

CROSS-GOAL STRATEGIES

Many of EPA's efforts—strengthening our partnerships with states and tribes, improving the quality and availability of the environmental and health information on which we base our decisions, and improving our management systems to achieve better results—contribute to our progress toward all five of our goals. This cross-Agency, cross-media work includes both support functions, such as administrative and financial management or legal services, and the strategies or means we employ to help accomplish our objectives, such as science and research or information management.

Each of these efforts is a significant component of our work and plays a critical role in the accomplishment of all of our goals. This chapter highlights a few of these cross-goal strategies: Partnerships, Information, Innovation, Human Capital, Science, Homeland Security, and Economic and Policy Analysis. For each, we will discuss the Agency's approach, explain how the strategy will contribute to the achievement of our goals, and describe some of the activities we will conduct and results we hope to achieve using this approach.

Partnerships

The advances made in protecting our Nation's health and environment since EPA was established would not have been possible without state, tribal, and local government participation and support. EPA is committed to strengthening these partnerships and, recognizing the unique concerns and contributions that each of us brings to the table, to working together to address environmental problems and achieve results. The discussion that follows outlines our approach to establishing and improving our partnerships with states and tribes.

State Partnerships

EPA's partnership strategy is based on the belief that states and EPA are equal partners in the national effort to protect human health and the environment. Progress toward all five of our *Strategic Plan* goals depends not only on EPA's efforts, but on the efforts of all 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and the Islands of the Pacific Insular areas.

Most of the Nation's environmental laws envision a strong role for state governments in managing environmental and human health protection programs. National laws set certain goals,

standards, and approaches for environmental protection to which EPA and our state partners are committed. But environmental issues and problems can vary from region to region, and EPA is also committed to adapting to these situations.

As state environmental authority and management capacity have grown over the past three decades, EPA has delegated or authorized primary responsibility to states for implementing many day-to-day program activities, such as issuing permits, conducting compliance and enforcement programs, and monitoring environmental conditions. States' direct administration of environmental and human health protection programs—along with EPA oversight to ensure, through compliance with federal statutes and achievement of national objectives, that all Americans have a healthy environment—has brought about significant improvements in the environment and human health across the country.

In 1995, the states and EPA agreed on the series of principles that guide our collaborative work. Articulated in the *Joint Commitment to Reform Oversight and Create the National Environmental Performance Partnership System*, the “NEPPS Agreement,” these principles call upon the states and EPA to set priorities jointly; develop performance agreements to define their roles, responsibilities, and accountability; encourage innovative environmental and human health protection strategies; agree upon performance measures; and jointly evaluate the results achieved.

The states and EPA use a variety of tools to define their relationship and guide their implementation of the Nation's environmental laws and the principles of the NEPPS Agreement. These tools include performance partnership agreements (PPAs), performance partnership grants (PPGs) and/or categorical program grants to states, enforcement agreements, and primacy delegation or authorization agreements. In addition to the Performance Partnership System, EPA works with a variety of associations representing state environmental agencies, such as the National Governor's Association, the Environmental Council of the States, and other organizations that deal with specific environmental media, such as the Association of State and Interstate Water Pollution Control Administrators. We also work with state agricultural and public health agencies on environmental protection efforts.

In 2002 and 2003, state environmental commissioners and senior EPA managers conducted a joint evaluation of the Performance Partnership System. They found the Partnership to be based on sound principles, which guide a flexible process for adapting environmental goals to local conditions. The evaluation indicated that, by breaking down organizational and media-program barriers, states and EPA regional offices are building trust. Increased joint planning and priority setting have focused state and EPA regional office efforts on achieving results, increased work sharing and emphasized cross-media approaches, allowed more flexibility in funding, and reduced oversight and reporting that is not value-added.

In addition to these positive findings, the joint evaluation identified several problem areas for improvement. These included concerns that EPA's priority-setting and planning processes (including PPAs, issuance of national program guidance, budgeting, and accountability systems) are not aligned in a way that fosters joint planning and priority setting across media program lines.

In addition, transaction costs for developing PPAs were believed to be too high for the benefits obtained. States enter EPA's planning process too late to enable the PPA to reflect a true partnership, hampering the use of the PPA as a definitive agreement to guide EPA-state operating relationships.

Improving Alignment

Working with our state partners, we intend to better align our priority setting, planning and budgeting processes and develop PPAs that can definitively guide our relationship. Aligning EPA and state strategic planning processes will allow us to better inform, influence, and reflect one another's priorities and approaches to achieving our environmental protection goals. In developing this *Strategic Plan*, for example, EPA has sought earlier state input on strategies and priorities. Similarly, soliciting state input early in developing EPA's new Regional Plans will influence how EPA Regions will work with their state and tribal partners to help achieve the Agency's strategic goals and objectives.

This early consultation with our partners is also important as we develop National Program Guidance and conduct our annual planning and budgeting. We are reforming these processes to lower transaction costs by focusing on results, synchronizing processes across program areas, and reducing targets and indicators to the fewest necessary to ensure accountability for results and inform national program management. We will continue to work with our partners to develop and use better performance measures that focus on outcomes and provide accountability.

Improving Performance Partnership Agreements and Grants

We are working to make development of PPAs less burdensome and more meaningful by engaging with our state partners early and through more transparent processes. Early state input to EPA's *Strategic Plan*, regional plans, *Annual Plan and Budget*, and national program guidance will lower transaction costs of developing PPAs by minimizing surprises and reducing conflicts that can arise during the preparation of the PPA itself. Resolving potential conflicts early on will enable states and EPA to rely on the final PPA to define roles, responsibilities, and accountability of all partners, thereby making the PPA definitive for the program areas and time period it addresses. Such a definitive agreement will address environmental performance expectations and provide for joint EPA-state performance evaluations that will hold both accountable. We will continue to work with our state partners through a joint evaluation process to identify ways to improve and advance PPAs and the methods by which they are developed and negotiated.

Further, recognizing that states and their environmental issues and concerns are diverse, EPA will continue to develop a range of PPAs tailored to state needs. These PPAs will contain elements essential to ensure alignment, accountability, and a clear definition of the agreement. We will base priorities, strategies, and activities on a level of reasonable strategic thinking. The PPA will be related to architecture presented in EPA's *Strategic Plan*, will include both programmatic and environmental measures, and will outline a process for possible changes during its term.

In addition, EPA is working with states to achieve greater value from PPGs. We are conducting a structured, three-part effort to evaluate and remove barriers that prevent EPA and states from taking greater advantage of the flexibility that PPGs provide. First, we will identify and assess legal and administrative barriers. Next, state and federal front-line grant managers and negotiators will develop plans for reducing barriers and increasing use of PPG flexibility. Finally we will build on these efforts to develop a training module and a best practices guide.

The movement across all levels of government to focus work on achieving performance results continues to grow. Our efforts to manage for better results; improve environmental indicators; promote innovation; and establish an exchange network that will allow EPA, states, and the public better access to environmental data demonstrate our support for this burgeoning movement. Strengthening our working relationship with the states is an important part of this performance management effort. Together, these initiatives will help to focus the entire national environmental protection system on achieving improved results.

Tribal Partnerships

EPA's mission—to protect human health and the environment—applies to all our Nation, including Indian country and Alaska Native Villages. In carrying out our mission, we will build on our strong foundation of working with our tribal partners to ensure that our efforts encompass all U.S. lands, regardless of ownership status or jurisdiction.

Tribes have unique cultural, jurisdiction, and legal issues that present special challenges to the coordination and implementation of environmental management activities in Indian country. EPA's 1984 Indian Policy formally recognized the uniqueness of tribal jurisdictional lands. Vital to that policy is the principle that EPA works with tribes on a government-to-government basis that reaffirms the federal trust responsibility to tribes. Therefore, EPA's work toward a comprehensive plan of environmental protection activities in Indian country and Alaska Native Villages must use innovative approaches and coordinated programs that complement tribal government structures, incorporate tribal priorities, and recognize tribal cultural considerations.

EPA's work with tribes is about more than physical landscapes, rules, regulations, matters of jurisdiction, and funding. We recognize that Indian people have distinct ways of life that set them apart from other Americans. Their cultural survival depends on the protection and vitality of their tribal homelands. Therefore, protecting that environment and ensuring equitable environmental protection in Indian country and Alaska Native Villages is critical to maintaining the vibrancy of tribal culture.

The Agency will collaborate with tribes by tailoring environmental programs to protect the natural resources and traditional ways of life and to complement tribal government structures. The improvements and benefits of PPAs and PPGs are also available to tribes. As we strive to advance consistency and equitable environmental protection in Indian country and for Alaska Native Villages, EPA will promote development of metrics under all of our strategic goals that indicate performance and environmental results for tribes. Where we lack environmental data for Indian country, we will continue our work to reduce those data gaps.

Information

Accurate, timely, and usable information is the foundation for decisions and actions taken by EPA, states, and others responsible for protecting human health and the environment. Effective information management is vital to the success of EPA's mission, and contributes to the achievement of all Agency strategic goals. The federal community has recognized and commended EPA for ensuring that information investments are made wisely to achieve environmental results.

EPA's Cross-Cutting Environmental Information Strategy

Enhance environmental results through the improved use of quality environmental information by EPA decision-makers, states, tribes, other partners, and the public to:

- *Promote environmentally beneficial action*
- *Improve environmental decisions*
- *Promote more environmentally responsible attitudes*
- *Improve knowledge.*

EPA develops, collects, analyzes, and provides integrated access to information to promote more knowledgeable and environmentally responsible attitudes, decisions, and actions. EPA strives to

provide the right information, at the right time, in the right format, to the right people. This means making quality environmental and management information available for developing environmental policies and priorities. It means making environmental data publicly accessible to support individual and community involvement in decisions that can affect environmental quality and public health. And it means building the necessary infrastructure to provide secure information, reliable data, efficient and timely access, and analytic information tools.

New ways of conducting business are required to meet new, more complex information challenges, especially for EPA's vital responsibility to work with federal, state, and local partners to ensure homeland security. The Agency's cross-cutting information strategy, developed in the framework of the President's Management Agenda, is a three-pronged approach to meeting these challenges. To achieve EPA's mission, over the next 5 years EPA's information strategy will focus on:

Analytic Capacity—Providing access to new analytic tools that facilitate data interpretation and enable users to respond to environmental problems; assess risk; set priorities; make sound decisions; and manage for results, using integrated resource and performance information.

Governance—Adopting an Agency-wide approach to managing information, including administrative and programmatic systems, data, and investment priorities.

Excellence in Information Service Delivery—Working collaboratively with states, tribes, other federal agencies, and key stakeholders to improve the efficiency and utility of environmental information.

Finally, the need to make environmental information accessible and usable by the American public, including populations that have been historically disenfranchised, is critical to solving problems and addressing challenges.

