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Sustainable Development: Economy, Society and Environment

**By
Alice A. Fleenor**

**Final Project
Presented to the College Scholars Program
And the University Honors Program
At the University of Tennessee**

August 16, 2004



Table of Contents

Sustainability and Environmental Communication: Society, the Environment and the Economy	1-39
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Bibliography	40
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Appendix

- I. Case studies
- II. Important Legislation
- III. U.S. and U.K. facts, figures and reports
- IV. Sustainable development
- V. Innovation case studies and examples
- IV. Additional resources

Despite popular misconceptions, environmental concerns have been developing for centuries. Noted figures like Rachel Carson, author of *Silent Spring*, a book that “animated the environmental awakening of the 1960’s,” were instrumental in the progress of the modern environmental movement. However, the true history of environmental consciousness can be traced back much further. “Long before *Silent Spring*, centuries before Greenpeace activists defied whalers’ harpoons, many thousands of “green crusaders” tried to stop pollution, promote public health and preserve wilderness.” (American Historical Association, p. 1-2)

The Encyclopedia of Sustainable Development suggests that for the first hundred thousand years, humankind, composed primarily of hunter-gatherers, relied on immediately available resources and the survival of the group depended on this close proximity. Then, as time passed and humans became more aware of their environment, a slow progression toward agriculture began. As the new agricultural age brought increased prosperity to the people of the world, they continued to desire more, and, as a result, the age of industrialization would give way to a consumer driven society. What the people perhaps did not foresee was the critical impact this age would have on their existence and the existence of generations to come. It has only been in the past hundred years that humans have begun to examine the effects of their relationship on the environment. Historically, the survival of mankind was dependent upon the availability of resources. The success of the group was threatened as they quickly depleted the environment of its resources.

As much research and literature suggests, environmental issues have been a concern of many diverse and ancient cultures, long before humans began to explore the effects of more popular issues such as the Industrial Revolution. The American Historical Association (AHA)

suggests the world's oldest major religion was the first source of concern for the environment. They site Vedic scriptures called Aranyakas (forest books) which concentrate on the uses of the forests and their need for preservation by early savages that called the forests home. The AHA also suggests that to the east of India, "Taoism and Confucianism explain and help people follow the patterns of nature. To the west, Egyptian, Samarian, Babylonian and other civilizations have extensive and intricate links between nature and the divine." (AHA, p.1)

Greek and Roman history denote the importance of natural resources as coastal cities experienced soil erosion after depleting the forests and siltation filled in the water supplies by the rivers. According to the AHA, Greek philosopher Plato compared hills and mountains of Greece to the bones of a wasted body: "All the richer and softer parts have fallen away and the mere skeleton of the land remains." (AHA 2004, p.4-6) In comparison, the Ancient Romans, struggled with lead poisoning and environmental pollution generated from pre-industrial smoke from wood burning and the crafting industry. While water pollution was less severe in some ancient civilizations, odor and runoff from garbage and sewage from their modernized sewer systems still "fouled the air and water." (AHA 2004, p. 4) Despite their ecological insufficiencies, the Roman emperor Justinian recognized the seriousness of the situation and issued a Legal code in 535 AD with the first section on the *Law of Things* acknowledging that "By the law of nature these things are common to mankind- the air, running water, the sea, and consequently the shores of the sea." (AHA 2004, p.6)

The Middle Ages and the Renaissance also saw their share of environmental concerns. While water pollution and soil conservation were not as large a problem as in other eras, public health and environmental concerns were at the forefront of public thought. However, there were some positive environmental developments in the era. Although the Bubonic plague destroyed

Europe, it forced the initiation of the public health laws. In the early 1300's Forest Codes were introduced in France and helped regulate the wood harvesting industry. By 1388, the British Parliament passed a law forbidding people to dispose of their rubbish in the streets, rivers and ditches. The bathroom was also an important invention by Sir John Harrington that would eventually work to help eliminate the odor and water pollution from raw sewage in England. Noted inventor Benjamin Franklin also made contributions to the environment such as when he led a petition to the Pennsylvania Assembly to stop waste dumping and remove tanneries from Philadelphia's commercial district

By the 1600's, rapid industrialization in England led to quick depletion of forests and increased the need for the substitution of coal. Sixty years later, John Evelyn wrote "Fumifugium, or the Inconvenience of the Aer and Smoake of London Dissipated" and proposed remedies for London's fog problem created by the overuse of coal fuel. (AHA 2004, p.3) In 1684, Evelyn wrote in a diary that the smoke was so severe "hardly could one see across the street, and this filling the lungs with its gross particles exceedingly obstructed the breast, so as one would scarce breathe." (AHA 2004, p.3)

The mid-1700's brought the age of enlightenment, and the idea that the individual citizen was to be valued. According to historic accounts by the AHA, Benjamin Franklin continued his fight against water pollution. James Lind, author of *A Treatise on Scurvy*, also made a contribution to public health by fighting scurvy as prisons and slums began to be cleaned. Despite their efforts, gas from coal dripped tar into the rivers, rubber plants discharged noxious fumes and released chemicals directly into streams and coal smoke continued to accumulate in dangerous amounts around large urban areas.

Reform began in the early 1800's with the development of the first modern sewer system. Influential characters such as Ralph Waldo Emerson took on the subject as he led the movement that included Coleridge, Byron, Shelly, Keats, Thoreau, Ruskin and Whitman. (AHA 2004, p6-10) In response to their overwhelming concerns, policy makers began to make adjustments that would affect the environment. In 1818, the British Parliament "express[ed] concerns that steam engines and furnaces could work in a manner 'less prejudicial to public health.'" (AHA 2004, p.9-10)." John Wordsworth, artist and Oxford Professor was on the conservation bandwagon, claimed that 'modern' towns were "...little more than laboratories for the distillation into heaven of venomous smokes and smells, mixed with effluvia from decaying animal matter, and infectious miasmata from purulent disease... [Every river was] a common sewer, so that you cannot so much as baptize an English baby vut filth, unless you hold its face out in the rain, and even that falls dirty." (AHA 2004, p. 9)

The Industrial Revolution brought with it living conditions that "horrified the reform minded commissions" in the U.K. and the U.S. (AHA 2004, p. 1) Still, the development and the advent of new technologies quickly gave way to a full-blown Industrial Revolution. It wasn't until this time in the middle of the 18th century that production, trade and commerce had an impact on the global environment. (Hutchinson1997, p. 36) Water pollution quickly became a major issue as the cholera epidemic was traced partly to a single contaminated water pump. Consequently, this period of time began to slowly reveal the rapid change of mankind's relationship to the Earth (Encyclopedia of Sustainable Development 2004, p.1).

As the Industrial age progressed quickly, man moved from "relying on the Earth for survival and sustenance" to attempting to "control and exploit it, often without recognizing the environmental consequences." (Encyclopedia of Sustainable Development 2004, p.1) Many

citizens, employers and policy makers of the Industrial Revolution did not realize the connection between pollution and environmental fallacies. Others like William Morris, a writer and “fierce critic of the industrial revolution” turned his apathy into revealing literature that now represents the quality of life that existed in the larger towns in England and in America. He wrote “Forget six counties overhung with smoke, Forget the snorting steam and piston stroke, Forget the spreading of the hideous town; Think rather of the pack-horses on the down, Land dream of London, small, and white and clean...” (AHA 2004, p.3)

As the Age of Industrialization swept through Britain in the 18th and early 19th centuries, the public witnessed the development of mass production processes and factory based systems that were dependent on an enormous amount of power derived from fossil fuels. According to the Encyclopedia of Sustainable Development, fossil fuels were primarily used to generate steam power and electricity. (2004, p.1) Consequently, in 1847, policy makers in the United Kingdom acknowledged the need for sanitation measures in written policy, passing the Towns Improvement Clauses Act that encouraged the “paving, drainage, cleansing and lighting of towns” as well as giving towns the power to elect an appointed full time medical officer to deal with disease resulting from sanitation and pollution problems. The same year, a milestone was made in the U.S. as US Congressman George Perkins Marsh noted the destructive impact of people on the land in a speech to Congress and later published *Man and Nature: The Earth as Modified by Human Action*. (AHA 2004, p. 7) Yet, as word of the wonders of the new electric world spread, people continued to flock from the countryside to the city with the hope of attaining increased prosperity and better employment.

Despite early warning signs “industry continued to adopt ecologically unsound materials and techniques” and continued to produce with “no vision beyond the abstracting of resources

and the dumping of toxic and degraded materials back into the natural environment” (Hutchinson 1997, p. 37). While two centuries of industrialization did make life better in countless ways for many people, the process used to obtain the resources necessary to sustain such development had an enormous and, in some cases irreparable, impact on the environment. There has been, and continues to be, damage done to the physical systems and social fabric that influence the well being of the nation and of the global community as well. Today, despite an increase in public awareness of environmental issues, the environment faces an increase in pollution, the depletion of non-renewable energy sources and the loss of biodiversity that makes our environment what it is. (Office for Official Publications of the European Communities 1990, p.15)

With the fallout of the American Frontier of the late 1800’s came the Progressive Era, a time when reform was a common concern for citizens and policy makers alike. President Teddy Roosevelt’s first message to Congress in 1902 set the pace for the following century and clearly recommend water and forest reclamation, preservation and conservation. Following his lead, strong social activists and reformers began to not only to call for action, but also to form organizations to help society carry out the necessary progressive movement to accomplish it.

The first of the U.S. organizations to be founded was the General Federation of Women’s Club to promote conservation and ecology. Shortly thereafter, the Sierra Club was founded by Jon Muir, Robert Underwood and William Colby “to do something for the wilderness and make the mountains glad.” (AHA 2004, p. 3) The American Scenic and Historic Preservation Society followed in New York out of the state-level Trustees of Scenic and Historic Places and Objects which had been founded by Andrew H. Green who served as President of the Commissioners of the State Reservation at Niagara. (AHA LoC Chronology 2004, p. 7)

After the fail at an earlier organizational attempt, the National Audubon Society, named after famed wildlife painter John James Audubon, was founded by George Bird Grinnell solely for the purpose of promoting the conservation of wildlife in the United States. Policy makers jumped on the bandwagon in 1906, creating the Food and Drug Administration to protect public health. They also began legally protecting the land forming the National Park Service, Yosemite National Park and the Grand Canyon Game Preserve which was established by Congress. The Supreme Court even got involved when the first air pollution lawsuit, eventually deciding to limit the amount of sulfur and other noxious fume emissions. The majority opinion, delivered by Chief Justice Oliver Wendell Holmes, stated: "It is a far and reasonable demand on the part of a sovereign that the air over its territory should not be polluted on a great scale by sulphurous acid gas, that the forests on its mountains should not be further destroyed or threatened by the act of persons beyond its control, that the crops and orchards on its hills should not be endangered." (Georgia v. Tennessee Copper Co. and Ducktown Sulphur, Copper & Iron Co., 206 U.S. 230 1907, p. 13)

The early 1900's brought about much environmental and policy reform. The National Coast Anti-Pollution League was formed by state and municipal officials in an effort to stop oil dumping. (AHA 2004, p.2) In 1924, the Oil Pollution Act was passed to prohibit the discharge of oil from any vessel within a three mile limit. In the United Kingdom, the Public Health Act of 1863 was expanded to control chemical processes that might cause serious pollution. The Civilian Conservation Corps. was also formed and provided for the opening of more than 2, 000 camps where trees were planted. During the Franklin D. Roosevelt's administration, the Tennessee Valley Authority and the Soil Conservation Service were formed. In 1936, the U.S.

Congress passed Public Contracts Act mandating health and safety standards for any business operating under government contract.

While this era saw much progress towards the yet undeveloped idea of sustainable development, there were concerns that surfaced with the multi-faceted corporation still known today as General Motors. Researchers working for GM discovered tetraethyl lead as an anti-knock gasoline agent. Fourteen months after its invention, the product went on sale despite the concern caused by the release of fumes from the product. In 1925, the Surgeon General held a conference on leaded gasoline although alternatives to using the leaded gasoline were not produced. Shortly thereafter, a researcher for the British Medical Journal released a groundbreaking report on the use of leaded gasoline, stating that it would create a “slow, subtle insidious saturation of the system by infinitesimal doses of lead extending over a period of time. (AHA 2004, p.6)

The 1960’s and 1970’s proved to be an incredibly volatile period of time in both the U.K and the U.S. as environmental issues surfaced and raged to a boil. Arguably one of the most influential environmental accounts, *Silent Spring*, a book that generated much controversy and interest in pesticides and the environment, was published by biologist Rachel Carson. According to the American Historical Association, *Silent Spring* is often seen as a turning point in environmental history because it opened a much stronger national dialogue about the relationship between people and nature. (AHA, p.1) As public pressure continued to build with the publication of similar books and essays, General Motors and Standard Oil of New Jersey (Exxon) “abandoned” Ethyl Corp. and sold it as the main manufacturer of leaded gasoline (Appendix I.). Particularly productive years followed as the White House Conservation Conference was held and the U.S. Congress passed the Water Quality Act and the Clean Air Act

(Appendix II.). Funds allocating more than \$90 Million for local and national clean up efforts were developed. Less than one year later, Congress created the National Wilderness Preservation System, allocating more than 9 million acres of land “to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.” (AHA 2004, p.2)

With such actions in mind, by 1967 the Environmental Defense Fund was established. Only two years later, Congress passed the national Environmental Policy Act stating that “...it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” (AHA 2004, p5)

According to the Encyclopedia of Sustainable Development, among the first “pressure groups” to emerge and accelerate the environmental movement included the Sierra Club, Friends of the Earth and Greenpeace. As people became increasingly disillusioned with the increase in negative effects of industry on the environment, there was a sharp increase in interests as the groups aimed to raise public awareness of the seriousness and increasing urgency of the declining state of the environment. In 1970 the first “Earth Day” was sponsored and attracted an estimated 20 million Americans. (Encyclopedia of Sustainable Development 2004, p.1) As the demonstrations continued, policy makers and environmental groups began to recognize that the most efficient way to deal with such a global issue was to call for international cooperation to protect the environment shared by those around the world.

As a result, 1970 was declared European Conservation Year. By 1972, the United Nation's first Conference on the Human Environment was held with the goal of producing a declaration of "principles designed to deal with specific environmental problems." (Encyclopedia of Sustainable Development 2004, p.1) With this attitude came the slow shift of attitude from regional issues to encompass wider, global environmental issues.

With the birth of the Environmental Protection Agency (EPA) came a concentrated environmental cleanup effort with air pollution cut back dramatically and a ban on leaded gasoline implemented (Appendix II.). Water pollution was also tackled and greatly decreased through a massive sewage treatment expansion. (AHA 2004, p.1) In the following years Congress made great strides towards regulation of environmental instruments and safety by:

1970 – EPA signed into law

1970 – Occupational Health and Safety Administration signed into law

1972 Federal Water Pollution Control Act passed

Coastal Zone Management Act passed

Ocean Dumping Act

Marine Mammal Protection Act

Federal Insecticide, Fungicide, Rodenticide Act amended

Toxic Substances Control Act

First Bottle recycling bill passed

1973 Endangered Species Act passed

1976 Resource Conservation and recovery Act

Federal Land Policy Management Act

1977 Soil and Water Conservation Act

Surface Mining Control and reclamation act

1978 National Energy Act

Endangered American Wilderness Act

Antarctic Conservation Act

While Congress was busy passing laws, others took a different approach at reaching solutions to the environmental issues ahead. In June 1972, the United Nations held the first Conference on the Human Environment in Stockholm, Sweden. The conference was controversial but the United Nations General Assembly formed the UN Environmental Programme (UNEP)(Appendix IV). Others responded to their concerns in a different way.

In 1972 following the controversy of UNEP, Rene DuBois published *A God Within*, expressing her feelings about the state of the environmental movement: “Erosion of the land, destruction of animal and plant species, excessive exploitation of natural resources, and ecological disasters are peculiar to the Judeo-Christian tradition and to scientific technology. “...man’s thoughtless interventions into nature have had a variety of disastrous consequences. All over the globe and at all times men have pillaged nature and disturbed the ecological equilibrium.” (AHA 2004, p.3)

Later, renown author and environmentalist Rene DuBois, along with Barbara Ward publish these timely words in *Only One Earth: The Care and Maintenance of a Small Planet*. “We are not sleep walkers or sheep. If men have not hitherto realized the extent of their planetary interdependence, it was in part at least because, in clear, precise physical and scientific fact, it did not yet exist. The new insights of our fundamental condition can also become the insights of our survival. We may be learning just in time.” (AHA 2004, p3-8)

Perhaps the most appropriate piece written during this time that would ring true for years to come was written by E.F. Schumacher, founding father of the Intermediate Technology Development Group, and published in *Small is Beautiful: Economics as if People Mattered*. “One of the most fateful errors of our time is the belief that ‘the problem of production’ has been solved...A businessman would not consider a firm to have solved its problem of production and to have achieved viability if he saw that it was rapidly consuming its capital. How, then, could we overlook this vital fact when it comes to the very big firm, the economy of Spaceship Earth?” (AHA 2004, p.4)

This quote, perhaps an early indication of the need for sustainable development practices that would support the environment and leave natural resources for generations to come, proved to be appropriate in recent years which have seen more than their share of business related environmental dangers. While there seemed to be legislative progress in these areas towards a more sustainable environment, new issues emerged and proved to be more serious than most expected.

Toxic chemicals were the first to come under attack with an incident where Allied Corporation deliberately endangered employees with exposure to toxic chemicals. Nuclear power also became a hot issue after the Three Mile Island incident caused concern over its safety. The Superfund Act of 1980 was passed as environmental disasters began to “show the tenuous and fragile side of industrial technology.” (AHA 2004, p.1) In 1985, British scientist Joe Farman discovered and published the discovery of a hole in the ozone layer over Antarctica and NASA soon confirmed the discovery. The year 1986 began with the explosion of the Chernobyl nuclear reactor in the Ukraine where more than 4,000 people died. Next was an incident in Cameroon, Africa where a cloud of carbon dioxide gas boiled out of Lake Nyos and

killed 1,700 people as it swept downstream. In 1989, the most publicized environmental disaster in American history broke as the Exxon Valdez ran aground in Prince William Sound, Alaska and spilled an estimated 11 million gallons of oil into the ocean. Finally, one of the largest environmental catastrophes occurred during the Persian Gulf War in Kuwait and Iraq when oil spills creates a disastrous environmental hazard.

Despite these environmental horrors, the U.N. held the Earth Summit in Rio de Janeiro, Brazil where Agenda 21, among other legislation, was developed to assist developing nations in attaining environmentally sound business and production practices as the Earth's population exceeded 6 billion. Another step forward in the United States would come with the presidential election of 1992. During his term in office, President Bill Clinton set a new record for preservation of natural resources and habitat. He left office in 2001 having protected more than 58 million new acres of national forest from development and creating eight million acres of land as national monuments. (AHA 2004, p.2-7)

Recently, government agencies have predicted that the world's population will double by 2010. It seems inevitable that environmental issues will remain the forefront of public concern. Governments, agencies and corporations will continue to struggle as standards of living rise as well as the level of production required by increasing population and consumer demand. Organizations will be forced to restructure their corporate philosophies to support the consumer demand and to maintain their corporate sustainable responsibilities.

Today the environmental movement has experienced a shift from development to conservation. As Public and private sectors have become increasingly aware that, in order to maintain society's current rate of development, business must find a way to leave suitable resources for future generations to come. The Encyclopedia of Sustainable Development

suggests that environmental problems today must be “tackled by considering their relationship with the state of the economy and the wellbeing of society.” (2004, p.1)

Sustainable Development

Sustainable development is defined as the responsible use of natural resources that will enable future generations to thrive while supporting today's business operations (Appendix IV). It is a concept that has evolved as society has come to the realization that the Earth's resources will not allow people to enjoy economic growth if our environmental practices are not adjusted to allow for the basic requirements of life – air, food and water. Complicating this current matter is the idea that the “economy exists entirely within society” as many economic issues related to environmental controls threaten to weaken the societal institutions that have taken so many years to form. (Encyclopedia of Sustainable Development 2004, p. 1)

By the late 1980's, the economic impact of environmental change became increasingly evident. As a result of increasing concerns about the effects of economic development on health and wellbeing and natural resources, a group of international politicians, civil servants and environmental experts, prepared and released the Brundtland Report (Encyclopedia of Sustainable Development 2004, p.1). This historic report, also known as *Our Common Future*, was the first of its kind in the U.N. to acknowledge the urgent need for sustainable development and to establish its definition as ‘development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

This landmark report also established the priorities for the sustainable development movement and stressed that sustainable development would involve a process by which economic, environmental and social needs would come into balance with one another. It further sites that economic development would “remain the basis of human development” despite changes that would make progression less environmentally destructive. (Encyclopedia of Sustainable Development 2004, p.1) According to the Encyclopedia of Sustainable

Development, the Brundtland Report highlighted several fundamental components of sustainable development, the environment, the economy and society:

- *Environment* – to conserve and enhance resource base by changing the way technologies are used and developed
- *Social Equity*- developing nations will be allowed to meet basic needs including employment, food, energy, water and sanitation
- *Economic Growth*- growth will be revived and developing nations will be allowed to grow as already developed nations

Five years after the Brundtland Report was issued, the U.N. General Assembly held the Conference on Environment and Development in Brazil with the intention of examining the progress being made towards reaching the goals set forth in the report. The Rio Earth Summit was a success, attracting more than 30,000 people and 100 heads of state. While the focus of the Summit was environmental, other issues concerning budget, population growth, consumption rates and waste arose as important concerns regarding the continued plans towards achieving a sustainable global system.

Despite the push for developing nations to embrace the policies towards stabilizing their environmental impact, less developed nations pushed for the chance to continue to develop and industrialize (Appendix IV). Despite a mix of opinion regarding the extent to which government should control and regulate the sustainable development movement, it was at this Summit that legislation was passed committing nations, including the U.K. and U.S., to an agreement on guidelines that are still very much in practice today (Appendix II.).

On October 1976, Congress passes a law to control hazardous wastes, end open dumping and promote conservation of resources. The Resource Conservation and Recovery Act (42 U.S.C. s/s 6901 et seq. 1976) was a big step toward ending open waste dumping (Appendix IV.). It also

called for continued research, demonstrations, information dissemination and public participation activities to enlarge the pool of knowledge about environmental concerns. (EPA History 2004, p.1) According to EPA History, the new law provided for the following provisions:

- A requirement that all Federal Procurement agencies procure items composed of the maximum allowable percentage of recycled materials.
- A requirement that all public participation must be promoted in the development of all Federal and State regulations, guidelines, information, and programs under the act.
- Permission for citizens to bring suits to force compliance with the law.
- Requirement of a number of specialized studies.

One of the most significant pieces of legislation established at the 1992 United Nations Conference on Environment and Development was Agenda 21, which would prove to have a great impact on the United Kingdom. It agreed along with its commitment to sustainable development, to be monitored by the International Commission on Sustainable Development (ICSD) which would act as a function of the U.N. Economic and Social Council (ECOSOC) (Appendix IV.). With such an agreement made, the United Kingdom would commit to address “the development of societies and economies by focusing on the conservation and preservation of the environment and its natural resources.” (Encyclopedia of Sustainable Development 2004, p.1)

As the Department of Environment, Food and Rural Affairs (DEFRA) suggests, Agenda 21 provided a guideline for countries dealing with sustainable development issues concerning poverty, hunger, resource consumption and the deterioration of ecosystems (Appendix II.). For the first time, as guided by the standards and conventions established by Agenda 21, the United

Kingdom would gauge its economic success, not only in monetary terms, but also in terms of environmental success.

By reviewing the history of the environmental movement, it becomes evident that the idea of sustainable development is one that represents a global struggle to maintain standards of living as well as protect and nurture the environment. The push for sustainable development has become a core issue in modern society as many elections in the U.S. focus on environmental policy.

As the U.K. agreed to Agenda 21, it would face problems not only on a regional level, but on a national and global level as well. While the U.K. did not face problems as immediately serious as some developing countries where people had no access to health care or little income, the government did recognize that global concerns had to be taken into consideration. The integration of Agenda 21 principles posed a great obstacle to all governments and it became apparent that the process would only be successful with the full engagement of government, non-governmental agencies and, most importantly, the public at large.

As agreed upon by commitment to Agenda 21, the U.K. began to develop its own guidelines that would aid in the progress of sustainable development. With such a strategy, the United Kingdom recognized that “everybody has the right to a healthy, clean and safe environment.” (Encyclopedia of Sustainable Development 2004, p.1) While poverty, poor housing, and unemployment were all areas of improvement to be addressed in the U.K. Sustainable Development Strategy, the government felt the need for “a more environmentally sound approach to development, especially with regard to transport, energy production and waste management.” (Encyclopedia of Sustainable Development 2004, p. 1)

Under the provisions of Agenda 21, the U.K. and the U.S. held a unique position, as the governments scrambled to develop and implement acceptable policies. At the same time, they

were faced with the problem of allowing continued economic prosperity without disregarding the negative environmental affects that, in due time, would only slow economic growth for generations to come. For the U.K and the U.S., the adoption of a corporate environmental mission goes beyond adoption of an environmental statement. Many organizations establish research foundations, participate in international or national environmental organizations, or work hard to adopt the regulations provided by local and international agencies (Appendix IV.). (Roberts 1995, p. 18)

According to the Encyclopedia of Sustainable Development, the U.K. strategy was a “catalyst for change” and set forth ten “guiding principles” that would affect the future of sustainable development:

- putting people at the centre
- taking a long term prospective
- taking account of costs and benefits
- creating an open and supportive economic system
- combating poverty and social exclusion
- respecting environmental limits
- the precautionary principle
- using scientific knowledge
- transparency, information, participation and access to justice
- making the polluter pay (Encyclopedia of Sustainable Development 2004, p.1)

The U.S. National Environmental Protection Agency (EPA) organization was created in 1970 and brought together a “patchwork of federal programs concerned with various aspects of the environment under the control of a single regulatory agency.” (Environmental Regulation: Early Days at the EPA 2004, p.1-2) While the tasks from a managerial point of view were daunting, its mission was to establish credibility in the eyes of the community both private and governmental. As a result, the EPA opened its doors and immediately filed cases against Detroit, Cleveland, and Atlanta for river pollution.

A major goal of the EPA and its administration was education of the public at large about environmental issues threatening their quality of life. With their aggressive actions, the EPA began to see payoff against their “backdrop of aggressive enforcement and education.” (Environmental Regulations: The Early Days at EPA 2004, p1) EPA administrator William K. Reilly, suggested that his administration was determined “to secure for future generations of Americans their rightful share of our Nation’s natural resources, as well as clean and healthful environment in which to enjoy them.” (EPA History 2004, p.1-5)

In 1996, the U.K. Environment Agency was organized and today it is the “leading public body for protecting and improving the environment in England and Wales.” (U.K. Government Sustainable Development 2004, p.3-4) The Agency, sponsored by DEFRA, was developed with the mission of ensuring that the environment is looked after by all of today’s society so that “tomorrow’s generations will inherit a cleaner, healthier world.” (UK Government Sustainable Development 2004, p. 3) According to the UK Government, the agency has a staff of approximately 10,000 and enjoys an annual budget reaching more than £750 million a year. This enables the agency to provide a “high quality” of environmental protection and encourage “improvement in England and Wales through an emphasis on prevention and education through vigorous enforcement when necessary.” (2004, p. 3) Former Environmental Minister Michael Meacher suggested that “the Environment Agency plays a key role in delivering the Government’s environmental protection...” (U.K. Government Sustainable Development 2004, p.3)

In the Foreword to *A Better Quality of Life Report*, a Government publication released in 1999 dealing with strategy for sustainable development in the U.K., the British Prime Minister Tony Blair encouraged continued progress towards sustainable development by stating that “we

must ensure that economic growth contributes to our quality of life, rather than degrading it.”
(UK Sustainable Development 2004, p.1)

In 2000, the U.K. government proposed a new Sustainable Development Commission after the *White Paper: A Better Quality of Life* was released. Today, as outlined in the Encyclopedia, the Commission’s role is to advocate sustainable development across all sectors of the U.K., review progress towards it, and build consensus on the actions needed if further progress is to be achieved. Its specific objectives are to:

- review how far sustainable development is being achieved in the UK in all relevant fields, and identify any relevant processes or policies which may be undermining this;
- identify important unsustainable trends which will not be reversed on the basis of current or planned action and recommend action to reverse the trends;
- deepen understanding of the concept of sustainable development, increase awareness of the issues it raises, and build agreement on them;
- encourage and stimulate good practice.

Today the struggle to maintain standards of sustainability continues and, although the idea is simple, the task remains substantial as global government agencies strive to maintain a stable, competitive economy which is the first priority in achieving new progress towards sustainable development locally and nationally. The groundwork legislation has been laid for continued progress in the U.K. and the U.S. toward a more sustainable society that will protect the resources of the environment for generations to come. However, there are still significant barriers that threaten to slow the progression towards a world in which all people are privileged in which people have “more widely available goods and services: decent housing, efficient

household equipment; safe and nutritious food; and access to a growing range of leisure activities.” (U.K. Sustainable Development 2004, p.1)

Therefore, the U.K. has developed an approach to sustainable development that will encourage such progress. By adopting strategic development practices to deliver a more sustainable community, the government will allow for continued economic success. Environmental agencies have also pinpointed current areas in which sustainable development needs to be addressed, including a prosperous and sustainable economy where better use is made of resources and the development of new skills.

Another current issue to be addressed is the management of the environment and its resources while challenging businesses and consumers to use resources efficiently. The development of sustainable communities and international co-operation and development is another critical issue as the UK commits to work with other nations to tackle global environmental issues. (UK Government Sustainable Development 2004, p.1)

The Business of Sustainability

Over the past decade, companies have become increasingly aware of the environmental and social repercussions facing business. (Hall 2003, p.1) Today, evidence suggests that the cost of environmental policies is minimal when weighed against the detriment to the environment that will impact the economy of future generations. (Office for Official Publications of the European Communities 1990, p.13) In 2004, as the research into cost and impact of “market-and-industrial-policy-driven innovation still lags”, the U.K. and U.S. continue to make small strides in policy that will positively impact the affects of industry and modernization on the environment (Appendix III.). (Henderson 1996, p.140)

Hall and Vredenburg, authors of *The Challenges of Innovating for Sustainable Development*, suggest that a strategy that integrates the goals of innovation and sustainable development is needed. (2003, p.1) As both the U.S. and U.K. governments continue to modernize their approach to sustainable development, an increase in the lack of support from business and the public sector has complicated the process. Businesses wonder how legislation will impact their profits and bottom line as they struggle to keep pace with changing policies. While numerous businesses cite sustainable development as a significant challenge, Levio Desimone, Chairman of 3M, suggests that: “The sustainability agenda is developing faster than any other part of the business agenda and ...the relevant understanding and skills are likely to be necessary conditions for success in the 21st century business world. (U.K. Sustainable Development 2004, p.1)

Concern for the environment is one that adds a new dimension to conventional management concerns. It “complicates decision making, and necessitates a broadening of expertise among mangers and consultants.” (Cradle to Cradle: Remaking the Way We Make Things 2002, p.58) Herein lies one challenge, as becoming versed in the topics of environmental management, social

responsibility and sustainability has become a daunting task. But it has affected the marked to the extent that sustainable practices have become a core curricula area as the importance of the issue has grown. Moreover, companies and their management continue to seek ways in which they can “achieve economic vitality while helping the planet towards environmental and social vigor.”(Walking the Talk: A Business Case for Sustainable Development 2002, p.58)

Roberts suggests that the concept of managing for and with the environment is not static; it has changed and will continue to change as environmental conditions do. His solution is to suggest an adopted concept of management that embraces a vast array of management and environmental issues. This attitude that addresses environmental concerns at the core of management’s concerns suggests that it is “no longer possible or satisfactory to regard environmental matters as irrelevant or to treat them in a tokenistic manner.” (Roberts 1995, Introduction)

As Robert suggests, the environment should be regarded as one of the dominant factors in the development and implementation of business strategies. It is an essential element in the cultivation of the relationship between a company and its environment as well as to the success of any contemporary business. Roberts suggests that there are three broad factors that have pushed the emergence of environmental concern in the business sector:

- There has been a growing awareness and appreciation of the depth, breadth and seriousness of the environmental consequences that result from previous eras of economic growth and from dominant attitudes in business which regard the environment as a provider of free goods rather than as a set of finite and precious resources.

- This greater awareness and appreciation has been heightened by a series of major industrial accidents and crises. The consequences of environmental failure, even in incidents such as those at Bhopal and Chernobyl, have become instantly visible to citizens throughout the world through the medium of television. Such messages provide a powerful and legitimate focus of concern for governments, businesses and citizens alike.
- Governments, citizens and companies have realized that the varying degree of emphasis which is placed upon the environment in different countries, and which reflected in legislation, both distorts the terms of trade and places uneven burdens upon the public and private sectors. In some countries companies are required to incorporate the costs of good environmental practice within their internal economic structures, whilst in other countries governments, or individual citizens, are left to count the cost of environmental irresponsibility (Roberts 1995, p.2).

Roberts also suggest that in analyzing the increased concern in business, there can be some important trends identified. Often these trends affect both private and public sector businesses and organization.

- There has been a shift in attitude of some companies away from a grudging minimum level of compliance with a prevailing regime of environmental regulation and towards a more proactive role in setting and maintaining new standards of behavior.

- Some businesses have gone further and have moved beyond the requirements for environmental performance as specified in current legislation and towards a willing participation in both enhancing their own level of performance and stimulating a higher degree of environmental responsibility in other companies.
- The arena in which the above changes have occurred has widened with companies becoming more concerned about the overall performance of their business, rather than restricting environmental concerns to, for example, the minimization of any pollution associated with production processes.
- The above changes have been linked to a shift in attitudes, from a concern solely with the environmental problems and potentials of an individual company, to a more general concern with the role of the company in the local environment within which it is located.
- There has also been a move from a position whereby the operation of a company, especially with regard to environmental matters, is cloaked with secrecy, to a greater degree of openness and willingness to disclose information (Roberts 1995, p.5).

While many interpretations of sustainable development exist, the most widely used definition states that sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (Roberts WCED 1987,

p. 8) Guided by this definition, Roberts developed a set of six basic concepts for sustainable business development.

- Discriminating development – business should be discriminating in the use of resources in order to minimize waste and to prevent environmental and ecological damage.
- Conserving resources – preference should be given to the use of renewable resources and local resources should be used where possible.
- Maximize the 4 R's – repair, reconditioning, reuse and recycling should be given priority in order to reduce the consumption of resources.
- Creative work – work should be organized in such a way as to make the fullest possible use of human abilities and to involve people in ensuring that activities are conducted in a sustainable way.
- Maximization of non-material growth – although growth which consumes resources has to be limited, this does not apply to activities, such as the arts, education and leisure, which do not consume excessive amounts of resources.
- Self-directed personal investment – opportunities should be created to allow investment to take place in activities which will support sustainability and which will serve the needs of individuals and communities. (Roberts 1995, p. 16-17).

Finally, Roberts identifies a number of general principles that can be used to guide environmentally sustainable development.

- The polluter pays principle
- Prevention should be prioritized over a cure
- Do not use resources faster than they can be renewed
- Minimize resource use and recycle used materials
- Co-ordinate and negotiate solutions across sectors

While the continued progress of sustainable development challenges business practices, it also offers a wealth of significant opportunity (Appendix IV.). With businesses at different levels of achievable sustainable development, the shift towards a more sustainable society encourages increased competitiveness and ingenuity. The principles that guide sustainable developments are healthy for businesses as they increase efficiency and strive to minimize waste and the costs of hazardous waste disposal significantly improving productivity and profits.

Roberts suggests that “some of the problems that face business have potential, through the use of imagination and a willingness to learn from mistakes, to be translated into new business ventures or new products.” (1995, p.21) Management often finds this transition tedious, but when considering long-term trade-offs, most consider encouraging sustainable business practices an essential competitive advantage.

As business requires continual improvement of performance, Rob Margetts, Vice Chairman of ICI, feels that sustainable development is the future of business: “We see sustainability as a tremendous technological challenge, and one that presents us with new markets and

opportunities. It gives a new engine for growth. New products. New customers. New technology. My ambition is to drive my company towards a future that is more sustainable, and to position it to take advantage of the changes.” (UK Sustainable Development 2004, p.3)

Roberts argues that “enhanced environmental attitudes and behavior are seen as an essential prerequisite for long-term business success.” (Roberts 1995, p. 42) In *Towards Sustainability*, a project commissioned by the European Union, the business sector is identified as having “a particularly significant impact” on the environmental quality and economic growth as mutually dependant.” (Commission of the European Union, 1992 p. 28)

A report to the House of the Lords Select Committee on the European Communities (1993) notes “the considerable size and rapid growth rate of the market for environmental friendly products.” (Roberts 1995, p. 42). According to Roberts, the report makes reference to a market that has the potential in less than a decade to grow by \$300 billion. In this way, the environmental movement continues to replenish our resources by offering a market with huge potential and creating new ways for businesses to grow while maintaining a healthy level of environmental development.

Today, companies can redesign and develop new products, offer new designs and services, refurbish old products, create new markets or enter new markets with replacement products. The Centre for the Exploitation of Science and Technology (CEST) suggests that there are 13 key problems that require immediate attention. Consequently, their solutions provide opportunities to develop new business ventures.

Roberts outlines some key problems and possible business opportunities that are associated with them:

Environmental problems and associated business opportunities

Problem	Cleaner Product	Cleaner Process	Conservation
Greenhouse effect	Efficient boilers	Low carbon fuels	Insulation
Ozone depletion	CFC replacements	Water cleaning	Fridge maintenance
Acid rain	Low sulfur fuels	Coal washing	Energy saving
Water quality	Low phosphate	Low solvent use	Water management
Air quality	Cleaner cars	Pyrolysis	Traffic management
Waste management	Recyclable products	Low waste	--
Major spills	--	Risk assessment	Energy efficiency

The Practice of Environmental Communication

As the environmental movement has continued to evolve, so has the history, theory and practice of public relations. Today, virtually no business, organization or government entity is immune from public interest concerning environmental issues. In the public arena, environmental issues are rarely judged on their own merits. They often overlap with safety and health issues including social justice, property value and quality of life. This dual role, which combines the rigors of applied science with the absolutes of environmental science, creates many challenges and opportunities for dealing effectively with environmental communication situations. Operating in this competitive environment, environmental public relations has become a multi-faceted applied process that includes research, analysis, policy programming and communication.

According to Carol J. Forrest and Renee Hix Mays of the Equinox Environmental Consultants, Ltd., there are many different terms that refer to the process of working with the public in regard to environmental relations. (1997, p.2) “Public participation”, “community outreach” and “stakeholder relations” are all terms used interchangeably by the Environmental Protection Agency (EPA) and other private and public sector organizations. However, community relations is generally regarded as the most recognizable term that covers the gamut of activities and scenarios charged to an environmental communications practitioner.

Environmental community relations is further defined as an “on-going process of substantive two-way communication to enhance public understanding of environmental issues and to encourage input from the public so that their concerns are considered in organizational decision-making processes.” (Forrest 1997, p.3) For the environmental communicator,

community relations is much more than a release of information. It is a science applied to shaping behavior that involves the building of trustworthy and credible relationships with key stakeholders in the environmental community. According to John P. Perrecone, community involvement coordinator for the U.S. EPA Region V's Office of Public Affairs, "trust and credibility are the most important components in communications about environmental issues." (Forrest 1997, p.4)

For the environmental communicator, the idea of communicating to stakeholders is linked with the idea of power. As Forrest and Mays suggest, the communications process can seriously hinder or block the operation of a facility, the investigation or cleanup of a site, or the implementation of a project. Environmental community relations provides an important framework for mediating between stakeholders and the organization. Since many concerns about environmental issues are based on misinformation or a difference of opinion, a good dialogue is essential to provide stakeholders with enough information about the scientific, technical, and regulatory aspects of the issue so that good decisions can be made." (1997, p. 4) Consequently, the environmental programs impact the behavior of employees, consumers, impact groups and governmental agencies.

Today, environmental communications also has a powerful effect on daily business operations that impact the bottom line. Peter Roberts, noted professor, author and research fellow at the University of Dundee, suggests that of equal concern for the environment is the "attitude and behavior of business to future conditions of the environment." (1995, p. 1.) The central economic concern for business is that "the real limits to economic growth are the capacity of the environment to deal with waste and the threats to the atmosphere from pollution and deforestation." (1995, p.46) In this case, environmental communication programs affect the

future of the global environment in a way that will inevitably sustain the business development of their organization and generations to come.

The process of environmental communication is a complex one. According to The Practical Guide to Environmental Community Relations, two-way communication and positive relationships with stakeholders provide the cornerstones of environmental community relations. (1997, p. 78) Consequently, they act as “pillars” to promote trust in the community relations process and the managers and responsible organizations.

Such organizational matters involving communication with internal stakeholders help determined the response generated from the company to the concerned public. Roberts suggests that “the general organizational and operational characteristics of business, together with the overall structure of economic activity, exerts a considerable degree of influence upon the attitude that is adopted by an individual company towards the environment.” (Roberts 1995, p. 94)

Organizational communication issues are perhaps the most imperative because, while allowing the proper environmental communication, an understanding of this communication can create positive organizational changes that can provide both a stimulus for management innovation and an opportunity to tackle an old problem in a new way. (Roberts 1997, p.95)

For public relations practitioners, this is also an important concept because the first public of any organization is its employees. As ‘management guru’ Peter Drucker suggests, “an organization is a human community” and it is for this reason that the internal communications form the basis of further communications programs. (Center and Jackson 2003, p. 36) Today as managers and supervisors are as much employees of the board of directors as the custodians, secretaries and administrators, a attitude that views employees as a line-item budget cost exists.

According to Center and Jackson this is a dangerous attitude that fosters the idea that the less employees are paid, the more competitive a product will be. (2003, p.36)

Yet the most significant trend in successful organizations worldwide is the “melding of interests and heightened cooperation between management and employees.” (2003, p. 37) Benefits of successful employee relations include happier employees that provide customer delight and help build trusting relationships with the community. The results of a productive and open employee-employer relationship include fewer work stoppages, less absenteeism, higher productivity and fewer work errors.

Rules of effective employee relations are outlined by Center and Jackson, authors of *Public Relations Practices: Managerial Case Studies and Problems*, suggest the following rules of effective employee relations:

1. Employees must be told first. Employees should be the first to be told information affecting them and their jobs and should be told directly by employers.
2. Tell bad news along with the good. Revealing bad news openly and candidly generates trust and commonality.
2. Ensure timeliness. Getting information out fast builds trust and dialogue.
3. Employees must be informed on subjects they consider important. The top three include organizational plans for the future, job advancement opportunities and job-related “how-to” information.

4. Use the media that employees trust. Immediate supervisor and employee group meetings top the list.

Operational and structural matters also play an important part in the development of environmental community relations programs. Operational matters are concerned with understanding and assessing the current impact of the organization on the environment of the community. Often, assessment takes place through environmental audits performed in cooperation with a group of outside professionals that can help a corporation establish current operational hazards. Consequently, the effectiveness of an environmental communications plan can help determine what stakeholders in the company need to be addressed and the appropriate manner in which communication should take place.

Effective environmental community relations practices must also take organizational structure into consideration. The structure of a company, or the framework of the business beyond the individual company, affects the actions of a company as they strive to compete or meet industry regulations. As a result, the structure can also be affected by the state of the industry itself as it may be regulated by local or global organizations. Many organizations that pressurize the passing of environmental legislation are of different origin so what is appropriate for one industry in one section may not be appropriate operations for others.

Despite organizational, operational and structural frameworks of an organization, environmental communication is most effective when it occurs on an ongoing basis as part of a long-term, comprehensive communications plan. (Forrest 1997, p.79) As with other types of programs, early pro-active communication is best received and provides a basis for

environmental protocols in unforeseen circumstances. It is this early approach that is essential to maintaining an open and trustworthy dialogue within the community.

One challenge specific to environmental communication is communicating complex technical concepts to a lay audience. According to *The Practical Guide to Environmental Community Relations*, it is this ability to communicate directly to stakeholders that diffuses concerns, allows stakeholders to make informed decisions and provides stakeholders with a level of comfort on environmental issue. Forrest and Mays suggest that the challenge lies in making sure the information is simple yet accurate.

When the publication of technical information is essential, terminology and level of detail should match the specific needs of the target audience. Testing readability is also a concern for publications directed at community stakeholders. The less knowledgeable a stakeholder group, the less technical information should be used to successfully disseminate the message.

Risk communication is another area of interest for environmental communicators. With any type of risk communication, there is an increased incidence of prominence and consequently, an increase in the chance of crisis. The Environmental Protection Agency (EPA) defines risk communication as “the purposeful exchange of information between interested parties about environmental risks.” (Forrest 1997, p. 101) Practices of successful risk communication involve community assessment, audience assessment, message selection (technical information, detail level), and channel selection.

Not only does actual legitimate risk affect risk communication. Perception is a key in communicating successfully with concerned audiences. Whether or not the risk is real, if it is perceived as a threat by a stakeholder it will have a negative effect on stakeholder relations in the

community. Not addressing perceived concerns only works to add to the difficulty of the situation, breaking down effective channels of communication within the community.

Perception also affects the sender of the message, as stakeholders often pay more attention to the biases or expectations of an organization representation delivering the information. While these factors including message sender and receiver, intent and public perception may represent potential barriers in risk communication, a pro-active, well-planned communications program can go a long way in avoiding any unnecessary environmental concern in the community.

Unfortunately, crisis communication is another area of specialized environmental communication. As with risk communication, it is imperative to have a pro-active plan of action in the event of a crisis. Often such situations will require trustworthy and immediate communication to the stakeholders of an organization. While different crisis situations will require different responses, there are several steps that should be taken to prepare for an environmental crisis situation. According to the Practical Guide to Environmental Community Relations, these steps include:

- Identifying potential crisis scenarios.

This step includes identifying hazards such as fire, explosion, spill or release. Most often, it is done with other professionals of a company who can help with risk assessment. Methods for gathering information include safety and health surveys and examining any existing emergency planning that is in place. It is equally important to share the plan of action with others who will be involved in the event of a crisis such as managers and supervisors or board members.

- Designating a spokesperson.

There should be two spokesperson, one primary and an alternate, designated to respond to crisis situations. Often, this is where the crisis scenario planning comes into play. The designated spokesperson will already be familiar with practices and approaches that are appropriate in handling the situation. The most appropriate spokesperson is typically a local facilities or project manager. Often a visit from a senior manager who acts as the alternate spokesperson is effective in communicating the organizations level of concern for the situation.

- Identifying the “crisis communication team” and other resources.
- Identifying persons who should be notified during a crisis.

Responding to a crisis is stressful and can often require more work than one environmental communicator can handle. It is important to access the team of persons who have been informed of the pro-active crisis planning and are familiar with procedure and protocols for addressing such a situation. Teams are generally formed of support personnel who write releases and perform other important daily tasks. Such teams generally include a community relations specialist, often an outside crisis communications consultants and legal assistance.

- Assembling background material and developing other materials for use in a crisis.

General information about operations should be readily available for use as background information in the event of a crisis. It is important to include the history of a company or an organization, number of employees, types of products and services provided, training received by employees and pollution control methods.

Lastly, regulatory requirements that govern environmental community relations can present a challenge to an environmental communications program. Because of the desire for increased public involvement, many regulations require that the public be informed of any operational plans. At times, the plans must be made readily available to the public or even be approved by them.

A primary act that requires public involvement is The Resource Conservation and Recovery Act (RCRA) (Appendix IV.). Under Title 40 of the Code of Federal Regulations requirements are listed and summarized. (Forrest 1997, p.252) After its implementation in 1976, the policy regulating the disposal of solid waste has continued to evolve. Requirements for treatment, storage and disposal of hazardous wastes are outlined along with measures for required public involvement activities.

Over the past 25 years, the U.S. has made considerable strides in eliminating the harmful effects of inadequate sustainable development practices. The air and water are cleaner. Fewer sites are being used for harmful dumping and there are stricter guidelines in place to ensure that this trend will continue. Despite these successes, there is much to be done to ensure that our environmental practices will have the least negative impact possible on future generations. Environmental communication is essential in the continued success of the sustainable development movement as it strives to establish a relationship between the environment, the economy and society that will aid in protecting the environment for many generations to come.

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CASE 9-3 A CLASSIC: WHEN POSITIVE ACTIONS DON'T RESULT IN POSITIVE PERCEPTIONS¹

On March 24, 1989, the *Exxon Valdez* struck Bligh Reef in Prince William Sound, releasing 11 million gallons of crude oil (one-fifth of its cargo) into the sea.² This incident created a crisis of epic proportions for Exxon. The mission was to clean 1,300 miles of shoreline, approximately 15 percent of the area's 9,000 miles of shoreline, and restore the area to its original condition. In 1992, after the completion of successful and extensive cleanup efforts, a federal on-scene coordinator (the U.S. Coast Guard) declared the cleanup complete saying, "Further shoreline treatment would provide no net benefit to the environment." The State of Alaska confirmed these findings. However, the damage for Exxon did not end

with the termination of cleanup efforts. What was the real problem?

PERCEPTIONS, NOT FACTS; ACTIONS, NOT WORDS

While it was only the 34th largest oil spill at that time, it goes on record as one that people will remember the most. In one study, the *Exxon Valdez* remains one of the most remembered corporate crises.³ Environmentalists have perceived it as limitless in damage even though there are few remaining signs of the spill. Many have characterized the accident as civilization once again trouncing on nature in order to reap the benefits of its limited resources and

FACTORS TO CONSIDER WHEN DEVELOPING A CRISIS COMMUNICATION PLAN

- Develop a crisis communication plan in advance to handle any situation; determine exactly how and what key publics will be instructed to do in case of an emergency.
- Conduct research to discover information that is not readily available.
- Insist that all company operations be monitored regularly. A crisis that results because of operational failure without these preparations will surely cause the company to lose credibility.

¹This case was developed from a case study authored by two University of Florida students, Fred Forlano and Greg Lorenz, under the direction of Frank Stansberry, Manager of Guest Affairs for Coca-Cola U.S.A. at Epcot Center.

²Lee W. Baker, *The Credibility Factor*, Homewood, IL: Business One Irwin, 1993, p. 38.

³*pr reporter*, July 12, 1993.

associate it with the deaths of many birds, otters, and other aquatic life.

In reality, the Alaskan food chain has survived (See Figure 9-3). Pink salmon harvests set records in 1990 and 1991. Tourism has rebounded strongly and so have Exxon's profits. It appears that the only thing severely damaged was the company's reputation. Those who remember it perceive it as a disaster that was poorly handled by Exxon.

HOW DID THESE PERCEPTIONS DEVELOP?

Today, the spill has been cleaned up and Exxon is thriving as it was previously, but the residual effects of the ordeal linger.

From the beginning, Exxon concentrated on emphasizing cleanup efforts rather than addressing the public perception that it didn't do enough, soon enough (See Figure 9-4). This emphasis was apparent from the moment that CEO Lawrence G. Rawl entered the picture. Unfavorable media comparisons were made of Rawl with the positive images of James Burke of Johnson & Johnson and his handling of the Tylenol incident (See Case 6-3). He was characterized as opposed to serving as a spokesperson, or even publicly showing interest, because he remained in New York until 2 days after the spill. When he finally entered the scene, he presented himself as rigid and aggressive, not bowing to the

FIGURE 9-3 Exxon published a series of reports about the aftermath of the *Valdez* oil spill and its effect on Prince William Sound and the Gulf of Alaska. Shown here is a report entitled "Three Years After" from October 1992.



(Courtesy of Exxon Company, U.S.A.)

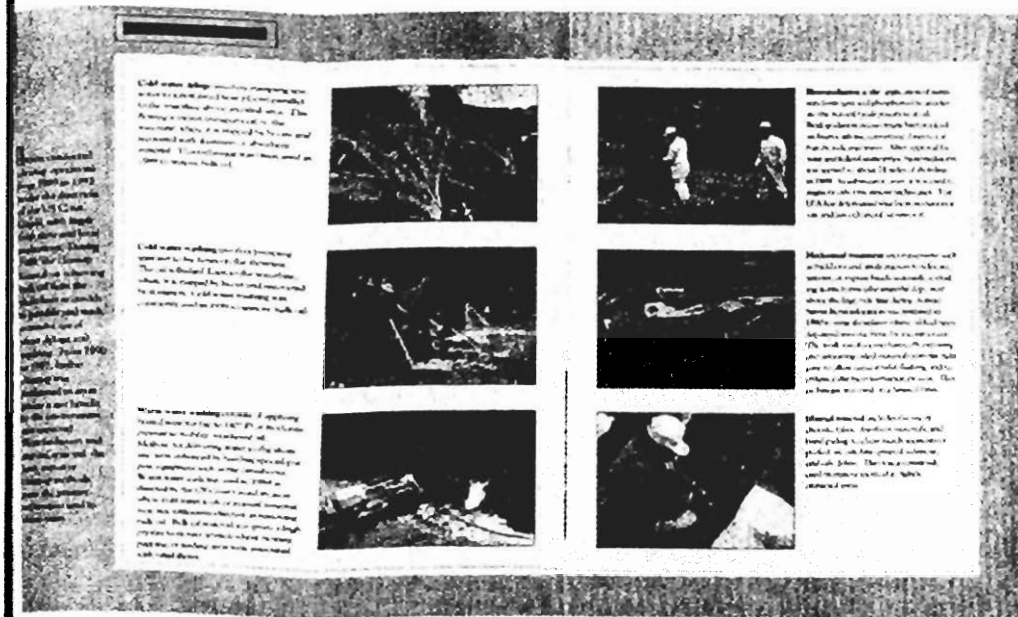


FIGURE 9-4 Exxon used many techniques in order to clean up the shoreline along Prince William Sound in Alaska.

(Courtesy of Exxon Company, U.S.A.)

ups that opposed him or to the media. inflexibility may have cost him opportunities to seek positive relationships with the various publics.⁴

When Exxon designated a location for a crisis center, the company created another location that conflicted with its goals. It offered the media center in Port of Valdez. Information was often slow in coming, and communication lines to Port of Valdez became jammed with information inquiries from media. It was also hard for management in New York to get information.

Another problem hampering Exxon's credibility was that it did not address how the public was perceiving the spill and its effects. It focused primarily on the facts concerning cleanup efforts and let impressions

about long-term effects on the region form on their own. These facts consisted of dollar amounts, size of work force, and stories about the confusion they had to overcome to begin the process. The public, knee deep in "green issues," found no reassurance that Alaska's vast natural regions would recover.

For legal reasons, it was difficult for Exxon to show remorse or even admit to the environmental ramifications of the crisis. It did not realize the significance of visual images and the emotional response they evoked. Media images of animals in distress were displayed often and increased negative perceptions of the company. Exxon's credibility and reputation were being strongly questioned at this time.

When Rawl was asked later why he did not become more of a force in the crisis communications, Rawl replied "his first instinct was to head to Alaska . . . but he was swayed by his colleagues' arguments that he would 'just get in the way.'" From Lee Baker, *The Credibility Factor*, Homewood, IL: Business One Irwin, 1992, p. 41.

Exxon's full-page apology ads on April 3, 1989, were badly timed and plagued with conflicting messages. They claimed that, "Exxon has moved swiftly and competently to minimize" the damage. In the *same* papers, front pages reported how slowly the company had been in starting the cleanup, with a specific list of unflattering reasons why. The actual "we're sorry statement" appeared in the last paragraph, vastly minimizing readership in today's sound-bite world.⁵

COMMUNICATIONS IS THE HUB OF A CRISIS SITUATION

Exxon became the scapegoat for all environmental causes. CEO Rawl served as a prime example of stereotypical negative perceptions of the corporate executive. Topics discussed in the media portrayed Exxon as being money-focused and inhuman. How could a company so vast have such poor crisis communication planning? Hadn't they learned by other companies' examples what they should do and how they should act during a crisis? Remembering that hindsight is 20/20, here are some basic communication principles that Exxon should have kept in mind before and after the *Valdez* ran aground.

- Develop a plan that will construct a positive image. Or at least try not to create a situation that will put you two steps back.
- Exxon could have spent more time emphasizing the personal commitment being made, rather than the processes involved and the \$2.5 billion spent on cleanup.
- Conduct media research to discover the realities of opinions conveyed to the public. Are the

messages strong, or do they have gaps that you can fill with your own information? Whose side is the media on? What are they saying to whom? Where are they getting their information, and is it accurate? In addition, conducting gap research (gap research measures the gap between reality and expectations of an audience) with publics would have been fruitful.

- Attempt to establish credibility by being honest and personable with the public. If Rawl was not an effective spokesperson, he could have been replaced with someone who had the training and experience. The faces and images the public saw on television were the ones that are associated with Exxon.

Much like UCC in the Bhopal case (Case 9-2), Exxon needed to make certain that all information was accurate, consistent, and complete. Cases like this illustrate why candor is the best policy. Reveal what is being done and why. Convey what is known and when it became known. Don't let the media find out for themselves. Exxon did not follow these basic guidelines when cleanup efforts halted for the winter in September of 1989. Rather than telling the public that because of weather limitations, cleanup would prove fruitless, Exxon simply discontinued efforts for the season. Cleanup continued until the federal on-scene coordinator and state declared it complete in 1992, but the public did not completely understand the cleanup process. They needed someone to explain it to them, and *it could have been Exxon*.

