

## GOAL 3

# LAND PRESERVATION AND RESTORATION

*Preserve and restore the land by using innovative waste management practices and cleaning up contaminated properties to reduce risks posed by releases of harmful substances.*

Left uncontrolled, hazardous and nonhazardous wastes on the land can migrate to the air, ground water, and surface water, contaminating drinking-water supplies, causing acute illnesses or chronic diseases, and threatening healthy ecosystems in urban, rural, and suburban areas. Hazardous substances can kill living organisms in lakes and rivers, destroy vegetation in contaminated areas, cause major reproductive complications in wildlife, and otherwise limit the ability of an ecosystem to survive.

EPA will work to preserve and restore the land using the most effective waste management and cleanup methods available. We use a hierarchy of approaches to protect the land: reducing waste at its source, recycling waste, managing waste effectively by preventing spills and releases of toxic materials, and cleaning up contaminated properties. The Agency is especially concerned about threats to our most sensitive populations, such as children, the elderly, and individuals with chronic diseases.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund)<sup>1</sup> and the Resource Conservation and Recovery Act (RCRA)<sup>2</sup> provide the legal authority for most of EPA's work toward this goal. The Agency and its partners use Superfund authority to clean up uncontrolled or abandoned hazardous waste sites and return the land to productive use. Under RCRA, EPA works in partnership with states and tribes to address risks associated with leaking underground storage tanks (USTs) and with the generation and management of hazardous and nonhazardous wastes.

EPA also uses authorities provided under the Clean Air Act,<sup>3</sup> Clean Water Act,<sup>4</sup> and Oil Pollution Act of 1990<sup>5</sup> to protect against spills and releases of hazardous materials. Controlling the many risks posed by accidental and intentional releases of harmful substances presents a significant challenge to protecting the land. EPA uses an approach that integrates prevention, preparedness, and response activities to minimize these risks. Spill-prevention activities keep harmful substances from being released to the environment. Improving EPA's readiness to respond to emergencies through training, development of clear authorities, and provision of proper equipment will ensure that we are adequately prepared to minimize contamination and harm to the environment when spills do occur.

## OBJECTIVES

**Objective 3.1: Preserve Land.** By 2008, reduce adverse effects to land by reducing waste generation, increasing recycling, and ensuring proper management of waste and petroleum products at facilities in ways that prevent releases.

**Sub-objective 3.1.1: Reduce Waste Generation and Increase Recycling.** By 2008, reduce materials use through product and process redesign, and increase materials and energy recovery from wastes otherwise requiring disposal.

Strategic Targets:

- ▼ Each year through 2008, maintain the national average municipal solid waste generation rate at no more than 4.5 pounds per person per day.<sup>6</sup>
- ▼ By 2008, increase recycling of the total annual municipal solid waste produced to 35 percent from 31 percent in 2002.<sup>7</sup>

**Sub-objective 3.1.2: Manage Hazardous Wastes and Petroleum Products Properly.** By 2008, reduce releases to the environment by managing hazardous wastes and petroleum products properly.

Strategic Targets:

- ▼ By the end of 2008, prevent releases from RCRA hazardous waste management facilities by increasing the number of facilities with permits or other approved controls from 79 percent at the end of FY 2002 to 95 percent.<sup>8</sup> (Total universe is approximately 2,750 facilities, but will be reassessed in FY 2006.<sup>9</sup>)
- ▼ By 2008, update controls for preventing releases at the 150 facilities that are due for permit renewal by the end of 2006. (By 2006, we will complete a system for tracking the number of facilities due for permit renewals. Currently, we estimate that, through 2008, a total of 450 facilities will be due for permit renewal.)
- ▼ By 2008, reduce hazardous waste combustion facility emissions of dioxins and furans by 90 percent and particulate matter by 50 percent from 1994 levels of 880 grams/year and 9,500 tons/year, respectively.<sup>10</sup>

- ▼ By 2008, increase the percentage of UST facilities that are in significant operational compliance<sup>11</sup> with both release detection and release prevention requirements by 4 percent compared to 2004, out of a total estimated universe of approximately 263,000 facilities. (The baseline compliance rate will be determined in 2004, but is estimated to be approximately 60 percent.<sup>12</sup>)
- ▼ Each year through 2008, minimize the number of confirmed releases at UST facilities to 10,000 or fewer. (Between FY 1999 and FY 2002, confirmed releases averaged 13,980.<sup>13</sup>)

## **Means and Strategies for Achieving Objective 3.1**

### **Reducing and Recycling Waste**

EPA's strategy for reducing waste generation and increasing recycling is based on (1) establishing and expanding partnerships with businesses, industries, states, communities, and consumers; (2) stimulating infrastructure development, new technologies, and environmentally responsible behavior by product manufacturers, users, and disposers ("product stewardship"); and (3) helping businesses, government, institutions, and consumers by providing education, outreach, training, and technical assistance.

### Promoting the Resource Conservation Challenge

The Resource Conservation Challenge (RCC), the Agency's primary vehicle for implementing this multi-component strategy, represents a major national effort to find flexible yet protective ways to conserve our valuable natural resources through waste reduction, recycling, and energy recovery.<sup>14</sup> The RCC is designed to elicit a response from all Americans, since we all have opportunities to reduce the waste we produce and to increase recycling. Through the RCC, EPA challenges Americans to make purchasing and disposal decisions that conserve our natural resources, save energy, reduce costs, and preserve the environment for future generations.

