using and drinking water with nearly 10 times the EPA-recommended safe level of MTBE. I understand that an investigation is trying to determine whether the MTBE came from a nearby tank and whether it is a factor contributing to the children's nosebleeds and other reported health problems.

When there is a gasoline overflow, spill, or tank leak—referred to as releases—the tank owners and operators are to report the incident to EPA if the release is on tribal lands, or otherwise to the state agency implementing the tank program, and to initiate cleanup. Most releases are not discovered, however, until the tanks are taken out of service, when they must be permanently closed to eliminate future leaks. To help states cover their program costs, the Congress annually provides the states with grants from a trust fund it created in 1986. In fiscal year 2001, states each received from $252,000 to $4.5 million, depending primarily on their cleanup workload, for a total of $58.7 million. States can use these resources for, among other things, cleaning up releases when the owner or

[1] *Environmental Protection: Improved Inspections and Enforcement Would Better Ensure the Safety of Underground Storage Tanks* (GAO-01-464, May 4, 2001).

operator is unable or unwilling to perform the cleanup, or cannot be identified. The fund is replenished primarily through a $.001/gallon federal tax on gasoline and other fuels and had a balance of $1.7 billion at the end of fiscal year 2001.

Because of rising concerns about continuing releases and the resulting contamination, especially from MTBE, we determined the (1) extent to which these releases may contain MTBE, and whether the contaminant poses health risks or affects cleanups, (2) progress states have made in cleaning up releases, and (3) the party responsible for the cleanup costs. In summary, we found the following:

- A majority of the 50 states have reported finding MTBE when they discover gasoline contamination at their tank sites and, increasingly, in their groundwater, surface water, and drinking water. This widespread contamination occurs, even though currently only certain communities in only about one-third of the states use gasoline with MTBE as a fuel additive. Contamination continues because, among other things, MTBE has been used in the past as an octane enhancer and is currently transported through the same fuel pipes and trucks that deliver gasoline across the country.[2] MTBE's health effects have not been conclusively established, but the federal government has determined it to be a potential human carcinogen. Because of the health uncertainties, EPA has not regulated MTBE; instead it has simply advised people not to drink water that contains concentrations in excess of 20 to 40 parts per billion. Fourteen states have gone further on their own and partially or completely banned the use of MTBE within their borders or established other regulations on its use. According to a December 2000 report on a survey of state tank program managers sponsored by EPA,[3] finding MTBE at a tank site does not typically affect the cleanup method but can increase the time and cost of cleanup because MTBE travels faster and farther than other gasoline contaminants. Several states reported that their cleanup costs doubled as a result of addressing MTBE.

[2] According to a recent EPA estimate, MTBE is used as an additive in about 87 percent of gasoline in the United States.

[3] New England Interstate Water Pollution Control Commission, *A survey of State Experiences with MTBE Contamination at LUST Sites* (Dec. 15, 2000).

- States have made progress in addressing the releases they have discovered, including MTBE contamination, but face a continuing and substantial cleanup workload. States reported to EPA that they have completed cleanups of 64 percent of the more than 400,000 identified releases as of the end of fiscal year 2001, and have begun some type of cleanup action for another 26 percent. Nevertheless, states still have to both complete these ongoing cleanups and begin cleanups for almost another 40,000 releases, or determine that they do not pose enough risk to warrant a cleanup. In addition, states face a potentially large, but unknown, future workload in addressing releases from a number of sources, as we previously reported. These include unidentified abandoned tanks, identified but empty and inactive tanks that have not yet been removed, active tanks that leak because their leak detection and prevention equipment is not being properly operated and maintained, and unreported leaks from tanks in those states that do not inspect them. Some states reported that even their new tanks with the latest leak detection and prevention equipment are leaking, increasing the cleanup workload. A majority of the 13 states that we contacted—those that had cleaned up many releases or had a large backlog left to address—identified the lack of staff to oversee cleanups as a barrier affecting cleanup progress.

- States typically depend on tank owners or operators to pay some portion of cleanup costs and cover the remainder with their own funding programs. The states depend on the relatively small federal trust fund grants to pay staff to oversee cleanups and administer their programs. States typically do not receive appropriations from their legislatures to cover their cleanup costs but pay for them out of funds supported by state gasoline tax revenues, annual tank fees, or both. In a May 2001 survey of state funding programs, by the Vermont Department of Environmental Conservation,[4] 36 states reported having adequate funding to cover their current costs while 11 reported having more costs to cover than funds available. In addition, 16 states have stopped accepting, or are scheduled to stop accepting, new claims for reimbursements, leaving it up to tank owners to obtain adequate insurance or other means to cover their cleanup liabilities. In the future, some states may seek additional federal support when and if their funding programs end and they turn their attention to addressing

[4] Vermont Department of Environmental Conservation, *A Summary of State Fund Survey Results* (May 2001). The Department conducts this survey annually.

the many unidentified abandoned tanks nationwide that have no financially viable owners to pay for cleanup.