When it comes to the source of communication, make certain that the spokes-

⁵*pr reporter*, April 17, 1989.

person is qualified, with proper crisis communication training. Shooting from the hip should be avoided, and a clear message should be sent at all times. Providing the image of sympathy and remorse, complemented with sincerity, may have saved Exxon's reputation and, in turn, made the future seem brighter for all the parties involved.

A plan that defines all necessary contacts and a proposed sequence of events could have been developed. A spill of any variety would involve the media, state and local governments, environmental groups, and internal and external publics. The support of employees is crucial. At a time when it is difficult to reach the spokesperson, the media often will create its own in a security guard or a technician.

The cleanup effort was not effectively coordinated with the efforts of all groups involved. No one knew what each group should do or when. Observers felt that both of these aspects should have been considered and put into the crisis plan as well. Even if a plan was not in place, as soon as the smoke cleared Exxon could have been initiating the coordination of communications and development of a strategy and plan with all pertinent groups.

A better understanding of how the media works in relation to delivering a prescribed message to different publics would also have been beneficial. As mentioned earlier, the public can and will sympathize with helpless animals. A good portion of media attention was given to oil-covered birds vividly depicted on television and in magazines. Even journalists said at the time that it would have been more sensible for Exxon to divert this attention by devising

proactive programs the media could focus on. Since hard news sells, a program of hard-hitting environmental programs and principles could have been implemented. This strategy could have made the media a channel for communicating to the public that Exxon was aware of and cares about the environment and its inhabitants.

LESSONS LEARNED

Issue anticipation is the key to averting many crises. Some top management advisers insist that positive leadership is the only way to develop positive relationships. They believe that to think negatively would not be consistent with their goals or beneficial to the company. Exxon learned that even a very large company has a malleable reputation that can change in an instant.

Exxon was forced to realize that perceptions control reputation. In relation to other oil companies, Exxon's cleanup and spill control plan was reportedly top-of-the-line. However, by communicating specifics about the cleanup process, rather than the effects the spill would have on the environment, the company was not addressing the issues of concern. Displaying emotion and remorse for the outcome could have created a positive image of Exxon in the public's eye.

The hard lesson learned is that *anticipation*, while it may not prevent a crisis, certainly makes the road a little less bumpy. Ignoring possible situations that may occur, be they positive or negative, can lead to reputation and relationship disruptions that continue for years. An organization must be forward-thinking in order to survive in our volatile world. ■

QUESTIONS FOR DISCUSSION

1. As evidenced by the Exxon case, perceptions speak louder than the actual facts. Can you think of anything more

that Exxon could have done to avoid this public relations disaster and salvage its soiled reputation? Can you

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CASE 9-2 A CLASSIC: BHOPAL—A NIGHTMARE FOR UNION CARBIDE

In effective handling of a critical issue, preparation and anticipation are key considerations. Managing issues means intercepting the ninety percent that are self-inflicted. Critical issues may be created in any of the following manners:

- Maintaining irresponsible policies
- Failing to monitor internal activities
- Not applying sound response strategies when faced with criticism
- Failing to allocate adequate resources and priority to anticipating issues

And, of course, sometimes crises will occur even when all possible preparations have been made.

When an issue escalates, it may become a crisis. A crisis is defined as a highly stressful struggle or conflict within an adversarial environment. It is marked by a potentially damaging turning point that could result in financial or mortal disaster—after which things will never be the same.

Effective communication is an essential part of trying to control any crisis situation. It is the responsibility of the company or organization to provide information about what is happening, the effects it will have on numerous publics, and what the company

plans to do to resolve the situation. The questions most asked by the publics involved are:

1. What exactly has happened?
2. Why was information about the crisis not released sooner?
3. What could have been done to prevent it from happening?

When a crisis hits, its effects are felt throughout an organization. The atmosphere is emotionally unstable and forces those involved to react quickly and sometimes without thinking of long-term ramifications, even if there is some sort of anticipatory plan in place.

The focus of this case (as well as Case 9-3) is the analysis of a major industrial corporation and how it anticipated and managed its crisis—or, you be the judge, how it failed to do so.

HISTORY

In December of 1984, Union Carbide Corporation (UCC), a chemical manufacturer, was the 37th-largest industrial organization in the United States.¹ The chain of events that occurred on December 2 and 3 in Bhopal at Union Carbide India, Ltd. (UCIL), changed the face of UCC forever.

¹Our thanks to Bob Berzok, Director, Corporate Communications, at Union Carbide for providing us with a wealth of information for this case.

UCC had formed UCIL in the 1920s for manufacturing its products there. After India gained its independence from Britain in 1947, the government began to push for greater ownership in the country's businesses.

According to J. J. Kenney, the director of federal government affairs (now retired), construction of the Bhopal plant in 1977 was controlled by the regulations of the Indian government. After UCC gave the preliminary plant designs to the government, government agencies took over the final design and construction of the Bhopal facility.² It was the government that approved the plant design when the facility was built.

The government wanted the plant to be as labor-intensive as possible—in order to provide needed employment—so it had not installed the computer systems in use at UCC plants in the United States to monitor operations.

By the time of the Bhopal tragedy, UCC had reduced its share of ownership to 50.9 percent, while the Indian government and private citizens owned the other 49.1 percent. Plant operations were managed solely by Indians.

THE CRISIS HITS

At about 11:30 P.M. on December 2, a leak in one of the valves was discovered by employees at the plant. The leak was detected after a report that the eyes of some employees were tearing from irritation. At approximately 12:15 A.M. a control room operator reported an increase in tank pressure. The tank contained liquefied methyl isocyanate (MIC), a lethal pesticide. A safety valve ruptured and released excess liquid into an adjacent tank, where a caustic soda solution would have neutralized the chemical. This neutralization did not occur.

In the case of an emergency, the safety system was supposed to flash (instantaneously light and burn) any escaping gas to prevent it from entering the outside atmosphere. This system was not operating, and 40 tons of deadly gas poured into the neighboring community.

Theories as to how the leak had occurred were many and widespread. One popular theory reported extensively in the newspapers was that an employee had failed to follow correct procedures and thus started the reaction that released the MIC gas: It wasn't until 1½ years later that investigators found that an employee had sabotaged the tanks by deliberately connecting a water hose to the MIC tanks (See Figure 9-1).

DEATH IN THE COMMUNITY

Many residents in the area thought UCIL manufactured *kheti ki dawai*, a harmless medicine for the crops. In reality, the chemical-turned-gas was lethal to humans because it formed liquid in the lungs of its victims. While some died in their sleep, others drowned from the liquid in their lungs while running through the streets looking for help.

Official estimates stated that 1,700 residents were killed. In addition, 3,500 were hospitalized and 75,000 were treated for injuries sustained from exposure to the gas. Death figures range from anywhere between 1,700 to 4,000. It was also estimated that 60,000 people will require long-term respiratory care. These figures earned it the designation as "the worst industrial disaster ever."³

Many of those killed were living in shantytowns constructed illegally near the plant. UCC had repeatedly requested that these be moved from the area. Instead of

² W. Baker, *The Credibility Factor*, Homewood, IL: Business One Irwin, 1993, p. 48.
³ Ibid., p. 45.

Union Carbide and Bhopal

Setting the Record Straight on Employee Sabotage and Efforts to Provide Relief

WHAT REALLY HAPPENED AT BHOPAL? Since the tragedy in December 1984, Union Carbide Corporation's primary concern has been with providing relief and assistance to the victims, and determining how the incident happened. Generally, initial details and subsequent news reports and books have contained a great deal of erroneous information. New information uncovered during an on-going investigation has led UCC to the conclusion that the tragedy was caused by employee sabotage and that there was a cover-up afterwards by certain operators on duty that night.



FIGURE 9-1 Union Carbide published a brochure that illustrated its hypothesis as to how the tragedy in Bhopal happened. Shown here is "Setting the Record Straight on Employee Sabotage and Efforts to Provide Relief."

(Courtesy of Union Carbide.)

requiring the people in these illegal shantytowns to move, the Indian government changed the law to make it legal for them to be so close to the plant.

UCC POLICIES BROKEN

The magnitude of disaster at the Bhopal facility was partly attributed to the many breakdowns in its safety equipment (See Figure 9-2). The plant would poorly repair or simply shut off malfunctioning equipment. Both of these actions are serious violations of UCC policy. The following inconsistencies contributed to the conditions during the emerging crisis:

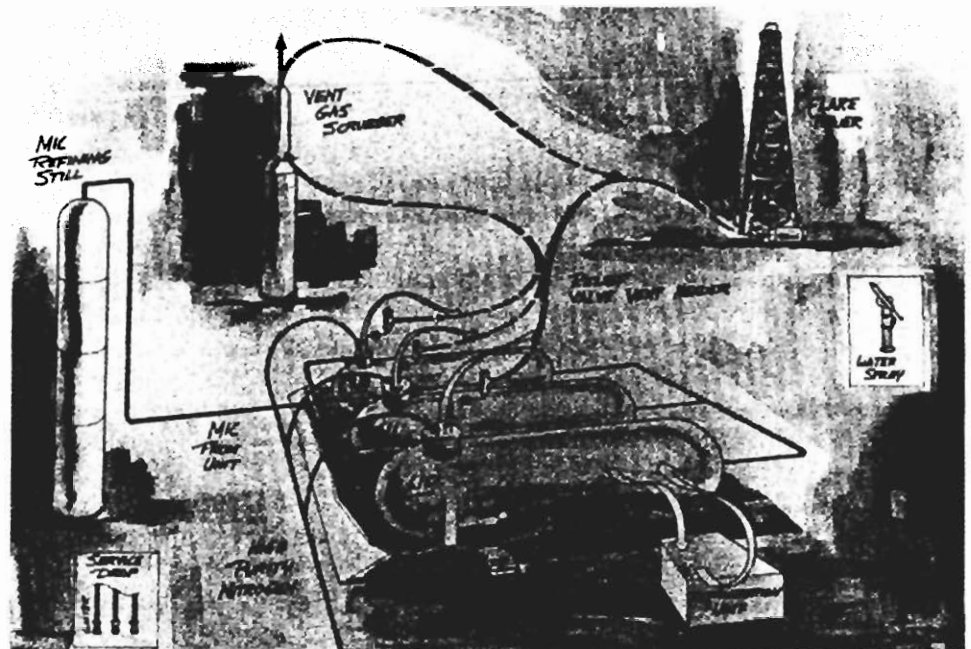
- A cooling unit was shut down months before the incident. Policy stated that this unit must remain functioning to prevent overheating.

- A flare tower, designed to flash escaping gases, had been out of service for 6 days.
- A scrubber (an apparatus used for removing impurities from gases), which was to be continuously running, had been down for 2 months.
- The warning system was inadequate for the tasks that the plant was performing. There were no alarms, no employee drills, no public education, and so on.

COMMUNICATIONS DIFFICULTIES

From the beginning, UCC encountered problems in addressing public concerns because of the physical communication difficulties it encountered.

FIGURE 9-2 A diagram of the system setup at the UCIL plant in Bhopal.



(Courtesy of Union Carbide.)

- ▶ *In an international incident such as Bhopal, communication difficulties can be caused not only by physical boundaries but also by cultural ones.* UCC communicators in the United States from the beginning tried to be open and candid. However, UCIL officials in India were advised by legal counsel not to communicate.
- ▶ *Bhopal, a city of 750,000, had only two international telephone lines serving the city. This situation hampered any communications that were necessary.* Because of this obstacle, UCC was receiving the bulk of its information from media reports.
- ▶ *The company's communication specialists who were put on this case found it extremely difficult to obtain reliable information from India.*
- ▶ *The Bhopal facility failed to educate the community.* Death could have been avoided if the citizens had been instructed to place a wet cloth over the face. Most of the deaths that occurred were the old and the young because their lungs could not withstand the poison.
- ▶ *Communications management for UCC in the United States was among the last to know about the incident.* Hours after the incident, Edward Van Den Ameele, UCC press relations manager and officer on duty, received a call at 4:30 A.M. at his home from a reporter from CBS radio. The reporter was calling for a reaction to the pesticide leak. This was the first that Van Den Ameele had heard of it.

- ▶ *The plant manager of the Indian subsidiary had no background in communication, let alone crisis management.* He told a local official that "this will probably have no ill effect."

UCC ACCEPTS MORAL RESPONSIBILITY

UCC did have a domestic crisis plan, but what happened in Bhopal was unimaginable for all. The initial reactions of UCC executives in the United States were humanitarian ones. Within hours of hearing the news of the chemical leak and what limited information was available, CEO Warren Anderson declared he was traveling to India to serve as the immediate supervisor of the situation and offer any assistance that the company could contribute. UCC also announced it would cease producing MIC until the cause of the explosion was known. Anderson announced that UCC would be open with the public and the media.

Unfortunately, communication was poor in Bhopal as well. While the Indian government had assured Anderson that he could travel safely there, when he arrived he was placed under "house" arrest for charges of "culpable homicide." In addition, he was faced with the challenge of conducting communications in an area that displayed an emotionally gripping scene.

UCC declared that it accepted moral responsibility for the tragedy. One week later, UCC offered \$1 million to the Prime Minister's Relief Fund, which was accepted. Four months later it offered another \$5 million in humanitarian aid to the Indian government. In this instance it was refused. UCC then offered the money to the Red Cross to disburse to those who needed it in India—and that was turned down for more than a year.

LESSONS LEARNED FROM BHOPAL

According to Bob Berzok, director of communications at Union Carbide headquarters in Danbury, Connecticut, UCC learned four very important lessons from the Bhopal incident.*

1. It is important to be *open and candid* in every message prepared to deal with a situation. Attempts to shield information are immediately picked up by the public.
2. In the event of a huge crisis, *make immediate use of existing programs that are*

identified with the organization and accentuate their strengths.

3. Don't forget *secondary publics*, "When you have a sudden crisis like Bhopal, two audiences people think of communicating with are press and employees. It's important to consider shareholders, government officials, and customers," advise Berzok.
4. Each crisis is different—*there is no formula for dealing with them.*

**pr reporter*, April 23, 1990.

THE AFTERMATH OF BHOPAL

After the Bhopal incident and the intense scrutiny and criticisms UCC received from the public and the media, the company grew cautious. Many of the company's lucrative divisions were sold off, and by 1991 the company was half the size it was before Bhopal.

UCC poured money into its safety systems and supervisory procedures, some analysts say too much, according to *The Wall Street Journal*.⁴ Maintenance practices that should have taken 30 minutes began to take 3 or 4 hours to complete. Even CEO Robert D. Kennedy (replacing Anderson in 1986) concedes that the same safety levels were achieved at some of his rivals' plants, while spending a fraction of the cost incurred by UCC.

As for the legal outcome of the Bhopal tragedy, UCC settled Indian civil suits in

1989 for \$470 million. The Indian courts have recommended that former CEO Anderson be extradited to India to face charges for culpable homicide. To date, the Indian government has not requested Anderson's extradition from the U.S. government.

As indicated earlier, the principle that 90 percent of all crises are self-inflicted seems evident in this case. After receiving reports from the Bhopal facility that everything was in order, UCC could have conducted regular inspections to confirm the statements presented. Simply relying on reports received from the plant obviously was not enough. If those inspections had been done, the company may have avoided the serious magnitude of the incident, prevented some of the deaths and injuries, saved legal fees and fines, and maintained a positive reputation. A proactive plan focusing on safety measures and policies covering

⁴"Wounded Giant: Union Carbide Offers Some Sober Lessons in Crisis Management," *The Wall Street Journal*, January 28, 1992.

CASE 8-5 ONE TOWN'S FIGHT TO AVOID SUPERFUND STATUS

The Berkshires region of Massachusetts is one of the most beautiful areas of New England. With the Housatonic River running through it, the quaint town of Pittsfield sits in the heart of Berkshire country. However, the area is not as pure as it appears. Pittsfield was the battleground for one of the most unpleasant environmental battles in the country. It was between General Electric (GE) and the Environmental Protection Agency (EPA).

Imagine if you learned that the town you live in has for years contained a chemical classified by EPA as a potential carcinogen, and that a major *Fortune* 50 company was responsible for the presence of that chemical. How would you feel about that company? You'd most likely expect them to take responsibility for cleaning up the contamination. But would you want them to be allowed to continue doing business in your area? This case examines why one town fought not only for the cleanup of its land, but also to maintain a relationship with the company responsible for the presence of the chemical.

GE'S HISTORY IN PITTSFIELD

In 1931, unaware of any environmental dangers present, GE began using PCBs (polychlorinated biphenyls) in the production of electric transformers and other products at its factory in Pittsfield, Massachusetts. PCBs were used as insulators and flame retardants and at the time were considered state of the art for this type of equipment. In the 1940s and 1950s, some landowners in the town

obtained soil from the GE plant for use as fill at their properties. This soil was much later found to contain PCBs. GE continued to use PCBs in its manufacturing operations until just before Congress outlawed PCB use in 1977, when studies confirmed that PCB chemical causes liver cancer and reproductive problems in animals.

In 1981, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act, known as the Superfund hazardous waste cleanup program. Properties with a Superfund designation are eligible for federal cleanup under the EPA, which can sue responsible parties for up to three times the cost of the cleanup if the parties refuse to conduct the cleanup themselves.

By the time GE shut down its transformer and defense businesses in Pittsfield over a period of years in the late 1980s and early 1990s, 12 miles of the Housatonic River adjacent to and downstream of the plant had been directly contaminated and a 55-mile stretch of the river showed some effects of the chemical leakage. As a result of GE's use of PCBs, its 250-acre plant in Pittsfield was severely contaminated in several locations. Years later, traces of PCB were found in fish as far away as sections of the Housatonic River in Connecticut, and fish in the Massachusetts portion of the Housatonic registered some of the highest PCB levels in the United States.

Pittsfield had once been a thriving community. GE was a driving force behind the region's economy, employing over 14,000 people. Like many small- and mid-sized

towns with a single major employer, Pittsfield relied heavily on GE for its economic life. But the closing of the majority of GE's property contributed to years of economic decline in Pittsfield. For decades the area struggled to diversify its economy, and to cope with the loss of defense and manufacturing jobs.

For almost two decades (from 1960 to 1979), GE's recently retired CEO John "Jack" Welch lived in Pittsfield and worked for GE in the company's plastics division. Under his leadership, it grew from a small niche business to one of the company's most profitable units. In 1981, Welch became CEO. When GE began to downsize its presence in Pittsfield in the mid- to late-1980s by exiting the power transformer and defense businesses, many residents felt GE—including Welch—was turning its back on them. However, the plastics operations remained; they are currently located on 75 acres in Pittsfield and employ 600 people.

ENVIRONMENTALISTS URGE HOUSATONIC CLEANUP

In 1992, the Housatonic River Initiative was founded by State Representative Christopher J. Hodgkins, one of the first people to urge the cleanup of the river, and George Wislocki, president of the Berkshire National Resources Council. The organization's grassroots mission was to remove PCBs from the Housatonic River to make the river fishable and swimmable.

For years, federal regulators worked with GE and interested parties to determine the appropriate cleanup plan. Although GE vehemently fought the designation as a Superfund site, it spent \$130 million on cleanup and testing of potentially contaminated sites over more than a 10-year period.

In 1997, several important events sped the cleanup efforts. First, GE received negative publicity after a major testing of resi-

dential soil revealed substantial PCB contamination. Pittsfield residents learned that the soil they had received free from the GE plant years before for use in landscaping and construction of homes contained PCBs. Consequently, land on which more than 100 homes were built was contaminated. GE denied having any knowledge that the soil was contaminated.

In addition, records revealed that a retired GE engineer had warned the company about the potential problem in 1981. These findings prompted the EPA to request all company-related records regarding waste removal in Pittsfield. The State Attorney General's office ordered a grand jury investigation into the situation. Simultaneously, comprehensive cleanup negotiations began among GE, the EPA, the state, and the city of Pittsfield.

NATIONAL PRESS EYES PITTSFIELD

In August 1997, John Devillars, EPA Regional Administrator, proposed the GE/Housatonic River site as a candidate for the Superfund National Priority List. He promised to remove the nomination if GE agreed to a fuller and faster settlement than Superfund could provide. By this point, local, regional, and national news media had picked up the story and were offering readers regular coverage of the situation. *The New York Times*, *The Wall Street Journal*, *The Boston Globe*, and other papers were carrying stories with each new development.

In response to the national media attention, General Electric took out more than \$100,000 worth of advertising in the local paper to try and ease homeowners' concerns, providing details of its cleanup efforts and denying that PCBs caused health risks as extensive as environmental groups claimed.

Around this time, Mayor Gerald Doyle Jr. publicly opposed support of Superfund,

claiming such a designation would trigger "economic disaster" for the region, as companies would be hesitant to bring operations to the area. The mayor's comments initiated a deep public debate over the pros and cons of Superfund status. Environmentalists claimed Superfund status was the only sure way to guarantee the cleanup of the area, since Superfund status would allow EPA to clean up the sites and sue GE for up to three times the costs.

But those opposed to Superfund status pointed out that for years Pittsfield had been a thriving community, and that even with a reduced workforce, GE was still a driving force behind the region's economy. They claimed designation of Superfund would stigmatize the city and cost it money over the long run.

STALL IN TALKS BRINGS THREAT OF SUPERFUND STATUS

On April 2, 1998, the EPA talks reached an impasse. John Devillars, the EPA regional administrator, ordered the process for Superfund designation to begin. He said the property was one of New England's five most hazardous waste sites. He claimed Superfund status would give the federal government the resources and power to clean up the contaminated sites. GE said this move could set the stage for years of legal battles.

Less than a week later, Stephen Ramsey, vice president of corporate environmental programs at GE, wrote in a letter to EPA that there was no scientific link between PCBs and cancer or birth defects.

Later that month at the company's stockholder meeting, CEO John Welch debated Sister Pat Daley, who compared GE to the tobacco companies. The national media picked up the story reporting that Welch told Daley she "owed it to God to be on the side of truth."

MAYOR URGES PITTSFIELD TO AVOID SUPERFUND

Talks continued through the summer 1998, with GE offering cleanup proposals and EPA presenting counterproposals. On June 12, 1998, Mayor Doyle wrote Pittsfield residents to provide them with more information on the GE proposals, saying, "There is much to lose if we do not achieve a settlement." He said the EPA should negotiate a cleanup plan and avoid Superfund status. In addition, the local Chamber of Commerce sent memos to its members asking them to lobby politicians to support Mayor Doyle's plan.

Business leaders praised Doyle's stance. But some environmentalists and residents felt the mayor pressured the EPA to make a deal. By late August, there was still a substantial divide on the key issues. An advisory board was set up and appointed by the mayor to advise the mayor on the issue. Four members of this board resigned because they disagreed with the way he was handling the negotiations.

AN UNPRECEDENTED AGREEMENT TO WORK TOGETHER

On September 25, 1998, the dispute was ended when GE and the EPA agreed to work together to clean up the contamination and avoid Superfund status. General Electric agreed to clean up PCBs on its land and in the surrounding affected areas. It would do so under standards, specified in the agreement, that EPA agreed were fully protective of health and the environment. GE agreed to clean up its factory site, the upper half-mile of the Housatonic River, and surrounding areas—including a school and several residential and commercial properties. The EPA agreed to clean up the next 1½ miles of the river under a cost-sharing agreement with GE. The agreement

also set up a process for the continued study and ultimately the selection of a cleanup plan for the remainder of the river, which GE would have to carry out after any court challenges.

In addition, a new economic development authority was created, called the Pittsfield Economic Development Authority (PEDA), which was charged with encouraging and overseeing economic redevelopment within the city, including the GE plant. GE agreed to demolish approximately 2.1 million square feet of buildings at its 250-acre plant, and turn over 52 acres of land within that plant in an area that was once the heart of the Berkshire's economy, to PEDA. General Electric committed \$10 million in cash over 10 years to the city to offset lost property taxes, \$15 million in a rebuilding budget to assist PEDA with redevelopment efforts, and \$3 million to a landscape budget, and agreed to pay for marketing studies to help attract new businesses to the site.

After the agreement had been made, several government officials—including Senator Edward Kennedy, EPA regional administrator John DeVillars, and Pittsfield Mayor Gerald Doyle—said elements of the process would serve as a national model for other communities facing similar challenges. Carol M. Browner, EPA administrator, said, “GE’s agreement to help fund an economic redevelopment package to benefit the community is a significant part of the agreement. It ensures that public health and the environment will be protected and the local economy will prosper.”

The settlement was finalized in a lengthy document that was filed in court in October 1999 and approved by the court in October 2000. In addition, the State Attorney General’s office and GE reached an agreement to settle the grand jury investigation. ■

QUESTIONS FOR DISCUSSION

1. You are hired as a public relations consultant by General Electric in the fall of 1997. What strategic counsel do you provide to the company for responding to the developing media attention?
2. As Vice President of Corporate Affairs for General Electric in 1998, just before the final agreement is made with the EPA, you are charged with managing all media relations for the company. What is your official statement to the media regarding the outcome of the case?
3. What relationships should General Electric have focused on building—or rebuilding—after the agreement was reached on September 25, 1998?
4. What are the (a) legal and (b) ethical responsibilities of a company like GE to remediate conditions that occurred openly, legally, and honestly in an earlier era?

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CASES

CASE 8-1 VALUES ON A COLLISION COURSE

The process of obtaining lumber and wood pulp for domestic use, as well as for export, imposes a toll on the various environments in which wildlife can survive and flourish. Logging practices can threaten the existence of birds, fish, animals, and plant life. Single-minded timber practices are among the consequences of developing technologies that have resulted in the disappearance of 200 species of wildlife, and some 230 more are on endangered lists. Birds have made up a large part of the loss, as nearly 80 species have become extinct in 300 years in the United States.

The lumber industry plays a significant role in the fate of our forests and the wildlife that dwells within them. The U.S. Forest Service has been selling timber companies the rights to cut trees in old-growth forests at a rate of about 62,000 acres annually—under a directive from Congress to create jobs in timber regions. At this rate, most authorities estimate, the old-growth forests will be gone in 20 years.¹ Today, only 2.4 million acres of Pacific old-growth forests remain; a mere remnant of the 19 to 20 million acres of ancient forests that once existed in Washington and Oregon alone.² Old-growth forests consist not just of ancient standing trees, but of fallen trees, snags, massive decaying vegetation, and

numerous resident plant and animal species, many of which live nowhere else. More than 200 species of fish and wildlife flourish in ancient forest ecosystems, and more than 1,500 species of invertebrates can inhabit a single stand of ancient forest. One tree can be home to 100 separate plant species. These forests provide habitat for as many as two dozen threatened or endangered plant and animal species.³

Through most of our country's history there was little or no demand for logging in the national forests. Intensive logging began during World War II and increased over the years. After 30 years of extensive logging, the National Forest Management Act was adopted in 1976 in hopes of serving both environmentalist and industrial groups. But despite increasing concern over the environment, logging sales by the Forest Service continued, as authorized by Congress.

One endangered species that survives in Pacific Northwest ancient forests is the northern spotted owl (See Figure 8-2). Because of past habitat loss from logging and development, today's population of northern spotted owls represents a small fraction of the numbers that once existed. Studies show that the owl population continues to decline.

¹Sy Montgomery, "Protective Legislation Filed," *Boston Globe*, July 6, 1992.

²Ibid. We thank the Wilderness Society for information provided for this case—though readers must realize this excellent public service organization does have a viewpoint on these issues.

³Taken from "Ancient Forests of the Pacific Northwest and the Northern Spotted Owl" provided by the Wilderness Society.



FIGURE 8-2 The northern spotted owl has been the centerpiece of extreme controversy in the Pacific Northwest.

(Courtesy of the Wilderness Society.)

Special interest groups that favor owl preservation, forest conservation, and timber production have found themselves head to head in the battle of “whose cause is most important.” The thrust of this case study shows that *maintaining positive relationships through changing issues is difficult* and that *compromises don’t necessarily result in a happy ending*. The best solution may be

found in shifting the focus of the controversy to an activity that aims for a win-win resolution. It is a truism that we can’t have the best of both worlds. There have to be choices and trade-offs.

The question is “Can one aspect of an issue oversimplify the issue in its entirety—therefore hindering the progress of achieving a positive resolution?”

In this particular study, the trade-off hinges on the disciplining of industrial practices. Specifically, how much restraint in normal timber logging operations is acceptable in order to help save the spotted owl, uphold the Endangered Species Act, conserve old-growth forest, and yet preserve timber industry jobs?

MORE THAN JUST OWL VERSUS LOGGING

The Wilderness Society and the lumber industry sought publicity to gain public awareness and support for their respective concerns and their solutions—both economic and environmental. These debates centered around the overruling of the Endangered Species Act that allowed logging on 13 tracts of land designated as spotted owl habitat in the Pacific Northwest.

In 1992 the Forest Service found itself the center of attention throughout the debates. Until this time, the Forest Service was rarely faced with the challenge of negotiating with two strongly opposed viewpoints. They had maintained a good reputation for their work with communities, but were now considered the bad guy by two significant parties. Environmental groups lobbied the Forest Service to protect the spotted owl and save the old forests, and the timber industry wanted it to preserve logging jobs. Naturally, the Forest Service aimed to accomplish both, but as it was to find out, a compromise doesn't always satisfy opposing parties.

ENDANGERED SPECIES ACT BECOMES ENDANGERED

In 1973, Congress passed the Endangered Species Act (ESA). The act prohibits anyone, with a few exceptions, from killing,

capturing, or harming a listed endangered species. Federal agencies must ensure that any action they authorize, fund, or carry out will not jeopardize the continued existence of any endangered or threatened species. The act calls for the creation of "Recovery Plans" that help restore endangered species through conservation programs. The ESA, however, was first overruled in 1979 when Grayrock Dam was built in Wyoming—despite the threat to whooping cranes, a listed endangered species, on the Platte River in Nebraska. Environmental groups were outraged at the prospect of changing the law in order to satisfy ever-increasing human technologies.

In 1992, the Endangered Species Act was overruled a second time. The original Recovery Plan was designed to rescue the spotted owl from extinction by preserving 5.4 million acres of ancient forest but at the estimated cost of 32,000 logging jobs. The subsequent Preservation Plan, upheld by the Bush administration, allowed limited timber harvests in areas in Washington and Oregon populated by the northern spotted owl. This overruling aimed to preserve 17,000 logging jobs and maintain the economy in small towns dependent upon the timber industry; it would, however, result in the eventual extinction of the owl in those areas. The decision aimed to halt the dispute between the environmentalists and the logging industry by allowing limited timber harvests in certain old-growth forests while the government came up with a plan to protect the owl.⁴

The response to the Preservation Plan compromise was not favorable. Both parties felt cheated of their goals. The northern spotted owl would still reach extinction within decades, and the timber industry would still lose logging jobs. The one group

⁴"High Court Backs Some Logging in Spotted Owl Areas," *Boston Globe*, March 26, 1991.

that felt satisfied with the plan were those working in certain lumber companies. Some lumber companies profited from the spotted owl controversy because the curtailment of cutting raised the price of lumber and increased profits.⁵

OPPOSING PARTY STRATEGIES

To counteract opponents in these highly publicized debates, special interest groups initiated activities to gain awareness and public support for their causes.

The Wilderness Society

Founded in 1935, the Wilderness Society is the largest national conservation organization devoted primarily to the protection and management issues of public lands. The society employs a combination of advocacy, analysis, and public education in its campaigns to improve management of America's national parks, forests, wildlife refuges, and Bureau of Land Management lands.

One lobbying activity of the Wilderness Society during the debates included the unveiling of a series of computer-generated maps showing the heavy fragmentation of remaining ancient forest in 12 national forests of the Pacific Northwest. The maps were given to members of Congress in hopes of them using the data as the raw material to help forge a solution that would protect ancient forests and establish a sustainable regional economy. The maps showed that more than 75 percent of the remaining old growth found in the 12 national forests located in Oregon, Washington, and northern California is unprotected, and the

remaining areas are in isolated and highly fragmented stands.⁶

Developing its thematic arguments, the Wilderness Society stated that lumber mill automation, improved labor productivity, and rising raw log exports—not the spotted owl—were the main contributors to the loss of 26,000 timber jobs since 1979. They also advised that a 25 percent reduction in raw log exports could provide the equivalent of between 4,500 and 5,000 U.S. timber jobs—jobs that would turn raw logs into finished products.

The Wilderness Society agreed that logging has a place, although diminished, in the future economy of the Pacific Northwest. The issue facing Congress was how to cushion an economic transition that would occur regardless of the fate of the spotted owl.

The Timber Industry

The timber industry argued that studies of old-growth forest measurements have been inconsistent. Environmental organizations and the Forest Service reported the existence of approximately 3,000 pairs of the spotted owl. The timber industry, however, reported that 4,018 owl pairs and 2,047 owl singles existed for a total population of over 10,000 northern spotted owls, well above the previously quoted figures. Research shows that owl population and reproduction are not correlated with the amount of suitable habitat within the study sites and that more environmental factors are likely involved.⁷

The timber industry argued that the loss of logging jobs in the timber industry in the 1980s was due to the economic recession and not to automation. They claimed that employment levels remained fairly constant since 1983.⁸

⁵Bill Richards, "Owl of All Things Help Weyerhaeuser Cash in on Timber," *The Wall Street Journal*, June 24, 1992.

⁶Taken from a news release distributed by the Wilderness Society, February 20, 1992.

⁷Ross Mickey, "The Northern Spotted Owl: The Rest of the Story," *Building Towards a Balanced Solution*, compiled by the Northwest Forest Resource Council, April 1993, p. 10.

⁸Charles Burley, "Employment and Mill Automation," *Ibid.*, pp. 5-6.

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Key arguments included that timber sales reductions would result in worker displacement, business closure, social service demands, and the many personal problems associated with unemployment.⁹ Furthermore, restrictions on timber sales in the United States would only result in the logging of other forests worldwide.¹⁰

The U.S. Forest Service

The U.S. Forest Service is charged with maintaining national forests as a resource for the citizens of the United States. In the spotted owl controversy, it became clear that there was no longer any consensus or even tacit consent on which management programs could be developed.

To grasp the full implications of the spotted owl and timber industry debates, the Forest Service reviewed literature on the owl, heard presentations from scientists doing spotted owl research, considered the concerns of numerous interest groups, and conducted field trips in Washington, Oregon, and northern California to examine the owl's habitat. The Forest Service recognized that much of the attention directed toward the owl stems from a growing debate over managing old-growth forests on federal lands and from a concern about protecting biodiversity. They understood the larger issues, but kept to a mandate of developing a conservation strategy specifically for the spotted owl.

The U.S. Forest Task Force developed a conservation strategy. The outcome was a mapped network of Habitat Conservation Areas (HCAs) that would ensure a viable, well-distributed population of owls. Wherever possible, each HCA would contain a minimum of 20 pairs of owls with a maximum 12-mile distance between HCAs.

Logging and other forestry activities cease within HCAs.

Though each interest group felt that the Forest Service would support its cause, the Forest Service saw its role as an attempt to *maintain positive relations* between the parties.

SEEKING CONSENSUS

On April 2, 1993, President Clinton held a Forest Conference in Portland, Oregon, to break the gridlock over federal forest management that had created confusion and controversy in the Pacific Northwest and northern California. The conference aimed to achieve economic diversification and economic opportunities in the region.

The Forest Conference called for a strategy that recognized both the importance of the timber industry to the economy of the Northwest and the need to preserve old-growth forests as an irreplaceable part of our national heritage.

Five principles gave guidelines to three committees organized to put the strategy together.

1. Remember the human and economic dimensions of the problem.
2. Protect the long-term health of our forests, wildlife, and waterways.
3. Make all efforts scientifically sound, ecologically credible, and legally responsible.
4. Produce predictable and sustainable levels of timber sales and nontimber resources that will not degrade or destroy the environment.
5. End the gridlock within all branches of the federal government and insist on collaboration, not confrontation.

⁹Robert Lee, "Effects of Federal Timber Sales Reductions on Workers, Families, Communities, and Social Service," *Ibid.*, p. 1.

¹⁰Con Schallau, "Global Implications of Timber Supply Restrictions," *Ibid.*, p. 8.

A NEW PLAN

The outcome of the conference, the Northwest Forest Protection Plan, calls for reducing timber harvests in the Pacific Northwest to an average of 1.2 billion board feet annually for 10 years. This value is approximately 75 percent less than the industry's harvest throughout the late 1980s. Restrictions would be placed on timber cutting around spotted owl nests on private lands. Logging would be limited in protected reserves established on federal lands.

Anticipating a loss of 6,000 timber industry jobs, a 5-year, \$1.2 billion economic assistance package was designed to create 8,000 jobs and provide retraining opportunities. And finally, the plan asks Congress to encourage more domestic milling by eliminating a tax subsidy for timber companies that export raw logs.

The plan also calls for new methods of forestry. "New forestry" sets out to turn younger stands of trees into forests that look more like old growth in hopes of increasing habitat for old-growth species. Loggers practicing new forestry set out to reshape the woods, taking out the uniformity by randomly cutting trees to create meadows for wild grasses and leaving the downed trees to rot to promote ground vegetation.

CONTINUED OPPOSITION

Despite these efforts to appease the opposing parties, the Forest Protection Plan didn't receive favorable response. Environmental-

ists recognized the plan as a positive first step, but argued in favor of the creation of permanent reserves on 8.6 million acres in three states. Environmental scientists said that new forestry wouldn't work because forest systems contain complex details of biological, physical, and chemical processes that cannot be reproduced by humans.

The timber industry wanted the administration to permit higher harvests over a period of years. The target of 1.2 billion board feet would be a substantial loss, resulting in higher lumber prices, a slowdown in home purchases due to greater costs, and a stalled economic recovery. Those in the timber industry also disagreed with new forestry because it doesn't allow for logging. It is *no forestry*.

SHIFTING THE FOCUS

Despite the opposition, the Forest Protection Plan is attempting to solve the spotted owl controversy in the context of a broader strategy. It has *shifted the debate* from the protection of individual owls to the preservation of an ecosystem for various species. It recognizes that a long-term management plan for natural resources in the public domain can no longer be based on a single set of values but must take into account a broad diversity of national interests. ■

QUESTIONS FOR DISCUSSION

1. The strategy of the Clinton administration was to shift the focus of the controversy from owl protection to the preservation of ecosystems for various

species. Will this decision provide a long-term solution to the issue? Or will environmentalists and timber industry employees never reach a satisfying

CASE 5-2 A CLASSIC: NADER TAKES ON GENERAL MOTORS

THE OPPONENTS

A small group challenging a company such as General Motors (GM) sets up a tantamount-heavyweight, David and Goliath situation. Not only is GM a Goliath in sales and earnings, but in 1987 it had more than 315 million shares of stock around the world in the hands of some 830,000 shareholders. The company takes in more money every year than all but a handful of sovereign nations!

Without doubt, the majority of shares were in the hands of a few hundred shareholders and their representatives who held views similar to corporate management's. Rounding up a majority of opinion opposing GM management on any business issue seemed unrealistic.

But not to Ralph Nader and his associates, the challengers in this case. "The Nader group versus GM" is a classic example of minority shareholders expression. The group owned only 12 shares of General Motors stock but sought to induce modifications in the corporation's management policies.

THE NADER PAST WITH GM

Nader had a prior experience tangling with GM in 1965. He had written a book, *Unsafe at Any Speed*,¹ which criticizes the auto industry in general, and in particular denounced the early Corvair autos built by GM.

¹Ralph Nader, *Unsafe at Any Speed*. New York: Grossman, 1965.

At that time, GM's legal department ran an investigation on Nader that focused on his private life. To Nader this was a form of harassment invading his right to privacy. Nader brought suit. The company settled out of court for \$425,000 and GM's board chairman apologized for the harassment. Nader said the money would be used to establish a "continuing legal monitoring of General Motors' activities in the safety, pollution, and consumer relations area."

Shortly before the settlement, Nader created an organization of young lawyers called the Project on Corporate Responsibility. Ralph Nader, the spokesman, announced at a Washington press conference that the project's efforts would be directed at "the establishment of enduring access to corporate information, effective voice for affected social and individual interests, and thorough remedy against unjust treatment."

THE NADER-SIDE STRATEGY

In 1970, Nader took on GM again, this time to make changes regarding General Motors' investor relations.

In conjunction with formation of Project on Corporate Responsibility, the Nader group announced "Campaign GM," which would "seek to persuade GM shareholders to demand stronger 'public interest' efforts by GM, such as reducing air and water pollution and making safer cars." Campaign GM, the announcement said, was going to

THE POWER OF A SHAREHOLDER

The shareholders of a corporation collectively own it. In theory, they are collectively "the boss" and should have a voice in policy making and an active part in the decision-making process. Shareholders express their independent decisions most often through their votes on matters submitted to them. Votes are allocated on the basis of one vote for each share owned, *not* one vote for each shareholder.

In actual practice, the directors and top management of a corporation (who may also own shares) have the authority to run the corporation the way they feel will best benefit shareholders collectively. They must also look after the other publics, such as customers and employees, on whom the corporation depends for its success. A shareholder with a few shares feels powerless. The only choices minority shareholders have are to write complaint letters, accept whatever decisions are made, or sell their shares. Minority shareholders historically have rarely raised questions or expressed dis-course. Consequently, most corporate annual meetings have traditionally been formal, scripted, cut-and-dry, rubber-stamp affairs.

THERE HAVE BEEN EXCEPTIONS

There are, however, some perennial critics who make a point to attend meetings

and raise questions. On occasion, individuals in positions to speak for many small shareholders, and persons owning large blocks of stock who share a different viewpoint than the management, have banded together and spoken with a single voice. Small shareholders try to change a policy or attitude by making a proposal for inclusion in the proxy statement. This statement is voted upon at the annual shareholders' meeting.

Whether the proposal is adopted or not, small shareholders have alerted the corporate management and the financial news media (the media are usually present at the major company annual meetings) to their opinions and perhaps attracted others who share common views. Examples of questions raised have been environmental and safety issues, overextended salaries for corporate management, and minority employment. The outcomes of these efforts are considered a gain for those who represent the small shareholders in the same sense that the expression of a minority viewpoint in a Supreme Court decision is a gain for the losing side. Winners can't ignore the existence of the minority view.

seek public and private support, climaxing at GM's annual meeting of shareholders with three proposals offered as resolutions:

- **Proposal number 1** would add three public representatives to GM's twenty-four-member board: The campaign's candidates were to be the former consumer adviser to a U.S. president, a Pulitzer Prize-winning biologist and member of a President's Advisory Committee on Environmental Quality, and a minister who was then a Democratic party committeeman from the District of Columbia.
- **Proposal number 2** would create a Committee for Corporate Responsibility with representatives from the company and from conversationist, union, civil rights, consumer, and religious groups.
- **Proposal number 3** would deal with the amending of the company's corporate character to specify public interest requirements.

In addition, Campaign GM created six additional proposals included in the proxy sent to shareholders before the meeting.

The Securities and Exchange Commission (SEC), on inquiry from GM, decided that seven of the total of nine proposals could be omitted from the proxy statement and that the project's Campaign GM should amend one of the two remaining proposals to make it suitable for its inclusion. The surviving proposals were for expansion of the board of directors and establishment of a Committee for Corporate Responsibility.

Nonetheless, the campaign's strategy called for rousing the support of institutional investors and their constituents. Nader appealed to shareholders as "citizens and consumers, victims of water pollution, congested and inefficient transportation, and rocketing repair bills for shoddy workmanship."²

THE GM-SIDE STRATEGY

The GM vice president for public relations wrote during the months between the project's Campaign GM proposals and the annual meeting:

February and March were extremely busy months for us. As the days passed, it became obvious that the Project was having little trouble getting all the media coverage it wanted. For us, there was the question of whether we should fight the Project at every point or whether the better course was to "play it cool" and not increase the opportunities for rebuttal headlines. In the end, our response could be characterized as walking the middle ground—answering all the charges but avoiding response which would provide a further forum.

The spring saw the first Earth Day and the first teach-ins on the environment. Seminars and discussions at high schools and colleges throughout the nation focused attention on environmental problems. General Motors sent speakers to 116 of these teach-ins . . .

The Project attempted to capitalize on this college environmental movement in order to generate attention and support for its cause. It tried to form students into pressure groups to force the

²In preparing this case study, and again in preparing the revision, we wrote to Mr. Nader, asking for information that would tell the "Nader side of the story." Both invitations went unanswered, even though it was made clear that the information was wanted for classroom use.

universities to back the Project and vote endowment shares against GM management. Generally, its efforts failed.

Amid all this public controversy and discussion, the owners of our business, the stockholders, were taking the challenge rather calmly. Only 264 letters, or 12 percent of the 2,200 comments received prior to the annual meeting, dealt with one or both of the Project's two proposals. This surprised us, because we thought the publicity which had been given the Project's activities would generate a greater stockholder response.

While our stockholders weren't strongly motivated to write us about the proposals, they did write in far

greater numbers for tickets to the annual meeting. We received 3,500 requests for tickets.³

THE ANNUAL MEETING

The meeting itself, starting at 2:00 P.M., went on for more than six hours, with the GM chairman presiding. In the course of the meeting, contrary to precedent, some 67 shareholders and proxy holders spoke. (See Figure 5-1).

Before that happened, a motion picture was shown depicting how the company was meeting some of its social responsibilities. (This film subsequently went into the company's film catalog, and in its first three

FIGURE 5-1 A packed house for annual meeting of shareholders in world's largest industrial corporation the year Campaign GM began.



(Courtesy of General Motors.)

³Anthony DeLorenzo, "Round Three," also from speeches to public relations professionals and corporate secretaries.

years was shown 11,348 times to an estimated total audience of 337,938.)

The prepared remarks by the chairman covered the deaths of a GM executive and a United Auto Workers (UAW) top official; retirement of two directors; introduction of 20 directors present; the trend of sales and earnings, influences on them, and problem ahead, the matter of social responsibility and GM activities in that area; introduction of the film; and introduction of the proposals in the proxy statement.⁴

Of the five proposals on the agenda, the first one, the selection of independent public accountants, was overwhelmingly ratified. The other four—to limit executive compensation, to provide cumulative voting in the election of directors, to establish a responsibility committee, and to increase the number of directors—were defeated by massive majorities. The last two of these were the proposals of the Project.

The chairman made a closing statement pledging socially responsible conduct by the corporation. At a press conference immediately afterward, he was asked whether he thought GM had achieved a “victory.” His response was, “I don’t think we won a victory. I think we won a vote of confidence from our shareholders. I think we could lose that vote of confidence very quickly unless we respond in the way our shareholders expect us to—and that’s what we intend to do.”

IN THE WAKE OF THE MEETING: ROUND ONE

One move came within two months. A five-member Public Policy Committee was formed as a permanent standing committee of the board to “inquire into all phases of the corporation’s operations that relate to

public policy and recommend actions to the full Board.” On the committee at the outset were the chairman of the Mellon National Bank and a trustee of Carnegie-Mellon University; the chairman of the corporation of Massachusetts Institute of Technology; the chairman of Allied Chemical Corporation and former Secretary of Commerce; the trustee of Meharry Medical College; and the president of Marshall Field, who was also a trustee of Northwestern University.

At the beginning of the next year, the board elected the first African American to membership—the originator of the Opportunities Industrialization Centers of America. In April, a professor of mechanical engineering at the University of California (an expert in thermodynamics and air pollution) was hired as vice president for environmental activities, to coordinate work in automobile safety, emissions, product assurance, and industrial air and water pollution control.

Spurred by the Public Policy Committee, a Science Advisory Committee, chaired by a Nobel Prize winner, was formed to assist in technological and scientific matters involving basic and applied research.

SHIFT IN STRATEGY

According to the vice president, after evaluation GM’s public relations people decided to return to and review the second step in the process, strategic planning. After review, they felt sure Campaign GM would hammer away at the responsibility theme. They decided to swing from their reactive “cool-it” tactics to a proactive advocacy.

Implementing a proactive approach, the company’s news relations section stepped up the number of interviews by financial, popular, and trade media with senior GM

⁴Extracted from *Report of the 62nd General Motors Stockholders’ Meeting*, a company booklet.

officials. There was an all-day conference at the GM Proving Ground for newspaper publishers. This event was repeated for prominent educators and representatives of foundations and investment institutions. The range of subjects was wide, even getting into such sticky problem areas as abandoned cars.

These meetings, important in themselves, additionally provided the substance for a booklet to shareholders, employees, and business and community leaders. Concurrently, there was no letup in communications efforts; television shorts were shown, as just one example. The company's next annual report contained a report of progress in areas of social concern.

THE NEXT ANNUAL MEETING: ROUND TWO

Campaign GM, in round two at the next year's annual meeting, offered three proposals:

- **Proposal number 1** termed "stockholder democracy," would permit the listing of shareholder nominees for the board in the company's proxy.
- **Proposal number 2** on "constituent democracy," sought board positions for representatives of employees, auto dealers, and consumers.
- **Proposal number 3** on "disclosure," would require disclosure of policies, activities, and expenditures in the areas of pollution, safety, and minority hiring in the annual report.

All three proposals were put into the proxy statement by GM, and the corporation's opposition to all three was clearly stated, not because of their cost, but because they would "do more harm than good."

Those hoping for fireworks were disappointed. The proposals were overwhelmingly majorities of more than 95 percent.

How Public Relations Became
Regarding the GM public relation, one shareholder proposed a public relations counselor to board of directors. This item was reported in the postmeeting these words:

The Chairman said that GM has its own public relations and utilizes outside consultants. He also said that directors chosen for general as well as specific interests of the Corporation board memberships for persons with particular occupations. A stockholder supported a proposal, saying such a director should be able to assist in meeting public relations problems. A proxy-holder recommended a woman as public relations counselor and said for too long GM has been interested or dependent, to the exclusion of other considerations. The chairman replied that General Motors has been concerned with many other aspects of its business. A stockholder said that a public relations counselor at all corporations, including GM, should be obvious.

The vote on this proposal was 5.27 percent opposed and 4.27 percent in favor.

Questions raised at the meeting all ran the same course as those of the previous year. They were pleasantly answered with courtesy and tact. The most emotion-laden issue proposed from the Episcopal

discontinue GM's operations in South Africa. The black GM director spoke for the proposal, the first time in the corporation's experience that a director had publicly opposed the announced position of the board.

ROUND THREE

The project was back at it a third year. Meantime, GM again stepped up its proactive efforts to take its position out publicly to the working, buying, investing, and voting public. Speeches, magazines, and newspaper advertising and network television were used.

In an extensive magazine article, the vice president for public relations raised what he termed, from GM's standpoint, a basic question: "What is the Project really trying to do?" He cited GM's answer in a booklet sent to shareholders. "The Project is using General Motors as a means through which it can challenge the entire system of corporate management in the United States."

A spokesman for the Nader group, Susan L. Gross, explained the selection of GM this way: "We haven't chosen GM because it is all bad, but because it epitomized all corporations. And we have found that if you can get GM to change, other corporations will follow."

The GM vice president for public relations termed the project a "time-consuming distraction from a basic reevaluation of goals and responsibilities which has been under way for several years."⁵ Regarding the criticisms and reacting to them,

The real danger is that through misinformation or a reluctance to tell our

side of the story, our political system will overreact to the critics' charges. Some critics of business exaggerate, misquote and make statements which are flatly and purposely misleading. Businessmen are not venal, money-grubbing villains who each day do their best to deceive and cheat the consumer. On the other hand, we can't complain if people hold that view of us if we don't try to tell our side of the story.

The vice president quoted from the chairman's address to GM's divisional and central office public relations people:

At various times in the history of General Motors, different staffs have been called upon to make vital contributions to our company. Today it is you public relations men [*sic*] who are being tested.

GM public relations has more visibly and aggressively taken the corporation's human side to its constituency in controlled media and messages.

AT THE MARKETPLACE

In mid-1988, GM decided to use a combination of marketing and public relations pizzazz in a campaign to regain its image as the invincible leader on top of the world auto industry. The campaign was launched with a lavish exhibit called "GM Teamwork & Technology—for Today and Tomorrow," staged in New York's Waldorf Astoria, and coupled with eight-page inserts in magazines such as *Reader's Digest*, at a cost of \$20 million. Streamlined design, getaway speed, power, and luxurious fittings were their evidences of image and leadership.

⁵This and other quotations cited are from the speech "Round Three" presented by Anthony DeLorenzo, vice president for public relations at the time.

CASE 4-4 NUCLEAR WASTE GOES DOWN THE DRAIN

Every day people all across the country choose to do things that have a certain degree of risk—crossing the street, driving a car, flying in an airplane, bungee jumping, or eating foods they know do not constitute good nutrition.

What happens, though, when someone else controls the risks we face? Do we ask our friend to pull the car over so we can get out? Never unless we pilot the plane? What happens if an organization wants to take a risk in a community, such as dumping low-level nuclear waste, even if it may be smaller than the risks we take in everyday life?

More and more, organizations are facing strident opposition to their plans from groups and coalitions opposed to taking on more risk. Grassroots environmental concerns have fostered attitudes such as Not In My Back Yard (NIMBY) and Not On Planet Earth (NOPE) to limit any sort of activities viewed as at all risky. Yet, in many cases, organizations need to assume some risk in order to run their business, produce products, adhere to government standards, or make a profit.

Risk management deals with explaining and persuading a risk-averse public to allow the execution of necessary actions that may carry some risk (See Figure 4-7). But risk communication is more than explanation or persuasion. It must be process-oriented to allow interaction between the opposing groups—the public, proponents, experts, and regulatory officials—and allow each to identify the true issues at stake from its perspective. Only then can the average citizen form an intelligent judgment.

IS RISK COMMUNICATION A DIFFERENT BALL GAME?

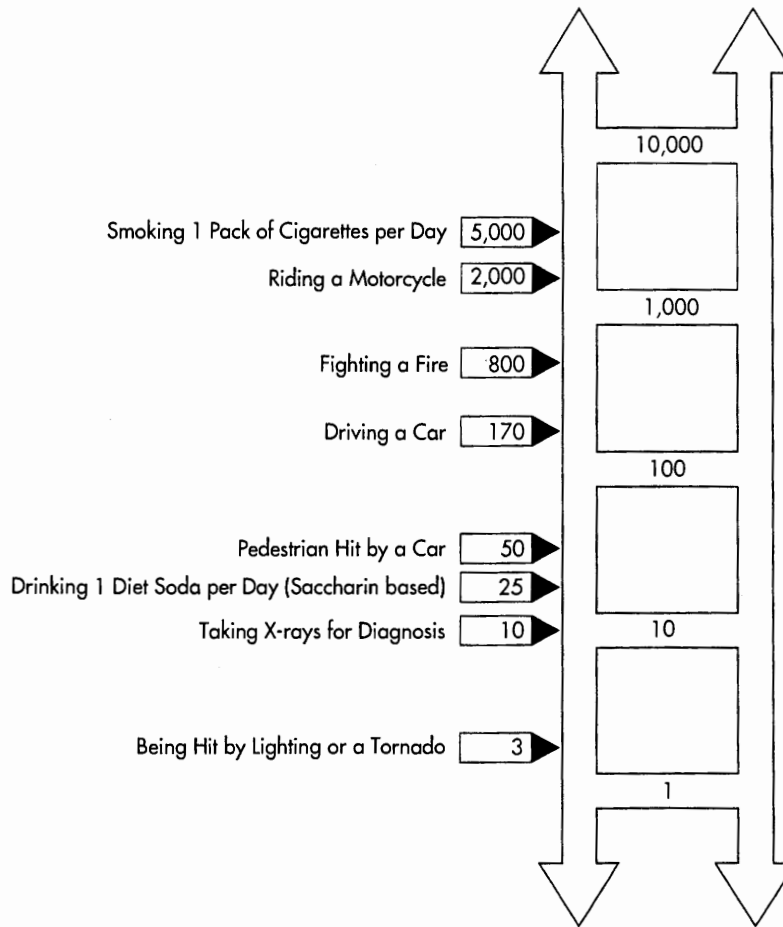
As technology has changed, so have the type and amount of risks we face. Public reaction to risk can be varied, depending on each individual's mind-set and experiences. Each person perceives risk in his or her own personal context and with his or her own established biases for or against that risk.

In 1983, the National Research Council (NRC) completed a study on managing risk, leading to a report entitled *Risk Assessment in the Federal Government: Managing the Process*. Raised in this study was the realization that with risk management comes a new kind of communication, risk communication. The NRC chartered a committee, the Risk Perception and Communication Committee, to research how to communicate risks effectively to the public. The committee found that explaining risks in a logical manner was not effective for convincing a risk-averse public that the risks were nothing to worry about. People evaluate risks contextually, and their *perception* of that risk motivates their behavior.

ONE EXAMPLE

For many years, the city of Albuquerque, New Mexico, had an ordinance forbidding anyone—except hospitals and radiation treatment clinics—from disposing of low-level radioactive wastes in the city's sewer system. Low-level radioactive waste covers anything that may have been contaminated by radioactive materials, such as equipment, clothing, tools, and so on.

ANNUAL NUMBER OF DEATHS PER MILLION PEOPLE



Source: Adapted from Schultz, W., G. McClelland, B. Hurd, and J. Smith (1986), *Improving Accuracy and Reducing Costs of Environmental Benefits Assessment*. Vol. IV. Boulder: University of Colorado, Center for Economic Analysis.

WARNING! USE OF DATA IN THIS FIGURE FOR RISK COMPARISON PURPOSES CAN SEVERELY DAMAGE YOUR CREDIBILITY (SEE TEXT).