Decisions regarding Agency information management can affect EPA employees; state, tribal, and local partners; and the regulated community. EPA employees rely on the Agency's information management systems, central information services, and special information resources to achieve the Agency's mission. EPA has adapted information models that show the clear linkages between information investments and achievement of efficient, effective environmental results. These logical models are part of the business case methodology that EPA uses to evaluate proposed investments in information technology.¹ We will continue to ensure that information technology and data initiatives directly support EPA's mission, and are fully coordinated within EPA and with the efforts of our federal, state, tribal, and local agency partners to avoid duplication, reduce burden, and increase effectiveness.

Analytic Capacity

Environmental data are most meaningful when examined from a holistic perspective, when users are able to examine all of the data about a particular situation, location, or source at once.

Integrated analytic capacity is fundamental to meeting the Agency's five goals.

To meet the objectives under each goal, EPA, other federal agencies, states, tribes, and other partners require specific information on environmental and human health conditions and analytic tools capable of isolating specific stressors associated with those conditions. These capabilities must be designed to meet the needs of specific objectives—whether assessing global issues, such as stratospheric ozone depletion; regional issues, such as haze; state-level issues, such as watershed protection; or local issues, such as ambient air quality protection within a particular metropolitan area.

Improved capacity to integrate and analyze environmental data will support cross-media solutions to complex environmental and human health problems. Better analytic tools will also help EPA fulfill its homeland security responsibilities by providing a clear picture of spatial relationships and corporate ownership of regulated facilities.

What We Intend to Accomplish

Better analytic capabilities will help managers to assess existing baseline conditions, isolate data gaps and identify research needs, track the implementation of specific solutions, and develop methods for evaluating the results achieved. By 2008, EPA will provide analytic tools to support decisionmaking, results-based management, and the public's right to know. Over the next 5 years, EPA will:

- **Continue to implement the Environmental Indicators Initiative.** EPA will establish a set of performance indicators of environmental and human health conditions, to support assessments of the effectiveness of environmental programs.
- **Implement a suite of customized tools for emergency management.** These tools will deliver secure, reliable, and timely data access and communications to on-scene coordinators, emergency response teams, and investigators from field locations.
- **Continue to increase the availability of useful health and environmental information.** EPA will continue to implement the Toxics Release Inventory (TRI) Program to provide the

Desired Outcome by 2008

Improved use of environmental information to strengthen EPA's, states', and the public's decisions.

public with information on releases of toxic chemicals to the environment.² The Agency will build on the foundation of existing public access tools, such as Envirofacts³ and Window to My Environment⁴ (a geographic portal to community-based environmental information), by providing additional access to information collected by EPA, its partners and stakeholders, and the public.

Governance

EPA recognizes that successful organizations align technology, people, and processes with goals. Information governance is the Agency's strategy to ensure efficient, coordinated management of information assets across all EPA programs. An Agency-wide approach to information will allow EPA to make key information, technology, and funding investments that improve the efficiency and effectiveness of services and operations. Ultimately, this enterprise-wide approach to environmental information management will benefit EPA and its partners by streamlining access to and exchange of information.

Desired Outcomes by 2008

- ▼ *Improved Agency operations including the security, collection, and exchange of information by implementing an EPA-wide approach to managing technology and information.*
- ▼ *A highly diverse, well-trained workforce able to fully benefit from information technology investments and deliver quality and timely information products and services.*

In 1998, through the State/EPA Information Management Workgroup (IMWG), states and EPA committed to a partnership for building locally and nationally accessible, cohesive, and coherent environmental information systems. This commitment was codified in the IMWG's "Vision and Operating Principles." Improvements made through this partnership will help ensure that public and regulatory agencies have access to information to document environmental performance, understand environmental conditions, and make sound decisions that ensure environmental protection.

Now, with more than 5 years of joint experience, the IMWG has developed a more specific vision for how this partnership could be realized. The National Environmental Information Exchange Network⁵ is expected to revolutionize the management of environmental information by improving the quality of environmental data, providing regulatory agencies and the public ready access to data, and increasing their ability to use this information to protect human health and the environment. The Network will be standards-based, highly interconnected, dynamic, flexible, and secure and will operate with the broad-based, voluntary participation of state environmental agencies and EPA. Over the next 5 years, EPA will:

- **Continue to develop its enterprise architecture.** Enterprise architecture involves identifying the business processes that support Agency goals, the data needed for measuring environmental results, and the technology that most efficiently secures and delivers the data. Enterprise architecture promotes wise investments in information technology.⁶
- **Continue to focus on partnering.** EPA will continue to strengthen emerging partnerships, identify collaborative goals, promote integrated planning, and foster interagency coordination with other federal agencies, states, and tribes. The foundation for meeting these goals is access to the collective data resources of all partners.
- **Improve existing governance processes.** EPA will continue to pursue an investment strategy to support a strong Agency information architecture program and investment management process, as outlined by the Federal Chief Information Officer Council and as required by the Clinger-Cohen Act.⁷ The architecture and investment review processes that use integrated information systems or more advanced applications of the Exchange Network will govern funding for individual systems development and modernization.

Excellence in Information Service Delivery

Desired Outcome by 2008

Enhanced information integrity, analysis, and access strengthened by software tools and the collection of quality and appropriate data.

Information technology is transforming the way EPA conducts the business of environmental protection. But EPA faces information management challenges similar to those faced by many other private and public organizations. The Agency must continually adapt to emerging technologies, such as electronic-commerce and web services that enable organizations to become more productive, effective, and proactive in service delivery. Three major themes of change in

information service delivery are streamlining management processes, linking data partners, and improving information access.

Streamlining Management Processes

EPA, like other public and private organizations, is exploiting information technology to streamline internal management processes. New administrative systems for financial, personnel, and program management will integrate data, eliminating database fragmentation and limited information

access. Groupware applications are enhancing the traditional Agency workgroup process by improving information flow, facilitating meeting scheduling, and encouraging more frequent team member involvement. In other organizational settings, changes such as these have been shown to deliver measurable improvements in the quality and efficiency of administrative work processes.

Linking Data Partners

Networks will link EPA to federal, state, tribal, and other public and private agency partners throughout the country to exchange policy, research, management, and performance information. In the U.S. economy, distributed network technology is quickly eliminating time and distance as obstacles to business collaboration. Today, vast webs of suppliers are able to contribute to work products in a global marketplace according to their specialized expertise. The result: greater innovation and resource productivity.

Improving Information Access

Explosive growth in data processing and storage capacity has opened up new opportunities for accessing data from multiple sources. Fine-resolution data from local monitoring organizations can be assembled into geographic information systems, providing holistic environmental pictures on large and small geographic scales. Mountains of data collected using advanced monitoring technologies in space, in the air, and on the ground can be placed at the public's fingertips in usable formats. Integrated public information has been shown to deliver bottom-line improvements in environmental programs, by closing the behavioral gap between environmental policy and private actions.

Improved information service delivery is key to the implementation of many of the objectives detailed under the Agency's five strategic goals. The utility of environmental information, from ambient monitoring data to compliance assistance material, will depend largely upon the Agency's ability to ensure that the right information is provided to the right user at the right time.

By 2008, EPA will increase the operational efficiency of all Agency business processes through the use of information technology. Over the next 5 years, EPA will:

- **Solicit partner feedback.** Through various techniques, EPA will solicit feedback to systematically improve information usability, clarity, accuracy, reliability, completeness, and scientific soundness.⁸ Other efforts to improve information will include working with the Environmental Data Standards Council on developing and implementing necessary data standards and associated registries to improve the consistency, quality, and comparability of data managed in national environmental systems. EPA will require that data quality is known and appropriate for intended uses. Usability testing and customer satisfaction baselines will

ensure that the information the Agency provides is meeting the needs of its customers.

- **Streamline information collection.** Streamlining will help regulated entities meet regulatory requirements, while eventually easing burdens placed on states and the Agency to collect information. The Agency will continue to assess the information reporting burdens placed on its partners and on the regulated community, and will align information collection requirements with specific needs. EPA will improve the timeliness and completeness of requests for information by implementing an Agency-wide electronic records and document management system. The Agency plans to develop and acquire the necessary software and hardware to begin phased implementation of the system throughout the Agency.⁹
- **Continue to develop the Exchange Network.** The Exchange Network is a comprehensive, integrated information exchange program designed to strengthen the partnership and facilitate information sharing among EPA, states, other federal agencies, tribes, localities, the research community, and the regulated community. The Exchange Network will provide a wide range of shared environmental information and will improve environmental decisionmaking through increased availability of quality data, enhanced security of sensitive data, avoidance of data redundancy and conflict, and reduced burden on those who provide and those who access information. It uses an Internet-based, multimedia approach to environmental information exchange that is standards-based, highly connected, flexible, and secure. Additionally, through the National Environmental Information Exchange Grant Program begun in 2002, states and tribes will be better positioned to participate in the Exchange Network.¹⁰

The Central Data Exchange (CDX)¹¹ is the electronic portal of the Exchange Network, through which information is securely received, translated, and forwarded to EPA's data systems. We anticipate that, by 2004, the CDX infrastructure will service 46 states, and more than 25,000 facilities, companies, and laboratories will use it to provide data to EPA electronically. By widely implementing an electronic reporting infrastructure, CDX will reduce reliance on less efficient, paper-based processes, resulting in reduced reporting burden and the creation of new opportunities for simplifying the reporting process. Electronic reporting through CDX will be possible for all of the national environmental systems. CDX will serve as the Agency's node on the Exchange Network, providing data exchange services for states and other EPA partners. The Agency will make strategic investments in the information infrastructure that supports our 10 regional offices.

- **Continue to focus on data quality.** EPA plays a key role in working with data partners to develop and promote consistent, complete, current, and reliable data to support full and effective information sharing, environmental monitoring, and enforcement. EPA will continue to develop Agency-wide policies and procedures for planning, identifying data needs,

documenting, implementing, and assessing data collection and use in Agency decisions. EPA will continue to work with data partners to develop and implement data standards. The Agency will also continue to implement its Information Quality Guidelines, to help ensure that information EPA provides to the public is of the highest quality.¹²

Federal Innovation in Information Management

All of EPA's emerging information capabilities will continue to support and further the President's Management Agenda Electronic Government (e-Gov) Strategy for improving service to individuals, business, and others while increasing efficiencies.¹³ EPA will continue to collaborate with other federal agencies; states; tribes; environmental, public health, and research organizations; and local partners to expand Internet access, improve the quality of services, and drive down the cost of basic government functions. The approach of the e-Gov Strategy is to simplify processes and unify operations to better serve citizens' needs. EPA will continue to implement this vision and eliminate redundancies and overlaps in such functions as small business compliance, payroll and other resource functions, and geospatial information.

