

# Fiscal Year 2002 Agency Profile and Annual Report

*The Agency for Toxic Substances  
and Disease Registry*

October 1, 2001, to September 30, 2002

### *Disclaimer*

The mention of a company name or product in this annual report is for identification only and does not constitute endorsement by the Agency for Toxic Substances and Disease Registry (ATSDR). Information in this report is intended primarily for internal administrative use by the agency.

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## **Foreword**

The Agency for Toxic Substances and Disease Registry (ATSDR) is pleased to present this report of the agency's principal works and findings from fiscal year 2002. Collectively, ATSDR annual reports provide a historical record of significant accomplishments under the Comprehensive Environmental Response, Compensation, and Liability Act (also known as the Superfund statute), as amended, and other federal statutes.

This annual report highlights the accomplishments of fiscal year 2002 in sufficient detail for the reader to appreciate the wide breadth of ATSDR's programs and the advances in public health that occurred during the year.

The employees of the agency take great pride in the accomplishments and the contributions that the agency made in fiscal year 2002 toward improving public health and environmental protection. Comments from interested readers are always welcome.

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# Executive Summary

**T**he Agency for Toxic Substances and Disease Registry (ATSDR) is the lead public health agency responsible for implementing the health-related provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also known as Superfund).

ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposure and disease related to toxic substances.

ATSDR's primary goals are to

- evaluate human health risks from toxic sites and releases and take action in a timely and responsive public health manner
- ascertain the relationship between exposure to toxic substances and disease
- develop and provide reliable, understandable information for people in affected communities and tribes, and for other stakeholders
- build and enhance effective partnerships, and
- foster a quality work environment at ATSDR.

## Report Highlights

This report highlights ATSDR's accomplishments and the activities that were conducted in fiscal year 2002. The profile chapter gives a general overview of the agency's structure and funding. Subsequent chapters give highlights of the agency's major program areas.

## Evaluating Human Health Risks From Toxic Sites and Releases

ATSDR's health assessment activities help (1) identify people who may have been exposed to hazardous substances in the environment and (2) determine whether these people might be at risk of adverse health effects as a result of that exposure. Helping ATSDR carry out health assessments and related activities are the 31 states, the Commonwealth of Puerto Rico, and the Gila River Indian Community that have cooperative agreements with the agency to conduct health assessments and related activities. During fiscal year 2002, ATSDR and its cooperative agreement partners performed more than 1,481 health assessment-related activities.

ATSDR estimates that more than 1.7 million people live within 1 mile of 371 sites where health assessments or health consultations were conducted in fiscal year 2002. Arsenic, detected at 21% of the sites, was the contaminant found most often at the sites assessed in fiscal year 2002. Other contaminants commonly found were lead, which was found at 20% of the sites; volatile organic compounds (VOCs), also found at 20%; trichloroethylene, found at 19% of the sites; and polycyclic aromatic hydrocarbons (PAH), found at 15% of the sites.

### *Site Example—Warren, Ohio*

An example of a site where ATSDR conducted public health assessment activities in fiscal year 2002 is the Warren Recycling site in Warren,



*Residential water sampling in Warren, Ohio*

Ohio. Community members were concerned that levels of hydrogen sulfide in the air were affecting their health and the health of children attending local schools. ATSDR determined that levels of hydrogen sulfide in the air were high enough potentially to cause symptoms and that the site posed a public health hazard. ATSDR created a multi-agency committee to develop and carry out a public health action plan to address health concerns.

In response to recommendations made by ATSDR and the committee, the local school district purchased hydrogen sulfide monitors at the three schools located closest to the area of concern. An emergency evacuation plan was also developed for those times when odors are high at the schools. ATSDR also worked to establish a 24-hour odor hotline that residents may call to report hydrogen sulfide odors. The agency is also planning to conduct other public health activities, including a health study of asthmatic children in the area.

### *Emergency Response to Anthrax Contamination*

As part of its goal to identify people who may be exposed to hazardous substances, ATSDR provides emergency response services, including a response line that offers technical assistance to federal, state, and local responders during emergencies that involve the spills of hazardous substances. ATSDR's expertise in environmental sampling and assessment was called upon in the response to the anthrax attacks. ATSDR provided environmental health support to the CDC's anthrax investigation teams as they responded to intentional releases across the country.

This support began with development of an environmental sampling plan for the AMI facility in Boca Raton, Florida. With the discovery of anthrax in the NBC News Headquarters in New York City, ATSDR provided members for the first team that went into the building and assisted in identifying sample locations for the Federal Bureau of Investigation (FBI).

Later in fiscal year 2002, ATSDR provided a team of trained entry personnel to assist the FBI in characterizing a building in Florida that had been closed since it was contaminated with anthrax. Staff members from ATSDR collaborated with the FBI, National Institute of Occupational Safety and Health (NIOSH), and the National Center for Environmental Health (NCEH) to help collect nearly 5,000 evidence samples at the Boca Raton building in September 2002.

### *National Asbestos Exposure Review*

ATSDR is continuing its public health response to asbestos contamination in Libby, Montana, with a review of other sites across the country that received vermiculite that was contaminated with tremolite asbestos. People in the town had

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been potentially exposed to tremolite asbestos for a number of years. Contaminated vermiculite ore from Libby was shipped to 244 sites around the country. ATSDR and its partners are reviewing 28 sites that have been identified as the largest processors of the vermiculite ore or as having asbestos contamination. During fiscal year 2002, ATSDR completed site visits for 27 of the 28 priority sites identified. ATSDR and its state partners are developing site-specific health consultations for each of the priority sites.

### **Ascertaining Relationships Between Exposure to Toxic Substances and Disease: Toxicologic Research**

One of the ways ATSDR evaluates the relationships between hazardous substances in the environment and human health outcomes is through toxicologic research. ATSDR's toxicologic research program is filling many data gaps about how hazardous substances affect human health. ATSDR oversees two major research programs designed to help fill these data gaps—the ATSDR Great Lakes Human Health Effects Research Program and the ATSDR Minority Health Professions Foundation Research Program.

ATSDR's toxicologic research provides critical information to public health decision makers about the health effects of hazardous substances. For example, findings from ATSDR's Great Lakes Human Health Effects Research Program have been published in an International Joint Commission report on the priorities established and progress made under the Great Lakes Water Quality Agreement. During fiscal year 2002, researchers supported by the Great Lakes research program reported findings from a study that looked at serum PCB levels of people who ate Great Lakes fish and their thyroid hormone levels. Serum PCB

levels and consumption of Great Lakes fish were significantly associated with lower levels of thyroxine (T4), a hormone secreted by the thyroid, in both women and men.

ATSDR toxicological profiles provide information about the relationship between hazardous substances and health outcomes. These profiles summarize information about many of the most hazardous substances found at Superfund sites. In fiscal year 2002, the division released ATSDR ToxProfiles 2002™, a CD-ROM document that contains 159 toxicological profiles. Toxicological profiles are also available on the ATSDR Internet Website.

ATSDR has identified 190 priority data needs for the first 50 substances of the Substance-Specific Applied Research Program. To date, 143 priority data needs are being addressed via the mechanisms that ATSDR has implemented, and 62 of these have been filled. Data obtained from the research program are used to update ATSDR toxicological profiles and to develop health-guidance values for hazardous substances evaluated in ATSDR's public health assessments conducted at waste sites.

### **Ascertaining Relationships Between Exposure to Toxic Substances and Disease: Health Studies**

ATSDR conducts and supports health studies to evaluate the relationship between exposure to hazardous substances and adverse health effects. ATSDR also conducts studies to evaluate how people become exposed to hazardous substances.

For example, the Missouri Department of Health conducted an ATSDR-funded study to assess whether public health intervention efforts in Jasper County, Missouri, had been effective in reducing blood lead levels of the commu-

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nity's children. ATSDR and its partners in the state and local health departments had worked with the community of Jasper County, Missouri, on ways to reduce exposure to lead, which was processed in the area for many years. The results of the study indicated that educational and environmental interventions initiated since 1991 to reduce blood lead levels of children living in the mining waste and smelter area of Jasper County, Missouri, have been effective. In part because of the health education program, the number of children with high levels of lead in their blood (greater than 10 micrograms per deciliter) dropped by 86% in 10 years.

During fiscal year 2002, ATSDR continued its work in evaluating residents and former residents of Libby, Montana. ATSDR is developing a registry of people who were exposed to tremolite asbestos in Libby to track their health. The registry will include former vermiculite workers, their household contacts, and people who participated in ATSDR's medical testing program. In 2002, ATSDR began tracing former workers and their household contacts.

## **Providing Reliable Information to Communities and Stakeholders**

ATSDR draws on its resources in health education, risk communication, environmental medicine, and health promotion to prevent or reduce the harmful health effects of exposure to hazardous substances in communities. ATSDR provides such preventive measures as training local physicians about the health concerns associated with contaminants, providing communities with information about the health effects of hazardous substances, and providing clinical evaluations and screenings. ATSDR also conducts health education and promotion activities that have a nationwide focus, such as its case study program on environmental medicine. These activities are conducted with the

assistance of numerous partners with whom the agency has cooperative agreements, including states, American Indian tribal nations or groups, and national organizations.

The services offered by ATSDR's network of 11 Pediatric Environmental Health Specialty Units (PEHSUs) at major universities and medical centers across the country continued to grow in fiscal year 2002. During the fiscal year, more than 1,500 children were evaluated at the PEHSU clinics by pediatricians specially cross-trained in environmental medicine, up from about 900 in fiscal year 2001. The PEHSUs provided training to more than 23,000 health care professionals in fiscal year 2002, up from 16,275 in the previous year.



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# Agency Profile

## History of ATSDR

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal agency that Congress created through the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), commonly referred to as the Superfund legislation. Congress enacted Superfund as part of its response to two highly publicized and catastrophic events: discovery of the Love Canal hazardous waste site in Niagara Falls, New York, and an industrial fire in Elizabethtown, New Jersey, that released highly toxic fumes into a densely populated area. Congress created ATSDR to implement the health-related sections of laws that protect the public from hazardous wastes and uncontrolled releases of hazardous substances into the environment.

In 1983, an administrative order of the Secretary of the U.S. Department of Health and Human Services (DHHS) established ATSDR as a separate agency of the Public Health Service. In June 1985, ATSDR was formally organized to begin to implement provisions of CERCLA. ATSDR was to work in concert with the Environmental Protection Agency (EPA),

the Centers for Disease Control (CDC, now the Centers for Disease Control and Prevention), and the National Institute of Environmental Health Sciences.

When Congress reauthorized Superfund in 1986 in the Superfund Amendments and Reauthorization Act (SARA), ATSDR received major new mandates. By August 1989, the agency had assumed its current structure. Since



*ATSDR's headquarters in Atlanta, GA*

1989, ATSDR has received additional non-CERCLA statutory responsibilities. The agency, headquartered in Atlanta, Georgia, is staffed by more than 400 health professionals and other staff members who work in Atlanta, in the agency's Washington office, and in 10 EPA

regional offices throughout the country.

## Mission of the Agency

ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and disease related to toxic substances. As the lead public health agency responsible for implementing the health-related provisions of CERCLA, ATSDR is charged with assessing health hazards at

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specific Superfund sites, helping to prevent or reduce exposure and the illnesses that result, and increasing knowledge and understanding of the health effects that may result from exposure to hazardous substances. ATSDR works closely with state, local, and other federal agencies to reduce or eliminate harmful health effects that are related to exposure to toxic substances at waste disposal and spill sites.

CERCLA mandated that ATSDR (1) establish a National Exposure and Disease Registry; (2) create an inventory of health information on hazardous substances; (3) create a list of sites that had been closed or had access restricted because of toxic contamination; (4) provide medical assistance during hazardous substance emergencies; and (5) determine the relationship between hazardous substance exposure and illness.

The Resource Conservation and Recovery Act (RCRA), as amended in 1984, mandated that ATSDR work with EPA to (1) identify new hazardous wastes to be regulated; (2) conduct health assessments at RCRA sites at EPA's request; and (3) consider petitions by states or members of the public to conduct health assessments at sites.

SARA broadened ATSDR's responsibilities, giving ATSDR mandates to conduct public health assessments, establish and maintain toxicologic databases, disseminate information, and provide medical education. The Great Lakes Critical Programs Act of 1990 required EPA, in cooperation with ATSDR, to report to Congress on the adverse health effects of water pollutants on people, fish, shellfish, and wildlife.

## Agency Goals

ATSDR's mission is supported by five goals, which are included in the agency's 5-year strategic plan for 2002 through 2007. These goals are as follows:

Goal 1—Evaluate human health risks from toxic sites and releases and take action in a timely and responsive public health manner.

Goal 2—Ascertain the relationship between exposure to toxic substances and disease.

Goal 3—Develop and provide reliable, understandable information for affected communities, tribes, and stakeholders.

Goal 4—Build and enhance effective partnerships.

Goal 5—Foster a quality work environment at ATSDR.

## Priorities for the Future

During fiscal year 2002, ATSDR completed several major tasks aimed at taking a long-range view of the agency's public health activities. Specifically, ATSDR entered the first year of a multi-year research agenda and finalized its 5-year strategic plan.

The research agenda, Agenda for Public Health Environmental Research (APHER) 2002–2010, is helping to guide ATSDR's research programs in areas of critical need. The applied research projects proposed in the agenda focus on six areas: exposure assessment, chemical mixtures, susceptible populations, community and tribal involvement, evaluation and surveillance of health effects, and health promotion and intervention.

Results of applied research in these areas will improve ATSDR public health activities and interventions for communities exposed to hazardous substances through contaminated water, soil, air, or food. Applied research in each of the focus areas will improve the tools, methods, and approaches used to evaluate and prevent exposure and adverse health outcomes. The agenda will facilitate planning and communication and foster collaboration on crosscutting areas of research.

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The research efforts will benefit numerous communities in the United States and around the world as the applied research findings are incorporated into more effective environmental public health practice. The agenda will be updated over time to monitor priorities and resources. ATSDR is also working closely with the National Institute of Environmental Health Sciences, EPA, CDC, and other agencies in coordinating research agendas and identifying important areas for collaborative research.

In fiscal year 2002, APHER funds supported six research projects. These projects are as follows:

- an evaluation of psychosocial stress levels in children who live in communities affected by hazardous substances
- a feasibility study for examining the long-term health consequences of exposure to trichloroethylene in drinking water in Beaverton, Oregon
- a study examining thimerosal pharmacokinetics: assessment of distribution, metabolism, and excretion
- an evaluation of potential health benefits associated with a reduction in exposure to hazardous air pollutants
- an evaluation of environmental exposure to diisocyanates and respiratory effects
- a study of the variation in urinary creatinine and dissolved solids during development.

In addition, ATSDR provided EPA with funds to support a request for application under the research agenda program on “lifestyle and cultural practices of tribal populations and risk from toxic substances in the environment.”

ATSDR finalized its strategic plan during fiscal year 2002. The plan, which covers the period 2002–2007 provides a framework for the agency’s overall vision and establishes critical measures to monitor progress. The develop-

ment of the strategic plan followed a process that relied closely on input from internal and external stakeholders of the agency.

During fiscal year 2002, ATSDR and the National Center for Environmental Health (NCEH) continued to strengthen their collaboration on environmental health issues. For example, they closely collaborated in the response to terrorism, including the response to the anthrax contamination at various postal facilities and other buildings in several states.

Previously, ATSDR and NCEH developed a vision statement outlining a model environmental health program. A CDC/ATSDR Working Group drafted a report on a shared vision that aims to establish common ground on which to build ATSDR and NCEH programs that would become national and international resources for addressing environmental public health threats and promoting health by improving the environment. The vision document calls for greater coordination and collaboration between the two environmental health agencies.

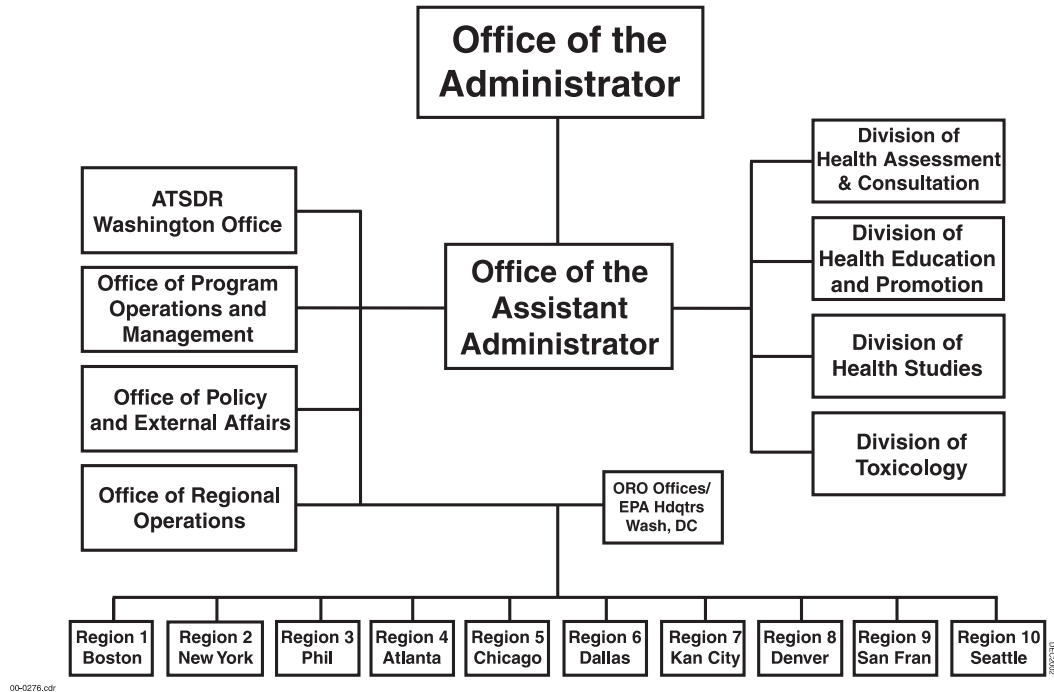
## **ATSDR Organizational Structure**

ATSDR executes its operations through four program-specific divisions—the Division of Health Assessment and Consultation, the Division of Toxicology, the Division of Health Studies, and the Division of Health Education and Promotion.

### *Division of Health Assessment and Consultation*

The responsibilities of the Division of Health Assessment and Consultation include the following activities:

# Agency for Toxic Substances and Disease Registry



- Conducting public health assessments or other evaluations of sites listed on the National Priorities List
- Responding to petitions for public health assessments
- Providing consultation on health issues related to exposure to hazardous or toxic substances, including consultations requested by EPA, state, or local officials
- Determining the extent of danger to public health from a release or threatened release of a hazardous substance.

## *Division of Toxicology*

The responsibilities of the Division of Toxicology include the following activities:

- Re-examining the CERCLA Priority List of Hazardous Substances annually and updating the list to include any additional hazardous substances found to pose a significant potential threat to human health. Updated lists are published every two years.
- Preparing a toxicological profile for each hazardous substance on the CERCLA Priority List of Hazardous Substances. In a toxicological profile, ATSDR scientists interpret all known information about a specific substance and identify the concentration level of the substance that may cause harm to people who are exposed to it. The toxicological profile also identifies significant gaps in knowledge about the substance, thus serving to initiate additional research when needed.
- Providing emergency response consultations to assist in determining the extent of danger to public health from a release—or threatened release—of a hazardous substance and providing advice on preventing or mitigating the danger.
- Conducting a research program in cooperation with the National Toxicology Program to determine the health effects of those hazardous substances about which ATSDR, EPA, and other agencies have determined that insufficient information exists.

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## *Division of Health Studies*

The responsibilities of the Division of Health Studies include the following activities:

- Conducting periodic survey and screening programs to determine relationships between exposure to toxic substances and illness
- Conducting epidemiologic studies that test scientific hypotheses to evaluate the causal nature of associations between disease outcomes and exposure to hazardous substances
- Conducting health surveillance programs of populations exposed to hazardous substances, including medical testing and referral for treatment
- In cooperation with the states, establishing and maintaining a National Exposure Registry of persons exposed to hazardous substances.

## *Division of Health Education and Promotion*

The responsibilities of the Division of Health Education and Promotion include the following activities:

- Conducting site-specific programs to assist communities and health professionals in understanding, preventing, or reducing adverse health effects of exposure to hazardous substances. These program activities promote awareness, share information, increase knowledge, promote behavioral changes, provide medical consultations, and communicate potential health risks.
- Supporting a wide array of environmental health education and promotion activities for health care providers, public health officials, and communities through cooperative agreement programs with national organizations of health professionals.
- Developing, distributing, and evaluating environmental public health information and

training programs in various formats, languages, and media.

## *Office of the Assistant Administrator*

In addition to the program-specific divisions, ATSDR has several offices that provide administrative, scientific, or management support to the agency and its divisions. These offices are contained within the Office of the Assistant Administrator.

**The Office of the Associate Administrator for Science (OAAS)** serves as the agency focal point for science issues that have an impact on ATSDR programs and activities. OAAS provides administrative and technical support to ATSDR's Board of Scientific Counselors and that board's Community/Tribal Subcommittee. OAAS also supports the ATSDR external peer review process, a monthly science forum that reviews science issues and develops proposals for senior management, and offers regular science seminars designed to keep staff informed on the latest relevant scientific developments. OAAS also conducts clearance of agency publications to ensure that scientific quality and policy standards are maintained. The office reviews all protocols for human subjects issues and serves as the liaison to CDC's Institutional Review Boards. OAAS has developed a long-range research agenda for ATSDR and tracks the agency's annual research expenditures.