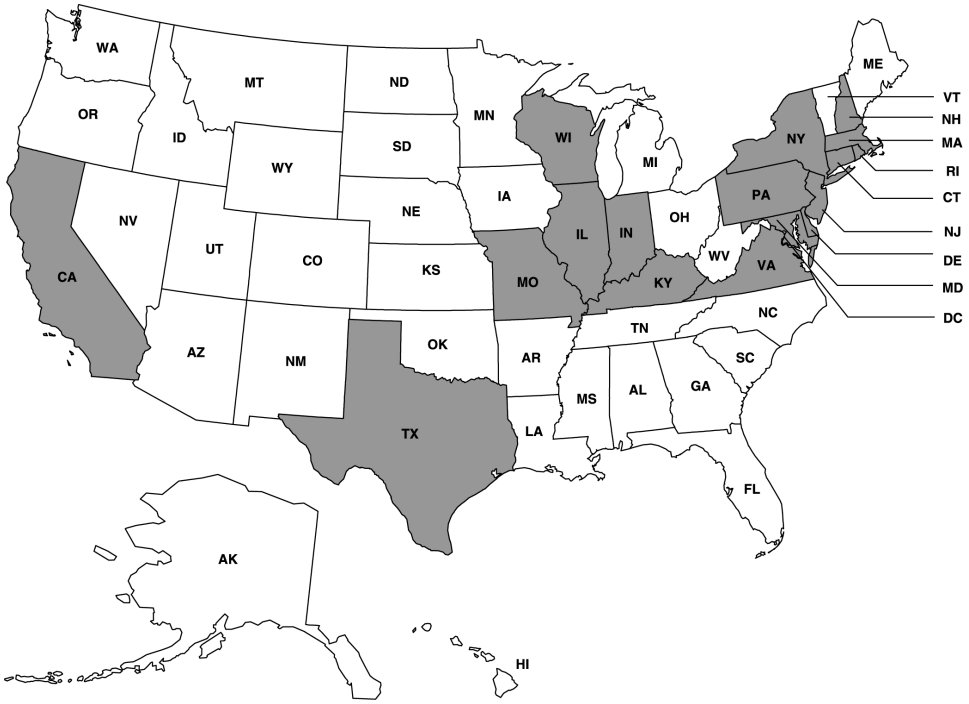
MTBE Has Been Detected Nationwide But the Extent of Its Effect on Human Health and the Cleanup of Releases Is Uncertain

While the full extent of MTBE contamination is unknown, most states reported in the EPA-sponsored survey that they are finding the contaminant in groundwater from releases at tank sites, and some are beginning to find it in their drinking water sources. The extent to which the contaminant poses a health risk is uncertain, however, in part because EPA does not yet have the data necessary to determine MTBE's health effects. Detecting MTBE from a release typically does not influence the type of cleanup method selected, but could increase the time and cost of the cleanup, according to a number of states.

Most States Have Found MTBE in Groundwater from Releases at Tank Sites; Fewer Have Found It in Their Drinking Water

Portions of 17 states and the District of Columbia currently use gasoline potentially containing the additive MTBE to limit air pollution (see figure 1). However, MTBE is being detected nationwide because, among other things, it had been used as an octane enhancer in gasoline in the past and because the pipes and trucks used to carry gasoline throughout the nation have been cross contaminated with the substance.

Figure 1: States Using MTBE and Other Fuel Additives to Limit Air Pollution



Source: EPA.

Forty-four states reported in the EPA-sponsored survey that they sample groundwater at leaking tank sites and test it for MTBE. [5] Furthermore, 35 states reported that they find MTBE in groundwater at least 20 percent of the time they sample for it, and 24 states said that they find it at least 60 percent of the time.

States are not only finding MTBE at tank sites with reported releases—half of the states reported finding it at tank sites even when there was no documented release, although they did not know the number of these cases. About half of the states also reported finding MTBE that they could not attribute to a leaking tank and suspected that it came from other sources, such as above-ground tanks used to store fuel.

The extent of MTBE contamination may be understated because some tank releases go undetected and because only 19 states said that they are

[5] Washington reported that it planned to add such testing by 2001.

taking any extra steps to make sure that MTBE is not migrating further from a tank site than other contaminants when a release has been detected. MTBE is less likely to cling to soil than other gasoline components and dissolves more easily in water, allowing it to travel faster, farther, and sometimes deeper. Therefore, parties might have to use more test wells around a leaking tank to determine if and where MTBE is present. If states do not conduct the extra tests, they may not detect the MTBE.