Currently, we are working with our partners to identify additional performance goals for the RCC that will supplement our existing strategic targets. These goals will reflect the expanded effort the Agency is beginning in 2003 to decrease the use and increase the recovery of materials and energy by reducing and recycling municipal, industrial, and hazardous wastes. As part of this effort, EPA will review waste generation and management practices to identify opportunities to reduce wastes, remove barriers to recycling and recovery, and promote safe beneficial uses. To further promote hazardous waste recycling, we will analyze changes in the amount of hazardous waste recycled and the factors

influencing these changes, including non-regulatory factors. Our ultimate goal is to move the Nation from a waste-oriented to a life-cycle-management way of thinking about materials. (The Agency is also encouraging industry to minimize the generation of priority-list chemicals in hazardous waste streams, an effort presented in 5.2.2 under Goal 5: Compliance and Environmental Stewardship.)

### Establishing and Expanding Partnerships

EPA will establish and expand its partnerships with industry, states, and other entities to reduce waste and develop and deliver tools that can help businesses, manufacturers, and consumers. Nationally recognized programs, such as WasteWise,<sup>15</sup> which uses voluntary partnerships to encourage waste prevention and recycling, will serve as models for new alliances among federal, state, and local governments and businesses that capitalize on voluntary efforts to reduce waste and increase recycling. EPA and the Nation will continue to benefit from well-established programs.

Another example of an expanded partnership program is the WasteWise Building Challenge, which EPA initiated in 2002.<sup>16</sup> This program will continue to promote development of new tools, such as waste-hauling contracts that provide financial incentives for haulers to identify and implement cost-effective, resource-efficient source reduction and recovery.

EPA will also continue to help our tribal partners improve practices for managing solid waste on Indian lands. EPA has direct implementation responsibility for RCRA hazardous waste and UST programs in Indian country. Recognizing the unique challenges encountered on tribal lands, EPA will work with tribes on a government-to-government basis that affirms the federal government's vital trust responsibility to 572 tribal governments and recognizes the importance of conserving natural resources for cultural uses. We will conduct joint projects to upgrade tribal solid waste management infrastructure, including plans, codes and ordinances; recycling programs; and other alternatives to open dumping. These efforts will help to prevent open dumping in Indian country in the future and allow clean up of existing dumps, reducing the risks that such dumps pose to human health and the environment.

### Stimulating Infrastructure Development, Product Stewardship, and New Technologies

Another key strategy for reducing waste is fostering development of infrastructure that will make it easier for businesses and consumers to reduce the waste they generate, acquire and use recycled materials, and purchase products containing recycled materials. EPA will continue to promote development of new and better recycling technologies and to explore ways to obtain energy or products from waste.

Several initiatives already underway demonstrate the potential of such efforts. EPA has

established voluntary product stewardship partnerships with manufacturers, retailers, and governmental and nongovernmental organizations to reduce the impacts that electronics and carpets can have on the environment throughout their lives. In January 2002, EPA, a carpet trade association, major manufacturers, and a variety of state and regional government organizations agreed to substantially reduce the amount of used carpet going to landfills. They also created a new industry-funded organization to support the development of recycling infrastructure and to provide for government procurement and market-development initiatives to support this undertaking.

EPA will also promote development of new and better recycling technologies and will explore ways to obtain energy or products from waste. For example, through bioreactor technology, the collection of landfill gases containing methane offers promise as a future source of energy. The Agency will continue to support initiatives that revamp technologies to reduce or eliminate the use of virgin materials, recover energy to produce power, and improve waste management.

#### Providing Education, Outreach, Training, and Technical Assistance

EPA will continue to work with major retailers, electronics manufacturers, and the amusement and motion picture industries to revitalize, create, and display conservation, waste prevention, and recycling messages. Communicated via movie and video trailers, posters targeted to schoolchildren, in-store displays and advertisements, and print and broadcast public service announcements, the messages will encourage consumers, young people, and underserved communities to make smarter, more responsible environmental decisions. The Agency and its partners will design activities that encourage students and teachers to start innovative recycling programs and will develop unique tools and projects to promote waste reduction, recycling, and neighborhood revitalization in Hispanic and African-American communities and on Indian lands.

#### **Managing Hazardous Wastes and Petroleum Products**

Recognizing that some hazardous wastes cannot yet be completely eliminated or recycled, the RCRA program works to reduce the risks of exposure to hazardous wastes by maintaining a “cradle-to-grave” approach to waste management.

#### Preventing Hazardous Releases from RCRA Facilities

EPA’s strategy for addressing hazardous wastes that must be treated or stored is based on achieving greater efficiencies at waste management facilities through more focused permitting processes and tightening standards where appropriate. We will work with our state, tribal, and local government partners to ensure that hazardous waste management facilities have approved controls in place and continue to strive for safe waste management.

EPA will work with authorized states—specifically, those with a large number of facilities lacking approved controls in place—to help resolve issues and transfer successful strategies from other states. We also plan to study the universe of unpermitted facilities and work with states to identify and resolve issues that might be preventing key categories of facilities from obtaining permits or putting other approved controls in place. To achieve greater efficiencies at facilities that treat or store hazardous waste, the Agency will also promote innovative technologies that streamline permitting processes and improve protection of human health and the environment.

#### Reducing Emissions from Hazardous Waste Combustion

EPA will continue to develop and issue regulations regarding emission standards for hazardous waste combustion facilities. Implementation of these regulations is key to reducing the emission of dioxins, furans, particulate matter, and acid gases. Within 2 years from the date when EPA issues new limits, facilities will conduct emission tests to demonstrate reductions. Additional periodic tests will ensure continued compliance with the limits established for emissions.