Overall, EPA is participating as a partner in 14 designated e-Gov projects and is the lead agency for the government-wide Online Rulemaking Initiative to make the rule-making process more transparent to individuals and businesses.¹⁴ By implementing this information strategy, EPA will keep pace with the rapid advances in information technology and meet the growing demand for reliable, quality environmental information.

In addition, the Federal Financial Assistance Management Improvement Act of 1999 mandates that federal agencies work together to streamline grant application and reporting requirements for all grants and to develop a central electronic portal for grant application and reporting. EPA continues to deploy the Integrated Grant Management System that is moving the Agency from a paper-based grants culture to an electronic culture by fully automating the grants process within the Agency. The system will also be capable of exchanging data with the E-Grant electronic storefront for recipient application and reporting, creating an all-electronic grant process. Grant information will be available online to every grant manager and project officer in the Agency for better decisionmaking. The system, which supports tracking of grant milestones, products, and post-award management activities, will save time and resources by eliminating duplicate data entry, avoiding mail and photocopy costs, and reducing the time it takes to track grants or build and maintain separate grant tracking systems.

Innovation

EPA and many other environmental policy leaders see a critical need for environmental innovation.¹⁵ The U.S. environmental protection system is widely recognized as one of the strongest in the world. For more than 30 years, this system has succeeded in cleaning up some of the most visible and egregious forms of pollution and has provided Americans with strong environmental and public health protection.

But that legacy of progress is challenged by an increasingly complex set of environmental problems, such as global climate change and polluted runoff, that will require a broader set of tools than we have relied upon in the past. At the same time, EPA and other agencies are experiencing the reality of tight budgets and pressure to be more accountable for results. Other factors spurring environmental innovation include the availability of powerful new information technologies that can advance

environmental knowledge and public and private interests in making environmental management a value-added endeavor. Yet another factor is the need to address sustainability, environmental justice, and other issues with interwoven social, economic, and environmental dimensions. Together, such challenges make environmental innovation an absolute imperative.

In 2002, EPA released a strategy to strengthen environmental protection through the power and promise of innovation. *Innovating for Better Environmental Results: A Strategy To Guide the Next Generation of Environmental Protection* is designed to drive innovation in environmental programs and provides a vision for what our environmental protection system should be.¹⁶ That vision—one that is now widely shared in the environmental policy community—is for a system that puts more emphasis on results; that focuses on environmental responsibility, not just pollution control; and that uses multimedia approaches to address problems comprehensively rather than piecemeal. The system envisioned would rely more on incentives to motivate better environmental performance and on partnerships that help to leverage ideas and resources for greater environmental gain.

EPA's Innovation Strategy

- ▼ Enable state and tribal innovation
- ▼ Use innovation to solve priority problems
- ▼ Develop problem-solving tools and approaches
- ▼ Create a culture and organizational systems to foster innovation

The Strategy's Four Elements

Developed in consultation with states, the Innovation Strategy consists of four interconnected elements that will enable progress toward this long-term vision and, in the shorter term, progress under EPA's *Strategic Plan*.

Promoting State and Tribal Innovation

The first element of the Innovation Strategy is designed to strengthen our partnership with states and tribes. With shared responsibilities for environmental programs, states and tribes are EPA's most important partners, and they share our interest in innovations that can improve results. The Innovation Strategy lays out a set of actions designed to enable state and tribal innovation. These include finding ways to improve the National Environmental Performance Partnership System and the Joint State/EPA Agreement to Pursue Regulatory Innovations—two policy tools that provide a means for jointly advancing innovation initiatives. Another priority is providing states with opportunities for earlier, more meaningful input in EPA's planning and budgeting processes, where decisions about resources for innovation are made.

Using Innovation to Solve Priority Problems

The second element focuses on using innovation to solve a set of priority environmental problems—greenhouse gases, smog, degrading water quality, and deteriorating water infrastructure. While there is a need for innovation in solving many environmental problems, these are especially important because they are persistent, widespread problems that are not being adequately addressed with the tools and approaches that exist today. From partnerships with industry sectors, to market-based trading programs that create an economic incentive for environmental improvement, to new information tools that support decisionmaking, the Innovation Strategy calls for a suite of creative approaches for making progress on these priority problems.

Developing Problem-Solving Tools and Approaches

The problems described in the previous section highlight the importance of continuously developing new tools and approaches that can expand and enhance environmental problem-solving. The third element of the Innovation Strategy focuses EPA on the continued development of tools that have already proven effective on a limited scale and that have applicability across many environmental programs. They include information tools that can improve our understanding of problems and solutions, environmental management systems (EMSs)¹⁷ that can foster a more comprehensive approach to environmental protection, incentives that can motivate better environmental performance, environmental technologies that can improve results and lower costs, and performance measures that

show how well innovations are working.

Creating a Culture and Organizational Systems to Foster Innovation

Finally, the Innovation Strategy focuses on what may be the most important element of all—creating a culture and set of organizational systems that foster innovation throughout EPA. The goal is to have each individual within the EPA workforce view his or her job more broadly, as an environmental problem-solver, a partner, a facilitator, and a leader, as well as a program implementor. Communicating results from innovations, rewarding the innovators, and ensuring that successful approaches are considered for broader replication are just some of the ways we will work to realize our innovation potential.

Innovative Approaches For Achieving National Goals

With its comprehensive focus and detailed plan for implementation, EPA's Innovation Strategy identifies a number of actions that will drive innovation throughout the Agency and ensure progress toward each of our national environmental goals.

Clean Air and Global Climate Change

From indoor environments to global climate change, EPA faces the challenge of developing air strategies that are workable on very different scales and for very different circumstances. We will meet this challenge by innovating in air programs, policies, and regulations. For example, our strategy for reducing smog calls for national leadership—creating new inherently innovative programs, such as the Clear Skies Initiative, a new market-based cap-and-trade program modeled after the acid rain trading program.¹⁸ We will continue to develop new regulations where needed, but those regulations will be crafted in innovative ways to improve results, ease implementation, and decrease costs. Outside the regulatory arena, we will work to reduce smog and greenhouse gas emissions by developing new cleaner technologies and promoting the use of those developed by others. We are also creating a range of partnership and information programs to catalyze improvements across the nation.

But federal government actions alone are not the solution. That is why we will continue to work at the international, regional, state, tribal, and local levels, providing information and tools to empower individuals, community groups, air quality officials, and other interested stakeholders who want to work for cleaner, healthier air.

The Innovation Strategy also calls for management actions that will lead to more efficient and effective regulatory approaches to clean air. One action is to evaluate pilot projects that can show

whether an innovation has value. For example, in the mid-1990s, EPA launched a series of innovative air permitting projects designed to streamline the regulatory process and foster pollution prevention. The results show that flexible air permits can help companies achieve equal or greater environmental protection, improve competitiveness, and encourage pollution prevention, while still retaining practicable enforceable capabilities.¹⁹

Over the years we have developed a number of innovative programs and new tools to achieve environmental improvements. Now the key is to learn from these innovative approaches and use our experience to create additional options for cleaning the air. In this way, we can tailor clean air strategies, using new and traditional tools, to ensure that we are using the approach that will achieve the best possible results.

Clean and Safe Water

The national water program focuses on watersheds—those naturally defined areas that encompass and affect our rivers, streams, and lakes. By looking at the watershed as a whole, rather than as a set of unrelated components, watershed management offers a more advanced and effective approach for improving water quality. To support this approach, the Innovation Strategy commits EPA to issuing a national policy on water-quality trading. This policy, along with a new policy on watershed-based permitting, will lead to more cost-effective approaches to meeting water quality goals. In addition, EPA has launched a new national Watershed Protection Initiative that, in its first year, awarded \$15 million in grants to support protection and restoration activities in 20 priority watersheds.²⁰

Another priority for the national water program—and one that can clearly benefit from innovative solutions—is water infrastructure. A 2002 EPA study revealed a critical funding gap for meeting U.S. wastewater and drinking-water infrastructure needs.²¹ Recognizing this gap, the Innovation Strategy called for a national forum to discuss innovative management mechanisms, such as EMSs, that can reduce the life-cycle costs of infrastructure and more flexible financial mechanisms to fund improvements. EPA held that forum in January 2003,²² and many of the ideas that emerged are reflected in this *Strategic Plan*.

Preserved and Restored Land

The Innovation Strategy's emphasis on testing, evaluating, and implementing innovative approaches to environmental problems; fostering a more innovative friendly culture within EPA; and working through partnerships and stakeholder collaboration will promote better waste management and the cleanup of contaminated waste sites. In particular, innovative tools and approaches will be used for land revitalization; consistency and enhanced effectiveness in site cleanups; and waste minimization,

recycling, and energy recovery of hazardous and nonhazardous wastes.

Building upon the success of its Brownfields Program, EPA will pilot projects that integrate land reuse into all land cleanup processes, explore the use of innovative public and private property reuse and stewardship mechanisms, and actively seek out opportunities for policy reforms. We will do so by working with partners and stakeholders to enhance coordination, planning, and communication across the full range of federal, state, tribal, and local cleanup programs. These efforts will improve the pace, efficiency, and effectiveness of site cleanups, as well as more fully integrate land reuse into cleanup programs.

Recognizing that many changes have taken place since the Resource Conservation and Recovery Act²³ was passed, EPA is launching a national Resource Conservation Challenge that is designed to find flexible, yet more protective, ways to conserve our natural resources through waste reduction and energy recovery.²⁴ This new program will take a comprehensive, integrated approach that includes traditional waste management programs and lesser recognized avenues, inside and outside of EPA, for promoting waste minimization and natural resource conservation. This approach will involve forming diverse partnerships to test innovative approaches to waste reduction and to stimulate development of new environmental management infrastructure and technologies.

Healthy Communities and Ecosystems

The Innovation Strategy recognizes the value of community-based approaches that integrate environmental management with human needs, consider long-term ecosystem health, and highlight the positive correlations between environmental well-being and economic prosperity. Many actions planned under the Innovation Strategy demonstrate this kind of comprehensive, community-based focus. For example, the national air program is supporting the development of a regional strategy to comprehensively address multiple air quality problems, as well as economic growth, land-use patterns, transportation, and energy issues, in a growing urban area along the North Carolina-South Carolina border. Likewise, the national water program's watershed strategy will enable a more comprehensive, stakeholder-driven approach to achieving water quality goals.

The Innovation Strategy also calls for environmental protection tools and approaches that can be used to protect people, communities, and ecosystems. For example, improving the use and deployment of information resources and technology means we will have more powerful tools to make environmental management decisions. It will also enable us to give citizens information they can use in their own lives, and if they choose, to become more involved in environmental decisionmaking. The emphasis on developing results-based performance goals and measures will have similar consequences, creating information that agencies can use to manage programs and provide public accountability.

Finally, the plans for strengthening our partnership with states and tribes are designed to improve the environmental and public health effectiveness of our individual levels of government. Engaging states earlier in national planning and budgeting processes; facilitating state innovations; and reaching out to build working relationships with agriculture, transportation, and other agencies with environmental interests are just some of the means through which we will enhance protection for people, communities, and ecosystems.