In 1998, ATSDR established an **Office of Children's Health** to (1) coordinate child health programs throughout the agency; (2) identify (in collaboration with other divisions and offices) new projects that benefit children; and (3) solicit input from and disseminate information to partner agencies and organizations. ATSDR's office complements EPA's formation of the Office of Children's Health Protection

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and the federal Task Force on Children's Environmental Health and Safety Risks (established under Executive Order No. 13045).

The **Office of Policy and External Affairs** promotes the mission of ATSDR by coordinating the agency's efforts to build public health capacity in state and local entities, by providing analysis of agency policy, and by communicating information about ATSDR's activities. The office coordinates public affairs activities, provides graphics and editorial services to the agency, and produces various publications, reports, and fact sheets to communicate agency activities.

The **Office of Program Operations and Management (OPOM)** develops and executes ATSDR's budget, including Superfund and other federal program funds. In addition to managing the budget, OPOM provides management support for the agency in the areas of program planning; recruitment and employee development; information access, exchange, and utilization; training; travel; and procurement and other administrative services.

The **Office of Regional Operations (ORO)** assists in the implementation of ATSDR activities across the country. ORO has ATSDR regional representatives at each of the 10 EPA regional offices in addition to providing a liaison at EPA headquarters in Washington, D.C. This distribution of staff in regional locations promotes communication and interaction with ATSDR's main partners: the public, EPA, and state and local environmental and public health agencies.

The **Office of Urban Affairs** coordinates the agency's efforts on issues related to environmental justice and minority health.

The **ATSDR ombudsman** provides an independent, neutral resource for all parties concerned with environmental health disputes involving

ATSDR. Finding common ground to establish a workable agreement between each faction is the ombudsman's primary objective.

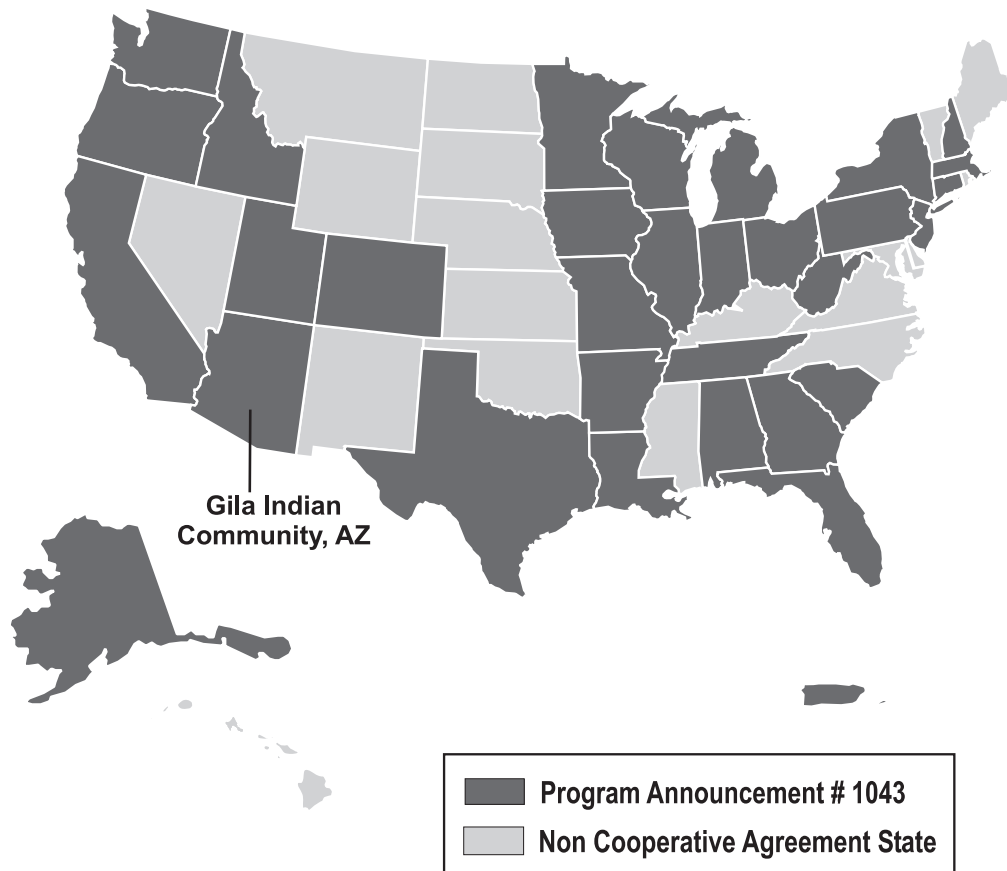
**ATSDR's Washington office** links the agency with other executive branch departments and agencies and the legislative branch of federal government. This office enables ATSDR to respond quickly to issues raised by Congress, by other federal agencies, and by public interest and private sector organizations that have an interest in agency programs.

## Partnerships with States and Federal Agencies

ATSDR provides funding to a number of state health departments to conduct a variety of public health activities. The largest cooperative agreement program funded by the agency is the 1043 Cooperative Agreement Program to Conduct and Coordinate Site-Specific Activities, a program that provides funds and technical oversight for participating partners to conduct health assessments, consultations, and studies, in addition to providing health education in communities near hazardous waste sites. (See Figure 1.) Staff members in participating health departments use ATSDR guidance for conducting public health assessments, consultations, and studies. Through this partnership, state staff members also receive training and experience in assessing the public health impact of hazardous waste sites, and they have access to ATSDR's scientific resources.

In fiscal year 2002, the eighth year of a combined cooperative agreement program, more than \$10.5 million in new funds were awarded to 33 partners, made up of 31 state health departments, one commonwealth health department, and one Indian nation.

ATSDR also has partnerships with various federal agencies, including the Department of Defense (DOD), the Department of Energy



**Figure 1. Map of Cooperative Agreement Partners**

(DOE), the National Aeronautics and Space Administration, the Department of Agriculture, the Department of the Interior, the Chemical Safety and Hazard Investigation Board, and the Agency for International Development.

For example, through a memorandum of understanding with the Agency for International Development (USAID) Office of Foreign Disaster Assistance, ATSDR provides training in dealing with spills, releases, or other disasters involving hazardous substances in foreign countries, along with assistance in developing emergency response capabilities. Under this partnership, ATSDR provided technical assistance to USAID in Djibouti in March 2002 to assist in the cleanup of a spill of a wood preservative, copper chromated arsenic, from a ship. ATSDR provided monitoring equipment and training on how to use the equipment, along with personal protective clothing and other equipment.

These activities helped ensure the safety of the Djibouti community, the safety of U.S. forces stationed there to support Operation Enduring Freedom, and the safety of food aid shipments to a nearby United Nations warehouse.

The Federal Emergency Management Agency (FEMA) is providing funds for ATSDR to assist the New York City Department of Health and Mental Hygiene develop a registry of people who worked or lived in the vicinity of the World Trade Center site on September 11, 2001. The registry will track the health of these people in an effort to determine if their exposures to smoke, dust, and airborne substances from the collapse of the World Trade Center towers may have long-term impacts on their health. The registry will also attempt to assess the potential long-term psychological impacts. The registry will likely enroll between 100,000 and 200,000

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people, making it the largest registry of its kind. ATSDR is providing technical expertise for the registry.

ATSDR is also working with FEMA to enhance communities' emergency preparedness through FEMA's Comprehensive Hazmat Emergency Response-Community Assessment Program (CHER-CAP). CHER-CAP is offered by FEMA to help local communities better understand HazMat risks, identify planning deficiencies, update plans, train first responders, and test their response systems. Through the program, ATSDR collaborates with local emergency planners, assesses hospitals' emergency response capabilities, provides training in disaster planning and other efforts, and identifies special needs populations in communities.

ATSDR is collaborating with FEMA in the Tri-Town area (New London, East Lyme, and Waterford) of Connecticut and in Boston, Massachusetts. ATSDR participated in a CHER-CAP field exercise in Tri-Town in May 2002. The exercise simulated a mass casualty emergency. ATSDR provided support by evaluating several aspects of the exercise, including the effectiveness of hospital decontamination. An exercise is also planned for Boston.

## **Focusing on Communities**

During fiscal year 2002, ATSDR continued its emphasis on working with people in communities to resolve their public health concerns about hazardous substances from waste sites or spills. ATSDR's Office of Urban Affairs, Community Involvement Branch, and Office of Tribal Affairs have a special focus on working with communities by promoting innovative ways of involving people in environmental health decisions in their communities.

### *Office of Urban Affairs*

The two overarching issues that were the focus of the Office of Urban Affairs fiscal year 2002 initiatives were environmental justice and eliminating ethnic and racial disparities in health. The Office of Urban Affairs' work with communities includes helping communities develop their capacity to collect, analyze, and disseminate health data.

### *Community Involvement Branch*

ATSDR's community involvement staff members have a significant role in ATSDR's activities at sites. These staff members work to establish and maintain partnerships with communities near sites where ATSDR is conducting health assessments or consultations. Community involvement staff members facilitate collaboration and information exchange between ATSDR and communities and other government agencies involved at those sites. They provide an essential link between the community and the ATSDR scientists who are working to address the communities' health concerns and to protect public health.

### *Office of Tribal Affairs*

ATSDR's Office of Tribal Affairs develops policy and programs specific to working with American Indian and Alaska Native people and their respective governments. The Office of Tribal Affairs serves as a central conduit for American Indian and Alaska Native tribes to access agency programs and services; assists ATSDR in responding to presidential executive orders; and coordinates agency activities in response to American Indian and Alaska Native public health needs.

ATSDR funds a cooperative agreement with seven American Indian Tribes which surround the Hanford Nuclear Reservation to build tribal environmental health programs, address



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health issues related to releases of hazardous substances, and develop culturally appropriate health education materials. Among the concerns of these American Indian Tribes is whether off-site contamination affected any native foods and local materials used in tribal products such as pottery, baskets, mats and clothing. Under the cooperative agreement, ATSDR works with the Coeur d'Alene, Colville Confederated Tribes, Confederated Tribes of the Umatilla Reservation, Kalispel Tribe, Kootenai Tribe, Nez Perce, and the Spokane Tribe.

ATSDR partnered with EPA in the development of a project to assess the "Lifestyle and Cultural Practices of Tribal Populations and Risk from Toxic Substances in the Environment." A "request for proposal" was developed to address (1) exposure and effects assessment methods that can be broadly applied across geographic regions and cultural practices and (2) risk management strategies and options that will lead to reduction in risk from exposure. Tribal leaders and representatives will take a leading role in planning, conducting, analyzing, and effecting transition and dissemination of research.

ATSDR provides training on working effectively with tribal governments to both ATSDR staff members and other federal agencies' staff members. This training provides insights into appropriate protocols for working with tribal governments and people. It addresses cultural considerations for assessing the public health of American Indian and Alaska Native people. During fiscal year 2002 ATSDR also worked on developing a training course for tribal clinicians to increase their knowledge of the health issues related to exposure to environmental contaminants. The course is aimed at helping tribal clinicians identify, prevent, and respond to health concerns related to environmental contaminants.

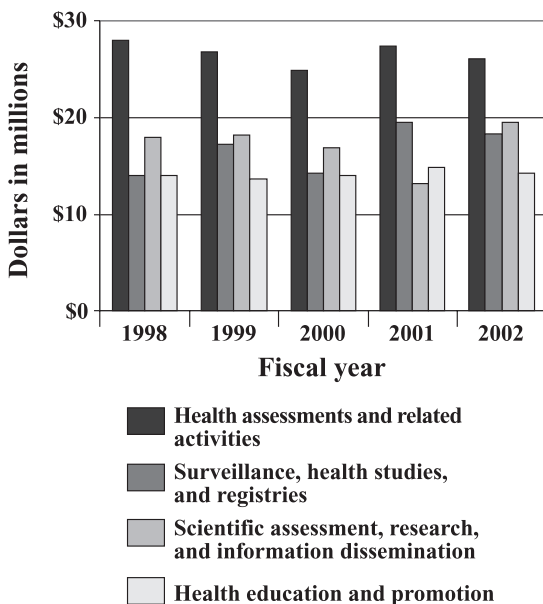


*A Tribal Clinician*

## ATSDR Budget and Appropriations History

Figure 2 contains a breakdown of ATSDR's Superfund budget obligations, by budget activity, for fiscal year 1998 through fiscal year 2002.

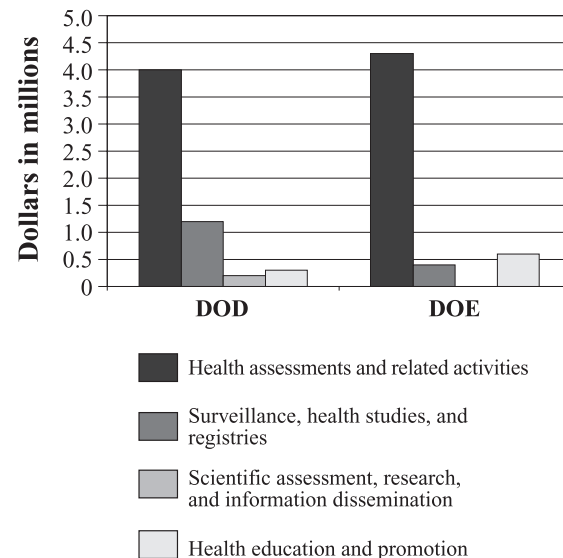
**Figure 2. ATSDR CERCLA Budget, Fiscal Year 1998–Fiscal Year 2002**



ATSDR is mandated by Congress to conduct public health assessments, health studies, surveillance activities, and health education at federal National Priority List waste sites, and to develop toxicological profiles of high-priority chemicals found at these sites. These tasks are complicated by the absence of a congressional mandate to federal agencies (with the exception of the Department of Defense) to provide ATSDR with the necessary staff and budget to conduct these activities. ATSDR negotiates with the Department of Defense (DOD) and the Department of Energy (DOE) to establish annual workplans and budgets required for its

programs at their facilities. Figure 3 illustrates ATSDR's fiscal year 2002 DOD and DOE operating budgets, by budget activity. DOD's obligations to ATSDR totaled \$5.7 million in fiscal year 2002. DOE's obligations to the agency totaled \$5.2 million for the fiscal year.

**Figure 3. ATSDR's Fiscal Year 2002 Operating Budget From DOD and DOE**



In fiscal year 2002, ATSDR had a staff of about 425, all bringing a variety of skills and expertise to the agency's work. ATSDR's staff includes epidemiologists, environmental engineers, health educators, hydrologists, physicians, toxicologists, and other public health professionals. One of the goals included in ATSDR's strategic plan for 2002–2007 is to foster a quality work environment at ATSDR. ATSDR has a very active Quality of Work Life Committee, which exists to facilitate communication between staff and senior management on the work-related well-being of all ATSDR employees.

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ATSDR management and the Quality of Work Life Committee continued to develop activities to enhance internal communications, including holding informal discussions (Brown Bag lunches) between staff members and the agency's assistant administrator. ATSDR also strives toward a commitment to diversity by recruiting at minority-led career fairs, seminars, and conferences; targeting minority journals and other advertising to fill vacancies; and sponsoring internships at targeted schools and universities.

# Chapter One

## **ATSDR's Primary Partners in Evaluating Sites**

*Cooperative Agreement Partners  
(activities also include health  
education and some health studies)*

**Alabama - Alaska - Arizona - Arkansas**

**California - Colorado - Connecticut**

**Florida - Georgia**

**Gila River Indian Community - Idaho**

**Illinois - Indiana - Iowa - Louisiana**

**Massachusetts - Michigan - Minnesota**

**Missouri - New Hampshire - New Jersey**

**New York - Ohio - Oregon**

**Pennsylvania - Puerto Rico**

**South Carolina - Tennessee**

**Texas - Utah - Washington**

**West Virginia - Wisconsin**





# Evaluating Human Health Risks from Toxic Sites and Taking Action

One of ATSDR's primary goals is to evaluate human health risks from toxic sites and to take action in a timely and responsive public health manner. ATSDR's public health assessments, consultations, and related activities play a key role in achieving this goal. ATSDR's health assessment activities help identify people who potentially have been exposed to hazardous substances in the environment and help determine whether those people might be at risk of adverse health effects. The activities that are part of the health assessment process also are often the trigger for a variety

of health studies to be conducted, or for a public health advisory to be issued to recommend immediate actions to prevent exposure.

Helping ATSDR carry out health assessments and related activities are 31 states, the Commonwealth of Puerto Rico, and the Gila River Indian Community, which have cooperative agreements with the agency to conduct health assessments and related activities. During fiscal year 2002, ATSDR and its cooperative agreement partners performed more than 1,481 health assessment activities.

*In fiscal year 2002, ATSDR and its partners prepared 159 public health assessment documents for 122 sites. Of those sites, 28.5% were found to pose a public health hazard.*

## Overview of Public Health Assessment Findings

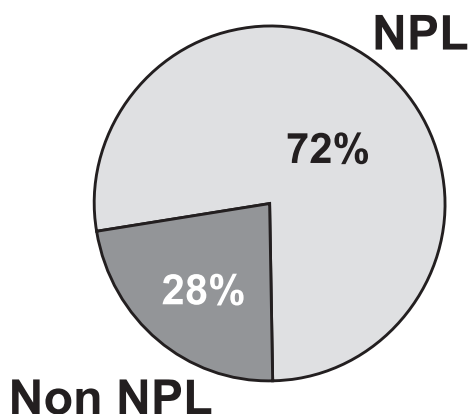
A public health assessment is a review of information about hazardous substances at a site and an evaluation of whether exposure to those substances at the levels found might harm people. Public health assessments often include recommendations about actions needed to prevent or mitigate potential health effects and identify any follow-up or additional studies that may be needed at the site to protect public health.

of other ATSDR activities and public health recommendations. The activities may identify a need for health education in a community, for

In fiscal year 2002, ATSDR and its cooperative agreement partners prepared 159 public health assessment documents for 122 sites. Of those sites, 28.5% were found to pose a public health hazard. The 122 sites consisted of 88 (72%) NPL Sites, and 35 (28%) non-NPL sites. (See

Figure 1.) In addition, six were sites that were covered by the Resource Conservation and Recovery Act (RCRA), and four were sites for which the community or others had petitioned ATSDR to conduct a public health assessment. RCRA covers the control of hazardous substances at operating facilities, such as manufacturing plants.

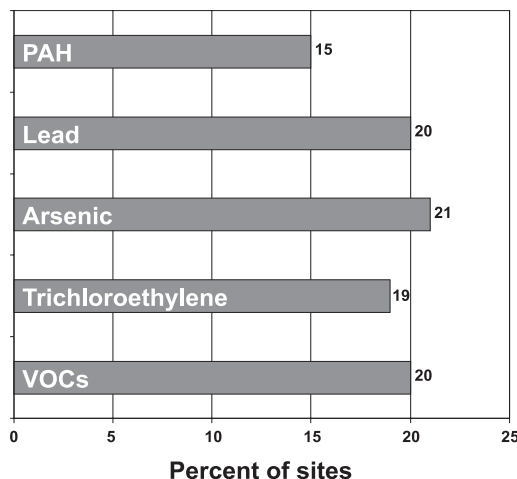
**Figure 1. NPL Status of Sites with ATSDR Public Health Assessment Activity in Fiscal Year 2002**



ATSDR estimates that more than 1.7 million people live within 1 mile of 371 sites for which public health assessments or health consultations were conducted in fiscal year 2002.

Arsenic was the contaminant found most often at the sites assessed in fiscal year 2002. Arsenic was detected at 21% of the sites. Other contaminants commonly found were lead, which was found at 20% of the sites; volatile organic compounds (VOCs), also found at 20%; trichloroethylene, found at 19% of the sites; and polyaromatic hydrocarbons (PAH), found at 15% of the sites. (See Figure 2.)

**Figure 2. Major Contaminants Found at Sites Assessed in Fiscal Year 2002**



One fourth of the sites assessed in public health assessments in fiscal year 2002 were manufacturing or industrial sites. Mining industry sites made up 17% of the sites where public health assessments were conducted, and waste storage and government-owned sites accounted for 16% each. (See Table 1.)

**Table 1. Types of Sites Assessed in Fiscal Year 2002**

Type of Site	Number of Sites	Percentage
Manufacturing or industrial	31	25
Mining	21	17
Natural area	20	16
Waste storage or treatment	19	16
Government	19	16
Waste recycling	8	7
Residential	3	2
School	1	1
Total	122	100

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Following are examples of public health assessments conducted in fiscal year 2002.

### *Vasquez Boulevard and I-70, Colorado*

The Vasquez Boulevard and I-70 (VBI70) site area spans approximately 450 acres in northeast Denver, Colorado. It includes smaller areas that EPA has designated as part of the National Priority List (NPL). Located primarily southeast of the interchange of Interstate 25 and Interstate 70, the study area has an irregular shape. It includes all or part of the following five Denver neighborhoods: Clayton, Cole, Elyria, Southwest Globeville, and Swansea. The area is a mix of residential (approximately 17,500 people living in 5,126 housing units), commercial, and industrial areas. EPA has taken soil samples from approximately 3,000 or 75% of the residential properties in the VBI70 study area and tested them for several metals, particularly arsenic and lead.