FIGURE 4-7 One tactic used by risk communicators has been to make risk comparisons in order to communicate the extent of the risk. But making quantitative risk comparisons with voluntary risk has proved illogical and damaging to the organizations who employ this tactic. Demonstrating it visually is more effective.

(Courtesy of the Chemical Manufacturers Association. From Vincent T. Covello, Peter M. Sandman, and Paul Slovic, *Risk Communication, Risk Statistics and Risk Comparisons: A Manual for Plant Managers* [Washington, D.C.: CMA, 1988].)

In 1991, Sandia National Laboratories (a facility of the Department of Energy, DOE) and Inhalation Toxicology Research Institute (ITRI) petitioned the city to dis-

pose of their waste in the city sewer systems, as the hospitals were already allowed to do. Sandia initially made the proposal because it wanted to dump 50,000 gallons of

low-level radioactive water (used to shield nuclear reactor fuel rods) into the sewer system. Radiation experts assured Albuquerque residents that the risk was minimal and their tap water had more natural or “background” radiation in it than the wastewater did.¹

An amendment to change the city’s sewer-use ordinance was put before the city council. The change would have allowed anyone licensed to use radioactive material to dump low-level radioactive waste into the sewers. Though more organizations would be allowed to dump, more stringent limits would be set on how radioactive the waste could be. They would be able to dump waste at only one-tenth the radioactivity standards established by the Nuclear Regulatory Commission.

After investigating, the city council found that its ordinance or any amendment to an ordinance regarding discharging radioactive wastewater does not fall under its jurisdiction. These regulations are set by the federal government through the Nuclear Regulatory Commission and DOE. Thus Sandia as a federal laboratory could ignore the city ordinance and dump anyway—that is, if its managers thought this was acceptable public relations policy. They did not, however, so the issue went to public debate.

A VOCAL OPPOSITION

Citizen opposition was immediate and outspoken. A group named People’s Emergency Response Committee (PERC) began to organize. PERC was formed a year before the emergence of this issue, when those involved first became aware of Mayor Louis Saavedra’s attempt to change the city’s sewer-use ordinance. It is an ad hoc

coalition of citizens’ organizations made up of Hospital and Healthcare Workers Union 1199, Citizens for Alternatives to Radioactive Dumping, the South West Organizing Project, New Mexico Public Interest Research Group, the Albuquerque Center for Peace and Justice, Sierra Club, and the Labor Committee for Peace and Justice.

PERC immediately established its position with four fundamental statements:

- No other industries including Sandia National Laboratories should be allowed to dump radioactive wastes in the sewers.
- The existing Albuquerque sewer ordinance should be strengthened to control and monitor the radioactive wastes being dumped by hospitals and other medical treatment facilities.
- The DOE and private industries must develop long-range plans for dealing with their radioactive waste. These plans should not include dumping in the sewers as an option.
- All plans must include strategies on how these companies and the DOE will reduce the *generation* of radioactive waste in the first place.

Representatives of the group were at the first hearing regarding the change. They were concerned that the issue was more than obtaining permission to dump 50,000 gallons of waste. They saw it as a ploy to allow any business in the future to rid itself of radioactive waste. Concerns were raised about the water’s path. Would it enter the Rio Grande and then affect towns

¹Background radiation is naturally occurring radiation that accounts for more than half of the radiation we are exposed to. It is generated from cosmic rays, naturally occurring elements such as uranium, and radioactive chemicals in the body.

downstream from Albuquerque? This was not a risk that the citizens of Albuquerque and the surrounding towns were prepared to take, PERC felt.

PERC'S TACTICS

One communication tactic that PERC utilized was to publish a newsletter entitled *Radioactive Pipeline* to establish its position. Its focus was on the risks that residents perceived: that this could contaminate Albuquerque and that there was no telling if Sandia and the others could be trusted. This newsletter helped PERC get its message out to make people aware of the situation. The newsletters and flyers PERC distributed urged the citizens of Albuquerque and surrounding areas to take action and voice their concerns at community and city council meetings. Postcard campaigns were mounted by distributing preprinted cards so that citizens could easily send them to local city councilors expressing opposition to this ordinance. A petition drive was started, gathering more than 7,000 signatures.

OBSTACLES FOR SANDIA

Media coverage was not helpful for Sandia, either. While officials were explaining how safe the water was in one article, other articles in the newspaper reported some of Sandia's sewer violations and mismanagement of radioactive materials by DOE.

City council meetings were packed with citizens who came to voice their outrage. Sandia arranged for two radiation experts to speak in an attempt to reassure people of their physical safety, but this expertise did not address the underlying issues that made up a major part of this controversy.

- Many Americans have a **lack of trust** for the federal government and those organizations that are a part of it. When, or if, stories con-

cerning federal mismanagement and secret nuclear tests are uncovered, the public will remember them later.

- The effects of radioactive wastes are not completely understood. Some effects will not be apparent for a very long time, and this **uncertainty** is difficult for anyone to deal with.
- Many people already have **biases** against anything nuclear, especially if it is near where they live.
- Albuquerque residents were concerned with what this initial dumping would mean for the **future**. They were asking themselves: What else would be dumped, and how often would it happen?

THE SANDIA SIDE OF IT

Sandia's public affairs department did make an attempt to educate the public about this risk to try and allay public fears about radiation and radioactive materials. Some of their activities included:

- Organizing some of the public meetings to create the opportunity for citizens to voice their concerns and get questions answered.
- Reaching out to public officials and leaders who showed opposition to the proposal to give them the facts of the issue.
- Making public affairs people available for any and all questions that the public had about the issue.
- Arranging for television interviews with radiation experts to disseminate to the public the facts of radiation.

—CAN THERE EVER BE AGREEMENT?

On November 5, 1991, the Albuquerque City Council voted against the proposal to change the city ordinance. The Council then formed a study committee to review important questions about radioactive dumping and offer recommendations in six months. Two years and two research studies later, the city council finally consented to the disposal of the wastewater in the sewer system.

For Sandia National Laboratories, the task of disposing of its waste became an ordeal. A simple task of applying for a permit had become an extended three-year controversy.

For all affected organizations, the question remains: What will we do with our low-level radioactive waste? What is often overlooked is the benefits that nuclear science offers. Do we abolish nuclear science altogether? NIMBYists demand that disposal not be done where they live. Where else, then? Will there ever be an acceptable alternative? For public relations practitioners, the challenge of communicated risk will only become greater as technology advances.

—YUCCA MOUNTAIN—AN UNRESOLVED RISK MANAGEMENT PROBLEM

While Sandia National Laboratories was eventually successful in obtaining permission to dispose of its wastewater in the city sewer system, another Department of Energy (DOE) proposal for the disposal of radioactive materials continues to remain unresolved. The Yucca Mountain case is further complicated by issues of alleged environmental racism and the right to protect culturally sacred sites.

In 1982, Congress passed the Nuclear Waste Policy Act that set an objective framework for government officials to study and evaluate multiple potential repository

sites for nuclear waste in the United States. The DOE faces the task of finding a geologic repository to permanently store 77,000 metric tons of high-level radioactive waste that is temporarily being stored at various locations around the country. About 90 percent of this waste is from commercial nuclear power plants; the remainder is from government defense programs.

The Nuclear Waste Policy Act Amendment of 1987—nicknamed “Screw Nevada Act” by residents there—(1) eliminated all but one of the potential repository sites, Yucca Mountain in Nevada, and (2) directed the DOE to study only that location for site suitability. The Amendment stressed that if, at any time, the Yucca Mountain site is found unsuitable, studies of the site will be stopped immediately. If the studies are discontinued, the site will be restored and the DOE will seek new direction from Congress.

Yucca Mountain is located 100 miles northwest of Las Vegas and sits on the western edge of the DOE’s former nuclear-weapons test site. The proposed repository would sit 1,000 feet below the top of the mountain and 1,000 feet above the ground water.

In 1992, Congress passed the Energy Policy Act, which required the Environmental Protection Agency (EPA) to develop site-specific radiation protection standards for Yucca Mountain to protect public health and the environment from harmful exposure to the radioactive waste that would be stored there. The Nuclear Regulatory Commission (NRC) is responsible for implementing the standards set by the EPA. Ultimately the NRC would be responsible for establishing the process for deciding whether Yucca Mountain meets the EPA’s standards.

From the beginning, the State of Nevada has firmly opposed the plan and is prepared to file lawsuits through all steps of

PR MESSAGES SET RISK PERCEPTIONS, AND RISK IS EVERYWHERE

All communications have become risk communications. Therefore, the rules for dealing with hazardous waste and cancer fears should be applied to every communication—to employees, shareholders, stakeholders, and customers, and surely to regulators, government entities, and the body politic.

Why? Because today publics are interested in two things: What can you do *for me*? And what, if I'm not careful, might you do *to me*? That second query—people's natural skepticism raised to new levels by today's troubled economy and quality-of-life—adds a risk perspective to every message or appeal.

INFLUENCING PEOPLE'S PERCEPTION OF RISK

Risk communication is proactive. Its goal is to improve knowledge and change perceptions, attitudes, and behaviors of the target public, write Leandro Batista and Dulcie Straughan, of the University of North Carolina at Chapel Hill.¹ They note, however, that changing risk perception—a necessary step for behavior change—is complicated. It can be:

1. *Objective*: product of research, statistics, experimental studies, surveys, probabilistic risk analysis, or
2. *Subjective*: how those without expert or inside knowledge interpret the research or the situation—which is based on their values and particular levels of experience and knowledge.

Thus experts and lay people build different mental models that lead

them to interpret risk activities differently. One does it objectively, the other subjectively.

FORMAT OF THE MESSAGE

The format of the risk message forms the risk perception. For example, radon and asbestos have a 25-fold difference in *actual* risk to the population, but generate only a slight difference in *perceived* threat. The inaccuracy of people's perceptions of the relative risks of radon and asbestos can be explained by the similarity of the format of messages conveying the risks involved. Regardless of the actual content of the message, the idea that is usually conveyed is that "this is a technical area that you probably won't understand, but there is a *danger here*." In other words, people will have similar responses to messages that are expressed in similar formats, even though the information may be different. Public relations teams can apply their knowledge of this aspect of human nature to formulate effective messages in a systematic way.

1. Each risk has its own identity (or risk perception), which is a specific combination of subjective risk factors (see box), or, as Neil Weinstein and Peter Sandman call them, "Outrage Factors."²
2. Some combination of these outrage factors leads people to be more upset about hazard X than hazard Y.
3. Not all factors are relevant for all risks, and there is no trade-off among factors—scoring high on one factor will not compensate for a low score on another (the

(continued)

(continued)

noncompensatory model). Factors are either on or off in the overall perception of that risk.

4. Therefore, it's important to understand the underlying dimensions that affect the perception of a particular risk—how the outrage factors combine to form a risk perception.
5. Messages should not be formulated until these underlying dimensions are understood.

A final concept to keep in mind is the one that governs the decision-making process: With health or environmental risks, people will modify their behavior if a highly threatening situation exists (or is perceived to exist). Thus a minimum standard, or threshold, is set for risk acceptability. If a risk is greater than the threshold, action occurs; otherwise the status quo is preferred. In all probability, this concept is as true for risks of being overcharged, getting fired, or losing on investments as it is for nuclear discharges.

Peter Sandman's formula for identifying risk has become widely used by public relations practitioners: **HAZARD + OUTRAGE = RISK PERCEPTION.**³

SUBJECTIVE RISK FACTORS

Less Risky	More Risky
voluntary	involuntary
familiar	unfamiliar
controllable	uncontrollable
controlled by self	controlled by others
fair	unfair
not memorable	memorable
not dreaded	dreaded
chronic	acute
diffused in time and space	focused in time and space
natural	artificial

¹"Dimensions Influencing Risk Perception: The Case of Lung Diseases." Unpublished paper, n.d.

²Neil D. Weinstein and Peter M. Sandman, "Predicting Homeowner Mitigation Responses to Radon Test Data," *Journal of Social Issues* 48, 1992.

³Peter Sandman, *Responding to Community Outrage: Strategies for Effective Risk Communication*, Fairfax, VA: American Industrial Hygiene Association, 1993.

the process if Yucca Mountain is recommended as the permanent repository site. The state is supported in its opposition by more than 200 environmental groups.

Primary concerns with the plan to make Yucca Mountain the permanent resting grounds for the country's nuclear waste are: (1) The threat of earthquakes in the pro-

posed area which could cause leakage. Since 1976, over 600 earthquakes of 2.5 or more on the Richter scale have occurred within a 50-mile radius of Yucca Mountain. In 1992, a 5.6 earthquake occurred on a previously unknown fault at Yucca Mountain. (2) There is evidence, uncovered by the Los Alamos Department of Energy Project in 1998, that

Yucca Mountain would not comply with guidelines regarding ground water flow. Data regarding rainwater infiltration of Yucca Mountain would have called for the immediate disqualification under set guidelines. However, Yucca Mountain was not disqualified. When the nuclear industry found that two of the DOE requirements were going to be violated, they lobbied Congress to change the suitability guidelines.

In November 1998, the opposition held a news conference. Many political representatives and members of consumer organizations and environmental groups introduced a petition from more than 200 groups opposed to the plan. They urged the DOE to "follow the law, disqualify the site because it could not meet the environmental guidelines under the current law." Despite the opposition, the evaluation of Yucca Mountain continues. In August 1999, the EPA released draft radiation protection standards for Yucca Mountain. It gave a preliminary approval of Yucca Mountain as a safe disposal site. After issuing its report, the EPA accepted written comments and held public hearings around the country "to ensure public involvement in the decision-making process."

In December 1999, a policy revision proposal for Yucca Mountain was released by the Federal government. The proposal eliminated safeguards regarding water flow on the mountain. Nevada Senator Henry Reid said the change contradicted Energy Secretary Bill Richardson's original goal that science, not politics, would drive the decisions regarding the disposal of nuclear waste.

Nevada Agency for Nuclear Projects sponsored a series of public workshops designed to encourage public participation and comment on the DOE's Yucca Mountain draft Environmental Impact Statement (EIS). The DOE was conducting public hearings on the draft EIS in ten

Nevada communities. State-sponsored workshops were held in those same communities. Its goal was to prepare Nevadans to effectively comment on the draft EIS. The DOE is required to address the public's comments in the final EIS.

ENVIRONMENTAL RACISM IS INVOLVED

Opposition also comes from native rights groups and, more specifically, the Western Shoshone Nation because Yucca Mountain is a place of spiritual significance to the Shoshone and Paiute peoples. The Western Shoshone Nation contends that the government has no right to use the land since it was guaranteed to them by an 1863 treaty (18 Statutes at Large 689). Corbin Harney, a Western Shoshone spiritual leader, says "Even the mere study of the site is a violation of the treaty. The Shoshone people want the DOE off their land and their mountain restored to them."

Based on the history of the interaction of the United States government with Indian tribes, mistrust of the government is deeply instilled in most native people. In their view, another treaty violation and further dismissal of native participation in the process simply validates and exacerbates this mistrust. Many native and environmental groups believe that native lands are specifically targeted for nuclear waste disposal by the federal government and that these actions can be defined as environmental racism. According to Grace Thorpe of the National Environmental Coalition of Native Americans, the following factors make native lands an easy selection for governmental agencies:

- The lands are some of the most isolated in North America
- The lands and the populations are extremely impoverished

- The tribes are politically vulnerable
- Their tribal sovereignty can be used to bypass state environmental laws

A review of the government's Yucca Mountain Project Web site (www.ymp.gov) indicates that the spiritual concerns and land rights issues of the Western Shoshone Nation are given little, if any, consideration. Under a section entitled "Preservation through Conservation," the site states "the U.S. Department of Energy works to protect important cultural resources at the site . . . through the Yucca Mountain Project's Cultural Resources Program. As part of the Cultural Resources Program, delegates from the Project have met with tribal leaders . . . to gather cultural data for the Program." While this Program professes to endeavor to protect the "archaeological, botanical, and cultural resources," there is no mention of the spiritual nature of the land or acknowledgement of the 1863 treaty and, therefore, the alleged illegality of the presence of the Project in the Yucca

Mountain area. In fact, the Web site states "Nearly all of the land surrounding Yucca Mountain is federally owned."

Although the Yucca Mountain repository was originally scheduled to open by 1998, numerous technical and political delays have advanced that date. Spencer Abraham, Secretary of Energy, was expected to decide in 2001 whether to recommend to President Bush that Yucca Mountain be established as a nuclear waste repository site but that decision was further postponed by the September 11 terrorist attacks. The attacks put the safety of transporting nuclear waste from one location to another under further scrutiny. However, in January 2002, Secretary Abraham announced that he would recommend to the president that Yucca Mountain be used as a nuclear waste storage site. The president will then decide whether to recommend the site to Congress for approval. If approved, the DOE must apply for licensing from the Nuclear Regulatory Commission. The license would then permit the DOE to construct the facility and begin waste disposal in 2010. ■

QUESTIONS FOR DISCUSSION

1. If you were a public relations practitioner working at a local hospital that was dumping low-level radioactive waste into the sewers, what would you have counseled management to do during the Sandia attempt to gain authorization to dump its waste? Why would you recommend that?
2. Would it have been possible to convince the citizens of Albuquerque to allow the dumping of radioactive waste in the sewers? Why do you believe this? What tactics could Sandia have used to allay the fears of the public?
3. Why was PERC successful in gathering so much public support? What did it do differently than Sandia?
4. If you were the EPA's public relations director, what would you do to reach the opposition and communicate about the risks involved at Yucca Mountain? Do you think it's possible to reach a win-win solution? If so, how? Or must the government strong-arm its plan into place? If it pushes through its plan, what do you think will be the consequences?

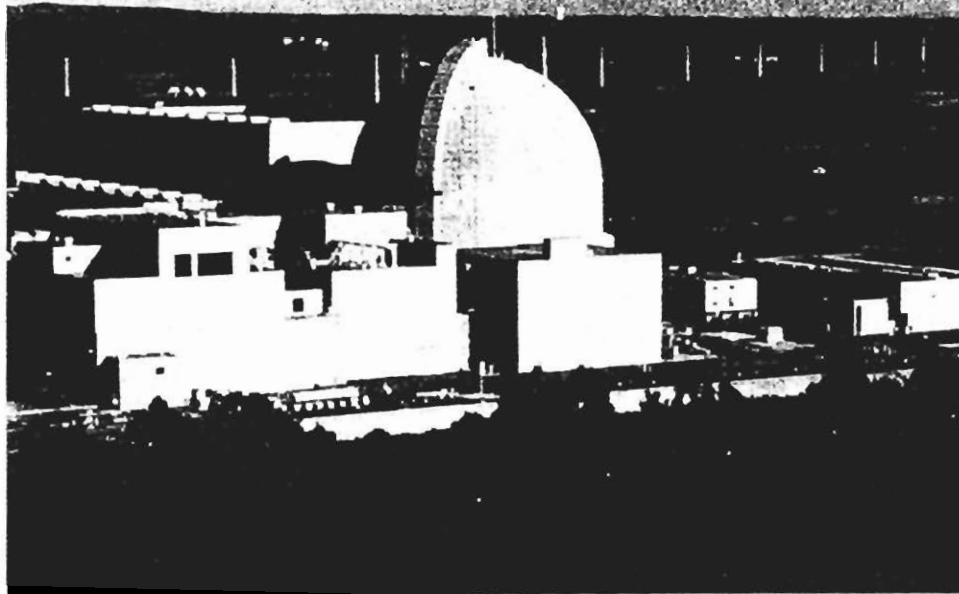
CASE 4-3 THE STRUGGLE FOR NUCLEAR POWER

One of the most challenging public relations positions since the 1970s has been working for an electric utility with a nuclear plant—such as Seabrook Station, which became a national symbol of the nuclear power debate in the 1970s and 1980s. Located in Seabrook, New Hampshire, forty miles north of Boston (See Figure 4-4), it was built on New Hampshire's seventeen-mile North Atlantic coastline in an extensive salt marsh area. During the prolonged construc-

tion and licensing process, Public Service Company of New Hampshire (PSNH)—the original owner—encountered persistent opposition from various sources.

- Initially, opposition came from environmentalists who were concerned about the potential impact a “once-through” water cooling system would have on ocean temperature. Among other issues,

FIGURE 4-4 Seabrook Station, located near the seacoast in Seabrook, New Hampshire.



(Courtesy of Seabrook Station.)

they were worried about possible irreparable damage that warming ocean waters would have on the biological populations in and under those waters.

- ▶ As plant construction progressed, a broader section of the community became increasingly concerned about the safety of the reactor and the proposed evacuation plans.
- ▶ The cost of the plant and its possible effect on the region's electricity rates sparked additional opposition. Increased power costs were perceived as an obstacle blocking industrial development and the prosperity of northern New England.
- ▶ Some citizens protested the plant because they doubted New Hampshire's need for a new power source.

Perhaps the first sign of problems for Seabrook Station occurred when the proposal to build came before various official boards. The illustrated model showed the containment unit, with a proposed height of 250 feet, mostly hidden from view by trees. But redwoods don't grow in New England!

Seabrook Station encountered delays as activists started demonstrating. The opposition intervened in the Nuclear Regulatory Commission's (NRC) adjudicatory review boards. The legal case was led by the Seacoast Anti-Pollution League (SAPL), while other grassroots activists spearheaded by the Clamshell Alliance led protests. The Clamshell used grassroots organizing, group decision making, and affinity networking against public or private projects felt to be disruptive to an area. Its activities ranged from peaceful demonstrations to forceful attempts at site occupation with mass arrests.

After nearly eighteen years of licensing, construction, and regulatory review, Seabrook Station began regular full-power operation on August 19, 1990. "We realize that we may never be able to satisfy the core group of people who do not support nuclear power," said Richard Winn, Seabrook's communications counsel at that time, "but we do not ignore them either." Through the years Seabrook Station has become more sensitive to the needs and concerns of its

publics. At that time, according to Winn, Seabrook was doing something that a nuclear power plant does not have to do—that is, focusing on "the sorts of things that don't make electricity," such as community relations, public education, and environmental information.

THE OPPOSITION

The Audubon Society opposed Seabrook Station before safety became an issue—before Three Mile Island. Its concern was environmental. When Seabrook changed the design of its cooling systems in order to prevent interference with the ocean, Audubon withdrew its opposition. Today, Seabrook is partnering with the Audubon Society and NH Fish and Game to build an osprey nest on its site in the hope of attracting a pair of nesting ospreys.

After the Three Mile Island and Chernobyl accidents, safety became the main concern of opposition. Seabrook opponents did include many gate-bashers, the form of opposition that comes to mind

where nuclear power is concerned. But many other activists sought a different route to get their message heard. Issues of opposition ranged from complete rejection of nuclear power to the location of Seabrook Station.

The Clamshell Alliance, one of the most visible opposing organizations, went door to door in towns affected by Seabrook Station to gather support for protest. They also staged large, nonviolent and occasionally somewhat violent demonstrations.

Some real estate agencies and banks were opposed to Seabrook. Individuals in these fields joined other activist groups. In general, they were opposed to the possible drop in real estate value.

The Seacoast Anti-Pollution League (SAPL), a small group of dedicated volunteers, legally pursued Seabrook's perceived lack of safety. Their purpose at that time was "to work toward the deferral of the proposed nuclear plant at Seabrook."¹ Members, in conjunction with their attorney, Robert Backus, worked through the NRC's judicial system to improve the evacuation plan. SAPL believed that the initial plan was not adequate to meet the needs of the neighboring communities. Indeed, only three roads—all two-lane—lead away from the beach area adjacent to the plant, where on a summer Sunday as many as 100,000 people congregate for swimming and other beach activities.

Now that Seabrook is on line, SAPL strategies still emphasize the risks associated with living near a nuclear power plant. SAPL works in coordination with the Massachusetts-based Citizens within a 1/2-Mile Radius (C-10) to monitor the levels

of background radiation to see if any additional radiation is being emitted from Seabrook Station. Their efforts are directed toward discovering if there is a correlation between increased levels of radiation and increased health problems in the area.

SAPL members often visit local schools to speak about the dangers of nuclear power, and they set up question-and-answer booths at university fairs and other events. SAPL also responds to NRC regulation changes distributed by the Nuclear Information and Resource Service. Members receive newsletters encouraging them to write letters to the editors of local newspapers in an effort to notify people about how these regulatory changes affect the general public. To this day, some dedicate their lives to opposing nuclear power.

FINANCIAL TROUBLES PLAGUE SEABROOK

As a result of the mounting costs of Seabrook, PSNH was forced into bankruptcy. The company became financially strained when New Hampshire legislators passed the CWIP (Construction Work In Progress) law, which forbade the utility from including the cost of the plant's construction in consumer electric rates until the power was turned on. This law delayed the economic burden on New Hampshire citizens but added to the utility's interest costs on millions borrowed to finance construction.

Construction ceased temporarily in 1984. Then New Hampshire Yankee (NHY), a division of PSNH, took over the project and with the Seabrook Joint Owners² (other

¹Henry F. Bedfore, *Seabrook Station*, Amherst, MA: University of Massachusetts Press, 1990, p. 67.

²Originally, Seabrook Station was jointly owned by a large number of companies with PSNH holding the largest percentage of ownership. In 2001, Seabrook Station was jointly owned by Northeast Utilities, which is the current majority owner, along with 10 other minority owners. Due to deregulation, however, the biggest change in ownership will occur in 2002 when the plant will be auctioned/sold, bringing about a consolidation and ownership change.

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IDENTIFYING THE SEABROOK PUBLICS

The Seabrook communications staff identified important publics for Seabrook.

INTERNAL PUBLICS

- All Seabrook Station employees who live in communities around the plant site
- Employees who do not live in the area

EXTERNAL PUBLICS

- Massachusetts and New Hampshire residents living both inside and outside the Emergency Planning Zone
- Local and national news media
- The financial community

Seabrook community relations staff targeted, in the 23 New Hampshire and Massachusetts towns, public and private schools, day-care facilities, police and fire departments, local officials and opinion leaders, local media, advocacy groups, large (over 50 employees) and small businesses, chambers of commerce, network organizations such as the Lions and Rotary clubs and the local United Way, and citizens living within the 22-mile radius.

power companies with an interest in the plant) reaffirmed determination to complete Seabrook. People from PSNH were moved into top position at New Hampshire Yankee.

DEVELOPING STRATEGIES

NHY's community relations team focused on Seabrook's publics in the seacoast area (see *Identifying the Seabrook Publics*). The public relations team initially used reactive programming to address the opposition's concerns and to resolve cognitive dissonance.³ They used one-way and two-way communication techniques to address these goals.

One-Way Techniques

1. Created a series of hard-hitting ads featuring Seabrook employees offering words of reassurance (See Figure 4-5).
2. Distributed a "safety kit" consisting of information on Seabrook, waste management, radiation, and safety systems.
3. Circulated *Energy*, a community-targeted newsletter, between 1988 and 1989 to all publics in the emergency area. The articles focused on issues related to energy.

Two-Way Techniques

1. In 1986, NHY formally invited the surrounding community to tour the nuclear plant. More than 7,000 people

³The theory of cognitive dissonance, first put forth by Leon Festinger in 1947, suggests a human desire for consistency between what people know and what they do. Any conflict creates a disturbance. See Glen Broom, Allen Center, and Scott Cutlip. *Effective Public Relations*, 8th ed., Toronto, Ontario: Prentice Hall Canada, 1999.

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Teryl Jasinski, Quality Assurance Engineer At Seabrook Station, On Her Job And Her Commitment To Safety.



copy

Seabrook Station
 1000 Seabrook Station
 Portsmouth, NH 03893

I grew up along the seacoast and I've always been conscious of how people treat the environment. That's how I became interested in science and in learning more about my surroundings.

Today, I'm part of a group that is responsible for testing the Seabrook's Quality Assurance Program really works. I feel that by ensuring the plant's safe operation, we also protect the environment around Seabrook.

For confidence that the plant's systems will run smoothly because we take actions to assure they will. Through regular testing and we know our equipment is top-notch.

If we're in the field observing how work is performed on your nuclear facilities — you know it's in this way, we assure that your nuclear equipment is maintained at the highest level of

Our program works well, and that's been proven by countless reviews from the U.S. Nuclear Regulatory Commission and the Institute of Nuclear Power Operations.

Quality is everyone's responsibility, not just ours. That's why our program is effective.

I'm a mother of two now; my new baby, Kristin, was born just six months ago. I'm back on the job and looking forward to making a contribution to my children's future. Through my work at Seabrook, I can ensure that a safe, reliable supply of electricity will be available when they need it.

If I would like to learn more about safety at Seabrook Station, please send me a free information kit.

NAME _____
 STREET _____
 CITY _____ STATE _____ ZIP _____

We will use your name in a mailing about safety at the Seabrook Station. We will not give your name to anyone else.

Seabrook station
 A SAFE INVESTMENT
 IN OUR ENERGY FUTURE
 This message is brought to you by New Hampshire Yankee.

FIGURE 4-5 Example of ads featuring a NHY employee and "The Lesson of Chernobyl."

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3. According to NRC regulations, the state must inform the public in the 23 affected towns about emergency and safety procedures. NHY took this one-way task and made it into a two-way strategy. Public relations staff created a calendar decorated with photographs of the seacoast and mailed copies to all homes in the area. The calendars include public notification information, including which radio stations broadcast emergency

Activity Guide



**The Science &
Nature Center**
AT NEW HAMPSHIRE YANKEE

FIGURE 4-6 A brochure of the Science and Nature Center.

(Courtesy of Seabrook Station.)

bulletins and instructions. Employees hand-delivered calendars to approximately 4,000 of the 7,000 small businesses in the area. Only 2 percent of those businesses rejected the information.

Seabrook did encounter some heated public opposition to the evacuation plan, and that attracted a lot of media attention. Some schools were unhappy with the proposed evacuation plans because teachers would be required to stay with their classes even though their instinct would be

to rush to their own families. These perceptions of the proposed evacuation plan's shortcomings forced many towns to reject the emergency procedures.

4. Communicators representing Seabrook met with school superintendents and business executives to educate them about emergency planning. They also developed relationships with Massachusetts emergency medical squads and fire departments.
5. NHY communications approached the media proactively. If a siren that

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had nothing to do with Seabrook sounded off in a surrounding town or if a rumor about Seabrook was circulated, NHY called the media before the media called them.

These efforts helped Seabrook Station achieve on-line status. NHY won its contested case before the NRC's adjudicating boards.

THE NEED FOR PROACTIVE MEASURES

Seabrook public relations teams did not stop once the plant was on line. "We did the things we needed to do to get our license according to the rules and regulations. And then we went a step farther to be proactive and adopt a policy of 'management of expectations' for our community relations efforts," wrote Richard Winn.

Seabrook utilized strategy to build one-on-one relationships. Now that the plant was up and running, those relationships needed to be maintained. According to Seabrook research at that time, the greatest percentage of people were not definitively for or against nuclear power. Therefore, public relations staff believed it was vital that the public feel comfortable about contacting Seabrook whenever there was a concern.

REINFORCING RELATIONSHIPS

NHY took measures to reinforce the relationships it had established.

1. NHY continued to send out an Emergency Plan Information Calendar to all of its external publics. The calendar consists of 33 pages of emergency planning and safety information.
2. The Science and Nature Center was made accessible for school and

community-based field trips. The Center provides hands-on exhibits featuring energy and environment and the Owascoag Nature Trail—approximately one mile of preserved woods and marshlands with a variety of plants and animals.

3. NHY established a local hotline for citizens in surrounding communities to call and inquire about specific problems and concerns.

FOCUSING ON THE COMMUNITY

In 1991, Seabrook Station employees and volunteers participated in several community-oriented events and activities. The community relations department initiated at least one new program encouraging community involvement each quarter.

1. Employees participated in the Lion's Camp Pride, a summer camp facility offering educational and recreational overnight programs to children with special needs. Volunteers installed docks, stained and painted buildings, and cleaned and set up bunkhouses.
2. Employees participated in the sea-coast's Seafood Festival. They raised money at the event by selling popcorn and donated all proceeds to My Greatest Dream, an organization that benefits terminally ill children.
3. Volunteers participated in Coastweeks, a nationwide celebration of the nation's coastal areas. NHY cleaned up Hampton Beach, a New Hampshire state park about two miles from the Seabrook plant.
4. Time and building materials were donated to Action Cove Playground, an innovative playground in West Newbury, Massachusetts. The children's area was designed for explorative and imaginative play.

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continuing efforts

continuing efforts

5. NHY founded a local Project Homefront, an effort assisting families whose relatives were called to serve in the Persian Gulf War. A total of 163 volunteers offered services and assistance in transportation; auto, electrical and plumbing repair; carpentry; and babysitting. Employees also donated \$1,135 to this project.

Other community endeavors aided organizations such as Wish Upon a Star, which provides anonymous Christmas gifts to needy children, and the Girl Scouts of America. According to Martha Netsch, Director of Communications for the Swiftwater Girl Scout Council, the Girl Scouts frequently visit Seabrook Station's Science and Nature Center, work with staff on scout education programs about solutions to today's energy problems, and recognize the Science and Nature Center as support for young women interested in mathematics, science, and technology.

Seabrook encourages employees to become involved in local civic organizations and in local government. Many are on town and city boards, volunteer emergency medical squads and fire departments; Rotary, Lions, and Kiwanis clubs; or are active in school organizations. Every year employees serve as judges at local science fairs.

THROUGH THE 1990S, INTO THE 21ST CENTURY

In 1992, control of Seabrook was bought by Connecticut-based Northeast Utilities, which earlier took over bankrupt PSNH. One of its subsidiaries, North Atlantic Energy Corporation, oversees the daily operation of the plant. From a business perspective, Seabrook Station was recognized

as Business of the Year 1991 by *Business New Hampshire Magazine*.

Some activist groups continue to exist, however, though most are now peaceful in their approach. According to SAPL's Joan and Charles Pratt, both SAPL and C-10 work as watchdogs. Their mission is to make sure Seabrook complies with NRC regulations. The Citizens Radiological Monitoring Network acts as a support group that focuses on how to live with potential hazards. Its goals are to monitor every air and water emission from Seabrook, to hold Seabrook socially accountable for every emission, and to expect a responsible attitude from the station itself. All these awareness groups keep a close eye on Seabrook.

Despite the controversial issues, Seabrook employees, for the most part, maintain professional relationships with activist groups. There are still a small number of people opposing the plant who remain very reserved and refuse to speak to anyone who works at Seabrook Station. The plant's community relations department believes it is in their best interest to deal cooperatively with these groups. North Atlantic Energy Corporation has grown ever more sensitive to the concerns of all involved publics.

As Alan Griffith,⁴ who currently heads the Seabrook Station Communications Team, notes, "A subtle community relations shift occurred at Seabrook Station as the plant became more accepted and proved itself to be a good neighbor. Initially, the value of a solid community outreach program in large part was to help support the plant's efforts to get licensed and begin generating power. Now that Seabrook has done that, our community outreach is just as important now as it ever was. In many ways, our community relations activities have

⁴Our thanks to Alan Griffith for providing updated information on the current status of Seabrook Station and its community relations.

CASES

CASE 4-1 A CLASSIC: CHEMICAL INDUSTRY TAKES RESPONSIBILITY FOR COMMUNITY CONCERNS

TRADE ASSOCIATION TAKES THE INITIATIVE

The American Chemistry Council (ACC) is the trade group for the chemical industry. Its members represent 90 percent of the industrial chemical productive capacity in the United States. Dues are based on a percentage of a company's chemical sales.

Chemical companies must be constantly innovative to remain competitive in today's global marketplace. Like most trade associations, ACC helps members stay abreast of issues and techniques. It provides assistance in complying with laws and regulations. ACC also offers **leadership training** and **task force groups** to develop skills and knowledge in the managerial, legislative, technical, and communications areas.

Over the years, Responsible Care's^{®1} focus has evolved from a measure of process to one of improved performance. After initially focusing on shaping our companies' operating behavior practices and reaching "Practice-in-Place," we have stepped up our commitment to Responsible Care[®]. Our industry is now dedicated to a vision of no

accidents, no injuries and no harm to the environment.

TOM REILLY, CEO OF REILLY INDUSTRIES

We have said all along that we are not asking the public to *trust* us. We are asking everyone to *track* us, to monitor our performance and make suggestions that will help us improve.

FRED WEBBER, PRESIDENT,
AMERICAN CHEMISTRY COUNCIL

As public awareness of environmental health and safety issues has increased over the past few decades, the chemical industry has been scrutinized by activists, regulators, and consumers more closely than ever before. As environmentalists make louder protests, legislators respond with more stringent regulations.

Under the Superfund Amendments and Reauthorization Act (SARA), also known as the Emergency Planning and Community Right-to-Know Act, chemical manufacturers and other organizations are required to inform employees and the community about the nature and hazards of the materials with which they work.²

¹Responsible Care[®] is a copyright of the American Chemistry Council. Thanks to Lisa Grepps, APR, Manager of Strategic Communications for Responsible Care[®] for providing extensive updated information on this program for the 6th edition of this text.

²Bernard J. Nebel. *Environmental Science*. Upper Saddle River, NJ: Prentice Hall, 1990, p. 290.

As pressures from legislation mounted and NIMBYists³ began paying closer attention to environmental issues in their communities, the chemical industry realized that it needed to reach beyond one-way communication of its side of the story. It needed to do three things:

1. *Listen to and recognize the perceptions and fears* of the public, especially neighbors of chemical plants.
2. *Own up to any performance problems.*

3. *Take action* to correct problems and address perceptions.

PROACTIVE RESPONSE TO PUBLIC CONCERNS: RESPONSIBLE CARE®

ACC created an initiative in the United States called *Responsible Care*® in 1988 (See Figure 4-1). Modeled after a Canadian Chemical Producers Association program, *Responsible Care*® couples environmental, health, and safety improvements in individual

FIGURE 4-1 Shown here is the symbol of *Responsible Care*®.



(Courtesy of ACC.)

³*Not In My Back Yard*. An update is *NOPE (Not On Planet Earth)*.

plants with invitations for industry and public scrutiny. Many observers believe this to be one of the best strategic public relations programs, although the industry does not acknowledge it as such.

An integral part of the Responsible Care® program is its **six Codes of Management Practices** (See Figure 4-2). These codes established priorities for operating chemical plants. ACC places reduction of emissions, reduction of the waste that facilities generate, and sound management of remaining releases and wastes at the top of its priorities.

According to Richard Doyle, vice president of Responsible Care® at ACC,

Responsible Care® calls for continuous improvement by the chemical industry in health, safety, and environmental performance. Responsible Care® is not

a quick fix or an overnight cure. It is not a public relations program. It is an ongoing process, and a call for action. . . . Its ultimate goal remains to *create a dialogue with constituents in order to educate and obtain input into how the chemical industry can most effectively improve its performance in a manner that is responsive to the public.* [Emphasis added.]

Responsible Care® is *proactive public relations*. Rather than waiting for an accident to occur, or the public to become fearful or upset, it actively *invites* people to learn which chemicals are produced at a plant, how the plant is operated, and what protective measures are in place should an accident occur.

Studies have shown that *fear* of an unknown event is more powerful than an

FIGURE 4-2 The six Codes of Management Practices turn guiding principles to practical application.

1. **Community Awareness and Emergency Response Code (CAER)**
to reduce potential harm to the employees and the public in an emergency as well as bring the chemical industry and communities together
2. **Pollution Prevention Code**
to improve the industry's ability to protect people and the environment by generating less waste and minimizing emissions
3. **Process Safety Code**
to prevent fire, explosions, and accidental chemical releases
4. **Distribution Code**
to reduce employee and public risks from the shipment of chemicals
5. **Employee Health and Safety Code**
to maximize worker protection and accident prevention, through training and communications
6. **Product Stewardship Code**
to ensure that the design, development, manufacture, transport, use, and disposal of chemical products is done safely and without environmental damage

(Reprinted courtesy of ACC.)

actual *bad occurrence*. In a study of a group known to have latent tendencies for developing Huntington's disease, the majority of those whose genetic tests showed they would most likely develop this incurable malady felt that knowing was beneficial. "Better to know than be always wondering." Those that knew they were likely to get the disease reported their quality of life and psychological health was better than those for whom testing was inconclusive.

This holds true for knowing and communicating about chemical risks as well. Most people can handle truth better than being left in doubt. Open communication shows respect for people by treating them like responsible adults. However, the Huntington study also indicates that all people do not react the same when learning of risks. About 10 percent had trouble adjusting to the news, even when it was good (i.e., they would probably not develop the disease). Apparently for some, just handling the change or believing the test is accurate was more impactful than the relief. As always, no rule fits everyone.⁴

Responsible Care[®] is comprised of 10 elements:

1. Guiding Principles: followed by every member and partner company
2. Codes of Management Practices: environmental, health, and safety guidelines
3. Dialogue with the Public: to identify and address public concerns
4. Self-Evaluation: annual reporting on a company's implementation of the Codes
5. Measures of Performance: to view progress of Responsible Care[®]
6. Performance Goals: company-specific goals reported on annually

⁴*pr reporter* 36, May 3, 1993, pp. 2-3.

7. Management Systems Verification: independent review of companies' implementation of Responsible Care[®]
8. Mutual Assistance: company-to-company dialogue
9. Partnership Program: helping companies to participate in Responsible Care[®]
10. Obligation of Membership: to participate in Responsible Care[®] and follow these elements

ACC member companies adhere to a list of ten guiding principles about safe plant operations and proper public communications. Figure 4-3 illustrates these principles.

RESPONSIBLE CARE[®]'S TARGET AUDIENCES

The goal of Responsible Care[®] is to continuously advance the level of chemical industry performance, demonstrating commitment to a better, safer world. This message is targeted to:

- The chemical industry
- Teachers and students
- Employees
- Federal and state officials
- The media
- The general public
- Plant neighbors
- Local and national interest groups
- Supply chain customers

BUILDING PUBLIC RELATIONSHIPS

Activities to Reach External Audiences

ACC member and partner companies use a combination of one-way and two-way

1. To seek and incorporate public input regarding our products and operations.
2. To provide chemicals that can be manufactured, transported, used, and disposed of safely.
3. To make health, safety, the environment, and resource conservation critical considerations for all new and existing products and processes.
4. To provide information on health or environmental risks and pursue protective measures for employees, the public, and other key stakeholders.
5. To work with customers, carriers, suppliers, distributors, and contractors to foster the safe use, transport, and disposal of chemicals.
6. To operate our facilities in a manner that protects the environment and the health and safety of our employees and the public.
7. To support education and research on the health, safety, and environmental effects of our products and processes.
8. To work with others to resolve problems associated with past handling and disposal practices.
9. To lead in the development of responsible laws, regulations, and standards that safeguard the community, workplace, and environment.
10. To practice Responsible Care[®] by encouraging and assisting others to adhere to these principles and practices.

FIGURE 4-3 ACC member companies adhere to a list of 10 guiding principles about safe plant operations and proper public communications.

(Reprinted courtesy of ACC.)

communication activities to invite external publics to communicate with their local plants. One-way (or information transfer) efforts include:

- **Brochures** featuring shelter-in-place messages and explanations of Responsible Care[®]
- **Annual Responsible Care[®] reports** that target the business community, as well as community stakeholders, and report on the company's environmental, health, and safety performance
- **ChemicalGuide.com** Web site featuring member and partner company Web sites detailing products and outreach activities, as well as Responsible Care[®] performance

- **Advertisements** on the local level
- **Community newsletters** sent to plant neighbors to keep them informed about the company and its activities

Two-way (or relationship-building) efforts include:

- **Community advisory panels (CAPs)**, groups of citizens with diverse backgrounds and feelings toward the chemical industry. CAPs are sponsored by local chemical plants and encouraged to voice community concerns with industry representatives. Well-run CAPs provide dialogue between the plant and the community. To date, ACC members and partners

sponsor nearly 300 CAPs across the country with great success. One example is the LeMoyné (Alabama) Community Advisory Panel, which works to improve emergency response service to the local community and sponsors an annual "Responsible Care® Night" at member company plants to help residents understand the initiative.

- **Hazardous material drills** involving plants and local emergency responder groups. These exercises help improve knowledge and response time in the event of an incident. For more information, visit www.transcaer.org.
- **Responsible Care® fairs/days/open houses** are sponsored by the plants or CAP groups. These events are opportunities for the community to tour the plant and learn about its operations.
- **Inviting state legislators and local and national activist leaders to speak at association meetings** and sending ACC delegates or scientists to meetings of environmental, regulatory, and community groups.

Activities to Change Behavior of ACC Members

To maintain ACC membership, companies are required to implement Responsible Care® guiding principles and codes of management practice. More than 1,000 executives and managers have attended ACC workshops on implementing the codes for Responsible Care®. Many have found creative ways to reach their new objectives. For example, some have tied managerial bonuses to achieved objectives. Others use peer pressure of recognition to moti-

vate and support the Responsible Care® initiative.

As codes are implemented, ACC requires every company to report its progress along the way. As of 2001, 110 members or approximately 95 percent of companies that have been implementing the initiatives for five or more years are at full implementation of the six codes of management practices.

EVALUATION: EXTERNAL PUBLICS

The National Association of Public Environmental Communicators commended Responsible Care® for its one-way and two-way communication vehicles.

EVALUATION: INTERNAL PUBLICS

Reductions in Chemical Emission

ACC members reported that total releases (occurring when a chemical is discharged into the land, air, or water) declined from 381 million pounds in 1988 to 139 million pounds in 1998. Air releases dropped more than 69 percent. Water releases were cut by 75 percent, and chemicals sent to landfills were reduced by 74 percent. Underground injection of chemicals was cut by 39 percent. Off-site transfers (excluding off-site recycling and recovery) decreased 47 percent.

Self-Evaluation

The ACC Responsible Care® initiative includes a self-evaluation process. Member companies are required to furnish ACC with an annual report of their progress in implementing the Codes of Management Practices. They have shown significant gains in Process Safety, Distribution, Community Awareness, and Emergency Response.

Although these results show improvements, ACC recognizes the fact that company self-evaluations are subject to challenges of credibility. ACC is now identifying

additional code measurement systems that continue to meet objective public scrutiny.

Performance Measures

Performance measures exist to demonstrate the progress being made through Responsible Care® and are used to help drive performance improvement throughout the membership. The performance measures include Community Awareness and Emergency Response, Pollution Prevention, Process Safety, Distribution, Employee Health and Safety, and Product Stewardship.

Performance Goals

Member and partner companies are asked to:

- Establish at least one goal for a Responsible Care® performance result

- Make steady performance improvement toward that goal
- Publicly communicate the goal(s) and progress toward meeting that goal(s)
- Annually report to the Council the established goal(s), progress, and public reporting mechanism

This case demonstrates the trend of public relations programs to *begin with responsible action* by organizations, with public relations practitioners playing a key role in *design and strategy*. The *communications and relationship-building activities* then follow to gain recognition for the responsible action. ■

QUESTIONS FOR DISCUSSION

1. Richard Doyle, then ACC vice president of Responsible Care®, said the initiative "is not a public relations program." What did he intend to convey? He said Responsible Care® is a performance improvement initiative and that ACC's members are striving for public input into this process. What do you think he meant, and how can this goal best be achieved? Do you think the community advisory panels in neighborhoods around facilities are beneficial?
2. To what extent can a voluntary performance improvement initiative by private industry forestall government legislation and regulation on environmental matters? Explain your position.
3. What else could ACC do to attain higher credibility for Responsible Care® with:
 - The public
 - Its own members
4. How could it measure an increase or decrease in credibility?
 - Associated industries
 - Legislators and regulators
 - Activist groups
5. List other industries whose products or operations engender fear. What steps are you aware of that each is taking to allay public apprehension? How does Responsible Care® compare with what these industries are doing?
6. Imagine yourself living across the street from a chemical plant. List all the feelings you can think of that you might have about the plant—positive, negative, or neutral. What specific actions would representatives from the plant need to take to address your feelings?
7. Draft a letter from a chemical plant manager to those living near the plant announcing introduction of the Responsible Care® initiative.

CASE 3-4 KODAK'S SNAPSHOTS

The early 1990s were troubled times for Kodak. Pressed by changing technologies, international competition, and fickle consumer behavior, the Rochester, New York-based photo giant found itself struggling to maintain its legendary leadership in consumer photography.

In 1993, Kodak hired CEO George Fisher to lead a turnaround. He and his management team undertook an aggressive campaign to make Kodak more competitive and performance-driven. The backbone of this campaign was a “one-on-one” communication strategy designed to increase morale and productivity.

Kodak developed this strategy of speaking one-on-one with its 100,000 employees around the globe to resolve a problem it uncovered in late 1994: Employees were unclear about what was expected of them and their business units during a time of rapid change.

Though Fisher got broad employee approval, opinion surveys showed employees were confused and unable to see the big picture. “It’s obviously difficult to build a performance-based culture if we fail to share expectations for performance with those charged with delivering the results,” Fisher said.

As a result, the decision was made that managers and supervisors throughout the organization would meet quarterly with their work groups for a face-to-face briefing. Corporate performance information—including financial results as well as customer and employee satisfaction—would be communicated, providing a context for local unit information. It would also provide opportunities to educate employees and

managers about significant business news and key performance indicators. The proposal was endorsed and rolled out a month later. In 2001, the Snapshots program continues to bring supervisors and/or managers together with employees for regular face-to-face communication.

RESEARCH ON THE IMPORTANCE OF ONE-TO-ONE COMMUNICATION

1. Kodak best practices research shows **employees prefer direct interaction with supervisors**. This interaction also significantly increases understanding and reinforces the leadership responsibility of supervisors.
2. Employee surveys revealed skepticism and lack of confidence in Kodak managers—indicating a pressing need to build their credibility both as messengers of company information and leaders guiding the direction of change.
3. Two-thirds of production, technical, and clerical employees relied on outside sources like local news reports for company information. The leading sources for professional employees were supervisors and the company newspaper.
4. The communication rollout of major benefit reductions in the fall of 1994 was an important test of the face-to-face approach. For the first time, Kodak used direct management conversations to reach all U.S. employees with this news.
5. Post roll-out surveys of nearly 3,000 employees showed 84 percent felt the

A Tolerant Attitude

At Safeplay plants and in sales offices, there is some pilferage of products by employees. There is a company policy that any employee removing company property from the premises without authorization is subject to dismissal. So far this policy has never been invoked where products are concerned. The unspoken attitude of management is much the same as exists in many consumer product companies, particularly those that make food, confections, or inexpensive clothing items. It is tolerant, treats it quietly as a minor cost written into the price of products, and looks the other way rather than confront employees, with the risk of possible repercussions if someone is falsely accused. Put another way, management reluctantly concludes that the cost of a baseball mitt taken home in a lunch pail or paper bag to a kid on occasion is not high if employee turnover is low and working enthusiasm is high.

As a means of trying to discourage pilferage, Safeplay offers employees a discount on any products they buy from the store in the personnel office, and on the tenth birthday of any employee's child the employee can select any product priced under \$20 and take it home free.

Tolerance Abused

Recently, however, the "mysterious disappearance" of sports items has gone beyond the boundaries of normal pilferage and management tolerance. Whole containers of items in the stockroom and in the shipping area have disappeared. Inventory records have apparently been doctored.

Obviously distressed, the home office has sent in a private detective agency. The agency's preliminary investigation and analysis are disturbing. It appears that there is an organized thievery ring involving as many as twenty-five of the Westward plant's employees. It appears, also, that the former athletic star on the payroll is somehow involved, but to what extent is not clear. Someone on the inside, not yet identified, deals with an outside "fence," and someone else on the inside, also not yet identified, handles the payoff to all the cooperating employees. Some of the involved employees are members of the union, and some are in the office "white-collar" jobs.

The Decision Process

At an executive decision-making meeting, you, as director of public relations, have been called in, along with the director of personnel and a company lawyer from the home office. The three of you have been asked to assess the repercussions if the town's police are called in and legal action is taken. You are asked to offer any other resolution that would "better serve the interests of all involved."

The lawyer says that as soon as an airtight case can be accumulated, including photographs and eyewitness accounts of products being removed, being transported to a "fence," and an actual money transaction completed, she favors appropriate law enforcement action and legal redress against those involved.

The personnel manager prefers, he says, to bring charges only against the leader or leaders inside and all those involved on the outside. He prefers to handle the cooperating employees individually, possibly allowing some sort of plea bargaining to keep the employees the company considers of real value on the payroll. He feels this approach

cent understood why the changes were being made. Just as important, the process helped put a face on local leadership throughout the company.

OBJECTIVES OF THE "SNAPSHOTS" PROGRAM

1. Establish a communication infrastructure that helps employees see the "big picture" in a way that (1) fosters management credibility and (2) mitigates negative surprises.
2. Enable employees to understand Kodak performance expectations and act to achieve company objectives.
3. Clarify corporate and unit goals by answering "What does this mean to me?" and "What actions should I take?"
4. Stimulate regular, two-way communication between supervisors and employees.

HOW IT'S DONE

1. **A cross-disciplinary team**—including employee communication, human resources, finance, corporate research, and representative business units—develops the information to be put into the system.
2. **This team assembles the Snapshots package** for managers worldwide, which includes briefing charts and bullet-point scripts. In recent years, more effort has been placed on providing a "news" section along with the standard measures each quarter. This section includes topics of worldwide interest and impact, such as Kodak's consumer digital strategy, introduction of Kodak's new president, and an update on Kodak's online services business.

3. **Quick cycle time is a priority**, so briefing packages are prepared and approved within two days of receiving quarterly performance measures. The package is posted on the company's intranet, which is a big time and cost saver, eliminating all out-of-pocket costs for the corporate package.
4. **Grassroots pull** is created by "watch-for" messages in Kodak's employee media.
5. **Managers and supervisors are expected to meet face-to-face with employees** to present Snapshots information—but they are given a high degree of discretion in how they choose to do this.

RESULTS

Evaluation is built into the process, including quarterly attendance reports and post-meeting employee opinion surveys. Key findings have included:

1. **Attendance at voluntary briefings** increased from 57 to 81 percent in the first year. At many sites it approached 100 percent. These gains are a vote of confidence in the program. In 1999, five years into the program, 88 percent of employees attended a Snapshots session regularly or occasionally.
2. **Communication survey results** have been strongly positive. Employees agreeing Snapshots "helped me understand the company better" jumped from 71 percent in the first quarter to 81 percent in the fourth quarter. In 1999, 80 percent said the meetings provided useful information about the company's performance and 70 percent said the meetings helped them understand how successful Kodak is in meeting its goals.
3. **Opinion surveys** tracked gains in employee confidence in Kodak

REQUIREMENTS UNDER RCRA

The Resource Conservation and Recovery Act (RCRA) public involvement requirements are contained in Title 40 of the Code of Federal Regulations (40 CFR) Parts 124 and 270 and summarized in various EPA manual publications and guidances. The EPA primarily uses the phrase "public involvement" rather than "community relations," "public participation," or other similar terms when referring to RCRA activities in the regulatory guidances. The following discussion presents the essential components of RCRA public involvement as contained within the guidances and applicable regulations. First, a brief overview describing the major provisions of the act is provided.

RCRA Provisions

The Resource Conservation and Recovery Act was enacted in 1976, as an amendment to the Solid Waste Disposal Act, in order to address the increasing nationwide problem concerning the disposal of solid wastes. The intent of the RCRA legislation was to reduce or eliminate the generation and subsequent disposal of hazardous wastes to as great a degree as possible. The act has continued to evolve throughout the years, perhaps most significantly with the passage of the Hazardous and Solid Waste Amendments (HSWA) in 1980 and 1984. These amendments significantly expanded the scope of RCRA and resulted in the creation of corrective action provisions intended to ensure the timely identification, evaluation, and remediation of contaminated RCRA facilities.

Subtitle C of RCRA, promulgated in 40 CFR Parts 261-266 and Parts 267-270, established a program to manage hazardous wastes "from cradle to grave." The regulations identify the characteristics that are used to define a waste as "hazardous." The provisions regulate the generation, transportation, treatment, storage, and disposal of these hazardous wastes. RCRA regulatory requirements for treatment, storage, and disposal facilities (commonly referred to as TSDFs) comprise the largest category of provisions. In addition, the regulations set technical standards for the design and operation of hazardous waste facilities. Permitting requirements for all types of RCRA facilities are also contained in these regulations.

Following is a summary of the RCRA permitting and corrective action programs, both of which require public involvement activities throughout the regulatory process.

RCRA Permitting

Owners and/or operators of a facility must complete and submit a permit application covering all aspects of the facility's operation into parts A and B. Part A is a standard submission of general facility information and detailed information on the facility's design, operating procedures, monitoring, record keeping, and closure plans. There is no "pre-application" period for Part A. For a new application, so the owner or operator must submit a Part A application and then a Part B application to achieve permanent operating status. For an existing facility, a new facility must submit Parts A and B at least 180 days before the date on which construction of the facility commences.

RCRA Corrective Action Provisions

Corrective actions are required at facilities caused a release of hazardous wastes resulting in contamination of the water or soil. Amendments provided three corrective action provisions under EPA's authority to initiate such actions.

1. Section 3004(u) requires that any permit holder, after November 8, 1984, under Section 3005(c) of RCRA, must submit a corrective action plan for releases of hazardous wastes or constituents from a treatment, storage, and disposal unit (TSDF) at the facility.
2. Section 3004(v) authorizes the EPA to require corrective action beyond its physical boundary.
3. Section 3008(h) authorizes the EPA to initiate court actions to require corrective action for releases of hazardous wastes or constituents from a RCRA facility operating under a permit.

The RCRA Part B permit or administrative order (for an interim status facility) specifies the conditions under which the owner or operator must provide corrective actions.