Compliance and Environmental Stewardship

The vision described in the Innovation Strategy would raise the bar for environmental performance by creating an environmental protection system that encourages greater environmental stewardship across all parts of society. Getting there means finding ways to bring together compliance, pollution prevention, and environmental leadership initiatives in a way that facilitates environmental management and maximizes environmental results. It also means meeting the various needs that exist along the environmental performance spectrum, from the leaders who are pursuing advanced environmental improvements to those enterprises, such as small businesses, that require assistance in meeting regulatory responsibilities.

One way toward these ends is by working in partnership with industry sectors on tailored environmental management strategies that recognize the unique issues affecting their operations. Through its Sector Strategies Program,²⁵ EPA works with industries to address sector-specific barriers to improving performance and develop EMSs and other innovative tools that are designed with each sector's needs in mind. Sector-based programs enable EPA to better understand the industries we oversee and to tap into the creative thinking of others who can help us devise new and better ways of improving environmental and economic results.

The Innovation Strategy calls for more support and encouragement for environmental leaders by expanding the National Environmental Performance Track.²⁶ This unique program offers rewards and recognition for strong environmental performance. The Innovation Strategy focuses on making membership even more valuable by offering additional regulatory incentives and a higher level of membership for the very top performers. While the program clearly benefits members, its greatest value is in creating role models and mentors from whom other facilities can learn as they pursue their own environmental improvements.

The Innovation Strategy also recognizes the value of smart and strategic compliance assurance in helping companies meet their environmental responsibilities. To this end, it focuses EPA on using the full range of compliance assurance tools and combining them in ways that improve environmental management by regulated entities, maximize compliance, and address the needs of environmental justice communities. These integrated approaches include voluntary compliance incentives, such as the Audit,

Small Business, and Small Communities Policies²⁷ to encourage self-auditing, reporting and correction; the use of EMSs in enforcement settlements to address serious environmental management problems; and creative supplemental environmental projects that return significant, tangible benefits to communities harmed by noncompliance.

The award-winning environmental results program represents another successful approach.²⁸ Pioneered by Massachusetts, this program merits expansion because it improves the performance of small businesses, results in savings for those businesses, and allows EPA and states to focus resources on priority environmental problems.

Providing smart, strategic compliance assurance also means providing additional tools to help facilities understand environmental laws and regulations. EPA partners with compliance assistance providers to provide easy access to compliance information through the National Compliance Assistance Clearinghouse and “virtual” compliance assistance centers that support specific industry sectors and national environmental program priorities.²⁹ These innovative resources harness the power of the Internet to meet small business needs. The Innovation Strategy will direct more attention to small business needs, starting with a national small business environmental summit and development of a comprehensive small business assistance strategy.

Managing Innovation at EPA

The complexity of today's environmental challenges, coupled with the need to achieve environmental results more cost-effectively, make environmental innovation an imperative. But innovation brings its own set of challenges. As EPA pursues new approaches for improving environmental results, we are faced with the difficulty of crafting multimedia solutions within a single-medium-based organization, the complexity of sharing responsibilities across several layers of government, and the need to maintain baseline environmental protections while still creating room for experimentation.

EPA's Innovation Action Council provides experienced leadership for addressing these and other challenges. This group of EPA's most senior career managers provides overall direction for innovation, demonstrated most recently through the development of the Innovation Strategy. The Innovation Action Council also helps resolve policy issues that invariably arise when exploring new approaches.

EPA is also making strategic organizational changes to support and facilitate innovation. In 2003, EPA formed a National Center for Environmental Innovation to advance innovation in environmental programs.³⁰ Combining staff who have led some of EPA's most innovative initiatives,

and the Center has several unique roles. First and foremost, it is a focal point for strategic thinking on innovative approaches to environmental management and provides a point of contact for organizations that share EPA's interests in environmental innovation. The Center acts as a partner with organizations that want to test and evaluate innovative approaches and as a proponent for replicating innovations that prove successful. The Center also stays at the forefront of scientific, economic, and other social trends to bring the value of new developments to EPA's strategic thinking, planning, and management.

While the National Center for Environmental Innovation will foster innovation throughout EPA, there have been additional efforts within EPA's national programs. The national air program has established a Center for Excellence on Air Innovations/Futures to enhance information-sharing among EPA's regional air divisions. And the national solid waste and emergency response program has realigned staff in a new innovation office that will help drive innovation in its programs and policies.

Together, these moves will ensure that EPA has the innovation leadership it needs to achieve better environmental results.

Human Capital

Protecting human health and the environment requires a diverse, highly skilled, and motivated workforce that seeks creative solutions to environmental problems and is committed to achieving excellence. To develop and retain such a workforce, EPA was among the first agencies to publish a human capital strategy. Issued in 2000, *Investing in Our People, EPA's Strategy for Human Capital, 2001 - 2003*³¹ has guided our human capital efforts over the past few years.

We are now updating our human capital strategy to address the President's Management Agenda and to better integrate human capital issues into EPA's strategic planning for the coming 5 years. *Investing in Our People II, EPA's Strategy for Human Capital, 2003 - 2008*³² (our updated "human capital strategy") will ensure that the Agency's workforce is high-performing, results-oriented, and aligned with our strategic goals and objectives for air, water, land, communities and ecosystems, and compliance and environmental stewardship.

Our updated human capital strategy will help us integrate workforce planning, employee development, and targeted recruitment with our ongoing strategic planning and resource management processes. By promoting strong national leadership and effective planning and implementation of human capital programs across the Agency, the human capital strategy addresses both our current and future workforce needs to accomplish our goals and objectives.

EPA's HUMAN CAPITAL STRATEGY

Vision

EPA has the right people, with the right skills, in the right place, at the right time to protect human health and the environment.

Values

EPA respects and values integrity, the trust and confidence of the public, diversity of cultures and thinking, competence, innovation, continuous learning, and sound science. We treat our people fairly and with respect, and we encourage a spirit of teamwork and the consistent practice of these values.

Human Capital Goals

- 1. Agency systems and organizational structures are well designed and work together to position and support EPA employees in accomplishing the Agency's strategic goals.*
- 2. EPA attracts and retains a diverse and talented workforce.*
- 3. EPA's employees are highly capable and perform to their highest potential to support the Agency mission.*
- 4. EPA employees at all levels are results-focused, act with integrity, and help to improve environmental programs through innovation, creativity and reasonable risk-taking.*
- 5. Teamwork and collaboration are routinely practiced with internal and external partners.*

As part of the President's Management Agenda, the Office of Personnel Management (OPM) is leading the federal government's Strategic Management of Human Capital Initiative. New Human Capital Standards for Success,³³ developed jointly by OPM, the Office of Management and Budget (OMB), and the General Accounting Office (GAO), provide the foundation for this initiative.

Guided by our Human Resources Council (HRC), which is composed of senior leaders

representing headquarters and regional offices, EPA is developing its human capital strategy to

address OPM's Human Capital Standards for Success. Our updated human capital strategy will help to ensure that EPA:

- Aligns its workforce to accomplish strategic goals and objectives to protect human health and the environment through effective integration of Agency-wide planning and management processes.
- Conducts workforce planning and deployment at the regional and program levels and deploys employees or assigns work based on mission-critical needs.
- Maintains continuity of leadership and employee skills and competencies through strong knowledge management, employee development programs, and succession planning.
- Encourages a results-oriented workplace and culture by emphasizing performance management.
- Identifies, hires, and retains a diversity of talented individuals, using innovative and progressive tools for recruitment and retention.
- Evaluates its human capital programs to ensure they are data-driven, cost-effective, and held accountable for results by developing and linking program performance to organizational goals.

Aligning Our Workforce and Mission

Aligning EPA's workforce with our goals for protecting the environment and human health is a critical element of our human capital strategy. The Agency will accomplish this alignment in two ways: (1) by addressing human capital management issues under each of the Agency's five strategic goals and (2) by explicitly linking human capital activities with annual Agency-wide processes for strategic planning and budgeting. EPA will make planning, reporting, and accountability for effective human capital management an essential component of its Annual Performance Plan and Budget. Linking dollars, people, and skills will enable program managers across the Agency to develop a more complete assessment of the resources required to meet annual performance goals and strategic goals and objectives.

The HRC will communicate the Agency's vision for human capital to EPA employees at every level and will continue to provide staff with information on human capital planning activities. Concurrently, EPA's Senior Policy Council—composed of Assistant and Regional Administrators to address cross-cutting Agency issues—is expected to communicate human capital roles and

responsibilities and inspire employee commitment to the President's and the Administrator's vision. Senior Policy Council members will also ensure that resources and tools for sharing knowledge are available to their organizations and across the Agency and foster a culture of continuous learning. Both councils will support Agency efforts to develop performance measures for evaluating the effectiveness of EPA's human capital programs.

As we implement our human capital strategy, we will continue to benchmark other federal agencies' best practices and evaluate whether EPA should implement similar strategies or processes. We also expect to strengthen our human capital strategy as a result of our ongoing work with OPM, OMB, and GAO and to consider lessons learned to improve our strategies.

Planning and Deploying Our Workforce

Strategic workforce planning is integral to addressing many of EPA's human capital issues. We have identified 20 major occupations—each with a unique set of skills and competencies—to help the Agency align mission-critical work with the skills of its workforce. To facilitate this alignment, EPA developed a National Strategic Workforce Planning methodology and online support system and is in the midst of phased implementation.³⁴ The Agency's workforce planning system will enable line managers to make decisions on deploying employees with mission-critical skills and competencies both programmatically and geographically to fulfill EPA's mission. By 2005, EPA's workforce planning system, in conjunction with established Agency planning and budgeting systems, will support analysis and decision making for effectively managing human capital.

In making sound workforce deployment decisions, EPA recognizes the need to look beyond numbers of employees and their respective skills. We continuously examine environmental objectives, changing priorities, and emerging technologies. Our competitive sourcing efforts complement our human capital strategy by providing an opportunity to analyze the Agency's activities and increase the efficiency and effectiveness of our operations. We are examining those activities with potential for efficiency gains either through internal improvements or competition/direct conversion.

To leverage the skills and talents of our workforce, the Agency will evaluate innovations in human capital management for their potential nationwide. Examples include:

- ▼ *Assignments, Not Positions* Program. EPA Region 10 offers voluntary rotations every 3 years to encourage employees to swap jobs and learn about technical programs outside their immediate areas of expertise. Since 1996, approximately 70 employees have participated in each of the three *Assignments, Not Positions* exercises, and more than 100 people have moved to different organizations, bringing insights and fresh points of view to their new

assignments.