Some of the states that have identified MTBE contamination have also found that it reached drinking water sources. More states may not have reported finding MTBE in part because only 24 states in the EPA-sponsored survey said that their drinking water program offices routinely analyzed drinking water sources for MTBE, while another 24 said that their offices were not conducting these analyses. Although a number of states were not sure how many public or private drinking water wells had been contaminated by MTBE, 11 states said that at least 10 public wells had been contaminated at the time of the survey, and 15 states reported that 10 private wells had been closed. The Maryland Department of the Environment reported that MTBE was found in low concentrations in about 100 of more than 1,200 water systems tested. In contrast, some communities in California, Kansas, and Maine have had more extensive problems with contaminated groundwater. For example, Santa Monica, California, closed seven wells supplying 50 percent of the city's water.

At the national level, the U.S. Geologic Survey (USGS) and EPA have conducted some water-monitoring efforts, but have yet to find high concentrations of MTBE in many drinking water sources. According to a USGS study, MTBE was detected in generally lower concentrations in 14 percent of surface water sources.[6] Another USGS study points out, however, that it was 10 times more likely to find MTBE in areas that use it as a fuel additive to reduce pollution.[7] A third USGS study, done in cooperation with EPA and issued in 2001, examined monitoring data from over 2,000 randomly selected community water systems in the northeast and mid-Atlantic regions and reported that MTBE was detected in about 9

[6] *National Survey of MTBE, Other Ether Oxygenates, and Other VOCs in Community Drinking Water Sources*, U.S. Geological Survey (Open-File Report 01-399, 2001).

[7] *Contaminants of Drinking Water Sources in 2001: Recent Findings of the U.S. Geological Survey*, U.S. Geological Survey (Open-File Report 00-510, 2001).

percent of the systems that analyzed samples for MTBE.[8] Finally, EPA has completed the first year of a 3-year effort—under the recently implemented Unregulated Contaminant Monitoring Rule—to have all large water systems (serving populations of 10,000 or more), as well as selected small public water systems (serving populations of 3,000 or less), test their water for MTBE. Of the one-third of the systems required to test in the first year, 1 of 131 large systems and 3 of the 283 small systems detected the substance.

Reviews on the Extent that MTBE in Drinking Water Poses Health Risks Are Still Pending

An interagency assessment of potential health risks associated with fuel additives to gasoline, primarily MTBE, concluded that while available data did not fully determine risks, MTBE should be regarded as a potential carcinogenic risk to humans.[9] However, the extent that MTBE may be present in high concentrations in drinking water and jeopardizing public health is unknown. Because MTBE has a bad taste and odor at relatively low concentrations, people may not be able to tolerate drinking contaminated water in large enough quantities to pose a health risk. On the other hand, some people may become desensitized to the taste and smell and could end up drinking MTBE for years in their well water, according to the EPA program manager.

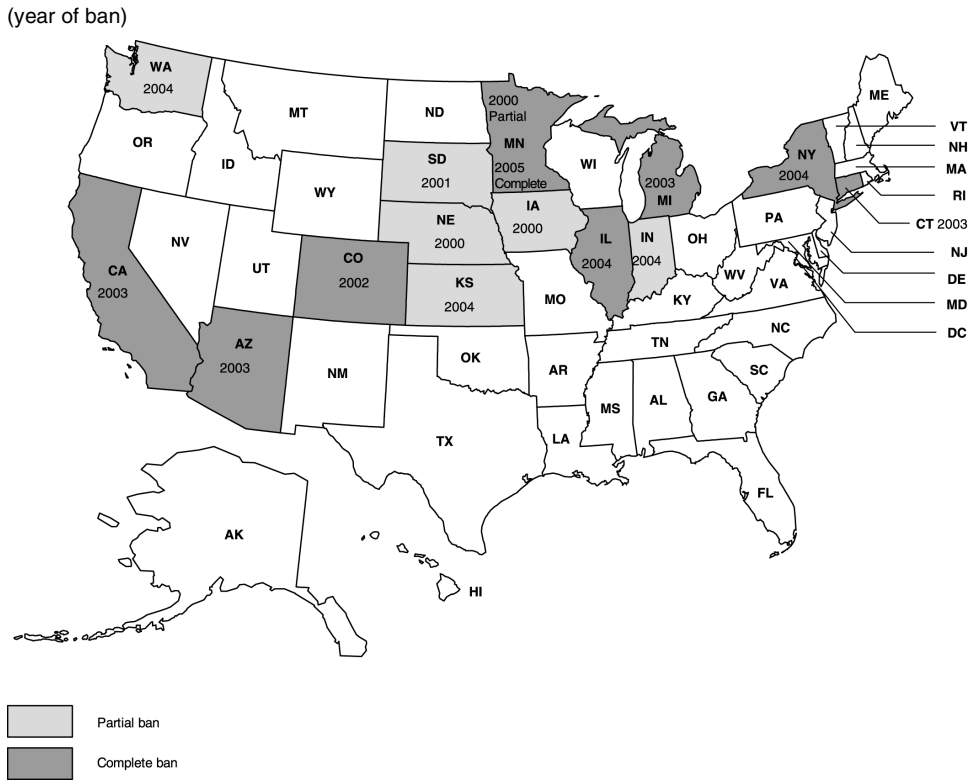
EPA has efforts underway to fill in some of the data gaps on the health effects of MTBE and its occurrence in drinking water supplies. Additional research and water quality monitoring must be concluded before EPA can determine whether a water quality standard—an enforceable limit on the concentration of MTBE allowed in drinking water—is warranted. EPA has issued an advisory suggesting that drinking water should not contain MTBE in concentrations greater than 20 to 40 parts per billion, based on taste and odor concerns. EPA is considering taking further steps to regulate MTBE, but notes that to establish a federally enforceable standard could take about 10 years.