#### Preventing Releases from Underground Storage Tank Systems

EPA recognizes that the size and diversity of the regulated community puts state authorities in the best position to regulate USTs and to set priorities. RCRA Subtitle I allows state UST programs approved by EPA to operate in lieu of the federal program.<sup>17</sup> Except in Indian country, even states that have not received formal state program approval from EPA are in most cases the primary implementing agencies and receive annual grants from EPA.

While the frequency and severity of releases from UST systems have been greatly reduced, EPA and its state partners have observed that releases are still occurring. Improved release prevention and tank management practices and effective compliance assistance and enforcement activities can help reduce the number of confirmed releases.

In any given year, however, it is possible that factors such as greater field presence and discovery of older releases during site closures will increase the number of confirmed releases reported, potentially exceeding the Agency's annual strategic target numbers. Despite such apparent increases in releases, however, human health and the environment are being better protected than if the releases went undetected or unreported. EPA will continue to work with its state and tribal partners to prevent and detect petroleum releases from USTs by ensuring that compliance with release detection requirements and with release prevention requirements (e.g., spill, overfill, and corrosion protection) is a national priority. While the vast majority of the approximately 698,000 active USTs have the equipment required under the regulations, significant work remains to ensure that UST owners and operators maintain and operate their systems properly.<sup>18</sup> Therefore, in FY 2004, the Agency will

continue its evaluation of the performance of new or upgraded UST systems to better identify the causes of releases and to determine how successful leak detection systems are in quickly identifying releases. The Agency will also continue to identify opportunities for improving UST system performance.

To protect our Nation's ground water and drinking water from petroleum releases, EPA will continue to support state programs; strengthen partnerships among stakeholders; and provide technical assistance, compliance assistance, and training to promote and enforce UST facilities' compliance. In addition, EPA will continue its work to obtain states' commitments to increase their inspection and enforcement presence if state-specific goals are not met. The Agency and states will use innovative compliance approaches, along with outreach and education tools, to bring more tanks into compliance. For example, multi-site agreements can be effective in bringing a single tank owner with multiple sites into compliance. In Region 6, EPA successfully used a multi-site agreement to achieve compliance at approximately 25 UST facilities owned by a single company.

The Agency will also provide guidance to foster the use of new technology to enhance compliance. For example, the presence of methyl-tertiary-butyl-ether (MTBE) in gasoline increases the importance of preventing and rapidly detecting releases. Because releases that contain MTBE often require complicated ground-water cleanups, they are generally more expensive and take longer to address, affecting achievement of our national cleanup goals.<sup>19</sup> The Agency will focus its efforts on reducing UST releases and increasing early detection of petroleum products, including MTBE, by further evaluating the performance of compliant UST systems.

---

**Objective 3.2: Restore Land.** By 2008, control the risks to human health and the environment by mitigating the impact of accidental or intentional releases and by cleaning up and restoring contaminated sites or properties to appropriate levels.

**Sub-objective 3.2.1: Prepare for and Respond to Accidental and Intentional Releases.**

By 2008, reduce and control the risks posed by accidental and intentional releases of harmful substances by improving our Nation's capability to prepare for and respond more effectively to these emergencies.

Strategic Targets:

- Each year through 2008, improve the Agency's emergency preparedness by achieving and maintaining the capability to respond to simultaneous large-scale emergencies and by increasing response readiness by 10 percent from a baseline established by the end of 2003 using the core emergency response

criteria.

- Each year through 2008, respond to 350 hazardous substance releases and 300 oil spills.
- Each year through 2008, minimize impacts of potential oil spills by inspecting or conducting exercises or drills at 6 percent of approximately 6,000 oil storage facilities required to have Facility Response Plans. (Between FY 1997 and FY 2002, 30 percent of these facilities were inspected.<sup>20</sup>)

**Sub-objective 3.2.2: Clean Up and Reuse Contaminated Land.** By 2008, control the risks to human health and the environment at contaminated properties or sites through cleanup, stabilization, or other action, and make land available for reuse.

Strategic Targets:

- By 2008, perform 88,000 health and environmentally based site assessments and make 41,700 final-assessment decisions under Superfund, and assess 100 percent (approximately 1,714) RCRA baseline facilities.<sup>21</sup> Universe of RCRA baseline facilities will be evaluated and, if necessary, adjusted in FY 2004.
- By 2008, control all identified unacceptable human exposures from site contamination to at or below health-based levels for current land and/or ground-water use conditions at 95 percent (approximately 1,628) of RCRA baseline facilities<sup>22</sup> and 84 percent (1,259) of 1,494<sup>23</sup> Superfund human exposure sites (as of FY 2002).
- By 2008, control the migration of contaminated ground water through engineered remedies or natural processes at 80 percent (approximately 1,371) of RCRA baseline facilities<sup>24</sup> and 65 percent (832) of 1,275<sup>25</sup> Superfund ground-water exposure sites (as of FY 2002).
- By 2008, select final remedies (cleanup targets) at 30 percent (approximately 514) of RCRA baseline facilities and approximately 82 percent (1,223) of 1,498<sup>26</sup> Superfund sites (as of FY 2002).
- By 2008, clean up and reduce the backlog of approximately 140,000 leaking UST sites by 50 percent, and complete construction of remedies at 20 percent (approximately 343) of RCRA baseline facilities<sup>27</sup> and approximately 72

percent (1,086) of 1,498<sup>28</sup> Superfund sites (as of FY 2002). (Construction completion is a benchmark used to show that all significant construction activity has been completed, even though additional remediation may be needed for all cleanup goals to be met.)