- ▼ *The Senior Executive Service (SES) Mobility Program:* To develop our senior executives and optimize their talents, EPA moved more than 60 executives into new positions across the Agency in 2002 through the SES Mobility Program. The Mobility Program concept may be extended to other EPA levels of management to strengthen leadership skills and provide exposure to programs across the Agency. Such flexibility supports continued development of EPA managers by challenging them with new learning experiences and broadening their view of the Agency. If implemented, these development opportunities would strengthen EPA's succession planning and management efforts as well.

EPA is using advances in information technology to improve managers' and employees' access to personnel data through its automated human resources information system, PeoplePlus.³⁵ Improved access to personnel data will help employees manage their careers and help Agency leaders make critical decisions in managing their organizations' human capital resources.

- *Employee Profiles* will provide employees with access to their official personnel records to update personal information, such as emergency contacts, home address/phone, handicap/special needs designations, and other business process-related information.
- *E-Development* provides web-based access for employees and managers to update/review training information, review/approve training enrollment, and document newly acquired skills.
- *The Manager's Desktop* gives supervisors and managers access to workforce information to facilitate organizational decision making. It also provides the connection for managers to initiate and track personnel action change requests electronically.

EPA is also supporting the President's government-wide E-Gov Internal Efficiencies and Effectiveness initiatives³⁶ to bring commercial best practices to key government operations. The Agency is an active participant in a number of government-wide human resources-related E-Gov activities:

- *E-Payroll* consolidates systems at more than 14 processing centers across government and eliminates duplication in purchasing enterprise resource planning software.
- *Enterprise Human Resources Integration* integrates personnel records across government electronically and reduces delays in processing security clearances.
- *Recruitment One-Stop* modifies *USA Jobs* to create an automated resource for federal

government information and career opportunities. It allows for automated resume and assessment tools to route resumes, assess candidates, and streamline the federal hiring process, and it provides an up-to-the-minute status on job applications.³⁷

EPA has annually awarded over half of its budget in grants to state, local, and tribal governments, educational institutions, and nonprofit organizations and uses grants as a key means to achieve its strategic goals. Therefore, we need grant specialists and project officers skilled in grants management. They will be responsible for reviewing, negotiating, and administering EPA's grant agreements—from pre-award review of applications, to post-award monitoring and final closeout.

Given our renewed emphasis on grants oversight, EPA must supplement our grant specialists' traditional skill set (i.e., grants processing) with a new competency centered on the business aspects of grants management. We will develop a standardized training program that, when fully implemented, will enable specialists to verify grantee compliance with procurement and other administrative requirements, identify unallowable costs, and ensure that the rare exemptions made to allow noncompetitive awards are appropriately justified.. In addition, we will improve accountability for grants oversight by requiring that grant specialists' and project officers' performance standards adequately address their grant management responsibilities.

Investing in human capital for grants management is linked to and complements EPA's human resources plan and the President's Management Agenda initiative on strategic management of human capital.

Managing Leadership and Knowledge

The loss of institutional knowledge that can result as managers and employees retire clearly highlights the need for effective systems to retain leadership and knowledge. To meet this need, EPA relies on three core strategies: (1) developing leaders throughout the organization, (2) promoting continuous learning, and (3) enabling knowledge transfer.

Through EPA's Workforce Development Strategy, the Agency develops leaders by offering programs centered on EPA's core competencies and the SES Executive Core Qualifications. Using classroom training, mentoring, coaching, and rotational assignments, EPA will continue to build its leadership capacity. As an increasing number of EPA's senior executives become eligible for retirement, our SES Candidate Development Program (CDP) will help to mitigate the loss of leadership, institutional knowledge, and expertise.³⁸ By 2004, over 50 highly qualified EPA SES candidates will graduate to replace the retiring SES corps. We will continue to strengthen the SES CDP to ensure continuity of leadership.

EPA is establishing a continuous learning culture that enables employees and managers to adapt to the rapidly changing political, social, and economic environment. Feedback systems are key to developing this culture. EPA's performance management system, PERFORMS (Performance Planning, Employee Rating, Feedback, Opportunity, and Recognition Management System), provides regular performance feedback to employees and helps them understand how their work aligns with the Agency's mission. To help Agency managers assess and improve their performance, EPA has implemented a 360-degree feedback program that enables employees and peers to provide feedback on managers' performance.

Evaluating EPA's human capital programs will provide feedback at the organizational level. In 2003, we evaluated our EPA Intern Program to assess its effectiveness in recruiting and preparing a diverse group of future Agency leaders.³⁹ In 2004, we will begin evaluating other EPA workforce development programs, and we will use the results to improve and refine our leadership development and knowledge management activities.

In addition, the Agency will use its workforce planning system to enhance its knowledge management activities by examining ways to access and link information on EPA expertise in selected skills and competencies. This capability will enable us to align our in-house resources and expertise with mission-critical projects.

Developing a Performance Culture

EPA is implementing three core strategies to build a results-oriented workforce and culture: (1) enhancing performance management, (2) fostering workplace diversity, and (3) improving employee-labor relations management.

In 1998, EPA redesigned PERFORMS to more clearly, simply, and easily communicate performance expectations to managers and employees. PERFORMS reduces administrative burden and minimizes paperwork for managers by providing broader spans of control and promotes more frequent, meaningful, two-way communication between supervisors and employees. An essential aspect of PERFORMS is separating cash awards from ratings of record, so that feedback and rewards occur not just at appraisal time, but throughout the year to highlight and reinforce excellence in a timely manner.

A variety of monetary and non-monetary awards are available to supervisors and managers to motivate or recognize individual employees, teams, or organizations for high performance. Although the Agency has pay and performance systems in place to provide timely feedback and pay for increased contributions, we are reviewing these systems to ascertain that skilled individuals are indeed attracted,

encouraged, and rewarded for their high performance. We are also evaluating PERFORMS to confirm that the system improves communication between employees and managers and sets appropriate performance expectations. We will continue to benchmark other federal and private-sector performance management systems for application in EPA.

EPA's National Diversity Action Plan Initiative⁴⁰ represents the Agency's strategy to ensure that all employees are treated equitably. EPA is educating its employees about diversity issues, promoting dialogue within every office to address and work through diversity concerns, recruiting and maintaining a diverse workforce, and developing and implementing concrete solutions to EPA's diversity issues. We are also expanding our targeted recruitment initiatives to identify well-qualified candidates for mission-critical positions.

EPA and its National Partnership Council are working to foster collaborative relationships between Agency managers, unions, and employees to improve working conditions, career development, and employee morale. We have established the Workplace Solutions Staff⁴¹ to provide employees with one-stop service for preventing and resolving workplace conflicts, including informal mediation, conflict resolution, Alternative Dispute Resolution Awareness training, outreach, and consultation. The Workplace Solutions Staff coaches employees in dealing with workplace conflicts more effectively to resolve disputes before filing formal grievances or complaints. To improve labor management accountability, PeoplePlus provides modules to manage labor-employee relations by creating a corporate database for tracking labor-management agreements, decisions, and disputes.

Recruiting and Retaining Talent

In light of changing Agency priorities, the growing number of senior managers and employees eligible for retirement, and the increasingly competitive market for individuals with desirable or unique skills, EPA's human capital strategy emphasizes recruiting and retaining creative and talented people. We are using our workforce planning system to identify gaps in mission-critical skills, knowledge, and competencies, and we are employing a variety of human resource tools to recruit and retain a diverse and highly skilled workforce.

Toward this end, EPA is maximizing its use of special hiring authorities, incentives, and internship and fellowship programs. For example, to recruit and retain talented researchers and scientists, the Agency is examining the use of a pilot program to hire up to five researchers a year. Under the pilot, the Agency will be able to offer the competitive salaries needed to attract and retain world-class scientists and researchers. In addition, we are reviewing innovative pay strategies being used across government, focusing on pay structures; flexibility; and opportunities related to the Agency's workforce needs, program requirements, and job-market conditions.

We are also exploring flexible organization structures, collaborative work arrangements, multi-skilled teams, and options to promote a family-friendly, quality work environment. EPA is interested in reviewing the proposed civil service retirement system computations for part-time service, which would eliminate disincentives for employees nearing the end of their careers who would like to phase into retirement by working part-time schedules. This would allow EPA to retain senior staff in hard-to-fill positions as part of our succession planning/management effort.

In addition, EPA is using and will continue to use various human resource tools (e.g., voluntary separation incentives and early retirement authority) provided by the Homeland Security Act.⁴² These tools provide more flexibility than do those offered under current regulations, and they may aid in reshaping the workforce when an organization's skill mix is no longer optimal for carrying out the Agency's mission.

Ensuring Accountability

To manage our human capital efforts effectively, the Agency has established and continues to improve its Human Resources Management (HRM) Accountability Program.⁴³ The HRM Accountability Program provides a template to ensure that all Agency employees, from the Administrator to EPA's rank and file, understand their human capital roles and responsibilities. EPA's senior political and career leaders are taking an active role in communicating EPA's human capital vision at all levels of the Agency. The HRC advises the Administrator and Deputy Administrator on human resource issues, maintains a sustained commitment to managing human resources within EPA, and oversees implementation of Agency-wide human capital initiatives and policies. The Senior Policy Council advises the Administrator and Deputy Administrator on cross-cutting Agency issues and helps to communicate the impact of human capital issues on the Agency.

EPA's human resource program managers in headquarters and regional offices ensure that employees are recruited and hired to meet Agency needs in accordance with merit-based principles and other civil service personnel requirements. Our new HRM Accountability Program ensures effective merit-based decision making by collecting substantive data that serve as a primary diagnostic tool and provide information on performance measurement indicators. Annual onsite reviews of human resources offices and delegated examining units will:

- Certify knowledge of, and compliance with, Merit System principles
- Identify the contribution that human resource management makes to organizational effectiveness
- Determine whether human resource management is accomplishing its objectives

- Establish a database that can assist managers in making human resource decisions
- Identify strengths and weaknesses of human resource programs and processes.

As a part of EPA's future human capital planning process, we will prepare annual human capital plans in concert with the Agency-wide process for developing Annual Performance Plans. Data-based planning and analysis required for Annual Performance Plans will rely heavily on the completion of EPA's workforce planning and allocation model to help programs identify the competencies needed to meet EPA's strategic and organizational goals. Annual human capital plans will present strategies for deploying the resources and workforce development tools needed to achieve EPA's goals and objectives.

We are also developing results-oriented performance goals and measures and a tracking mechanism to link the effectiveness of the human capital program with the Agency's environmental protection mission. These performance goals and measures will help to guide implementation of our human capital strategy, track our progress toward our human capital objectives, and evaluate our approach for aligning human capital with EPA's *Strategic Plan*.

Science

Today, scientific knowledge and technical information are more important than ever as we seek to understand, and successfully address, the increasingly complex environmental problems facing our Nation.⁴⁴ EPA has identified reliance on sound science and credible data among the guiding principles we will follow to fulfill our mission to protect human health and the environment. EPA depends on science, technology, and scientifically defensible data and models to evaluate risk, develop and defend protective standards, anticipate future health and environmental threats, and identify their solutions.