In March 2002, public meetings in English with Spanish translators were held to present the public health assessment's conclusions. ATSDR's public health assessment describes the health implications of arsenic and lead in soil. It noted that about 650 properties sampled had arsenic levels that might pose a public health hazard for preschool children who have soil-pica behavior—i.e., eat large amounts of soil. ATSDR estimates that about 300 preschool children live at these properties with high arsenic levels. Soil arsenic levels are also a concern for people who lived as children at a property with high levels of arsenic and who continue to live there as adults. These residents could have a higher chance of getting certain kinds of cancer. EPA has identified about 260 such properties with long-time residents. The meetings were followed up with poster sessions and fact sheet handouts. Each poster and fact sheet was



*Children in a VBI70 Neighborhood*

printed in English and Spanish, and Spanish-speaking personnel were available to help field questions.

Through a cooperative agreement, the Colorado Department of Public Health and Environment (CDPHE) was awarded \$290,000 to conduct a survey to assess soil-pica behavior among preschool children and to identify household cases of acute and chronic arsenic or lead poisoning. In June 2002 the study assessing soil pica behavior was begun in cooperation with ATSDR, CDPHE, and the University of Colorado. Covering all five neighborhoods, the study included urine and blood samples for children 6 months to 6 years of age.

ATSDR has provided comments to EPA on that agency's proposed plan for the VBI70 site, including comments on EPA's proposed clean-up levels. ATSDR is also conducting an intervention project in the community. The project involves conducting health care provider education and community education.

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## *Lower Duwamish Waterway, Washington*

On September 13, 2001, EPA added the Lower Duwamish Waterway site to the NPL. The site is comprised of contaminated sediments within a 5-mile stretch of the Duwamish River in Washington. Contaminants of concern include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury, and other metals. The Washington State Department of Health released a draft public health assessment of the Lower Duwamish site for public comment on July 11, 2002.

The public health assessment concluded that the consumption of shellfish, crab, resident fish from the Lower Duwamish Waterway, and rockfish from nearby Elliot Bay poses some health risk for frequent consumers. Although general advisories already existed for many of the fish and shellfish species, more specific consumption limits were recommended for resident fish in the Lower Duwamish Waterway and for rockfish in Elliot Bay. In addition, crab consumers were warned not to eat the hepatopancreas, a digestive gland that functions as the crab's liver and pancreas. These advisories were communicated through newspapers, public service announcements, internet postings, fact sheets, and community meetings. Fact sheets have been translated into seven different languages. Warning signs, accompanied by educational information about the fish advisories, are to be posted at known fishing locations.

The Department of Health conducted an extensive community outreach campaign in conjunction with the preparation of the public health assessment. Outreach activities included arranging focus groups through the local health department, attending community events, participating in river tours, and talking one-on-one with community leaders and community representatives. Health concerns and feedback for future outreach activities were gathered from

the various ethnic groups living in the South Park and Georgetown communities, including Cambodian, Chinese, Vietnamese, Filipino, Hmong, Laotian, Tongan, Hispanic, and Native American community members. Concerns and opinions were also collected from environmental groups involved in river restoration, from state representatives, from business leaders, and from a Washington State Fish and Wildlife Conservation officer.

## **Health Consultations**

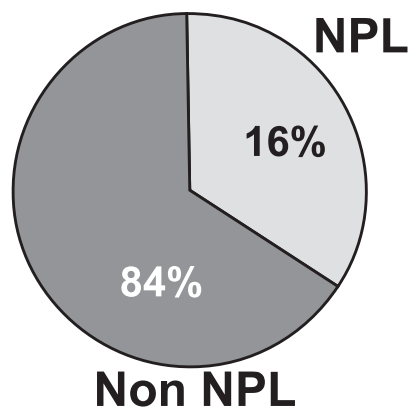
Health consultations provide advice and recommendations on specific, health-related questions concerning actual or potential human exposure to hazardous substances or to other related human health hazards. A health consultation is often needed quickly to evaluate situations and recommend immediate actions to mitigate or prevent harm to human health from exposure to hazardous substances in the environment.

Consultations vary in complexity; either an individual health professional or a team may respond to a question about a site or issue. In some cases, ATSDR prepares more than one health consultation in response to a request for help with an exposure or a potential exposure. Health consultation reports, which may be either written or oral, are timely; for example, an oral report might be provided on the day a request reaches ATSDR.

In fiscal year 2002, ATSDR staff members and state health assessors issued 272 health consultations for 241 hazardous waste sites in 41 states. In contrast to public health assessments, the majority (84%) were non-NPL sites and the minority (16%) were NPL sites (see Figure 3). Eighty-four of the health consultations responded to public health concerns about manufacturing or industrial sites.



**Figure 3: NPL Status of Fiscal Year 2002 Health Consultations**



Following are examples of sites for which ATSDR or its cooperative agreement partners provided health consultations in fiscal year 2002.

### *Brush Wellman, Elmore, Ohio*

ATSDR was asked by U.S. Senator Mike DeWine of Ohio to investigate whether beryllium air emissions and possible worker-take-home contamination from the Brush Wellman's Elmore Plant present a health hazard to the community of Elmore, Ohio. Approximately 4,000 persons live within 5 miles of the Brush Wellman Plant, and more than 500 persons work at the plant. The plant smelts and refines beryllium ore and extrudes and machines the refined beryllium.

In August 2002, ATSDR issued a health consultation that evaluated air emissions and worker-take-home pathways. ATSDR concluded that long-term air emissions from the Brush Wellman Plant do not present a health hazard to the community. However, ATSDR did not have sufficient environmental data to determine whether community exposures to beryllium may be occurring from a possible worker-take-home pathway. ATSDR is proposing an exposure investigation to evaluate the worker-take-

home pathway. Exposure from past deposition from air emissions will also be investigated. Other activities planned by ATSDR include assessing local health care providers' knowledge of chronic beryllium disease.

In addition to evaluating the exposure pathways, ATSDR's involvement at the site has facilitated communication and cooperation between major stakeholders. ATSDR has engaged stakeholders that include the community, the Ohio Environmental Protection Agency, Ohio Citizen Action, and Brush Wellman throughout ATSDR's involvement with the site. ATSDR has conducted several public meetings and availability sessions with the community and other stakeholders to develop an understanding of the community's concerns, describe the public health assessment process, outline health consultation findings, and recommend follow-up actions. ATSDR will issue an exposure investigation protocol as a public comment draft for stakeholder review because of the intense interest in community beryllium exposure.

### *Residential Vapor Intrusions, Hartford, Illinois*

The Village of Hartford is located in western Madison County, Illinois, between the Mississippi River levy and an oil refinery. Homes nearest the refinery are within 500 feet of the refinery property line. Oil products have been manufactured in the area during most of the last century, and Hartford residents have been exposed to petroleum products through the years from reported air emissions, spills, and oil line breaks. Also, volatile organic chemicals (VOCs) have been found in soil, and a non-aqueous layer of petroleum products (estimated to be millions of gallons) currently floats on groundwater under Hartford. The groundwater is about 10 feet below the surface.

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Soil gas and vapors have affected homes mainly in the northern area of Hartford. Previous complaints dating from the mid-1960s suggest that combustible air and gas mixtures and petroleum odors were present in Hartford homes. In the 1970s, an explosion and several fires in Hartford homes were linked to combustible soil gas. By 1992, a vapor recovery system was operational in Hartford, and it continues to operate today. The system extends to about two blocks north of the homes affected by vapor intrusions in May 2002.

On May 13, 2002, after several weeks of heavy rain, residents of Hartford contacted Illinois Department of Public Health (IDPH) staff to report strong fuel odors in their homes. The survey instruments used by Illinois EPA emergency response staff in the basements of the affected homes measured from 10,000 to 11 million parts per billion (ppb) of total VOCs. During the week of May 13, Illinois EPA and IDPH recommended that homes with odors be ventilated and that residents find alternative housing until further investigations determined that levels of VOCs were no longer an acute health hazard. IDPH staff placed stainless steel evacuated canisters in the basements of four homes and collected 24-hour air samples. In addition to high total VOC levels, the results of these samples showed benzene levels as high as 330 ppb.

Residents returned to their homes in June, but IDPH continued to sample affected homes periodically to determine background levels for the basement air. Environmental sampling has shown a return to background levels of VOCs indoors during the summer months. Staff members from the IDPH, the Illinois Environmental Protection Agency, and the Madison County Health Department, with the support of the Village of Hartford, hand-delivered a questionnaire to about 550 addresses in Hartford. The survey results, compiled from 112 completed

questionnaires, showed many more health concerns and symptoms reported by residents in the northeast portion of Hartford. In addition, the IDPH Division of Epidemiologic Studies released a cancer incidence report for Hartford in September 2002. The cancer incidence report did not suggest an increase in cancers related to exposure to VOCs and gasoline in particular.

### *Warren Recycling, Inc., Warren, Ohio*

In August 2002, ATSDR began an investigation of hydrogen sulfide exposure in Warren Township, Ohio. Community members were concerned that levels of hydrogen sulfide in ambient air were adversely affecting their health and the health of their children. Several hundred residents and thousands of school children live and are educated in an area surrounding Warren Recycling Inc., a construction and demolition debris landfill that residents and officials believe is the source of hydrogen sulfide in air.

After collecting health concerns from nearly 200 residents during ATSDR's first visit, staff determined the site as time-critical. Many parents were concerned about their children going back to school in late August in the affected area. Residents consistently reported health concerns typical of hydrogen sulfide exposure: headache, nausea, vomiting, dizziness, fatigue, eye irritation, and weight loss, among others. ATSDR determined that site conditions posed a public health hazard. Limited air sampling data demonstrated levels of hydrogen sulfide in air sufficiently elevated to affect the health of residents and cause symptoms many had reported. Concentrations of hydrogen sulfide ranged as high as 13 parts per million (ppm) in outdoor air.

ATSDR created a multi-agency committee to form and carry out a public health action plan that addressed the recommendations made by

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ATSDR's health consultation. The committee consists of members from federal, state, and local health and environmental agencies.

ATSDR worked with local emergency responders and the local school board to create a response and evacuation plan during times when hydrogen sulfide odors are highest, recommending that the local school district purchase and install hydrogen sulfide monitors equipped with alarms at three schools closest to the area of concern. The school district followed the recommendation and purchased three portable monitors. An emergency evacuation plan was developed for those times when high levels are detected. ATSDR also organized a training session for school staff and emergency responders on the use of the monitor/alarms and the emergency response plan. ATSDR currently reviews all data collected by the school monitors.

ATSDR also worked with local health departments, fire stations, and police dispatchers to establish a 24-hour odor hotline that residents can call to report odors. The Ohio Department of Health and EPA collected residential well samples and tested for gases escaping from residential wells in 15 area homes. Hydrogen sulfide was detected volatilizing from residential well water at levels as high as 8 ppm.

ATSDR and EPA installed 14 ambient air monitors that collected air samples both indoors and outdoors in the community for 90 days to characterize hydrogen sulfide concentrations in the area and determine the most impacted areas in the community.

Ohio EPA and Warren City are working with the landfill to expedite the installation of groundwater monitoring wells and ambient air monitors on-site.

ATSDR is planning to conduct a health study of asthmatic children in the area. The agency is also currently working with community lead-

ers to offer health education workshops for residents and a physician education program regarding hydrogen sulfide exposure in the community. ATSDR has used newsletters and fact sheets to keep the community aware of the progress of the investigation and next steps.

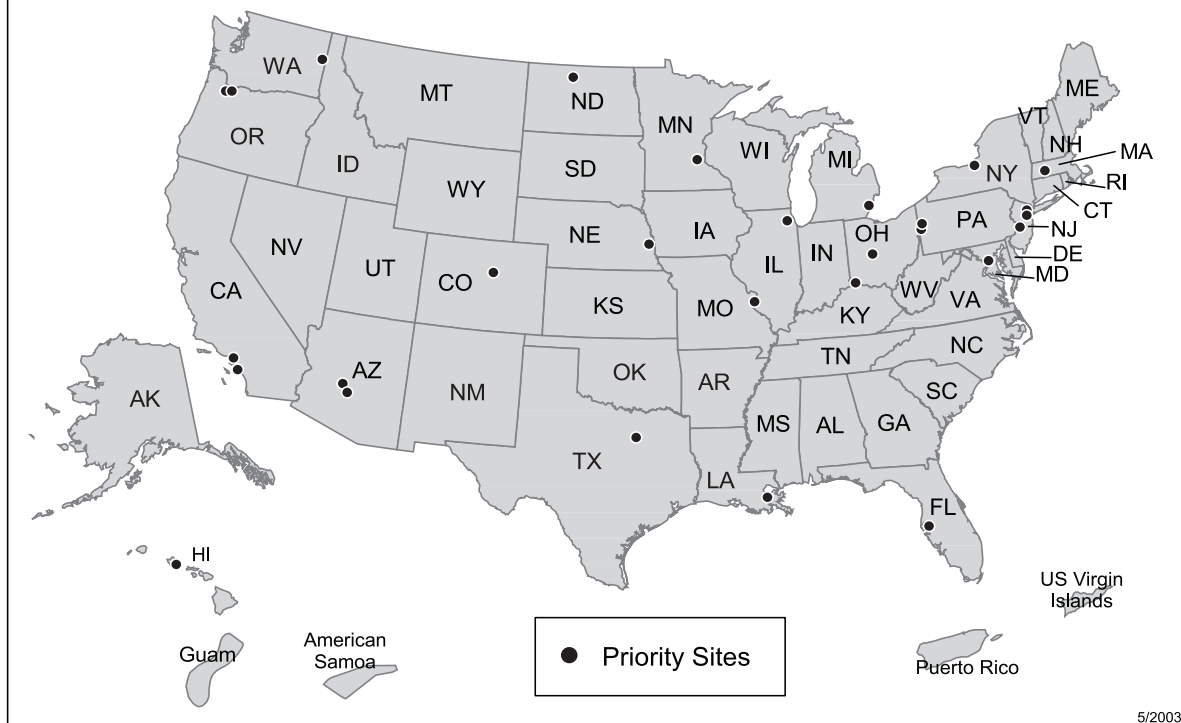
## **ATSDR National Asbestos Exposure Review**

Vermiculite, which is used in lawn and garden products, in various building materials, and in insulation, was mined and processed in Libby, Montana, from the early 1920s until 1990. Although most vermiculite products pose no health problem, the vermiculite ore from the Libby mine was contaminated with asbestos. Studies have shown that people who worked in the mine and processing facilities and people who lived in the Libby community were exposed to asbestos-contaminated vermiculite during the time the facilities were in operation. Prolonged exposure to asbestos can cause very serious health problems, including asbestosis and mesothelioma (a type of cancer).

Records show that the vermiculite ore from Libby was shipped to 244 locations around the United States for processing. Former workers and people around these sites where the vermiculite was shipped may have been exposed to asbestos in various ways, such as handling the vermiculite, playing in the process by-products, or taking home dust on clothes.

ATSDR's National Asbestos Exposure Review is working with other federal, state, and local environmental and public health agencies to evaluate the 244 sites by (1) identifying past and present exposure pathways and (2) determining if there is a significant hazard to public health at any of the sites. On the basis of site-specific investigations, ATSDR will recommend further actions as necessary to protect public health.

## ATSDR Priority Vermiculite Sites



5/2003

The scope of this project requires close coordination with other federal, state, and local environmental and health agencies. On a national level, ATSDR staff members are involved in several interagency work groups comprised of experts from EPA, the Occupational Safety and Health Administration, the National Institute of Occupational Safety and Health, the Mine Safety and Health Administration, and the National Institute of Standards and Technology. These work groups are focused on addressing technical and regulatory issues regarding asbestos.

ATSDR has worked closely with EPA regional staff as well as state health partners to capture available site information for the 244 sites and conduct evaluations centered on potential exposure pathways and public health impacts at these sites. The site evaluations are progressing in two phases.

In the first phase, ATSDR selected priority sites for review according to the following criteria:

- EPA required further action at the site on the basis of contamination in place, or
- The site was an exfoliation facility that processed more than 100,000 tons of vermiculite ore from Libby mine. Exfoliation (heating the ore) is a type of processing that is expected to release more asbestos than other processing methods.

In 2002, ATSDR completed site visits for 27 of the 28 priority sites identified. The site visits included coordination meetings with state public health partners as well as with EPA staff in each of the 10 regions. State partners have committed to take the lead on the investigations

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and on reporting for 13 of the priority sites. ATSDR has the lead on the remaining priority sites.

ATSDR and its state partners will develop site-specific health consultations for each of the priority sites. The health consultations will identify further actions as necessary to protect public health. A summary report will also be created for the priority sites selected for initial review; the report will include recommendations for evaluating the remaining sites (200+) nationwide that received Libby vermiculite.

In general, the site evaluations involve former facilities that ceased operations more than 10 years ago. Consequently, current onsite information is limited. Because the past operations and facility practices are important in evaluating exposure pathways, ATSDR is conducting additional research and historical investigations beyond the site visit.

In the second phase, ATSDR will continue to evaluate Libby vermiculite sites in accordance with its findings and recommendations. ATSDR will identify further actions as necessary to protect public health.

## **Exposure Investigations**

ATSDR conducts exposure investigations to gather and analyze site-specific information to determine whether human populations have been exposed to hazardous substances. Staff members obtain this information through biomedical testing, environmental testing, and exposure-dose reconstruction. Biomedical testing (for example, urine or blood samples) can show current, and sometimes past, exposure to a contaminant. Environmental testing (for contamination of soil, water, or air) is focused on where people live, spend leisure time, or might come into contact with contaminants under investigation. Exposure-dose reconstruction analyses use environmental sampling infor-

mation and computer models to estimate the contaminant levels that people may have been exposed to. The data and information collected during an exposure investigation help determine whether people have been exposed and, if so, the extent of the exposure. The results of exposure investigations are used to make public health decisions and to recommend appropriate public health actions.

The focus of an exposure investigation is to identify and test residents with the highest potential for exposure. An exposure investigation is not intended to be a study or a complete characterization of a site. Rather, it is a transitional activity designed to provide information that will allow ATSDR to carry out its public health activities more efficiently and effectively. Follow-up activities to exposure investigations may include recommendations for additional sampling, an epidemiologic study, medical evaluations, health education, or more rapid public health action to reduce exposure.

ATSDR conducted 26 exposure investigations in fiscal year 2002. An example of one of these follows.

### *Spring Valley Site, Washington, D.C.*

ATSDR conducted a two-phase exposure investigation at the Spring Valley site in Washington, D.C., in fiscal year 2002. The site is a residential area that has contamination from chemical munitions buried many years ago. During World War I, the U.S. Army conducted chemical warfare research in the area where American University and the Spring Valley neighborhood are now located. Chemical weapons were detonated during research and testing operations, and chemical agents and weapons were buried in some areas. The testing areas have since been developed and are now occupied by university property and homes.

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ATSDR conducted the first phase of an exposure investigation in the Spring Valley community in March 2002. A total of 13 homes and 32 individuals were tested for arsenic levels in urine, hair and household dust. Only three of the individuals tested had reportable levels of inorganic arsenic in their urine.

The second phase of the exposure investigation was conducted in the summer of 2002. At that time, a total of 22 homes and 40 individuals were tested for arsenic levels in urine. The purpose of the second test was to determine whether people were exposed to arsenic at levels that may pose a risk, especially during the summer months when outdoor activities increase.

The testing showed that 92% of the participants in this investigation had “normal” urine arsenic values. Three people had mild elevations of inorganic arsenic in their urine, but the levels would not be expected to cause health effects. Participants whose urinary arsenic levels were mildly elevated were given recommendations to have follow-up analyses and to discuss their results with their personal health care providers. Participants or their health care providers could discuss results with an ATSDR physician.

## **Responding to Emergency Events**

ATSDR emergency response staff members provide health-related technical support to federal, state, and local responders during emergencies involving the uncontrolled release of hazardous substances. As resources permit, ATSDR emergency response staff members also do time-critical consultations. ATSDR emergency response coordinators have immediate access to various experts, including chemists, toxicologists, environmental scientists, and medical

*ATSDR assisted first responders in addressing the public health needs of more than 8,100 people who were potentially affected by accidental spills or releases during fiscal year 2002.*

professionals. Site-specific consultation teams can be convened to provide support 24 hours a day, usually within 30 minutes.

ATSDR emergency response staff members received a total of 513 requests for assistance or consultation from EPA regional offices, other federal agencies, state and local agencies, and private citizens during fiscal year 2002. Of these, 41 were acute events for which ATSDR provided information. During these emergencies, ATSDR assisted first responders in addressing the public health needs of more than 8,100 people who were potentially affected by these accidental spills or releases. In response to these requests, ATSDR provided protocols for treatment of people who were exposed to hazardous substances, evaluated the health implications of spills, and provided action levels to protect workers and the public. About one-fifth of the requests for assistance in acute events were made by a federal on-scene coordinator—an official from either the Coast Guard or the EPA, depending on the location of the release.

A major national emergency event that ATSDR responded to in fiscal year 2002 was the anthrax attacks on federal postal facilities, government offices, and news media offices. Following are

**Protective suit worn by public health personnel entering the AMI building**



details about several of ATSDR's emergency response activities, including assistance the agency provided during fiscal year 2002 in response to the anthrax attacks.