**Sub-objective 3.2.3: Maximize Potentially Responsible Party Participation at Superfund Sites.** Through 2008, conserve Superfund trust fund resources by ensuring that potentially responsible parties conduct or pay for Superfund cleanups whenever possible.<sup>29</sup>

Strategic Targets:

- ▼ Each year through 2008, reach a settlement or take an enforcement action before the start of a remedial action at 90 percent of Superfund sites having viable, liable responsible parties other than the federal government.
- ▼ Each year through 2008, address all Statute of Limitations cases for Superfund sites with unaddressed total past costs equal to or greater than \$200,000.

## **Means and Strategies for Achieving Objective 3.2**

EPA leads the country's activities to reduce the risks posed by releases of harmful substances and by contaminated land. The most effective approach to controlling these risks incorporates developing and implementing prevention measures, improving response capabilities, and maximizing the effectiveness of response and cleanup actions. This approach will help ensure that human health and the environment are protected and that land is returned to beneficial use.

### **Preparedness and Response**

EPA plays a major role in reducing the risks that accidental and intentional releases of harmful substances and oil pose to human health and the environment. Under the National Response System (NRS), EPA evaluates and responds to thousands of releases annually. The NRS is a multi-agency preparedness and response mechanism that includes the following key components: the National Response Center; the National Response Team (NRT), composed of 16 federal agencies; 13 Regional Response Teams; and federal On-Scene Coordinators (OSCs). These organizations work with state and local officials to develop and maintain contingency plans that will enable the Nation to respond effectively to hazardous substance and oil emergencies. When an incident occurs, these groups coordinate with the OSC in charge to ensure that all necessary resources, such as personnel and equipment, are available and that containment, cleanup, and disposal activities proceed quickly,

efficiently, and effectively. EPA's primary role in the NRS is to serve as the federal OSC for spills and releases in the inland zone. As a result of NRS efforts, the Nation has successfully contained many major oil spills and releases of hazardous substances, minimizing the adverse impacts on human health and the environment.

EPA's emergency preparedness, prevention, and response staff are vital to this work. We will continue to develop technical personnel in the field, ensuring their readiness and protecting their health and safety when responding to releases of dangerous materials. In addition, EPA will strengthen its information infrastructure by making information management decisions Agency-wide and by improving operations and the security, collection, and exchange of information.

### Preparing for Emergencies

Preparedness on a national level is essential to ensure that emergency responders are able to deal with multiple, large-scale emergencies, including those that may involve chemicals, oil, biological agents, or weapons of mass destruction. Over the next several years, EPA will enhance its core emergency response program to respond quickly and effectively to chemical, oil, biological, and radiological releases and will improve coordination mechanisms to enable response to simultaneous, large-scale national emergencies, including homeland security incidents. We will focus our efforts on Regional Response Teams and coordination among regions; health and safety issues, including provision of clothing that protects and identifies responders, training, and exercise; establishment of delegation and warrant authorities; and response readiness, including equipment, transportation, and outreach. The criteria for excellence in the core emergency response program will ensure a high level of overall readiness throughout the Agency and improve our ability to support multi-regional responses.

In addition to enhancing our readiness capabilities, EPA will work to improve internal and external coordination and communication mechanisms. For example, as part of the National Incident Coordination Team, EPA will continue to improve its policies, plans, procedures, and decision-making processes for coordinating responses to national emergencies. Under the Continuity of Operations/Continuity of Government program, we will upgrade and test plans, facilities, training, and equipment to ensure that essential government business can continue during a catastrophic emergency. NRT capabilities are being expanded to coordinate interagency activities during large-scale responses. EPA will coordinate its activities with the Department of Homeland Security, Federal Emergency Management Administration (FEMA), Federal Bureau of Investigation (FBI), other federal agencies, and state and local governments. EPA will also continue to clarify its roles and responsibilities to ensure that Agency security programs are consistent with the national homeland security strategy.

### Responding to Hazardous Substance Releases and Oil Spills

Each year, EPA personnel assess, respond to, mitigate, and clean up thousands of releases—whether accidental, deliberate, or naturally occurring. These incidents range from small spills at chemical or oil facilities to national disasters, such as hurricanes, earthquakes, terrorist events like the 2001 World Trade Center/Pentagon and anthrax attacks, and the 2003 Columbia shuttle tragedy.

EPA will work to improve its capability to respond effectively to incidents that can involve harmful chemical, oil, biological, and radiological substances. As part of its strategy for improving effectiveness, the Agency will explore improvements in response readiness levels, including field and personal protection equipment and response training and exercises; review response data provided in the “after-action” reports prepared by EPA emergency responders following a release; and examine “lessons learned” reports to identify which activities work and which need to be improved. Application of this information and other data will advance the Agency’s state-of-the-art emergency response operations.

### Preventing and Preparing for Oil Spills

An important component of EPA’s land strategy is preventing potential oil spills and being prepared for spills that do occur from reaching our Nation’s waters. Under the Oil Pollution Act,<sup>30</sup> the Agency requires certain facilities (defined in 40 CFR 112.2) to develop Facility Response Plans and to practice implementing the plans by conducting drills and exercises to be prepared in the event of a spill. Compliance with these requirements reduces the number of oil spills that reach navigable waters and prevents detrimental effects on human health and the environment should a spill occur.