REQUIREMENTS UNDER RCRA

The Resource Conservation and Recovery Act (RCRA) public involvement requirements are contained in Title 40 of the Code of Federal Regulations (40 CFR) Parts 124 and 270 and summarized in various EPA manual publications and guidances. The EPA primarily uses the phrase "public involvement" rather than "community relations," "public participation," or other similar terms when referring to RCRA activities in the regulatory guidances. The following discussion presents the essential components of RCRA public involvement as contained within the guidances and applicable regulations. First, a brief overview describing the major provisions of the act is provided.

RCRA Provisions

The Resource Conservation and Recovery Act was enacted in 1976, as an amendment to the Solid Waste Disposal Act, in order to address the increasing nationwide problem concerning the disposal of solid wastes. The intent of the RCRA legislation was to reduce or eliminate the generation and consequent disposal of hazardous wastes to as great a degree as possible. The act has continued to evolve throughout the years, perhaps most significantly with the passage of the Hazardous and Solid Waste Amendments (HSWA) in 1984. These amendments significantly expanded the scope of RCRA and resulted in the creation of corrective action provisions intended to ensure the timely identification, evaluation, and remediation of contaminated RCRA facilities.

Subtitle C of RCRA, promulgated in 40 CFR Parts 261-266 and Parts 268-270, established a program to manage hazardous wastes "from cradle to grave." The regulations identify the characteristics that are used to define a waste as "hazardous." The provisions regulate the generation, transportation, treatment, storage, and disposal of these hazardous wastes. RCRA regulatory requirements for treatment, storage, and disposal facilities (commonly referred to as TSDFs) comprise the largest category of provisions. In addition, the regulations set technical standards for the design and operation of hazardous waste facilities. Permitting requirements for all types of RCRA facilities are also contained in these regulations.

Following is a summary of the RCRA permitting and corrective action programs, both of which require public involvement activities throughout the regulatory process.

RCRA Permitting

Owners and/or operators of a facility must complete and submit a permit application covering all aspects of the facility's operation into parts A and B. Part A is a standard submission of general facility information, including detailed information on the facility's design, operation, maintenance, record keeping, and closure plans. There is no permit application, so the owner or operator must submit a permit application (40 CFR Parts 264 and 270). Existing facilities that have not submitted a Part A application and those facilities that are required to submit a Part A application to achieve permanent operation must submit Parts A and B at least 180 days before the date on which the facility commences.

RCRA Corrective Action Program

Corrective actions are required at RCRA facilities that have caused a release of hazardous waste in contamination of the water or soil. The HSWA Amendments provided three corrective action provisions. EPA's authority to initiate such actions.

1. Section 3004(u) requires that any permit holder, under Section 3005(c) or (d), must submit a corrective action plan for releases of hazardous wastes or contaminants from a management unit (SWMU) at the facility.
2. Section 3004(v) authorizes the EPA to require corrective action beyond its physical boundaries.
3. Section 3008(h) authorizes the EPA to initiate court actions to require corrective action at a RCRA facility operating under a permit.

The RCRA Part B permit or administrative order (for an interim status facility) specifies the conditions under which the owner or operator must provide corrective action.

Important Legislation

Environmental Protection Agency – there are more than one dozen laws or major statutes that form the legal basis for the programs of the Environmental Protection Agency

National Environmental Policy Act of 1969 (NEPA); 42 U.S.C. 4321-4347 – The groundwork for the basic national protection of the environment.

Chemical Safety Information, Site Security and Fuels Regulatory Relief Act
Public Law 106-40, Jan 6, 1999; 42 U.S.C. 7412(r)

The Clean Air Act (CAA); 42 U.S. U.S.C. s/s 7401 et seq. (1970)

The Clean Water Act (CWA); 33 U.S.C. ss/1251 et seq. (1977)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) 42 U.S.C. s/s 9601 et seq. (1980)

The Emergency Planning & Community Right-To-Know Act (EPCRA); 42 U.S.C. 11011 et seq. (1986)

The Endangered Species Act (ESA); 7 U.S.C. 136;16 U.S.C. 460 et seq. (1973)

The Freedom of Information Act (FOIA); U.S.C. s/s 552 (1966)

The Occupational Safety and Health Act (OSHA); 29 U.S.C. 651 et seq. (1970)

The Oil Pollution Act of 1990 (OPA); 33 U.S.C. 2702 to 2761

The Pollution Prevention Act (PPA); 42 U.S.C. 13101 and 13102, s/s et seq. (1990)

The Resource Conservation and Recovery Act (RCRA); 42 U.S.C. s/s 321 et seq. (1976)

The Safe Drinking Water Act (SDWA); 42 U.S.C. s/s 300f et seq. (1974)

The Superfund Amendments and Reauthorization Act (SARA); 42 U.S.C.9601 et seq. (1986)

The Toxic Substances Control Act (TSCA); 15 U.S.C. s/s 2601 et seq. (1976)

Features of the 1990 Clean Air Act

The role of the federal government and the role of the states

Although the 1990 Clean Air Act is a federal law covering the entire country, the states do much of the work to carry out the Act. For example, a state air pollution agency holds a hearing on a permit application by a power or chemical plant or fines a company for violating air pollution limits.

Under this law, EPA sets limits on how much of a pollutant can be in the air anywhere in the United States. This ensures that all Americans have the same basic health and environmental protections. The law allows individual states to have stronger pollution controls, but states are not allowed to have weaker pollution controls than those set for the whole country.

The law recognizes that it makes sense for states to take the lead in carrying out the Clean Air Act, because pollution control problems often require special understanding of local industries, geography, housing patterns, etc.

States have to develop **state implementation plans (SIPs)** that explain how each state will do its job under the Clean Air Act. A state implementation plan is a collection of the regulations a state will use to clean up polluted areas. The states must involve the public, through hearings and opportunities to comment, in the development of each state implementation plan.

EPA must approve each SIP, and if a SIP isn't acceptable, EPA can take over enforcing the Clean Air Act in that state.

The United States government, through EPA, assists the states by providing scientific research, expert studies, engineering designs and money to support clean air programs.

Interstate air pollution

Air pollution often travels from its source in one state to another state. In many metropolitan areas, people live in one state and work or shop in another; air pollution from cars and trucks may spread throughout the interstate area. The 1990 Clean Air Act provides for interstate commissions on air pollution control, which are to develop regional strategies for cleaning up air pollution. The 1990 Clean Air Act includes other provisions to reduce interstate air pollution.

International air pollution

Air pollution moves across national borders. The 1990 law covers pollution that originates in Mexico and Canada and drifts into the United States and pollution from the United States that reaches Canada and Mexico.

Permits

One of the major breakthroughs in the 1990 Clean Air Act is a **permit** program for larger sources that release pollutants into the air.[2]

[2] A source can be a power plant, factory or anything that releases pollutants into the air. Cars, trucks and other motor vehicles are sources, and consumer products and machines used in industry can be sources too. Sources that stay in one place are referred to as stationary sources; sources that move around, like cars or planes, are called mobile sources.

Requiring polluters to apply for a permit is not a new idea. Approximately 35 states have had state-wide permit programs for air pollution. The Clean Water Act requires permits to release pollutants into lakes, rivers or other waterways. Now air pollution is also going to be managed by a national permit system. Under the new program, permits are issued by states or, when a state fails to carry out the Clean Air Act satisfactorily, by EPA. The permit includes information on which pollutants are being released, how much may be released, and what kinds of steps the source's owner or operator is taking to reduce pollution, including plans to **monitor** (measure) the pollution. The permit system is especially useful for businesses covered by more than one part of the law, since information about all of a source's air pollution will now be in one place. The permit system simplifies and clarifies businesses' obligations for cleaning up air pollution and, over time, can reduce paperwork. For instance, an electric power plant may be covered by the acid rain, hazardous air pollutant and non-attainment (smog) parts of the Clean Air Act; the detailed information required by all these separate sections will be in one place--on the permit.

Permit applications and permits are available to the public; contact your state or regional air pollution control agency or EPA for information on access to these documents.

Businesses seeking permits have to pay **permit fees** much like car owners paying for car registrations. The money from the fees will help pay for state air pollution control activities.

Enforcement

The 1990 Clean Air Act gives important new **enforcement** powers to EPA. It used to be very difficult for EPA to penalize a company for violating the Clean Air Act. EPA has to go to court for even minor violations. The 1990 law enables EPA to fine violators, much like a police officer giving traffic tickets. Other parts of the 1990 law increase penalties for violating the Act and bring the Clean Air Act's enforcement powers in line with other environmental laws.

Deadlines

The 1990 Clean Air Act sets **deadlines** for EPA, states, local governments and businesses to reduce air pollution. The deadlines in the 1990 Clean Air Act were designed to be more realistic than dead- lines in previous versions of the law, so it is more likely that these deadlines will be met.

Public participation

Public participation is a very important part of the 1990 Clean Air Act. Throughout the Act, the public is given opportunities to take part in deter- mining how the law will be carried out. For in- stance, you can take part in hearings on the state and local plans for cleaning up air pollution.

You can sue the government or a source's owner or operator to get action when EPA or your state has not enforced the Act. You can request action by the state or EPA against violators.

The reports required by the Act are public documents. A great deal of information will be collected on just how much pollution is being released; these **monitoring (measuring) data** will be available to the public. The 1990 Clean Air Act ordered EPA to set up **clearinghouses** to collect and give out technical information. Typically, these clearinghouses will serve the public as well as state and other air pollution control agencies.

See the list at the end of this summary for organizations to contact for additional information about air pollution and the Clean Air Act.

Market approaches for reducing air pollution; economic incentives

The 1990 Clean Air Act has many features designed to clean up air pollution as efficiently and inexpensively as possible, letting businesses make choices on the best way to reach pollution cleanup goals. These new flexible programs are called **market** or **market-based** approaches. For instance, the acid rain clean-up program offers businesses choices as to how they reach their pollution reduction goals and includes pollution allowances that can be traded, bought and sold.

The 1990 Clean Air Act provides **economic incentives** for cleaning up pollution. For instance, gasoline refiners can get **credits** if they produce cleaner gasoline than required, and they can use those credits when their gasoline doesn't quite meet clean-up requirements.

Introduction to the Clean Water Act

The Clean Water Act (CWA) is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with ground water nor with water quantity issues.) The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

For many years following the passage of CWA in 1972, EPA, states, and Indian tribes focused mainly on the chemical aspects of the "integrity" goal. During the last decade, however, more attention has been given to physical and biological integrity. Also, in the early decades of the Act's implementation, efforts focused on regulating discharges from traditional "point source" facilities, such as municipal sewage plants and industrial facilities, with little attention paid to runoff from streets, construction sites, farms, and other "wet-weather" sources.

Starting in the late 1980s, efforts to address polluted runoff have increased significantly. For "nonpoint" runoff, voluntary programs, including cost-sharing with landowners are the key tool. For "wet weather point sources" like urban storm sewer systems and construction sites, a regulatory approach is being employed.

Evolution of CWA programs over the last decade has also included something of a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining state water quality and other environmental goals is another hallmark of this approach.

Clean Water Act History

Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. The Act established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The Clean Water Act also continued requirements to set water quality standards for all contaminants in surface waters. The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution.

Subsequent enactments modified some of the earlier Clean Water Act provisions. Revisions in 1981 streamlined the municipal construction grants process, improving the capabilities of treatment plants built under the program. Changes in 1987 phased out the construction grants program, replacing it with the State Water Pollution Control Revolving Fund, more commonly known as the Clean Water State Revolving Fund. This new funding strategy addressed water quality needs by building on EPA-State partnerships.

Over the years, many other laws have changed parts of the Clean Water Act. Title I of the Great Lakes Critical Programs Act of 1990, for example, put into place parts of the Great Lakes Water Quality Agreement of 1978, signed by the U.S. and Canada, where the two nations agreed to reduce certain toxic pollutants in the Great Lakes. That law required EPA to establish water quality criteria for the Great Lakes addressing 29 toxic pollutants with maximum levels that are safe for humans, wildlife, and aquatic life. It also required EPA to help the States implement the criteria on a specific schedule.

The electronic version of the Clean Water Act (available below) is a thirtieth anniversary snapshot of the law, as amended through the enactment of the Great Lakes Legacy Act of 2002 (Public Law 107-303, November 27, 2002). Provided by the Congressional Great Lakes Task Force, it is the amended law as of that particular point in time. This electronic version annotates the sections of the Act with the corresponding sections of the U.S. Code and footnote commentary on the effect of other laws on the current form of the Clean Water Act.

CERCLA Overview

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, \$1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. CERCLA:

- established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- provided for liability of persons responsible for releases of hazardous waste at these sites; and
- established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response.
- Long-term remedial response actions, that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List (NPL).

CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL.

CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

The Emergency Planning and Community Right-To-Know Act

42 U.S.C. 11001 et seq. (1986)

Also known as Title III of SARA, EPCRA was enacted by Congress as the national legislation on community safety. This law was designated to help local communities protect public health, safety, and the environment from chemical hazards.

To implement EPCRA, Congress required each state to appoint a State Emergency Response Commission (SERC). The SERC's were required to divide their states into Emergency Planning Districts and to name a Local Emergency Planning Committee (LEPC) for each district.

Broad representation by fire fighters, health officials, government and media representatives, community groups, industrial facilities, and emergency managers ensures that all necessary elements of the planning process are represented.

Sec. 11003. - Comprehensive emergency response plans

(a) Plan required

Each local emergency planning committee shall complete preparation of an emergency plan in accordance with this section not later than two years after October 17, 1986. The committee shall review such plan once a year, or more frequently as changed circumstances in the community or at any facility may require.

(b) Resources

Each local emergency planning committee shall evaluate the need for resources necessary to develop, implement, and exercise the emergency plan, and shall make recommendations with respect to additional resources that may be required and the means for providing such additional resources.

(c) Plan provisions

Each emergency plan shall include (but is not limited to) each of the following:

(1)

Identification of facilities subject to the requirements of this subchapter that are within the emergency planning district, identification of routes likely to be used for the transportation of substances on the list of extremely hazardous substances

referred to in section 11002(a) of this title, and identification of additional facilities contributing or subjected to additional risk due to their proximity to facilities subject to the requirements of this subchapter, such as hospitals or natural gas facilities.

(2)

Methods and procedures to be followed by facility owners and operators and local emergency and medical personnel to respond to any release of such substances.

(3)

Designation of a community emergency coordinator and facility emergency coordinators, who shall make determinations necessary to implement the plan.

(4)

Procedures providing reliable, effective, and timely notification by the facility emergency coordinators and the community emergency coordinator to persons designated in the emergency plan, and to the public, that a release has occurred (consistent with the emergency notification requirements of section 11004 of this title).

(5)

Methods for determining the occurrence of a release, and the area or population likely to be affected by such release.

(6)

A description of emergency equipment and facilities in the community and at each facility in the community subject to the requirements of this subchapter, and an identification of the persons responsible for such equipment and facilities.

(7)

Evacuation plans, including provisions for a precautionary evacuation and alternative traffic routes.

(8)

Training programs, including schedules for training of local emergency response and medical personnel.

(9)

Methods and schedules for exercising the emergency plan.

(d) Providing of information

For each facility subject to the requirements of this subchapter:

(1)

Within 30 days after establishment of a local emergency planning committee for the emergency planning district in which such facility is located, or within 11 months after October 17, 1986, whichever is earlier, the owner or operator of the facility shall notify the emergency planning committee (or the Governor if there is no committee) of a facility representative who will participate in the emergency planning process as a facility emergency coordinator.

(2)

The owner or operator of the facility shall promptly inform the emergency planning committee of any relevant changes occurring at such facility as such changes occur or are expected to occur.

(3)

Upon request from the emergency planning committee, the owner or operator of the facility shall promptly provide information to such committee necessary for developing and implementing the emergency plan.

(e) Review by State emergency response commission

After completion of an emergency plan under subsection (a) of this section for an emergency planning district, the local emergency planning committee shall submit a copy of the plan to the State emergency response commission of each State in which such district is located. The commission shall review the plan and make recommendations to the committee on revisions of the plan that may be necessary to ensure coordination of such plan with emergency response plans of other emergency planning districts. To the maximum extent practicable, such review shall not delay implementation of such plan.

(f) Guidance documents

The national response team, as established pursuant to the National Contingency Plan as established under section 9605 of this title, shall publish guidance documents for preparation and implementation of emergency plans. Such documents shall be published not later than five months after October 17, 1986.

(g) Review of plans by regional response teams

The regional response teams, as established pursuant to the National Contingency Plan as established under section 9605 of this title, may review and comment upon an emergency plan or other issues related to preparation, implementation, or exercise of such a plan upon request of a local emergency planning committee. Such review shall not delay implementation of the plan

Endangered Species Act

7 U.S.C. 136; 16 U.S.C. 460 et seq. (1973)

The Endangered Species Act provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The U.S. Fish and Wildlife Service of the Department of the Interior maintains the list of 632 endangered species (326 are plants) and 190 threatened species (78 are plants).

Species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees. Anyone can petition FWS to include a species on this list. The law prohibits any action, administrative or real, that results in a "taking" of a listed species, or adversely affects habitat. Likewise, import, export, interstate, and foreign commerce of listed species are all prohibited.

EPA's decision to register a pesticide is based in part on the risk of adverse effects on endangered species as well as environmental fate (how a pesticide will affect habitat). Under FIFRA, EPA can issue emergency suspensions of certain pesticides to cancel or restrict their use if an endangered species will be adversely affected. Under a new program, EPA, FWS, and USDA are distributing hundreds of county bulletins that include habitat maps, pesticide use limitations, and other actions required to protect listed species.

The Freedom of Information Act

5 U.S.C. s/s 552 (1966)

The Freedom of Information Act provides specifically that “any person” can make requests for government information. Citizens who make requests are not required to identify themselves or explain why they want the information they have requested. The position of Congress in passing FOIA was that the workings of government are “for and by the people” and that the benefits of government information should be made available to everyone.

All branches of the Federal government must adhere to the provisions of FOIA with certain restrictions for work in progress (early drafts), enforcement confidential information, classified documents, and national security information.

Sec. 552. - Public information; agency rules, opinions, orders, records, and proceedings

(a)

Each agency shall make available to the public information as follows:

(1)

Each agency shall separately state and currently publish in the Federal Register for the guidance of the public -

(A)

descriptions of its central and field organization and the established places at which, the employees (and in the case of a uniformed service, the members) from whom, and the methods whereby, the public may obtain information, make submittals or requests, or obtain decisions;

(B)

statements of the general course and method by which its functions are channeled and determined, including the nature and requirements of all formal and informal procedures available;

(C)

rules of procedure, descriptions of forms available or the places at which forms may be obtained, and instructions as to the scope and contents of all papers, reports, or examinations;

(D)

substantive rules of general applicability adopted as authorized by law, and statements of general policy or interpretations of general applicability formulated and adopted by the agency; and

(E)

each amendment, revision, or repeal of the foregoing.

Except to the extent that a person has actual and timely notice of the terms thereof, a person may not in any manner be required to resort to, or be adversely affected by, a matter required to be published in the Federal Register and not so published. For the purpose of this paragraph, matter reasonably available to the class of persons affected thereby is deemed published in the Federal Register when incorporated by reference therein with the approval of the Director of the Federal Register.

(2)

Each agency, in accordance with published rules, shall make available for public inspection and copying -

(A)

final opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of cases;

(B)

those statements of policy and interpretations which have been adopted by the agency and are not published in the Federal Register;

(C)

administrative staff manuals and instructions to staff that affect a member of the public;

(D)

The Occupational Safety and Health Act (OSHA)

29 U.S.C. 651 et seq. (1970)

Congress passed the Occupational and Safety Health Act to ensure worker and workplace safety. Their Goal was to make sure employers provide their workers a place of employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions.

In order to establish standards for workplace health and safety, the Act also created the National Institute for Occupational Safety and Health(NIOSH) as the research institution for the Occupational Safety and Health Administration . OSHA is a division of the U.S. Department of Labor that oversees the administration of the Act and enforces standards in all 50 states.

The Oil Pollution Act of 1990 (OPA)

33 U.S.C. 2702 to 2761

The Oil Pollution Act (OPA) of 1990 streamlined and strengthened EPA's ability to prevent and respond to catastrophic oil spills. A trust fund financed by a tax on oil is available to clean up spills when the responsible party is incapable or unwilling to do so. The OPA requires oil storage facilities and vessels to submit to the Federal government plans detailing how they will respond to large discharges. EPA has published regulations for aboveground storage facilities; the Coast Guard has done so for oil tankers. The OPA also requires the development of Area Contingency Plans to prepare and plan for oil spill response on a regional scale.

The Pollution Prevention Act (PPA)

42 U.S.C. 13101 and 13102, s/s et seq. (1990)

The Pollution Prevention Act focused industry, government, and public attention on reducing the amount of pollution through cost-effective changes in production, operation, and raw materials use. Opportunities for source reduction are often not realized because of existing regulations, and the industrial resources required for compliance, focus on treatment and disposal. Source reduction is fundamentally different and more desirable than waste management or pollution control.

Pollution prevention also includes other practices that increase efficiency in the use of energy, water, or other natural resources, and protect our resource base through conservation. Practices include recycling, source reduction, and sustainable agriculture.

The Toxic Substance Control Act (TSCA)

Sec. 2601. - Findings, policy, and intent

(a) Findings

The Congress finds that -

(1)

human beings and the environment are being exposed each year to a large number of chemical substances and mixtures;

(2)

among the many chemical substances and mixtures which are constantly being developed and produced, there are some whose manufacture, processing, distribution in commerce, use, or disposal may present an unreasonable risk of injury to health or the environment; and

(3)

the effective regulation of interstate commerce in such chemical substances and mixtures also necessitates the regulation of intrastate commerce in such chemical substances and mixtures.

(b) Policy

It is the policy of the United States that -

(1)

adequate data should be developed with respect to the effect of chemical substances and mixtures on health and the environment and that the development of such data should be the responsibility of those who manufacture and those who process such chemical substances and mixtures;

(2)

adequate authority should exist to regulate chemical substances and mixtures which present an unreasonable risk of injury to health or the environment, and to take action with respect to chemical substances and mixtures which are imminent hazards; and

(3)

authority over chemical substances and mixtures should be exercised in such a manner as not to impede unduly or create unnecessary economic

barriers to technological innovation while fulfilling the primary purpose of this chapter to assure that such innovation and commerce in such chemical substances and mixtures do not present an unreasonable risk of injury to health or the environment.

(c) Intent of Congress

It is the intent of Congress that the Administrator shall carry out this chapter in a reasonable and prudent manner, and that the Administrator shall consider the environmental, economic, and social impact of any action the Administrator takes or proposes to take under this chapter

Thanks to Cornell University for their publication of these laws and the EPA for their sponsorship. Note that parts of the collection were generated from the most recent version of the Government Printing Office CD ROM.

Entire collection and latest updates available at: <http://www.epa.gov>



Chemical Safety Information, Site Security and Fuels Regulatory Relief Act

Under Section 112(r) of the Clean Air Act (CAA), by June 21, 1999, certain facilities were required to have in place a risk management program and submit a summary of that program - called a Risk Management Plan (RMP) - to the Environmental Protection Agency. On Aug. 5, 1999, President Clinton signed legislation that removes from coverage by the RMP program any flammable fuel when used as fuel or held for sale as fuel by a retail facility. The legislation also limits access to Off-Site Consequence Analysis (OCA) data that are reported in RMPs by covered facilities. For one year beginning Aug. 5, 1999, OCA information will not be available to the public except in certain ways. During that one year period, the federal government will conduct an assessment and issue regulations governing future public access to OCA data.

What's New?

The recently enacted Chemical Safety Information, Site Security and Fuels Regulatory Relief Act establishes new provisions for reporting and disseminating information under Section 112(r) of the Clean Air Act. The law has two distinct parts that pertain to:

- Flammable fuels; and
- Public access to OCA (also known as "worst-case scenario") data.

Despite the removal of flammable fuels from the RMP program, firefighters and other local emergency responders should receive information on the potential off-site effects of accidents involving flammable fuels. EPA and industry are working with the National Fire Protection Association (NFPA), a group that develops fire protection codes and standards, to ensure that local responders receive that information. The new law directs the General Accounting Office (GAO) to assess in two years whether this goal has been accomplished.

Flammable Fuels

Flammable fuels used as fuel or held for sale as fuel at a retail facility are removed from coverage by the RMP program. However, flammable fuels used as a feedstock or held for sale as fuel at a wholesale facility are still covered. A retail facility is a facility "at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program."

Public Access to OCA Data

The law exempts OCA data from disclosure under the Freedom of Information Act (FOIA) and limits its public availability for at least one year. By August 5, 2000, the federal government is to (1) assess the risks of Internet posting of OCA data and the benefits of public access to that data, and (2) based on that assessment, publish regulations governing public access to OCA data. In the meantime, EPA is to make publicly



available the OCA data without facility identification information, and covered facilities must conduct public meetings to provide summaries of their OCA data (see "Facility Requirements"). If the government fails to issue regulations by August 5, 2000, the FOIA exemption expires.

Major Provisions

The law :

- Exempts OCA information from public disclosure under FOIA for at least one year;
- Makes OCA data available to Federal, State and local officials, including members of Local Emergency Planning Committees, for emergency planning and response purposes;
- Provides for a system for making OCA data available to qualified researchers;
- Prohibits Federal, State and local officials and qualified researchers from publicly releasing OCA data except as authorized by the law;
- Calls for an assessment and regulations regarding public access to OCA data within one year;
- Pre-empts State FOIA laws regarding public access to OCA data unless data are collected under State law; and
- Requires reports be submitted to Congress describing the effectiveness of the RMP regulations in reducing the risk of criminally caused releases, the vulnerability of facilities to criminal and terrorist activity, and the security of transportation of substances listed under CAA Section 112(r).

Facility Requirements

The new law requires every covered facility to:

- Hold a public meeting to share information about the local implications of its RMP, including a summary of the OCA portion of its plan. Small businesses can meet this requirement by publicly posting the OCA summary;
- Notify the FBI by June 5, 2000, that it held such a meeting or posted such a notice within one year before, or six months after, August 5, 1999; and
- Tell EPA if it distributes its OCA data to the public without restrictions. EPA is to maintain a public list of the facilities that have so distributed their OCA data.

Penalties

The law includes criminal penalties of up to \$1 million for violating the prohibition on unauthorized disclosure of OCA data.

For More Information

Visit EPA's Chemical Emergency Preparedness and Prevention Office homepage at <http://www.epa.gov/ceppo>

View RMPs, except for the off-site consequence analysis data, in RMP*Info at <http://www.epa.gov/enviro>.

Contact the EPCRA hotline: (800) 424-9346 or (703) 412-9810.

The National Environmental Policy Act of 1969, as amended

(Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982)

An Act to establish a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Environmental Policy Act of 1969."

Purpose

Sec. 2 [42 USC § 4321].

The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

TITLE I

CONGRESSIONAL DECLARATION OF NATIONAL ENVIRONMENTAL POLICY

Sec. 101 [42 USC § 4331].

(a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound

influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may --

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;

- 5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- 6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Sec. 102 [42 USC § 4332].

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall --

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for

such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the views of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and, if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement.

The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility under this Act; and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction.

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's

world environment;

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(I) assist the Council on Environmental Quality established by title II of this Act.

Sec. 103 [42 USC § 4333].

All agencies of the Federal Government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this Act and shall propose to the President not later than July 1, 1971, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this Act.

Sec. 104 [42 USC § 4334].

Nothing in section 102 [42 USC § 4332] or 103 [42 USC § 4333] shall in any way affect the specific statutory obligations of any Federal agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any other Federal or State agency, or (3) to act, or refrain from acting contingent upon the recommendations or certification of any other Federal or State agency.

Sec. 105 [42 USC § 4335].

The policies and goals set forth in this Act are supplementary to those set forth in existing authorizations of Federal agencies.

TITLE II

COUNCIL ON ENVIRONMENTAL QUALITY

Sec. 201 [42 USC § 4341].

The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report (hereinafter referred to as the "report") which shall set forth (1) the status and condition of the major natural, manmade, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban and rural environment; (2) current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; (4) a review of the programs and activities (including regulatory activities) of the Federal Government, the State and local governments, and nongovernmental entities or individuals with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

Sec. 202 [42 USC § 4342].

There is created in the Executive Office of the President a Council on Environmental Quality (hereinafter referred to as the "Council"). The Council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate. The President shall designate one of the members of

the Council to serve as Chairman. Each member shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the Federal Government in the light of the policy set forth in title I of this Act; to be conscious of and responsive to the scientific, economic, social, aesthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment.

Sec. 203 [42 USC § 4343].

(a) The Council may employ such officers and employees as may be necessary to carry out its functions under this Act. In addition, the Council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this Act, in accordance with section 3109 of title 5, United States Code (but without regard to the last sentence thereof).

(b) Notwithstanding section 1342 of Title 31, the Council may accept and employ voluntary and uncompensated services in furtherance of the purposes of the Council.

Sec. 204 [42 USC § 4344].

It shall be the duty and function of the Council --

1. to assist and advise the President in the preparation of the Environmental Quality Report required by section 201 [42 USC § 4341] of this title;
2. to gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are

interfering, or are likely to interfere, with the achievement of the policy set forth in title I of this Act, and to compile and submit to the President studies relating to such conditions and trends;

3. to review and appraise the various programs and activities of the Federal Government in the light of the policy set forth in title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;
4. to develop and recommend to the President national policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation;
5. to conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality;
6. to document and define changes in the natural environment, including the plant and animal systems, and to accumulate necessary data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;
7. to report at least once each year to the President on the state and condition of the environment; and
8. to make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

Sec. 205 [42 USC § 4345].

In exercising its powers, functions, and duties under this Act, the Council shall --

1. consult with the Citizens' Advisory Committee on Environmental Quality established by Executive Order No. 11472, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor, conservation organizations, State and local governments and other groups, as it deems advisable; and
2. utilize, to the fullest extent possible, the services, facilities and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

Sec. 206 [42 USC § 4346].

Members of the Council shall serve full time and the Chairman of the Council shall be compensated at the rate provided for Level II of the Executive Schedule Pay Rates [5 USC § 5313]. The other members of the Council shall be compensated at the rate provided for Level IV of the Executive Schedule Pay Rates [5 USC § 5315].

Sec. 207 [42 USC § 4346a].

The Council may accept reimbursements from any private nonprofit organization or from any department, agency, or instrumentality of the Federal Government, any State, or local government, for the reasonable travel expenses incurred by an officer or employee of the Council in connection with his attendance at any conference, seminar, or similar meeting conducted for the benefit of the Council.

Sec. 208 [42 USC § 4346b].

The Council may make expenditures in support of its international activities, including expenditures for: (1) international travel; (2) activities in implementation of

international agreements; and (3) the support of international exchange programs in the United States and in foreign countries.

Sec. 209 [42 USC § 4347].

There are authorized to be appropriated to carry out the provisions of this chapter not to exceed \$300,000 for fiscal year 1970, \$700,000 for fiscal year 1971, and \$1,000,000 for each fiscal year thereafter.

The Environmental Quality Improvement Act, as amended (Pub. L. No. 91- 224, Title II, April 3, 1970; Pub. L. No. 97-258, September 13, 1982; and Pub. L. No. 98-581, October 30, 1984.

42 USC § 4372.

(a) There is established in the Executive Office of the President an office to be known as the Office of Environmental Quality (hereafter in this chapter referred to as the "Office"). The Chairman of the Council on Environmental Quality established by Public Law 91-190 shall be the Director of the Office. There shall be in the Office a Deputy Director who shall be appointed by the President, by and with the advice and consent of the Senate.

(b) The compensation of the Deputy Director shall be fixed by the President at a rate not in excess of the annual rate of compensation payable to the Deputy Director of the Office of Management and Budget.

(c) The Director is authorized to employ such officers and employees (including experts and consultants) as may be necessary to enable the Office to carry out its functions ;under this chapter and Public Law 91-190, except that he may employ no more than ten specialists and other experts without regard to the provisions of Title 5, governing appointments in the competitive service, and pay such specialists and

experts without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, but no such specialist or expert shall be paid at a rate in excess of the maximum rate for GS-18 of the General Schedule under section 5332 of Title 5.

(d) In carrying out his functions the Director shall assist and advise the President on policies and programs of the Federal Government affecting environmental quality by --

1. providing the professional and administrative staff and support for the Council on Environmental Quality established by Public Law 91- 190;
2. assisting the Federal agencies and departments in appraising the effectiveness of existing and proposed facilities, programs, policies, and activities of the Federal Government, and those specific major projects designated by the President which do not require individual project authorization by Congress, which affect environmental quality;
3. reviewing the adequacy of existing systems for monitoring and predicting environmental changes in order to achieve effective coverage and efficient use of research facilities and other resources;
4. promoting the advancement of scientific knowledge of the effects of actions and technology on the environment and encouraging the development of the means to prevent or reduce adverse effects that endanger the health and well-being of man;
5. assisting in coordinating among the Federal departments and agencies those programs and activities which affect, protect, and

improve environmental quality;

6. assisting the Federal departments and agencies in the development and interrelationship of environmental quality criteria and standards established throughout the Federal Government;
7. collecting, collating, analyzing, and interpreting data and information on environmental quality, ecological research, and evaluation.

(e) The Director is authorized to contract with public or private agencies, institutions, and organizations and with individuals without regard to section 3324(a) and (b) of Title 31 and section 5 of Title 41 in carrying out his functions.

42 USC § 4373. Each Environmental Quality Report required by Public Law 91-190 shall, upon transmittal to Congress, be referred to each standing committee having jurisdiction over any part of the subject matter of the Report.

42 USC § 4374. There are hereby authorized to be appropriated for the operations of the Office of Environmental Quality and the Council on Environmental Quality not to exceed the following sums for the following fiscal years which sums are in addition to those contained in Public Law 91- 190:

- (a) \$2,126,000 for the fiscal year ending September 30, 1979.
- (b) \$3,000,000 for the fiscal years ending September 30, 1980, and September 30, 1981.
- (c) \$44,000 for the fiscal years ending September 30, 1982, 1983, and 1984.
- (d) \$480,000 for each of the fiscal years ending September 30, 1985 and 1986.

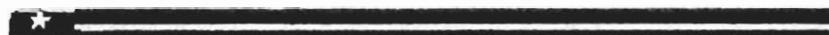
42 USC § 4375.

(a) There is established an Office of Environmental Quality Management Fund (hereinafter referred to as the "Fund") to receive advance payments from other agencies or accounts that may be used solely to finance --

1. study contracts that are jointly sponsored by the Office and one or more other Federal agencies; and
2. Federal interagency environmental projects (including task forces) in which the Office participates.

(b) Any study contract or project that is to be financed under subsection (a) of this section may be initiated only with the approval of the Director.

(c) The Director shall promulgate regulations setting forth policies and procedures for operation of the Fund.

**?****CEQ**

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[CITE: 42USC4321]

**TITLE 42--THE PUBLIC HEALTH AND WELFARE CHAPTER 55--NATIONAL ENVIRONMENTAL
POLICY**

Sec. 4321. Congressional declaration of purpose

The purposes of this chapter are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

(Pub. L. 91-190, Sec. 2, Jan. 1, 1970, 83 Stat. 852.)

Short Title

Section 1 Pub. L. 91-190 provided: ``That this Act [enacting this chapter] may be cited as the `National Environmental Policy Act of 1969'.''

Transfer of Functions

Enforcement functions of Secretary or other official in Department of the Interior related to compliance with system activities requiring coordination and approval under this chapter, and enforcement functions of Secretary or other official in Department of Agriculture, insofar as they involve lands and programs under jurisdiction of that Department, related to compliance with this chapter with respect to pre-construction, construction, and initial operation of transportation system for Canadian and Alaskan natural gas transferred to Federal Inspector, Office of Federal Inspector for Alaska Natural Gas Transportation System, until first anniversary of date of initial operation of Alaska Natural Gas Transportation System, see Reorg. Plan No. 1 of 1979, Secs. 102(e), (f), 203(a), 44 F.R. 33663, 33666, 93 Stat. 1373, 1376, effective July 1, 1979, set out in the Appendix to Title 5, Government Organization and Employees. Office of Federal Inspector for the Alaska Natural Gas Transportation System abolished and functions and authority vested in Inspector transferred to Secretary of Energy by section 3012(b) of Pub. L. 102-486, set out as an Abolition of Office of Federal Inspector note under section 719e of Title 15, Commerce and Trade.

Emergency Preparedness Functions

For assignment of certain emergency preparedness functions to Administrator of Environmental Protection Agency, see Parts 1, 2, and 16 of Ex. Ord. No. 12656, Nov. 18, 1988, 53 F.R. 47491, set out as a note

under section 5195 of this title.

Necessity of Military Low-Level Flight Training To Protect National Security and Enhance Military Readiness

Pub. L. 106-398, Sec. 1 [[div. A], title III, Sec. 317], Oct. 30, 2000, 114 Stat. 1654, 1654A-57, provided that: ``Nothing in the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) or the regulations implementing such law shall require the Secretary of Defense or the Secretary of a military department to prepare a programmatic, nation-wide environmental impact statement for low-level flight training as a precondition to the use by the Armed Forces of an airspace for the performance of low-level training flights.''

Pollution Prosecution

Pub. L. 101-593, title II, Nov. 16, 1990, 104 Stat. 2962, provided that:

``SEC. 201. SHORT TITLE.

``This title may be cited as the `Pollution Prosecution Act of 1990'.

``SEC. 202. **EPA OFFICE OF CRIMINAL INVESTIGATION.**

``(a) The Administrator of the Environmental Protection Agency (hereinafter referred to as the `Administrator') shall increase the number of criminal investigators assigned to the Office of Criminal Investigations by such numbers as may be necessary to assure that the number of criminal investigators assigned to the office--

``(1) for the period October 1, 1991, through September 30, 1992, is not less than 72;

``(2) for the period October 1, 1992, through September 30, 1993, is not less than 110;

``(3) for the period October 1, 1993, through September 30, 1994, is not less than 123;

``(4) for the period October 1, 1994, through September 30, 1995, is not less than 160;

``(5) beginning October 1, 1995, is not less than 200.

``(b) For fiscal year 1991 and in each of the following 4 fiscal years, the Administrator shall, during each such fiscal year, provide increasing numbers of additional support staff to the Office of Criminal Investigations.

``(c) The head of the Office of Criminal Investigations shall be a position in the competitive service as defined in 2102 of title 5 U.S.C. or a career reserve position as defined in 3132(A) of title 5 U.S.C. and the head of such office shall report directly, without intervening review or approval, to the Assistant Administrator for Enforcement.

``SEC. 203. CIVIL INVESTIGATORS.

``The Administrator, as soon as practicable following the date of the enactment of this Act [Nov. 16, 1990], but no later than September 30, 1991, shall increase by fifty the number of civil investigators assigned to assist the Office of Enforcement in developing and prosecuting civil and administrative actions and carrying out its other functions.

``SEC. 204. NATIONAL TRAINING INSTITUTE.

``The Administrator shall, as soon as practicable but no later than September 30, 1991 establish within the Office of Enforcement the

National Enforcement Training Institute. It shall be the function of the Institute, among others, to train Federal, State, and local lawyers, inspectors, civil and criminal investigators, and technical experts in the enforcement of the Nation's environmental laws.

``SEC. 205. AUTHORIZATION.

``For the purposes of carrying out the provisions of this Act [probably should be ``this title''], there is authorized to be appropriated to the Environmental Protection Agency \$13,000,000 for fiscal year 1991, \$18,000,000 for fiscal year 1992, \$20,000,000 for fiscal year 1993, \$26,000,000 for fiscal year 1994, and \$33,000,000 for fiscal year 1995.''

REORGANIZATION PLAN NO. 3 OF 1970

Eff. Dec. 2, 1970, 35 F.R. 15623, 84 Stat. 2086, as amended Pub. L. 98-80, Sec. 2(a)(2), (b)(2), (c)(2)(C), Aug. 23, 1983, 97 Stat. 485, 486

Prepared by the President and transmitted to the Senate and the House of Representatives in Congress assembled, July 9, 1970, pursuant to the provisions of Chapter 9 of Title 5 of the United States Code.

ENVIRONMENTAL PROTECTION AGENCY

Section 1. Establishment of Agency

(a) There is hereby established the Environmental Protection Agency, hereinafter referred to as the ``Agency.''

(b) There shall be at the head of the Agency the Administrator of the Environmental Protection Agency, hereinafter referred to as the ``Administrator.''. The Administrator shall be appointed by the President, by and with the advice and consent of the Senate.

(c) There shall be in the Agency a Deputy Administrator of the Environmental Protection Agency who shall be appointed by the President, by and with the advice and consent of the Senate. The Deputy Administrator shall perform such functions as the Administrator shall from time to time assign or delegate, and shall act as Administrator during the absence or disability of the Administrator or in the event of a vacancy in the office of Administrator.

(d) There shall be in the Agency not to exceed five Assistant Administrators of the Environmental Protection Agency who shall be appointed by the President, by and with the advice and consent of the Senate. Each Assistant Administrator shall perform such functions as the Administrator shall from time to time assign or delegate. [As amended Pub. L. 98-80, Sec. 2(a)(2), (b)(2), (c)(2)(C), Aug. 23, 1983, 97 Stat. 485, 486.]

Sec. 2. Transfers to Environmental Protection Agency

(a) There are hereby transferred to the Administrator:

(1) All functions vested by law in the Secretary of the Interior and the Department of the Interior which are administered through the Federal Water Quality Administration, all functions which were transferred to the Secretary of the Interior by Reorganization Plan No.

2 of 1966 (80 Stat. 1608), and all functions vested in the Secretary of the Interior or the Department of the Interior by the Federal Water Pollution Control Act or by provisions of law amendatory or supplementary thereof [see 33 U.S.C. 1251 et seq.].

(2) (i) The functions vested in the Secretary of the Interior by the Act of August 1, 1958, 72 Stat. 479, 16 U.S.C. 742d-1 (being an Act relating to studies on the effects of insecticides, herbicides, fungicides, and pesticides upon the fish and wildlife resources of the United States), and (ii) the functions vested by law in the Secretary of the Interior and the Department of the Interior which are administered by the Gulf Breeze Biological Laboratory of the Bureau of Commercial Fisheries at Gulf Breeze, Florida.

(3) The functions vested by law in the Secretary of Health, Education, and Welfare or in the Department of Health, Education, and Welfare which are administered through the Environmental Health Service, including the functions exercised by the following components thereof:

(i) The National Air Pollution Control Administration,

(ii) The Environmental Control Administration:

(A) Bureau of Solid Waste Management,

(B) Bureau of Water Hygiene,

(C) Bureau of Radiological Health,

except that functions carried out by the following components of the Environmental Control Administration of the Environmental Health Service are not transferred: (i) Bureau of Community Environmental Management, (ii) Bureau of Occupational Safety and Health, and (iii) Bureau of Radiological Health, insofar as the functions carried out by the latter Bureau pertain to (A) regulation of radiation from consumer products, including electronic product radiation, (B) radiation as used in the healing arts, (C) occupational exposures to radiation, and (D) research, technical assistance, and training related to clauses (A), (B), and (C).

(4) The functions vested in the Secretary of Health, Education, and Welfare of establishing tolerances for pesticide chemicals under the Federal Food, Drug, and Cosmetic Act, as amended, 21 U.S.C. 346, 346a, and 348, together with authority, in connection with the functions transferred, (i) to monitor compliance with the tolerances and the effectiveness of surveillance and enforcement, and (ii) to provide technical assistance to the States and conduct research under the Federal Food, Drug, and Cosmetic Act, as amended [21 U.S.C. 301 et seq.], and the Public Health Service Act, as amended [42 U.S.C. 201 et seq.].

(5) So much of the functions of the Council on Environmental Quality under section 204(5) of the National Environmental Policy Act of 1969 (Public Law 91-190, approved January 1, 1970, 83 Stat. 855) [42 U.S.C. 4344(5)], as pertains to ecological systems.

(6) The functions of the Atomic Energy Commission under the Atomic Energy Act of 1954, as amended [42 U.S.C. 2011 et seq.], administered through its Division of Radiation Protection Standards, to the extent that such functions of the Commission consist of establishing generally applicable environmental standards for the protection of the general environment from radioactive material. As used herein, standards mean limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radio-active material.

(7) All functions of the Federal Radiation Council (42 U.S.C. 2021(h)).

(8) (i) The functions of the Secretary of Agriculture and the Department of Agriculture under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 135-135k) [7 U.S.C. 136 et seq.], (ii) the functions of the Secretary of Agriculture and the Department of Agriculture under section 408(1) of the Federal Food, Drug, and Cosmetic Act, as amended (21 U.S.C. 346a(1)), and (iii) the functions vested by law in the Secretary of Agriculture and the Department of Agriculture which are administered through the Environmental Quality Branch of the Plant Protection Division of the Agricultural Research Service.

(9) So much of the functions of the transferor officers and agencies referred to in or affected by the foregoing provisions of this section as is incidental to or necessary for the performance by or under the Administrator of the functions transferred by those provisions or relates primarily to those functions. The transfers to the Administrator made by this section shall be deemed to include the transfer of (1) authority, provided by law, to prescribe regulations relating primarily to the transferred functions, and (2) the functions vested in the Secretary of the Interior and the Secretary of Health, Education, and Welfare by section 169(d)(1)(B) and (3) of the Internal Revenue Code of 1954 (as enacted by section 704 of the Tax Reform Act of 1969, 83 Stat. 668); but shall be deemed to exclude the transfer of the functions of the Bureau of Reclamation under section 3(b)(1) of the Water Pollution Control Act (33 U.S.C. [former] 466a(b)(1)).

(b) There are hereby transferred to the Agency:

(1) From the Department of the Interior, (i) the Water Pollution Control Advisory Board (33 U.S.C. [former] 466f) [see 33 U.S.C. 1363], together with its functions, and (ii) the hearing boards provided for in sections 10(c)(4) and 10(f) of the Federal Water Pollution Control Act, as amended (33 U.S.C. [former] 466g(c)(4); 466g(f)). The functions of the Secretary of the Interior with respect to being or designating the Chairman of the Water Pollution Control Advisory Board are hereby transferred to the Administrator.

(2) From the Department of Health, Education, and Welfare, the Air Quality Advisory Board (42 U.S.C. 1857e) [42 U.S.C. 7417], together with its functions. The functions of the Secretary of Health, Education, and Welfare with respect to being a member and the Chairman of that Board are hereby transferred to the Administrator.

Sec. 3. Performance of Transferred Functions

The Administrator may from time to time make such provisions as he shall deem appropriate authorizing the performance of any of the functions transferred to him by the provisions of this reorganization plan by any other officer, or by any organizational entity or employee, of the Agency.

Sec. 4. Incidental Transfers

(a) So much of the personnel, property, records, and unexpended balances of appropriations, allocations, and other funds employed, used, held, available or to be made available in connection with the functions transferred to the Administrator or the Agency by this reorganization plan as the Director of the Office of Management and Budget shall determine shall be transferred to the Agency at such time or times as the Director shall direct.

(b) Such further measures and dispositions as the Director of Office of Management and Budget shall deem to be necessary in order to effectuate the transfers referred to in subsection (a) of this section shall be carried out in such manner as he shall direct and by such agencies as he shall designate.

Sec. 5. Interim Officers

(a) The President may authorize any person who immediately prior to the effective date of this reorganization plan held a position in the executive branch of the Government to act as Administrator until the office of Administrator is for the first time filled pursuant to the provisions of this reorganization plan or by recess appointment, as the case may be.

(b) The President may similarly authorize any such person to act as Deputy Administrator, authorize any such person to act as Assistant Administrator, and authorize any such person to act as the head of any principal constituent organizational entity of the Administration.

(c) The President may authorize any person who serves in an acting capacity under the foregoing provisions of this section to receive the compensation attached to the office in respect of which he so serves. Such compensation, if authorized, shall be in lieu of, but not in addition to, other compensation from the United States to which such person may be entitled.

Sec. 6. Abolitions

(a) Subject to the provisions of this reorganization plan, the following, exclusive of any functions, are hereby abolished:

(1) The Federal Water Quality Administration in the Department of the Interior (33 U.S.C. [former] 466-1).

(2) The Federal Radiation Council (73 Stat. 690; 42 U.S.C. 2021(h)).

(b) Such provisions as may be necessary with respect to terminating any outstanding affairs shall be made by the Secretary of the Interior in the case of the Federal Water Quality Administration and by the Administrator of General Services in the case of the Federal Radiation Council.

Sec. 7. Effective Date

The provisions of this reorganization plan shall take effect sixty days after the date they would take effect under 5 U.S.C. 906(a) in the absence of this section.

Message of the President

To the Congress of the United States:

I transmit herewith Reorganization Plan No. 3 of 1970, prepared in accordance with chapter 9 of title 5 of the United States Code and providing for an Environmental Protection Agency. My reasons for transmitting this plan are stated in a more extended accompanying message.

After investigation, I have found and hereby declare that each

reorganization included in Reorganization Plan No. 3 of 1970 is necessary to accomplish one or more of the purposes set forth in section 901(a) of title 5 of the United States Code. In particular, the plan is responsive to section 901(a)(1), ``to promote the better execution of the laws, the more effective management of the executive branch and of its agencies and functions, and the expeditious administration of the public business;'' and section 901(a)(3), ``to increase the efficiency of the operations of the Government to the fullest extent practicable.''

The reorganizations provided for in the plan make necessary the appointment and compensation of new officers as specified in section 1 of the plan. The rates of compensation fixed for these officers are comparable to those fixed for other officers in the executive branch who have similar responsibilities.

Section 907 of title 5 of the United States Code will operate to preserve administrative proceedings, including any public hearing proceedings, related to the transferred functions, which are pending immediately prior to the taking effect of the reorganization plan.

The reorganization plan should result in more efficient operation of the Government. It is not practical, however, to itemize or aggregate the exact expenditure reductions which will result from this action.

Richard Nixon.

The White House, July 9, 1970.

Message of the President

To the Congress of the United States:

As concern with the condition of our physical environment has intensified, it has become increasingly clear that we need to know more about the total environment--land, water and air. It also has become increasingly clear that only by reorganizing our Federal efforts can we develop that knowledge, and effectively ensure the protection, development and enhancement of the total environment itself.

The Government's environmentally-related activities have grown up piecemeal over the years. The time has come to organize them rationally and systematically. As a major step in this direction, I am transmitting today two reorganization plans: one to establish an Environmental Protection Agency, and one to establish, within the Department of Commerce, a National Oceanic and Atmospheric Administration.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

Our national government today is not structured to make a coordinated attack on the pollutants which debase the air we breathe, the water we drink, and the land that grows our food. Indeed, the present governmental structure for dealing with environmental pollution often defies effective and concerted action.

Despite its complexity, for pollution control purposes the environment must be perceived as a single, interrelated system. Present assignments of departmental responsibilities do not reflect this interrelatedness.

Many agency missions, for example, are designed primarily along media lines--air, water, and land. Yet the sources of air, water, and land pollution are interrelated and often interchangeable. A single source may pollute the air with smoke and chemicals, the land with solid wastes, and a river or lake with chemical and other wastes. Control of

the air pollution may produce more solid wastes, which then pollute the land or water. Control of the water-polluting effluent may convert it into solid wastes, which must be disposed of on land.

Similarly, some pollutants--chemicals, radiation, pesticides--appear in all media. Successful control of them at present requires the coordinated efforts of a variety of separate agencies and departments. The results are not always successful.

A far more effective approach to pollution control would:

- identify pollutants.
- trace them through the entire ecological chain, observing and recording changes in form as they occur.
- Determine the total exposure of man his environment.
- Examine interactions among forms of pollution.
- Identify where in the ecological chain interdiction would be most appropriate.

In organizational terms, this requires pulling together into one agency a variety of research, monitoring, standard-setting and enforcement activities now scattered through several departments and agencies. It also requires that the new agency include sufficient support elements--in research and in aids to State and local anti-pollution programs, for example--to give it the needed strength and potential for carrying out its mission. The new agency would also, of course, draw upon the results of research conducted by other agencies.

components of the **epa**

Under the terms of Reorganization Plan No. 3, the following would be moved to the new Environmental Protection Agency:

- The functions carried out by the Federal Water Quality Administration (from the Department of the Interior).
- Functions with respect to pesticides studies now vested in the Department of the Interior.
- The functions carried out by the National Air Pollution Control Administration (from the Department of Health, Education, and Welfare).
- The functions carried out by the Bureau of Solid Waste Management and the Bureau of Water Hygiene, and portions of the functions carried out by the Bureau of Radiological Health of the Environmental Control Administration (from the Department of Health, Education, and Welfare).
- Certain functions with respect to pesticides carried out by the Food and Drug Administration (from the Department of Health, Education, and Welfare).
- Authority to perform studies relating to ecological systems now vested in the Council on Environmental Quality.
- Certain functions respecting radiation criteria and standards now vested in the Atomic Energy Commission and the Federal Radiation Council.
- Functions respecting pesticides registration and related activities now carried out by the Agricultural Research Service (from the Department of Agriculture).

With its broad mandate, **EPA** would also develop competence in areas of environmental protection that have not previously been given enough attention, such, for example, as the problem of noise, and it would provide an organization to which new programs in these areas could be added.

In brief, these are the principal functions to be transferred:

Federal Water Quality Administration.--Charged with the control of pollutants which impair water quality, it is broadly concerned with the impact of degraded water quality. It performs a wide variety of functions, including research, standard-setting and enforcement, and provides construction grants and technical assistance.

Certain pesticides research authority from the Department of the Interior.--Authority for research on the effects of pesticides on fish and wildlife would be provided to the **EPA** through transfer of the specialized research authority of the pesticides act enacted in 1958. Interior would retain its responsibility to do research on all factors affecting fish and wildlife. Under this provision, only one laboratory would be transferred to the **EPA**--the Gulf Breeze Biological Laboratory of the Bureau of Commercial Fisheries. The **EPA** would work closely with the fish and wildlife laboratories remaining with the Bureau of Sport Fisheries and Wildlife.

National Air Pollution Control Administration.--As the principal Federal agency concerned with air pollution, it conducts research on the effects of air pollution, operates a monitoring network, and promulgates criteria which serve as the basis for setting air quality standards. Its regulatory functions are similar to those of the Federal Water Quality Administration. **NAPCA** is responsible for administering the Clean Air Act, which involves designating air quality regions, approving State standards and providing financial and technical assistance to State Control agencies to enable them to comply with the Act's provisions. It also sets and enforces Federal automotive emission standards.

Elements of the Environmental Control Administration.--**ECA** is the focal point within **HEW** for evaluation and control of a broad range of environmental health problems, including water quality, solid wastes, and radiation. Programs in the **ECA** involve research, development of criteria and standards, and the administration of planning and demonstration grants. From the **ECA**, the activities of the Bureaus of Water Hygiene and Solid Waste Management and portions of the activities of the Bureau of Radiological Health would be transferred. Other functions of the **ECA** including those related to the regulation of radiation from consumer products and occupational safety and health would remain in **HEW**.

Pesticides research and standard-setting programs of the Food and Drug Administration.--**FDA**'s pesticides program consists of setting and enforcing standards which limit pesticide residues in food. **EPA** would have the authority to set pesticide standards and to monitor compliance with them, as well as to conduct related research. However, as an integral part of its food protection activities, **FDA** would retain its authority to remove from the market food with excess pesticide residues.

General ecological research from the Council on Environmental Quality.--This authority to perform studies and research relating to ecological systems would be in addition to **EPA**'s other specific research authorities, and it would help **EPA** to measure the impact of pollutants. The Council on Environmental Quality would retain its authority to conduct studies and research relating to environmental quality.

Environmental radiation standards programs.--The Atomic Energy Commission is now responsible for establishing environmental radiation standards and emission limits for radioactivity. Those standards have been based largely on broad guidelines recommended by the Federal Radiation Council. The Atomic Energy Commission's authority to set standards for the protection of the general environment from radioactive material would be transferred to the Environmental Protection Agency.

The functions of the Federal Radiation Council would also be transferred. AEC would retain responsibility for the implementation and enforcement of radiation standards through its licensing authority.

Pesticides registration program of the Agricultural Research Service.--The Department of Agriculture is currently responsible for several distinct functions related to pesticides use. It conducts research on the efficacy of various pesticides as related to other pest control methods and on the effects of pesticides on non-target plants, livestock, and poultry. It registers pesticides, monitors their persistence and carries out an educational program on pesticide use through the extension service. It conducts extensive pest control programs which utilize pesticides.

By transferring the Department of Agriculture's pesticides registration and monitoring function to the **EPA** and merging it with the pesticides programs being transferred from HEW and Interior, the new agency would be given a broad capability for control over the introduction of pesticides into the environment.

The Department of Agriculture would continue to conduct research on the effectiveness of pesticides. The Department would furnish this information to the **EPA**, which would have the responsibility for actually licensing pesticides for use after considering environmental and health effects. Thus the new agency would be able to make use of the expertise of the Department.

advantages of reorganization

This reorganization would permit response to environmental problems in a manner beyond the previous capability of our pollution control programs. The **EPA** would have the capacity to do research on important pollutants irrespective of the media in which they appear, and on the impact of these pollutants on the total environment. Both by itself and together with other agencies, the **EPA** would monitor the condition of the environment--biological as well as physical. With these data, the **EPA** would be able to establish quantitative ``environmental baselines''--critical if we are to measure adequately the success or failure of our pollution abatement efforts.