### *Response to the Anthrax Attacks*

ATSDR provided environmental health support to the CDC's anthrax investigation teams as they responded to intentional releases across the country. This support began with development of an environmental sampling plan for the AMI facility in Boca Raton, Florida. With the discovery of anthrax in the NBC News headquarters in New York City, ATSDR provided members for the first team that went into the building and assisted in identifying sample locations for the Federal Bureau of Investigation (FBI).

As the connection with the U.S. Postal Service facilities became more definite, ATSDR provided members to the CDC environmental sampling teams in Kansas City, Missouri, and Wallingford, Connecticut. ATSDR emergency response specialists also helped staff CDC's

Emergency Response Center. Twenty-five percent of the agency's personnel resources were involved in the anthrax response in some manner during the fall of 2001.

ATSDR staff members were deployed to be members of the "Tiger Team," which provided emergency on-scene technical expertise, public health assessment, and consultative support to EPA, the Senate sergeant-at-arms, and the attending physician at Capitol Hill. These staff members reviewed sampling data from the Hart Building, made recommendations for additional air sampling in the offices of Senator Tom Daschle and the heating and air ventilation system, and helped draft a team report and other documents. Two ATSDR staff members were on hand in the first few days of the reopening of the Hart Building to answer Capitol Hill staff members' questions and health concerns.

A team of ATSDR industrial hygienists and sanitarians and staff from the National Institute for Occupational Safety and Health repeatedly sampled the regional mail sorting facility in Connecticut. The team was successful in detecting anthrax contamination at the mail facility, where two previous rounds of sampling had failed to find any anthrax spores. The environmental sampling was conducted to identify potential sources of anthrax that led to the death of a 94-year-old Connecticut woman. ATSDR also assisted in the sampling of the woman's home and other locations.

Later in fiscal year 2002, ATSDR provided a team of trained entry personnel to assist the FBI in characterizing a building in Florida that had been closed since it was contaminated with anthrax. Staff members from ATSDR collaborated with the FBI, NIOSH, and NCEH to help collect nearly 5,000 evidence samples at the Boca Raton building in September 2002. Scientists and FBI investigators worked together on building entry and medical monitoring teams throughout the field investigation. On

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the basis of laboratory testing, some items were removed from the building for additional testing. The field investigation team successfully applied new combinations of scientific techniques to locate, quantify, and collect concentrations of anthrax spores within the building.

### *Response to Border Cyanide Incident, Mexico*

A cargo van containing a cyanide salt was stolen near Mexico City, and concerns arose on both sides of the border regarding the potential use of this material in a terrorist attack in the United States or Mexico. ATSDR provided Region VI EPA with an analysis of the potential threat to water supplies. Later, CDC requested that ATSDR join a team from NCEH and NIOSH departing for Mexico to assist national health officials there to prepare for a chemical incident, including the intentional release of cyanide. Using the missing van as a scenario, the CDC team worked with their counterparts from Mexico to develop an action plan for responding to the intentional use of the cyanide and a framework for a national response system for chemical incidents. ATSDR provided information on chemical treatment of the cyanide in the field when the missing cargo was located and assisted NIOSH in providing air monitoring and sampling. ATSDR also provided other resources to the Mexican authorities.

### *Response to the Magnolia Avenue Site, Sea Girt, New Jersey*

ATSDR provided a time-critical consultation to the New Jersey Department of Health and Senior Services and the Borough of Sea Girt regarding the volatile organic concentrations in indoor air at an elementary school. The school was located in the path of a groundwater plume of chlorinated organic solvents from a dry cleaning facility that had burned to the ground 20 years ago. The current owner of the property

had recently discovered that an underground storage tank was releasing high concentrations into the aquifer. The contaminant was vaporizing and, in turn, was apparently infiltrating into the school building. ATSDR was asked whether the school was safe to open after the winter holiday break.

ATSDR determined that the air in the school posed no human health concern to the staff or students as long as the ventilation system was operating. When the school ventilation system was turned on, the concentration in the inhabited portions of the school was below detectable levels. Later, New Jersey health officials and EPA Region II staff members requested on-site support at a public meeting involving the school data already reviewed and indoor air data collected by the state at various homes and businesses between the suspected source and the school. ATSDR reviewed the data and assessed the health implications of site-related contaminants and other volatile organic compounds identified in the homes. ATSDR provided information on background levels and common uses for the identified contaminants and met with individual homeowners.

### *Mercury Spill, San Bernardino, California*

An EPA on-scene coordinator called ATSDR regarding a 50-pound mercury spill in a residential neighborhood of San Bernardino, California. Three homes were known to be contaminated, and as many as 12 homes were potentially involved. The on-scene coordinator requested indoor air action levels and a summary of potential environmental health issues he was likely to encounter in the course of the removal action.

ATSDR provided recommended action levels protective of public health, discussed the merits and limitations of various real-time instruments



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available on the market, mentioned significant concerns about tracking of liquid mercury from spill areas into indoor environments, and offered various documents to facilitate the removal action. After transmitting the ToxFAQ on elemental mercury and the Suggested Action Level Guide developed for use at various sites in Region V via fax and electronic mail, ATSDR advised the on-scene coordinator about clean-up challenges posed by porous materials and electronic devices. ATSDR also recommended that the on-scene coordinator consult with EPA Region V about the relatively recent experience with several thousands of homes potentially contaminated with mercury.

### *Georgia Pacific Hydrogen Sulfide, Pennington, Alabama*

In the first formal collaboration under a Memorandum of Understanding with the Chemical Safety Investigation Board (CSB), ATSDR assisted the CSB with the public health and medical aspects of an investigation into a release of toxic gas that resulted in the deaths of two construction contractors and the injury of perhaps a dozen more workers. ATSDR staff members met with the health care providers involved in responding to the incident and discussed the events surrounding the release with the surviving workers. The incident occurred at a Georgia-Pacific pulp and paper mill in Pennington, Alabama.

# Chapter Two



## **ATSDR's Primary Partners in Conducting Toxicologic Research**

### *Voluntary Research Program*

**Electric Power Research Institute, Inc.**

**General Electric Company (GE)**

**Halogenated Solvents Industry Alliance, Inc. (HSIA)**

**American Chemistry Council (ACC)**

### *Minority Health Professions*

#### *Foundation Research*

**Charles R. Drew University of Medicine and Science**

**Florida A&M University**

**Meharry Medical College**

**Morehouse School of Medicine**

**Texas Southern University**

**Tuskegee University**

**Xavier University**

### *Great Lakes Research*

**Michigan State University**

**New York State Department of Health**

**Research Foundation of State University of New York at Buffalo**

**State University of New York at Albany**

**State University of New York at Oswego**

**University of Illinois at Chicago**

**University of Illinois at Urbana-Champaign**

**University of Wisconsin-Milwaukee**

**Wisconsin Department of Health and Family Services**

### *Chemical Mixtures Program*

**Colorado State University**

**University of Georgia**

**University of Louisiana**

**University of Minnesota**

### *Other Applied Research*

**University of Rochester**



*Ascertaining Relationships Between  
Exposure to Toxic Substances and Disease:*

# Toxicologic Research

A second major goal of ATSDR is to ascertain the relationship between exposure to toxic substances in the environment and disease. To help achieve that goal, ATSDR has a toxicological research program that is filling many of the data gaps about how hazardous substances affect human health. ATSDR also helps provide information about the relationship between hazardous substances and health outcomes by developing toxicological profiles that summarize information about many of the most hazardous substances found at Superfund sites.

## Identification and Ranking of Hazardous Substances

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Priority List of Hazardous Substances contains the names of 275 substances found at NPL sites and believed to pose the most significant potential threat to human health. This list helps form ATSDR priorities on many issues. The Superfund Amendments and Reauthorization Act of 1986 (SARA) requires ATSDR, in cooperation with EPA, to compile this priority list, which is drawn from all hazardous substances known to exist at NPL sites. The ranking of substances on the priority list is based on three criteria: (1) frequency of occurrence at NPL sites, (2) toxicity, and (3) potential

for human exposure. Each substance on the priority list is a candidate to become the subject of a toxicological profile prepared by ATSDR and, subsequently, a candidate for the identification of priority data needs.

**Table 1. Top 10 Substances on the 2001 Priority List**

Rank	Name
1	Arsenic
2	Lead
3	Mercury
4	Vinyl chloride
5	Polychlorinated biphenyls
6	Benzene
7	Cadmium
8	Benzo(a)pyrene
9	Polyaromatic hydrocarbons
10	Benzo(b)fluoranthene

To ensure that the priority list is current, ATSDR periodically re-examines its information database (HazDat) of all hazardous substances known to exist at NPL sites. In October 2001, the 2001 CERCLA Priority List of Hazardous Substances was published. Its availability was announced in the Federal

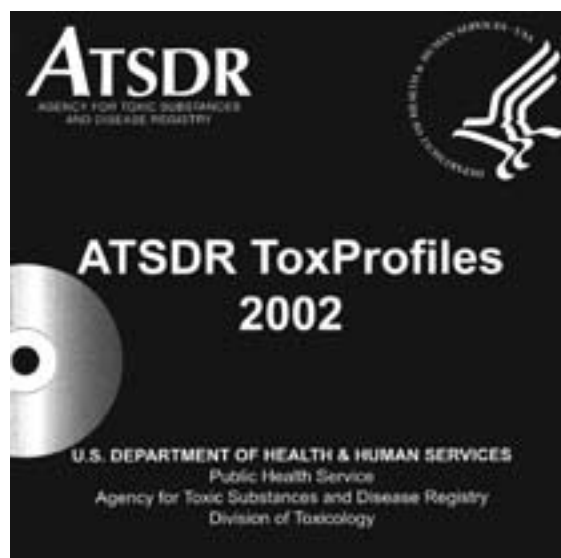
Register on October 25, 2001 (66 FR 54014). The top substance on the 2001 Priority List of Hazardous Substances was arsenic, followed by lead and mercury (see Table 1).

Along with the publication of the revised priority list in October 2001, ATSDR also published an updated Completed Exposure Pathway Site Count Report. A completed exposure pathway (CEP) is an exposure pathway that links a contaminant source to a receptor population. The CEP ranking is based on a site frequency count; it thus lists the number of sites at which a substance has been found in a completed exposure pathway. The substance found in a completed exposure pathway at the most sites was lead, followed by trichloroethylene and arsenic (see Table 2).

**Table 2. Hazardous Substances Found Most Frequently at Sites with a Completed Exposure Pathway (CEP)**

Substance	Number of sites with substance in a CEP	
	All Sites	NPL Sites
Lead	359	238
Trichloroethylene	319	271
Arsenic	267	176
Tetrachloroethylene	236	190
Cadmium	176	123
Benzene	174	128
Chromium	169	113
VOCs	162	118
PCBs	152	104
Mercury	136	82

The priority list is revised and published every two years, with a yearly informal review and revision. Thus, in October 2002, a draft priority list was developed. In October 2003, a revised priority list will be developed and published.



## Preparation of Toxicological Profiles

CERCLA, as amended, requires ATSDR to prepare toxicological profiles for each hazardous substance on the CERCLA Priority List of Hazardous Substances. These profiles summarize the current scientific literature and interpret available toxicologic and epidemiologic information to determine levels of significant human exposure regarding the substances.

ATSDR also provides toxicological profiles at the request of the Department of Energy (DOE). Twenty-four toxicological profiles were under development as final versions or drafts for public comment during fiscal year 2002. These profiles covered CERCLA substances and non-CERCLA substances identified by DOE (See Appendix B for a list of toxicological profiles completed in fiscal year 2002). The public comment period has ended for the five toxicological

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profiles developed for DOE. The profiles are currently being revised on the basis of relevant public comments received as well as newly identified studies.

*ATSDR released nine interaction profiles, which cover various chemical mixtures, during fiscal year 2002.*

Among the toxicological profiles developed in fiscal year 2002, the profiles for pyrethrins/pyrethroids and malathion were released as drafts for public comment. Both of these profiles cover substances that are relevant to mosquito abatement efforts to control the outbreak of the West Nile virus. These documents reflect the most current and relevant data available regarding the health hazards associated with exposure to these substances. The profiles will support public health personnel in addressing health concerns associated with spraying activities to control mosquitoes.

In fiscal year 2002, ATSDR released its ToxProfiles 2002™ which contained 159 toxicological profiles on CD-ROM. Toxicological profiles are also available on the ATSDR Internet website.

Fact sheets (called ToxFAQs™), containing material drawn from ATSDR public health statements, were revised as appropriate based on the release of new or updated toxicological profiles during fiscal year 2002. ATSDR now has 159 fact sheets posted on the Internet in HTML and PDF formats. During fiscal year 2002, 87 ToxFAQs™ were translated

into Spanish. Twenty-five of the translated ToxFAQs™ are available on the agency's Spanish website.

## **ATSDR's Substance-Specific Applied Research Program**

ATSDR is working to determine the relationships between exposure to toxic substances and adverse human health outcomes through its Substance-Specific Applied Research Program (SSARP). CERCLA requires that for each hazardous substance listed, ATSDR, in consultation with EPA and other public health agencies and programs, assess whether adequate information is available on the health effects of the substance. Furthermore, the law requires that ATSDR, in cooperation with the National Toxicology Program, initiate a research effort designed to determine the health effects of those substances for which adequate information is not available (or under development).

A major focus of the SSARP is to fill the toxicologic research needs the agency has identified. ATSDR used several mechanisms to fill these priority data needs in fiscal year 2002. These included industry testing through EPA rule-making, private-sector voluntarism, and university-based research conducted through an agreement with the Minority Health Professions Foundation. Additional research needs are being addressed in collaboration with the National Toxicology Program and through other agency programs, including ATSDR's Great Lakes Human Health Effects Research Program.

Significant progress has been made in filling the priority data needs. ATSDR has identified 190 priority data needs for the first 50 substances of the SSARP. To date, 143 priority data needs are being addressed via the mechanisms that ATSDR has implemented, and 62 of these have been filled. Data obtained from the research program are used to update ATSDR toxicologi-

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cal profiles and to develop health-guidance values for hazardous substances evaluated in ATSDR's public health assessments conducted at waste sites.

ATSDR has continued to expand its SSARP by identifying priority data needs for an additional 10 priority hazardous substances, bringing the current total number of substances with a research agenda to 60. The priority data needs for the 10 additional substances were published in the Federal Register, and public comments were solicited. During fiscal year 2002, ATSDR finalized these priority data needs on the basis of public comments, and a Federal Register notice was prepared to announce the final list of priority data needs, with an anticipated publication date in 2003.

## Industry Testing through EPA

The Toxic Substances Control Act of 1976 (TSCA) authorizes EPA to ensure that chemicals are safe for their intended use. EPA places some of this responsibility on chemical manufacturers and processors by requiring them to conduct toxicological testing. Costs of conducting this research are borne completely by the industries.

### Substances with Some Research Needs to Be Addressed by Industry Testing

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Benzene  
Chloroethane  
Hydrogen cyanide  
Methylene chloride  
Sodium cyanide  
Tetrachloroethylene  
Toluene  
Trichloroethylene

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ATSDR and EPA have finalized information to support development of a TSCA test rule for eight substances that are currently part of ATSDR's Substance-Specific Applied Research Program. The agency has identified exposure and toxicity priority data needs for these 8 substances, and findings for 64 chemical specific toxicity tests have been written. A test rule is a legally enforceable document that describes (1) EPA's authority to require testing, (2) the specific testing required, (3) why it is required, and (4) who should conduct the testing.

Publication of the proposed test rule is expected in 2003.

## Private Sector Voluntarism

ATSDR encourages chemical manufacturers and processors to conduct needed research voluntarily into the toxicity of priority chemicals. Studies conducted under ATSDR's voluntary research program are sponsored by private-sector industry groups at no expense to ATSDR. The agency accepts the voluntary research studies and their conclusions according to the recommendations of external peer reviewers who evaluate the study protocol and final report as well as the industry group's satisfactory response to reviewers' comments. In total, the activities associated with the voluntary research program are responsible for monetary savings to the agency of more than \$10 million.

### Substances with Some Research Needs Addressed by Private-Sector Voluntarism

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Methylene chloride  
Polychlorinated biphenyls  
Tetrachloroethylene  
Trichloroethylene  
Vinyl chloride

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To date, ATSDR has established agreements (memorandum of understanding [MOU]) with the American Chemistry Council (ACC), formerly called the Chemical Manufacturers Association, General Electric Company (GE), and the Halogenated Solvents Industry Alliance (HSIA), Inc. to conduct substance-specific research. Through the voluntary research efforts of these organizations, at least 16 research needs for 5 substances are being addressed. These research needs include the remaining priority data needs for tetrachloroethylene and trichloroethylene which HSIA proposed to fill in a letter of agreement signed with ATSDR during fiscal year 2002.

In addition to the substance-specific MOUs with these three organizations, ATSDR has signed an MOU with the Electric Power Research Institute, Inc. (EPRI). EPRI volunteered to support a study, "Verification of Techniques for Assessing the Effects of Neurotoxicants on Neurodevelopment in Children," that is being administered by a grant from ATSDR to the University of Rochester. The objective of the study is to validate a battery of neurodevelopmental tests for use in assessing the effects of prenatal or postnatal exposure to developmental neurotoxicants. Once validation is complete, these tests will be useful for assessing the potential developmental neurotoxicity of ATSDR priority substances such as PCBs, methylmercury, and lead. In addition to the private sector support, ATSDR is coordinating a federal effort (via interagency agreements with EPA, the Food and Drug Administration, and the National Institute of Environmental Health Sciences) to support the study. The study continued during fiscal year 2002, and it is expected to be completed in fiscal year 2003.

### *Trichloroethylene*

During fiscal year 2002, HSIA submitted a study protocol in which physiologically based pharmacokinetic (PBPK) modeling will be used to estimate oral intakes of trichloroethylene-contaminated environmental media that would not produce human developmental toxicity. The modeling study will be based on data obtained from a previous HSIA study in rats that assessed the developmental toxicity of trichloroethylene.

### *Methylene Chloride*

During fiscal year 2002, ATSDR reviewed and accepted the conclusions of an HSIA study assessing the potential immunotoxicity of methylene chloride following oral exposure. The recent study, conducted by PBPK modeling, used data from a 2000 HSIA study (also sponsored by HSIA and accepted by ATSDR) that assessed the potential toxic effects on the immune system of rats exposed to methylene chloride for 28 days via inhalation. The results of the recent PBPK modeling study predicted that no adverse health effects would be expected to occur to the human immune system from drinking water containing about 8,000 parts per million (ppm) of methylene chloride during a short time period. The need for research data for oral exposure is a priority because ATSDR has identified ingestion of contaminated media (e.g., water, soil) as the most common exposure route for methylene chloride at hazardous waste sites. Methylene chloride is found in at least 884 hazardous waste sites on the EPA NPL sites. The chemical is currently ranked No. 78 on ATSDR's Priority List of Hazardous Substances found at NPL sites.

### *Tetrachloroethylene*

During fiscal year 2002, ATSDR accepted HSIA's study protocol for assessing the potential developmental toxicity of tetrachloroethylene. HSIA recently initiated the study, which is

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expected to be completed in fiscal year 2003. Tetrachloroethylene is found in at least 902 hazardous waste sites on the NPL. The chemical is currently ranked No. 32 on ATSDR's Priority List of Hazardous Substances found at NPL sites.

## Research Program of the Minority Health Professions Foundation

The Minority Health Professions Foundation's Environmental Health and Toxicology Research Program is a partnership that involves minority health-professions schools located throughout the nation. A major component of the Substance-Specific Applied Research Program, this research program provides ATSDR with a major mechanism for filling gaps in knowledge about the effects of hazardous substances on human health.

Examples of significant new findings from the program in fiscal year 2002 include the following:

- The number of surviving rat pups and the levels of hormones necessary to maintain pregnancy were decreased when dams inhaled benzo(a)pyrene (BaP) during gestation. Previous findings indicated that the development of mature sperm was also altered following BaP exposures. Further studies will determine how reproductive function and fertility may be affected by BaP across generations.
- A study of the prevalence in elevated blood lead levels (levels greater than 10 micrograms per deciliter of blood) has been completed. Children from lower income levels who live in urban environments (generally with a larger volume of older homes) are reported to be at higher risk for lead poisoning. The geometric mean blood lead level found among urban Atlanta children attend-

ing inner-city daycares was 2.4 micrograms per deciliter of blood, which is consistent with national geometric means reported by CDC (2.0 micrograms per deciliter of blood in 2000). It was determined that the best predictor of higher blood lead levels in this group of children was the total number of elevated lead sources in the household rather than a correlation with levels from any single source.

- A study that examined the effects of bone lead levels on blood pressure during pregnancy found that the concentration of lead in trabecular bone is directly associated with increased blood pressure and an increased risk for hypertension during the third trimester. The amount of lead in trabecular bone represents the cumulative lead exposure over an extended period. Hypertension alone during pregnancy can result in adverse outcomes for both mother and fetus, and the factors contributing to this condition are not fully known. An increased risk for hypertension associated with past lead exposures would result in a greater overall risk for adverse outcomes in pregnancy.
- An association between residential soil lead content and children's blood lead in New Orleans previously reported in ATSDR sponsored research has been corroborated by findings from a study of blood lead levels and soil lead content in Syracuse, New York.