[8] *Occurrence and Distribution of Methyl tert-Butyl Ether and Other Volatile Organic Compounds in Drinking Water in the Northeast and Mid-Atlantic Regions of the United States, 1993-98*, U.S. Geological Survey (Water Resources Investigations Report 00-4228, 2001).

[9] National Sciences and Technology Council, Committee on Environment and Natural Resources, *Interagency Assessment of Potential Health Risks Associated with Oxygenated Gasoline* (Feb. 1996).

While the potential health risks of MTBE are uncertain, 14 states—9 of which are not required to use a fuel additive to limit air pollution in certain areas—have partially or completely banned the use of MTBE within their boundaries (see figure 2).

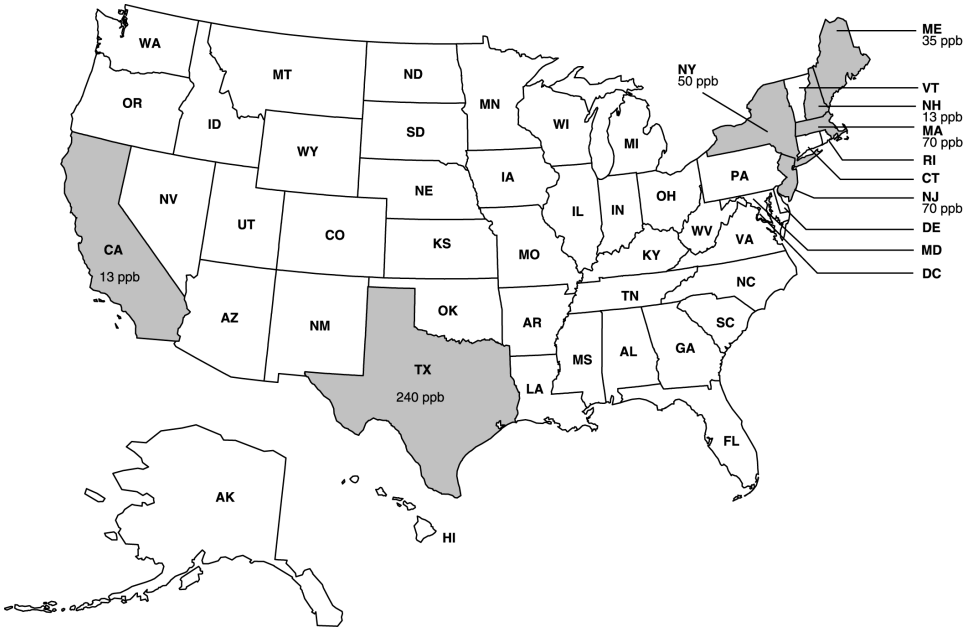
Figure 2: States That Have Banned MTBE



Source: EPA.

In addition, seven states reported in the December 2000 EPA-sponsored survey that they had established their own health-based primary drinking water standard for MTBE, as shown in figure 3. Six of these states currently use fuel additives to limit air pollution and the seventh state voluntarily used such additives until 1999.

Figure 3: States With a Health-Based Drinking Water Standard for MTBE



Source: A Survey of State Experiences with MTBE Contamination at Leaking Underground Storage Tank Sites, New England Interstate Water Pollution Control Commission (December 15, 2000).