As no disjointed array of separate programs can, the **EPA** would be able--in concert with the States--to set and enforce standards for air and water quality and for individual pollutants. This consolidation of pollution control authorities would help assure that we do not create new environmental problems in the process of controlling existing ones. Industries seeking to minimize the adverse impact of their activities on the environment would be assured of consistent standards covering the full range of their waste disposal problems. As the States develop and expand their own pollution control programs, they would be able to look to one agency to support their efforts with financial and technical assistance and training.

In proposing that the Environmental Protection Agency be set up as a separate new agency, I am making an exception to one of my own principles: that, as a matter of effective and orderly administration, additional new independent agencies normally should not be created. In this case, however, the arguments against placing environmental protection activities under the jurisdiction of one or another of the existing departments and agencies are compelling.

In the first place, almost every part of government is concerned with the environment in some way, and affects it in some way. Yet each

department also has its own primary mission--such as resource development, transportation, health, defense, urban growth or agriculture--which necessarily affects its own view of environmental questions.

In the second place, if the critical standard-setting functions were centralized within any one existing department, it would require that department constantly to make decisions affecting other departments--in which, whether fairly or unfairly, its own objectivity as an impartial arbiter could be called into question.

Because environmental protection cuts across so many jurisdictions, and because arresting environmental deterioration is of great importance to the quality of life in our country and the world, I believe that in this case a strong, independent agency is needed. That agency would, of course, work closely with and draw upon the expertise and assistance of other agencies having experience in the environmental area.

roles and functions of **epa**

The principal roles and functions of the **EPA** would include:

- The establishment and enforcement of environmental protection standards consistent with national environmental goals.
- The conduct of research on the adverse effects of pollution and on methods and equipment for controlling it, the gathering of information on pollution, and the use of this information in strengthening environmental protection programs and recommending policy changes.
- Assisting others, through grants, technical assistance and other means in arresting pollution of the environment.
- Assisting the Council on Environmental Quality in developing and recommending to the President new policies for the protection of the environment.

One natural question concerns the relationship between the **EPA** and the Council on Environmental Quality, recently established by Act of Congress.

It is my intention and expectation that the two will work in close harmony, reinforcing each other's mission. Essentially, the Council is a top-level advisory group (which might be compared with the Council of Economic Advisers), while the **EPA** would be an operating, ``line'' organization. The Council will continue to be a part of the Executive Office of the President and will perform its overall coordinating and advisory roles with respect to all Federal programs related to environmental quality.

The Council, then, is concerned with all aspects of environmental quality--wildlife preservation, parklands, land use, and population growth, as well as pollution. The **EPA** would be charged with protecting the environment by abating pollution. In short, the Council focuses on what our broad policies in the environment field should be; the **EPA** would focus on setting and enforcing pollution control standards. The two are not competing, but complementary--and taken together, they should give us, for the first time, the means to mount an effectively coordinated campaign against environmental degradation in all of its many forms.

The oceans and the atmosphere are interacting parts of the total environmental system upon which we depend not only for the quality of our lives, but for life itself.

We face immediate and compelling needs for better protection of life and property from natural hazards, and for a better understanding of the total environment--and understanding which will enable us more effectively to monitor and predict its actions, and ultimately, perhaps to exercise some degree of control over them.

We also face a compelling need for exploration and development leading to the intelligent use of our marine resources. The global oceans, which constitute nearly three-fourths of the surface of our planet, are today the least-understood, the least-developed, and the least-protected part of our earth. Food from the oceans will increasingly be a key element in the world's fight against hunger. The mineral resources of the ocean beds and of the oceans themselves, are being increasingly tapped to meet the growing world demand. We must understand the nature of these resources, and assure their development without either contaminating the marine environment or upsetting its balance.

Establishment of the National Oceanic and Atmospheric Administration--NOAA--within the Department of Commerce would enable us to approach these tasks in a coordinated way. By employing a unified approach to the problems of the oceans and atmosphere, we can increase our knowledge and expand our opportunities not only in those areas, but in the third major component of our environment, the solid earth, as well.

Scattered through various Federal departments and agencies, we already have the scientific, technological, and administrative resources to make an effective, unified approach possible. What we need is to bring them together. Establishment of NOAA would do so.

By far the largest of the components being merged would be the Commerce Department's Environmental Science Services Administration (ESSA), with some 10,000 employees (70 percent of NOAA's total personnel strength) and estimated Fiscal 1970 expenditures of almost \$200 million. Placing NOAA within the Department of Commerce therefore entails the least dislocation, while also placing it within a Department which has traditionally been a center for service activities in the scientific and technological area.

components of noaa

Under terms of Reorganization Plan No. 4, the programs of the following organizations would be moved into NOAA:

- The Environmental Science Services Administration (from within the Department of Commerce).
- Elements of the Bureau of Commercial Fisheries (from the Department of the Interior).
- The marine sport fish program of the Bureau of Sport Fisheries and Wildlife (from the Department of the Interior).
- The Marine Minerals Technology Center of the Bureau of Mines (from the Department of the Interior).
- The Office of Sea Grant Programs (from the National Science Foundation).
- Elements of the United States Lake Survey (from the Department of the Army).

In addition, by executive action, the programs of the following

organizations would be transferred to NOAA:

- The National Oceanographic Data Center (from the Department of the Navy).
- The National Oceanographic Instrumentation Center (from the Department of the Navy).
- The National Data Buoy Project (from the Department of Transportation).

In brief, these are the principal functions of the programs and agencies to be combined:

THE ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

(ESSA) comprises the following components:

- The Weather Bureau (weather, marine, river and flood forecasting and warning).
- The Coast and Geodetic Survey (earth and marine description, mapping and charting).
- The Environmental Data Service (storage and retrieval of environmental data).
- The National Environmental Satellite Center (observation of the global environment from earth-orbiting satellites).
- The ESSA Research Laboratories (research on physical environmental problems).

ESSA's activities include observing and predicting the state of the oceans, the state of the lower and upper atmosphere, and the size and shape of the earth. It maintains the nation's warning systems for such natural hazards as hurricanes, tornadoes, floods, earthquakes and seismic sea waves. It provides information for national defense, agriculture, transportation and industry.

ESSA monitors atmospheric, oceanic and geophysical phenomena on a global basis, through an unparalleled complex of air, ocean, earth and space facilities. It also prepares aeronautical and marine maps and charts.

Bureau of Commercial Fisheries and marine sport fish activities.-- Those fishery activities of the Department of the Interior's U.S. Fish and Wildlife Service which are ocean related and those which are directed toward commercial fishing would be transferred. The Fish and Wildlife Service's Bureau of Commercial Fisheries has the dual function of strengthening the fishing industry and promoting conservation of fishery stocks. It conducts research on important marine species and on fundamental oceanography, and operates a fleet of oceanographic vessels and a number of laboratories. Most of its activities would be transferred. From the Fish and Wildlife Service's Bureau of Sport Fisheries and Wildlife, the marine sport fishing program would be transferred. This involves five supporting laboratories and three ships engaged in activities to enhance marine sport fishing opportunities.

The Marine Minerals Technology Center is concerned with the development of marine mining technology.

Office of Sea Grant Programs.--The Sea Grant Program was authorized in 1966 to permit the Federal Government to assist the academic and industrial communities in developing marine resources and technology. It aims at strengthening education and training of marine specialists, supporting applied research in the recovery and use of marine resources, and developing extension and advisory services. The Office carries out these objectives by making grants to selected academic institutions.

The U.S. Lake Survey has two primary missions. It prepares and

publishes navigation charts of the Great Lakes and tributary waters and conducts research on a variety of hydraulic and hydrologic phenomena of the Great Lakes' waters. Its activities are very similar to those conducted along the Atlantic and Pacific coasts by ESSA's Coast and Geodetic Survey.

The National Oceanographic Data Center is responsible for the collection and dissemination of oceanographic data accumulated by all Federal agencies.

The National Oceanographic Instrumentation Center provides a central Federal service for the calibration and testing of oceanographic instruments.

The National Data Buoy Development Project was established to determine the feasibility of deploying a system of automatic ocean buoys to obtain oceanic and atmospheric data.

role of noaa

Drawing these activities together into a single agency would make possible a balanced Federal program to improve our understanding of the resources of the sea, and permit their development and use while guarding against the sort of thoughtless exploitation that in the past laid waste to so many of our precious natural assets. It would make possible a consolidated program for achieving a more comprehensive understanding of oceanic and atmospheric phenomena, which so greatly affect our lives and activities. It would facilitate the cooperation between public and private interests that can best serve the interests of all.

I expect that NOAA would exercise leadership in developing a national oceanic and atmospheric program of research and development. It would coordinate its own scientific and technical resources with the technical and operational capabilities of other government agencies and private institutions. As important, NOAA would continue to provide those services to other agencies of government, industry and private individuals which have become essential to the efficient operation of our transportation systems, our agriculture and our national security. I expect it to maintain continuing and close liaison with the new Environmental Protection Agency and the Council on Environmental Quality as part of an effort to ensure that environmental questions are dealt with in their totality and they benefit from the full range of the government's technical and human resources.

Authorities who have studied this matter, including the Commission on Marine Science, Engineering and Resources, strongly recommended the creation of a National Advisory Committee for the Oceans. I agree. Consequently, I will request, upon approval of the plan, that the Secretary of Commerce establish a National Advisory Committee for the Oceans and the Atmosphere to advise him on the progress of governmental and private programs in achieving the nation's oceanic and atmospheric objectives.

AN ON-GOING PROCESS

The reorganizations which I am here proposing afford both the Congress and the Executive Branch an opportunity to re-evaluate the adequacy of existing program authorities involved in these consolidations. As these two new organizations come into being, we may

well find that supplementary legislation to perfect their authorities will be necessary. I look forward to working with the Congress in this task.

In formulating these reorganization plans, I have been greatly aided by the work of the President's Advisory Council on Executive Organization (the Ash Council), the Commission on Marine Science, Engineering and Resources (the Stratton Commission, appointed by President Johnson), my special task force on oceanography headed by Dr. James Wakelin, and by the information developed during both House and Senate hearings on proposed NOAA legislation.

Many of those who have advised me have proposed additional reorganizations, and it may well be that in the future I shall recommend further changes. For the present, however, I think the two reorganizations transmitted today represent a sound and significant beginning. I also think that in practical terms, in this sensitive and rapidly developing area, it is better to proceed a step at a time--and thus to be sure that we are not caught up in a form of organizational indigestion from trying to rearrange too much at once. As we see how these changes work out, we will gain a better understanding of what further changes--in addition to these--might be desirable.

Ultimately, our objective should be to insure that the nation's environmental and resource protection activities are so organized as to maximize both the effective coordination of all and the effective functioning of each.

The Congress, the Administration and the public all share a profound commitment to the rescue of our natural environment, and the preservation of the Earth as a place both habitable by and hospitable to man. With its acceptance of these reorganization plans, the Congress will help us fulfill that commitment.

Richard Nixon.

The White House, July 9, 1970.

Ex. Ord. No. 11472. Cabinet Committee on the Environment and Citizens' Advisory Committee on Environmental Quality

Ex. Ord. No. 11472, May 29, 1969, 34 F.R. 8693, as amended by Ex. Ord. No. 11514, Mar. 5, 1970, 35 F.R. 4247; Ex. Ord. No. 12007, Aug. 22, 1977, 42 F.R. 42839, provided:

By virtue of the authority vested in me as President of the United States, it is ordered as follows:

Part I--Cabinet Committee on the Environment

Section 101. Establishment of the Cabinet Committee. (a) There is hereby established the Cabinet Committee on the Environment (hereinafter referred to as ``the Cabinet Committee'').

(b) The President of the United States shall preside over meetings of the Cabinet Committee. The Vice President shall preside in the absence of the President.

(c) The Cabinet Committee shall be composed of the following members:

The Vice President of the United States
Secretary of Agriculture
Secretary of Commerce
Secretary of Health, Education, and Welfare
Secretary of Housing and Urban Development
Secretary of the Interior

Secretary of Transportation and such other heads of departments and agencies and others as the President may from time to time direct.

(d) Each member of the Cabinet Committee may designate an alternate, who shall serve as a member of the Cabinet Committee whenever the regular member is unable to attend any meeting of the Cabinet Committee.

(e) When matters which affect the interest of Federal agencies the heads of which are not members of the Cabinet Committee are to be considered by the Cabinet Committee, the President or his representative may invite such agency heads or their alternates to participate in the deliberations of the Cabinet Committee.

(f) The Director of the Bureau of the Budget [now the Director of the Office of Management and Budget], the Director of the Office of Science and Technology, the Chairman of the Council of Economic Advisers, and the Executive Secretary of the Council for Urban Affairs or their representatives may participate in the deliberations of the Cabinet Committee on the Environment as observers.

(g) The Chairman of the Council on Environmental Quality (established by Public Law 91-190) [this chapter] shall assist the President in directing the affairs of the Cabinet Committee.

Sec. 102. Functions of the Cabinet Committee. (a) The Cabinet Committee shall advise and assist the President with respect to environmental quality matters and shall perform such other related duties as the President may from time to time prescribe. In addition thereto, the Cabinet Committee is directed to:

(1) Recommend measures to ensure that Federal policies and programs, including those for development and conservation of natural resources, take adequate account of environmental effects.

(2) Review the adequacy of existing systems for monitoring and predicting environmental changes so as to achieve effective coverage and efficient use of facilities and other resources.

(3) Foster cooperation between the Federal Government, State and local governments, and private organizations in environmental programs.

(4) Seek advancement of scientific knowledge of changes in the environment and encourage the development of technology to prevent or minimize adverse effects that endanger man's health and well-being.

(5) Stimulate public and private participation in programs and activities to protect against pollution of the Nation's air, water, and land and its living resources.

(6) Encourage timely public disclosure by all levels of government and by private parties of plans that would affect the quality of environment.

(7) Assure assessment of new and changing technologies for their potential effects on the environment.

(8) Facilitate coordination among departments and agencies of the Federal Government in protecting and improving the environment.

(b) The Cabinet Committee shall review plans and actions of Federal agencies affecting outdoor recreation and natural beauty. The Cabinet Committee may conduct studies and make recommendations to the President on matters of policy in the fields of outdoor recreation and natural beauty. In carrying out the foregoing provisions of this subsection, the Cabinet Committee shall, as far as may be practical, advise Federal agencies with respect to the effect of their respective plans and programs on recreation and natural beauty, and may suggest to such agencies ways to accomplish the purposes of this order. For the purposes of this order, plans and programs may include, but are not limited to, those for or affecting: (1) Development, restoration, and preservation

of the beauty of the countryside, urban and suburban areas, water resources, wild rivers, scenic roads, parkways and highways, (2) the protection and appropriate management of scenic or primitive areas, natural wonders, historic sites, and recreation areas, (3) the management of Federal land and water resources, including fish and wildlife, to enhance natural beauty and recreational opportunities consistent with other essential uses, (4) cooperation with the States and their local subdivisions and private organizations and individuals in areas of mutual interest, (5) interstate arrangements, including Federal participation where authorized and necessary, and (6) leadership in a nationwide recreation and beautification effort.

Sec. 103. Coordination. The Secretary of the Interior may make available to the Cabinet Committee for coordination of outdoor recreation the authorities and resources available to him under the Act of May 28, 1963, 77 Stat. 49 [16 U.S.C. 4601 et seq.], to the extent permitted by law, he may make such authorities and resources available to the Cabinet Committee also for promoting such coordination of other matters assigned to the Cabinet Committee by this order.

Sec. 104. Assistance for the Cabinet Committee. In compliance with provisions of applicable law, and as necessary to serve the purposes of this order, (1) the Council on Environmental Quality (established by Public Law 91-190) [this chapter] shall provide or arrange for necessary administrative and staff services, support, and facilities for the Cabinet Committee, and (2) each department and agency which has membership on the Cabinet Committee under Section 101(c) hereof shall furnish the Cabinet Committee such information and other assistance as may be available.

Part II--Citizens' Advisory Committee on Environmental Quality

[Revoked. Ex. Ord. No. 12007, Aug. 22, 1977, 42 F.R. 42839.]

Part III--General Provisions

Sec. 301. Construction. Nothing in this order shall be construed as subjecting any department, establishment, or other instrumentality of the executive branch of the Federal Government or the head thereof, or any function vested by law in or assigned pursuant to law to any such agency or head, to the authority of any other such agency or head or as abrogating, modifying, or restricting any such function in any manner.

Sec. 302. Prior bodies and orders. The President's Council on Recreation and Natural Beauty and the Citizens' Advisory Committee on Recreation and Natural Beauty are hereby terminated and the following are revoked:

- (1) Executive Order No. 11278 of May 4, 1966.
- (2) Executive Order No. 11359A of June 29, 1967.
- (3) Executive Order No. 11402 of March 29, 1968.

Termination of Cabinet Committee on the Environment

The Cabinet Committee on the Environment was terminated and its functions transferred to the Domestic Council, see section 2(b) of Ex. Ord. No. 11541, eff. July 1, 1970, 35 F.R. 10737, set out as a note under section 501 of Title 31, Money and Finance.

The Domestic Council was abolished by Reorg. Plan No. 1 of 1977, Sec. 3, 42 F.R. 56101, 91 Stat. 1633, set out in the Appendix to Title 5, Government Organization and Employees, effective on or before Apr. 1,

1978, at such time as specified by the President. Section 5D of Reorg. Plan No. 1 of 1977 transferred all functions vested in the Domestic Council to the President with power to delegate the performance of such transferred functions within the Executive Office of the President.

Termination of Citizens' Advisory Committee on Environmental Quality

For provisions relating to termination of Citizens' Advisory Committee on Environmental Quality see Ex. Ord. No. 12007, Aug. 22, 1977, 42 F.R. 42839, set out as a note under section 14 of the Federal Advisory Committee Act in the Appendix to Title 5, Government Organization and Employees.

Ex. Ord. No. 11514. Protection and Enhancement of Environmental Quality

Ex. Ord. No. 11514, Mar. 5, 1970, 35 F.R. 4247, as amended by Ex. Ord. No. 11991, May 24, 1977, 42 F.R. 26967, provided:

By virtue of the authority vested in me as President of the United States and in furtherance of the purpose and policy of the National Environmental Policy Act of 1969 (Public Law No. 91-190, approved January 1, 1970) [this chapter], it is ordered as follows:

Section 1. Policy. The Federal Government shall provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life. Federal agencies shall initiate measures needed to direct their policies, plans and programs so as to meet national environmental goals. The Council on Environmental Quality, through the Chairman, shall advise and assist the President in leading this national effort.

Sec. 2. Responsibilities of Federal agencies. Consonant with Title I of the National Environmental Policy Act of 1969 [42 U.S.C. 4331 et seq.], hereafter referred to as the ``Act'', the heads of Federal agencies shall:

(a) Monitor, evaluate, and control on a continuing basis their agencies' activities so as to protect and enhance the quality of the environment. Such activities shall include those directed to controlling pollution and enhancing the environment and those designed to accomplish other program objectives which may affect the quality of the environment. Agencies shall develop programs and measures to protect and enhance environmental quality and shall assess progress in meeting the specific objectives of such activities. Heads of agencies shall consult with appropriate Federal, State and local agencies in carrying out their activities as they affect the quality of the environment.

(b) Develop procedures to ensure the fullest practicable provision of timely public information and understanding of Federal plans and programs with environmental impact in order to obtain the views of interested parties. These procedures shall include, whenever appropriate, provision for public hearings, and shall provide the public with relevant information, including information on alternative courses of action. Federal agencies shall also encourage State and local agencies to adopt similar procedures for informing the public concerning their activities affecting the quality of the environment.

(c) Insure that information regarding existing or potential environmental problems and control methods developed as part of research, development, demonstration, test, or evaluation activities is made available to Federal agencies, States, counties, municipalities, institutions, and other entities, as appropriate.

(d) Review their agencies' statutory authority, administrative

regulations, policies, and procedures, including those relating to loans, grants, contracts, leases, licenses, or permits, in order to identify any deficiencies or inconsistencies therein which prohibit or limit full compliance with the purposes and provisions of the Act. A report on this review and the corrective actions taken or planned, including such measures to be proposed to the President as may be necessary to bring their authority and policies into conformance with the intent, purposes, and procedures of the Act, shall be provided to the Council on Environmental Quality not later than September 1, 1970.

(e) Engage in exchange of data and research results, and cooperate with agencies of other governments to foster the purposes of the Act.

(f) Proceed, in coordination with other agencies, with actions required by section 102 of the Act [42 U.S.C. 4332].

(g) In carrying out their responsibilities under the Act and this Order, comply with the regulations issued by the Council except where such compliance would be inconsistent with statutory requirements.

Sec. 3. Responsibilities of Council on Environmental Quality. The Council on Environmental Quality shall:

(a) Evaluate existing and proposed policies and activities of the Federal Government directed to the control of pollution and the enhancement of the environment and to the accomplishment of other objectives which affect the quality of the environment. This shall include continuing review of procedures employed in the development and enforcement of Federal standards affecting environmental quality. Based upon such evaluations the Council shall, where appropriate, recommend to the President policies and programs to achieve more effective protection and enhancement of environmental quality and shall, where appropriate, seek resolution of significant environmental issues.

(b) Recommend to the President and to the agencies priorities among programs designed for the control of pollution and for enhancement of the environment.

(c) Determine the need for new policies and programs for dealing with environmental problems not being adequately addressed.

(d) Conduct, as it determines to be appropriate, public hearings or conferences on issues of environmental significance.

(e) Promote the development and use of indices and monitoring systems (1) to assess environmental conditions and trends, (2) to predict the environmental impact of proposed public and private actions, and (3) to determine the effectiveness of programs for protecting and enhancing environmental quality.

(f) Coordinate Federal programs related to environmental quality.

(g) Advise and assist the President and the agencies in achieving international cooperation for dealing with environmental problems, under the foreign policy guidance of the Secretary of State.

(h) Issue regulations to Federal agencies for the implementation of the procedural provisions of the Act (42 U.S.C. 4332(2)). Such regulations shall be developed after consultation with affected agencies and after such public hearings as may be appropriate. They will be designed to make the environmental impact statement process more useful to decisionmakers and the public; and to reduce paperwork and the accumulation of extraneous background data, in order to emphasize the need to focus on real environmental issues and alternatives. They will require impact statements to be concise, clear, and to the point, and supported by evidence that agencies have made the necessary environmental analyses. The Council shall include in its regulations procedures (1) for the early preparation of environmental impact statements, and (2) for the referral to the Council of conflicts between

agencies concerning the implementation of the National Environmental Policy Act of 1969, as amended [this chapter], and Section 309 of the Clean Air Act, as amended [42 U.S.C. 7609], for the Council's recommendation as to their prompt resolution.

(i) Issue such other instructions to agencies, and request such reports and other information from them, as may be required to carry out the Council's responsibilities under the Act.

(j) Assist the President in preparing the annual Environmental Quality Report provided for in section 201 of the Act [42 U.S.C. 4341].

(k) Foster investigations, studies, surveys, research, and analyses relating to (i) ecological systems and environmental quality, (ii) the impact of new and changing technologies thereon, and (iii) means of preventing or reducing adverse effects from such technologies.

Sec. 4. Amendments of E.O. 11472. Executive Order No. 11472 of May 29, 1969, including the heading thereof, is hereby amended:

(1) By substituting for the term "the Environmental Quality Council", wherever it occurs, the following: "the Cabinet Committee on the Environment".

(2) By substituting for the term "the Council", wherever it occurs, the following: "the Cabinet Committee".

(3) By inserting in subsection (f) of section 101, after "Budget", the following: "the Director of the Office of Science and Technology,".

(4) By substituting for subsection (g) of section 101 the following:
"(g) The Chairman of the Council on Environmental Quality (established by Public Law 91-190) [this chapter] shall assist the President in directing the affairs of the Cabinet Committee."

(5) By deleting subsection (c) of section 102.

(6) By substituting for "the Office of Science and Technology", in section 104, the following: "the Council on Environmental Quality (established by Public Law 91-190) [this chapter]".

(7) By substituting for "(hereinafter referred to as the 'Committee')", in section 201, the following: "(hereinafter referred to as the 'Citizens' Committee')".

(8) By substituting for the term "the Committee", wherever it occurs, the following: "the Citizens' Committee".

Ex. Ord. No. 11523. National Industrial Pollution Control Council

Ex. Ord. No. 11523, eff. Apr. 9, 1970, 35 F.R. 5993, provided:

By virtue of the authority vested in me as President of the United States, and in furtherance of the purpose and policy of the National Environmental Policy Act of 1969 (Public Law 91-190, approved January 1, 1970) [this chapter], it is ordered as follows:

Section 1. Establishment of the Council. (a) There is hereby established the National Industrial Pollution Control Council (hereinafter referred to as "the Industrial Council") which shall be composed of a Chairman, a Vice-chairman, and other representatives of business and industry appointed by the Secretary of Commerce (hereinafter referred to as "the Secretary").

(b) The Secretary, with the concurrence of the Chairman, shall appoint an Executive Director of the Industrial Council.

Sec. 2. Functions of the Industrial Council. The Industrial Council shall advise the President and the Chairman of the Council on Environmental Quality, through the Secretary, on programs of industry relating to the quality of the environment. In particular, the Industrial Council may--

(1) Survey and evaluate the plans and actions of industry in the field of environmental quality.

(2) Identify and examine problems of the effects on the environment of industrial practices and the needs of industry for improvements in the quality of the environment, and recommend solutions to those problems.

(3) Provide liaison among members of the business and industrial community on environmental quality matters.

(4) Encourage the business and industrial community to improve the quality of the environment.

(5) Advise on plans and actions of Federal, State, and local agencies involving environmental quality policies affecting industry which are referred to it by the Secretary, or by the Chairman of the Council on Environmental Quality through the Secretary.

Sec. 3. Subordinate Committees. The Industrial Council may establish, with the concurrence of the Secretary, such subordinate committees as it may deem appropriate to assist in the performance of its functions. Each subordinate committee shall be headed by a chairman appointed by the Chairman of the Industrial Council with the concurrence of the Secretary.

Sec. 4. Assistance for the Industrial Council. In compliance with applicable law, and as necessary to serve the purposes of this order, the Secretary shall provide or arrange for administrative and staff services, support, and facilities for the Industrial Council and any of its subordinate committees.

Sec. 5. Expenses. Members of the Industrial Council or any of its subordinate committees shall receive no compensation from the United States by reason of their services hereunder, but may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by law (5 U.S.C. 5703) for persons in the Government service employed intermittently.

Sec. 6. Regulations. The provisions of Executive Order No. 11007 of February 26, 1962 (3 CFR 573) [see 5 U.S.C. 901 note] prescribing regulations for the formation and use of advisory committees, are hereby made applicable to the Industrial Council and each of its subordinate committees. The Secretary may exercise the discretionary powers set forth in that order.

Sec. 7. Construction. Nothing in this order shall be construed as subjecting any Federal agency, or any function vested by law in, or assigned pursuant to law to, any Federal agency to the authority of any other Federal agency or of the Industrial Council or of any of its subordinate committees, or as abrogating or restricting any such function in any manner.

Richard Nixon.

Executive Order No. 11643

Ex. Ord. No. 11643, eff. Feb. 8, 1972, 37 F.R. 2875, as amended by Ex. Ord. No. 11870, eff. July 18, 1975, 40 F.R. 30611; Ex. Ord. No. 11917, eff. May 28, 1976, 41 F.R. 22239, which related to environmental safeguards on activities for animal damage control on Federal lands, was revoked by Ex. Ord. No. 12342, Jan. 27, 1982, 47 F.R. 4223.

Ex. Ord. No. 11644. Use of Off-Road Vehicles on Public Lands

Ex. Ord. No. 11644, Feb. 8, 1972, 37 F.R. 2877, as amended by Ex. Ord. No. 11989, May 24, 1977, 42 F.R. 26959; Ex. Ord. No. 12608, Sept.

9, 1987, 52 F.R. 34617, provided:

An estimated 5 million off-road recreational vehicles--motorcycles, minibikes, trail bikes, snowmobiles, dunebuggies, all-terrain vehicles, and others--are in use in the United States today, and their popularity continues to increase rapidly. The widespread use of such vehicles on the public lands--often for legitimate purposes but also in frequent conflict with wise land and resource management practices, environmental values, and other types of recreational activity--has demonstrated the need for a unified Federal policy toward the use of such vehicles on the public lands.

NOW, THEREFORE, by virtue of the authority vested in me as President of the United States by the Constitution of the United States and in furtherance of the purpose and policy of the National Environmental Policy Act of 1969 (42 U.S.C. 4321), it is hereby ordered as follows:

Section 1. Purpose. It is the purpose of this order to establish policies and provide for procedures that will ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

Sec. 2. Definitions. As used in this order, the term:

(1) "public lands" means (A) all lands under the custody and control of the Secretary of the Interior and the Secretary of Agriculture, except Indian lands, (B) lands under the custody and control of the Tennessee Valley Authority that are situated in western Kentucky and Tennessee and are designated as "Land Between the Lakes," and (C) lands under the custody and control of the Secretary of Defense;

(2) "respective agency head" means the Secretary of the Interior, the Secretary of Defense, the Secretary of Agriculture, and the Board of Directors of the Tennessee Valley Authority, with respect to public lands under the custody and control of each;

(3) "off-road vehicle" means any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain; except that such term excludes (A) any registered motorboat, (B) any fire, military, emergency or law enforcement vehicle when used for emergency purposes, and any combat or combat support vehicle when used for national defense purposes, and (C) any vehicle whose use is expressly authorized by the respective agency head under a permit, lease, license, or contract; and

(4) "official use" means use by an employee, agent, or designated representative of the Federal Government or one of its contractors in the course of his employment, agency, or representation.

Sec. 3. Zones of Use. (a) Each respective agency head shall develop and issue regulations and administrative instructions, within six months of the date of this order, to provide for administrative designation of the specific areas and trails on public lands on which the use of off-road vehicles may be permitted, and areas in which the use of off-road vehicles may not be permitted, and set a date by which such designation of all public lands shall be completed. Those regulations shall direct that the designation of such areas and trails will be based upon the protection of the resources of the public lands, promotion of the safety of all users of those lands, and minimization of conflicts among the various uses of those lands. The regulations shall further require that the designation of such areas and trails shall be in accordance with the following--

(1) Areas and trails shall be located to minimize damage to soil, watershed, vegetation, or other resources of the public lands.

(2) Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats.

(3) Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.

(4) Areas and trails shall not be located in officially designated Wilderness Areas or Primitive Areas. Areas and trails shall be located in areas of the National Park system, Natural Areas, or National Wildlife Refuges and Game Ranges only if the respective agency head determines that off-road vehicle use in such locations will not adversely affect their natural, aesthetic, or scenic values.

(b) The respective agency head shall ensure adequate opportunity for public participation in the promulgation of such regulations and in the designation of areas and trails under this section.

(c) The limitations on off-road vehicle use imposed under this section shall not apply to official use.

Sec. 4. Operating Conditions. Each respective agency head shall develop and publish, within one year of the date of this order, regulations prescribing operating conditions for off-road vehicles on the public lands. These regulations shall be directed at protecting resource values, preserving public health, safety, and welfare, and minimizing use conflicts.

Sec. 5. Public Information. The respective agency head shall ensure that areas and trails where off-road vehicle use is permitted are well marked and shall provide for the publication and distribution of information, including maps, describing such areas and trails and explaining the conditions on vehicle use. He shall seek cooperation of relevant State agencies in the dissemination of this information.

Sec. 6. Enforcement. The respective agency head shall, where authorized by law, prescribe appropriate penalties for violation of regulations adopted pursuant to this order, and shall establish procedures for the enforcement of those regulations. To the extent permitted by law, he may enter into agreements with State or local governmental agencies for cooperative enforcement of laws and regulations relating to off-road vehicle use.

Sec. 7. Consultation. Before issuing the regulations or administrative instructions required by this order or designating areas or trails are required by this order and those regulations and administrative instructions, the Secretary of the Interior shall, as appropriate, consult with the Secretary of Energy and the Nuclear Regulatory Commission.

Sec. 8. Monitoring of Effects and Review. (a) The respective agency head shall monitor the effects of the use of off-road vehicles on lands under their jurisdictions. On the basis of the information gathered, they shall from time to time amend or rescind designation of areas or other actions taken pursuant to this order as necessary to further the policy of this order.

(b) The Council on Environmental Quality shall maintain a continuing review of the implementation of this order.

Sec. 9. Special Protection of the Public Lands. (a) Notwithstanding the provisions of Section 3 of this Order, the respective agency head shall, whenever he determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands, immediately close

such areas or trails to the type of off-road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

(b) Each respective agency head is authorized to adopt the policy that portions of the public lands within his jurisdiction shall be closed to use by off-road vehicles except those areas or trails which are suitable and specifically designated as open to such use pursuant to Section 3 of this Order.

Executive Order No. 11987

Ex. Ord. No. 11987, May 24, 1977, 42 F.R. 26949, which directed executive agencies, and encouraged States, local governments, and private citizens, to restrict the introduction of exotic species into the natural ecosystems on lands and waters under their control, and which directed executive agencies to restrict the exportation of native species for introduction of such species into ecosystems outside the United States where they do not naturally occur, unless such introduction or exportation was found not to have an adverse effect on natural ecosystems, was revoked by Ex. Ord. No. 13112, Sec. 6(b), Feb. 3, 1999, 64 F.R. 6186, set out below.

Ex. Ord. No. 11988. Floodplain Management

Ex. Ord. No. 11988, May 24, 1977, 42 F.R. 26951, as amended by Ex. Ord. No. 12148, July 20, 1979, 44 F.R. 43239, provided:

By virtue of the authority vested in me by the Constitution and statutes of the United States of America, and as President of the United States of America, in furtherance of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), the National Flood Insurance Act of 1968, as amended (42 U.S.C. 4001 et seq.), and the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat. 975) [see Short Title of 1973 Amendment note set out under 42 U.S.C. 4001], in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative, it is hereby ordered as follows:

Section 1. Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Sec. 2. In carrying out the activities described in Section 1 of this Order, each agency has a responsibility to evaluate the potential effects of any actions it may take in a floodplain; to ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management; and to prescribe procedures to implement the policies and requirements of this Order, as follows:

(a)(1) Before taking an action, each agency shall determine whether the proposed action will occur in a floodplain--for major Federal

actions significantly affecting the quality of the human environment, the evaluation required below will be included in any statement prepared under Section 102(2)(C) of the National Environmental Policy Act [42 U.S.C. 4332(2)(C)]. This determination shall be made according to a Department of Housing and Urban Development (HUD) floodplain map or a more detailed map of an area, if available. If such maps are not available, the agency shall make a determination of the location of the floodplain based on the best available information. The Water Resources Council shall issue guidance on this information not later than October 1, 1977.

(2) If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative consistent with the law and with the policy set forth in this Order requires siting in a floodplain, the agency shall, prior to taking action, (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of this Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain.

(3) For programs subject to the Office of Management and Budget Circular A-95, the agency shall send the notice, not to exceed three pages in length including a location map, to the state and areawide A-95 clearinghouses for the geographic areas affected. The notice shall include: (i) the reasons why the action is proposed to be located in a floodplain; (ii) a statement indicating whether the action conforms to applicable state or local floodplain protection standards and (iii) a list of the alternatives considered. Agencies shall endeavor to allow a brief comment period prior to taking any action.

(4) Each agency shall also provide opportunity for early public review of any plans or proposals for actions in floodplains, in accordance with Section 2(b) of Executive Order No. 11514, as amended [set out above], including the development of procedures to accomplish this objective for Federal actions whose impact is not significant enough to require the preparation of an environmental impact statement under Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended [42 U.S.C. 4332(2)(C)].

(b) Any requests for new authorizations or appropriations transmitted to the Office of Management and Budget shall indicate, if an action to be proposed will be located in a floodplain, whether the proposed action is in accord with this Order.

(c) Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans and shall require land and water resources use appropriate to the degree of hazard involved. Agencies shall include adequate provision for the evaluation and consideration of flood hazards in the regulations and operating procedures for the licenses, permits, loan or grants-in-aid programs that they administer. Agencies shall also encourage and provide appropriate guidance to applicants to evaluate the effects of their proposals in floodplains prior to submitting applications for Federal licenses, permits, loans or grants.

(d) As allowed by law, each agency shall issue or amend existing regulations and procedures within one year to comply with this Order. These procedures shall incorporate the Unified National Program for Floodplain Management of the Water Resources Council, and shall explain the means that the agency will employ to pursue the nonhazardous use of

riverine, coastal and other floodplains in connection with the activities under its authority. To the extent possible, existing processes, such as those of the Council on Environmental Quality and the Water Resources Council, shall be utilized to fulfill the requirements of this Order. Agencies shall prepare their procedures in consultation with the Water Resources Council, the Director of the Federal Emergency Management Agency, and the Council on Environmental Quality, and shall update such procedures as necessary.

Sec. 3. In addition to the requirements of Section 2, agencies with responsibilities for Federal real property and facilities shall take the following measures:

(a) The regulations and procedures established under Section 2(d) of this Order shall, at a minimum, require the construction of Federal structures and facilities to be in accordance with the standards and criteria and to be consistent with the intent of those promulgated under the National Flood Insurance Program. They shall deviate only to the extent that the standards of the Flood Insurance Program are demonstrably inappropriate for a given type of structure or facility.

(b) If, after compliance with the requirements of this Order, new construction of structures or facilities are to be located in a floodplain, accepted floodproofing and other flood protection measures shall be applied to new construction or rehabilitation. To achieve flood protection, agencies shall, wherever practicable, elevate structures above the base flood level rather than filling in land.

(c) If property used by the general public has suffered flood damage or is located in an identified flood hazard area, the responsible agency shall provide on structures, and other places where appropriate, conspicuous delineation of past and probable flood height in order to enhance public awareness of and knowledge about flood hazards.

(d) When property in floodplains is proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties, the Federal agency shall (1) reference in the conveyance those uses that are restricted under identified Federal, State or local floodplain regulations; and (2) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successors, except where prohibited by law; or (3) withhold such properties from conveyance.

Sec. 4. In addition to any responsibilities under this Order and Sections 202 and 205 of the Flood Disaster Protection Act of 1973, as amended (42 U.S.C. 4106 and 4128), agencies which guarantee, approve, regulate, or insure any financial transaction which is related to an area located in a floodplain shall, prior to completing action on such transaction, inform any private parties participating in the transaction of the hazards of locating structures in the floodplain.

Sec. 5. The head of each agency shall submit a report to the Council on Environmental Quality and to the Water Resources Council on June 30, 1978, regarding the status of their procedures and the impact of this Order on the agency's operations. Thereafter, the Water Resources Council shall periodically evaluate agency procedures and their effectiveness.

Sec. 6. As used in this Order:

(a) The term "agency" shall have the same meaning as the term "Executive agency" in Section 105 of Title 5 of the United States Code and shall include the military departments; the directives contained in this Order, however, are meant to apply only to those agencies which perform the activities described in Section 1 which are located in or affecting floodplains.

(b) The term ``base flood'' shall mean that flood which has a one percent or greater chance of occurrence in any given year.

(c) The term ``floodplain'' shall mean the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Sec. 7. Executive Order No. 11296 of August 10, 1966, is hereby revoked. All actions, procedures, and issuances taken under that Order and still in effect shall remain in effect until modified by appropriate authority under the terms of this Order.

Sec. 8. Nothing in this Order shall apply to assistance provided for emergency work essential to save lives and protect property and public health and safety, performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974 (88 Stat. 148, 42 U.S.C. 5145 and 5146).

Sec. 9. To the extent the provisions of Section 2(a) of this Order are applicable to projects covered by Section 104(h) of the Housing and Community Development Act of 1974, as amended (88 Stat. 640, 42 U.S.C. 5304(h)), the responsibilities under those provisions may be assumed by the appropriate applicant, if the applicant has also assumed, with respect to such projects, all of the responsibilities for environmental review, decisionmaking, and action pursuant to the National Environmental Policy Act of 1969, as amended [42 U.S.C. 4321].

Jimmy Carter.

Ex. Ord. No. 11990. Protection of Wetlands

Ex. Ord. No. 11990, May 24, 1977, 42 F.R. 26961, as amended by Ex. Ord. No. 12608, Sept. 9, 1987, 52 F.R. 34617, provided:

By virtue of the authority vested in me by the Constitution and statutes of the United States of America, and as President of the United States of America, in furtherance of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), in order to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative, it is hereby ordered as follows:

Section 1. (a) Each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

(b) This Order does not apply to the issuance by Federal agencies of permits, licenses, or allocations to private parties for activities involving wetlands on non-Federal property.

Sec. 2. (a) In furtherance of Section 101(b)(3) of the National Environmental Policy Act of 1969 (42 U.S.C. 4331(b)(3)) to improve and coordinate Federal plans, functions, programs and resources to the end that the Nation may attain the widest range of beneficial uses of the environment without degradation and risk to health or safety, each agency, to the extent permitted by law, shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such construction, and (2) that the proposed action includes all

practicable measures to minimize harm to wetlands which may result from such use. In making this finding the head of the agency may take into account economic, environmental and other pertinent factors.

(b) Each agency shall also provide opportunity for early public review of any plans or proposals for new construction in wetlands, in accordance with Section 2(b) of Executive Order No. 11514, as amended [set out above], including the development of procedures to accomplish this objective for Federal actions whose impact is not significant enough to require the preparation of an environmental impact statement under Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended [42 U.S.C. 4332(2)(C)].

Sec. 3. Any requests for new authorizations or appropriations transmitted to the Office of Management and Budget shall indicate, if an action to be proposed will be located in wetlands, whether the proposed action is in accord with this Order.

Sec. 4. When Federally-owned wetlands or portions of wetlands are proposed for lease, easement, right-of-way or disposal to non-Federal public or private parties, the Federal agency shall (a) reference in the conveyance those uses that are restricted under identified Federal, State or local wetlands regulations; and (b) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successor, except where prohibited by law; or (c) withhold such properties from disposal.

Sec. 5. In carrying out the activities described in Section 1 of this Order, each agency shall consider factors relevant to a proposal's effect on the survival and quality of the wetlands. Among these factors are:

(a) public health, safety, and welfare, including water supply, quality, recharge and discharge; pollution; flood and storm hazards; and sediment and erosion;

(b) maintenance of natural systems, including conservation and long term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber resources; and

(c) other uses of wetlands in the public interest, including recreational, scientific, and cultural uses.

Sec. 6. As allowed by law, agencies shall issue or amend their existing procedures in order to comply with this Order. To the extent possible, existing processes, such as those of the Council on Environmental Quality, shall be utilized to fulfill the requirements of this Order.

Sec. 7. As used in this Order:

(a) The term "agency" shall have the same meaning as the term "Executive agency" in Section 105 of Title 5 of the United States Code and shall include the military departments; the directives contained in this Order, however, are meant to apply only to those agencies which perform the activities described in Section 1 which are located in or affecting wetlands.

(b) The term "new construction" shall include draining, dredging, channelizing, filling, diking, impounding, and related activities and any structures or facilities begun or authorized after the effective date of this Order.

(c) The term "wetlands" means those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include

swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds.

Sec. 8. This Order does not apply to projects presently under construction, or to projects for which all of the funds have been appropriated through Fiscal Year 1977, or to projects and programs for which a draft or final environmental impact statement will be filed prior to October 1, 1977. The provisions of Section 2 of this Order shall be implemented by each agency not later than October 1, 1977.

Sec. 9. Nothing in this Order shall apply to assistance provided for emergency work, essential to save lives and protect property and public health and safety, performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974 (88 Stat. 148, 42 U.S.C. 5145 and 5146).

Sec. 10. To the extent the provisions of Sections 2 and 5 of this Order are applicable to projects covered by Section 104(h) of the Housing and Community Development Act of 1974, as amended (88 Stat. 640, 42 U.S.C. 5304(h)), the responsibilities under those provisions may be assumed by the appropriate applicant, if the applicant has also assumed, with respect to such projects, all of the responsibilities for environmental review, decisionmaking, and action pursuant to the National Environmental Policy Act of 1969, as amended [42 U.S.C. 4321 et seq.].

Ex. Ord. No. 12088. Federal Compliance With Pollution Control Standards

Ex. Ord. No. 12088, Oct. 13, 1978, 43 F.R. 47707, as amended by Ex. Ord. No. 12580, Jan. 23, 1987, 52 F.R. 2928; Ex. Ord. No. 13148, Sec. 901, Apr. 21, 2000, 65 F.R. 24604, provided:

By the authority vested in me as President by the Constitution and statutes of the United States of America, including Section 22 of the Toxic Substances Control Act (15 U.S.C. 2621), Section 313 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1323), Section 1447 of the Public Health Service Act, as amended by the Safe Drinking Water Act [now Safe Drinking Water Act of 1974] (42 U.S.C. 300j-6), Section 118 of the Clean Air Act, as amended (42 U.S.C. 7418(b)), Section 4 of the Noise Control Act of 1972 (42 U.S.C. 4903), Section 6001 of the Solid Waste Disposal Act, as amended (42 U.S.C. 6961), and Section 301 of Title 3 of the United States Code, and to ensure Federal compliance with applicable pollution control standards, it is hereby ordered as follows:

1-1. Applicability of Pollution Control Standards

1-101. The head of each Executive agency is responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal facilities and activities under the control of the agency.

1-102. The head of each Executive agency is responsible for compliance with applicable pollution control standards, including those established pursuant to, but not limited to, the following:

- (a) Toxic Substances Control Act (15 U.S.C. 2601 et seq.).
- (b) Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.).
- (c) Public Health Service Act, as amended by the Safe Drinking Water Act [now Safe Drinking Water Act of 1974] (42 U.S.C. 300f et seq.).
- (d) Clean Air Act, as amended (42 U.S.C. 7401 et seq.).
- (e) Noise Control Act of 1972 (42 U.S.C. 4901 et seq.).
- (f) Solid Waste Disposal Act, as amended (42 U.S.C. 6901 et seq.).

(g) Radiation guidance pursuant to Section 274(h) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2021(h)); see also, the Radiation Protection Guidance to Federal Agencies for Diagnostic X Rays approved by the President on January 26, 1978 and published at page 4377 of the Federal Register on February 1, 1978).

(h) Marine Protection, Research, and Sanctuaries Act of 1972, as amended (33 U.S.C. 1401, 1402, 1411-1421, 1441-1444 and 16 U.S.C. 1431-1434) [16 U.S.C. 1431 et seq., 1447 et seq.; 33 U.S.C. 1401 et seq., 2801 et seq.].

(i) Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 136 et seq.).

1-103. ``Applicable pollution control standards'' means the same substantive, procedural, and other requirements that would apply to a private person.

1-2. Agency Coordination

1-201. Each Executive agency shall cooperate with the Administrator of the Environmental Protection Agency, hereinafter referred to as the Administrator, and State, interstate, and local agencies in the prevention, control, and abatement of environmental pollution.

1-202. Each Executive agency shall consult with the Administrator and with State, interstate, and local agencies concerning the best techniques and methods available for the prevention, control, and abatement of environmental pollution.

1-3. Technical Advice and Oversight

1-301. The Administrator shall provide technical advice and assistance to Executive agencies in order to ensure their cost effective and timely compliance with applicable pollution control standards.

1-302. The administrator shall conduct such reviews and inspections as may be necessary to monitor compliance with applicable pollution control standards by Federal facilities and activities.

1-4. Pollution Control Plan

[Revoked by Ex. Ord. No. 13148, Sec. 901, Apr. 21, 2000, 65 F.R. 24604.]

1-5. Funding

1-501. The head of each Executive agency shall ensure that sufficient funds for compliance with applicable pollution control standards are requested in the agency budget.

1-502. The head of each Executive agency shall ensure that funds appropriated and apportioned for the prevention, control and abatement of environmental pollution are not used for any other purpose unless permitted by law and specifically approved by the Office of Management and Budget.

1-6. Compliance With Pollution Controls

1-601. Whenever the Administrator or the appropriate State, interstate, or local agency notifies an Executive agency that it is in violation of an applicable pollution control standard (see Section 1-102 of this Order), the Executive agency shall promptly consult with the

notifying agency and provide for its approval a plan to achieve and maintain compliance with the applicable pollution control standard. This plan shall include an implementation schedule for coming into compliance as soon as practicable.

1-602. The Administrator shall make every effort to resolve conflicts regarding such violation between Executive agencies and, on request of any party, such conflicts between an Executive agency and a State, interstate, or a local agency. If the Administrator cannot resolve a conflict, the Administrator shall request the Director of the Office of Management and Budget to resolve the conflict.

1-603. The Director of the Office of Management and Budget shall consider unresolved conflicts at the request of the Administrator. The Director shall seek the Administrator's technological judgment and determination with regard to the applicability of statutes and regulations.

1-604. These conflict resolution procedures are in addition to, not in lieu of, other procedures, including sanctions, for the enforcement of applicable pollution control standards.

1-605. Except as expressly provided by a Presidential exemption under this Order, nothing in this Order, nor any action or inaction under this Order, shall be construed to revise or modify any applicable pollution control standard.

1-7. Limitation on Exemptions

1-701. Exemptions from applicable pollution control standards may only be granted under statutes cited in Section 1-102(a) through 1-102(f) if the President makes the required appropriate statutory determination: that such exemption is necessary (a) in the interest of national security, or (b) in the paramount interest of the United States.

1-702. The head of an Executive agency may, from time to time, recommend to the President through the Director of the Office of Management and Budget, that an activity or facility, or uses thereof, be exempt from an applicable pollution control standard.

1-703. The Administrator shall advise the President, through the Director of the Office of Management and Budget, whether he agrees or disagrees with a recommendation for exemption and his reasons therefor.

1-704. The Director of the Office of Management and Budget must advise the President within sixty days of receipt of the Administrator's views.

1-8. General Provisions

1-801. The head of each Executive agency that is responsible for the construction or operation of Federal facilities outside the United States shall ensure that such construction or operation complies with the environmental pollution control standards of general applicability in the host country or jurisdiction.

1-802. Nothing in this Order shall create any right or benefit, substantive or procedural, enforceable at law by a party against the United States, its agencies, its officers, or any person.

1-803. Executive Order No. 11752 of December 17, 1973, is revoked.

Ex. Ord. No. 12114. Environmental Effects Abroad of Major Federal Actions

Ex. Ord. No. 12114, Jan. 4, 1979, 44 F.R. 1957, provided:

By virtue of the authority vested in me by the Constitution and the laws of the United States, and as President of the United States, in order to further environmental objectives consistent with the foreign policy and national security policy of the United States, it is ordered as follows:

Section 1

1-1. Purpose and Scope. The purpose of this Executive Order is to enable responsible officials of Federal agencies having ultimate responsibility for authorizing and approving actions encompassed by this Order to be informed of pertinent environmental considerations and to take such considerations into account, with other pertinent considerations of national policy, in making decisions regarding such actions. While based on independent authority, this Order furthers the purpose of the National Environmental Policy Act [42 U.S.C. 4321 et seq.] and the Marine Protection Research and Sanctuaries Act [16 U.S.C. 1431 et seq. and 33 U.S.C. 1401 et seq.] and the Deepwater Port Act [33 U.S.C. 1501 et seq.] consistent with the foreign policy and national security policy of the United States, and represents the United States government's exclusive and complete determination of the procedural and other actions to be taken by Federal agencies to further the purpose of the National Environmental Policy Act, with respect to the environment outside the United States, its territories and possessions.

Section 2

2-1. Agency Procedures. Every Federal agency taking major Federal actions encompassed hereby and not exempted herefrom having significant effects on the environment outside the geographical borders of the United States and its territories and possessions shall within eight months after the effective date of this Order have in effect procedures to implement this Order. Agencies shall consult with the Department of State and the Council on Environmental Quality concerning such procedures prior to placing them in effect.

2-2. Information Exchange. To assist in effectuating the foregoing purpose, the Department of State and the Council on Environmental Quality in collaboration with other interested Federal agencies and other nations shall conduct a program for exchange on a continuing basis of information concerning the environment. The objectives of this program shall be to provide information for use by decisionmakers, to heighten awareness of and interest in environmental concerns and, as appropriate, to facilitate environmental cooperation with foreign nations.

2-3. Actions Included. Agencies in their procedures under Section 2-1 shall establish procedures by which their officers having ultimate responsibility for authorizing and approving actions in one of the following categories encompassed by this Order, take into consideration in making decisions concerning such actions, a document described in Section 2-4(a):

(a) major Federal actions significantly affecting the environment of the global commons outside the jurisdiction of any nation (e.g., the oceans or Antarctica);

(b) major Federal actions significantly affecting the environment of a foreign nation not participating with the United States and not otherwise involved in the action;

(c) major Federal actions significantly affecting the environment of

a foreign nation which provide to that nation:

(1) a product, or physical project producing a principal product or an emission or effluent, which is prohibited or strictly regulated by Federal law in the United States because its toxic effects on the environment create a serious public health risk; or

(2) a physical project which in the United States is prohibited or strictly regulated by Federal law to protect the environment against radioactive substances.

(d) major Federal actions outside the United States, its territories and possessions which significantly affect natural or ecological resources of global importance designated for protection under this subsection by the President, or, in the case of such a resource protected by international agreement binding on the United States, by the Secretary of State. Recommendations to the President under this subsection shall be accompanied by the views of the Council on Environmental Quality and the Secretary of State.

2-4. Applicable Procedures. (a) There are the following types of documents to be used in connection with actions described in Section 2-3:

(i) environmental impact statements (including generic, program and specific statements);

(ii) bilateral or multilateral environmental studies, relevant or related to the proposed action, by the United States and one [or more] more foreign nations, or by an international body or organization in which the United States is a member or participant; or

(iii) concise reviews of the environmental issues involved, including environmental assessments, summary environmental analyses or other appropriate documents.

(b) Agencies shall in their procedures provide for preparation of documents described in Section 2-4(a), with respect to actions described in Section 2-3, as follows:

(i) for effects described in Section 2-3(a), an environmental impact statement described in Section 2-4(a)(i);

(ii) for effects described in Section 2-3(b), a document described in Section 2-4(a)(ii) or (iii), as determined by the agency;

(iii) for effects described in Section 2-3(c), a document described in Section 2-4(a)(ii) or (iii), as determined by the agency;

(iv) for effects described in Section 2-3(d), a document described in Section 2-4(a)(i), (ii) or (iii), as determined by the agency.

Such procedures may provide that an agency need not prepare a new document when a document described in Section 2-4(a) already exists.

(c) Nothing in this Order shall serve to invalidate any existing regulations of any agency which have been adopted pursuant to court order or pursuant to judicial settlement of any case or to prevent any agency from providing in its procedures for measures in addition to those provided for herein to further the purpose of the National Environmental Policy Act [43 U.S.C. 4321 et seq.] and other environmental laws, including the Marine Protection Research and Sanctuaries Act [16 U.S.C. 1431 et seq. and 33 U.S.C. 1401 et seq.], and the Deepwater Port Act [33 U.S.C. 1501 et seq.], consistent with the foreign and national security policies of the United States.

(d) Except as provided in Section 2-5(b), agencies taking action encompassed by this Order shall, as soon as feasible, inform other Federal agencies with relevant expertise of the availability of environmental documents prepared under this Order.

Agencies in their procedures under Section 2-1 shall make appropriate provision for determining when an affected nation shall be

informed in accordance with Section 3-2 of this Order of the availability of environmental documents prepared pursuant to those procedures.

In order to avoid duplication of resources, agencies in their procedures shall provide for appropriate utilization of the resources of other Federal agencies with relevant environmental jurisdiction or expertise.

2-5. Exemptions and Considerations. (a) Notwithstanding Section 2-3, the following actions are exempt from this Order:

(i) actions not having a significant effect on the environment outside the United States as determined by the agency;

(ii) actions taken by the President;

(iii) actions taken by or pursuant to the direction of the President or Cabinet officer when the national security or interest is involved or when the action occurs in the course of an armed conflict;

(iv) intelligence activities and arms transfers;

(v) export licenses or permits or export approvals, and actions relating to nuclear activities except actions providing to a foreign nation a nuclear production or utilization facility as defined in the Atomic Energy Act of 1954 [42 U.S.C. 2011 et seq.], as amended, or a nuclear waste management facility;

(vi) votes and other actions in international conferences and organizations;

(vii) disaster and emergency relief action.

(b) Agency procedures under Section 2-1 implementing Section 2-4 may provide for appropriate modifications in the contents, timing and availability of documents to other affected Federal agencies and affected nations, where necessary to:

(i) enable the agency to decide and act promptly as and when required;

(ii) avoid adverse impacts on foreign relations or infringement in fact or appearance of other nations' sovereign responsibilities, or

(iii) ensure appropriate reflection of:

(1) diplomatic factors;

(2) international commercial, competitive and export promotion factors;

(3) needs for governmental or commercial confidentiality;

(4) national security considerations;

(5) difficulties of obtaining information and agency ability to analyze meaningfully environmental effects of a proposed action; and

(6) the degree to which the agency is involved in or able to affect a decision to be made.

(c) Agency procedure under Section 2-1 may provide for categorical exclusions and for such exemptions in addition to those specified in subsection (a) of this Section as may be necessary to meet emergency circumstances, situations involving exceptional foreign policy and national security sensitivities and other such special circumstances. In utilizing such additional exemptions agencies shall, as soon as feasible, consult with the Department of State and the Council on Environmental Quality.

(d) The provisions of Section 2-5 do not apply to actions described in Section 2-3(a) unless permitted by law.