New research findings from this program provide critical information necessary to address national environmental health concerns (i.e., fill priority data needs) and are subsequently incorporated into updated toxicological profiles. In addition to being the agency's primary mechanism to address data gaps for hazardous substances, the Environmental Health and Toxicology Research Program supports depart-



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mental efforts to eliminate racial and/or ethnic disparities in health and thus help achieve departmental goals in environmental justice.

## Mixtures Assessment and Research Program

People who are exposed to contaminants from waste sites are often exposed to mixtures of hazardous substances because such sites frequently contain multiple chemicals. The principal aim of ATSDR's Mixtures Assessment and Research Program is to develop methods for assessing the joint toxicity of exposure to multiple chemicals that are commonly found at hazardous waste sites. The program seeks to identify pertinent mixtures, to assess joint toxicity, and to conduct experimental testing to fill research needs.

In order to assist environmental health scientists and toxicologists in determining whether exposure to chemical mixtures at hazardous waste sites may impact public health, ATSDR developed a Guidance Manual for the Assessment of Joint Toxic Action of Chemical Mixtures. The guidance manual was released for public comments in 2002. On the basis of the document, ATSDR has developed a pilot training program for health assessors who deal with chemical mixtures.

As part of the mixtures program, a series of documents—interaction profiles—have been developed for certain priority mixtures that are of special concern to ATSDR. Interaction profiles are prepared for simple mixtures of four to six chemicals. ATSDR's interaction profiles for chemical mixtures are intended to provide current toxicologic information on mixtures of hazardous chemicals and the public health implications resulting from exposures to these mixtures around hazardous waste sites.

Interaction profiles are based on the Guidance for the Preparation of an Interaction Profile. This document—also released for public com-

ments in fiscal year 2002—is intended to ensure consistency among all profiles in structure and in basic scientific concepts that are considered “state-of-the-art” in chemical mixtures research. The profiles feature brief summary data on toxicity, toxicokinetics, and toxicodynamics of the single components of the mixture; data on the whole mixture (if available); and evaluation of the evidence for interactions among the mixture components. The profiles also provide conclusions, where possible, on the relevance of these data to public health.

Interaction profiles released for public comments in fiscal year 2002 are as follows:

- interaction profiles for persistent chemicals found in fish—chlorinated dibenzo-p-dioxins (CDDs), hexachlorobenzene, dichlorodiphenyl dichloroethane (p,p'-DDE), methyl mercury, and polychlorinated biphenyls (PCBs).
- interaction profiles for persistent chemicals found in breast milk—chlorinated dibenzo-p-dioxins (CDDs), hexachlorobenzene, dichlorodiphenyl dichloroethane (p,p'-DDE), methyl mercury, and polychlorinated biphenyls (PCBs).
- interaction profile for 1,1,1-trichloroethane, 1,1-dichloroethane, trichloroethylene, and tetrachloroethylene.
- interaction profile for benzene, ethylbenzene, toluene, and xylenes (BTEX).
- interaction profile for arsenic, cadmium, chromium, and lead.
- interaction profile for copper, lead, manganese, and zinc.
- interaction profile for cesium, cobalt, polychlorinated biphenyls, strontium, and trichloroethylene.
- interaction profile for arsenic, hydrazines, jet fuels, strontium, trichloroethylene.
- interaction profile for cyanide, fluoride, nitrate, and uranium.

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The guidance manual and all profiles are available on CD-ROM and on ATSDR's Web site at [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov). The first six profiles pertain to chemical mixtures found at NPL hazardous waste sites. The last three profiles deal with mixtures that are found at Department of Defense (DOD) and Department of Energy (DOE) sites. The guidance manual and the DOD/DOE profiles are also available as printed copies.

Also during fiscal year 2002, ATSDR continued its support of experimental research to enhance the understanding of the underlying mechanisms of toxicity following exposure to chemical mixtures. Scientists from ATSDR and the Toxicology and Nutrition Office of the Netherlands selected a chemical mixture and predicted its joint toxicity according to assessment methods used to evaluate environmental chemical mixtures. Following this process, a carefully designed *in vivo* study with the 4-component mixture was conducted. A report is being prepared to summarize and compare the predicted and observed joint toxicity of this mixture.

## Computational Toxicology Program

ATSDR's Substance-Specific Applied Research Program incorporates state-of-the-art computational toxicology methods to aid in interpreting and assessing short, intermediate, and long-term health effects associated with exposure to hazardous substances. These methods include physiologically based pharmacokinetic/pharmacodynamic (PBPK/PD) modeling, structure-activity-relationship (SAR) techniques, and benchmark dose (BMD) models.

PBPK/PD, BMD, and SAR are computer-based mathematical models used to predict the action of chemicals on the body in the absence of adequate experimental data. The alternative to mathematical models is experimental work

that can take months to years to complete and is often costly. Once properly validated, these mathematical models can assist in exposure assessments of toxic chemicals, aiding the investigator in identifying important routes of exposure leading to observed high levels of the chemicals in tissues of the population around sites.

For example, PBPK models were constructed for 25 common PCB congeners for residents of Anniston, Alabama, an area that has had a long-standing fish advisory because of PCBs. The models were used to investigate the contribution of fish consumption to the observed high blood levels potentially associated with these PCBs in the community. Applying assumptions based on scientific knowledge of the toxicity of PCBs and habits of the population, the computer modeling effort showed that approximately 80% of the observed high blood levels in the population can be attributed to fish consumption.

In other situations, SAR methods are used to identify toxic risks for chemicals when experimental data are not available. For example, toxicity for 2-chloro-6-fluorophenol was examined upon a request by New York health officials and a congressman from New York who wanted to provide information to his constituents. The phenol compound was released in a spill from a chemical facility to the surrounding environment, and there was no known toxicity information available on this chemical. ATSDR computational Toxicology Laboratory scientists employed SAR methods to evaluate toxic endpoints, including mutagenicity, carcinogenicity, and developmental and dermal toxicity. On the basis of the analysis, the chemical was predicted to have little potential for toxicity. However, 2-chloro-6-fluorophenol was predicted to cause skin sensitization, on the basis of the available information from chemicals with similar chemical structures. Thus, avoiding skin contact was recommended. The results and

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public health recommendations were provided to the congressman and to the New York State Department of Health.

## Great Lakes Human Health Effects Research Program

The Great Lakes Human Health Effects Research Program is intended to build on, and amplify, the results of past and ongoing fish-consumption research in the Great Lakes basin, using existing structures and institutions already involved in human health research. This ATSDR-supported research program targets known at-risk populations to further define the human health consequences of exposure to persistent toxic substances identified in the Great Lakes basin.

During fiscal year 2002, significant research findings were reported. Some of those findings include the following:

- Serum PCB levels and consumption of Great Lakes fish were significantly associated with lower levels of thyroxine (T4), a hormone secreted by the thyroid, in women and men. In contrast, fish consumption, but not PCB serum levels, was significantly and inversely associated with triiodothyronine (T3), another hormone secreted by the thyroid, in men.
- The fish consumption pattern of whites, African Americans, and Hispanics was studied in the New York state angler cohort study. Among these three groups, the average number of fish meals consumed per year was 11.5, with African Americans consuming the most meals followed by Hispanics then whites at 40, 20, and 11 respectively. African-Americans in the age group 36 to 40 consumed on average 56 meals per year. Awareness of the fish advisories was lowest in African Americans and highest in whites. Lack of awareness of the health advisory

was the strongest predictor of consumption among African Americans.

ATSDR efforts in the Great Lakes were expanded in fiscal year 2002 with the addition of two new projects. In one effort, ATSDR is responding to a Congressional directive to report on the feasibility of establishing a pilot program in Michigan for fish consumption advisories. With the involvement of a cross-agency, multidisciplinary team of scientists, the directive was met by demonstrating how ATSDR and its Great Lakes partners can build upon 10 years of successful research efforts in the basin to establish a new program that specifically addresses this emerging public health priority. A 3-year effort was proposed. The report “Fish Consumption Advisories in Michigan” can be accessed on the ATSDR homepage. ATSDR anticipates funding for this pilot project to be available in fiscal year 2003.

In a second effort, the International Joint Commission (IJC) intends to comment on the hazards posed by the continuing presence of hazardous substances in the 26 U.S. Great Lakes’ Areas of Concern (AOCs). To this end, the Commission asked ATSDR to provide and evaluate information on public health assessments that it has conducted on hazardous waste sites within the 26 AOCs. ATSDR has agreed to:

- provide, analyze, and interpret public health assessment information
- bring in other sources of relevant information
- develop and make available user-friendly applications for accessing the information
- prepare assessments for and across each AOC.



*Fish drying in open air in Alaska*

## **Alaska Traditional Diet Project**

Food and dietary practices of Alaska Natives differ from those of the general U.S. population. There are emerging concerns about the potential contaminant burden among Alaskans who eat subsistence foods. ATSDR's Alaska Traditional Diet Project, an effort begun in October 2000, was developed to assist consumers of Alaskan traditional foods in making informed dietary decisions to prevent adverse health outcomes.

The project was developed in response to concerns about the effects of environmental contamination present in Arctic and sub-Arctic regions. Many Alaskans worry that exposures to contaminants resulting from a subsistence lifestyle, or through commercial and recreational activity, can potentially lead to cancer, worsen existing conditions such as diabetes and asthma, and increase the incidence of other health problems.

To have informed choices about foods, Alaskans have requested more information about the risk from these exposures and the nutritional benefits of traditional foods. In collaboration with Alaska Native organizations and others, the Alaska Traditional Diet Project will conduct dietary surveys in rural communities where there is concern about possible contaminants in locally harvested foods.

During fiscal year 2002, the food frequency survey was conducted in 13 native villages in different Alaskan regions. Analyses of the dietary surveys and the nutritional benefits of the foods results are anticipated to be available in January 2003. Also during fiscal year 2002, ATSDR made available additional funds to support limited sampling and analysis for contaminants in the traditional foods. Data on hazardous waste point sources in these villages and the potential presence of global pollutants are being evaluated to help determine which potential contaminants should be considered

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in the sampling plan. With the completion of these activities, all field and laboratory work identified in the project's goals will have been accomplished. Results of this pilot will be utilized by the participating villages and others to make informed decisions about the risks and benefits of the traditional diets in Alaska and to assess the need for further studies. ATSDR scientific staff members are continuing to provide technical support to all efforts through active participation on the Alaska Native Health Board oversight committee.

## **Community-Based Toxicology Curriculum**

As part of the ATSDR's mission of community outreach, the Division of Toxicology identified the need for a toxicology curriculum designed to meet identified needs of communities and residents who live near hazardous waste sites or who may be exposed to hazardous chemicals. At ATSDR's request, the Institute of Public Health at Florida A&M University collaborated with community leaders to develop a project aimed at educating and increasing communities' awareness and understanding of toxicology and environmental issues. The project materials were completed during fiscal year 2002, and it is anticipated that the materials will be tested in several pilot communities in fiscal year 2003.

Geared toward the lay public and entitled "Community-Based Toxicology," the curriculum is an enhancement of ATSDR's Chemical Specific Fact Sheets that address the most frequently asked questions regarding hazardous chemicals. The overall goal of the program is to educate communities and increase awareness and understanding about the toxicological issues surrounding chemicals to which residents may be exposed.

# Chapter Three

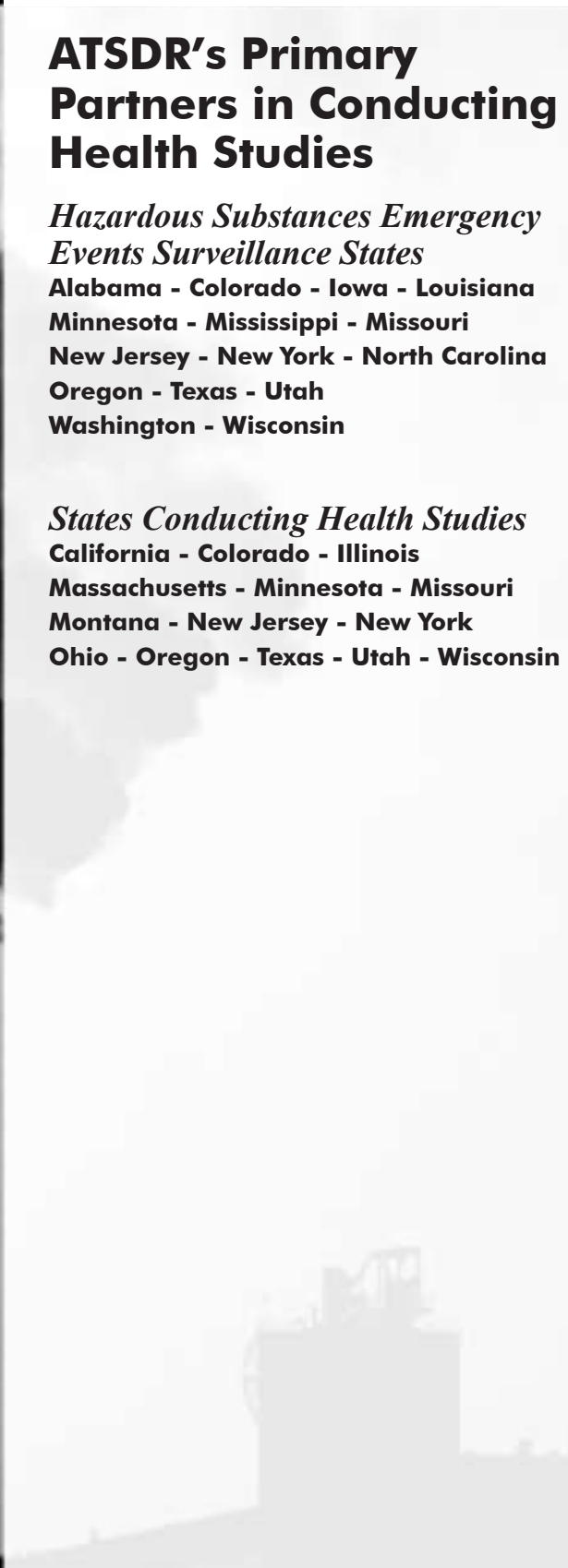
## **ATSDR's Primary Partners in Conducting Health Studies**

### *Hazardous Substances Emergency Events Surveillance States*

**Alabama - Colorado - Iowa - Louisiana  
Minnesota - Mississippi - Missouri  
New Jersey - New York - North Carolina  
Oregon - Texas - Utah  
Washington - Wisconsin**

### *States Conducting Health Studies*

**California - Colorado - Illinois  
Massachusetts - Minnesota - Missouri  
Montana - New Jersey - New York  
Ohio - Oregon - Texas - Utah - Wisconsin**





*Evaluating Relationships Between  
Hazardous Substances and Health:*

# Conducting Health Studies

**A**TSDR conducts and supports health studies to evaluate the relationship between exposure to hazardous substances and adverse health effects. Many of these studies have focused on seven priority health conditions ATSDR identified as those considered to be most sensitive to exposures to hazardous substances. These are birth defects and reproductive disorders, cancer, immune function disorders, kidney dysfunction, liver dysfunction, lung disease, and neurotoxic disorders. ATSDR also conducts studies to evaluate how people become exposed to hazardous substances.

In 2002, ATSDR completed 9 health studies. Another 11 health studies were initiated by ATSDR, and 31 health studies are continuing. ATSDR also continued several surveillance activities in fiscal year 2002, including its surveillance of hazardous spills and releases in a number of states. The following are summaries of some of the health studies that ATSDR performed in fiscal year 2002 and other related activities, such as convening expert panels to consider study designs.

## **Preliminary Findings of Asbestos Medical Testing, Libby, Montana**

A total of 7,307 persons participated in asbestos medical testing sponsored by ATSDR and conducted in 2000 and 2001. Those eligible for testing included former W.R. Grace workers from Libby and persons who lived, worked, or played in Libby for at least 6 months before December 31, 1990.

*A total of 7,307  
persons participated  
in asbestos medical  
testing for Libby  
residents and former  
residents.*

The testing included a face-to-face interview, a three-view chest x-ray, and a spirometry test. The interview was designed to obtain information needed to better analyze the health data collected during the medical testing. Questions asked included number of years lived in the Libby

area, smoking history, and exposure variables (such as having been a W.R. Grace worker, playing in vermiculite piles, playing at the ball field near the expansion plant, etc.). The chest x-ray helped identify changes in the lungs and lung lining that might be the result of asbestos exposure. The spirometry test measured air flow in and out of the lungs to evaluate lung function.

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Only study participants 18 years of age and older were eligible for x-rays. Three B-readers (experts in reading chest x-rays for asbestos-related lung abnormalities) found that 18% of those x-rayed had abnormalities in the lining of their lungs (pleural abnormalities). The risk of pleural abnormalities increased with increasing age and increasing length of residence in the Libby area. The rate of pleural abnormalities found in groups within the United States that have no known asbestos exposures ranges from 0.2% to 2.3%. Interstitial abnormalities (abnormalities of the lung tissue itself) were found in 0.8% of the persons undergoing chest x-rays. An x-ray was considered abnormal if two of three B-readers found an abnormality consistent with asbestos exposure.

Factors most strongly related to having pleural abnormalities were (1) having been a W.R. Grace/Zonolite worker, (2) having household contact with a W.R. Grace/Zonolite worker, and (3) being a male. The odds of finding a pleural abnormality were 1.7 to 4.4 times greater (depending on age) for former W.R. Grace workers as compared to nonworkers. The odds of finding a pleural abnormality were 3.3 times greater for females who had household contact with W.R. Grace workers as compared to women who had no household contacts with these workers. In non-household contacts, the odds of finding a pleural abnormality were five times greater for men than for women. Other factors associated with significantly increased odds of pleural abnormalities included smoking, playing in vermiculite piles, duration of residence in Libby, asbestos exposure in the military, and increased body mass index.

Lung function tests (spirometry) were offered to all study participants. Some of the key findings are as follows:

- Being a current smoker was the strongest risk factor for restrictive abnormalities.
- Moderate to severe restriction in breathing capacity was found in 1.8% of all those tested.
- Moderate to severe restriction in breathing capacity was found in 5.5% of former W.R. Grace workers.
- In those under 18 years of age who were tested, no one had moderately to severely restricted lung function.
- Other factors associated with restrictive abnormalities included being a non-W.R. Grace/Zonolite worker exposed to vermiculite, having had chest surgery, and being overweight.

## **Preliminary Findings of Computed Tomography Study in Libby, Montana**

ATSDR initiated a study in response to the Libby community's interest in the use of computed tomography testing. The overall goal was to determine if computed tomography is useful as a screening tool for detecting asbestos-related lung abnormalities in persons who had indeterminate chest x-rays in Libby, Montana.

The 353 participants of the 2000 Medical Testing Program who were participants in the computed tomography study were in one or more of the following categories:

- 18 years of age and older
- indeterminate chest x-ray—(Only one of the three B-readers reported an abnormality along the lining of the lungs or chest wall (pleural abnormalities) on participant's chest x-ray)
- former vermiculite mine and mill workers—55 participated
- their household contacts—99 participated
- persons with exposure to vermiculite as a result of past direct recreational behaviors—199 participated





*Computed Tomography Scanner*

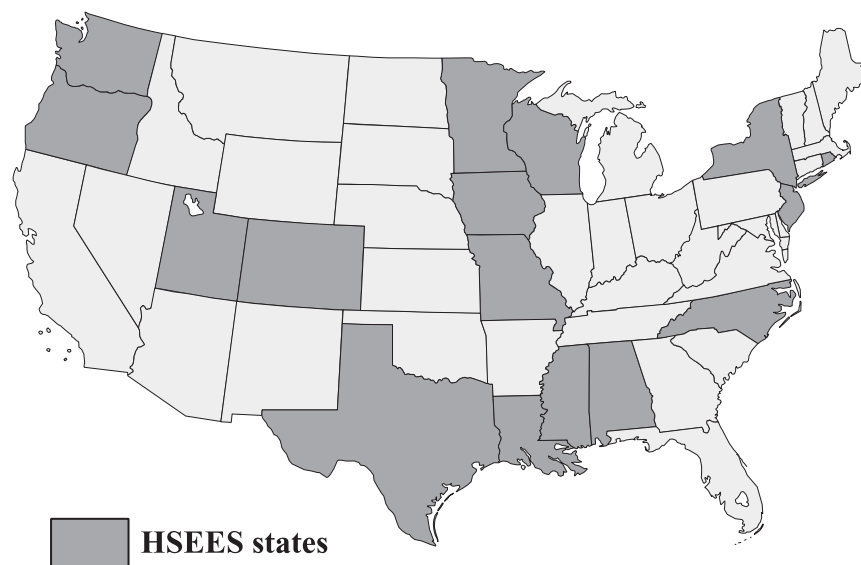
Computed tomography scans detected pleural abnormalities in 98 persons (28% of all tested) whose chest x-rays had been classified as indeterminate. Most of these persons—69 (70%)—were either former vermiculite mine or mill workers or their household contacts. In the group studied, participants who were in one or more of the following categories were more likely to have an abnormality detected by computed tomography scan:

- W.R. Grace/Zonolite worker
- secondary contractor worker
- household member with W.R. Grace worker or secondary contractor
- age 65 or older
- lived in Libby 35 years or more
- a cigarette smoker
- frequently “popped” vermiculite (that is, heated the vermiculite so the crystals would expand)
- had vermiculite insulation in home.