To conduct science of the highest quality and relevance, we promote collaborative partnerships and expert peer review. Our approach to addressing science issues is centered on generating and using

“Sound science is the foundation of EPA’s work. We rely upon science and technology to help us determine which environmental problems pose important risks to our natural environment, human health, and our quality of life.”

—Governor Christine Todd Whitman
Administrator
EPA Science Forum (May 2002)

scientific information based on science priorities (“doing the right science”) and sound science practices (“doing the science right”). We do this through partnerships with states, tribes, and other federal and international institutions and by producing scientific information of the highest quality. The Administrator has named a Science Advisor to work across the Agency to ensure that the highest-quality science is better integrated into the Agency’s programs, policies, and decisions.

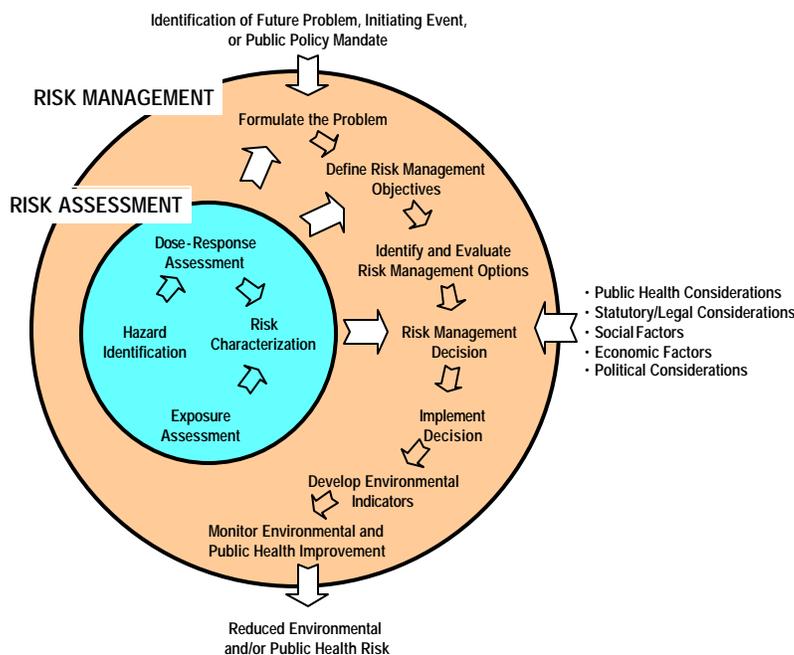


Figure 1. Risk Assessment/Risk Management Paradigm⁴⁵

Generating and Using Scientific Information

EPA’s organizing principle for generating and using scientific information is the risk assessment/risk management paradigm (Figure 1). Risk assessment is the process that scientists use to understand and evaluate the relative size (magnitude) and likelihood (probability) of risk posed to human health and ecosystems by environmental stressors, such as air pollution or chemicals in drinking water. Risk assessments play an important role in Agency decisions and, as appropriate, they are integrated with other scientific information, such as economic data and engineering studies, as part of a

complete scientific analysis to inform decisions. Risk management involves determining whether and how risks should be reduced. Scientific analysis taken together with nonscientific factors, such as public values, social factors, legal requirements, and statutory mandates, inform Agency management decisions and guide our actions.

The scientific data used in risk assessments are generated in research facilities, collected in the field, and compiled from the body of scientific literature. EPA creates and gathers scientific information through our laboratories, centers, and program and regional offices, and from external partners, such as states, tribes, other federal agencies, and the academic and regulated communities. Making environmental decisions built on sound science includes ensuring that scientific findings are properly described (characterized). To characterize scientific findings properly, the knowledge, assumptions, and uncertainties regarding the science must be clearly stated.

EPA Science Priorities (“Doing the Right Science”)

EPA determines its science priorities through coordinated science planning, while also taking into account the particular missions and mandates of individual programs. For example, EPA uses “analytic blueprints” to plan and guide scientific analyses throughout the regulatory decisionmaking process. Analytic blueprints lay out the sequence and nature of the scientific analyses and data needed to inform regulatory decisions. As more complex environmental science is included in the Agency’s regulatory and nonregulatory decisionmaking process, EPA scientists are increasingly involved throughout the decisionmaking process and help determine additional research and analyses needed to ensure that EPA’s policies are informed by the best possible science. For complex environmental management issues requiring close coordination across multiple programs and regions, EPA may develop Agency-wide science plans to ensure that the relevant science is available to inform its decisions and actions.

EPA’s science is strengthened through regional organizations that provide field sampling, analytic and data management support, and quality assurance for Agency programs nationwide. EPA regions have developed special capabilities and expertise (Centers of Applied Science) based on unique geographic and demographic issues. Centers have been designated for ambient monitoring, environmental biology, chemistry, microbiology, and analytic pollution prevention methodologies. EPA’s quality assurance programs ensure the integrity of environmental data by overseeing management of monitoring programs, approving data collection activity plans, and evaluating monitoring and laboratory practices. The fast pace of emerging technologies and science requires that Agency programs remain at the forefront of new analytic procedures, and developing and adapting analytic methods and procedures are increasingly important. These capabilities enable us to provide technical advice and assistance to our federal, state, and local government agency partners.

The Agency's research program is designed to conduct leading-edge research and foster the sound use of science and technology. EPA research both addresses specific needs to support Agency decisions and, by increasing our understanding of key processes—biological, physical/chemical, social, and others—that underlie and drive environmental systems, provides the generic scientific basis for responding to a wide variety of environmental problems.⁴⁶ Our research direction is described in research strategies and documented as performance measures in multi-year research plans. To ensure the quality of our research program, we use a coordinated, cooperative research planning process; rigorous, independent peer review; and interagency partnerships and extramural grants to academia to complement EPA's own scientific expertise. This approach allows EPA to keep its leading edge in environmental research and focuses our efforts and resources on those areas where we can add the most value toward reducing uncertainty in risk assessments and enhancing environmental management.

EPA is implementing the President's Management Agenda to improve research and development (R&D) program management and effectiveness through our application of explicit R&D investment criteria.⁴⁷ By carefully examining the relevance, quality, and performance of our research program, we are improving R&D program management, better informing R&D program funding decisions, and increasing public understanding of the possible benefits and effectiveness of the federal investment in R&D. Agency R&D programs strive to articulate *why* this investment is important, relevant, and appropriate. R&D programs have well-conceived plans that identify program goals and priorities and links to Agency program and regional office needs, as well as to national needs.

EPA's specific science priorities, identified in each strategic goal in a separate science/research objective, are summarized below:

- **Goal 1, Clean Air and Climate Change:** Science priorities focus on emissions, fate and transport, exposures, mechanisms of injury, and health effects of criteria air pollutants. Activities include routine monitoring, air quality modeling, fuel and fuel additive toxicity testing review, and risk assessments. Air toxics priorities include developing and improving air quality models and source receptor tools; cost-effective pollution prevention and other control options; and scientific information and tools for quantitative assessment of nationwide, urban, and residual air toxic risks. Other significant activities include analyses of the impacts of atmospheric change, the collection and analysis of solar UV monitoring data, community-based assessments, and building surveys.
- **Goal 2, Clean and Safe Water:** Science priorities address water quality and drinking water. Water quality priorities focus on approaches and methods to develop and apply criteria to support designated uses and to diagnose impairment of and protect and restore aquatic ecosystems. Drinking water priorities include assessing and managing risks to

human health posed by exposure to regulated and unregulated chemicals and pathogens, and protecting source waters and the quality of water in the distribution system.

- **Goal 3, Land Preservation and Restoration:** Science priorities focus on improving characterization, measuring, and monitoring methods; enhancing methods and models for estimating ecological effects; reducing uncertainty in human health and ecological risks; and developing more cost-effective and reliable remediation and treatment technologies.
- **Goal 4, Healthy Communities and Ecosystems:** Science priorities are wide ranging and comprise a variety of priorities among multiple program offices. These priorities include risk assessment/management of new and existing chemicals, protection of targeted aquatic ecosystems, refinement and enhancement of human health and ecological risk assessments, characterization of global climate change, development and support of emerging scientific advancements, and homeland security.
- **Goal 5, Compliance and Environmental Stewardship:** Science priorities are pollution prevention practices; new technology development; socioeconomics; and decisionmaking related to compliance, enforcement, incentives, monitoring, and innovative approaches to environmental stewardship and sustainable development..

In addition, EPA has identified cross-cutting science priorities that span several programs and help the Agency accomplish multiple science objectives. We have identified aggregate and cumulative risk assessment, genomics, computational toxicology, and susceptible subpopulations as high-priority cross-cutting activities. Advances in these areas will improve EPA's capability to predict and reduce potential human health and ecological risks under all five of the Agency's goals.

Aggregate and Cumulative Risk Assessment

Risk assessment is evolving from evaluating a single stressor in one environmental medium affecting one endpoint to considering aggregate and cumulative risks. Aggregate risk assessments consider exposure to a single stressor, such as a chemical, by multiple pathways and all relevant routes of exposure. Cumulative risk assessments describe and, where possible, quantify a wide variety of health and ecological effects from radiation, biological stressors, and chemicals. An example is the estimation of risks posed from concurrent exposure, through all relevant pathways and routes of exposure, to multiple chemicals that act the same way in the body. Cumulative assessments also consider characteristics of the population potentially at risk. These range from individuals to sensitive subgroups who may be highly susceptible to risks from stressors or groups of stressors due to their age, gender, disease history, size, or developmental stage.

Genomics

Advances in genetic toxicology will have an enormous impact on EPA's ability to assess potential risk. Our initial research is focusing on the use of genomics as a tool to identify and, ultimately, to solve human and environmental problems. Genomics examines the molecular basis of toxicity and develops biomarkers of exposure, effects, and susceptibility to chemicals and other stressors. Before genomics information can be used effectively in Agency risk assessments, such issues as accuracy, reproducibility, and data quality, and understanding whether a genetic change indicates an adverse effect, need to be resolved. An important goal for EPA is to use genomics approaches to provide data for the computational modeling of toxicological pathways for single chemicals or classes of chemicals ("computational toxicology").

Computational Toxicology

The Agency is enhancing the scientific basis and diagnostic/predictive capabilities of existing and proposed chemical testing programs by using *in vitro* or alternative approaches, such as molecular profiling, bioinformatics, and quantitative structure-activity relationships. These techniques will be used in attempting to determine genes that may be responsible for specific mechanisms of toxicity, diagnosing patterns of genes associated with known mechanisms of toxicity, and characterizing and modeling chemical structures associated with known mechanisms of toxicity, respectively. The term "computational toxicology" refers to using these alternative approaches in conjunction with highly sophisticated computer-based models. This approach is expected to greatly reduce the use of animal testing to obtain chemical toxicity information.