Section 3

3-1. Rights of Action. This Order is solely for the purpose of establishing internal procedures for Federal agencies to consider the

significant effects of their actions on the environment outside the United States, its territories and possessions, and nothing in this Order shall be construed to create a cause of action.

3-2. Foreign Relations. The Department of State shall coordinate all communications by agencies with foreign governments concerning environmental agreements and other arrangements in implementation of this Order.

3-3. Multi-Agency Actions. Where more than one Federal agency is involved in an action or program, a lead agency, as determined by the agencies involved, shall have responsibility for implementation of this Order.

3-4. Certain Terms. For purposes of this Order, ``environment'' means the natural and physical environment and excludes social, economic and other environments; and an action significantly affects the environment if it does significant harm to the environment even though on balance the agency believes the action to be beneficial to the environment. The term ``export approvals'' in Section 2-5(a)(v) does not mean or include direct loans to finance exports.

3-5. Multiple Impacts. If a major Federal action having effects on the environment of the United States or the global commons requires preparation of an environmental impact statement, and if the action also has effects on the environment of a foreign nation, an environmental impact statement need not be prepared with respect to the effects on the environment of the foreign nation.

Jimmy Carter.

Executive Order No. 12194

Ex. Ord. No. 12194, Feb. 21, 1980, 45 F.R. 12209, which established the Radiation Policy Council and provided for its membership, functions, etc., was revoked by Ex. Ord. No. 12379, Sec. 23, Aug. 17, 1982, 47 F.R. 36100, set out as a note under section 14 of the Federal Advisory Committee Act in the Appendix to Title 5, Government Organization and Employees.

Executive Order No. 12737

Ex. Ord. No. 12737, Dec. 12, 1990, 55 F.R. 51681, which established President's Commission on Environmental Quality and provided for its functions and administration, was revoked by Ex. Ord. No. 12852, Sec. 4(c), June 29, 1993, 58 F.R. 35841, formerly set out below.

Ex. Ord. No. 12761. Establishment of President's Environment and Conservation Challenge Awards

Ex. Ord. No. 12761, May 21, 1991, 56 F.R. 23645, provided:

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to establish, in accordance with the goals and purposes of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), the Environmental Quality Improvement Act of 1970, as amended (42 U.S.C. 4371 et seq.), and the National Environmental Education Act, Public Law 101-619, 104 Stat. 3325 (1990) [20 U.S.C. 5501 et seq.], an awards program to raise environmental awareness and to recognize outstanding achievements in the United States and in its territories in the areas of conservation and environmental protection by both the public and private sectors, it is hereby ordered as follows:

Section 1. Establishment. The President's Environment and Conservation Challenge Awards program is established for the purposes of recognizing outstanding environmental achievements by U.S. citizens, enterprises, or programs; providing an incentive for environmental accomplishment; promoting cooperative partnerships between diverse groups working together to achieve common environmental goals; and identifying successful environmental programs that can be replicated.

Sec. 2. Administration. (a) The Council on Environmental Quality, with the assistance of the President's Commission on Environmental Quality, shall organize, manage, and administer the awards program, including the development of selection criteria, the nomination of eligible individuals to receive the award, and the selection of award recipients.

(b) Any expenses of the program shall be paid from funds available for the expenses of the Council on Environmental Quality.

Sec. 3. Awards. (a) Up to three awards in each of the following four categories shall be made annually to eligible individuals, organizations, groups, or entities:

(i) Quality Environmental Management Awards (incorporation of environmental concerns into management decisions and practices);

(ii) Partnership Awards (successful coalition building efforts);

(iii) Innovation Awards (innovative technology programs, products, or processes); and

(iv) Education and Communication Awards (education and information programs contributing to the development of an ethic fostering conservation and environmental protection).

(b) Presidential citations shall be given to eligible program finalists who demonstrate notable or unique achievements, but who are not selected to receive awards.

Sec. 4. Eligibility. Only residents of the United States and organizations, groups, or entities doing business in the United States are eligible to receive an award under this program. An award under this program shall be given only for achievements in the United States or its territories. Organizations, groups, or entities may be profit or nonprofit, public or private entities.

Sec. 5. Information System. The Council on Environmental Quality shall establish and maintain a data bank with information about award nominees to catalogue and publicize model conservation or environmental protection programs which could be replicated.

George Bush.

Executive Order No. 12852

Ex. Ord. No. 12852, June 29, 1993, 58 F.R. 35841, as amended by Ex. Ord. No. 12855, July 19, 1993, 58 F.R. 39107; Ex. Ord. No. 12965, June 27, 1995, 60 F.R. 34087; Ex. Ord. No. 12980, Nov. 17, 1995, 60 F.R. 57819; Ex. Ord. No. 13053, June 30, 1997, 62 F.R. 39945 [35945]; Ex. Ord. No. 13114, Feb. 25, 1999, 64 F.R. 10099, which established the President's Council on Sustainable Development, was revoked by Ex. Ord. No. 13138, Sec. 3(f), Sept. 30, 1999, 64 F.R. 53880, formerly set out as a note under section 14 of the Appendix to Title 5, Government Organization and Employees.

Ex. Ord. No. 12898. Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Ex. Ord. No. 12898, Feb. 11, 1994, 59 F.R. 7629, as amended by Ex.

Ord. No. 12948, Jan. 30, 1995, 60 F.R. 6381, provided:

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1-1. IMPLEMENTATION.

1-101. Agency Responsibilities. To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

1-102. Creation of an Interagency Working Group on Environmental Justice. (a) Within 3 months of the date of this order, the Administrator of the Environmental Protection Agency ("Administrator") or the Administrator's designee shall convene an interagency Federal Working Group on Environmental Justice ("Working Group"). The Working Group shall comprise the heads of the following executive agencies and offices, or their designees: (a) Department of Defense; (b) Department of Health and Human Services; (c) Department of Housing and Urban Development; (d) Department of Labor; (e) Department of Agriculture; (f) Department of Transportation; (g) Department of Justice; (h) Department of the Interior; (i) Department of Commerce; (j) Department of Energy; (k) Environmental Protection Agency; (l) Office of Management and Budget; (m) Office of Science and Technology Policy; (n) Office of the Deputy Assistant to the President for Environmental Policy; (o) Office of the Assistant to the President for Domestic Policy; (p) National Economic Council; (q) Council of Economic Advisers; and (r) such other Government officials as the President may designate. The Working Group shall report to the President through the Deputy Assistant to the President for Environmental Policy and the Assistant to the President for Domestic Policy.

(b) The Working Group shall: (1) provide guidance to Federal agencies on criteria for identifying disproportionately high and adverse human health or environmental effects on minority populations and low-income populations;

(2) coordinate with, provide guidance to, and serve as a clearinghouse for, each Federal agency as it develops an environmental justice strategy as required by section 1-103 of this order, in order to ensure that the administration, interpretation and enforcement of programs, activities and policies are undertaken in a consistent manner;

(3) assist in coordinating research by, and stimulating cooperation among, the Environmental Protection Agency, the Department of Health and Human Services, the Department of Housing and Urban Development, and other agencies conducting research or other activities in accordance with section 3-3 of this order;

(4) assist in coordinating data collection, required by this order;

(5) examine existing data and studies on environmental justice;

(6) hold public meetings as required in section 5-502(d) of this order; and

(7) develop interagency model projects on environmental justice that evidence cooperation among Federal agencies.

1-103. Development of Agency Strategies. (a) Except as provided in section 6-605 of this order, each Federal agency shall develop an

agency-wide environmental justice strategy, as set forth in subsections (b)-(e) of this section that identifies and addresses disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The environmental justice strategy shall list programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to, at a minimum: (1) promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations; (2) ensure greater public participation; (3) improve research and data collection relating to the health of and environment of minority populations and low-income populations; and (4) identify differential patterns of consumption of natural resources among minority populations and low-income populations. In addition, the environmental justice strategy shall include, where appropriate, a timetable for undertaking identified revisions and consideration of economic and social implications of the revisions.

(b) Within 4 months of the date of this order, each Federal agency shall identify an internal administrative process for developing its environmental justice strategy, and shall inform the Working Group of the process.

(c) Within 6 months of the date of this order, each Federal agency shall provide the Working Group with an outline of its proposed environmental justice strategy.

(d) Within 10 months of the date of this order, each Federal agency shall provide the Working Group with its proposed environmental justice strategy.

(e) By March 24, 1995, each Federal agency shall finalize its environmental justice strategy and provide a copy and written description of its strategy to the Working Group. From the date of this order through March 24, 1995, each Federal agency, as part of its environmental justice strategy, shall identify several specific projects that can be promptly undertaken to address particular concerns identified during the development of the proposed environmental justice strategy, and a schedule for implementing those projects.

(f) Within 24 months of the date of this order, each Federal agency shall report to the Working Group on its progress in implementing its agency-wide environmental justice strategy.

(g) Federal agencies shall provide additional periodic reports to the Working Group as requested by the Working Group.

1-104. Reports to the President. Within 14 months of the date of this order, the Working Group shall submit to the President, through the Office of the Deputy Assistant to the President for Environmental Policy and the Office of the Assistant to the President for Domestic Policy, a report that describes the implementation of this order, and includes the final environmental justice strategies described in section 1-103(e) of this order.

Sec. 2-2. FEDERAL AGENCY RESPONSIBILITIES FOR FEDERAL PROGRAMS. Each Federal agency shall conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin.

Sec. 3-3. RESEARCH, DATA COLLECTION, AND ANALYSIS.

3-301. Human Health and Environmental Research and Analysis. (a) Environmental human health research, whenever practicable and appropriate, shall include diverse segments of the population in epidemiological and clinical studies, including segments at high risk from environmental hazards, such as minority populations, low-income populations and workers who may be exposed to substantial environmental hazards.

(b) Environmental human health analyses, whenever practicable and appropriate, shall identify multiple and cumulative exposures.

(c) Federal agencies shall provide minority populations and low-income populations the opportunity to comment on the development and design of research strategies undertaken pursuant to this order.

3-302. Human Health and Environmental Data Collection and Analysis. To the extent permitted by existing law, including the Privacy Act, as amended (5 U.S.C. section 552a): (a) each Federal agency, whenever practicable and appropriate, shall collect, maintain, and analyze information assessing and comparing environmental and human health risks borne by populations identified by race, national origin, or income. To the extent practical and appropriate, Federal agencies shall use this information to determine whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations;

(b) In connection with the development and implementation of agency strategies in section 1-103 of this order, each Federal agency, whenever practicable and appropriate, shall collect, maintain and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have a substantial environmental, human health, or economic effect on the surrounding populations, when such facilities or sites become the subject of a substantial Federal environmental administrative or judicial action. Such information shall be made available to the public, unless prohibited by law; and

(c) Each Federal agency, whenever practicable and appropriate, shall collect, maintain, and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding Federal facilities that are: (1) subject to the reporting requirements under the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. section 11001-11050 as mandated in Executive Order No. 12856 [former 42 U.S.C. 11001 note]; and (2) expected to have a substantial environmental, human health, or economic effect on surrounding populations. Such information shall be made available to the public, unless prohibited by law.

(d) In carrying out the responsibilities in this section, each Federal agency, whenever practicable and appropriate, shall share information and eliminate unnecessary duplication of efforts through the use of existing data systems and cooperative agreements among Federal agencies and with State, local, and tribal governments.

Sec. 4-4. SUBSISTENCE CONSUMPTION OF FISH AND WILDLIFE.

4-401. Consumption Patterns. In order to assist in identifying the need for ensuring protection of populations with differential patterns of subsistence consumption of fish and wildlife, Federal agencies, whenever practicable and appropriate, shall collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. Federal agencies shall communicate to the public the risks of those consumption patterns.

4-402. Guidance. Federal agencies, whenever practicable and appropriate, shall work in a coordinated manner to publish guidance reflecting the latest scientific information available concerning methods for evaluating the human health risks associated with the consumption of pollutant-bearing fish or wildlife. Agencies shall consider such guidance in developing their policies and rules.

Sec. 5-5. PUBLIC PARTICIPATION AND ACCESS TO INFORMATION. (a) The public may submit recommendations to Federal agencies relating to the incorporation of environmental justice principles into Federal agency programs or policies. Each Federal agency shall convey such recommendations to the Working Group.

(b) Each Federal agency may, whenever practicable and appropriate, translate crucial public documents, notices, and hearings relating to human health or the environment for limited English speaking populations.

(c) Each Federal agency shall work to ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public.

(d) The Working Group shall hold public meetings, as appropriate, for the purpose of fact-finding, receiving public comments, and conducting inquiries concerning environmental justice. The Working Group shall prepare for public review a summary of the comments and recommendations discussed at the public meetings.

Sec. 6-6. GENERAL PROVISIONS.

6-601. Responsibility for Agency Implementation. The head of each Federal agency shall be responsible for ensuring compliance with this order. Each Federal agency shall conduct internal reviews and take such other steps as may be necessary to monitor compliance with this order.

6-602. Executive Order No. 12250. This Executive order is intended to supplement but not supersede Executive Order No. 12250 [42 U.S.C. 2000d-1 note], which requires consistent and effective implementation of various laws prohibiting discriminatory practices in programs receiving Federal financial assistance. Nothing herein shall limit the effect or mandate of Executive Order No. 12250.

6-603. Executive Order No. 12875. This Executive order is not intended to limit the effect or mandate of Executive Order No. 12875 [former 5 U.S.C. 601 note].

6-604. Scope. For purposes of this order, Federal agency means any agency on the Working Group, and such other agencies as may be designated by the President, that conducts any Federal program or activity that substantially affects human health or the environment. Independent agencies are requested to comply with the provisions of this order.

6-605. Petitions for Exemptions. The head of a Federal agency may petition the President for an exemption from the requirements of this order on the grounds that all or some of the petitioning agency's programs or activities should not be subject to the requirements of this order.

6-606. Native American Programs. Each Federal agency responsibility set forth under this order shall apply equally to Native American programs. In addition, the Department of the Interior, in coordination with the Working Group, and, after consultation with tribal leaders, shall coordinate steps to be taken pursuant to this order that address Federally-recognized Indian Tribes.

6-607. Costs. Unless otherwise provided by law, Federal agencies shall assume the financial costs of complying with this order.

6-608. General. Federal agencies shall implement this order

consistent with, and to the extent permitted by, existing law.

6-609. Judicial Review. This order is intended only to improve the internal management of the executive branch and is not intended to, nor does it create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any person. This order shall not be construed to create any right to judicial review involving the compliance or noncompliance of the United States, its agencies, its officers, or any other person with this order.

William J. Clinton.

Ex. Ord. No. 13045. Protection of Children From Environmental Health Risks and Safety Risks

Ex. Ord. No. 13045, Apr. 21, 1997, 62 F.R. 19885, as amended by Ex. Ord. No. 13229, Oct. 9, 2001, 66 F.R. 52013, provided:

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1. Policy.

1-101. A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves. Therefore, to the extent permitted by law and appropriate, and consistent with the agency's mission, each Federal agency:

(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and

(b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

1-102. Each independent regulatory agency is encouraged to participate in the implementation of this order and comply with its provisions.

Sec. 2. Definitions. The following definitions shall apply to this order.

2-201. ``Federal agency'' means any authority of the United States that is an agency under 44 U.S.C. 3502(1) other than those considered to be independent regulatory agencies under 44 U.S.C. 3502(5). For purposes of this order, ``military departments,'' as defined in 5 U.S.C. 102, are covered under the auspices of the Department of Defense.

2-202. ``Covered regulatory action'' means any substantive action in a rulemaking, initiated after the date of this order or for which a Notice of Proposed Rulemaking is published 1 year after the date of this order, that is likely to result in a rule that may:

(a) be ``economically significant'' under Executive Order 12866 [5 U.S.C. 601 note] (a rulemaking that has an annual effect on the economy of \$100 million or more or would adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities); and

(b) concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children.

2-203. ``Environmental health risks and safety risks'' mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breath, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to).

Sec. 3. Task Force on Environmental Health Risks and Safety Risks to Children.

3-301. There is hereby established the Task Force on Environmental Health Risks and Safety Risks to Children (``Task Force'').

3-302. The Task Force will report to the President in consultation with the Domestic Policy Council, the National Science and Technology Council, the Council on Environmental Quality, and the Office of Management and Budget (OMB).

3-303. Membership. The Task Force shall be composed of the:

(a) Secretary of Health and Human Services, who shall serve as a Co-Chair of the Council;

(b) Administrator of the Environmental Protection Agency, who shall serve as a Co-Chair of the Council;

(c) Secretary of Education;

(d) Secretary of Labor;

(e) Attorney General;

(f) Secretary of Energy;

(g) Secretary of Housing and Urban Development;

(h) Secretary of Agriculture;

(i) Secretary of Transportation;

(j) Director of the Office of Management and Budget;

(k) Chair of the Council on Environmental Quality;

(l) Chair of the Consumer Product Safety Commission;

(m) Assistant to the President for Economic Policy;

(n) Assistant to the President for Domestic Policy;

(o) Assistant to the President and Director of the Office of Science and Technology Policy;

(p) Chair of the Council of Economic Advisers; and

(q) Such other officials of executive departments and agencies as the President may, from time to time, designate.

Members of the Task Force may delegate their responsibilities under this order to subordinates.

3-304. Functions. The Task Force shall recommend to the President Federal strategies for children's environmental health and safety, within the limits of the Administration's budget, to include the following elements:

(a) statements of principles, general policy, and targeted annual priorities to guide the Federal approach to achieving the goals of this order;

(b) a coordinated research agenda for the Federal Government, including steps to implement the review of research databases described in section 4 of this order;

(c) recommendations for appropriate partnerships among Federal, State, local, and tribal governments and the private, academic, and nonprofit sectors;

(d) proposals to enhance public outreach and communication to assist families in evaluating risks to children and in making informed consumer choices;

(e) an identification of high-priority initiatives that the Federal Government has undertaken or will undertake in advancing protection of

children's environmental health and safety; and

(f) a statement regarding the desirability of new legislation to fulfill or promote the purposes of this order.

3-305. The Task Force shall prepare a biennial report on research, data, or other information that would enhance our ability to understand, analyze, and respond to environmental health risks and safety risks to children. For purposes of this report, cabinet agencies and other agencies identified by the Task Force shall identify and specifically describe for the Task Force key data needs related to environmental health risks and safety risks to children that have arisen in the course of the agency's programs and activities. The Task Force shall incorporate agency submissions into its report and ensure that this report is publicly available and widely disseminated. The Office of Science and Technology Policy and the National Science and Technology Council shall ensure that this report is fully considered in establishing research priorities.

3-306. The Task Force shall exist for 6 years from the date of this order. At least 6 months prior to the expiration of that period, the member agencies shall assess the need for continuation of the Task Force or its functions, and make appropriate recommendations to the President.

Sec. 4. Research Coordination and Integration.

4-401. Within 6 months of the date of this order, the Task Force shall develop or direct to be developed a review of existing and planned data resources and a proposed plan for ensuring that researchers and Federal research agencies have access to information on all research conducted or funded by the Federal Government that is related to adverse health risks in children resulting from exposure to environmental health risks or safety risks. The National Science and Technology Council shall review the plan.

4-402. The plan shall promote the sharing of information on academic and private research. It shall include recommendations to encourage that such data, to the extent permitted by law, is available to the public, the scientific and academic communities, and all Federal agencies.

Sec. 5. Agency Environmental Health Risk or Safety Risk Regulations.

5-501. For each covered regulatory action submitted to OMB's Office of Information and Regulatory Affairs (OIRA) for review pursuant to Executive Order 12866 [5 U.S.C. 601 note], the issuing agency shall provide to OIRA the following information developed as part of the agency's decisionmaking process, unless prohibited by law:

(a) an evaluation of the environmental health or safety effects of the planned regulation on children; and

(b) an explanation of why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the agency.

5-502. In emergency situations, or when an agency is obligated by law to act more quickly than normal review procedures allow, the agency shall comply with the provisions of this section to the extent practicable. For those covered regulatory actions that are governed by a court-imposed or statutory deadline, the agency shall, to the extent practicable, schedule any rulemaking proceedings so as to permit sufficient time for completing the analysis required by this section.

5-503. The analysis required by this section may be included as part of any other required analysis, and shall be made part of the administrative record for the covered regulatory action or otherwise made available to the public, to the extent permitted by law.

Sec. 6. Interagency Forum on Child and Family Statistics.

6-601. The Director of the OMB ('`Director'') shall convene an

Interagency Forum on Child and Family Statistics ('`Forum''), which will include representatives from the appropriate Federal statistics and research agencies. The Forum shall produce an annual compendium ('`Report'') of the most important indicators of the well-being of the Nation's children.

6-602. The Forum shall determine the indicators to be included in each Report and identify the sources of data to be used for each indicator. The Forum shall provide an ongoing review of Federal collection and dissemination of data on children and families, and shall make recommendations to improve the coverage and coordination of data collection and to reduce duplication and overlap.

6-603. The Report shall be published by the Forum in collaboration with the National Institute of Child Health and Human Development. The Forum shall present the first annual Report to the President, through the Director, by July 31, 1997. The Report shall be submitted annually thereafter, using the most recently available data.

Sec. 7. General Provisions.

7-701. This order is intended only for internal management of the executive branch. This order is not intended, and should not be construed to create, any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or its employees. This order shall not be construed to create any right to judicial review involving the compliance or noncompliance with this order by the United States, its agencies, its officers, or any other person.

7-702. Executive Order 12606 of September 2, 1987 is revoked.

Ex. Ord. No. 13061. Federal Support of Community Efforts Along American Heritage Rivers

Ex. Ord. No. 13061, Sept. 11, 1997, 62 F.R. 48445, as amended by Ex. Ord. No. 13093, July 27, 1998, 63 F.R. 40357, provided:

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Environmental Policy Act of 1969 (Public Law 91-190) [42 U.S.C. 4321 et seq.], and in order to protect and restore rivers and their adjacent communities, it is hereby ordered as follows:

Section 1. Policies.

(a) The American Heritage Rivers initiative has three objectives: natural resource and environmental protection, economic revitalization, and historic and cultural preservation.

(b) Executive agencies ('`agencies''), to the extent permitted by law and consistent with their missions and resources, shall coordinate Federal plans, functions, programs, and resources to preserve, protect, and restore rivers and their associated resources important to our history, culture, and natural heritage.

(c) Agencies shall develop plans to bring increased efficiencies to existing and authorized programs with goals that are supportive of protection and restoration of communities along rivers.

(d) In accordance with Executive Order 12630 [5 U.S.C. 601 note], agencies shall act with due regard for the protection of private property provided for by the Fifth Amendment to the United States Constitution. No new regulatory authority is created as a result of the American Heritage Rivers initiative. This initiative will not interfere with matters of State, local, and tribal government jurisdiction.

(e) In furtherance of these policies, the President will designate rivers that meet certain criteria as ``American Heritage Rivers.''

(f) It is the policy of the Federal Government that communities shall nominate rivers as American Heritage Rivers and the Federal role will be solely to support community-based efforts to preserve, protect, and restore these rivers and their communities.

(g) Agencies should, to the extent practicable, help identify resources in the private and nonprofit sectors to aid revitalization efforts.

(h) Agencies are encouraged, to the extent permitted by law, to develop partnerships with State, local, and tribal governments and community and nongovernmental organizations. Agencies will be responsive to the diverse needs of different kinds of communities from the core of our cities to remote rural areas and shall seek to ensure that the role played by the Federal Government is complementary to the plans and work being carried out by State, local, and tribal governments. To the extent possible, Federal resources will be strategically directed to complement resources being spent by these governments.

(i) Agencies shall establish a method for field offices to assess the success of the American Heritage River initiative and provide a means to recommend changes that will improve the delivery and accessibility of Federal services and programs. Agencies are directed, where appropriate, to reduce and make more flexible procedural requirements and paperwork related to providing assistance to communities along designated rivers.

(j) Agencies shall commit to a policy under which they will seek to ensure that their actions have a positive effect on the natural, historic, economic, and cultural resources of American Heritage River communities. The policy will require agencies to consult with American Heritage River communities early in the planning stages of Federal actions, take into account the communities' goals and objectives and ensure that actions are compatible with the overall character of these communities. Agencies shall seek to ensure that their help for one community does not adversely affect neighboring communities. Additionally, agencies are encouraged to develop formal and informal partnerships to assist communities. Local Federal facilities, to the extent permitted by law and consistent with the agencies' missions and resources, should provide public access, physical space, technical assistance, and other support for American Heritage River communities.

(k) In addition to providing support to designated rivers, agencies will work together to provide information and services to all communities seeking support.

Sec. 2. Process for Nominating an American Heritage River.

(a) Nomination. Communities, in coordination with their State, local, or tribal governments, can nominate their river, river stretch, or river confluence for designation as an American Heritage River. When several communities are involved in the nomination of the same river, nominations will detail the coordination among the interested communities and the role each will play in the process. Individuals living outside the community may not nominate a river.

(b) Selection Criteria. Nominations will be judged based on the following:

(1) the characteristics of the natural, economic, agricultural, scenic, historic, cultural, or recreational resources of the river that render it distinctive or unique;

(2) the effectiveness with which the community has defined its plan of action and the extent to which the plan addresses, either through planned actions or past accomplishments, all three American Heritage Rivers objectives, which are set forth in section 1(a) of this order;

(3) the strength and diversity of community support for the nomination as evidenced by letters from elected officials; landowners; private citizens; businesses; and especially State, local, and tribal governments. Broad community support is essential to receiving the American Heritage River designation; and

(4) willingness and capability of the community to forge partnerships and agreements to implement their plan to meet their goals and objectives.

(c) Recommendation Process.

The Chair of the Council on Environmental Quality ('`CEQ'') shall develop a fair and objective procedure to obtain the views of a diverse group of experts for the purpose of making recommendations to the President as to which rivers shall be designated. These experts shall reflect a variety of viewpoints, such as those representing natural, cultural, and historic resources; scenic, environmental, and recreation interests; tourism, transportation, and economic development interests; and industries such as agriculture, hydropower, manufacturing, mining, and forest management. The Chair of the CEQ will ensure that the rivers recommended represent a variety of stream sizes, diverse geographical locations, and a wide range of settings from urban to rural and ensure that relatively pristine, successful revitalization efforts are considered as well as degraded rivers in need of restoration.

(d) Designation.

(1) The President will designate certain rivers as American Heritage Rivers. Based on the receipt of a sufficient number of qualified nominations, up to 20 rivers will be designated in the first phase of the initiative.

(2) The Interagency Committee provided for in section 3 of this order shall develop a process by which any community that nominates and has its river designated may have this designation terminated at its request.

(3) Upon a determination by the Chair of the CEQ that a community has failed to implement its plan, the Chair may recommend to the President that a designation be revoked. The Chair shall notify the community at least 30 days prior to making such a recommendation to the President. Based on that recommendation, the President may revoke the designation.

Sec. 3. Establishment of an Interagency Committee. There is hereby established the American Heritage Rivers Interagency Committee ('`Committee''). The Committee shall have two co-chairs. The Chair of the CEQ shall be a permanent co-chair. The other co-chair will rotate among the heads of the agencies listed below.

(a) The Committee shall be composed of the following members or their designees at the Assistant Secretary level or equivalent:

- (1) The Secretary of Defense;
 - (2) The Attorney General;
 - (3) The Secretary of the Interior;
 - (4) The Secretary of Agriculture;
 - (5) The Secretary of Commerce;
 - (6) The Secretary of Housing and Urban Development;
 - (7) The Secretary of Transportation;
 - (8) The Secretary of Energy;
 - (9) The Administrator of the Environmental Protection Agency;
 - (10) The Chair of the Advisory Council on Historic Preservation;
 - (11) The Chairperson of the National Endowment for the Arts; and
 - (12) The Chairperson of the National Endowment for the Humanities.
- The Chair of the CEQ may invite to participate in meetings of the

Committee, representatives of other agencies, as appropriate.

(b) The Committee shall:

- (1) establish formal guidelines for designation as an American Heritage River;
- (2) periodically review the actions of agencies in support of the American Heritage Rivers;
- (3) report to the President on the progress, accomplishments, and effectiveness of the American Heritage Rivers initiative; and
- (4) perform other duties as directed by the Chair of the CEQ.

Sec. 4. Responsibilities of the Federal Agencies. Consistent with Title I of the National Environmental Policy Act of 1969 [42 U.S.C. 4331 et seq.], agencies shall:

- (a) identify their existing programs and plans that give them the authority to offer assistance to communities involved in river conservation and community health and revitalization;
- (b) to the extent practicable and permitted by law and regulation, refocus programs, grants, and technical assistance to provide support for communities adjacent to American Heritage Rivers;
- (c) identify all technical tools, including those developed for purposes other than river conservation, that can be applied to river protection, restoration, and community revitalization;
- (d) provide access to existing scientific data and information to the extent permitted by law and consistent with the agencies mission and resources;
- (e) cooperate with State, local, and tribal governments and communities with respect to their activities that take place in, or affect the area around, an American Heritage River;
- (f) commit to a policy, as set forth in section 1(j) of this order, in making decisions affecting the quality of an American Heritage River;
- (g) select from among all the agencies a single individual called the "River Navigator," for each river that is designated an American Heritage River, with whom the communities can communicate goals and needs and who will facilitate community-agency interchange;
- (h) allow public access to the river, for agencies with facilities along American Heritage Rivers, to the extent practicable and consistent with their mission; and
- (i) cooperate, as appropriate, with communities on projects that protect or preserve stretches of the river that are on Federal property or adjacent to a Federal facility.

Sec. 5. Responsibilities of the Committee and the Council on Environmental Quality. The CEQ shall serve as Executive agent for the Committee, and the CEQ and the Committee shall ensure the implementation of the policies and purposes of this initiative.

Sec. 6. Definition. For the purposes of this order, Executive agency means any agency on the Committee and such other agency as may be designated by the President.

Sec. 7. Judicial Review. This order does not create any right or benefit, substantive or procedural, enforceable by any party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

William J. Clinton.

Executive Order No. 13080

Ex. Ord. No. 13080, Apr. 7, 1998, 63 F.R. 17667, as amended by Ex. Ord. No. 13093, July 27, 1998, 63 F.R. 40357, which established the American Heritage Rivers Initiative Advisory Committee, was revoked by

Ex. Ord. No. 13225, Sec. 3(b), Sept. 28, 2001, 66 F.R. 50292, set out as a note under section 14 of the Federal Advisory Committee Act in the Appendix to Title 5, Government Organization and Employees.

Proc. No. 7112. Designation of American Heritage Rivers

Proc. No. 7112, July 30, 1998, 63 F.R. 41949, provided:

In celebration of America's rivers, and to recognize and reward grassroots efforts to restore them, last year I announced the American Heritage Rivers initiative. My goal was to help communities realize their visions for their rivers by making it easier for them to tap existing programs and resources of the Federal Government. From across the country, hundreds of communities answered my call for nominations, asking that their rivers be designated American Heritage Rivers. I applaud all of the communities that have drawn together and dedicated themselves to the goal of healthy rivers, now and forever.

Having reviewed the recommendations of the American Heritage Rivers Initiative Advisory Committee, I am pleased to be able to recognize a select group of rivers and communities that reflect the true diversity and splendor of America's natural endowment, and the tremendous energy and commitment of its citizenry.

Pursuant to Executive Orders 13061 [set out above], 13080, and 13093 [set out above], I hereby designate the following American Heritage Rivers:

- <bullet> The Blackstone and Woonasquatucket Rivers, in the States of Massachusetts and Rhode Island;
- <bullet> The Connecticut River, in the States of Connecticut, Massachusetts, New Hampshire, and Vermont;
- <bullet> The Cuyahoga River, in the State of Ohio;
- <bullet> The Detroit River, in the State of Michigan;
- <bullet> The Hanalei River, in the State of Hawaii;
- <bullet> The Hudson River, in the State of New York;
- <bullet> The Upper Mississippi River, in the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin;
- <bullet> The Lower Mississippi River, in the States of Louisiana and Tennessee;
- <bullet> The New River, in the States of North Carolina, Virginia, and West Virginia;
- <bullet> The Rio Grande, in the State of Texas;
- <bullet> The Potomac River, in the District of Columbia and the States of Maryland, Pennsylvania, Virginia, and West Virginia;
- <bullet> The St. Johns River, in the State of Florida;
- <bullet> The Upper Susquehanna and Lackawanna Rivers, in the State of Pennsylvania;
- <bullet> The Willamette River, in the State of Oregon.

IN WITNESS WHEREOF, I have hereunto set my hand this thirtieth day of July, in the year of our Lord nineteen hundred and ninety-eight, and of the Independence of the United States of America the two hundred and twenty-third.

William J. Clinton.

Ex. Ord. No. 13112. Invasive Species

Ex. Ord. No. 13112, Feb. 3, 1999, 64 F.R. 6183, provided:

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.),

Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 et seq.), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa et seq.), Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.), Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and other pertinent statutes, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause, it is ordered as follows:

Section 1. Definitions.

(a) ``Alien species'' means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

(b) ``Control'' means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of invasive species from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of invasive species and to prevent further invasions.

(c) ``Ecosystem'' means the complex of a community of organisms and its environment.

(d) ``Federal agency'' means an executive department or agency, but does not include independent establishments as defined by 5 U.S.C. 104.

(e) ``Introduction'' means the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

(f) ``Invasive species'' means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

(g) ``Native species'' means, with respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

(h) ``Species'' means a group of organisms all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.

(i) ``Stakeholders'' means, but is not limited to, State, tribal, and local government agencies, academic institutions, the scientific community, nongovernmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.

(j) ``United States'' means the 50 States, the District of Columbia, Puerto Rico, Guam, and all possessions, territories, and the territorial sea of the United States.

Sec. 2. Federal Agency Duties. (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,

(1) identify such actions;

(2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on

invasive species and the means to address them; and

(3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

(b) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Sec. 3. Invasive Species Council. (a) An Invasive Species Council (Council) is hereby established whose members shall include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council may invite additional Federal agency representatives to be members, including representatives from subcabinet bureaus or offices with significant responsibilities concerning invasive species, and may prescribe special procedures for their participation. The Secretary of the Interior shall, with concurrence of the Co-Chairs, appoint an Executive Director of the Council and shall provide the staff and administrative support for the Council.

(b) The Secretary of the Interior shall establish an advisory committee under the Federal Advisory Committee Act, 5 U.S.C. App., to provide information and advice for consideration by the Council, and shall, after consultation with other members of the Council, appoint members of the advisory committee representing stakeholders. Among other things, the advisory committee shall recommend plans and actions at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order. The advisory committee shall act in cooperation with stakeholders and existing organizations addressing invasive species. The Department of the Interior shall provide the administrative and financial support for the advisory committee.

Sec. 4. Duties of the Invasive Species Council. The Invasive Species Council shall provide national leadership regarding invasive species, and shall:

(a) oversee the implementation of this order and see that the Federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, relying to the extent feasible and appropriate on existing organizations addressing invasive species, such as the Aquatic Nuisance Species Task Force, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, and the Committee on Environment and Natural Resources;

(b) encourage planning and action at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order, in cooperation with stakeholders and existing organizations addressing invasive species;

(c) develop recommendations for international cooperation in

addressing invasive species;

(d) develop, in consultation with the Council on Environmental Quality, guidance to Federal agencies pursuant to the National Environmental Policy Act on prevention and control of invasive species, including the procurement, use, and maintenance of native species as they affect invasive species;

(e) facilitate development of a coordinated network among Federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health;

(f) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, to the greatest extent practicable, the Internet; this system shall facilitate access to and exchange of information concerning invasive species, including, but not limited to, information on distribution and abundance of invasive species; life histories of such species and invasive characteristics; economic, environmental, and human health impacts; management techniques, and laws and programs for management, research, and public education; and

(g) prepare and issue a national Invasive Species Management Plan as set forth in section 5 of this order.

Sec. 5. Invasive Species Management Plan. (a) Within 18 months after issuance of this order, the Council shall prepare and issue the first edition of a National Invasive Species Management Plan (Management Plan), which shall detail and recommend performance-oriented goals and objectives and specific measures of success for Federal agency efforts concerning invasive species. The Management Plan shall recommend specific objectives and measures for carrying out each of the Federal agency duties established in section 2(a) of this order and shall set forth steps to be taken by the Council to carry out the duties assigned to it under section 4 of this order. The Management Plan shall be developed through a public process and in consultation with Federal agencies and stakeholders.

(b) The first edition of the Management Plan shall include a review of existing and prospective approaches and authorities for preventing the introduction and spread of invasive species, including those for identifying pathways by which invasive species are introduced and for minimizing the risk of introductions via those pathways, and shall identify research needs and recommend measures to minimize the risk that introductions will occur. Such recommended measures shall provide for a science-based process to evaluate risks associated with introduction and spread of invasive species and a coordinated and systematic risk-based process to identify, monitor, and interdict pathways that may be involved in the introduction of invasive species. If recommended measures are not authorized by current law, the Council shall develop and recommend to the President through its Co-Chairs legislative proposals for necessary changes in authority.

(c) The Council shall update the Management Plan biennially and shall concurrently evaluate and report on success in achieving the goals and objectives set forth in the Management Plan. The Management Plan shall identify the personnel, other resources, and additional levels of coordination needed to achieve the Management Plan's identified goals and objectives, and the Council shall provide each edition of the Management Plan and each report on it to the Office of Management and Budget. Within 18 months after measures have been recommended by the Council in any edition of the Management Plan, each Federal agency whose action is required to implement such measures shall either take the action recommended or shall provide the Council with an explanation of

why the action is not feasible. The Council shall assess the effectiveness of this order no less than once each 5 years after the order is issued and shall report to the Office of Management and Budget on whether the order should be revised.

Sec. 6. Judicial Review and Administration. (a) This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any other person.

(b) Executive Order 11987 of May 24, 1977, is hereby revoked.

(c) The requirements of this order do not affect the obligations of Federal agencies under 16 U.S.C. 4713 with respect to ballast water programs.

(d) The requirements of section 2(a)(3) of this order shall not apply to any action of the Department of State or Department of Defense if the Secretary of State or the Secretary of Defense finds that exemption from such requirements is necessary for foreign policy or national security reasons.

William J. Clinton.

Ex. Ord. No. 13148. Greening the Government Through Leadership in
Environmental Management

Ex. Ord. No. 13148, Apr. 21, 2000, 65 F.R. 24595, provided:

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. 11001-11050) (EPCRA), the Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109) (PPA), the Clean Air Act (42 U.S.C. 7401-7671q) (CAA), and section 301 of title 3, United States Code, it is hereby ordered as follows:

PART 1--PREAMBLE

Section 101. Federal Environmental Leadership. The head of each Federal agency is responsible for ensuring that all necessary actions are taken to integrate environmental accountability into agency day-to-day decisionmaking and long-term planning processes, across all agency missions, activities, and functions. Consequently, environmental management considerations must be a fundamental and integral component of Federal Government policies, operations, planning, and management. The head of each Federal agency is responsible for meeting the goals and requirements of this order.

PART 2--GOALS

Sec. 201. Environmental Management. Through development and implementation of environmental management systems, each agency shall ensure that strategies are established to support environmental leadership programs, policies, and procedures and that agency senior level managers explicitly and actively endorse these strategies.

Sec. 202. Environmental Compliance. Each agency shall comply with environmental regulations by establishing and implementing environmental compliance audit programs and policies that emphasize pollution prevention as a means to both achieve and maintain environmental compliance.

Sec. 203. Right-to-Know and Pollution Prevention. Through timely

planning and reporting under the EPCRA, Federal facilities shall be leaders and responsible members of their communities by informing the public and their workers of possible sources of pollution resulting from facility operations. Each agency shall strive to reduce or eliminate harm to human health and the environment from releases of pollutants to the environment. Each agency shall advance the national policy that, whenever feasible and cost-effective, pollution should be prevented or reduced at the source. Funding for regulatory compliance programs shall emphasize pollution prevention as a means to address environmental compliance.

Sec. 204. Release Reduction: Toxic Chemicals. Through innovative pollution prevention, effective facility management, and sound acquisition and procurement practices, each agency shall reduce its reported Toxic Release Inventory (TRI) releases and off-site transfers of toxic chemicals for treatment and disposal by 10 percent annually, or by 40 percent overall by December 31, 2006.

Sec. 205. Use Reduction: Toxic Chemicals and Hazardous Substances and Other Pollutants. Through identification of proven substitutes and established facility management practices, including pollution prevention, each agency shall reduce its use of selected toxic chemicals, hazardous substances, and pollutants, or its generation of hazardous and radioactive waste types at its facilities by 50 percent by December 31, 2006. If an agency is unable to reduce the use of selected chemicals, that agency will reduce the use of selected hazardous substances or its generation of other pollutants, such as hazardous and radioactive waste types, at its facilities by 50 percent by December 31, 2006.

Sec. 206. Reductions in Ozone-Depleting Substances. Through evaluating present and future uses of ozone-depleting substances and maximizing the purchase and the use of safe, cost effective, and environmentally preferable alternatives, each agency shall develop a plan to phase out the procurement of Class I ozone-depleting substances for all nonexcepted uses by December 31, 2010.

Sec. 207. Environmentally and Economically Beneficial Landscaping. Each agency shall strive to promote the sustainable management of Federal facility lands through the implementation of cost-effective, environmentally sound landscaping practices, and programs to reduce adverse impacts to the natural environment.

PART 3--PLANNING AND ACCOUNTABILITY

Sec. 301. Annual Budget Submission. Federal agencies shall place high priority on obtaining funding and resources needed for implementation of the Greening the Government Executive Orders, including funding to address findings and recommendations from environmental management system audits or facility compliance audits conducted under sections 401 and 402 of this order. Federal agencies shall make such requests as required in Office of Management and Budget (OMB) Circular A-11.

Sec. 302. Application of Life Cycle Assessment Concepts. Each agency with facilities shall establish a pilot program to apply life cycle assessment and environmental cost accounting principles. To the maximum extent feasible and cost-effective, agencies shall apply those principles elsewhere in the agency to meet the goals and requirements of this order. Such analysis shall be considered in the process established in the OMB Capital Programming Guide and OMB Circular A-11. The Environmental Protection Agency (**EPA**), in coordination with the

Workgroup established in section 306 of this order, shall, to the extent feasible, assist agencies in identifying, applying, and developing tools that reflect life cycle assessment and environmental cost accounting principles and provide technical assistance to agencies in developing life cycle assessments and environmental cost accounting assessments under this Part.

Sec. 303. Pollution Prevention to Address Compliance. Each agency shall ensure that its environmental regulatory compliance funding policies promote the use of pollution prevention to achieve and maintain environmental compliance at the agency's facilities. Agencies shall adopt a policy to preferentially use pollution prevention projects and activities to correct and prevent noncompliance with environmental regulatory requirements. Agency funding requests for facility compliance with Federal, State, and local environmental regulatory requirements shall emphasize pollution prevention through source reduction as the means of first choice to ensure compliance, with reuse and recycling alternatives having second priority as a means of compliance.

Sec. 304. Pollution Prevention Return-on-Investment Programs. Each agency shall develop and implement a pollution prevention program at its facilities that compares the life cycle costs of treatment and/or disposal of waste and pollutant streams to the life cycle costs of alternatives that eliminate or reduce toxic chemicals or pollutants at the source. Each agency shall implement those projects that are life-cycle cost-effective, or otherwise offer substantial environmental or economic benefits.

Sec. 305. Policies, Strategies, and Plans.

(a) Within 12 months of the date of this order, each agency shall ensure that the goals and requirements of this order are incorporated into existing agency environmental directives, policies, and documents affected by the requirements and goals of this order. Where such directives and policies do not already exist, each agency shall, within 12 months of the date of this order, prepare and endorse a written agency environmental management strategy to achieve the requirements and goals of this order. Agency preparation of directives, policies, and documents shall reflect the nature, scale, and environmental impacts of the agency's activities, products, or services. Agencies are encouraged to include elements of relevant agency policies or strategies developed under this part in agency planning documents prepared under the Government Performance and Results Act of 1993, Public Law 103-62 [see Short Title of 1993 Amendment note set out under 31 U.S.C. 1101].

(b) By March 31, 2002, each agency shall ensure that its facilities develop a written plan that sets forth the facility's contribution to the goals and requirements established in this order. The plan should reflect the size and complexity of the facility. Where pollution prevention plans or other formal environmental planning instruments have been prepared for agency facilities, an agency may elect to update those plans to meet the requirements and goals of this section.

(c) The Federal Acquisition Regulation (FAR) Council shall develop acquisition policies and procedures for contractors to supply agencies with all information necessary for compliance with this order. Once the appropriate FAR clauses have been published, agencies shall use them in all applicable contracts. In addition, to the extent that compliance with this order is made more difficult due to lack of information from existing contractors, or concessioners, each agency shall take practical steps to obtain the information needed to comply with this order from such contractors or concessioners.

Sec. 306. Interagency Environmental Leadership Workgroup. Within 4

months of the date of this order, **EPA** shall convene and chair an Interagency Environmental Leadership Workgroup (the Workgroup) with senior-level representatives from all executive agencies and other interested independent Government agencies affected by this order. The Workgroup shall develop policies and guidance required by this order and member agencies shall facilitate implementation of the requirements of this order in their respective agencies. Workgroup members shall coordinate with their Agency Environmental Executive (AEE) designated under section 301(d) of Executive Order 13101 [42 U.S.C. 6961 note] and may request the assistance of their AEE in resolving issues that may arise among members in developing policies and guidance related to this order. If the AEEs are unable to resolve the issues, they may request the assistance of the Chair of the Council on Environmental Quality (CEQ).

Sec. 307. Annual Reports. Each agency shall submit an annual progress report to the Administrator on implementation of this order. The reports shall include a description of the progress that the agency has made in complying with all aspects of this order, including, but not limited to, progress in achieving the reduction goals in sections 502, 503, and 505 of this order. Each agency may prepare and submit the annual report in electronic format. A copy of the report shall be submitted to the Federal Environmental Executive (FEE) by **EPA** for use in the biennial Greening the Government Report to the President prepared in accordance with Executive Order 13101 [42 U.S.C. 6961 note]. Within 9 months of the date of this order, **EPA**, in coordination with the Workgroup established under section 306 of this order, shall prepare guidance regarding the information and timing for the annual report. The Workgroup shall coordinate with those agencies responsible for Federal agency reporting guidance under the Greening the Government Executive orders to streamline reporting requirements and reduce agency and facility-level reporting burdens. The first annual report shall cover calendar year 2000 activities.

PART 4--PROMOTING ENVIRONMENTAL MANAGEMENT AND LEADERSHIP

Sec. 401. Agency and Facility Environmental Management Systems. To attain the goals of section 201 of this order:

(a) Within 18 months of the date of this order, each agency shall conduct an agency-level environmental management system self assessment based on the Code of Environmental Management Principles for Federal Agencies developed by the **EPA** (61 Fed. Reg. 54062) and/or another appropriate environmental management system framework. Each assessment shall include a review of agency environmental leadership goals, objectives, and targets. Where appropriate, the assessments may be conducted at the service, bureau, or other comparable level.

(b) Within 24 months of the date of this order, each agency shall implement environmental management systems through pilot projects at selected agency facilities based on the Code of Environmental Management Principles for Federal Agencies and/or another appropriate environmental management system framework. By December 31, 2005, each agency shall implement an environmental management system at all appropriate agency facilities based on facility size, complexity, and the environmental aspects of facility operations. The facility environmental management system shall include measurable environmental goals, objectives, and targets that are reviewed and updated annually. Once established, environmental management system performance measures shall be incorporated in agency facility audit protocols.

Sec. 402. Facility Compliance Audits. To attain the goals of section 202 of this order:

(a) Within 12 months of the date of this order, each agency that does not have an established regulatory environmental compliance audit program shall develop and implement a program to conduct facility environmental compliance audits and begin auditing at its facilities within 6 months of the development of that program.

(b) An agency with an established regulatory environmental compliance audit program may elect to conduct environmental management system audits in lieu of regulatory environmental compliance audits at selected facilities.

(c) Facility environmental audits shall be conducted periodically. Each agency is encouraged to conduct audits not less than every 3 years from the date of the initial or previous audit. The scope and frequency of audits shall be based on facility size, complexity, and the environmental aspects of facility operations. As appropriate, each agency shall include tenant, contractor, and concessioner activities in facility audits.

(d) Each agency shall conduct internal reviews and audits and shall take such other steps, as may be necessary, to monitor its facilities' compliance with sections 501 and 504 of this order.

(e) Each agency shall consider findings from the assessments or audits conducted under Part 4 in program planning under section 301 of this order and in the preparation and revisions to facility plans prepared under section 305 of this order.

(f) Upon request and to the extent practicable, the **EPA** shall provide technical assistance in meeting the requirements of Part 4 by conducting environmental management reviews at Federal facilities and developing policies and guidance for conducting environmental compliance audits and implementing environmental management systems at Federal facilities.

Sec. 403. Environmental Leadership and Agency Awards Programs.

(a) Within 12 months of the date of this order, the Administrator shall establish a Federal Government environmental leadership program to promote and recognize outstanding environmental management performance in agencies and facilities.

(b) Each agency shall develop an internal agency-wide awards program to reward and highlight innovative programs and individuals showing outstanding environmental leadership in implementing this order. In addition, based upon criteria developed by the **EPA** in coordination with the Workgroup established in section 306 of this order, Federal employees who demonstrate outstanding leadership in implementation of this order may be considered for recognition under the White House awards program set forth in section 803 of Executive Order 13101 of September 14, 1998 [42 U.S.C. 6961 note].

Sec. 404. Management Leadership and Performance Evaluations.

(a) To ensure awareness of and support for the environmental requirements of this order, each agency shall include training on the provisions of the Greening the Government Executive orders in standard senior level management training as well as training for program managers, contracting personnel, procurement and acquisition personnel, facility managers, contractors, concessioners, and other personnel as appropriate. In coordination with the Workgroup established under section 306 of this order, the **EPA** shall prepare guidance on implementation of this section.

(b) To recognize and reinforce the responsibilities of facility and senior headquarters program managers, regional environmental

coordinators and officers, their superiors, and, to the extent practicable and appropriate, others vital to the implementation of this order, each agency shall include successful implementation of pollution prevention, community awareness, and environmental management into its position descriptions and performance evaluations for those positions.

Sec. 405. Compliance Assistance.

(a) Upon request and to the extent practicable, the **EPA** shall provide technical advice and assistance to agencies to foster full compliance with environmental regulations and all aspects of this order.

(b) Within 12 months of the date of this order, the **EPA** shall develop a compliance assistance center to provide technical assistance for Federal facility compliance with environmental regulations and all aspects of this order.

(c) To enhance landscaping options and awareness, the United States Department of Agriculture (USDA) shall provide information on the suitability, propagation, and the use of native plants for landscaping to all agencies and the general public by USDA in conjunction with the center under subsection (b) of this section. In implementing Part 6 of this order, agencies are encouraged to develop model demonstration programs in coordination with the USDA.

Sec. 406. Compliance Assurance.

(a) In consultation with other agencies, the **EPA** may conduct such reviews and inspections as may be necessary to monitor compliance with sections 501 and 504 of this order. Each agency is encouraged to cooperate fully with the efforts of the **EPA** to ensure compliance with those sections.

(b) Whenever the Administrator notifies an agency that it is not in compliance with section 501 or 504 of this order, the agency shall provide the **EPA** a detailed plan for achieving compliance as promptly as practicable.

(c) The Administrator shall report annually to the President and the public on agency compliance with the provisions of sections 501 and 504 of this order.

Sec. 407. Improving Environmental Management. To ensure that government-wide goals for pollution prevention are advanced, each agency is encouraged to incorporate its environmental leadership goals into its Strategic and Annual Performance Plans required by the Government Performance and Results Act of 1993, Public Law 103-62 [see Short Title of 1993 Amendment note set out under 31 U.S.C. 1101], starting with performance plans accompanying the FY 2002 budget.

PART 5--EMERGENCY PLANNING, COMMUNITY RIGHT-TO-KNOW, AND
POLLUTION PREVENTION

Sec. 501. Toxics Release Inventory/Pollution Prevention Act Reporting. To attain the goals of section 203 of this order:

(a) Each agency shall comply with the provisions set forth in section 313 of EPCRA [42 U.S.C. 11023], section 6607 of PPA [42 U.S.C. 13106], all implementing regulations, and future amendments to these authorities, in light of applicable **EPA** guidance.

(b) Each agency shall comply with these provisions without regard to the Standard Industrial Classification (SIC) or North American Industrial Classification System (NAICS) delineations. Except as described in subsection (d) of this section, all other existing statutory or regulatory limitations or exemptions on the application of EPCRA section 313 to specific activities at specific agency facilities apply to the reporting requirements set forth in subsection (a) of this

section.

(c) Each agency required to report under subsection (a) of this section shall do so using electronic reporting as provided in **EPA's** EPCRA section 313 guidance.

(d) Within 12 months of the date of this order, the Administrator shall review the impact on reporting of existing regulatory exemptions on the application of EPCRA section 313 at Federal facilities. Where feasible, this review shall include pilot studies at Federal facilities. If the review indicates that application of existing exemptions to Federal Government reporting under this section precludes public reporting of substantial amounts of toxic chemicals under subsection 501(a), the **EPA** shall prepare guidance, in coordination with the Workgroup established under section 306 of this order, clarifying application of the exemptions at Federal facilities. In developing the guidance, the **EPA** should consider similar application of such regulatory limitations and exemptions by the private sector. To the extent feasible, the guidance developed by the **EPA** shall be consistent with the reasonable application of such regulatory limitations and exemptions in the private sector. The guidance shall ensure reporting consistent with the goal of public access to information under section 313 of EPCRA and section 6607 of PPA. The guidance shall be submitted to the AEEs established under section 301(d) of Executive Order 13101 [42 U.S.C. 6961 note] for review and endorsement. Each agency shall apply any guidance to reporting at its facilities as soon as practicable but no later than for reporting for the next calendar year following release of the guidance.

(e) The **EPA** shall coordinate with other interested Federal agencies to carry out pilot projects to collect and disseminate information about the release and other waste management of chemicals associated with the environmental response and restoration at their facilities and sites. The pilot projects will focus on releases and other waste management of chemicals associated with environmental response and restoration at facilities and sites where the activities generating wastes do not otherwise meet EPCRA section 313 thresholds for manufacture, process, or other use. Each agency is encouraged to identify applicable facilities and voluntarily report under subsection (a) of this section the releases and other waste management of toxic chemicals managed during environmental response and restoration, regardless of whether the facility otherwise would report under subsection (a). The releases and other waste management of chemicals associated with environmental response and restoration voluntarily reported under this subsection will not be included in the accounting established under sections 503(a) and (c) of this order.

Sec. 502. Release Reduction: Toxic Chemicals. To attain the goals of section 204 of this order:

(a) Beginning with reporting for calendar year 2001 activities, each agency reporting under section 501 of this order shall adopt a goal of reducing, where cost effective, the agency's total releases of toxic chemicals to the environment and off-site transfers of such chemicals for treatment and disposal by at least 10 percent annually, or by 40 percent overall by December 31, 2006. Beginning with activities for calendar year 2001, the baseline for measuring progress in meeting the reduction goal will be the aggregate of all such releases and off-site transfers of such chemicals for treatment and disposal as reported by all of the agency's facilities under section 501 of this order. The list of toxic chemicals applicable to this goal is the EPCRA section 313 [42 U.S.C. 11023] list as of December 1, 2000. If an agency achieves the 40

percent reduction goal prior to December 31, 2006, that agency shall establish a new baseline and reduction goal based on agency priorities.

(b) Where an agency is unable to pursue the reduction goal established in subsection (a) for certain chemicals that are mission critical and/or needed to protect human health and the environment or where agency off-site transfer of toxic chemicals for treatment is directly associated with environmental restoration activities, that agency may request a waiver from the **EPA** for all or part of the requirement in subsection (a) of this section. As appropriate, waiver requests must provide: (1) an explanation of the mission critical use of the chemical; (2) an explanation of the nature of the need for the chemical to protect human health; (3) a description of efforts to identify a less harmful substitute chemical or alternative processes to reduce the release and transfer of the chemical in question; and (4) a description of the off-site transfers of toxic chemicals for treatment directly associated with environmental restoration activities. The **EPA** shall respond to the waiver request within 90 days and may grant such a waiver for no longer than 2 years. An agency may resubmit a request for waiver at the end of that period. The waiver under this section shall not alter requirements to report under section 501 of this order.

(c) Where a specific component (e.g., bureau, service, or command) within an agency achieves a 75 percent reduction in its 1999 reporting year publicly reported total releases of toxic chemicals to the environment and off-site transfers of such chemicals for treatment and disposal, based on the 1994 baseline established in Executive Order 12856 [former 42 U.S.C. 11001 note], that agency may independently elect to establish a reduction goal for that component lower than the 40 percent target established in subsection (a) of this section. The agency shall formally notify the Workgroup established in section 306 of this order of the elected reduction target.

Sec. 503. Use Reduction: Toxic Chemicals, Hazardous Substances, and Other Pollutants. To attain the goals of section 205 of this order:

(a) Within 18 months of the date of this order, each agency with facilities shall develop and support goals to reduce the use at such agencies' facilities of the priority chemicals on the list under subsection (b) of this section for identified applications and purposes, or alternative chemicals and pollutants the agency identifies under subsection (c) of this section, by at least 50 percent by December 31, 2006.