## **Asbestos Health Statistics Review**

In December 2000, ATSDR completed an analysis of health outcome data for citizens of Libby, Montana. Findings from this analysis revealed that the rates of asbestos-related diseases were significantly elevated. EPA later identified that more than 300 sites in 42 states received this contaminated ore. Because of the elevated lung and breathing abnormality rates found in Libby, ATSDR was concerned about the health of other communities around the U.S. that received the ore. In the spring of 2001, DHS designed a health statistics review protocol to help interested state health departments analyze potential asbestos-related health outcome data (e.g., mortality and morbidity) for communities that may have received Libby ore.

ATSDR’s overall goal was to provide a way to evaluate whether these facilities may have caused human exposure and adverse health effects, using available health information from state health departments. The protocol was meant to serve as a screening tool for health departments to determine if excess asbestos-related cancer cases or deaths have occurred around these sites. If so, it may prove to be evidence of past worker and/or community exposures to the ore; determination of the potential for such exposures would then require further public health investigation or intervention. This activity is still in progress; however, to date, almost 1 million death certificates and approximately 325,000 cancer registry records have been analyzed by 15 participating state health departments.



**Figure 1. States participating in HSEES in Fiscal Year 2002**

## The Tremolite Asbestos Registry

ATSDR made a commitment to the Libby community to create a registry of persons exposed to tremolite asbestos (a type of asbestos that is particularly prone to release tiny fibers that people can breathe in) in Libby. This registry, to be called the Tremolite Asbestos Registry, will include the following groups of people:

- former vermiculite workers employed by Zonolite Co. or W.R. Grace Co. in Libby
- household contacts of former vermiculite workers
- participants in ATSDR's medical testing program

In 2002, ATSDR began a tracing project to locate and determine the vital status of former workers and their household contacts. To date, 2,351 workers and 4,796 household contacts have been identified. Of these, 666 living workers and 1765 living household contacts have been located and interviewed to date; 955 workers and 527 household contacts are known to be deceased. It is anticipated that this locat-

ing project will end in March 2003 and that the Tremolite Asbestos Registry will become active by August 2003.

## Hazardous Substances Emergency Events Surveillance (HSEES)

Since 1990, ATSDR has maintained an active, state-based Hazardous Substances Emergency Events Surveillance (HSEES) system. The purpose of HSEES is to describe the public health consequences associated with the release of hazardous substances and to develop strategies to reduce and prevent releases and their associated adverse health effects. In fiscal year 2002, 16 states participated in HSEES.

During fiscal year 2002, ATSDR published a report summarizing the findings of the surveillance for the 2-year period from 1999 through 2000. This report included information on 13,808 hazardous substance events and 4,425 injured persons (74 of whom died).

Participating states used the 1999–2000 data analysis to identify and implement prevention outreach activities that were geared to preventing spills, releases, and resulting injuries.

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*More than 38,000 people received information about accidental spills and releases of hazardous substances through fact sheets, Web sites, and other resources developed by HSEES states.*

Prevention activities have included developing fact sheets, reports, posters, presentations, Web sites, news articles, and journal articles. These activities were focused on counties and industries (for example, chlorine users and the transportation and agricultural industries) with the most frequent spills, and the most frequently spilled chemicals (that is, ammonia, chlorine, mercury, pesticides, and illicit methamphetamine chemicals). Other prevention activities have targeted population groups that are frequently injured, such as employees, first responders, and students. Preliminary feedback suggests that these activities increased knowledge in the target groups. Increased knowledge leading to sustained behavior change may result in decreased releases and fewer injuries.

In addition to the biennial report, ATSDR also published three articles on HSEES data in peer-reviewed journals and gave presentations at seven national conferences in fiscal year 2002. State health departments also developed fact sheets, other publications, and Web sites. More than 38,000 people were reached by these messages. Examples of the areas that states highlighted for prevention activities were mercury in schools, hospital and homes; agricultural ammonia releases in the Midwest; and hazardous substances spills in schools, including

pranks involving tearing agents, mishaps in the laboratory, inappropriate chemical mixing by janitors, and problems with building heating, cooling, and ventilation.

## **National Environmental Disease Tracking**

Increasingly, ATSDR is being asked by state and local health departments to help respond to compelling community concerns about apparent outbreaks of serious, noninfectious disease with unknown cause. But as the Pew Environmental Health Commission has pointed out, America lacks the critical information it needs to reduce or eliminate diseases that might be prevented by better control of environmental exposures. The commission recommended the creation of a federally supported Nationwide Health Tracking Network on high priority chronic diseases and related environmental hazards.

In response, in fiscal year 2002 ATSDR initiated two major activities related to disease tracking:

- Program Announcement 02155: Linking Chronic Disease and Environmental Data Sources
- Disease Specific Expert Panel Workshops.

ATSDR funded three applicants under Program Announcement 02155. They are the University of California, Los Angeles; Michigan Department of Community Health; and the Environmental and Occupational Health Sciences Institute, New Jersey. The University of California at Los Angeles plans to examine the relationship between control of asthma and exposure to air pollutants in Los Angeles and San Diego counties. The study will use data from the 2001 California Health Interview Survey and measurements of four major air pollutants. The Michigan Department of Community Health plans to

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examine whether the prevalence of low birth weight, infants' being small for gestational age, or preterm birth is elevated in areas with high levels of air pollution. The Environmental and Occupational Health Sciences Institute plans to develop a database system using environmental and chronic disease data from New Jersey and Washington. The institute will evaluate hypotheses of potential environmental causes of chronic disease and will recommend and design specific studies.

In addition, the program conducted four expert panel workshops to determine the feasibility of establishing tracking of the high priority diseases. The panels were as follows:

- Alzheimer's disease and Parkinson's disease panel
- multiple sclerosis and amyotrophic lateral sclerosis panel
- autoimmune panel (Hashimoto's thyroiditis, rheumatoid arthritis, scleroderma, and systemic lupus)
- autism panel.

## **Jasper County Superfund Site Childhood 2000 Lead Study, Missouri**

The Missouri Department of Health conducted an ATSDR-funded study to assess whether public health intervention efforts in Jasper County, Missouri, had been effective in reducing blood lead levels of the community's children. ATSDR and its partners in the state and local health departments had worked with the community of Jasper County, Missouri, on ways to reduce exposure to lead, which was processed in the area for many years.

The results of the study indicated that educational and environmental interventions initiated since 1991 to reduce blood lead levels of chil-

dren living in the mining waste and smelter area of Jasper County, Missouri, have been effective. In part because of the health education program, the number of children with high levels of lead in their blood (greater than 10 micrograms per deciliter) dropped by 86% in 10 years.

Blood lead levels declined on average by 2.42 micrograms per deciliter between 1991 and 2000. The proportion of children with blood lead levels greater than or equal to 10 micrograms per deciliter in 1991 was 14%, but in 2000, children living in the same area had comparative blood lead levels of only 2%.

The intervention efforts launched since 1991 included a health education campaign that incorporated lead poisoning awareness in the local school curricula and that developed a lead poisoning prevention merit badge for a local Girl Scouts' chapter. Health educators made presentations at grand rounds in local hospitals and distributed flyers and other materials to raise awareness about childhood lead poisoning and its prevention. In addition, EPA removed lead-contaminated soil from more than 2,300 yards in the area.

## **Evaluation of Neurobehavioral Health Status for Chronic and Repeated Exposure to Hydrogen Sulfide, Dakota City and South Sioux City, Nebraska**

Since the early 1990s, residents of Dakota City and South Sioux City, Nebraska, have been exposed to elevated concentrations of ambient hydrogen sulfide gas. Beginning in 1993, residents reported odor and adverse health symptoms (respiratory and neurologic) that were thought to be related to these exposures. In response to community health concerns about exposure to hydrogen sulfide air pollution in Dakota City and South Sioux City, ATSDR con-



*Dakota City, Nebraska*

ducted a health investigation using neurobehavioral tests to measure possible nervous system toxicity. The purpose of the investigation was to evaluate whether people exposed to hydrogen sulfide had poorer neurobehavioral health when compared with unexposed persons.

Analyses were conducted on 335 participants' records (171 target and 164 comparison participants' records). Results indicated the two groups were generally similar for demographic characteristics, various self-reported medical conditions, and lifestyles. The results of neurobehavioral tests for target and comparison groups were generally similar. For the adjusted analysis, age was an important covariate of test performance, followed by educational level and language of testing.

Relative to the comparison group, the target group demonstrated mixed performance on tests within and across the four neurologic domains tested. The target group performed better on seventeen tests and poorer on seven tests, but the magnitude of these differences was small.

No difference was observed in performance on four tests for both the target and comparison groups. Exposure to hydrogen sulfide was associated with marginally poorer performance for a test of memory (match to sample score) and a test of strength (grip strength). However, these differences were not statistically significant. Deficits in overall neurobehavioral performance were not associated with exposure to hydrogen sulfide in this study.

# Chapter Four

## **ATSDR's Primary Partners in Providing Reliable Information**

### *Cooperative Agreements with National Organizations*

**American Academy of Pediatrics**  
**American Association of Occupational Nurses**  
**American College of Medical Toxicology**  
**American College of Preventive Medicine**  
**Association of Occupational and Environmental Clinics**  
**Association of State and Territorial Health Officials**  
**Migrant Clinicians Network**  
**National Alliance for Hispanic Health**  
**National Association of County and City Health Officials**  
**National Environmental Health Association**

### *Pediatric Environmental Health Specialty Units*

**Association of Occupational and Environmental Clinics**  
**Boston Children's Hospital**  
**Cook County Hospital**  
**Emory University**  
**Environmental Protection Agency**  
**George Washington University Medical Center**  
**Harborview Medical Center**  
**Mt. Sinai—Irving J. Selikoff Center for Occupational and Environmental Medicine**  
**National Jewish Medical and Research Center**  
**University of California—Irvine**  
**University of California—San Francisco**  
**University of Iowa**  
**University of Texas Health Center**

### *Health Education and Promotion in Tribal Communities*

**Indian Health Council, Inc. (IHC)**  
**Eight Northern Indian Pueblos Council Inc. (New Mexico)**  
**Ely Shoshone Tribe**  
**Nuclear Risk Management for Native Communities**  
**St. Regis Mohawk Tribe (New York)**

### *Tribal Colleges*

**College of Menominee Nation (Wisconsin)**  
**Dine' College (New Mexico)**  
**Turtle Mountain Community College (North Dakota)**



# Providing Reliable Information to Communities and Stakeholders

One of ATSDR's goals is to develop and provide reliable, understandable information for people in affected communities and tribes and for other stakeholders. The agency achieves this goal by drawing on its resources in health education, risk communication, environmental medicine, and health promotion to assist communities. ATSDR provides services such as training for local physicians about the health concerns associated with contaminants to which their patients might be exposed. ATSDR also provides communities with information and education about the health effects of hazardous substances, and it offers clinical evaluations and screenings such as testing for lead exposure. ATSDR also conducts health education and promotion activities with a nationwide focus, such as its Case Studies in Environmental Medicine program. It also strives to make its public health information more easily accessible through its Web site and through the agency's information center.

ATSDR's health information activities are conducted with the assistance of numerous partners with whom the agency has cooperative agreements—states, American Indian tribal nations or groups, and national organizations. In fiscal year 2002, 33 health departments in 31 states, the Gila Mountain Indian Community, and Puerto Rico worked with ATSDR to plan, implement, and evaluate community and health professional education related to hazardous

waste sites and unplanned chemical releases. ATSDR, in cooperation with its cooperative agreement partners, performed health education activities at approximately 300 sites this year. ATSDR is in the third year of a new 5-year agreement with 10 national organizations (up from 5 under the previous agreement). ATSDR also continued to work with its network of 11 Pediatric Environmental Health Specialty Units in fiscal year 2002, as discussed below.

## Pediatric Environmental Health Specialty Unit Program

The Pediatric Environmental Health Specialty Unit Program (PEHSU) encourages medical specialists with environmental expertise to work collaboratively with pediatricians to develop pediatric environmental medical expertise. In 1998, three pilot units were established in Seattle, Boston, and New York City. These units focused on conducting activities in the areas of medical education and training, telephone clinical consultation and outreach, and clinical evaluation of children who might have been exposed to hazardous substances in the environment.

From this modest beginning, in fiscal year 2002 the PEHSU program has grown to include

- a national network of 11 operating units (see Figure 1)



**Figure 1. Location of Fiscal Year 2002 Pediatric Environmental Health Specialty Units**

- the addition of EPA as a partner in all of the units
- the establishment of PEHSUs by international agencies in Mexico and Canada using the ATSDR PEHSU model
- the continuing and increasing interest and demand for PEHSU services from the public and from government agencies at all levels
- opportunities to collaborate with additional partners, such as the Centers for Children’s Environmental Health and Disease Prevention Research
- an impact on the field of pediatric environmental health as a potential medical subspecialty
- the development of a body of published articles, curricula, and educational materials.

In fiscal year 2002, more than 1,500 children were evaluated at the PEHSU clinics by pediatricians especially cross-trained in environmental medicine, and about 1,500 phone consultations were provided to pediatricians across the

country. In addition, the PEHSUs provided training to more than 23,000 health care professionals in fiscal year 2002.

PEHSUs provide expertise that can help resolve the environmental health problems that some children and their communities face. For example, the Great Lakes Center for Children’s Environmental Health in Chicago helped the Chicago Housing Authority screen children who may have been exposed to arsenic found in the soil of a local playground. The Housing Authority contacted the PEHSU in July 2002 about arsenic contamination at the playground. Several planning meetings followed, and the Chicago Department of Public Health was brought in as a partner. PEHSU faculty developed the exposure screening tool that was used, an initial screening protocol, and the follow-up protocol.

During the next 8 weeks, patients were seen at a mobile clinic that was located conveniently at the housing development and was attended by Chicago Department of Public Health staff. Initial screening included completion of an exposure assessment and collection of a spot



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urine sample. In total, more than 250 urine specimens were analyzed for arsenic. Anyone found to have elevated arsenic levels in the spot urine sample was advised to follow up in the PEHSU clinic with a 24-hour collection and a hair sample, if feasible.

The Chicago PEHSU saw 14 children who had elevated initial urine levels. Follow up included an in-depth history and a physical as well as the 24-hour urine collections and hair analysis. Only two elevated levels in the 24-hour collections were found, one in a child and one in an adult. PEHSU staff members met with Chicago Housing Authority administrators and with community members during the screening period to provide risk communication. The source of the arsenic was never clearly defined. Once the presence of arsenic was identified, however, the Chicago Housing Authority began remediation efforts immediately.

## **Health Education Activities for Communities**

ATSDR's health education activities are designed to assist communities in understanding, preventing, or mitigating adverse health effects associated with exposure to hazardous substances. These activities include providing information and training to health care providers and providing information to enable people in communities to prevent or reduce their exposure to hazardous substances.

For example, staff from both ATSDR and the Missouri Department of Health and Human Services have conducted a number of health education activities in the community of Herculaneum, Missouri, which is located near the Doe Run lead smelter. The Doe Run lead smelter is the largest lead smelter in the United States, with lead smelting having been conducted at Herculaneum since 1892. An ATSDR exposure investigation found that blood lead

elevations were primarily related to air, soil, and interior dust. Blood lead screening done in fiscal year 2002 found that 22% of the children 72 months and younger have blood lead levels of over 10 micrograms per deciliter, the level of health concern. Older children and adults also show higher than expected levels of lead. In 2002, ATSDR staff members and state health department staff members worked with the Herculaneum community to complete many important public health activities, including comprehensive community and health professional education, a large-scale community needs assessment, a voluntary blood lead screening program in community and schools, a community census, several important public health consultations, and planning for a proposed health study.

### *Bunker Hill Superfund Site Lead Health Intervention Program, Idaho*

Another example of a community health education program is the Bunker Hill Superfund Site Lead Health Intervention Program. The program provides health education, annual blood lead screenings, and health care provider education for residents living near the site or in the Coeur d'Alene River Basin. ATSDR provides most of the funds for the intervention program, which is conducted by the Panhandle District Health Department.

As part of the program, health educators made presentations to children in local schools. The presentations were age-specific, ranging from a puppet show to a hand washing demonstration with Glo-germ powder to use of a dollhouse to demonstrate where lead exposure can occur in the home. Health education materials were sent home with all school children. The health education materials included fact sheets, brochures, and activity and coloring books about lead

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exposure. In addition, an announcement about the summer blood lead screening was sent home with the children.

Program staff members routinely address questions from community members, agencies, and other states about lead exposure prevention, and they provide materials on the health effects of lead exposure and on the operation of the lead intervention program. Information about the health effects associated with lead exposure is distributed to new residents in the Bunker Hill Superfund site, as well as in the Coeur d'Alene River Basin. Lead health information and lead disclosure requirements are routinely provided to real estate agents in the area. Project staff members provide information and results of environmental testing to individuals and real estate agents to assist with meeting requirements associated with disclosure of potential environmental hazards to prospective renters or buyers. Staff members respond to questions from local health care providers and provide them with blood lead level screening results. The program offers blood lead screening to pregnant women who live in the area and provides flyers to women who participate in the public health district's clinics and Women, Infants, and Children (WIC) program.

The goals of the lead intervention program are as follows:

- At least 95% of all children in each community will have blood lead levels that are under the level of health concern, 10 micrograms per deciliter.
- No more than 1% of children will have blood lead levels greater than 15 micrograms per deciliter.

There were 259 children ages 0-6 years in the Bunker Hill Superfund site who participated in the 2002 summer screening. Two percent had blood lead levels greater than 10 micrograms per deciliter and 1% had blood lead levels

greater than 15 micrograms per deciliter. These results show continued improvement from 1989, when 56 % had blood lead levels greater than 10 micrograms per deciliter and 26 % had blood lead levels greater than 15 micrograms per deciliter.

In 2002, 103 children ages 0–6 years in the Coeur d'Alene River Basin participated in the summer screening. Four percent had blood lead levels greater than 10 micrograms per deciliter, but none had a blood lead level greater than 15 micrograms per deciliter.

All children with blood lead levels of 10 micrograms per deciliter or higher received an in-home visit with a public health nurse. The nurse identifies exposure sources, counsels the parents on nutrition, educates the families on eliminating or reducing exposure, and counsels the family on the appropriate medical follow-up, if necessary.

## **Educating Health Professionals Nationwide**

ATSDR works through a variety of mechanisms to provide health education and information to health professionals nationally. Activities include grand rounds presentations, off-site seminars and workshops, newsletters, fact sheets, satellite broadcasts, and Web-based training. ATSDR often enters into partnerships with other organizations in these efforts. Partners include national organizations, local universities, and professional societies. ATSDR health education activities have been focused on implementing a national strategy to provide environmental health training for nurses and other frontline health care providers and on expanding partnerships in environmental health expertise.



*ATSDR provides Web-based training to health professionals through its Case Studies in Environmental Medicine web page*

### *Distance Learning Program*

ATSDR, working with CDC’s Public Health Practice Program Office, developed a Public Health Training Network Course entitled “Working with Communities for Environmental Health.” The program, broadcast live, was viewable as a downlink broadcast, as a “live” Webcast, and as a delayed-viewing archived program. The program was aimed at an audience of health educators, public health and environmental health professionals, state and local health agency personnel, nurses and nurse practitioners, health care providers, school health personnel, teachers, and academic specialists in public health or environmental science. The purpose of the program was (1) to raise awareness of environmental health information and resources, (2) to increase capacity among individuals and communities to make informed decisions and appropriate behavior

changes to promote and protect health, and (3) to more effectively prevent exposure to hazardous substances.

The program was broadcast live on September 12, 2002, via satellite to more than 450 satellite downlink sites throughout the United States, Puerto Rico, and the Virgin Islands. Following the program, more than 1,000 health education planning kits were mailed to registered participants. The program received many positive reviews, and ATSDR has received numerous requests for videotapes. Requests for additional resources and materials continue to be received even eight months after the program aired.

This complex project required substantial and lengthy preparation by all team members, along with effective collaboration among a wide range of specialists, including community workers in New York, a cultural competency expert from Seattle, City University of New York: Hunter College faculty, Rutgers University faculty and staff, an Emory University physician and educator, tribal representatives, and many others.

### *Capacity Building Through Public Health Training Centers*

In fiscal year 2002, ATSDR awarded funds to the Health Resources Services Administration’s (HRSA) public health training centers to permit inclusion of information about environmental health nursing in HRSA’s training activities. HRSA’s public health training center program is designed to improve the nation’s public health system by strengthening the technical, scientific, managerial, and leadership skills and abilities of current and future public health professionals. ATSDR partnered with HRSA to include an environmental health component in its nursing training programs. Using ATSDR materials and various approaches directed toward the nursing workforce, the HRSA training centers reached approximately 5,500 health

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care professionals. Approximately 2,700 health care professionals participated in training programs. Of those, 1,900 were nurses. Participants of these training sessions will become part of an environmental health nursing network that will build the capacity within their states.