### **Controlling Risks at Contaminated Sites**

Leaching contaminants can foul drinking water in underground aquifers used for wells or surface waters used by public water intakes. Contaminated soil can result in human ingestion or dermal absorption of harmful substances. Contamination can also affect subsistence resources, including resources subject to special protections due to treaties between federal and tribal governments. Furthermore, because of the risks it poses, contaminated land may not be available for use.

EPA and its partners work to clean up contaminated land to levels sufficient to control risks to human health and the environment and to return the land to productive use. The Agency’s cleanup activities, some new and some well-established, include removing contaminated soil, capping or containing contamination in place, pumping and treating ground water, and bioremediation.

EPA uses a variety of tools to accomplish cleanups: permits, enforcement actions, consent agreements, Federal Facilities Agreements, and many other mechanisms. As part of EPA’s One Cleanup Program Initiative, programs at all levels of government work together to ensure that

appropriate cleanup tools are used; that resources, activities, and results are coordinated with partners and stakeholders and communicated to the public effectively; and that cleanups are protective and contribute to community revitalization.<sup>31</sup> This approach reflects EPA's efforts to coordinate across all of its cleanup programs, while maintaining the flexibility needed to accommodate differences in program authorities and approaches.

EPA fulfills its cleanup and waste management responsibilities on tribal lands by acknowledging tribal sovereignty and recognizing tribal governments as being the most appropriate authorities for setting standards, making policy decisions, and managing programs consistent with Agency standards and regulations.

Through strong policy, leadership, program administration, and a dedicated workforce, EPA's cleanup programs will merge sound science, cutting-edge technology, quality environmental information, and stakeholder involvement to protect the Nation from the harmful effects of contaminated property. To accomplish its cleanup goals, the Agency will continue to forge partnerships and develop outreach and education strategies.

#### Assessment, Stabilization, and Cleanup

EPA and its partners follow four key steps to accomplish cleanups and control risks to human health and the environment: assessment, stabilization, selection of appropriate remedies, and implementation of remedies. We will continue to work with our federal, state, tribal, and local government partners at each step of the process to identify facilities and sites requiring attention and to monitor changes in priorities, addressing new priority sites or removing previously identified facilities that will be addressed through other mechanisms. For example, EPA is collecting tribal program baseline data for the Superfund program and has modified the Superfund data system to record sites of concern to tribes, along with those situated on Indian lands. As they modify existing systems and approaches and create new ones, cleanup programs will also continue to develop guidance for accomplishing each of these steps.

#### *Assessing Sites*

All cleanup programs assess preliminary site information to identify potential exposures and sites or facilities that require further action. These assessments flag sites that will require priority action to protect human health and the environment and also direct site owners and operators to the appropriate authorities for followup. To establish a common base of information for all stakeholders, EPA conducts site assessments with all partners who share authority for the site.

#### *Stabilizing Sites*

“Stabilization” refers to the initial actions taken to control actual or potential exposure, based on current land and ground-water use. Site stabilization activities can include installing hazardous waste containment remedies (such as slurry walls or impermeable caps) and ground-water remedies (such as pump-and-treat systems or permeable reactive walls). Where appropriate, these actions are taken immediately to protect populations located within a reasonable distance from the site from exposure to harmful contaminants.

### *Selecting Site Remedies*

In selecting final remedies, the Agency seeks to address all current and potential sources of contamination that threaten human health and the environment. Remedies are selected based on many criteria, including the protectiveness they offer, environmental media cleanup objectives, their short- and long-term effectiveness, implementation issues, and their acceptability to state and tribal governments and the affected community. In selecting remedies, EPA and its partners also consider reasonably anticipated future land use.

### *Implementing Site Remedies*

Implementation or construction of the site remedy is the first step in the final remediation process. Following implementation, EPA encourages monitoring the site to ensure that the cleanup adequately protects human health and the environment.

EPA is also planning several projects to help us characterize the results of various cleanup programs. These projects are intended to evaluate: (1) the placement of Superfund sites into exposure reduction categories based on cleanup progress, (2) the degree to which ecological receptors are protected from hazardous substances through cleanup activities, and (3) the economic impact of cleanup activities.

### *Reusing and Restoring Land*

Usable land is a valuable resource. However, where contamination presents a real or perceived threat to human health and the environment, options for future land use at that site may be limited. EPA’s cleanup programs have set a national goal of returning formerly contaminated sites to long-term, sustainable, and productive use. This goal creates greater impetus for selecting and implementing remedies that, in addition to providing clear environmental benefits, will support reasonably anticipated future land use options and provide greater economic and social benefits.

We are evaluating our policies and guidelines to determine where we can refine our approach to cleanups to facilitate beneficial site reuse. We are also forming partnerships with states, tribes, other federal agencies, local governments, communities, landowners, lenders, developers, and parties potentially responsible for contamination that can help bring about reuse of formerly contaminated sites.

(Also see the discussion of EPA's Brownfields Program under Goal 4: Healthy Communities and Ecosystems.)

### **Maximizing Potentially Responsible Party Participation at Superfund Sites**

Enforcement authorities play a critical role in all Agency cleanup programs. However, they have an additional and unique role under the Superfund program: they are used to leverage private-party resources to conduct a majority of the cleanup actions and to reimburse the federal government for cleanups financed by the Trust Fund. EPA will continue to pursue the following two strategies for limiting the use of trust funds.