Environmental Indicators

EPA is committed to identifying, developing, and applying indicators that can improve our ability to assess environmental progress. While they complement more traditional process indicators, such as measures of emissions or discharges, these new "outcome" measures are intended to more closely reflect the actual impact on ecological or public health from environmental decisions and help clarify—quantitatively and qualitatively—the benefits and costs associated with further incremental improvements. Under ORD's Environmental Indicator Initiative, launched in November 2001, our research will result in a technical report that provides the scientific foundation for future *Reports on the Environment* and will identify additional scientific research and data needed to improve our ability to make sound human and environmental health decisions.

Susceptible Subpopulations

The Agency conducts a continuing research program to protect the general public as well as

groups of individuals (for example, older people, children, and tribal peoples) who might be more sensitive/susceptible than the general population to the harmful effects of exposure to environmental agents (e.g., contaminants in drinking water). Studies conducted or supported by EPA to identify and characterize susceptible subpopulations can be described in the context of the various intrinsic (e.g., age, genetic traits) or acquired (e.g., pre-existing disease, exposure) characteristics that can modify the risk of illness or disease. Studies of susceptible subpopulations typically involve multi-disciplinary research and assessments to identify a range of possible adverse health effects, including cancer, reproductive toxicity, and gastrointestinal illness and other adverse health effects. Because of the importance and broad scope of this issue, EPA has established partnerships to leverage resources and capabilities with various federal and state agencies, universities, and other public or private research entities. Examples of activities at EPA include developing supplemental guidance to the cancer guidelines on cancer risk to children and prioritizing and studying environmental health hazards to older people.

EPA Science Practices (“Doing the Science Right”)

Equally important to doing the right science is doing it correctly. Sound science, as described by the Society of Environmental Toxicology and Chemistry, is “organized investigations and observations conducted by qualified personnel using documented methods and leading to verifiable results and conclusions.”⁴⁸ The R&D investment criterion of quality, mentioned earlier, refers to the Agency “doing the science right.” Sound science or “doing the science right” means supporting, enhancing, and implementing sound science practices and approaches, such as peer review, quality assurance, science coordination, and oversight.

Peer Review

External review of scientific work products by qualified, independent, knowledgeable scientists enhances credibility, uncovers technical problems, identifies additional information needs, and ensures that conclusions follow from data using generally accepted scientific standards. The goal of the Agency’s Peer Review Policy⁴⁹ is to enhance the quality and credibility of Agency decisions by ensuring that the scientific and technical work products underlying these decisions receive appropriate levels of peer review by independent scientific and technical experts.

External Advisory Groups

External advisory groups play an important role in “doing the right science” and “doing the science right.” In particular, the National Academy of Sciences (NAS), EPA’s Science Advisory Board (SAB), and the Board of Scientific Counselors (BOSC) provide scientific and technical advice

to the Agency. Each of these advisory groups is composed of a distinguished body of scientists and engineers who are recognized experts in their respective fields.

As chartered by Congress, NAS advises the federal government on scientific and technical matters and conducts studies for a variety of sponsors, including EPA.⁵⁰ The recommendations resulting from these studies are an important source of independent advice for Agency decision-makers and scientists.

SAB has a broad mandate to advise the Agency on technical matters.⁵¹ Among its principal missions are reviewing the quality and relevance of scientific and technical information being used or proposed as the basis for Agency regulations; reviewing research programs and the technical basis of applied programs; and advising the Agency on broad scientific matters in science, technology, social, and economic issues.

BOSC's mission is to provide advice, information, and recommendations about ORD research programs.⁵² Its specific responsibilities include evaluating ORD's science and engineering research, programs and plans, laboratories, and research management practices and recommending actions to improve their quality and/or strengthen their relevance to EPA's mission. BOSC also evaluates and provides advice on using peer review within ORD to sustain and enhance the quality of EPA's science and reviews ORD's program development and progress, research planning process, and research program balance.

Quality Assurance

Quality assurance involves planning, implementing, and reviewing data collection activities to ensure that the data collected by, or on behalf of, the Agency are of the type, quantity, and quality needed. EPA's peer review policy and quality system are described in our Information Quality Guidelines, which outline how we maximize the quality, objectivity, utility, and integrity of our scientific information.⁵³

Science Coordination and Oversight

The Science Policy Council (SPC) serves as a mechanism for addressing EPA's many significant science policy issues that go beyond regional and program boundaries⁵⁴. To integrate the policies that guide Agency decision-makers in their use of scientific and technical information, the SPC works to implement and ensure the success of selected initiatives recommended by external advisory bodies, such as NAS and the SAB, as well as the U.S. Congress, industry, environmental groups, and Agency staff. Examples of SPC issues include: revision of the cancer guidelines to provide a current state-of-the-art approach for determining cancer risk, harmonization of cancer and noncancer risk

assessment approaches, evaluation of toxicity testing approaches, and validation of laboratory methods.

The Risk Assessment Forum (RAF) is a standing committee of senior EPA scientists.⁵⁵ It was established to promote Agency-wide consensus on difficult and controversial risk assessment issues and to ensure that this consensus is incorporated into appropriate Agency risk assessment guidance. The RAF focuses on generic issues fundamental to the risk assessment process and related science policy issues.

Another effort to ensure Agency dialogue and coordination is the Council for Regulatory Environmental Modeling (CREM).⁵⁶ CREM was established to promote consistency and consensus between environmental model developers and users.

Meeting the Challenge

EPA intends to meet the challenge of advancing environmental science, and the use of this science in our decisions, by continuing and enhancing collaboration with states, tribes, and federal and international partners, and by measuring our performance through the use of environmental indicators and other measures.

Tribal Partnerships

The Tribal Science Council (TSC)⁵⁷ represents a new paradigm for how the Agency works with tribal governments. The mission of the TSC is to provide a forum for interaction between tribal and Agency representatives to work collaboratively on environmental scientific issues, including research, monitoring, modeling, information, technology, and training in Indian country. In conjunction with our tribal partners, the Agency is exploring a new approach, Health and Well-Being, that incorporates the cultural interconnectedness between tribes and the natural world into assessments and uses human and environmental health and well-being as its foundation. The TSC is committed to developing sound cross-media scientific approaches to support tribal cultural values and traditional ways of life and the availability of a healthy environment for present and future generations.

Other Federal Partners

Our emphasis on building partnerships also extends to our relationships with other federal agencies. EPA has ongoing partnerships with many federal agencies engaged in environmental research. We actively participate in the Committee on Environment and Natural Resources (CENR) of the National Science and Technology Council, which was established to foster and implement a coordinated multi-agency and interdisciplinary focus for federal environmental R&D. Through

partnerships with CENR members—such as the Departments of Energy, Agriculture, and the Interior and the National Institutes of Health—we can stay abreast of emerging technologies, evaluate new approaches, and provide a broad knowledge base to inform EPA decisions.

Achieving Results

EPA's approach to conducting and using science in service to the Agency's mission will ensure that Agency policies, decisions, and other activities reflect high-quality scientific information relevant to current and future environmental issues. We will accomplish this goal by ensuring that we work together, both across the Agency and with our partners, to identify the highest-priority science activities and that our work meets the highest standards of scientific excellence.

Homeland Security

The terrorist attacks of September 11, 2001, followed shortly by the deliberate use of anthrax to contaminate public buildings, brought into sharp focus the important role EPA has to play in helping America meet and defeat the threat of terrorism. EPA's role in environmental monitoring and remediation in lower Manhattan, along with the Agency's efforts to decontaminate the Hart Senate Office Building and other facilities on Capitol Hill, revealed the extent to which we will be on the front lines in the war against terrorism.

EPA's mission is clear: to protect human health and the environment. In pursuing this mission, we have developed certain unique scientific and technical expertise and possess additional capabilities that complement those of other federal agencies, including the new Department of Homeland Security.

The events of September 11 and thereafter led us to reassess our capabilities relating to national security and determine whether they can be enhanced to better protect the American people. Our role in homeland security reflects certain responsibilities given to the Agency under such laws as the Public Health Security and Bioterrorism Preparedness and Response Act of 2002,⁵⁸ several Presidential decision directives,⁵⁹ and the President's July 2002 National Strategy for Homeland Security.⁶⁰

Organizing the Work

EPA's homeland security efforts are centered on four main areas of responsibility: (1) critical infrastructure protection; (2) preparedness, response, and recovery; (3) communication and information; and (4) protection of EPA personnel and infrastructure. Each of these areas draws on expertise the Agency already possesses and expands on that experience to meet the challenges we face in protecting the Nation against the threat of terrorism.

Call-out:

EPA's homeland security efforts focus on

- *Protecting critical infrastructure*
- *Preparedness, response, and recovery*
- *Communication and providing information*
- *Protecting EPA personnel and infrastructure.*

Critical Infrastructure Protection

Under the National Strategy for Homeland Security, EPA is named the lead federal agency for protecting two of the Nation's critical infrastructure sectors: the Water Sector and the Chemical Industry and Hazardous Materials Sector.⁶¹ In addition, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 gives EPA specific responsibilities for promoting the security of the Nation's public drinking-water infrastructure.⁶²

These missions draw on EPA's unique programmatic responsibilities and expertise related to the drinking-water and wastewater industries and the use, handling, storage, release, and disposal of chemicals and chemical wastes at industrial facilities. In addition, as a result of EPA's experience with air monitoring and indoor air quality issues, the then-Office of Homeland Security at the White House gave the Agency the lead for the Biowatch system. This system is being implemented in cities across the country to monitor for airborne release of certain biological contaminants.

In these areas, EPA is committed to assessing and reducing vulnerabilities and strengthening detection and response capabilities for critical infrastructures. In addition, EPA will contribute to similar efforts by other federal departments and agencies addressing food, transportation, and energy, and will provide environmental expertise to support federal law-enforcement activities. Among EPA's program offices involved in this area are the Office of Solid Waste and Emergency Response (OSWER), the Office of Water (OW), the Office of Research and Development (ORD), the Office of Air and Radiation (OAR), and the Office of Prevention, Pesticides, and Toxic Substances (OPPTS). EPA's

goals for protecting critical infrastructure include:

- ▼ Work with the states, tribes, drinking-water and wastewater utilities (water utilities), and other partners to enhance the security of water and wastewater utilities.
- ▼ Work with the states, tribes, and other partners to enhance security in the chemical and oil industries.
- ▼ Work with other federal agencies, the building industry, and other partners to help reduce the vulnerability of indoor environments in buildings to chemical, biological, and radiological incidents.
- ▼ Help ensure that critical environmental threat monitoring information and technologies are available to the private sector, federal counterparts, and state and local governments to assist in detecting threats.
- ▼ Actively participate in national security and homeland security efforts pertaining to food, transportation, and energy.
- ▼ Manage its federal, civil, and criminal enforcement programs to meet our homeland security, counter-terrorism, and anti-terrorism responsibilities under Presidential Decision Directives 39⁶³, 62⁶⁴, and 63⁶⁵ and environmental, civil, and criminal statutes.