Another five states reported establishing a secondary standard to limit the allowable amount of MTBE in drinking water. These standards vary considerably, however, with concentrations ranging from 5 to 70 parts per billion.

Discovery of MTBE Does Not Drive the Cleanup Methods Implemented, but Could Increase the Cleanup's Duration and Cost

According to the EPA-sponsored survey, 37 states said that finding gasoline, or its components of concern, [10] in soil or groundwater at a tank site is the primary driver of cleanup activities, not the presence of MTBE. In other words, the methods used to clean up gasoline can also be used to address MTBE contamination. These proven cleanup technologies include pumping and treating groundwater at its source, treating the water at its point of use by running it through a filter, or using a process known as air sparging (injecting air into the contaminated area to volatilize and extract MTBE). Letting the contaminant naturally break down over time—known

[10] Some of the components of concern in gasoline include benzene, toluene, ethylbenzene, and xylene

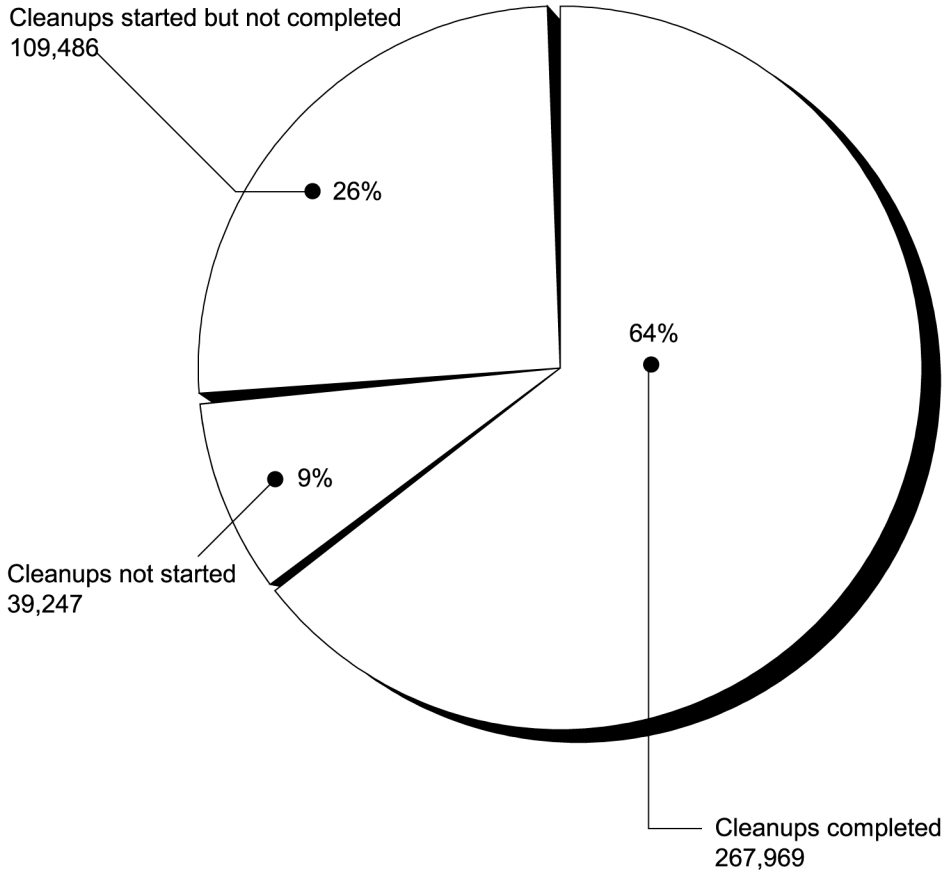
as natural attenuation—may not be as effective as with other components of gasoline because MTBE persists longer in soil and groundwater.

However, addressing MTBE could add time and costs to cleanups. According to the EPA-sponsored survey, 16 states reported cost increases as a result of MTBE cleanup, most less than 20 percent; 5 states reported that their costs had doubled. States spent, on average, about $88,000 addressing releases at each tank site in fiscal year 2001. Nineteen states indicated that it could cost more to test for MTBE because they take additional steps to ensure that this contaminant is not migrating beyond other contaminants in a release. Several states reported that their laboratories charged $10 to $50 more per sample to analyze for MTBE. In addition, many of the 16 states that cited higher cleanup costs for MTBE attributed these increases to such factors as longer plumes and increased cleanup time. Finally, the discovery of MTBE can increase costs because filters used to remove MTBE from water have to be changed more frequently.