#### Applying Superfund "Enforcement First"

The Superfund program's "Enforcement First" strategy will allow EPA to focus limited Trust Fund resources on sites where viable, potentially responsible parties either do not exist or lack the funds or capabilities needed to conduct the cleanup. By taking enforcement actions at sites where viable, liable parties do exist, EPA will continue to leverage private-party dollars so that Trust Fund money is used only when absolutely necessary to clean up hazardous waste sites.

#### Recovering Costs

Cost recovery is another way to leverage private-party resources through enforcement. Under Superfund, EPA has the authority to compel private parties to pay back Trust Fund money spent to conduct cleanup activities.<sup>32</sup> EPA will continue its efforts to address 100 percent of the Statute of Limitations cases for Superfund sites with unaddressed total past costs equal to or greater than \$200,000 and to report the value of costs recovered.

---

**Objective 3.3: Enhance Science and Research.** Through 2008, provide and apply sound science for protecting and restoring land by conducting leading-edge research and developing a better understanding and characterization of environmental outcomes under Goal 3.

**Sub-objective 3.3.1: Provide Science to Preserve and Remediate Land.** Through 2008, provide sound science and constantly integrate smarter technical solutions and

protection strategies that enhance our ability to preserve land quality and remediate contaminated land for beneficial reuse.

**Sub-objective 3.3.2: Conduct Research to Support Land Activities.** Through 2008, conduct sound, leading-edge scientific research to provide a foundation for preserving land quality and remediating contaminated land. Research will result in documented methods, models, assessments, and risk management options for program and regional offices, facilitating their accurate evaluation of effects on human health and the environment, understanding of exposure pathways, and implementation of effective risk-management options. Conduct research affecting Indian country in partnership with tribes.

## **Means and Strategies for Achieving Objective 3.3**

### **Science to Preserve and Remediate Land**

EPA will continue to improve its capability to assess environmental conditions and determine the relative risks that contaminated land poses to health and the environment. The Agency will ensure that the environmental data it collects are of known, documented, and acceptable quality by implementing necessary field and lab procedures, practices, and controls. We will continue integrating technological advances to enhance our site investigation capabilities, implement cost-effective remedies, and improve the operation and maintenance of existing remedies. In addition, we will continue to coordinate with other agencies to identify and communicate program research priorities.

### **Research to Preserve and Remediate Land**

To achieve our objectives for land, EPA's Office of Research and Development (ORD) has developed multi-year plans for research on contaminated sites and RCRA issues. Each of these research plans outlines our long-term goals for the next 5 to 10 years and describes targets the Agency intends to meet to reduce scientific uncertainties associated with these topics.<sup>33</sup>

### **Research to Clean Up and Reuse Contaminated Land**

To support cleanup and reuse of contaminated lands, we will conduct research to provide improved methods for site characterization, risk assessment and exposure analysis, and mitigation approaches. Through the Superfund Innovative Technology Evaluation Program, we will demonstrate and verify cost-effective technologies for characterizing and remediating contaminated sites. By providing site-specific technical support to site managers, we will enhance our communication of state-of-the-art methods. In addition, we will provide research results and advice to further apply sound

science in regulatory and nonregulatory efforts. More specifically, Agency research on contaminated sites will:

- Aid in selecting protective, cost-effective remedies for contaminated sediment by improving risk and site characterization and increasing understanding of different remedial options.
- Provide decision-makers with performance and cost information on alternatives to pump-and-treat remedies for ground water and tools for characterizing and assessing ground water.
- Provide tools and methods for assessing, remediating, and managing soil and land efficiently at contaminated sites.
- Provide scientific tools, methods, models, and technical support to characterize multimedia site contamination; assess, predict, and communicate risks; evaluate innovative remediation options; develop testing protocols and risk management strategies; and identify the fate and effects of oil spills.

#### Research to Preserve Land

EPA will provide a tested multimedia modeling system, peer-reviewed technical reports, and technical support to enable scientifically sound, consistent decisionmaking at RCRA sites and facilities. ORD is directing resources to assist in implementing RCC and will evaluate waste-derived products to ensure that materials that would otherwise require waste disposal are not presenting other environmental issues. To support our goals for increasing materials recovery and recycling, ORD is also investing in research on electronics waste recycling and plans to develop sampling guidance and risk screening, which we can provide to states and other stakeholders that are developing recycling programs to handle this new waste stream.

ORD is working on leaching issues and treatment technologies to support our commitment to evaluate the effectiveness of leaching methods and hard-to-treat wastes. To ensure that wastes are properly managed and contained and enhance the performance of landfill operations, we are evaluating different liners and landfill covers. ORD bioreactor research is supporting such current regulatory efforts as the Research Development and Demonstration rule for landfills and is producing products, such as a recently developed monitoring approach, that states can use in managing landfill sites. Finally, by evaluating dioxin/furan emissions, surrogates, and continuous monitoring systems, ORD's in-house and grants programs also support our objective for reducing hazardous waste facility combustion emissions of dioxins and furans.

## EXTERNAL FACTORS

EPA's ability to respond as the federal OSC for releases of harmful substances in the inland zone will be affected by several external factors. The NRS ensures that EPA will respond when necessary, but relies heavily on the ability of responsible parties and state, local, and tribal agencies to respond to most emergencies. The need for EPA to respond is a function of the quantity and severity of spills that occur, as well as the capacity of state, local, and tribal agencies to address spills.