(b) Within 9 months of the date of this order the Administrator, in coordination with the Workgroup established in section 306 of this order, shall develop a list of not less than 15 priority chemicals used by the Federal Government that may result in significant harm to human health or the environment and that have known, readily available, less harmful substitutes for identified applications and purposes. In addition to identifying the applications and purposes to which such reductions apply, the Administrator, in coordination with the Workgroup shall identify a usage threshold below which this section shall not apply. The chemicals will be selected from listed EPCRA section 313 [42 U.S.C. 11023] toxic chemicals and, where appropriate, other regulated hazardous substances or pollutants. In developing the list, the Administrator, in coordination with the Workgroup shall consider: (1) environmental factors including toxicity, persistence, and bio-accumulation; (2) availability of known, less environmentally harmful substitute chemicals that can be used in place of the priority chemical for identified applications and purposes; (3) availability of known, less environmentally harmful processes that can be used in place of the

priority chemical for identified applications and purposes; (4) relative costs of alternative chemicals or processes; and (5) potential risk and environmental and human exposure based upon applications and uses of the chemicals by Federal agencies and facilities. In identifying alternatives, the Administrator should take into consideration the guidance issued under section 503 of Executive Order 13101 [42 U.S.C. 6961 note].

(c) If an agency, which has facilities required to report under EPCRA, uses at its facilities less than five of the priority chemicals on the list developed in subsection (b) of this section for the identified applications and purposes, the agency shall develop, within 12 months of the date of this order, a list of not less than five chemicals that may include priority chemicals under subsection (b) of this section or other toxic chemicals, hazardous substances, and/or other pollutants the agency uses or generates, the release, transfer or waste management of which may result in significant harm to human health or the environment.

(d) In lieu of requirements under subsection (a) of this section, an agency may, upon concurrence with the Workgroup established under section 306 of this order, develop within 12 months of the date of this order, a list of not less than five priority hazardous or radioactive waste types generated by its facilities. Within 18 months of the date of this order, the agency shall develop and support goals to reduce the agency's generation of these wastes by at least 50 percent by December 31, 2006. To the maximum extent possible, such reductions shall be achieved by implementing source reduction practices.

(e) The baseline for measuring reductions for purposes of achieving the 50 percent reduction goal in subsections (a) and (d) of this section for each agency is the first calendar year following the development of the list of priority chemicals under subsection (b) of this section.

(f) Each agency shall undertake pilot projects at selected facilities to gather and make publicly available materials accounting data related to the toxic chemicals, hazardous substances, and/or other pollutants identified under subsections (b), (c), or (d) of this section.

(g) Within 12 months of the date of this order, the Administrator shall develop guidance on implementing this section in coordination with the Workgroup. The **EPA** shall develop technical assistance materials to assist agencies in meeting the 50 percent reduction goal of this section.

(h) Where an agency can demonstrate to the Workgroup that it has previously reduced the use of a priority chemical identified in subsection 503(b) by 50 percent, then the agency may elect to waive the 50 percent reduction goal for that chemical.

Sec. 504. Emergency Planning and Reporting Responsibilities. Each agency shall comply with the provisions set forth in sections 301 through 312 of the EPCRA [42 U.S.C. 11001-11022], all implementing regulations, and any future amendments to these authorities, in light of any applicable guidance as provided by the **EPA**.

Sec. 505. Reductions in Ozone-Depleting Substances. To attain the goals of section 206 of this order:

(a) Each agency shall ensure that its facilities: (1) maximize the use of safe alternatives to ozone-depleting substances, as approved by the **EPA's** Significant New Alternatives Policy (SNAP) program; (2) consistent with subsection (b) of this section, evaluate the present and future uses of ozone-depleting substances, including making assessments of existing and future needs for such materials, and evaluate use of,

and plans for recycling, refrigerants, and halons; and (3) exercise leadership, develop exemplary practices, and disseminate information on successful efforts in phasing out ozone-depleting substances.

(b) Within 12 months of the date of this order, each agency shall develop a plan to phase out the procurement of Class I ozone-depleting substances for all nonexcepted uses by December 31, 2010. Plans should target cost effective reduction of environmental risk by phasing out Class I ozone depleting substance applications as the equipment using those substances reaches its expected service life. Exceptions to this requirement include all exceptions found in current or future applicable law, treaty, regulation, or Executive order.

(c) Each agency shall amend its personal property management policies and procedures to preclude disposal of ozone depleting substances removed or reclaimed from its facilities or equipment, including disposal as part of a contract, trade, or donation, without prior coordination with the Department of Defense (DoD). Where the recovered ozone-depleting substance is a critical requirement for DoD missions, the agency shall transfer the materials to the DoD. The DoD will bear the costs of such transfer.

PART 6--LANDSCAPING MANAGEMENT PRACTICES

Sec. 601. Implementation.

(a) Within 12 months from the date of this order, each agency shall incorporate the Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds (60 Fed. Reg. 40837) developed by the FEE into landscaping programs, policies, and practices.

(b) Within 12 months of the date of this order, the FEE shall form a workgroup of appropriate Federal agency representatives to review and update the guidance in subsection (a) of this section, as appropriate.

(c) Each agency providing funding for nonfederal projects involving landscaping projects shall furnish funding recipients with information on environmentally and economically beneficial landscaping practices and work with the recipients to support and encourage application of such practices on Federally funded projects.

Sec. 602. Technical Assistance and Outreach. The **EPA**, the General Services Administration (GSA), and the USDA shall provide technical assistance in accordance with their respective authorities on environmentally and economically beneficial landscaping practices to agencies and their facilities.

PART 7--ACQUISITION AND PROCUREMENT

Sec. 701. Limiting Procurement of Toxic Chemicals, Hazardous Substances, and Other Pollutants.

(a) Within 12 months of the date of this order, each agency shall implement training programs to ensure that agency procurement officials and acquisition program managers are aware of the requirements of this order and its applicability to those individuals.

(b) Within 24 months of the date of this order, each agency shall determine the feasibility of implementing centralized procurement and distribution (e.g., ``pharmacy'') programs at its facilities for tracking, distribution, and management of toxic or hazardous materials and, where appropriate, implement such programs.

(c) Under established schedules for review of standardized documents, DoD and GSA, and other agencies, as appropriate, shall review

their standardized documents and identify opportunities to eliminate or reduce their use of chemicals included on the list of priority chemicals developed by the **EPA** under subsection 503(b) of this order, and make revisions as appropriate.

(d) Each agency shall follow the policies and procedures for toxic chemical release reporting in accordance with FAR section 23.9 effective as of the date of this order and policies and procedures on Federal compliance with right-to-know laws and pollution prevention requirements in accordance with FAR section 23.10 effective as of the date of this order.

Sec. 702. Environmentally Benign Adhesives. Within 12 months after environmentally benign pressure sensitive adhesives for paper products become commercially available, each agency shall revise its specifications for paper products using adhesives and direct the purchase of paper products using those adhesives, whenever technically practicable and cost effective. Each agency should consider products using the environmentally benign pressure sensitive adhesives approved by the U.S. Postal Service (USPS) and listed on the USPS Qualified Products List for pressure sensitive recyclable adhesives.

Sec. 703. Ozone-Depleting Substances. Each agency shall follow the policies and procedures for the acquisition of items that contain, use, or are manufactured with ozone-depleting substances in accordance with FAR section 23.8 and other applicable FAR provisions.

Sec. 704. Environmentally and Economically Beneficial Landscaping Practices.

(a) Within 18 months of the date of this order, each agency shall have in place acquisition and procurement practices, including provision of landscaping services that conform to the guidance referred to in section 601 of this order, for the use of environmentally and economically beneficial landscaping practices. At a minimum, such practices shall be consistent with the policies in the guidance referred to in section 601 of this order.

(b) In implementing landscaping policies, each agency shall purchase environmentally preferable and recycled content products, including **EPA**-designated items such as compost and mulch, that contribute to environmentally and economically beneficial practices.

PART 8--EXEMPTIONS

Sec. 801. National Security Exemptions. Subject to subsection 902(c) of this order and except as otherwise required by applicable law, in the interest of national security, the head of any agency may request from the President an exemption from complying with the provisions of any or all provisions of this order for particular agency facilities, provided that the procedures set forth in section 120(j)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. 9620(j)(1)), are followed, with the following exceptions: (a) an exemption issued under this section will be for a specified period of time that may exceed 1 year; (b) notice of any exemption granted under this section for provisions not otherwise required by law is only required to the Director of OMB, the Chair of the CEQ, and the Director of the National Security Council; and (c) an exemption under this section may be issued due to lack of appropriations, provided that the head of the agency requesting the exemption shows that necessary funds were requested by the agency in its budget submission and agency plan under Executive Order 12088 of October 13, 1978 [set out as a note above], and were not contained in the

President's budget request or the Congress failed to make available the requested appropriation. To the maximum extent practicable, and without compromising national security, each agency shall strive to comply with the purposes, goals, and implementation steps in this order. Nothing in this order affects limitations on the dissemination of classified information pursuant to law, regulation, or Executive order.

Sec. 802. Compliance. After January 1, 2002, OMB, in consultation with the Chair of the Workgroup established by section 306 of this order, may modify the compliance requirements for an agency under this order, if the agency is unable to comply with the requirements of the order. An agency requesting modification must show that it has made substantial good faith efforts to comply with the order. The cost-effectiveness of implementation of the order can be a factor in OMB's decision to modify the requirements for that agency's compliance with the order.

PART 9--GENERAL PROVISIONS

Sec. 901. Revocation. Executive Order 12843 of April 21, 1993 [former 42 U.S.C. 76711 note], Executive Order 12856 of August 3, 1993 [former 42 U.S.C. 11001 note], the Executive Memorandum on Environmentally Beneficial Landscaping of April 26, 1994 [not classified to the Code], Executive Order 12969 of August 8, 1995 [former 41 U.S.C. 401 note], and section 1-4. ``Pollution Control Plan'' of Executive Order 12088 of October 13, 1978 [set out as a note above], are revoked.

Sec. 902. Limitations.

(a) This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law by a party against the United States, its agencies, its officers, or any other person.

(b) This order applies to Federal facilities in any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, and any other territory or possession over which the United States has jurisdiction. Each agency with facilities outside of these areas, however, is encouraged to make best efforts to comply with the goals of this order for those facilities.

(c) Nothing in this order alters the obligations under EPCRA, PPA, and CAA independent of this order for Government-owned, contractor-operated facilities and Government corporations owning or operating facilities or subjects such facilities to EPCRA, PPA, or CAA if they are otherwise excluded. However, each agency shall include the releases and other waste management of chemicals for all such facilities to meet the agency's reporting responsibilities under section 501 of this order.

(d) Nothing in this order shall be construed to make the provisions of CAA sections [sic] 304 [42 U.S.C. 7604] and EPCRA sections 325 and 326 [42 U.S.C. 11045, 11046] applicable to any agency or facility, except to the extent that an agency or facility would independently be subject to such provisions.

Sec. 903. Community Outreach. Each agency is encouraged to establish a process for local community advice and outreach for its facilities relevant to aspects of this and other related Greening the Government Executive orders. All strategies and plans developed under this order shall be made available to the public upon request.

PART 10--DEFINITIONS

For purposes of this order:

Sec. 1001. General. Terms that are not defined in this part but that are defined in Executive Orders 13101 [42 U.S.C. 6961 note] and 13123 [42 U.S.C. 8251 note] have the meaning given in those Executive orders. For the purposes of Part 5 of this order all definitions in EPCRA and PPA and implementing regulations at 40 CFR Parts 370 and 372 apply.

Sec. 1002. ``Administrator'' means the Administrator of the **EPA**.

Sec. 1003. ``Environmental cost accounting'' means the modification of cost attribution systems and financial analysis practices specifically to directly track environmental costs that are traditionally hidden in overhead accounts to the responsible products, processes, facilities or activities.

Sec. 1004. ``Facility'' means any building, installation, structure, land, and other property owned or operated by, or constructed or manufactured and leased to, the Federal Government, where the Federal Government is formally accountable for compliance under environmental regulation (e.g., permits, reports/records and/or planning requirements) with requirements pertaining to discharge, emission, release, spill, or management of any waste, contaminant, hazardous chemical, or pollutant. This term includes a group of facilities at a single location managed as an integrated operation, as well as government owned contractor operated facilities.

Sec. 1005. ``Environmentally benign pressure sensitive adhesives'' means adhesives for stamps, labels, and other paper products that can be easily treated and removed during the paper recycling process.

Sec. 1006. ``Ozone-depleting substance'' means any substance designated as a Class I or Class II substance by **EPA** in 40 CFR Part 82.

Sec. 1007. ``Pollution prevention'' means ``source reduction,'' as defined in the PPA, and other practices that reduce or eliminate the creation of pollutants through: (a) increased efficiency in the use of raw materials, energy, water, or other resources; or (b) protection of natural resources by conservation.

Sec. 1008. ``Greening the Government Executive orders'' means this order and the series of orders on greening the government including Executive Order 13101 of September 14, 1998 [42 U.S.C. 6961 note], Executive Order 13123 of June 3, 1999 [42 U.S.C. 8251 note], Executive Order 13134 of August 12, 1999 [7 U.S.C. 7624 note], and other future orders as appropriate.

Sec. 1009. ``Environmental aspects'' means the elements of an organization's activities, products, or services that can interact with the environment.

William J. Clinton.

*** This full statute copy is provided as an educational example.**

The National Environmental Policy Act of 1969, as amended

(Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982)

An Act to establish a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Environmental Policy Act of 1969."

Purpose

Sec. 2 [42 USC § 4321].

The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

TITLE I

CONGRESSIONAL DECLARATION OF NATIONAL ENVIRONMENTAL POLICY

Sec. 101 [42 USC § 4331].

(a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may –

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

4. preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;
5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Sec. 102 [42 USC § 4332].

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall –

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the views of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and, if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement.

The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility under this Act; and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction.

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(I) assist the Council on Environmental Quality established by title II of this Act.

Sec. 103 [42 USC § 4333].

All agencies of the Federal Government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this Act and shall propose to the President not later than July 1, 1971, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this Act.

Sec. 104 [42 USC § 4334].

Nothing in section 102 [42 USC § 4332] or 103 [42 USC § 4333] shall in any way affect the specific statutory obligations of any Federal agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any other Federal or State agency, or (3) to act, or refrain from acting contingent upon the recommendations or certification of any other Federal or State agency.

Sec. 105 [42 USC § 4335].

The policies and goals set forth in this Act are supplementary to those set forth in existing authorizations of Federal agencies.

TITLE II

COUNCIL ON ENVIRONMENTAL QUALITY

Sec. 201 [42 USC § 4341].

The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report (hereinafter referred to as the "report") which shall set forth (1) the status and condition of the major natural, manmade, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban and rural environment; (2) current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; (4) a review of the programs and activities (including regulatory activities) of the Federal Government, the State and local governments, and nongovernmental entities or individuals with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

Sec. 202 [42 USC § 4342].

There is created in the Executive Office of the President a Council on Environmental Quality (hereinafter referred to as the "Council"). The Council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate. The President shall designate one of the members of the Council to serve as Chairman. Each member shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the Federal Government in the light of the policy set forth in title I of this Act; to be conscious of and responsive to the scientific, economic, social, aesthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment.

Sec. 203 [42 USC § 4343].

(a) The Council may employ such officers and employees as may be necessary to carry out its functions under this Act. In addition, the Council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this Act, in accordance with section 3109 of title 5, United States Code (but without regard to the last sentence thereof).

(b) Notwithstanding section 1342 of Title 31, the Council may accept and employ voluntary and uncompensated services in furtherance of the purposes of the Council.

Sec. 204 [42 USC § 4344].

It shall be the duty and function of the Council --

1. to assist and advise the President in the preparation of the Environmental Quality Report required by section 201 [42 USC § 4341] of this title;
2. to gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in title I of this Act, and to compile and submit to the President studies relating to such conditions and trends;
3. to review and appraise the various programs and activities of the Federal Government in the light of the policy set forth in title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;
4. to develop and recommend to the President national policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation;
5. to conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality;
6. to document and define changes in the natural environment, including the plant and animal systems, and to accumulate necessary data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;
7. to report at least once each year to the President on the state and condition of the environment; and
8. to make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

Sec. 205 [42 USC § 4345].

In exercising its powers, functions, and duties under this Act, the Council shall --

1. consult with the Citizens' Advisory Committee on Environmental Quality established by Executive Order No. 11472, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor, conservation organizations, State and local governments and other groups, as it deems advisable; and
2. utilize, to the fullest extent possible, the services, facilities and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

Sec. 206 [42 USC § 4346].

Members of the Council shall serve full time and the Chairman of the Council shall be compensated at the rate provided for Level II of the Executive Schedule Pay Rates [5 USC § 5313]. The other members of the Council shall be compensated at the rate provided for Level IV of the Executive Schedule Pay Rates [5 USC § 5315].

Sec. 207 [42 USC § 4346a].

The Council may accept reimbursements from any private nonprofit organization or from any department, agency, or instrumentality of the Federal Government, any State, or local government, for the reasonable

travel expenses incurred by an officer or employee of the Council in connection with his attendance at any conference, seminar, or similar meeting conducted for the benefit of the Council.

Sec. 208 [42 USC § 4346b].

The Council may make expenditures in support of its international activities, including expenditures for: (1) international travel; (2) activities in implementation of international agreements; and (3) the support of international exchange programs in the United States and in foreign countries.

Sec. 209 [42 USC § 4347].

There are authorized to be appropriated to carry out the provisions of this chapter not to exceed \$300,000 for fiscal year 1970, \$700,000 for fiscal year 1971, and \$1,000,000 for each fiscal year thereafter.

The Environmental Quality Improvement Act, as amended (Pub. L. No. 91- 224, Title II, April 3, 1970; Pub. L. No. 97-258, September 13, 1982; and Pub. L. No. 98-581, October 30, 1984.

42 USC § 4372.

(a) There is established in the Executive Office of the President an office to be known as the Office of Environmental Quality (hereafter in this chapter referred to as the "Office"). The Chairman of the Council on Environmental Quality established by Public Law 91-190 shall be the Director of the Office. There shall be in the Office a Deputy Director who shall be appointed by the President, by and with the advice and consent of the Senate.

(b) The compensation of the Deputy Director shall be fixed by the President at a rate not in excess of the annual rate of compensation payable to the Deputy Director of the Office of Management and Budget.

(c) The Director is authorized to employ such officers and employees (including experts and consultants) as may be necessary to enable the Office to carry out its functions ;under this chapter and Public Law 91-190, except that he may employ no more than ten specialists and other experts without regard to the provisions of Title 5, governing appointments in the competitive service, and pay such specialists and experts without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, but no such specialist or expert shall be paid at a rate in excess of the maximum rate for GS-18 of the General Schedule under section 5332 of Title 5.

(d) In carrying out his functions the Director shall assist and advise the President on policies and programs of the Federal Government affecting environmental quality by --

1. providing the professional and administrative staff and support for the Council on Environmental Quality established by Public Law 91- 190;
2. assisting the Federal agencies and departments in appraising the effectiveness of existing and proposed facilities, programs, policies, and activities of the Federal Government, and those specific major projects designated by the President which do not require individual project authorization by Congress, which affect environmental quality;
3. reviewing the adequacy of existing systems for monitoring and predicting environmental changes in order to achieve effective coverage and efficient use of research facilities and other resources;
4. promoting the advancement of scientific knowledge of the effects of actions and technology on the environment and encouraging the development of the means to prevent or reduce adverse effects that endanger the health and well-being of man;

5. assisting in coordinating among the Federal departments and agencies those programs and activities which affect, protect, and improve environmental quality;
6. assisting the Federal departments and agencies in the development and interrelationship of environmental quality criteria and standards established throughout the Federal Government;
7. collecting, collating, analyzing, and interpreting data and information on environmental quality, ecological research, and evaluation.

(e) The Director is authorized to contract with public or private agencies, institutions, and organizations and with individuals without regard to section 3324(a) and (b) of Title 31 and section 5 of Title 41 in carrying out his functions.

42 USC § 4373. Each Environmental Quality Report required by Public Law 91-190 shall, upon transmittal to Congress, be referred to each standing committee having jurisdiction over any part of the subject matter of the Report.

42 USC § 4374. There are hereby authorized to be appropriated for the operations of the Office of Environmental Quality and the Council on Environmental Quality not to exceed the following sums for the following fiscal years which sums are in addition to those contained in Public Law 91- 190:

- (a) \$2,126,000 for the fiscal year ending September 30, 1979.
- (b) \$3,000,000 for the fiscal years ending September 30, 1980, and September 30, 1981.
- (c) \$44,000 for the fiscal years ending September 30, 1982, 1983, and 1984.
- (d) \$480,000 for each of the fiscal years ending September 30, 1985 and 1986.

42 USC § 4375.

(a) There is established an Office of Environmental Quality Management Fund (hereinafter referred to as the "Fund") to receive advance payments from other agencies or accounts that may be used solely to finance --

1. study contracts that are jointly sponsored by the Office and one or more other Federal agencies; and
2. Federal interagency environmental projects (including task forces) in which the Office participates.

(b) Any study contract or project that is to be financed under subsection (a) of this section may be initiated only with the approval of the Director.

(c) The Director shall promulgate regulations setting forth policies and procedures for operation of the Fund.

Clean Air Act

The Clean Air Act is the comprehensive Federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

The goal of the Act was to set and achieve NAAQS in every state by 1975. The setting of maximum pollutant standards was coupled with directing the states to develop state implementation plans (Sip's) applicable to appropriate industrial sources in the state.

The Act was amended in 1977 primarily to set new goals (dates) for achieving attainment of NAAQS since many areas of the country had failed to meet the deadlines. The 1990 amendments to the Clean Air Act in large part were intended to meet unaddressed or insufficiently addressed problems such as acid rain, ground-level ozone, stratospheric ozone depletion, and air toxics.

Sec. 7401. - Congressional findings and declaration of purpose

(a) Findings

The Congress finds -

(1)

that the predominant part of the Nation's population is located in its rapidly expanding metropolitan and other urban areas, which generally cross the boundary lines of local jurisdictions and often extend into two or more States;

(2)

that the growth in the amount and complexity of air pollution brought about by urbanization, industrial development, and the increasing use of motor vehicles, has resulted in mounting dangers to the public health and welfare, including injury to agricultural crops and livestock, damage to and the deterioration of property, and hazards to air and ground transportation;

(3)

that air pollution prevention (that is, the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source) and air pollution control at its source is the primary responsibility of States and local governments; and

(4)

that Federal financial assistance and leadership is essential for the development of cooperative Federal, State, regional, and local programs to prevent and control air pollution.

(b) Declaration

The purposes of this subchapter are -

(1)

to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population;

(2)

to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution;

(3)

to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and

(4)

to encourage and assist the development and operation of regional air pollution prevention and control programs.

(c) Pollution prevention

A primary goal of this chapter is to encourage or otherwise promote reasonable Federal, State, and local governmental actions, consistent with the provisions of this chapter, for pollution prevention

The Chemical Safety Information, Site Security and Fuels Regulatory Relief Act

One Hundred Sixth Congress

of the

United States of America

AT THE FIRST SESSION

Begun and held at the City of Washington on Wednesday,

the sixth day of January, one thousand nine hundred and ninety-nine

An Act

To amend the Clean Air Act to remove flammable fuels from the list of substances with respect to which reporting and other activities are required under the risk management plan program, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “Chemical Safety Information, Site Security and Fuels Regulatory Relief Act”.

SEC. 2. REMOVAL OF PROPANE SOLD BY RETAILERS AND OTHER FLAMMABLE FUELS FROM RISK MANAGEMENT LIST.

Section 112(r) of the Clean Air Act (42 U.S.C. 7412(r)) is amended—

(1) by redesignating subparagraphs (A) through (C) of paragraph

(4) as clauses (i) through (iii), respectively, and indenting

appropriately;

(2) by striking in paragraph (4) “Administrator shall consider each of the following criteria—” and inserting the following:

“Administrator—

“(A) shall consider—”;

(3) in subparagraph (A)(iii) (as designated by paragraphs (1) and (2)), of paragraph (4) by striking the period at the end and inserting “; and”;

(4) by adding at the end of paragraph (4) the following:

“(B) shall not list a flammable substance when used as a fuel or held for sale as a fuel at a retail facility under this subsection solely because of the explosive or flammable properties of the substance, unless a fire or explosion caused by the substance will result in acute adverse health effects from human exposure to the substance, including the unburned fuel or its combustion byproducts, other than those caused by the heat of the fire or impact of the explosion.”; and

(5) by inserting the following new subparagraph at the end of paragraph (2):

“(D) The term ‘retail facility’ means a stationary source at which more than one-half of the income is obtained from direct sales to end users or at which more than

one-half of the fuel sold, by volume, is sold through a

cylinder

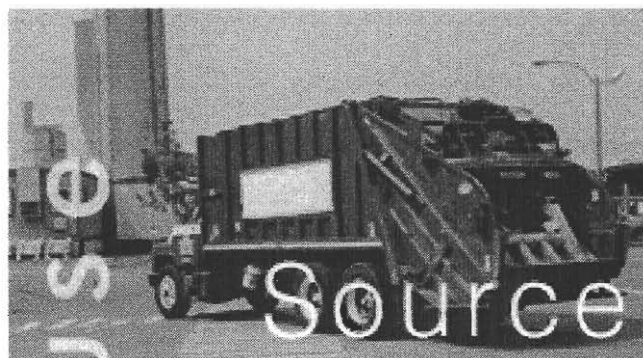
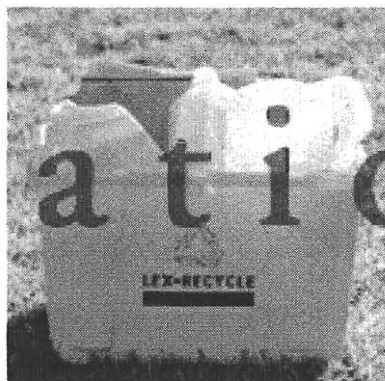
exchange

program.”.



Municipal Solid Waste in The United States: 2000 Facts and Figures

Generation



Use

Source

Reduction



cycle

Disposal

**MUNICIPAL SOLID WASTE
IN THE UNITED STATES: 2000 FACTS AND FIGURES**

EXECUTIVE SUMMARY

OVERVIEW

This report describes the national municipal solid waste (MSW) stream based on data collected for 1960 through 2000. The historical perspective is useful for establishing trends in types of MSW generated and in the ways it is managed. In this Executive Summary, we briefly describe the methodology used to characterize MSW in the United States and provide the latest facts and figures on MSW generation, recycling, and disposal.

In the United States, we generated approximately 231.9 million tons of MSW in 2000—an increase of 0.9 million tons from 1999.* This is an increase of only 0.3 percent from 1999 to 2000. Excluding composting, the amount of MSW recycled increased to 53.4 million tons, an increase of 3.3 million tons from 1999. This is a 6.6 percent increase in the tons recycled. The tons recovered for recycling (including composting) rose to 69.9 million tons in 2000, up from 64.8 million tons in 1999. The recovery rate for recycling (including composting) was 30.1 percent in 2000, up from 28.1 percent in 1999. (See Tables ES-1 and ES-2 and Figures ES-1 and ES-2.)

MSW generation in 2000 declined to 4.5 pounds per person per day.** The recycling rate in 2000 was 1.4 pounds per person per day. Discards after recycling declined to 3.2 pounds per person per day in 2000 (Table ES-3).

* Data shown for 1999 have been adjusted to reflect the latest revisions and, therefore, may differ slightly from the same measure reported previously. For example, tonnage of MSW generated in 1999 has been revised upward from 229.9 million tons to 231.0 million tons.

** The 2000 generation, recovery and disposal per person values were calculated from 2000 Census data. For data years 1999 and earlier, population estimates based on 1990 Census data were used. Revised Census data for 1999 and earlier years were not available when this Executive Summary was prepared. The population data series revisions will be included in later editions of this report.

**MUNICIPAL SOLID WASTE
IN THE UNITED STATES: 2000 FACTS AND FIGURES**

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Table ES-1
GENERATION, MATERIALS RECOVERY, COMPOSTING,
AND DISCARDS OF MUNICIPAL SOLID WASTE, 1960 - 2000
(In millions of tons)

Millions of tons								
	1960	1970	1980	1990	1995	1998	1999	2000
Generation	88.1	121.1	151.6	205.2	211.4	223.4	231.0	231.9
Recovery for recycling	5.6	8.0	14.5	29.0	45.3	48.0	50.1	53.4
Recovery for composting*	Neg.	Neg.	Neg.	4.2	9.6	13.1	14.7	16.5
Total Materials Recovery	5.6	8.0	14.5	33.2	54.9	61.1	64.8	69.9
Discards after Recovery	82.5	113.0	137.1	172.0	156.5	162.3	166.2	162.0

* Composting of yard trimmings and food wastes. Does not include mixed MSW composting or backyard composting.
Details may not add to totals due to rounding.
Source: Franklin Associates, Ltd.

Table ES-2
GENERATION, MATERIALS RECOVERY, COMPOSTING
AND DISCARDS OF MUNICIPAL SOLID WASTE, 1960 - 2000
(In pounds per person per day)

Pounds per person per day								
	1960	1970	1980	1990	1995	1998	1999	2000
Generation	2.68	3.25	3.66	4.50	4.40	4.52	4.64	4.51
Recovery for recycling	0.17	0.22	0.35	0.64	0.94	0.97	1.01	1.04
Recovery for composting*	Neg.	Neg.	Neg.	0.09	0.20	0.27	0.30	0.32
Total Materials Recovery	0.17	0.22	0.35	0.73	1.14	1.24	1.31	1.36
Discards after Recovery	2.51	3.03	3.31	3.77	3.26	3.29	3.33	3.15
Population (millions)	179.979	203.984	227.255	249.907	263.168	270.561	272.691	281.422

* Composting of yard trimmings and food wastes. Does not include mixed MSW composting or backyard composting.
Details may not add to totals due to rounding.
The per capita discard rate may decline for 1999 and earlier years when revised Census population figures are obtained.
Source: Franklin Associates, Ltd.

Table ES-3
GENERATION, MATERIALS RECOVERY, COMPOSTING,
AND DISCARDS OF MUNICIPAL SOLID WASTE, 1960 - 2000
(In percent of total generation)

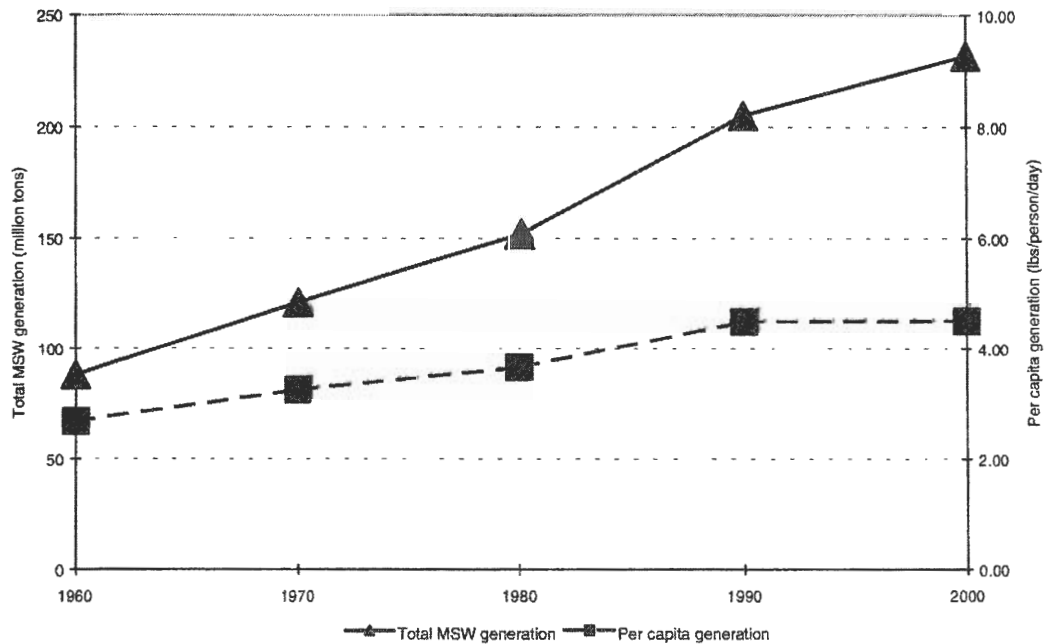
Percent of total generation								
	1960	1970	1980	1990	1995	1998	1999	2000
Generation	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Recovery for recycling	6.4%	6.6%	9.6%	14.2%	21.5%	21.5%	21.7%	23.0%
Recovery for composting*	Neg.	Neg.	Neg.	2.0%	4.5%	5.9%	6.4%	7.1%
Total Materials Recovery	6.4%	6.6%	9.6%	16.2%	26.0%	27.4%	28.1%	30.1%
Discards after Recovery	93.6%	93.4%	90.4%	83.8%	74.0%	72.6%	71.9%	69.9%

* Composting of yard trimmings and food scraps. Does not include mixed MSW composting or backyard composting.

Details may not add to totals due to rounding.

Source: Franklin Associates, Ltd.

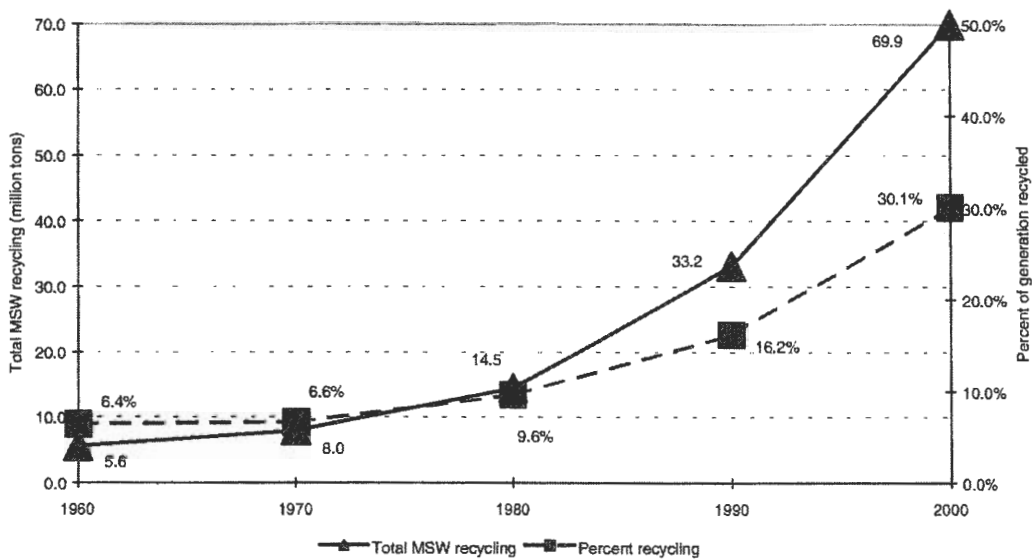
Figure ES-1: MSW Generation Rates from 1960 to 2000



Executive Summary

The state of the economy has a strong impact on consumption and waste generation. Waste generation continued to increase through the 1990s as economic growth continued to be strong. Between 1998 and 1999, paper and paperboard generation increased 4.9 percent. Total MSW generation increased only slightly between 1999 and 2000, and this can be attributed, to a great extent, to a decline in production of paper and paperboard of 1.7 percent.

Figure ES-2: MSW recycling rates from 1960 to 2000



(Paper industry production is very sensitive to economic factors, and 2000 was not a good year for the industry.) At the same time, recovery of products (including paper and paperboard) increased substantially in 2000, and therefore a recycling rate of 30.1 percent was achieved in spite of the slowdown in the economy. The paper and paperboard recovery, as a percent of generation, increased from 40.9 percent to 45.4 percent in 2000. The majority of the increase in recovery came from increased exports in 2000.

WHAT IS INCLUDED IN MUNICIPAL SOLID WASTE?

MSW—otherwise known as trash or garbage—consists of everyday items such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, and batteries. Not included are materials that also may be disposed in landfills, but are not generally considered MSW, such as construction and demolition debris, municipal wastewater treatment sludges, and non-hazardous industrial wastes.

MUNICIPAL SOLID WASTE IN PERSPECTIVE

Trends Over Time

Over the last few decades, the generation, recycling, and disposal of MSW have changed substantially (see Tables ES-1, ES-2, and ES-3 and Figures ES-1 and ES-2). MSW generation has continued to increase from 1960, when it was 88 million tons. The generation rate in 1960 was just 2.7 pounds per person per day; it grew to 3.7 pounds per person per day in 1980; reached 4.5 pounds per person per day in 1990; and it stabilized at 4.5 pounds per person per day in 2000 after increasing through the 1990s.

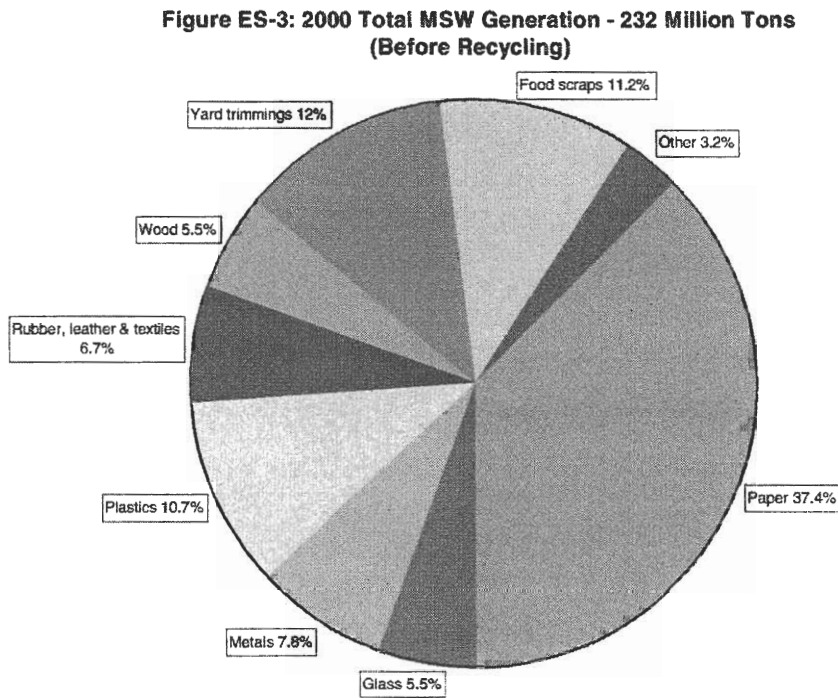
Over time, recycling rates have increased from 10 percent of MSW generated in 1980 to 16 percent in 1990, to 30 percent in 2000. Disposal has decreased from 90 percent of the amount generated in 1980 to 70 percent of MSW in 2000. This compares to 73 percent in 1999.

MUNICIPAL SOLID WASTE IN 2000

The U.S. Environmental Protection Agency (EPA) has two ways of analyzing the 231.9 million tons of MSW generated in 2000. The first is by **material** (paper and paperboard, yard trimmings, food scraps, plastics, metals, glass, wood, rubber, leather and textiles, and other); the second is by several major **product** categories. The product-based categories are containers and packaging; nondurable goods (e.g., newspapers) durable goods (e.g., appliances); food scraps; and other materials.

Materials in MSW

A breakdown, by weight, of the MSW **materials** generated in 2000 is provided in Figure ES-3. Paper and paperboard products made up the largest component of MSW generated (37 percent), and yard trimmings comprised the second-largest component (12 percent). Glass, metals, plastics, wood, and food scraps each constituted between 5 and 11 percent of the total MSW generated. Rubber, leather, and textiles combined made up about 7 percent of MSW, while other miscellaneous wastes made up approximately 3 percent of the MSW generated in 2000.



A portion of each material category in MSW was recycled or composted in 2000. The highest rates of recovery were achieved with yard trimmings, paper products, and metal products. About 57 percent (15.8 million tons) of yard trimmings were recovered for composting in 2000. This represents nearly a four-fold increase since 1990. About 45 percent (39.4 million tons) of paper and paperboard were recovered for recycling in 2000. Recycling these organic materials alone diverted nearly 24 percent of municipal solid waste from landfills and combustion facilities. In addition, about 6.4 million tons, or about 35 percent, of metals were

recovered for recycling. Recycling rates for all materials categories in 2000 are listed in Table ES-4.

Table ES-4
GENERATION AND RECOVERY OF MATERIALS IN MSW, 2000
(In millions of tons and percent of generation of each material)

	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Paper and paperboard	86.7	39.4	45.4%
Glass	12.8	2.9	23.0%
Metals			
Steel	13.5	4.6	34.0%
Aluminum	3.2	0.9	27.4%
Other nonferrous metals*	1.4	0.9	66.9%
<i>Total metals</i>	18.0	6.4	35.4%
Plastics	24.7	1.3	5.4%
Rubber and leather	6.4	0.8	12.2%
Textiles	9.4	1.3	13.5%
Wood	12.7	0.5	3.8%
Other materials	4.0	0.9	21.3%
<i>Total Materials in Products</i>	174.7	53.4	30.6%
Other wastes			
Food, other**	25.9	0.7	2.6%
Yard trimmings	27.7	15.8	56.9%
Miscellaneous inorganic wastes	3.5	Neg.	Neg.
<i>Total Other Wastes</i>	57.1	16.5	28.8%
<i>TOTAL MUNICIPAL SOLID WASTE</i>	231.9	69.9	30.1%

Includes waste from residential, commercial, and institutional sources.

* Includes lead from lead-acid batteries.

** Includes recovery of paper for composting.

Neg. = Less than 50,000 tons or 0.05 percent.

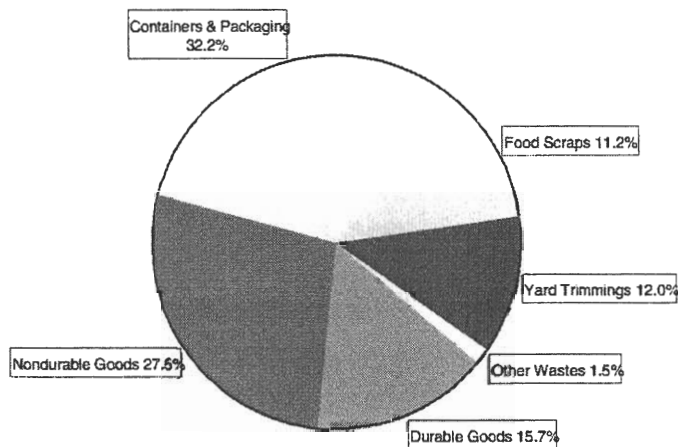
Source: Franklin Associates, Ltd.

Products in MSW

The breakdown, by weight, of **product categories** generated in 2000 is shown in Figure ES-4. Containers and packaging comprised the largest portion of products generated, at 32.2 percent (75 million tons) of total MSW generation. Nondurable goods were the second-largest

fraction, comprising 27.5 percent (64 million tons). The third-largest category of products is durable goods, which comprised 15.7 percent (36 million tons) of total MSW generation.

Figure ES-4: Products Generated in MSW - 2000
(Total Weight = 232 million tons)



The generation and recovery of the product categories in MSW in 2000 is shown in Table ES-5. This table shows that recovery of containers and packaging was the highest of the three product categories – almost 39 percent of containers and packaging generated in 2000 were recovered for recycling. About 55 percent of all aluminum cans were recovered (45 percent of all aluminum packaging, including foil), while 58 percent of steel packaging (mostly cans) was recovered. Paper and paperboard containers and packaging were recovered at a rate of 56 percent; corrugated containers accounted for most of that amount.

Approximately 26 percent of glass containers were recovered, while about 6 percent of wood packaging (mostly wood pallets removed from service) was recovered for recycling. About 9 percent of plastic containers and packaging were recovered, mostly soft drink, milk, and water bottles.

Table ES-5
GENERATION AND RECOVERY OF PRODUCTS IN MSW
BY MATERIAL, 2000
(In millions of tons and percent of generation of each product)

	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Durable Goods			
Steel	10.6	2.9	27.4%
Aluminum	1.0	Neg.	Neg.
Other non-ferrous metals*	1.4	0.9	64.3%
<i>Total metals</i>	13.0	3.8	29.2%
Glass	1.6	Neg.	Neg.
Plastics	7.5	0.3	4.0%
Rubber and leather	5.5	0.8	14.5%
Wood	4.8	Neg.	Neg.
Textiles	2.8	0.2	7.1%
Other materials	1.1	0.9	81.8%
<i>Total durable goods</i>	36.3	6.0	16.6%
Nondurable Goods			
Paper and paperboard	47.3	17.3	36.6%
Plastics	6.0	Neg.	Neg.
Rubber and leather	0.8	Neg.	Neg.
Textiles	6.4	1.0	15.6%
Other materials	3.2	Neg.	Neg.
<i>Total nondurable goods</i>	63.7	18.3	28.8%
Containers and Packaging			
Steel	2.9	1.7	58.6%
Aluminum	2.0	0.9	45.0%
<i>Total metals</i>	4.9	2.6	53.1%
Glass	11.2	2.9	25.9%
Paper and paperboard	39.4	22.1	56.1%
Plastics	11.2	1.0	8.9%
Wood	7.9	0.5	6.3%
Other materials	0.1	Neg.	Neg.
<i>Total containers and packaging</i>	74.7	29.1	38.9%
Other wastes			
Food, other**	25.9	0.7	2.6%
Yard trimmings	27.7	15.8	56.9%
Miscellaneous inorganic wastes	3.5	Neg.	Neg.
<i>Total Other Wastes</i>	57.1	16.5	28.8%
TOTAL MUNICIPAL SOLID WASTE	231.9	69.9	30.1%

Includes waste from residential, commercial, and institutional sources.

* Includes lead from lead-acid batteries.

** Includes recovery of paper for composting.

Details may not add to totals due to rounding.

Neg. = Less than 50,000 tons or 0.05 percent.

Source: Franklin Associates, Ltd.

Overall recovery of *nondurable goods* was 28.8 percent in 2000. Most of this recovery comes from paper products such as newspapers and high-grade office papers (e.g., white papers). Newspapers constituted the largest portion of this recovery, with 58 percent of newspapers generated being recovered for recycling. An estimated 54 percent of high-grade office papers and 32 percent of magazines were recovered in 2000. Each of these categories' recovery increased both in tonnage and percentage between 1999 and 2000.

Recovery percentages of other paper products in the nondurable goods category also increased between 1999 and 2000, with Standard (A) mail* recovered at an estimated 32 percent, directories at an estimated 18 percent, and other commercial printed products at an estimated 23 percent.

The nondurable goods category also includes clothing and other textile products—16 percent of these products were recovered for recycling or export in 2000.

Overall, *durable goods* were recovered at a rate of 16.6 percent in 2000. Nonferrous metals other than aluminum had one of the highest recovery rates, at 67 percent, due to the high rate of lead recovery from lead-acid batteries. Recovery of steel in all durable goods was 27.5 percent, with high rates of recovery from appliances and other miscellaneous durable goods. Twenty-six percent of rubber in tires was recovered for recycling. (Other tires were retreaded and shredded rubber tires were made into tire-derived fuel.)

One of the products with a very high recovery rate was lead-acid batteries, recovered at a rate of 96.4 percent in 2000. Other products with particularly high recovery rates were steel from major appliances (73.5 percent), corrugated boxes (70.7 percent), newspapers (58.2 percent), steel cans (57.2 percent), and aluminum cans (54.6 percent).

* Standard (A) mail was formerly called Third Class mail by the U.S. Postal Service.

RESIDENTIAL AND COMERCIAL SOURCES OF MSW

Sources of MSW, as characterized in this report, include both residential and commercial locations. We estimated residential waste (including waste from multi-family dwellings) to be 55 to 65 percent of total MSW generation. Commercial waste (including waste from schools, some industrial sites where packaging is generated, and businesses) constitutes between 35 and 45 percent of MSW. Local and regional factors, such as climate and level of commercial activity, contribute to these variations.

MANAGEMENT OF MSW

Overview

EPA's integrated waste management hierarchy includes the following three components, listed in order of preference:

- Source reduction (or waste prevention), including reuse of products and onsite, or backyard, composting of yard trimmings
- Recycling, including offsite, or community, composting.
- Disposal, including waste combustion (preferably with energy recovery) and landfilling.

Although EPA encourages the use of strategies that emphasize the top of the hierarchy whenever possible, all three components remain important within an integrated waste management system.

Source Reduction

When EPA established its waste management hierarchy in 1989, it emphasized the importance of *reducing* the amount of waste created, reusing whenever possible, and then recycling what is left. When municipal solid waste is reduced and reused, this is called "source reduction"—meaning the material never enters the waste stream. Instead it is managed at the source of generation.

Executive Summary

Source reduction, also called waste prevention, includes the design, manufacture, purchase, or use of materials, such as products and packaging, to reduce their amount or toxicity before they enter the MSW management system. Examples of source reduction activities are:

- Designing products or packaging to reduce the quantity or the toxicity of the materials used, or to make them easy to reuse.
- Reusing existing products or packaging; for example, refillable bottles, reusable pallets, and reconditioned barrels and drums.
- Lengthening the lives of products such as tires as fewer need to be produced and therefore disposed of.
- Using packaging that reduces the amount of damage or spoilage to the product.
- Managing nonproduct organic wastes (e.g., food scraps, yard trimmings) through onsite composting or other alternatives to disposal (e.g., leaving grass clippings on the lawn).

As the nation has begun to realize the value of its resources, both financial and material, efforts to reduce waste generation have increased. EPA has been able to estimate source reduction for the nation based on economic and waste data. Table ES-6 shows that steady progress was made in waste prevention since 1990. In 2000, the United States prevented more than *55 million tons* of municipal solid waste from entering the waste stream since 1990.

Table ES-6
SOURCE REDUCTION OF
MUNICIPAL SOLID WASTE SINCE 1990
(In millions of tons)

Year	Million Tons Source Reduced
1992	0.6
1994	8.0
1995	21.4
1996	31.0
1997	31.8
1998	37.3
1999	42.8
2000	55.1

The waste prevention achieved to date comes from all parts of the waste stream. However, reducing the amount of yard trimmings is a particularly important source reduction success story. Table ES-7 shows that almost half of the waste prevented in 2000 came from organic waste materials, particularly yard trimmings. This is likely the result of many locally enacted bans on the disposal of yard trimmings from landfills around the country, as well as successful campaigns promoting onsite composting and the use of mulching lawn mowers.

Prevention of waste other than yard trimmings has been important as well. Containers and packaging represent approximately 28 percent of the materials source reduced in 2000, in addition to nondurable goods (e.g., newspapers, clothing) at 17 percent, durable goods (e.g., appliances, furniture, tires) at 10 percent, and other MSW (e.g., yard trimmings, food scraps) at 45 percent.

Table ES-7
SOURCE REDUCTION BY MAJOR MATERIAL CATEGORIES, 2000
(In millions of tons)

Waste Stream	Million Tons Source Reduced
Durable Goods (e.g., appliances, furniture)	5.4
Nondurable Goods (e.g., newspapers, clothing)	9.3
Containers & Packaging (e.g., bottles, boxes)	15.5
Other MSW (e.g., yard trimmings, food scraps)	25.0
Total Source Reduction (1990 baseline)	55.1

There are several materials for which disposal rates have increased. In particular, clothing and footwear show significant increased disposal rates, as do plastic containers. Part of the rise in plastics use can be attributed to the long-term trend of manufacturers substituting their glass packaging with plastic. However, not all of the increases are due to material substitution.

Much of the nation's increase in waste generation in the 1990s was due to the booming economy. Americans found themselves with additional dollars in their pockets after paying the mortgage or rent and their other expenses. As a result, we increasingly became a nation of consumers. The result was an increasing need for the disposal of municipal solid waste. However, the United States made progress in the area of waste reduction and reuse, as indicated

Executive Summary

by the 55 million tons of source reduction in 2000. Had this source reduction not occurred, waste generation in 2000 would have risen from the actual level, 232 million tons, to 287 million tons. Source reduction avoided an increase of nearly 25 percent.

Recycling

- Recycling (including community composting) recovered 30.1 percent (69.9 million tons) of MSW in 2000.
- There were about 9,250 curbside recycling programs in the United States in 2000. This is slightly fewer than the 9,300 curbside recycling programs identified in 1999.
- About 3,800 yard trimmings composting programs were reported in 2000.

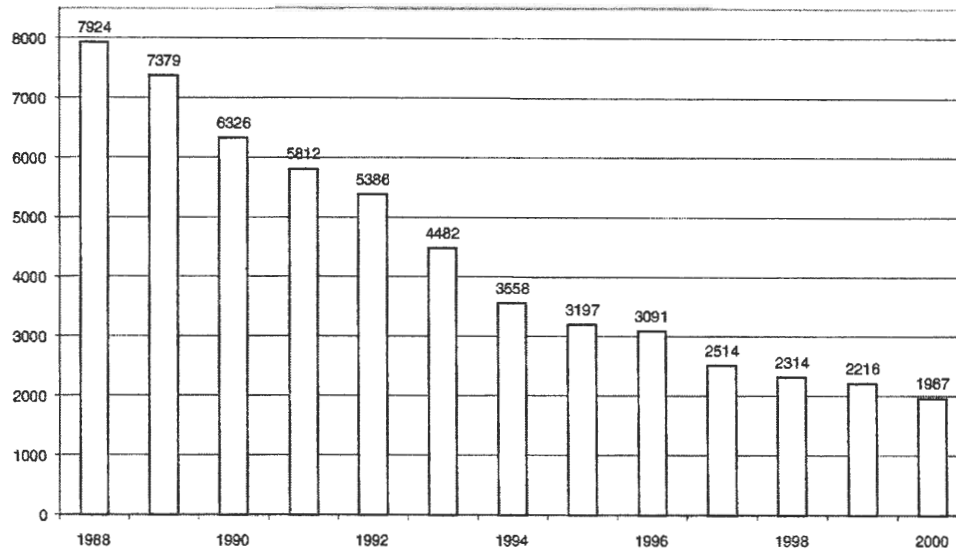
Disposal

An estimated 14.5 percent of MSW was combusted in 2000, slightly down from 14.7 percent in 1999. During 2000, about 55.3 percent of MSW was landfilled, down somewhat from 57.2 percent in 1999. As shown in Figure ES-5, the number of municipal solid waste landfills decreased substantially over the past 10 years, from nearly 8,000 in 1988 to 1,967 in 2000—while average landfill size increased. At the national level, capacity does not appear to be a problem, although regional dislocations sometimes occur.

- The percentage of MSW landfilled decreased slightly from 1999 to 2000. Over the long term, the tonnage of MSW landfilled in 1990 was 140.1 million tons, but decreased to 120.9 million tons in 1995. The tonnage increased to 132.1 million tons in 1999, then declined to 128.3 in 2000. The tonnage landfilled results from an interaction among generation, recycling, and combustion, which do not necessarily rise and fall at the same time.
- The net per capita discard rate (after recovery for recycling, including composting) was 3.15 pounds per person per day, down from 3.33 pounds per person per day in 1999* (Table ES-2).

* Note that the calculated per capita discard rate may decline for 1999 and earlier years when revised Census population figures are obtained.

Figure ES-5: Number of Landfills in the United States

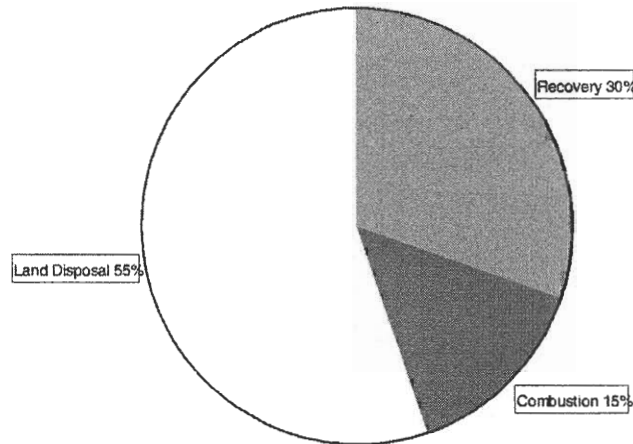


MSW recovered for recycling (including composting) and disposed of by combustion and landfilling in 2000 is shown in Figure ES-6. In 2000, 69.9 millions tons (30.1 percent) of MSW were recycled, 33.7 million tons (14.5 percent) were combusted, and 128.3 million tons (55.3 percent) were landfilled or otherwise disposed. (Relatively small amounts of this total undoubtedly were littered or illegally dumped rather than landfilled.)

PERSPECTIVE FOR THE NATION

As economic growth results in more products and materials being generated, there will be an increased need to invest in source reduction activities such as lightweighting of products and packaging, reuse of products, grasscycling, and backyard composting. Also important will be utilizing existing recycling and composting facilities, further developing this infrastructure, and buying recycled products, to conserve resources and minimize our dependence on disposal through combustion and landfilling.

Figure ES-6: Management of MSW in the United States - 2000



FOR FURTHER INFORMATION

This report and related additional data are available on the Internet at www.epa.gov/osw. Additional information on source reduction is available in *National Source Reduction Characterization Report for Municipal Solid Waste in the United States*, EPA530-R-99-034, November 1999.

Emissions of Greenhouse Gases in the United States 2001

December 2002

Energy Information Administration
Office of Integrated Analysis and Forecasting
U.S. Department of Energy
Washington, DC 20585

This report was prepared by the Energy Information Administration, the independent statistical and analytical agency within the Department of Energy. The information contained herein should be attributed to the Energy Information Administration and should not be construed as advocating or reflecting any policy position of the Department of Energy or of any other organization.