Preparedness, Response, and Recovery

Under the National Strategy for Homeland Security and various federal response plans, EPA has specific response and recovery responsibilities. As the Agency's experience since September 11 has made clear, we must expand and enhance our ability to provide response and recovery support to any future terrorist events. EPA will focus on strengthening and broadening its response capabilities, clarifying its roles and responsibilities to ensure an effective response, and promoting improved response capabilities across government and industry in the areas in which the Agency has unique knowledge, experience, and expertise. Among the program offices involved in this effort are OSWER, OPPTS, and ORD. To fulfill our responsibilities for preparedness, response, and recovery, EPA will:

- ▼ Be prepared to respond to and recover from a major terrorist incident anywhere in the country by maintaining trained personnel and effective communications, ensuring practiced coordination and decisionmaking, and providing the best technical tools and technologies to address threats.

- ▼ Communicate to federal, state, and local agencies its roles, responsibilities, authorities, capabilities, and interdependencies under all applicable emergency plans consistent with the National Strategy for Homeland Security and efforts undertaken by the new Department of Homeland Security. The Agency will also understand the roles, responsibilities, authorities, capabilities, and interdependencies of its partners. Support and develop the preparedness of state, local, and tribal governments and of private industry to respond to, recover from, and continue operations after a terrorist attack.
- ▼ Advance the state of the knowledge in the areas relevant to homeland security to provide first responders and decision-makers with the tools and scientific and technical understanding they need to manage existing and potential threats to homeland security.

Communication and Information

Comprehensive, accurate, well-organized, and timely information is critical to sound decisionmaking internally and to maintaining public confidence in times of threat. EPA possesses unique capabilities to collect, synthesize, interpret, manage, disseminate, and enhance understanding of complex information about environmental and human-made contaminants and the condition of the environment. Effectively managing and sharing this information within the Agency, among our partners at all levels of government, with the private sector, and with academia will contribute to the Nation's capability to detect, prepare for, prevent, protect against, respond to, and recover from terrorist incidents. Specifically, EPA will:

- ▼ Use reliable environmental information from internal and external sources to ensure informed decisionmaking and appropriate response.
- ▼ Effectively disseminate timely, quality environmental information to all levels of government, industry, and the public, allowing them to make informed decisions about human health and the environment.
- ▼ Exchange information with the national security community to prevent, detect, and respond to terrorist threats or attacks.
- ▼ Continuously and reliably communicate with employees and managers.

Protection of EPA Personnel and Infrastructure

The security and protection of EPA's personnel and infrastructure are critical to ensuring our ability to respond to terrorist incidents as well as continue to fulfill our mission. To further safeguard our staff, ensure the continuity of our operations, and protect the operational capability of our vital infrastructure assets, EPA is taking steps to:

- ▼ Safeguard its employees.
- ▼ Ensure the continuation of the Agency's essential functions and operations.
- ▼ Maintain a secure technology infrastructure capable of supporting lab data transport and analysis functions, continual telecommunications to all EPA locations, and management of critical data and information.
- ▼ Ensure that the Agency's physical structures and assets are secure and operational.

Coordinating the Effort

EPA's homeland security efforts are very much an extension of its traditional mission and involve a number of its program offices. To coordinate these efforts, the Agency has established the EPA Office of Homeland Security within the Office of the Administrator. This new office will serve as the central coordinating body in the Agency for homeland security and as a single point of entry for homeland security matters with other federal departments and agencies.

Working with the Department of Homeland Security and Other Partners

The new Department of Homeland Security is responsible for coordinating the various efforts of federal departments and agencies involved with homeland security. As an important partner of the Department of Homeland Security, EPA—through its program and regional offices—will work with the department on a host of homeland security issues, including critical infrastructure protection, research, and response and recovery. EPA's Office of Homeland Security will be responsible for ensuring that the Agency's various external efforts are properly coordinated and receive clear direction from the Office of the Administrator and other senior leadership.

Achieving Results

EPA is capable of meeting our homeland security mission without compromising our ability to fulfill our traditional mission. By keeping the operational aspects of homeland security in existing

programs (as opposed to creating a new homeland security program office), EPA should realize numerous cross-cutting benefits from its homeland security work.

For example, our work in enhancing technologies for detecting chemical or biological contaminants that could be deliberately introduced into a public water supply might prove useful in detecting naturally occurring contaminants. Similarly, efforts to enhance our response capacity to meet the challenges of several simultaneous terrorist acts could help the Agency respond more effectively, for example, to an accidental release at a chemical facility. As we continue to build our capacity to meet our homeland security responsibilities, we will bring our expertise and experience to bear in our efforts to protect human health and the environment under all of our strategic goals.

Economic and Policy Analysis

EPA's regulations and policies define the technical, operational, and legal details of many of the Nation's environmental programs. Each year, we issue hundreds of rules and policies—some routine and non-controversial, others dealing with complex, cutting-edge scientific issues or generating major economic benefits and costs. The quality of the analyses on which we base our decisions and the clarity of policies and regulations we develop determine how well environmental programs actually work and achieve health and environmental goals. Sound economic and policy analysis builds the foundation for EPA to meet its goals and use its resources wisely to do so.

To ensure that EPA uses sound analysis in developing priority regulations and guidance, we have adopted procedures to leverage cross-Agency expertise, emphasize early analytic planning, promote option development, and encourage timely management involvement. A recent review of our process for developing regulations found our current system to be well designed, but recommended several improvements, including strengthening economic and science analysis, considering a broader range of options, and increasing management attention.

To address these recommendations, we have developed a strategy for improving our internal processes. In particular, we will emphasize sound economic and policy analysis by continually investigating emerging analytic approaches and adopting them as appropriate, fostering consistent techniques across Agency programs, and ensuring that appropriate environmental results are achieved cost-efficiently. In addition, we have named an Economics Advisor who will work across the Agency to ensure that EPA uses the best economic science to support Agency regulations, policies, procedures, and decisions.

Achieving Environmental Results

Sound economic and policy analysis supports EPA's continuing efforts to quantify the benefits of its air, land, and water regulations, policies, and programs. For example, determining the value of ecological systems and the benefits of preserving these systems will be critical in our work toward healthy communities and ecosystems. Sound economic and policy analysis will also support EPA's goals for promoting stewardship and improved compliance by fostering consideration of such nonregulatory approaches as voluntary programs, innovative compliance tools, and flexible, market-based solutions. Sound analyses help gain support for Agency decisions, allowing us to implement regulations, policies, and programs effectively and efficiently. In addition, our analysis of issues and priorities established under statute or by executive order that cut across Agency programs—such as small business and unfunded mandates—help us better understand the economic effects of various approaches and ensure that we use the Nation's resources wisely. Carefully allocating resources is particularly important today, as many states face severe budget constraints.

What We Intend to Accomplish

Our strategy for improving EPA's regulatory and economic analysis addresses several objectives: (1) to enhance the quality of Agency decisions; (2) to refine our analytic tools and capabilities and factor new analytic information into Agency rules and policies more effectively; and (3) to address priorities. To accomplish these objectives, our strategy emphasizes analytic planning, management involvement, cross-office participation, and public input.

Enhancing the Quality of Agency Decisions

As suggested by our recent review of our regulatory development process, EPA is strongly committed to strengthening the quality and consistency of economic science and policy analysis supporting Agency decisions. Typically, EPA forms workgroups of technical experts to develop regulations and policies. We will strive to bolster workgroup expertise by engaging economists, policy analysts, scientists, and legal staff from offices across the Agency throughout the regulation and policy development process.

In addition, we will work to apply sound economic science and promote consistency. In FY 2001, following extensive peer review by the Economics Subcommittee of EPA's Science Advisory Board (SAB), the Agency released its *Guidelines for Preparing Economic Analyses*. In its final review report, SAB concluded that the guidelines "succeed in reflecting methods and practices that enjoy widespread acceptance in the environmental economics profession." EPA will work to ensure that staff across the Agency understand these guidelines and apply them consistently, and we will

conduct internal peer reviews to ensure the quality of economic analyses prepared for economically significant regulatory actions.

Finally, we will identify and investigate key cross-cutting environmental policy issues. Historically, EPA has addressed environmental problems by medium—air, water, or land. However, many problems might be addressed more efficiently using holistic or multimedia approaches. We will continue to use economic and policy analysis to identify emerging environmental concerns, such as children's health, and assess cross-media, cross-program issues, such as Agency policy on mercury.

Improving Analytic Tools and Capabilities

EPA must use the most up-to-date, sound information and economic analysis methods in developing regulations and policies. We are working to advance the tools and techniques we can use to assess the effects of Agency actions, communicate with our partners and the public, and strengthen our regulations and policies.

In the coming months, the Agency will issue an *Ecological Benefits Strategic Plan* to provide a framework for using ecology and economics to evaluate the impact of policies and regulations. We will also establish a research agenda to better account for ecological impacts in benefit-cost analyses.

We are finalizing an Agency *Environmental Economic Research Strategy* that will draw together EPA research and establish our economic research priorities. Future research will focus on such topics as resolving issues associated with determining the value of reducing health risks; improving our cost estimation; and treating uncertainty in benefit-cost analysis.

Through our SAB affiliation, EPA will work closely with preeminent economic scientists. We will continue to consult with the SAB Environmental Economics Advisory Committee to ensure that our *Economic Guidelines* comport with current economic science in mortality risk valuation, uncertainty analysis, and ecological benefits valuation. Finally, to improve our staff's capability to provide sound economic and policy analysis, our internal Economics Forum will continue to address economic issues. We will train staff in such key areas as economic analysis guidance, children's health valuation, quantitative uncertainty analysis, and incorporating analysis in regulation and policy development effectively.

Addressing Policy Priorities

EPA actions are bounded by many policy priorities and initiatives, including Congressional priorities provided in environmental or other statutes, Executive Office priorities presented in executive orders, and Agency initiatives. We will use appropriate economic and policy analysis to further the

Agency's policy priorities.

One such priority is reducing burden on small entities. Consistent with the Regulatory Flexibility Act, as amended by the Small Business Regulatory Enforcement Fairness Act, EPA will consider the impact of its actions on small entities. When appropriate, we will continue to convene a Small Business Advocacy Panel with the Office of Management and Budget and Small

Business Administration. To date, EPA has convened 26 panels and continues to assess the need for additional panels.

In addressing our policy priorities, we will continue to promote innovative analytic approaches, work with our federal, state, tribal, and local government partners, and encourage public participation to ensure that Agency decision-makers consider a broad range of approaches and perspectives.

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