EPA's ability to respond to homeland security incidents may be affected by circumstances surrounding each event. For instance, if travel or communication is severely impeded, EPA's response may be delayed and its efficiency compromised. Also, in the case of a single large-scale incident, our Removal Program resources will most likely be concentrated on that response, thus reducing our ability to address other emergency releases. In severe cases, EPA's current emergency response workforce and resources may not be sufficient to address a large number of simultaneous large-scale incidents.

In addition, a number of external factors could substantially affect the Agency's ability to achieve its objectives for cleanup and prevention. These factors include Agency reliance on private-party response and state and tribal partnerships, development of new environmental technologies, work by other federal agencies, and statutory barriers. Achieving the release prevention objectives and attaining our FY 2008 targets will depend heavily on the participation of states that have been authorized or approved to be the primary implementors of these programs.

Attaining our waste reduction and recycling objectives will depend on the participation of federal agencies, states, tribes, local governments, industries, and the general public in partnerships aimed at reducing waste generation and increasing recycling rates. EPA provides national leadership in the areas of waste reduction and recycling to facilitate public and private partnerships that can provide the impetus for government, businesses, and citizens to join in the campaign to significantly reduce the amount of waste generated and ultimately sent for disposal. However, both domestic and foreign economic stresses can adversely affect markets for recovered materials.

State programs are primarily responsible for implementing the RCRA Hazardous Waste and UST programs. Our ability to achieve our goals for these programs depends on the strength and funding levels of state programs. Similarly, our success in meeting compliance standards depends on extensive training and a strong state presence. To increase UST compliance, EPA will build upon its commitment to provide states and tribes with technical support and training.

### **Human Capital Focus For Achieving Goal 3**

EPA's workforce planning, hiring and training activities will emphasize:

- State-of-the-art techniques to detect, analyze, and respond to chemical, biological, and radiological agents
- Incident command system response management processes
- Insurance, real estate, and remediation strategies
- Characterization, monitoring, and sampling methods
- Multimedia and health/ecosystem effects estimation modeling methodologies
- Chemical treatment, land, combustion, and containment technologies.

Success also depends on using innovative education methods and providing a variety of tools to state, tribal, and local government partners to promote energy efficiency, conservation, and reuse of materials.

### **Efficiency Measures For Goal 3**

Efficiency measures relate results to the resources or time invested to achieve those results and augment effectiveness measures in evaluating performance. They help us integrate EPA's budget and performance—part of the President's Management Agenda—and demonstrate the cost-effectiveness and timeliness of program activities.

Under this goal, the RCRA Corrective Action Program is developing an efficiency measure that tracks the cost over time of meeting current objectives, such as controlling unacceptable human exposures from site contamination or the migration of contaminated ground water through engineered remedies or natural processes.

## Notes

1.42 U.S. Code 9601-9675

2.42 U.S. Code 6901-6992k

3.42 U.S. Code 7401-7671q

4.33 U.S. Code 1251-1387

5.33 U.S. Code 2701-2761

6.U.S. Environmental Protection Agency. June 2002. *Characterization of Municipal Solid Waste in the United States - 2000 Update*. Washington, DC: Government Printing Office. Available online at <http://www.epa.gov/epaoswer/non-hw/muncpl/msw99.htm> Last updated October 29, 2002.

7.U.S. Environmental Protection Agency. June 2002. *Characterization of Municipal Solid Waste in the United States - 2000 Update*. Washington, DC: Government Printing Office. Available online at <http://www.epa.gov/epaoswer/non-hw/muncpl/msw99.htm> Last updated October 29, 2002.

8.U.S. Environmental Protection Agency. *Resource Conservation and Recovery Act Information System (RCRAInfo)*, Hazardous Waste Facility Permitting Accomplishments. Available online at <http://www.epa.gov/epaoswer/hazwaste/permit/charts/charts.pdf>; EPA Office of Solid Waste. Last updated July 1, 2003.

9.Approximately 2,750 hazardous waste management facilities are currently regulated under RCRA. EPA plans to reassess this “universe” in FY 2006. Facilities that started activities subject to hazardous waste permitting after October 1, 1997, will be included in the count; facilities that should not have been counted (such as those coded as “never regulated,” “protective filers,” or “state regulated”) will be removed.

10.Information derived from: Data base of permit and compliance demonstration test results. Data base available at <http://www.epa.gov/epaoswer/hazwaste/combust/comwsite/cmb-noda.htm>  
Data availability was also published in 67 *Federal Register* 44452 - 44460, July 2, 2002 and 65 *Federal Register* 39581, June 27, 2000.

11.Determination of “significant operational compliance” begins in FY 2004. Previously, compliance depended on two determinations. Recently, an EPA/state workgroup adjusted the definition of significant operational compliance to increase consistent national reporting. Therefore, the current baseline of 60 percent compliance is uncertain, since FY 2004 is the first reporting period.

12. Memorandum from Sammy K. Ng, Acting Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Regional Program Managers. November 19, 1999. *FY99 End of Year Semi-Annual Activity Report*.

Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground

Storage Tank Regional Program Managers. November 16, 2000. *FY00 End of Year Semi-Annual Activity Report*.

Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Regional Division Directors, Regions 1-10. January 29, 2002. *FY2001 Semi-Annual (End of Year) Activity Report*.

Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Regional Division Directors, Regions 1-10. December 23, 2002. *FY 2002 End-of-Year Activity Report*.

13. Memorandum from Sammy K. Ng, Acting Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Regional Program Managers. November 19, 1999. *FY99 End of Year Semi-Annual Activity Report*.

Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Regional Program Managers. November 16, 2000. *FY00 End of Year Semi-Annual Activity Report*.

Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Regional Division Directors, Regions 1-10. January 29, 2002. *FY2001 Semi-Annual (End of Year) Activity Report*.

Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Regional Division Directors, Regions 1-10. December 23, 2002. *FY 2002 End-of-Year Activity Report*.

14. U.S. Environmental Protection Agency, Office of Solid Waste. Resource Conservation Challenge Web Site: <http://www.epa.gov/epaoswer/osw/conserves/index.htm>. Washington, DC. Last updated August 20, 2003.

15. U.S. Environmental Protection Agency, Office of Solid Waste, WasteWise Program Web Site, About WasteWise Page: <http://www.epa.gov/wastewise/about/index.htm>. Washington, DC. Last updated February 4, 2003.

16. U.S. Environmental Protection Agency, Office of Solid Waste, WasteWise Program Web Site, Building Challenge Web Page: <http://www.epa.gov/wastewise/wrr/cbuild.htm>. Washington, DC. Last updated September 27, 2002.

- 17.42 U.S. Code 6901-6992k

18. Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Division Directors in EPA Regions 1-10. June 19, 2003. *FY 2003 Semi-Annual (Mid-Year) Activity Report*.

19. New England Interstate Water Pollution Control Commission. 2000. *A Survey of State Experiences with MTBE Contamination at LUST Sites*. Web Site: <http://www.neiwpcc.org/mtbemain.html>

20. U.S. Environmental Protection Agency. CERCLIS Database, Superfund Comprehensive Accomplishments Plan Report, Version 8. Web Site: <http://www.epa.gov/superfund/sites/npl/current>.

21. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Corrective Action/Facility Information Web Site: <http://www.epa.gov/epaoswer/hazwaste/ca/facility.htm#RCRA>. Washington, DC. Last updated October 8, 2002.

RCRA baseline facilities are RCRA facilities with corrective action obligations that EPA and the authorized states have identified as highest priority. In FY 2004, EPA and the authorized states will reevaluate and, if necessary, adjust the current list of 1,714 facilities.

22. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Corrective Action/Facility Information Web Site: <http://www.epa.gov/epaoswer/hazwaste/ca/facility.htm#RCRA>. Washington, DC. Last updated October 8, 2002.

RCRA baseline facilities are RCRA facilities with corrective action obligations that EPA and the authorized states have identified as highest priority. In FY 2004, EPA and the authorized states will reevaluate and, if necessary, adjust the current list of 1,714 facilities.

23. U.S. Environmental Protection Agency. Superfund Information System CERCLIS database. Web Site: <http://www.epa.gov/superfund/sites/npl/current.htm>. Date of access: October 16, 2002.

24. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Corrective Action/Facility Information Web Site: <http://www.epa.gov/epaoswer/hazwaste/ca/facility.htm#RCRA>. Washington, DC. Last updated October 8, 2002.

RCRA baseline facilities are RCRA facilities with corrective action obligations that EPA and the authorized states have identified as highest priority. In FY 2004, EPA and the authorized states will reevaluate and, if necessary, adjust the current list of 1,714 facilities.

25. Analysis of information from CERCLIS database conducted by EPA's Office of Superfund Remediation and Technology Innovation /Planning Analysis and Resources Management staff, March 2001.

26. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Superfund Accomplishment Figures, Summary Fiscal Year 2003 Web Site: <http://www.epa.gov/superfund/action/process/numbers.htm>. Last updated April 7, 2003.

27. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Corrective Action/Facility Information Web Site: <http://www.epa.gov/epaoswer/hazwaste/ca/facility.htm#RCRA>. Washington, DC. Last updated October 8, 2002.

RCRA baseline facilities are RCRA facilities with corrective action obligations that EPA and the authorized states have identified as highest priority. In FY 2004, EPA and the authorized states will reevaluate and, if necessary, adjust the current list of 1,714 facilities.

28. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Superfund Accomplishment Figures, Summary Fiscal Year 2003 Web Site: <http://www.epa.gov/superfund/action/process/numbers.htm>. Washington, DC. Last updated April 7, 2003.

29. The Superfund Program began when Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980. The law created a revolving Trust Fund, which is also known as the Superfund. This large pot of money is used by EPA and other agencies to clean up hazardous waste sites. The Trust Fund is used primarily when those companies or people responsible for the contamination at Superfund sites cannot be found or cannot perform the cleanup or pay for the cleanup work. To make sure that those responsible clean up or pay for the cleanup as much as possible, EPA's Superfund Enforcement program identifies the companies or people responsible for contamination at a site and negotiates with them to do the cleanup. If EPA pays for some or all of the cleanup at a site and then finds the people responsible, EPA can recover from them the money it spent. The Fund was largely financed by a tax on crude oil and 42 commercially used chemicals. The taxing authority expired December 31, 1995.

30. 33 U.S. Code 2701-2761

31. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. One Cleanup Program Web Site: <http://www.epa.gov/swerrims/onecleanupprogram/index.htm>. Washington, DC. Last updated May 9, 2003.

32. 42 U.S. Code 9601-9675, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Sec. 107.

33. For more information on ORD's multi-year plans, visit: U.S. Environmental Protection Agency, Office of Research and Development. Research Directions, Multi-Year Plans Web Site: <http://www.epa.gov/osp/myr.htm>. Last updated August 26th, 2003.