### *Morehouse Regional Research Center for Minority Health*

ATSDR provides support for the Regional Research Center for Minority Health, which was established at Morehouse College to develop and direct an interdisciplinary program that promotes public health research on the health status of racial and ethnic minority population in the United States. Specific objectives include (1) increasing the technical expertise among students, faculty, and guest researchers to access and analyze currently available health data appropriate for minority health research and (2) providing a focal point for identifying a cadre of minority health researchers interested in health issues of racial and ethnic populations in the U.S. To date, approximately 40 regional research trainees have been supported through the program. Students are at various universities, including Emory, Morehouse, Clark-Atlanta, the University of Puerto Rico, and Tuskegee. They apply to the Morehouse program and, upon acceptance, are assigned to mentors. Some have worked with mentors at ATSDR. Following the research trainee program, many of the students have gone on to pursue postgraduate degrees, including PhDs, MDs, and MPHs.

### *Partnerships with Tribal Colleges and Governments*

In fiscal year 2002, ATSDR continued to fund a cooperative agreement with three tribal colleges. The College of the Menominee Nation, Wisconsin; Dine' College, Arizona; and Turtle Mountain Community College, North Dakota,

are funded to build programs for environmental and public health. The colleges develop course work, research projects, and resource materials specific to the needs of their regions. Specific needs include a focus on uranium waste in the Navajo Nation, water quality in North Dakota, and toxic material migration in the food chain in Wisconsin.

ATSDR has also developed health education and promotion partnerships with tribal governments and consortia through cooperative agreements. ATSDR has such cooperative agreements with the Eight Northern Indian Pueblos Council, the Saint Regis Mohawk Tribe, the Indian Health Council, the Ely Shoshone Tribe, and the organization Nuclear Risk Management for Native Communities. These cooperative agreements are intended to develop a variety of environmental health education and training programs for health professions and tribal communities.

For example, the Saint Regis Mohawk Tribe's environmental health education program developed a clearinghouse for results from environmental health studies conducted in the past 15 years in the Akwesasne Mohawk community. The clearinghouse, which includes articles and other educational materials, is regularly advertised and available for community members and other interested individuals. The program also developed a fish consumption guide for children, "Children are not Small Adults—A children's guide to consuming fish from the St. Lawrence River." The guide was created in collaboration with the Natural Resource Damage Assessment program. This material has been distributed at various health fairs and programs.

### *First Responder Stress Training*

During 2002, workshops were given to CDC, EPA, and ATSDR personnel on the handling the stresses of responding to technological disasters and terrorist attacks. In addition, ATSDR



*HAZMAT training*

participated in a FEMA Comprehensive Hazmat Emergency Response—Community Assessment Program (CHER-CAP) drill in May 2002 at Tri-Town, Connecticut, that included simulated disaster stress related scenarios to see if first responders could recognize and properly treat health conditions related to disaster stress.

## **ATSDR's Health Education and Promotion Partnerships with National Organizations**

ATSDR has worked with a variety of national organizations since 1989. It conducts many public health education and promotion activities through collaborative projects and partnerships with national organizations of health professionals. These activities build capacity by increasing knowledge of environmental medicine and public health issues for members of the participating organizations and by helping

members address the public health concerns of the people and communities they serve. In fiscal year 2002, ATSDR reached more than 80,000 health professionals through its funding of 10 national organizations. A listing of these organizations and a highlight of each organization's fiscal year 2002 activities follow.

- American Academy of Pediatrics (AAP) maintains a SafetyNet ListServ and is conducting a long-term evaluation of its environmental health course.
- American Association of Occupational Health Nurses (AAOHN) has developed a "Core Curriculum for Environmental Health."
- American College of Medical Toxicology (ACMT) is providing a network of experts in medical toxicology whom ATSDR staff members in regional offices can consult for assistance with chemical releases and other toxic impacts on human health.
- American College of Preventive Medicine (ACPM) is actively marketing its Web site modules, including one on health effects related to Iodine-131.
- Association of Occupational and Environmental Clinics (AOEC) reached more than 450 health professionals with site-specific information and education at the Superfund communities of Calcasieu, Louisiana; Elkhart, Indiana; Fishkill, New York; and Vasquez Boulevard and I-70, Colorado.
- Association of State and Territorial Health Officials (ASTHO) conducts health and environment electronic seminars.
- Migrant Clinicians Network (MCN) had 1,605 hits on environmental health materials on its Web site.
- National Alliance for Hispanic Health (NAHH) continues to implement the National Hispanic Environmental Health Education Network, designed to increase the knowledge of health professionals and

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to build the capacity of community based organizations to develop and implement culturally proficient environmental education programs for Hispanic families.

- National Association of County and City Health Officials (NACCHO) provided risk communication training to a group of local health departments dealing with Superfund issues and to all the attendees of its National Meeting in New Orleans in July 2002.
- National Environmental Health Association (NEHA) trained 1,400 public health professionals through its national conference and three terrorism preparedness workshops.

## **Health Risk Communication Training**

Several risk communication training activities occurred during 2002.

- ATSDR collaborated with the CDC Corporate University and the Society for Public Health Education to develop and present a one-day introductory risk communication course for CDC/ATSDR staff. The course was so successful that it had a waiting list of applicants.
- In May 2002, a risk communication workshop was provided at the Latin American Child Lead Workshop in Trinidad-Tobago. This meeting was sponsored by the Pan American Health Organization; it was attended by representatives of 21 countries. Working groups were formed to discuss recommended approaches to address lead poisoning in Latin America and the Caribbean. An ATSDR staff member coordinated the working group on health risk communication. In August 2002, ATSDR staff taught a risk communication course at the National Institute of Public Health in Mexico.

## **Requests for Information from the Public**

The ATSDR Information Center provides scientific and technical information to support ATSDR staff, agency constituents, and the public. The Information Center includes a research library, a clearinghouse, the ATSDR toll-free telephone access system, mailing activities, and a records management program. During fiscal year 2002, the Information Center responded to more than 34,600 requests and distributed more than 435,200 agency products and publications. With the addition of a Web document design and production activity, the Information Center assisted with placing on the Internet many important documents such as Toxicological Profiles, Public Health Statements, ToxFAQs, HazMat Emergency Preparedness Training and Tools for Responders, and the document Managing Hazardous Materials Incidents.

In addition to distributing information to the public and placing information on the Internet, the ATSDR Information Center participates in several projects each year. During fiscal year 2002, ATSDR's partners requested that the Information Center prepare a training class on the best practices for searching the Internet for information on hazardous substances. In response to this request, the Information Center designed and conducted the Building Online Searching Capacity training class. The class was offered during the agency's Cooperative Agreement Partners Meeting. It has also been offered to ATSDR staff throughout the year. A shorter version of the class was especially developed for the Public Health Assessment Training Program and conducted several times during the fiscal year. In fiscal year 2002, the Information Center also designed and developed many exhibits and displays for scientific meetings such as the annual meeting of the



ATSDR's ToxFAQs™ web page

Society of Occupational and Environmental Health and the International Conference on Chemical Mixtures.

ATSDR continues to use the Internet to offer information that is easily accessible to the public. Many of ATSDR's documents are available on the Internet site at <http://www.atsdr.cdc.gov/>. Use of the ATSDR Internet Website continues to grow, with more than 21 million hits in fiscal year 2002, up from 16 million in fiscal year 2001. In addition, ATSDR expanded its reach on the Internet in fiscal year 2002 by offering information on a Spanish language Web page.





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## Appendix A

# Sites at Which ATSDR Conducted Activities in Fiscal Year 2002

The following list shows the sites at which ATSDR conducted public health activities in fiscal year 2002, specifically public health assessments, health consultations, health education and promotion activities, health studies, and emergency response activities. Consultations that are not site specific are not listed. The listing uses these abbreviations:

HA = public health assessment

HS = health study

HC = health consultation

EI = exposure investigation

HE = health education

ER = emergency response

### Alabama

Anniston Lead Site \_\_\_\_\_ HE

Anniston PCB Site (Monsanto Co.) \_ HC(2), HS, HE

Redstone Arsenal \_\_\_\_\_ HE

Litchfield Airport Area \_\_\_\_\_ HE

Lower Gila River \_\_\_\_\_ HE

Lynx Creek \_\_\_\_\_ HE

Motorola Inc. (52nd Street Plant) \_\_\_\_\_ HC, HE

New River Groundwater Contamination \_\_\_\_ EI, HE

Tucson PCB Fire \_\_\_\_\_ ER

### Alaska

Adak Naval Air Station \_\_\_\_\_ HA

Arctic Surplus \_\_\_\_\_ HA

Ketchikan Pulp Company \_\_\_\_\_ HA

### Arkansas

Jonesboro Municipal Landfill \_\_\_\_\_ HE

Kopper Company Inc. \_\_\_\_\_ HE

Mountain Pine Pressure Treating \_\_\_\_\_ HA

Ouachita Nevada Wood Treater \_\_\_\_\_ HA, HE

Prairie Grove Cluster \_\_\_\_\_ HE

Red River Aluminum \_\_\_\_\_ HC, HE

### Arizona

ASARCO Inc. Hayden Plant \_\_\_\_\_ HA, HE

Hassayampa/Lynx Creek Abandoned Mines \_ HC(2)

Innaco Refuse Fire \_\_\_\_\_ HC

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**California**

Abex/Remco \_\_\_\_\_ HE  
Aerojet General Corp. \_\_\_\_\_ HE  
Chevron Chemical Inc. \_\_\_\_\_ HE  
Chrome Crankshaft \_\_\_\_\_ HA, HE  
Cooper Drum Company \_\_\_\_\_ HA, HE  
Del Amo \_\_\_\_\_ HA, HE  
Fort Ord Fire Training Area \_\_\_\_\_ HE  
Frank Street Dump \_\_\_\_\_ HC  
J&S Chrome Plating \_\_\_\_\_ HA  
Lava Cap Mine \_\_\_\_\_ HE  
Lawrence Livermore National Lab (Site 300) \_\_\_\_\_ HC  
Lawrence Livermore National Lab,  
Main Site \_\_\_\_\_ HA, HC, HE  
Laytonville Dump \_\_\_\_\_ HE  
Leviathan Mine \_\_\_\_\_ HA, HE  
Nevada County Air Park \_\_\_\_\_ HE  
Omega Chemical Corp. \_\_\_\_\_ HE  
Pacific Gas and Electric \_\_\_\_\_ HE  
Pemaco Maywood \_\_\_\_\_ HE  
Ramona Alesandro Elementary School \_\_\_\_\_ HE  
San Bernardino Mercury Release \_\_\_\_\_ ER  
Sherwin - Williams \_\_\_\_\_ HC  
Sierra Army Depot \_\_\_\_\_ HE  
Sonoma French Cleaners \_\_\_\_\_ HE  
Steele Lane Elementary Irrigation Well \_\_\_\_\_ HC  
Steeler Inc. Drywall Construction Supply \_\_\_\_\_ HC  
Sylvania Systems Group GTE Products \_\_\_\_\_ HC  
Vermiculite Sites \_\_\_\_\_ HE  
Waste Disposal Inc. \_\_\_\_\_ HA, HE

**Colorado**

Cherry Creek Plume \_\_\_\_\_ HC  
Colorado Springs Tire Fire \_\_\_\_\_ ER  
Pueblo Chemical Depot \_\_\_\_\_ HE  
Redfield Site Cleanup \_\_\_\_\_ HE  
Vasquez Boulevard and I-70 \_\_\_\_\_ HA, HE  
Vermiculite Facility \_\_\_\_\_ HE

**Commonwealth of the Northern Mariana Islands**

Tanapag Village, Saipan \_\_\_\_\_ HE

**Connecticut**

Allied Plating \_\_\_\_\_ HE  
Broad Brook Mill \_\_\_\_\_ HA, HE  
Brookfield Schools Asbestos \_\_\_\_\_ HE  
Bunker Hill Park \_\_\_\_\_ HC, HE  
Chase Brass and Copper \_\_\_\_\_ HC  
Evergreen Street Asbestos \_\_\_\_\_ HE  
Groton, Pfizer Fire \_\_\_\_\_ ER  
Hamden Middle School \_\_\_\_\_ HE  
Inter Royal Corp., Plainfield \_\_\_\_\_ HE  
Plainville Electroplating \_\_\_\_\_ HC  
Pliny Street \_\_\_\_\_ HE  
Raymark Industries Inc. \_\_\_\_\_ HC, HE  
Risdon Corporation \_\_\_\_\_ HC, HE  
Scovill Industrial Landfill \_\_\_\_\_ HC, HE  
Upjohn Co. Fine Chemicals \_\_\_\_\_ HE  
Wallingford, Anthrax Exposure \_\_\_\_\_ ER

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**Delaware**

Seaboard Lumber \_\_\_\_\_ HC  
St. Francis Hospital \_\_\_\_\_ ER  
Standard Chlorine \_\_\_\_\_ HE

**District of Columbia**

River Terrace Community \_\_\_\_\_ HE  
Spring Valley Chemical Munitions \_\_\_\_\_ EI, HE  
Washington Navy Yard \_\_\_\_\_ HA, HE

**Florida**

5th & Cleveland Incinerator Site \_\_\_\_\_ HC  
Alaric Area Groundwater Plume \_\_\_\_\_ HE  
AMI Anthrax Removal Action \_\_\_\_\_ ER  
Barnes Battery Recycling \_\_\_\_\_ HC  
Circle Lead Products \_\_\_\_\_ HC  
Crystal Springs Road Park Pond \_\_\_\_\_ HC  
Forest Street Incinerator \_\_\_\_\_ HC  
Fuzzell Wholesale Nursery Inc. \_\_\_\_\_ HC, HE  
Kerr-McGee Chem. Corp. \_\_\_\_\_ HE  
Leesburg Thermometer Site \_\_\_\_\_ HC, HE  
Material Exchange Corp. Landfill \_\_\_\_\_ HC, EI (2), HE  
Miami Civic Center Property \_\_\_\_\_ HC, HE  
Nocatee Hull Creosote \_\_\_\_\_ HA, HC  
Ouster Corporation \_\_\_\_\_ HC  
Petroleum Products Corp. \_\_\_\_\_ HC  
Port St. Joe Millville Addition \_\_\_\_\_ HE  
Queens 41 Auto \_\_\_\_\_ HA, HE  
Royal Oaks Community \_\_\_\_\_ HA, EI, HE  
Southern Solvents Inc. \_\_\_\_\_ HE  
Stauffer Chemical Co. (Tarpon Springs) \_\_\_\_\_ HC, HE

United Metals Inc. \_\_\_\_\_ HC, EI, HE  
U.S. Navy Air Station Cecil Field \_\_\_\_\_ HA  
Wingate Road Municipal Incinerator \_\_\_\_\_ HE

**Georgia**

Albany \_\_\_\_\_ ER  
Alco Controls \_\_\_\_\_ HC  
Atlantic Station \_\_\_\_\_ HE  
Brunswick Wood Preserving \_\_\_\_\_ HC, HE  
Cachet Cleaners \_\_\_\_\_ HC  
General Electric Company, Rome \_\_\_\_\_ HC, HE  
Georgia Pacific \_\_\_\_\_ HE  
Griffith Oil Company \_\_\_\_\_ HC  
Marine Corps Logistics Base \_\_\_\_\_ HA  
Newtown Community \_\_\_\_\_ HA, HE  
Richmond County Health Intervention Project \_\_\_\_\_ HE  
Sikes Oil Service \_\_\_\_\_ HC  
Social Circle Cotton Mill \_\_\_\_\_ HC  
Terry Creek Dredge Spoil Areas/Hercules \_\_\_\_\_ HA, HE  
Tri-State Steel Drum Co. Inc. \_\_\_\_\_ HA  
U.S. Marine Corps Logistics Base \_\_\_\_\_ HE

**Gila River Nation**

Boundary Site \_\_\_\_\_ HE

**Guam**

Agana Power Plant \_\_\_\_\_ HA, HE  
Andersen Air Force Base \_\_\_\_\_ HA  
Orote Landfill/Agat Bay \_\_\_\_\_ HE

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**Idaho**

Bunker Hill \_\_\_\_\_ HE  
Coeur d'Alene Basin \_\_\_\_\_ HE  
Eastern Michaud Flats \_\_\_\_\_ HE  
Idaho National Engineering Laboratory \_\_\_ HA, HE  
Idaho State Health Lab Fire \_\_\_\_\_ ER  
Poles Inc. Wood Treating Facility \_\_ HA, HC (2), HE  
Potlach Corp. \_\_\_\_\_ HE  
Southeast Idaho Selenium Project \_\_\_\_\_ HE  
St. Maries Cresote \_\_\_\_\_ HE  
Stibnite/Yellow Pine Mining Area \_\_\_\_\_ HA

**Illinois**

Batavia Groundwater Site \_\_\_\_\_ EI  
Bisbee Linseed Company \_\_\_\_\_ HC  
Browning-Ferris Industries Inc. \_\_\_\_\_ HA  
Circle Smelting Corp. \_\_\_\_\_ HA  
Downers Grove Groundwater \_\_\_\_\_ HE  
Ellsworth Industrial Park \_\_\_\_\_ HA  
Evergreen Manor Groundwater Contamination \_ HC  
Farmers Elevator Company \_\_\_\_\_ HC  
Gulf Mobile and Ohio Rail Yard \_\_\_\_\_ HA, HC  
Hartford Residential Vapor \_\_\_\_\_ HC, HE  
Ilada Energy Co. \_\_\_\_\_ HC  
Illinois Zinc Co. \_\_\_\_\_ HC  
Interlake Property \_\_\_\_\_ HC  
La Salle \_\_\_\_\_ HS  
Lanark City Dump \_\_\_\_\_ HC  
Lincoln Municipal \_\_\_\_\_ HC  
Lockformer Company \_\_\_\_\_ HA, HE  
Macon County Landfill #2 \_\_\_\_\_ HC

Nextel Leaking Underground Storage Tank \_\_\_\_ HC  
Old American Zinc Plant \_\_\_\_\_ HA  
Old La Salle Dump \_\_\_\_\_ HC  
Petersen Sand & Gravel \_\_\_\_\_ HC  
Rantoul Residential Wells \_\_\_\_\_ HC  
Rosiclare Mines \_\_\_\_\_ EI, HE  
Saint Louis Auto Shredding Drum Disposal \_\_\_\_ HC  
Sangamon Valley Landfill \_\_\_\_\_ HC  
Sauget Area I \_\_\_\_\_ HA  
Sauget Area I - Dead Creek Area G \_\_\_\_\_ HA  
Sauget Area I - Dead Creek Segment A \_\_\_\_\_ HA  
Sauget Wastewater Treatment Plant \_\_\_\_\_ HA  
Southeast Rockford  
Groundwater Contamination \_\_\_\_\_ HA  
Velsicol Chemical Corp. Marshall Plant \_\_\_\_\_ HC  
Waste Control \_\_\_\_\_ HC

**Indiana**

Con Rail Yard \_\_\_\_\_ HE  
Continental Steel Corp. \_\_\_\_\_ HC  
Dowden Landfill \_\_\_\_\_ HC  
Four County Landfill \_\_\_\_\_ HC  
General Motors \_\_\_\_\_ HE  
Hoosier Wood Treating \_\_\_\_\_ HC  
Lincoln Elementary School \_\_\_\_\_ HE  
Third Site \_\_\_\_\_ HC  
Town of Pines Groundwater Plume \_\_\_\_\_ HC, HE  
Vincennes Tar Seeps \_\_\_\_\_ HC

**Iowa**

Aluminum Company of America, Davenport \_\_\_\_ HC

Clarksville PCBs \_\_\_\_\_ HC  
 Iowa City Former Manufactured Gas Plant \_\_\_\_ HC  
 Iowa Malleable Iron Company \_\_\_\_\_ HC  
 Le Mars Coal Gas Plant \_\_\_\_\_ HE  
 Railroad Avenue Groundwater Contamination\_\_ HA  
 Williams Pipe Line Company, Coralville \_\_\_\_\_ HC

**Kansas**

Chemical Commodities Inc. \_\_\_\_\_ HC (2)  
 Sunflower Army Ammunition Plant \_\_\_\_\_ HA  
 Tri-County Public Airport \_\_\_\_\_ HA

**Kentucky**

Paducah Gaseous  
 Diffusion Plant (U.S. DOE) \_\_\_\_\_ HA, HC, HE  
 Rubbertown \_\_\_\_\_ EI  
 Versailles Mercury \_\_\_\_\_ ER  
 W.R. Grace, Wilder \_\_\_\_\_ HE

**Louisiana**

Agriculture Street Landfill \_\_\_\_\_ HE  
 Calcasieu Estuary, Mossville \_\_\_\_\_ HE  
 Central Wood Preserving Co. \_\_\_\_\_ HA  
 Coastal Radiation Services \_\_\_\_\_ HC  
 Delatte Metals \_\_\_\_\_ HE  
 Gulf State Utilities-North Ryan Street \_\_\_\_\_ HA  
 Mallard Bay Landing Bulk Plant \_\_\_\_\_ HA, HE  
 Myrtle Grove Trailer Park \_\_\_\_\_ HC, HE  
 Ruston Foundry \_\_\_\_\_ HA, HE  
 Slidell Mercury Exposure \_\_\_\_\_ ER

**Maine**

Callahan Mining Corp. \_\_\_\_\_ HA  
 Central Maine Disposal Landfill \_\_\_\_\_ HA  
 Eastern Surplus \_\_\_\_\_ HA

**Maryland**

Annapolis Mercury Exposure \_\_\_\_\_ ER  
 Beltsville Agricultural Research Center \_\_\_\_\_ HA  
 South Street Station \_\_\_\_\_ ER