States Have Made Progress in Cleaning Up Tank Releases, but Still Face a Potentially Large Cleanup Workload

States reported to EPA that as of the end of 2001, they had completed cleanups of 64 percent (267,969) of the 416,702 known releases at tank sites and had begun some type of cleanup action for another 26 percent (109,486), as figure 4 illustrates.

Figure 4: States Have Made Progress in Cleaning Up Tank Releases

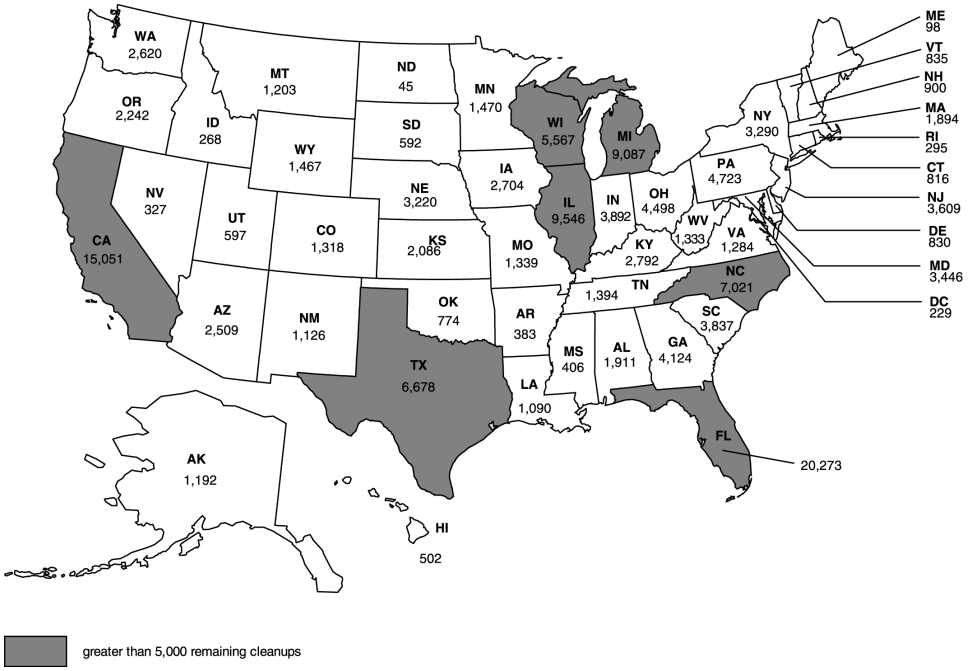


Note: Due to rounding, the percentages do not total 100 percent.

Source: GAO's analysis of data provided by states to EPA.

Because states typically set priorities for their cleanups by first addressing those releases that pose the most risk, states may have already begun to clean up some of the worst releases to date. However, EPA tank program managers cautioned that some of the many cleanups that are underway may still be in their early stages because states have varying criteria for "underway." For example, California reports a cleanup is underway as soon as a release is reported, even if no work has begun. In addition, states still have to address the remaining 39,247 known releases (9 percent) where cleanup is not underway by either ensuring it has begun or is not needed because the releases do not pose a risk. Figure 5 illustrates the remaining cleanup workload for known releases in each state and the District of Columbia.

Figure 5: States Still Have a Number of Cleanups to Initiate or Complete



Source: GAO's analysis of data provided by states to EPA.

As the figure shows, while states have made progress, seven states still have more than 5,000 releases that they have not fully addressed. Most of the 13 states we contacted cited a lack of staff as a barrier to achieving more cleanups. For example, the May 2001 Vermont survey of state funding programs indicated that, on average across the states, each staff person was responsible for overseeing about 130 tank sites during that year.

In addition to this known workload, states most likely will continue to face a potentially large but unknown future cleanup workload for a number of reasons:

- In a June 2000 report to the Congress, EPA estimated that as many as 200,000 tanks nationwide may be unregistered, abandoned, or both, and have not been assessed for leaks.[11]

[11] *Report to Congress on a Compliance Plan for the Underground Storage Tank Program*, U.S. Environmental Protection Agency (EPA 510-R-00-001, June 2000).

- Furthermore, even though many owners chose to close their tanks rather than upgrade them with leak detection and prevention equipment as federally required, tens of thousands of tanks nationwide are still empty and inactive, and have not been permanently closed, as we previously reported. Consequently, any leaks from these tanks may not have been identified.

- We also reported that an estimated 200,000 or more active tanks were not being properly operated or maintained, increasing the chance of a spill or leak. For example, 15 states reported that leak detection equipment was frequently turned off or improperly maintained.

- In addition, we reported that many states do not inspect their tanks frequently enough to ensure that they are not leaking and that known releases are reported. Only 19 states were physically inspecting all of their tanks at least once every 3 years—the minimum EPA considers necessary for effective tank monitoring. In addition, 22 states were not inspecting all of their tanks on any regular basis.