**Massachusetts**

Acre Middle School Site \_\_\_\_\_ HC  
 Atlas Tack Corp. \_\_\_\_\_ HA  
 Boston, Coast Guard \_\_\_\_\_ ER  
 Coastal Oil \_\_\_\_\_ HE  
 General Electric Co., Housatonic River \_\_\_\_ HC, HE  
 Hathaway & Patterson \_\_\_\_\_ HA, HE  
 High Street Farm (Lieberman) \_\_\_\_\_ HC  
 Materials Technology  
 Laboratory (U.S. Army) \_\_\_\_\_ HC, HE  
 McDonald's Road \_\_\_\_\_ HE  
 Modern Electroplating \_\_\_\_\_ HE  
 Natick Laboratory \_\_\_\_\_ HC  
 North Hatfield Road \_\_\_\_\_ HE  
 Nuclear Metals Inc. \_\_\_\_\_ HC (3), HE  
 Nyanza Chemical Waste Dump \_\_\_\_\_ HE  
 Old Colony Railroad \_\_\_\_\_ HE  
 Otis Air National Guard Base/  
 Camp Edward \_\_\_\_\_ HC, HE  
 Parker's Island Area \_\_\_\_\_ HC  
 Parker River, Danvers \_\_\_\_\_ HE  
 Schpack Landfill \_\_\_\_\_ HE

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Scituate _____	HE	Crenlo Truck Painting _____	HE
Sullivan's Ledge _____	HE	Faribault Municipal Well Field _____	HE
South Weymouth NAS _____	HE	Finland Radar Station _____	HE
Sutton Brook Disposal Area _____	HE	Fridley Commons Park Well Field _____	HA
Toka-Renbe Farm _____	HE	Gallagher Dump _____	HC
Weymouth Neck Landfill _____	HE	Gopher State Ethanol _____	HE
		Hatting Street Dump _____	HC
		Hines Dump _____	HC
<b>Michigan</b>		Hutchinson Dump _____	HE
Allied Paper Inc./Portage Creek/Kalamazo _____	HC	Joslyn Manufacturing & Supply Co. _____	HA, HE
Beard Elementary School _____	HE	Little Falls Dump _____	HE
Coloma Groundwater _____	HE	Marine Residence Mercury Spill _____	HC
Continental Aluminum _____	HC, HE	McQuay International _____	HE
Dow Chemical Co., Midland _____	HC, HE	MGK _____	HE
Grand Traverse Commons _____	HC	Melrose Dump _____	HC
Groundwater Contamination, Coloma Township _____	HC	Minnesota Brewing Co. _____	HA
Kent County Courthouse _____	ER	North Mankota Dump _____	HC
Miro Golf Course _____	HE	Owens-Corning _____	HE
Peet Packing _____	HC	Preston Tire Burning Plant _____	HE
Pellestar Limited _____	HC	St. Paul Residence Mercury Spill _____	HC
Princeton Ave. Mercury Spill _____	EI	Sunrise Dump _____	HC
Proposed Beard Street School _____	HC	Walker Dump _____	HC
Royal Park Clinic Spill _____	HC	Western Mineral Products _____	HE
Sparta Area Schools _____	HC	White Bear Lake Township _____	HE
Ten Mile Drainage System PCBs _____	HE		
Tittabawassee River _____	HC, HE		
Watervliet Mercury Spill _____	HC	<b>Mississippi</b>	
		American Creosote Works Inc _____	HA
<b>Minnesota</b>		Davis Timber Company _____	HA
Bass Lake Dump _____	HE	DuPont Delisle Plant _____	HE
Baytown Township Groundwater _____	HE		
Clandestine Drug Lab Response _____	HE		

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**Missouri**

12th Avenue Solvents \_\_\_\_\_ HC  
Amoco Oil Co. \_\_\_\_\_ HC  
Big River Mine Tailings \_\_\_\_\_ HE  
Bonne Terre Mine Tailings \_\_\_\_\_ HE  
Concentrated Animal Feeding Operations \_\_\_\_\_ HC  
Elvins Mine Tailings \_\_\_\_\_ HC  
Federal Tailings Pile \_\_\_\_\_ HE  
Hematite Radioactive Site \_\_\_\_\_ HE  
Herculaneum Lead Smelter Site \_\_\_\_\_ HC (5), HE  
Jasper County \_\_\_\_\_ HS  
Kansas City Bluffs Anthrax \_\_\_\_\_ ER  
Leadwood Mine Tailings \_\_\_\_\_ HE  
Madison Mine Site/Harmony Lake \_\_\_\_\_ HE  
Methamphetamine Labs \_\_\_\_\_ HE  
Moberly Former Manufactured Gas Plant \_\_\_\_\_ HC  
National Mine Tailings \_\_\_\_\_ HE  
Oak Grove Village Well \_\_\_\_\_ HA, HE  
Ramsey Corp. \_\_\_\_\_ HC  
Riverfront \_\_\_\_\_ HC, HE  
Sentinel Wood Treating Co. Inc. \_\_\_\_\_ HC, HE  
Wheeling Disposal Service \_\_\_\_\_ HE

**Montana**

Barker Hughesville Mining District \_\_\_\_\_ HA  
Billings Chlorine Exposure \_\_\_\_\_ ER  
Bitterroot Valley Sanitary Landfill \_\_\_\_\_ HC  
Carpenter Snow Creek Mining District \_\_\_\_\_ HA  
East Helena Site \_\_\_\_\_ HC  
Libby Asbestos Site \_\_\_\_\_ HA, HC, HS (2), HE  
Lockwood Solvent Groundwater Plume \_\_\_\_\_ HA

Milltown Reservoir Sediments \_\_\_\_\_ HC (2)

**Nebraska**

Dakota City and South Sioux City \_\_\_\_\_ HS  
Omaha Lead Refining \_\_\_\_\_ HE

**Nevada**

Fallon Leukemia Cluster \_\_\_\_\_ HE  
Fallon Naval Air Station \_\_\_\_\_ HC, HE

**New Hampshire**

Arlington Pond \_\_\_\_\_ HC  
Atherton Park \_\_\_\_\_ HC  
Dr. Crisp School/Gardner Roussell Park \_\_\_\_\_ HA, HC, HE  
Electrosonics/Spofford Place \_\_\_\_\_ HA  
Elite Laundry Company \_\_\_\_\_ HC (3), HE  
Former Electronics/Spofford Place \_\_\_\_\_ HE  
Henry Wilson Memorial Dr. School \_\_\_\_\_ HE  
Mohawk Tannery \_\_\_\_\_ HC  
Somersworth Sanitary Landfill \_\_\_\_\_ HE

**New Jersey**

Atlantic Resources \_\_\_\_\_ HA, HE  
BOMARC, McGuire Air Force Base \_\_\_\_\_ HA  
Cedarbrook Area \_\_\_\_\_ HA, HE  
Ciba-Geigy Corp. \_\_\_\_\_ HE  
Diamond Head Oil Refinery Division \_\_\_\_\_ HA, HE  
Dismal Swamp \_\_\_\_\_ HE  
Emmell's Septic Landfill \_\_\_\_\_ HA  
Fort Monmouth-Evans #1 \_\_\_\_\_ HC  
Hackensack Bolt & Nut Co. \_\_\_\_\_ HC





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Brush Wellman Inc. _____	HC, HE	Portland Harbor _____	HA, HE
Cady Road _____	HC, HE	Portland Harbor, Upland sites _____	HE
Dupont Washington Works _____	HE	Taylor Lumber & Treating _____	HE
Eagle Picher _____	HC	Teledyne Wah Chung _____	HE
Fayette Tubular Products _____	HC (3), HE	Triangle Lake _____	HE
Ford Road Industrial Landfill _____	HC	Umatilla Army Depot _____	HE
Gavin Power Plant _____	HC		
Greiner's Lagoons _____	HC	<b>Pennsylvania</b>	
Marion Engineer Depot _____	HE	Allegheny Groundwater Release _____	ER
North Sanitary Landfill _____	HE	American Chain Cable _____	EI
Sam Winer Motors _____	HC	Bally Groundwater Contamination _____	HC
Tiffin Landfill _____	HC	Blosenski Landfill _____	HC
Urbana Residential Wells _____	HC, HE	Defense Personnel Support _____	HE
Warren Recycling _____	HC, HE	Dublin TCE Site _____	HC
Yellow Springs Instruments Area _____	HC, HE	Eastern Diversified Metals _____	HE
		Franklin Slag Pile _____	HA
<b>Oklahoma</b>		Garland/Freeland Groundwater Site _____	HC
Dewey Mercury _____	HC	Gelast Company Fire, Tullytown _____	ER
Imperial Refining Company _____	HA	Hetzell Playground _____	HE
Tar Creek _____	HE	High Quality Polishing & Plating _____	HC
		Hilltop Mobile Xtramart _____	HE
<b>Oregon</b>		Hoffmann Industries Inc. _____	HC
Black Butte Mine _____	HE	Mike's Fancy Service Station Site _____	HC, HE
Buena Vista _____	HE	Molycorp Inc. _____	HE
Carpenter Lane Pesticides _____	HC, HE	Mount Union Creosote _____	HE
Grande Ronde _____	HE	MW Manufacturing _____	HC
Grants Pass Tire Fire _____	ER	Naval Air Development Center _____	HA
Mattel/Tyco _____	HE	Navy Ships Parts Control Center _____	HA
North Ridge Estates _____	HE	New Church College Release _____	ER
Pacificorp Young's Bay _____	HE	Nine Mile Run Slag Area _____	HE
Portland _____	ER	Pathan Chemical Site _____	HC, HE

Tranguch Gasoline Site \_\_\_\_\_ HE  
 Valmont TCE Site \_\_\_\_\_ HA, HE  
 Watson Johnson Landfill \_\_\_\_\_ HA, HC, HE  
 Western Norristown Dump \_\_\_\_\_ HE  
 William Dick Lagoons \_\_\_\_\_ HC  
 Willow Grove Naval Air and Air Reserve Station HA

**Puerto Rico**

Isla De Vieques Bombing Range \_\_\_ HA (2), EI, HE  
 Scorpio Recycling \_\_\_\_\_ HE  
 Vega Baja Landfill \_\_\_\_\_ HE

**Rhode Island**

291 Promenade Street Indoor Air \_\_\_\_\_ HC  
 Central Landfill \_\_\_\_\_ HE  
 Pascoag Utility District \_\_\_\_\_ HE  
 Providence, Coast Guard \_\_\_\_\_ ER

**South Carolina**

Admiral Home Appliances \_\_\_\_\_ HE  
 Arkwright Dump \_\_\_\_\_ HC  
 Chester Petition Sites \_\_\_\_\_ HE  
 Cryovac \_\_\_\_\_ ER  
 Fountain Inn Subdivision \_\_\_\_\_ EI (3), HE  
 Gaston Copper \_\_\_\_\_ HE  
 Health-tex Inc. \_\_\_\_\_ HC, HE  
 Huff Battery Salvage \_\_\_\_\_ HC  
 International Minerals and Chemicals \_\_\_\_\_ HC  
 Orangeburg Medical Center \_\_\_\_\_ ER  
 Savannah River Site (U.S. DOE) \_\_\_\_\_ HC, HE  
 Simpsonville Landfill \_\_\_\_\_ HE

**South Dakota**

Takini School \_\_\_\_\_ HC

**Tennessee**

CHEMTREC Urethane Fire \_\_\_\_\_ ER  
 Copper Basin Mining District \_\_\_\_\_ HC  
 CSX/Lewisburg Derailment \_\_\_\_\_ HC  
 Jersey Miniere Zinc Company \_\_\_\_\_ HA  
 McCallie Homes \_\_\_\_\_ HC  
 Memphis \_\_\_\_\_ ER  
 Memphis Defense Depot \_\_\_\_\_ HC  
 North Hollywood Dump \_\_\_\_\_ HC, HE  
 Oak Ridge National Laboratory \_\_\_\_\_ HE  
 Stauffer Chemical \_\_\_\_\_ HE  
 Volunteer Army Ammunition Plant \_\_\_\_\_ HE

**Texas**

Air Force Plant Number Four \_\_\_\_\_ HE  
 Arroyo Colorado Channel \_\_\_\_\_ HC  
 Brine Service Company \_\_\_\_\_ HA  
 Corpus Christi Landfills \_\_\_\_\_ HE  
 El Paso County Metal Survey \_\_\_\_\_ HC (3), HE  
 El Paso/Kern Place-Mission Hills  
 and Smelertown \_\_\_\_\_ HS  
 Former Laredo Air Force Base \_\_\_\_\_ HC  
 Greens Bayou \_\_\_\_\_ HC  
 Hi-Yield Ridgeway Lagoon \_\_\_\_\_ HC  
 Houston Ship Channel \_\_\_\_\_ HC  
 Huntsville State Park \_\_\_\_\_ HC  
 Kelly Air Force Base \_\_\_\_\_ HE  
 Lydia Patterson School \_\_\_\_\_ HC

Malone Service Co., Swan Lake Plant \_\_\_\_\_ HA  
 Marine Safety Unit Galveston \_\_\_\_\_ ER  
 Palmer Barge Line \_\_\_\_\_ HA  
 Patrick Bayou \_\_\_\_\_ HA  
 R & H Oil/Tropicana \_\_\_\_\_ HA  
 State Marine of Port Arthur \_\_\_\_\_ HC  
 Tropicana Energy Company \_\_\_\_\_ HA  
 Winters Seed Company \_\_\_\_\_ HC

**Utah**

American Fork Canyon/Uinta National Forest \_\_ HC  
 Bountiful/Woods Cross 5th South  
 PCE Plume \_\_\_\_\_ HA, HE  
 Davenport and Flagstaff Smelters \_\_\_\_\_ HA, HE  
 Eureka Mills \_\_\_\_\_ HA, HE  
 Intermountain Waste Oil Refinery \_\_\_\_\_ HE  
 International Smelting and Refining \_\_\_\_\_ HA, HE  
 Sunset/Clinton \_\_\_\_\_ HE  
 Tooele Army Depot \_\_\_\_\_ HE

**Vermont**

Elizabeth Mine \_\_\_\_\_ HC

**Virginia**

Avtex Fibers Inc. \_\_\_\_\_ HC, HE  
 CHEMTREC \_\_\_\_\_ ER  
 Coal Technology Corporation \_\_\_\_\_ HC  
 Defense General Supply Center \_\_\_\_\_ HC (2)  
 Norfolk Naval Base, Sewells Point \_\_\_\_\_ HA  
 Pentagon Attack Response \_\_\_\_\_ ER  
 Tire Fire, Roanoke \_\_\_\_\_ ER

**Washington**

Alder Mill \_\_\_\_\_ HE  
 B&L Woodwaste Landfill \_\_\_\_\_ HE  
 Bobby's Flower Basket \_\_\_\_\_ HC  
 Burlington Environmental Inc.,  
 Georgetown \_\_\_\_\_ HC (2), HE  
 Cadet Manufacturing \_\_\_\_\_ HC (2), HE  
 Champion Int. Corp./Klickitat Lumbermill \_ HC, HE  
 Chris V-8 Shop \_\_\_\_\_ HC  
 Eastside Laundry \_\_\_\_\_ HE  
 Former Knot Foundry \_\_\_\_\_ HC  
 Former Unocal 76 \_\_\_\_\_ HC  
 Hamilton/Labree Roads  
 Groundwater Contamination \_\_\_\_\_ HA, HE  
 Hanford Nuclear Reservation \_\_\_\_\_ HE  
 Hop Union USA Inc. \_\_\_\_\_ HC  
 Les' Radiator and Ron's Heavy Equipment \_\_\_\_ HC  
 Lower Duwamish Waterway \_\_\_\_\_ HA, HE  
 Midnight Mine \_\_\_\_\_ HE  
 North Galloway Road \_\_\_\_\_ HC  
 Oeser Co. \_\_\_\_\_ HC  
 Old Mill Town Mall \_\_\_\_\_ HE  
 Pacific Wood Treating \_\_\_\_\_ HE  
 Palermo Well Field  
 Groundwater Contamination \_\_\_\_\_ HC  
 Quality Rock Products \_\_\_\_\_ HE  
 Rayonier Mill \_\_\_\_\_ HC, HE  
 Roderick Timber Track Repair \_\_\_\_\_ HE  
 Thermal Reduction Landfill \_\_\_\_\_ HC  
 Vermiculite Northwest \_\_\_\_\_ HE  
 Western Farmers Inc. \_\_\_\_\_ HA  
 Yakima Hop Road \_\_\_\_\_ HE

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## West Virginia

Marion County Landfill \_\_\_\_\_ HE  
Vienna Tetrachloroethylene \_\_\_\_\_ HE  
Williamsburg sites \_\_\_\_\_ HE

## Wisconsin

Ackerville Groundwater Contamination \_\_\_\_\_ HE  
Ashland/Northern States  
Power Lakefront \_\_\_\_\_ HA, HC, HE  
Bell Labs Fire \_\_\_\_\_ ER  
Better Brite III/Chippewa Falls \_\_\_\_\_ EI  
Columbia Propane \_\_\_\_\_ HE  
Dane County Fire \_\_\_\_\_ ER  
Dupont Barksdale Explosives Plant \_\_\_\_\_ HA, HE  
Former Merit Chemical Property \_\_\_\_\_ HC  
Former Tannery \_\_\_\_\_ HE  
Fox River PCB Releases \_\_\_\_\_ HA, HE  
Green Bay East High School Mercury \_\_\_\_\_ HE  
H&R Paper Landfill \_\_\_\_\_ HE  
Hydrite Chemical/Avganics \_\_\_\_\_ HC  
Lincoln Wood Products Inc. \_\_\_\_\_ HC  
Madison Kipp Corp. \_\_\_\_\_ HE  
Metal Fabricators \_\_\_\_\_ HC  
National Auto Wrecking \_\_\_\_\_ HE  
Northwestern Barrel \_\_\_\_\_ HC  
Random Lake Oil Corp. \_\_\_\_\_ HE  
Ripon Former Manufactured Gas Plant \_\_\_\_\_ HE  
Robert Betz Trust Property \_\_\_\_\_ HC, HE  
Scray's Hill \_\_\_\_\_ HC  
St. Francis Auto Wreckers \_\_\_\_\_ HC  
Wisconsin Avenue School Chemical Vapors \_\_\_\_\_ HC

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*Appendix B*

# Toxicological Profiles Prepared in Fiscal Year 2002

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**CERCLA**

**Final**

Aldrin/Dieldrin (Update)

Beryllium (Update)

Creosote (Update)

DDT/DDE/DDD (Update)

Di(2-ethylhexyl phthalate) (Update)

Hexachlorobenzene (Update)

Methoxychlor (Update)

**Public Comment Draft**

Atrazine

Fluorides (Update)

Malathion

Mustard Gas (Update)

Pyrethrins/Pyrethroids

Selenium (Update)

**Under Development**

Ammonia (Update)

Chlorine Dioxide

Copper (Update)

PBBs/PBDEs (Update)

Perchlorates

Synthetic Vitreous Fibers

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**U.S. Department of Energy**

Public Comment Draft

Americium

Cesium

Cobalt (Update)

Iodine

Strontium



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*Appendix C:*

# **ATSDR Resources on the Internet**

Many documents on ATSDR's Internet site provide information about specific sites, substances, agency programs, and activities. These documents include full public health assessments for a number of sites, easy-to-read fact sheets on toxic substances (ToxFAQs), and case studies for health care professionals. ATSDR's Internet address is

[www.atsdr.cdc.gov](http://www.atsdr.cdc.gov)

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**Some of the resources available on the Web site are listed below.**

2001 CERCLA Priority List  
of Hazardous Substances

A Primer on Health Risk Communication  
Principles and Practices

A Shared Vision for Environmental Public  
Health at CDC/ATSDR

Alaska Native Subsistence and Dietary  
Contaminants Program

An Evaluation Primer on Health Risk  
Communication Programs and Outcomes

Announcements

ATSDR 2002-2007 Strategic Plan

ATSDR FY 2001 Profile and Annual Report

ATSDR Cancer Policy Framework

ATSDR National Alerts-Toxic Substances

ATSDR Public Health Advisories

ATSDR Public Health Assessments

ATSDR Science Corner

ATSDR Statement of Values

ATSDR's Most Frequently Asked Questions

Case Studies in Environmental Medicine

Community Involvement Pages

Community Matters: About ATSDR

Community Matters: Exposure

Community Matters: Find Out About Sites in  
Your Community

Community Matters: Information for  
Communities

Community Matters: Resources and Contacts

Community Matters: Search for a Specific  
Chemical

Community Matters: The ATSDR Ombudsman

Community Matters: What You Can Expect  
from ATSDR

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Congressional Testimony: Medical Monitoring at Hanford Nuclear Facility

Congressional Testimony: The Scientific Aspects of Mercury

Dioxin and Dioxin-Like Compounds in the Soil, Part 1, ATSDR Interim Policy Guideline

GATHER interactive map server

Glossary of Terms

Great Lakes Human Health Effects Research Program

Hair Panel Report

Hazardous Substances Emergency Events Surveillance (HSEES) Annual Report

HazDat Site Activity Query Map

Landfill Gas Primer

Malathion: Chemical Technical Summary for Public Health and Public Safety Professionals

Methyl Parathion Expert Panel Report

Mississippi Delta Project

News Archive

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