- While the number of leaks should decrease in the future—because all new of active tanks should have leak detection and prevention equipment—we previously reported that 14 states traced newly discovered leaks to upgraded tanks and 20 states did not know whether their upgraded tanks leaked.

- Finally, 10 states reported in the EPA-sponsored survey that they had reopened a small number of completed cleanups because MTBE had been subsequently detected. If more states follow suit, the future cleanup workload will increase, although the size of this workload is unknown. In addition, states may be responsible for the costs of these reopened cleanups because tank owners and operators are not required to maintain financial responsibility for tanks that were properly cleaned up or closed.

States Rely on Their Own Programs and Private Parties to Pay for Cleanups, but May Require Federal Funding to Accelerate Cleanups and Address Abandoned Tanks

States have relied primarily on their own funding programs and private parties to pay for cleanups, using the relatively small federal trust fund grants they receive for staff, program administration, and to a lesser extent, cleanups. States' reliance on private and federal funding could increase in the future if they end their funding programs and begin to address the problem of abandoned tanks with no financially viable owner.

State Funding Programs and Private Parties Have Paid for Most Cleanups

In creating the Underground Storage Tank program, the Congress expected tank owners and operators to take financial responsibility for cleaning up contamination from their tanks, correcting environmental damage, and compensating third parties for any injuries. Tank owners and operators were to demonstrate that they had the financial resources to cover potential cleanup liabilities. Initially, private insurers were hesitant to take on the risks of providing liability coverage to owners and operators of underground storage tank systems, so many states created their own financial assurance funds. These state funds could be used to cover the financial responsibilities of owners and operators for site cleanup as long as long as the state funds met the federal financial responsibility requirements. Forty-seven states established such programs most often from a gasoline tax, an annual tank fee, or both, rather than state appropriations. The remaining three states relied on owners and operators to locate suitable insurance, now more readily available, or other financial resources. Under many state programs, owners or operators pay for the cleanup and seek reimbursement for a portion of the cleanup costs from the state. Six of the 13 states we contacted cap the amount of reimbursements and expect tank owners and operators to be financially liable for the remaining costs.

In the May 2001 Vermont survey of state funding programs, states reported spending a cumulative $6.2 billion from their funds since their programs began (13 states did not report their costs). The amount of private funds spent on cleanups is unknown. At the time of the survey, 36 states reported having adequate funding to cover their current costs, but 11 other states said that they were about $625 million short of the funds necessary to cover known claims. Program managers in five of the 13 states we contacted said that their state funds were stable. In addition, nine states

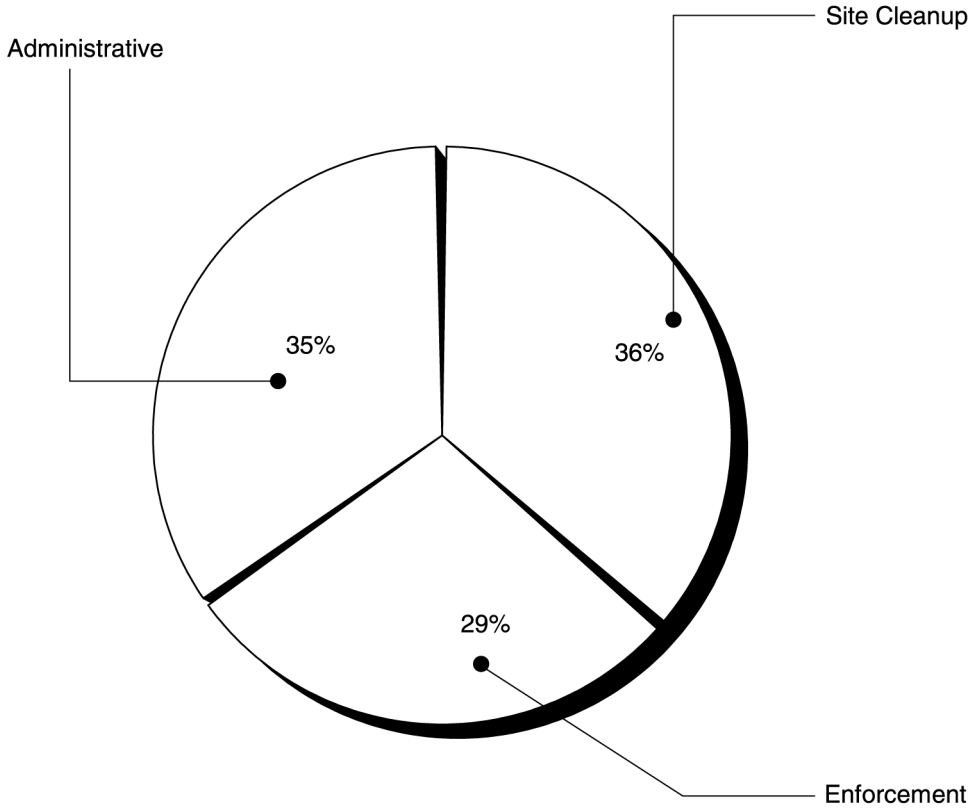
reported that eligibility for their programs had ended[12]—meaning they would no longer accept any reimbursement claims for new releases—and another seven states expected eligibility to end by 2026. Furthermore, the program fees used to replenish state programs had expired in 1 state and were expected to expire in another 12 states within the next decade. As a result of these provisions, tank owners and operators would be responsible for cleanup costs with no state funding support.

States Have Used Federal Funds Primarily for Cleanup Oversight

States have been using federal grants from the Leaking Underground Storage Tank Trust Fund primarily to pay for staff to oversee cleanups and pursue owners and operators so that they clean up their sites, according to the EPA program manager. States cannot use these federal funds to clean up releases when an owner or operator can pay. States spent $662.5 million in federal trust fund dollars from fiscal year 1987 through fiscal year 2001, roughly 10 percent of the expenditures from states' funds during the same period. States used $19.5 million, or 36 percent, of the $58.7 million they received in fiscal year 2001 grants on cleanup (see figure 6).

[12] In Maine, fund eligibility expired only for "non-conforming" tanks—those which had not been upgraded with leak detection and prevention equipment.

Figure 6: States' Use of Grants from the Federal Trust Fund



Source: EPA.

Of the 13 states we contacted, 7 said that their programs rely on the federal grants. On the other hand, for example, a program manager in Florida said that the state's program does not depend on federal grants because it is a small amount of money compared with the amount coming from the state fund. Some states use their federal funds for staffing costs. However, a Maryland program official pointed out that the size of the annual federal grants to states has not kept pace with the salary and other costs they must cover for staff. An Indiana program official attributed a backlog of 4,000 cleanups at one point in the state's program to a lack of federal funding that could be used to pay for additional staff. States may be using their federal trust fund grants to pay for staff because the use of these funds is more restrictive than the state funds, which can be used to reimburse tank owners for their cleanup costs, among other things.

Six states have used an additional funding source that receives federal support to cover some cleanup costs, namely, their Clean Water State Revolving Funds. States get federal seed money to initiate and maintain this type of fund. Eligible parties can apply for loans under the fund and have used them to cover a variety of leak prevention and cleanup projects. According to the EPA, the six states using this vehicle have made a total of $84 million in loans for tank cleanups through June 2000. Program managers in 9 of the 13 states we contacted said that they did not expect to use their revolving loan fund for tank cleanups.

Some States May Seek More Federal Support for Cleanups in the Future

In addition to the federal grants and loan funds, some states may look to the federal government in the future to help them clean up those abandoned tanks that pose health risks when financially viable parties cannot be identified to pay for cleanups. States admit that they do not often identify releases until they are closing or removing tanks, meaning that EPA and the states might inadvertently be underestimating the risks and cleanup workload that abandoned tanks pose.

States may seek additional federal assistance to address abandoned tanks if state funding programs expire or are depleted. As of January 2002, states can access one new source of federal funding for abandoned tanks, made possible by the Small Business Liability Relief and Brownfields Revitalization Act. Under the act, the Congress authorized up to $50 million annually to clean up properties that may be contaminated by a petroleum release, including abandoned tanks.

Scope and Methodology

To respond to your questions, we primarily analyzed data (1) that states reported to EPA on the status of tank releases, (2) from the December 2000 report on the EPA-sponsored survey of state tank programs, and (3) from the May 2001 Vermont survey of state cleanup funding programs. In addition, we contacted 13 state tank program managers to discuss their cleanup workload, their concerns with MTBE, and their approach for funding cleanups. We selected these states because they had addressed the largest number of releases, had the largest backlog, or both. We also met with EPA tank program managers to discuss cleanup efforts. We performed our work from April to May 2002 in accordance with generally accepted government auditing standards.

Mr. Chairman, this concludes my statement. I would be pleased to respond to any question you or Members of the Committee may have.

Contact and Acknowledgments

For further information, please contact John Stephenson at (202) 512-3841. Individuals making key contributions to this testimony were Ellen Crocker, Rich Johnson, Eileen Larence, Gerald Laudermilk, Christopher Murray, and Paul Schearf.