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Preface

Title XVI, Section 1605(a) of the Energy Policy Act of 1992 (enacted October 24, 1992) provides:

Not later than one year after the date of the enactment of this Act, the Secretary, through the Energy Information Administration, shall develop, based on data available to, and obtained by, the Energy Information Administration, an inventory of the national aggregate emissions of each greenhouse gas for each calendar year of the baseline period of 1987 through 1990. The Administrator of the Energy Information Administration shall annually update and analyze such inventory using

available data. This subsection does not provide any new data collection authority.

The first report in this series, *Emissions of Greenhouse Gases 1985-1990*, was published in September 1993. This report—the tenth annual report, as required by law—presents the Energy Information Administration's latest estimates of emissions for carbon dioxide, methane, nitrous oxide, and other greenhouse gases. These estimates are based on activity data and applied emissions factors and not on measured or metered emissions monitoring.

The estimates of greenhouse gas emissions contained in this report are based on energy consumption data from the Energy Information Administration's (EIA's) *Annual Energy Review 2001 (AER2001)*. The *AER2001* is the first EIA publication that contains revised electricity and fuel data from 1989 to 2000. As a result, EIA has revised its estimates for the years 1989 through 2000 for energy-related carbon dioxide emissions, total greenhouse gas emissions, sector-specific emissions, and emissions by fuel type. Last year's emissions report was based primarily on EIA's July 2001 *Monthly Energy Review* (see text box on page 27).

Contents

Executive Summary	ix
1. U.S. Emissions of Greenhouse Gases in Perspective	1
About This Report	1
The Greenhouse Effect and Global Climate Change	1
International Developments in Global Climate Change	12
2. Carbon Dioxide Emissions	19
Overview	19
Energy Consumption	21
Carbon Dioxide Emissions and Economic Growth	26
Adjustments to Energy Consumption	30
Other Carbon Dioxide Emissions	30
3. Methane Emissions	37
Overview	37
Energy Sources	38
Waste Management	40
Agricultural Sources	42
Industrial Sources	43
4. Nitrous Oxide Emissions	51
Overview	51
Energy Use	52
Agriculture	53
Waste Management	54
Industrial Processes	54
5. Other Gases: Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride	61
Overview	61
Hydrofluorocarbons (HFCs)	64
Perfluorocarbons (PFCs)	68
Sulfur Hexafluoride (SF ₆)	69
6. Land Use Issues	73
Overview	73
Land Use Change and Forestry Carbon Sequestration	73
Changes in Forest Carbon Stocks	76
Changes in Urban Tree Carbon Stocks	77
Changes in Agricultural Soil Carbon Stocks	77
Changes in Landfilled Yard Trimming Carbon Stocks	78
Land Use and International Climate Change Negotiations	78
Land Use Data Issues	79
References	81
Related Links	93
Glossary	95
Appendixes	
A. Estimation Methods	
B. Carbon Coefficients Used in This Report	
C. Uncertainty in Emissions Estimates	
D. Emissions Sources Excluded	
E. Emissions of Energy-Related Carbon Dioxide in the United States, 1949-1999	
F. Common Conversion Factors	
G. Global Warming Potentials	

Special Topics

Units for Measuring Greenhouse Gases	2
What's New in This Report	4
Comparison of Global Warming Potentials from the IPCC's Second and Third Assessment Reports	11
Historical and Projected U.S. Carbon and Total Greenhouse Gas Intensity	14
Evolution of EIA Emissions Estimates for the Electric Power Sector	20
Energy-Related Carbon Dioxide Emissions in Manufacturing	23
EIA Changes to Electric Power Sector and Fossil Fuel Data	27
Methane Emissions from Industrial Wastewater Treatment	41
Potential Effects of a Shift in Swine Farm Size	43
Alternatives to Chlorofluorocarbons: Lowering Ozone Depletion Potentials vs. Raising Global Warming Potentials	62
The EPA Vintaging Model: Estimation Methods and Uncertainty	65
EPA Revises Emissions Estimation Methodology	66
Global Estimates of Carbon Sequestration Through Land Use and Forestry Activities	74
Satellite Data Indicate That Forests Store 700 Million Metric Tons of Carbon Annually	76

Tables

ES1. Summary of Estimated U.S. Emissions of Greenhouse Gases, 1990-2001	ix
ES2. U.S. Emissions of Greenhouse Gases, Based on Global Warming Potential, 1990-2001	x
1. Global Atmospheric Concentrations of Selected Greenhouse Gases	2
2. Global Natural and Anthropogenic Sources and Absorption of Greenhouse Gases	5
3. Numerical Estimates of Global Warming Potentials Compared With Carbon Dioxide	10
4. U.S. Carbon Dioxide Emissions from Energy and Industry, 1990-2001	32
5. U.S. Carbon Dioxide Emissions from Energy Consumption by End-Use Sector, 1990-2001	32
6. U.S. Carbon Dioxide Emissions from Residential Sector Energy Consumption, 1990-2001	33
7. U.S. Carbon Dioxide Emissions from Commercial Sector Energy Consumption, 1990-2001	33
8. U.S. Carbon Dioxide Emissions from Industrial Sector Energy Consumption, 1990-2001	34
9. U.S. Carbon Dioxide Emissions from Transportation Sector Energy Consumption, 1990-2001	34
10. U.S. Carbon Dioxide Emissions from Electric Power Sector Energy Consumption, 1990-2001	35
11. U.S. Carbon Sequestered by Nonfuel Use of Energy Fuels, 1990-2001	35
12. U.S. Carbon Dioxide Emissions from Industrial Processes, 1990-2001	36
13. U.S. Methane Emissions from Anthropogenic Sources, 1990-2001	44
14. U.S. Methane Emissions from Coal Mining and Post-Mining Activities, 1990-2001	45
15. U.S. Methane Emissions from Natural Gas Systems, 1990-2001	46
16. U.S. Methane Emissions from Petroleum Systems, 1990-2001	46
17. U.S. Methane Emissions from Stationary Combustion Sources, 1990-2001	47
18. U.S. Methane Emissions from Mobile Sources, 1990-2001	48
19. U.S. Methane Emissions from Landfills, 1990-2001	48
20. U.S. Methane Emissions from Enteric Fermentation in Domesticated Animals, 1990-2000	49
21. U.S. Methane Emissions from the Solid Waste of Domesticated Animals, 1990-2001	49
22. U.S. Methane Emissions from Industrial Processes, 1990-2001	50
23. Estimated U.S. Emissions of Nitrous Oxide, 1990-2001	56
24. U.S. Nitrous Oxide Emissions from Mobile Combustion, 1990-2001	56
25. U.S. Nitrous Oxide Emissions from Stationary Combustion, 1990-2001	57
26. U.S. Nitrous Oxide Emissions from Nitrogen Fertilization of Agricultural Soils, 1990-2001	58
27. U.S. Nitrous Oxide Emissions from Solid Waste of Domesticated Animals, 1990-2001	58
28. U.S. Nitrous Oxide Emissions from Industrial Processes, 1990-2001	59
29. U.S. Emissions of Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride, 1990-2001	71
30. U.S. Emissions of Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride, 1990-2001	71
31. Net Carbon Dioxide Sequestration from U.S. Land Use Change and Forestry, 1990 and 1995-2000	73
32. Net Carbon Dioxide Sequestration in U.S. Forests, 1990 and 1995-2000	77
33. Net Carbon Dioxide Sequestration in U.S. Agricultural Soils, 1990 and 1995-2000	78

Figures

ES1. U.S. Greenhouse Gas Emissions by Gas, 2001.....	x
ES2. Carbon Dioxide Emissions Intensity of U.S. Gross Domestic Product, Population, and Electricity Production, 1990-2001	xi
ES3. U.S. Carbon Dioxide Emissions by Sector, 1990-2001	xi
ES5. U.S. Emissions of Nitrous Oxide by Source, 1990-2001.....	xiii
ES4. U.S. Emissions of Methane by Source, 1990-2001.....	xiii
1. Annual Change in U.S. Carbon Dioxide Emissions, 1990-2001	19
2. Growth in U.S. Carbon Dioxide Emissions and GDP, Energy Intensity of GDP, and Carbon Dioxide Intensity of Energy Use, 1990-2001	26
3. U.S. Emissions of Methane by Source, 1990-2001.....	38
4. U.S. Emissions of Nitrous Oxide by Source, 1990-2001.....	51
5. U.S. Emissions of Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride, 1990-2001.....	61



Executive Summary

Overview

U.S. Anthropogenic Greenhouse Gas Emissions, 1990-2001	
	Carbon Equivalent
Estimated 2001 Emissions (Million Metric Tons)	1,883.3
Change Compared to 2000 (Million Metric Tons)	-23.7
Change from 2000 (Percent)	-1.2%
Change Compared to 1990 (Million Metric Tons)	200.8
Change from 1990 (Percent)	11.9%
Average Annual Increase, 1990-2001 (Percent)	1.0%

U.S. emissions of greenhouse gases in 2001 totaled 1,883 million metric tons carbon equivalent, 1.2 percent less than in 2000 (1,907 million metric tons carbon equivalent). The 1.2-percent decrease from 2000 to 2001 is the largest percentage annual decline in total U.S. greenhouse gas emissions during the 1990 to 2001 time frame. The only other year since 1990 in which total emissions have declined is 1991, when emissions fell by 0.6 percent. U.S. greenhouse gas emissions have averaged 1.0-percent annual growth since 1990. The decline in

U.S. greenhouse gas emissions can be attributed to the combination of the following factors: a reduction in overall economic growth from 3.8 percent in 2000 to 0.3 percent in 2001; a 4.4-percent reduction in manufacturing output that lowered industrial emissions; warmer winter weather that decreased the demand for heating fuels; and a drop in electricity demand and coal-fired power generation that reduced emissions from electricity generation.

U.S. greenhouse gas emissions in 2001 were 11.9 percent higher than 1990 emissions (1,683 million metric tons carbon equivalent). Since 1990, U.S. emissions have increased more slowly than the average annual growth in population (1.2 percent), primary energy consumption (1.2 percent), electric power generation (1.9 percent), or gross domestic product (2.9 percent).

Table ES1 shows trends in emissions of the principal greenhouse gases, measured in million metric tons of gas. In Table ES2, the value shown for each gas is weighted by its global warming potential (GWP), which is a measure of "radiative forcing." The GWP concept, developed by the Intergovernmental Panel on Climate Change (IPCC), provides a comparative measure of the impacts of different greenhouse gases on global warming relative to the global warming potential of carbon dioxide.¹

In 2001, the IPCC Working Group I released its Third Assessment Report, *Climate Change 2001: The Scientific Basis*.² Among other things, the Third Assessment Report updated a number of the GWP estimates that

Table ES1. Summary of Estimated U.S. Emissions of Greenhouse Gases, 1990-2001
(Million Metric Tons of Gas)

Gas	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	P2001
Carbon Dioxide ^R	5,002.8	4,960.6	5,063.9	5,175.4	5,260.2	5,320.9	5,505.0	5,573.0	5,596.4	5,672.8	5,855.1	5,788.5
Methane	31.7	31.9	31.9	31.0	31.1	31.1	29.9	29.5	29.0	28.7	28.3	28.0
Nitrous Oxide	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
HFCs, PFCs, and SF ₆	*	*	*	*	*	*	*	*	*	*	*	*

^REstimates of energy-related carbon dioxide emissions have been revised as part of an agency-wide adjustment to energy consumption data. See text box on page 27 for detailed explanation.

*Less than 0.05 million metric tons of gas.

P = preliminary data.

Note: Data in this table are revised from the data contained in the previous EIA report, *Emissions of Greenhouse Gases in the United States 2000*, DOE/EIA-0573(2000) (Washington, DC, November 2001).

Source: Estimates presented in this report.

¹See "Units for Measuring Greenhouse Gases" on page 2, and Intergovernmental Panel on Climate Change, *Climate Change 2001: The Scientific Basis* (Cambridge, UK: Cambridge University Press, 2001).

²Intergovernmental Panel on Climate Change, *Climate Change 2001: The Scientific Basis* (Cambridge, UK: Cambridge University Press, 2001).

Executive Summary

Table ES2. U.S. Emissions of Greenhouse Gases, Based on Global Warming Potential, 1990-2001
(Million Metric Tons Carbon Equivalent)

Gas	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	P2001
Carbon Dioxide ^R	1,364	1,353	1,381	1,411	1,435	1,451	1,501	1,520	1,526	1,547	1,597	1,579
Methane	199	200	200	194	195	195	188	185	182	180	178	176
Nitrous Oxide	94	96	98	99	106	102	101	99	99	100	98	97
HFCs, PFCs, and SF ₆	25	23	24	25	25	27	31	32	35	34	34	31
Total	1,663	1,673	1,703	1,730	1,760	1,775	1,821	1,836	1,842	1,861	1,907	1,883

^REstimates of energy-related carbon dioxide emissions have been revised as part of an agency-wide adjustment to energy consumption data and sectoral allocations.

P = preliminary data.

Note: Data in this table are revised from the data contained in the previous EIA report, *Emissions of Greenhouse Gases in the United States 2000*, DOE/EIA-0573(2000) (Washington, DC, November 2000).

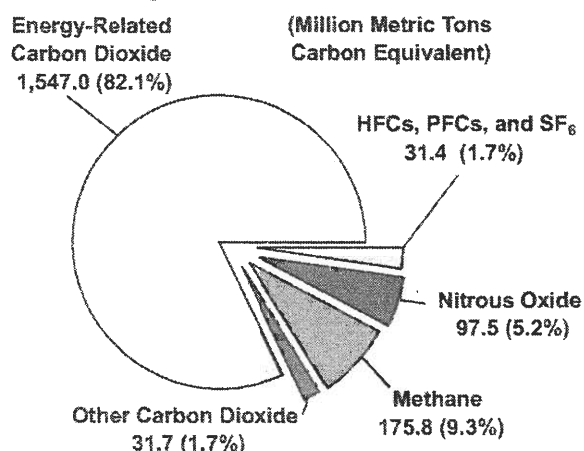
Sources: Emissions: Estimates presented in this report. Global Warming Potentials: Intergovernmental Panel on Climate Change, *Climate Change 2001: The Scientific Basis* (Cambridge, UK: Cambridge University Press, 2001), pp. 38 and 388-389.

appeared in the IPCC's Second Assessment Report.³ The GWPs published in the Third Assessment Report were used for the calculation of carbon-equivalent emissions for this report. For a discussion of GWPs and a comparison of U.S. carbon-equivalent emissions calculated using the GWPs from the IPCC's Third and Second Assessment Reports, see Chapter 1, page 12. Generally, total U.S. carbon equivalent emissions are 0.8 percent higher when the GWPs from the Third Assessment Report are used.

During 2001, 82.1 percent of total U.S. greenhouse gas emissions consisted of carbon dioxide from the combustion of fossil fuels such as coal, petroleum, and natural gas (after adjustments for U.S. territories and international bunker fuels). U.S. emissions trends are driven largely by trends in fossil energy consumption. In recent years, national energy consumption, like emissions, has grown relatively slowly, with year-to-year deviations from trend growth caused by weather-related phenomena, fluctuations in business cycles, changes in the fuel mix for electric power generation, and developments in domestic and international energy markets.

Other 2001 U.S. greenhouse gas emissions include carbon dioxide from non-combustion sources (1.7 percent of total U.S. greenhouse gas emissions), methane (9.3 percent), nitrous oxide (5.2 percent), and other gases (1.7 percent) (Figure ES1). Methane and nitrous oxide emissions are caused by the biological decomposition of various waste streams and fertilizer, fugitive emissions from chemical processes, fossil fuel production and combustion, and many smaller sources. The other gases include hydrofluorocarbons (HFCs), used primarily as refrigerants; perfluorocarbons (PFCs), released as fugitive emissions from aluminum smelting and also used in semiconductor manufacture; and sulfur hexafluoride (SF₆), used as an insulator in utility-scale electrical equipment.

Figure ES1. U.S. Greenhouse Gas Emissions by Gas, 2001



Source: Table ES2 and Table 4 in this report.

This report, required by Section 1605(a) of the Energy Policy Act of 1992, provides estimates of U.S. emissions of greenhouse gases, as well as information on the methods used to develop the estimates. The estimates are based on activity data and applied emissions factors, not on measured or metered emissions monitoring.

Carbon Dioxide

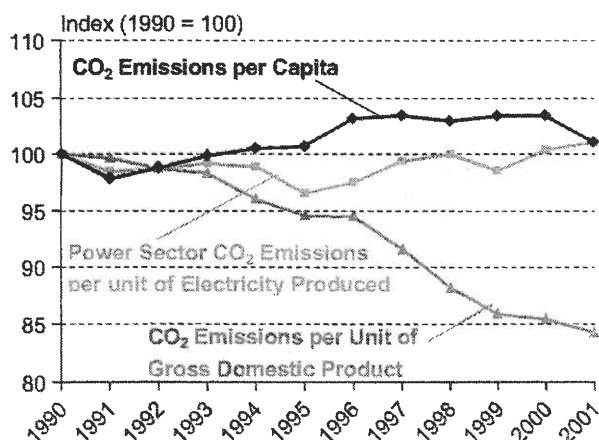
The preliminary estimate of U.S. carbon dioxide emissions from both energy consumption and industrial processes in 2001 is 1,579 million metric tons carbon equivalent, which is 1.1 percent lower than in 2000 and accounts for 84 percent of total U.S. greenhouse gas emissions. The 1.1-percent decrease in carbon dioxide emissions in 2001 is the largest annual decline of the 1990 to 2001 period. A 0.8-percent decline in 1991 was the only other annual decrease in carbon dioxide emissions during the period. U.S. carbon dioxide emissions have

³Intergovernmental Panel on Climate Change, *Climate Change 1995: The Science of Climate Change* (Cambridge, UK: Cambridge University Press, 1996).

grown by an average of 1.3 percent annually since 1990. Although short-term changes in carbon dioxide emissions can result from temporary variations in weather, power generation fuel mixes, and the economy, in the longer term their growth is driven by population, income, and consumer choices of energy-using equipment, as well as the "carbon intensity" of energy use (carbon dioxide emissions per unit of energy consumed).

Figure ES2 shows recent trends in some common indexes used to measure the carbon intensity of the U.S. economy. Carbon dioxide emissions per unit of GDP have continued to fall relative to 1990; this measure is now 15.8 percent lower than in 1990. Carbon dioxide emissions per capita, after rising to 3.5 percent above the 1990 level in 1999 and 2000, fell in 2001 to 1.1 percent above the 1990 level. The combination of increasing population growth and rising carbon dioxide emissions per capita resulted in increased aggregate carbon dioxide emissions per year from 1990 through 2000 (a total increase of 17.0 percent). The drop in per capita emissions in 2001 brought the increase since 1990 down to 15.7 percent. Carbon dioxide emissions per unit of net electricity generation increased by 0.6 percent in 2001 from the 2000 level. Although coal-fired generation fell more than other sources of fossil-fuel-generated electric power, increases in emissions from oil- and natural-gas-fired generators offset the decrease. Because oil-fired generators often are less efficient than those that use other fuels, they produce more emissions per unit of

Figure ES2. Carbon Dioxide Emissions Intensity of U.S. Gross Domestic Product, Population, and Electricity Production, 1990-2001



Sources: Estimates presented in this report.

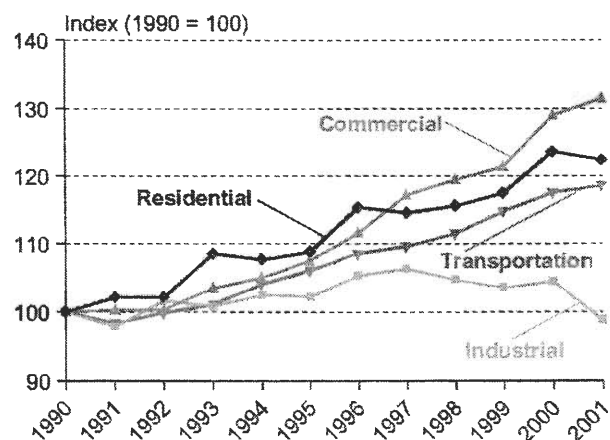
⁴As described in detail in Chapter 2, the Energy Information Administration (EIA) has recently completed a reorganization of its electric power data systems to provide better accounting of fuel use, electricity generation, emissions, and other information from the U.S. electric power industry, which has undergone significant structural changes over the past decade. The data reorganization has led to revisions in EIA's historical data on fuel use for electricity generation, with corresponding revisions in the 1990-2000 estimates of energy-related carbon dioxide emissions, total greenhouse gas emissions, sector-specific emissions, and emissions by fuel type.

electricity produced. Declines in two of these indexes reflect an economy that was less carbon-intensive in 2001 than in 2000.

Carbon dioxide emissions from the U.S. electric power sector (which includes utilities, independent power producers, and combined heat and power facilities whose primary business is the production and sale of electricity) in 2001 are estimated at 611.7 million metric tons carbon equivalent, 1.5 percent lower than the 2000 level of 621.2 million metric tons carbon equivalent.⁴ The 2001 decrease can be attributed largely to a 2.2-percent drop in total electricity generation. A 2.6-percent decline in carbon dioxide emissions from coal combustion indicates that the most carbon-intensive form of power generation fell even more than total generation. Also contributing to the decline was a 2.0-percent increase in generation from nuclear fuel, which produces no carbon dioxide emissions.

Figure ES3 illustrates trends in carbon dioxide emissions by energy consumption sector. In general, with the exception of the industrial sector, emissions have increased steadily at the sectoral level since 1990. An exception to the general upward trend was 1990-1991, when economic recession and higher oil prices following the Iraqi invasion of Kuwait led to downturns in both the transportation and industrial sectors that were enough to produce a 0.9-percent decrease in national energy-related carbon dioxide emissions in 1991. Average annual growth rates in carbon dioxide emissions by sector during the 1990-2001 period were 2.5 percent for the commercial sector, 1.8 percent for the residential

Figure ES3. U.S. Carbon Dioxide Emissions by Sector, 1990-2001



Sources: Estimates presented in this report.

6. Land Use Issues

Overview

Land use change and forestry issues are important to national and global inventories of greenhouse gases in two ways:

- Vegetation can “sequester” or remove carbon dioxide from the atmosphere and store it for potentially long periods in above- and below-ground biomass, as well as in soils. Soils, trees, crops, and other plants may make significant contributions to reducing net greenhouse gas emissions by serving as carbon “sinks.”
- Humans can alter the biosphere through changes in land use and forest management practices and, in effect, alter the quantities of atmospheric and terrestrial carbon stocks, as well as the natural carbon flux among biomass, soils, and the atmosphere.

Land use issues are of particular interest to the United States because U.S. forests and soils annually sequester large amounts of carbon dioxide. Much of the forest land in the United States was originally cleared for agriculture, lumber, or fuel in the hundred years prior to 1920. Since then, however, much of the agricultural and pasture land has reverted to forest land, increasing its ability to sequester atmospheric carbon dioxide.

The amount of carbon being sequestered annually is uncertain, in part because of an absence of data and difficulties in measuring sequestration. Moreover, in addition to technical uncertainties, there are also policy and

accounting questions about the aspects of the biological carbon cycle that would be included in national inventories as anthropogenic emissions and removals.

The revised guidelines for national emissions inventories published in 1997 by the Intergovernmental Panel on Climate Change (IPCC) stipulate the inclusion of carbon sequestration through land use and forestry in national greenhouse gas inventories as an offset to gross greenhouse gas emissions from other sources.¹³³ The U.S. Environmental Protection Agency (EPA) estimates annual U.S. carbon sequestration for the year 2000 at 246 million metric tons carbon equivalent, a decline of approximately 17.7 percent from the 299 million metric tons carbon equivalent sequestered in 1990 (Table 31). Between 1990 and 2000, land use change and forestry practices represented an offset of approximately 15.4 percent of total U.S. anthropogenic carbon dioxide emissions.

Land Use Change and Forestry Carbon Sequestration

The EPA’s estimates for carbon sequestration from land use change and forestry in 2000 include four main components: (1) changes in forest carbon stocks (210 million metric tons carbon equivalent or 85.4 percent of the total), (2) changes in agricultural soil carbon stocks (18 million metric tons carbon equivalent or 7.3 percent of the total), (3) changes in carbon stocks in urban trees (16 million metric tons carbon equivalent or 6.5 percent of

Table 31. Net Carbon Dioxide Sequestration from U.S. Land Use Change and Forestry, 1990 and 1995-2000
(Million Metric Tons Carbon Equivalent)

Component	1990	1995	1996	1997	1998	1999	2000
Forests	268 ^a	267 ^a	267 ^b	207 ^b	205 ^b	208 ^b	210 ^b
Urban Trees	16 ^a	16 ^a	16 ^a	16 ^a	16 ^a	16 ^a	16 ^a
Agricultural Soils	10 ^b	16 ^a	16 ^a	17 ^c	18 ^b	19 ^b	18 ^b
Landfilled Yard Trimmings	5 ^a	3 ^a	3 ^a	3 ^b	2 ^b	2 ^b	2 ^b
Total	299^a	303^a	302^b	242^b	242^b	245^b	246^b

^aEstimate based on historical data.

^bEstimate based on a combination of historical data and projections.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹³³Intergovernmental Panel on Climate Change, *Greenhouse Gas Inventory Reference Manual: Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, Vol. 3 (Paris, France, 1997), web site www.ipcc.ch/pub/guide.htm.

Global Estimates of Carbon Sequestration Through Land Use and Forestry Activities

Two recent studies have attempted to estimate global levels of carbon sequestration. A 2000 report by the Intergovernmental Panel on Climate Change (IPCC) on land use, land use change and forestry (LULUCF) activities provides a range of values for global carbon sequestration attributable to land use and forestry practices. The IPCC maintains that accounting for the amount of carbon being sequestered annually involves a high degree of uncertainty due to lack of data and to difficulties in measuring sequestration. Further, the report states that there are policy and accounting uncertainties regarding which aspects of the biological carbon cycle should be included in national inventories as anthropogenic emissions and removals. Nevertheless, the IPCC does provide values for carbon sequestration attributable to LULUCF activities.^a

The report provides estimates for carbon stock changes resulting from LULUCF activities under IPCC guidelines and, alternatively, under three United Nations Food and Agriculture Organization (FAO) "definitional scenarios." The FAO definitional scenarios are based on different accounting methods, which assume that area conversion rates remain constant and exclude carbon in soils and wood products. All the accounting scenarios provide estimates for sequestration within UNFCCC Annex I countries^b during the first commitment period (2008-2012) of the Kyoto Protocol. The FAO scenarios include the harvest/regeneration cycle, because regeneration is defined as reforestation. Three FAO accounting approaches are distinguished:

- In the FAO *Land-Based I Accounting Scenario*, the stock change over the full commitment period is measured, including stock losses during harvest, as well as delayed emissions from dead organic matter for reforestation. This approach results in estimated Annex I emissions of 333 to 849 million metric tons carbon equivalent per year from land use and forestry activities.
- In the FAO *Land-Based II Accounting Scenario*, the carbon stock change between the beginning of the activity and the end of the commitment period is

measured, including decay from harvest. This approach results in estimates for the Annex I countries that range from net sequestration of 205 million metric tons carbon equivalent per year to net emissions of 280 million metric tons carbon equivalent per year from land use and forestry activities.

- In the FAO *Activity-Based Accounting Scenario*, only the accumulation of carbon in new forest stands and new dead organic matter is counted under reforestation. This approach results in estimates for the Annex I countries that range from net sequestration of 483 million metric tons carbon equivalent per year to net emissions of 3 million metric tons carbon equivalent per year from land use and forestry activities.

Other global studies also provide a wide range of estimates of carbon sequestration. A working paper developed by the CICERO Center for International Climate and Environmental Research indicates that, globally, the area available for forest plantations could range from 345 million to 510 million hectares, and that an estimated 2.9 billion metric tons of carbon per year can be removed from the atmosphere in forest plantations.^c In contrast, a 1991 study by Nordhaus^d suggests that approximately 0.3 billion metric tons of carbon could be captured annually over a period of 75 years. The fact that the estimates from the two studies differ by a full order of magnitude illustrates the difficulties and uncertainties involved in estimating carbon sequestration.

The table on the opposite page shows estimates of annual carbon sequestration totals for Annex I and non-Annex I countries that could result from LULUCF activities under the Kyoto Protocol. According to those estimates, more than 300 million metric tons of carbon sequestration "credits" could be made available annually through LULUCF activities in the Annex I countries, and the potential for sequestration is much greater in the non-Annex I countries. The greatest potential for carbon sequestration is in forestry-related activities.^e

(continued on page 75)

^aIntergovernmental Panel on Climate Change, *Summary for Policymakers: Land Use, Land-Use Change, and Forestry* (Cambridge, UK: Cambridge University Press, May 2000), p. 4, web site www.ipcc.ch/pub/srlulucf-e.pdf.

^bAs designated in the United Nations Framework Convention on Climate Change (UNFCCC).

^cH. Kolshus, *Carbon Sequestration in Sinks: An Overview of Potential and Costs*, CICERO Working Paper 2001: 11 (Oslo, Norway: CICERO Center for International Climate and Environmental Research, November 2001), web site www.cicero.uio.no/media/1616.pdf.

^dW.D. Nordhaus, "The Cost of Slowing Climate Change: A Survey," *The Energy Journal*, Vol. 12, No. 1 (1991), pp. 37-65.

^eH. Kolshus, *Carbon Sequestration in Sinks: An Overview of Potential and Costs*, CICERO Working Paper 2001: 11 (Oslo, Norway: CICERO Center for International Climate and Environmental Research, November 2001), web site www.cicero.uio.no/media/1616.pdf.

Global Estimates of Carbon Sequestration Through Land Use and Forestry Activities (Continued)

Estimates of Annual Carbon Sequestration Through LULUCF Activities by 2010 Under Provisions of the Kyoto Protocol

(Million Metric Tons Carbon per Year)

Activities	Annex I Countries	Non-Annex I Countries
Article 3.3		
Reduced Deforestation	60 (0-90)	1,698
Afforestation and Reforestation	26 (7-46)	373 (190-538)
Article 3.4		
Croplands (e.g., reduced tillage, erosion control)	75	50
Forests (e.g., enhanced regeneration, fertilization).	101	69
Grazing Lands (e.g., herd, fire, and wood management)	69	168
Agroforests (e.g., management of trees in agriculture).	12	14
Urban land (e.g., tree, waste and wood product management)	1	1
Deforested Land to Agroforest Instead of Pasture/Crop	0	391
Severely Degraded Land to Crop, Grass, or Forest land	1	3
Cropland to Grassland	24	14
Total for Article 3.4	300	710

Notes: Numbers in parentheses represent a range of estimates. Quantities for Articles 3.3 and 3.4 cannot be summed, because they may apply for the same area. Totals may not equal sum of components due to independent rounding.

Sources: H. Kolshus, *Carbon Sequestration in Sinks: An Overview of Potential and Costs*, CICERO Working Paper 2001: 11 (Oslo, Norway: CICERO Center for International Climate and Environmental Research, November 2001), p. 6, web site www.cicero.uio.no/media/1616.pdf; I. Noble and R.J. Scholes, "Sinks and the Kyoto Protocol," *Climate Policy*, Vol. 1 (2001), pp. 5-25; and F. Missfeldt and E. Haites, "The Potential Contribution of Sinks to Meeting Kyoto Protocol Commitments," *Environmental Science and Policy*, Vol. 4, No. 6 (2001), pp. 269-292.

the total), and (4) changes in carbon stocks in landfilled yard trimmings (2 million metric tons carbon equivalent or 0.8 percent of the total).¹³⁴

The EPA's estimates for carbon sequestration in forests are based on carbon stock estimates developed by the U.S. Forest Service, U.S. Department of Agriculture (USDA), employing methodologies that are consistent with the 1996 IPCC guidelines. The USDA estimates of carbon stocks in urban trees were based on field measurements in ten U.S. cities and data on national urban tree cover, again employing a methodology consistent with the 1996 IPCC guidelines. Estimates for sequestration in agricultural soils were based on changes in carbon stocks in mineral and organic soils resulting from agricultural land use and land management, as well as emissions of carbon dioxide resulting from the use of crushed limestone and dolomite on soils. Methodologies drawn from the IPCC guidelines were used to derive all components of changes in agricultural soil carbon stocks. The EPA estimates for carbon stocks in landfilled

yard trimmings are based on the EPA's own method of examining life-cycle greenhouse gas emissions and sinks associated with solid waste management.¹³⁵

The EPA's carbon flux estimates, with the exception of those from wood products, urban trees, and liming, are based on surveys of U.S. forest lands and soils carried out at 5- or 10-year intervals by the U.S. Forest Service. The resulting annual averages are applied to years between surveys. Annual estimates of carbon fluxes between survey years are interpolated and, therefore, change little from year to year, except when a new assessment is made. For landfilled yard trimmings, periodic solid waste survey data are interpolated to derive annual storage estimates. The most current national forest and soil surveys were completed for the year 1997; thus, carbon flux estimates from forests are derived in part from modeled projections for future years. Data on carbon fluxes from urban trees, collected over the decade 1990-2000, were applied to the entire time series.¹³⁶

¹³⁴U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹³⁵U.S. Environmental Protection Agency, *Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks*, 2nd Edition, EPA-530-R-02-006 (Washington, DC, May 2002), web site www.epa.gov.

¹³⁶U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

Satellite Data Indicate That Forests Store 700 Million Metric Tons of Carbon Annually

In a recent study, investigators have used satellite data from the National Aeronautics and Space Administration (NASA) to construct detailed maps of forest carbon pools, sources, and sinks in North America, Europe, and Russia. Their findings indicate that approximately 700 million metric tons of carbon is stored in those forests annually—equivalent to approximately 11.5 percent of global energy-related carbon dioxide emissions in 1999. The data indicate that, with the exception of Canada's boreal forests, which were

found to be losing carbon, most northern forests are actively storing carbon. Russia, which contains the most forest land, accounted for approximately 40 percent of the biomass carbon sink. The researchers reported that about 61 billion tons of carbon is contained in the wood components of these northern forests, with American and European forests containing more carbon per unit of area than either Canadian or Russian forests (56 versus 41 tons of carbon per hectare).¹³⁷

¹³⁷R. Myneni et al., "Forests Storing 700 Million Tons of Carbon Per Year," *UniSci Daily University Science News* (December 12, 2001), web site <http://unisci.com/stories/20014/1212012.htm>.

Changes in Forest Carbon Stocks

Worldwide, the most significant anthropogenic activity that affects forest carbon sequestration is deforestation, particularly that of tropical forests. During the 1980s, tropical deforestation is projected to have resulted in approximately 6 billion metric tons of carbon dioxide emissions to the atmosphere annually. This value represents approximately 23 percent of global carbon dioxide emissions resulting from anthropogenic activities during the 1980s. Approximately 7 percent of global carbon dioxide emissions were compensated for by carbon sequestration as a result of forest re-growth in the Northern Hemisphere.¹³⁷ In the United States, the most significant pressures on the amount of carbon sequestered through forest lands are land management activities and the continuing effects of past changes in land use. These activities directly affect carbon flux by shifting the amount of carbon accumulated in forest ecosystems.¹³⁸ Land management activities affect both the stocks of carbon that can be stored in land-based carbon sinks, such as forests and soils, and the flows, or fluxes, of carbon between land-based sinks and the atmosphere.

Forests are multifaceted ecosystems with numerous interrelated components, each of which stores carbon. These components include:

- Trees (living trees, standing dead trees, roots, stems, branches, and foliage)
- Understory vegetation (shrubs and bushes, roots, stems, branches, and foliage)

- Forest floor (fine woody debris, tree litter, and humus)
- Down dead wood (logging residue and other dead wood on the ground, stumps, and roots of stumps)
- Organic material in soil.

As a result of natural biological processes occurring within forests, as well as anthropogenic activities, carbon is constantly cycling through these components and between the forest and the atmosphere. The net change in overall forest carbon may not always be equal to the net flux between forests and the atmosphere, because timber harvests may not necessarily result in an instant return of carbon to the atmosphere. Timber harvesting transfers carbon from one of the seven forest components or "forest pools" to a "product pool." Once carbon is transferred to a product pool, it is emitted over time as carbon dioxide as the product combusts or decays. Emission rates vary significantly, depending on the type of product pool that houses the carbon.¹³⁹

In the United States, enhanced forest management, regeneration of formerly cleared forest areas, and timber harvesting have resulted in the annual sequestration of carbon throughout the past decade. Since the 1920s, deforestation for agricultural purposes has become a practically nonexistent practice. More recently, managed growth practices have become common in eastern forests, greatly increasing their biomass density over the past 50 years. In the 1970s and 1980s, federally sponsored tree planting and soil conservation programs were embraced. These programs resulted in the reforestation of formerly harvested lands, improvement in timber management activities, soil erosion abatement, and the

¹³⁷U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹³⁸U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹³⁹U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

conversion of cropland to forests. Forest harvests have also affected carbon sequestration. The majority of harvested timber in the United States is used in wood products. The bulk of the discarded wood products are landfilled; thus, large quantities of the harvested carbon are relocated to long-term storage pools rather than to the atmosphere. The size of wood product landfills has increased over the past century.¹⁴⁰

According to the EPA (Table 32), between 1990 and 2000, U.S. forest and harvested wood components accounted for an average annual net sequestration of 210 million metric tons carbon equivalent, resulting from domestic forest growth and increases in forested land area. Over the same period, however, increasing harvests and land-use changes have resulted in a decrease of approximately 22 percent in the overall rate of annual sequestration.

Changes in Urban Tree Carbon Stocks

Urban forests make up a considerable portion of the total tree canopy cover in the United States. Urban areas, which cover 3.5 percent of the continental United States, are estimated to contain about 3.8 billion trees, accounting for approximately 2.8 percent of total tree cover. The

EPA's carbon sequestration estimates for urban trees are derived from estimates by Nowak and Crane,¹⁴¹ based on data collected from 1990 through 2000. Net carbon dioxide flux from urban trees is estimated at 16 million metric tons carbon equivalent annually from 1990 through 2000 (Table 31).¹⁴²

Changes in Agricultural Soil Carbon Stocks

The amount of organic carbon in soils depends on the balance between addition of organic materials and loss of carbon through decomposition. The quantity and quality of organic matter within soils, as well as decomposition rates, are determined by the interaction of climate, soil properties, and land use. Agricultural practices—including clearing, drainage, tillage, planting, grazing, crop residue management, fertilization, and flooding—can alter organic matter inputs and decomposition, causing a net flux of carbon to or from soils. The IPCC methodology, which is used by the EPA to estimate the net flux from agricultural soils (Table 33), is divided into three categories of land use and land management activities: (1) agricultural land use and land management activities on mineral soils; (2) agricultural land use and land management activities on organic soils; and (3) liming of soils. Of the three activities, the

Table 32. Net Carbon Dioxide Sequestration in U.S. Forests, 1990 and 1995-2000
(Million Metric Tons Carbon Equivalent)

Description	1990 ^a	1995 ^a	1996 ^a	1997 ^b	1998 ^b	1999 ^b	2000 ^b
Forest Carbon Stocks	211	211	211	149	149	149	149
Trees	128	128	128	122	122	122	122
Understory	3	3	3	4	4	4	4
Forest Floor	7	7	7	-8	-8	-8	-8
Down Dead Wood	15	15	15	16	16	16	16
Forest Soils	58	58	58	15	15	15	15
Harvested Wood Carbon Stocks ..	57	56	56	58	58	59	61
Wood Products	13	15	15	16	14	17	18
Landfilled Wood	44	41	41	42	42	42	43
Total	268	267	267	207	205	208	210

^aEstimates based on historical data.

^bEstimates based on a combination of historical data and projections.

Notes: The sums of the annual net stock changes in this table (shown in the "Total" row) represent estimates of the actual net flux between the total forest carbon pool and the atmosphere. Forest values are based on periodic measurements; harvested wood estimates are based on annual surveys. Totals may not equal sum of components due to independent rounding.

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹⁴⁰U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), p. 129, web site www.epa.gov.

¹⁴¹D.J. Nowak and D.E. Crane. "Carbon Storage and Sequestration by Urban Trees in the United States." *Environmental Pollution*. Vol. 116, No. 3 (2001), pp. 381-389.

¹⁴²U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

use and management of mineral soils is estimated to be the most significant contributor to total flux from 1990 through 2000.¹⁴³

Changes in Landfilled Yard Trimming Carbon Stocks

Carbon stored in landfilled yard trimmings can remain indefinitely. In the United States, yard trimmings (grass clippings, leaves, and branches) make up a considerable portion of the municipal waste stream, and significant amounts of the yard trimmings collected are discarded in landfills. Both the amount of yard trimmings collected annually and the percentage of trimmings landfilled have declined over the past decade, and net carbon dioxide sequestration in landfilled yard trimmings has declined accordingly (Table 31). The EPA's methodology for estimating carbon storage relies on a life-cycle analysis of greenhouse gas emissions and sinks associated with solid waste management.¹⁴⁴

Land Use and International Climate Change Negotiations

In past international negotiations on climate change, the United States and many other countries have maintained that the inclusion of LULUCF activities in a binding agreement that limits greenhouse gas emissions is of the utmost importance; however, issues of whether and how terrestrial carbon sequestration could be accepted for meeting various commitments and targets have remained subjects of complex and difficult international negotiations on climate change.

Many of the countries involved in climate change negotiations have agreed that implementation of LULUCF activities under an international climate change agreement may be complicated by a lack of clear definitions for words such as "reforestation" and "forest." Further, implementation may be hindered by the lack of effective accounting rules. According to researchers at the Pew Center on Global Climate Change,¹⁴⁵ implementation of LULUCF provisions in an international climate change agreement raises many issues for such activities and/or projects, such as:

- What is a direct human-induced activity?
- What is a forest and what is reforestation?
- How will uncertainty and verifiability be addressed?
- How will the issues of (non) permanence and leakage be addressed?
- Which activities beyond afforestation, reforestation and deforestation (ARD), if any, should be included, and what accounting rules should apply?
- Which carbon pools and which greenhouse gases should be considered?

Uncertainties related to data issues have also slowed international negotiations on climate change.

The most recent UNFCCC climate negotiations, which took place at the Conference of the Parties (COP) in Bonn, Germany, in July 2001 (COP-6.5) and Marrakech, Morocco, in November 2001 (COP-7) led to an agreement called the Marrakech Accords. LULUCF activities were debated throughout the negotiations, and it is believed that the LULUCF issue was one of the main

Table 33. Net Carbon Dioxide Sequestration in U.S. Agricultural Soils, 1990 and 1995-2000
(Million Metric Tons Carbon Equivalent)

Description	1990	1995	1996	1997	1998	1999	2000
Mineral Soils	18.9 ^a	25.1 ^a	25.1 ^a	25.1 ^a	27.2 ^b	27.2 ^b	27.2 ^b
Organic Soils	-6.1 ^a	-6.2 ^a	-6.2 ^a	-6.2 ^a	-6.2 ^b	-6.2 ^b	-6.2 ^b
Liming of Soils	-2.6 ^a	-2.4 ^a	-2.4 ^a	-2.4 ^a	-2.6 ^a	-2.5 ^a	-2.6 ^a
Total	10.2^a	16.4^a	16.4^a	16.5^a	18.3^a	18.5^a	18.4^a

^aEstimates based on historical data.

^bEstimates based on a combination of historical data and projections.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹⁴³U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹⁴⁴U.S. Environmental Protection Agency, *Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks*, 2nd Edition, EPA-530-R-02-006 (Washington, DC, May 2002), web site www.epa.gov.

¹⁴⁵G. Marland and B. Schlamadinger, *Land Use and Global Climate Change: Forests, Land Management, and the Kyoto Protocol* (Arlington, VA: Pew Center on Global Climate Change, June 2000), p. 5, web site www.pewclimate.org/projects/land_use.cfm.

reasons that the negotiations at COP-6 in November 2000 failed. Consensus on including carbon sinks in the Kyoto Protocol was reached only at the very end of the climate change negotiations at COP-7.¹⁴⁶ Should the Kyoto Protocol eventually be ratified, specific implementation rules for LULUCF would have to be developed.

Land Use Data Issues

Uncertainties in the EPA estimates of U.S. carbon sequestration include sampling and measurement errors inherent to forest carbon estimates. The forest surveys engage a statistical sample that represents the expansive variety of growth conditions over large territories. Although more current inventories are conducted annually in each State, much of the existing data may have been collected over more than one year in any given State. Thus, there may be uncertainty about the year associated with the forest survey data. In addition, the existing forest survey data do not include forest stocks in Alaska, Hawaii, and the U.S. territories (although net carbon fluxes from these stocks are anticipated to be insignificant).¹⁴⁷

Additional uncertainty results from the derivations of carbon sequestration estimates for forest floor, understory vegetation, and soil from models based on forest ecosystem studies. To extrapolate results of these studies to the forested lands in question, an assumption was made that the studies effectively described regional or national averages. This assumption may result in bias from applying data from studies that improperly represent average forest conditions, from modeling errors, and/or from errors in converting estimates from one reporting unit to another.¹⁴⁸

Aside from the land use data issues and uncertainties discussed above, which are specific to the methodologies used for the EPA estimates, there is concern about larger and more general uncertainty surrounding estimates of terrestrial carbon sequestration. It is anticipated to be difficult, as well as expensive, to determine carbon stock changes over shorter time periods, such as the 5-year periods suggested during international climate

change negotiations. This concern is especially problematic if the carbon stocks are large and the stock changes are comparatively small.¹⁴⁹ Several countries involved in the negotiations have maintained that the accounting of terrestrial carbon stock changes over a 5-year commitment period fails to account for the differing dynamics of carbon stocks and fluxes over time.

Accounting for carbon sequestration through land use and forestry practices also raises the issues of "permanence" and "leakage." Carbon sequestration occurring at one time and place presents the issue of whether the carbon will be lost at a later time (permanence) or result in offsetting losses elsewhere (leakage). For example, suppose an international climate change agreement is developed in which changes in carbon stocks within a certain commitment period are used to meet targets. If there is a gap between commitment periods, there will be a possibility for unaccounted losses (or gains) in certain countries. A similar possibility of unaccounted losses will arise if countries in one geographic area receive "credits" for carbon that is sequestered in countries in a different geographic area but subsequent carbon losses remain unaccounted.¹⁵⁰

Leakage is defined as the unexpected loss of expected carbon sequestration benefits when the displacement of activities or market effects leads to carbon losses elsewhere. For example, avoiding deforestation in one geographic location may accelerate the rate of deforestation in another geographic location. Leakage may also occur through the impact of a large reforestation program on timber prices. Increased availability of timber could result in lower prices, which in turn could cause reduced rates of planting in other locations. Reduced timber prices may also result in the conversion of existing forests for agriculture.¹⁵¹

In addition to concerns about uncertainty, permanence, and leakage, a recent scientific study published in the science journal *Nature* has raised questions about carbon sequestration through terrestrial sinks. The authors of the study, Dr. John Lichter and Dr. William Schlesinger, concluded that while forests do sequester carbon dioxide from the air and store it in the soil, the majority of the sequestered carbon is ultimately released back into the

¹⁴⁶H. Kolshus, *Carbon Sequestration in Sinks: An Overview of Potential and Costs*, CICERO Working Paper 2001: 11 (Oslo, Norway: CICERO Center for International Climate and Environmental Research, November 2001), web site www.cicero.uio.no/media/1616.pdf.

¹⁴⁷U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹⁴⁸U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2000*, EPA-430-R-02-003 (Washington, DC, April 2002), web site www.epa.gov.

¹⁴⁹G. Marland and B. Schlamadinger, *Land Use and Global Climate Change: Forests, Land Management, and the Kyoto Protocol* (Arlington, VA: Pew Center on Global Climate Change, June 2000), p. 31, web site www.pewclimate.org/projects/land_use.cfm.

¹⁵⁰G. Marland and B. Schlamadinger, *Land Use and Global Climate Change: Forests, Land Management, and the Kyoto Protocol* (Arlington, VA: Pew Center on Global Climate Change, June 2000), p. 31, web site www.pewclimate.org/projects/land_use.cfm.

¹⁵¹G. Marland and B. Schlamadinger, *Land Use and Global Climate Change: Forests, Land Management, and the Kyoto Protocol* (Arlington, VA: Pew Center on Global Climate Change, June 2000), p. 32, web site www.pewclimate.org/projects/land_use.cfm.

atmosphere as carbon dioxide when organic soil material decomposes. They maintain that their findings highlight the uncertainty of the role of soils as long-term carbon storage pools and assert that considerable long-term net carbon sequestration in forest soils may be unlikely. Many scientists agree that much work remains to be done on the science surrounding terrestrial carbon sequestration; however, a number of the countries involved in international climate change negotiations assert that the potential for terrestrial carbon sequestration should be embraced, or at the very least, not discounted or overlooked.

In response to the findings presented by Drs. Lichter and Shlesinger, EcoSecurities Ltd., an established environmental finance company that specializes in advising on global warming issues, maintains that their research has been consistently misinterpreted. The company believes that the study's conclusions are inappropriate for two reasons. First, it was never the carbon fertilization effect

alone that climate change policymakers considered to be the greenhouse gas mitigation value of forests. Second, because more than 20 percent of all anthropogenic greenhouse gas emissions come from forest conversion and degradation, the avoidance of deforestation should also be viewed as a prime emission reduction measure.¹⁵²

Thus, while there are methods available for estimating the amount of carbon sequestered through U.S. forests and soils, many uncertainties remain in the accounting methodology and overall conceptual feasibility of carbon sequestration both nationally and globally. For this reason, caution should be employed when accounting for and accepting as fact the amount of carbon sequestered through land use and forestry practices, or when making decisions about the amount of sequestered carbon to be treated as an offset to national carbon dioxide emissions.

¹⁵²EcoSecurities Ltd. "Sinks' and Climate Change. Comment on Recent Reporting on Last Week's *Nature Journal*," Press Release (June 2001), web site www.ecosecurities.com/200about_us/223press_releases/223press_release_sinks_climate.html.

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Text table 7-4.
Environmental worries

Issue	Worry "a great deal" (percent)		
	1997	1999	2000
Pollution of drinking water	NA	68	72
Pollution of rivers, lakes, and reservoirs	NA	61	66
Contamination of soil and water by toxic waste	NA	63	64
Contamination of soil and water by	NA	48	52
radioactivity from nuclear facilities			
Air pollution	42	52	59
Loss of natural habitat for wildlife	NA	51	51
Damage to Earth's ozone layer	33	44	49
Loss of tropical rain forests	NA	49	51
Ocean and beach pollution	NA	50	54
Extinction of plant and animal species	NA	NA	45
Urban sprawl and loss of open space	NA	NA	42
"Greenhouse effect" or global warming	24	34	40
Acid rain	NA	29	34

NA = not available

SOURCE: Gallup Organization, "Only One in Four Americans Are Anxious About the Environment," Poll Release (Princeton, NJ, 2001).

Science & Engineering Ind

HAZARDOUS WASTE

Source: Department of Ecology (360) 407-8000
Internet Homepage: <http://www.ecy.wa.gov/>

Waste In Tons

Calendar Year	1995	1996	1997	1998	1999	2000
Number of Hazardous Waste Reporters	7,135	7,049	6,967	6,937	6,831	6,775
Total of All Reported Hazardous Waste						
Recurrent ¹	7,110,470	7,574,448	3,665,706	244,198	390,656	218,630
Non-Recurrent ²	233,694	270,555	415,923	321,524	42,558	37,357
Special Categories of Waste						
Wastewaters PBR/TBG ³	6,473,004	6,952,625	3,300,234	93,232	49,358	48,566
Radioactive	120,696	81,543	101,705	42,155	38,131	55,574
All Reported Waste by County⁴						
Benton	130,414	97,499	117,921	37,080	27,567	52,705
Cowlitz	46,710	51,055	80,537	40,700	47,788	45,898
King	1,458,543	836,397	1,273,224	67,244	65,053	43,427
Snohomish	98,188	68,428	115,802	77,216	35,125	35,037
Pierce	648,321	946,932	1,040,526	287,484	22,215	20,851
Kitsap	27,689	23,856	25,757	9,513	15,862	17,525
Klickitat	50,368	15,292	7,598	4,202	15,603	8,589
Whatcom	847,537	980,868	852,516	16,770	12,153	5,347
Spokane	25,800	34,375	88,672	5,373	6,854	4,883
Clark	274,954	260,107	416,087	8,157	5,995	3,304
Chelan	2,938	3,364	3,002	2,156	6,304	3,289
Skagit	3,551,294	4,407,100	68,066	1,251	132,224	2,614
Yakima	26,508	454	552	578	1,064	1,260
Grant	99,389	94,971	139,611	443	38,001	413
Thurston	531	360	346	212	216	151
Franklin	1,850	1,241	1,006	112	176	100
Lewis	52,553	19,512	17,785	36	56	54
Whitman	65	75	1,899	86	176	51
Stevens	7	7	2	5,669	6	7
All Others	544	1,098	641	1,242	575	498
All Reported Hazardous Waste by Industry Group						
Transportation and Utilities	106,423	56,569	64,009	34,122	49,129	52,699
Equipment Manufacturing	1,314,034	671,619	1,341,919	60,576	70,246	80,607
Primary and Fabricated Metals	720,009	889,070	815,238	103,071	246,171	52,464
Chemical and Petroleum Products	5,116,751	6,191,698	1,789,204	331,873	41,617	51,125
Lumber, Wood, Printing	5,911	9,911	8,512	19,785	9,208	6,808
Wholesale Trade	6,521	8,878	5,677	4,362	3,864	4,912
Services	7,509	1,361	28,431	600	892	933
Public Administration	37,777	172,892	196,241	2,616	3,125	1,747
Retail Trade	31	18	18	546	31	21
Other Categories	29,199	42,987	42,379	7,962	8,929	15,670
Waste Amounts by Source⁵						
Generated and Managed at Site of Generation	7,106,215	7,693,336	4,089,095	418,302	231,254	127,930
Generated in WA, Managed at WA State TSDRs ⁶	37,618	34,786	38,816	32,936	40,693	31,008
Generated in WA, Sent Out-of-State for Management	200,330	166,880	153,716	114,485	151,264	97,049
Imported into WA from other States for TSDR Management	12,324	19,749	22,839	17,373	15,045	12,145
¹ Resulting from a site's on-going production processes. ² Demolition debris, spill materials, or clean-up wastes. ³ Regulatory change in 1998 no longer requires reported the majority of Permit-by-Rule (PBR) wastewaters; Treatment-by-Generator (TBG) is still reported. ⁴ Includes all reported hazardous wastes. All Others: twenty counties who reported less than 500 tons during these years. ⁵ Treatment Storage/Disposal/Recycling Facility (TSDR). Note: Totals may not add due to rounding. Table: VT09						

Exhibit 1.6 Rank Ordering of States Based on Number of Hazardous Waste Generators and Quantity of RCRA Hazardous Waste Generated, 1999

State	Large Quantity Generators			Hazardous Waste	
	Rank	Number	Percentage	Rank	Tons Generated
NEW YORK	1	2,647	13.2	14	548,928
CALIFORNIA	2	1,850	9.2	16	427,302
OHIO	3	1,181	5.9	5	1,644,029
NEW JERSEY	4	1,071	5.3	13	650,534
ILLINOIS	5	1,006	5.0	3	2,907,327
PENNSYLVANIA	6	965	4.8	17	417,477
TEXAS	7	907	4.5	1	14,923,520
MICHIGAN	8	823	4.1	8	1,385,375
INDIANA	9	586	2.9	10	984,595
WASHINGTON	10	545	2.7	28	91,245
WISCONSIN	11	540	2.7	23	159,174
NORTH CAROLINA	12	508	2.5	33	74,757
MASSACHUSETTS	13	448	2.2	9	1,191,465
LOUISIANA	14	440	2.2	2	4,351,245
TENNESSEE	15	396	2.0	4	2,218,753
CONNECTICUT	16	391	1.9	27	92,201
GEORGIA	17	384	1.9	22	209,206
FLORIDA	18	366	1.8	19	272,387
SOUTH CAROLINA	19	347	1.7	42	14,761
KENTUCKY	20	340	1.7	21	214,842
VIRGINIA	21	332	1.7	25	121,787
MISSOURI	22	312	1.6	24	158,682
MARYLAND	23	289	1.4	32	80,256
ALABAMA	24	274	1.4	15	491,178
MINNESOTA	25	262	1.3	34	56,573
ARKANSAS	26	241	1.2	11	970,995
KANSAS	27	224	1.1	7	1,594,119
OREGON	28	208	1.0	30	81,270
ARIZONA	29	193	1.0	38	39,016
IOWA	30	188	0.9	36	46,828
NEW HAMPSHIRE	31	168	0.8	45	11,682
COLORADO	32	163	0.8	35	49,190
OKLAHOMA	33	147	0.7	18	417,460
RHODE ISLAND	34	145	0.7	39	37,622
WEST VIRGINIA	35	139	0.7	26	92,503
MISSISSIPPI	36	136	0.7	6	1,598,642
PUERTO RICO	37	105	0.5	29	86,630
MAINE	38	102	0.5	48	4,374
NEVADA	38	102	0.5	44	11,473
UTAH	40	91	0.5	31	80,427
NEBRASKA	41	85	0.4	37	43,224
DELAWARE	42	76	0.4	40	26,071
VERMONT	43	65	0.3	46	5,275
ALASKA	44	42	0.2	51	1,335
NEW MEXICO	45	41	0.2	20	238,558
IDAHO	46	38	0.2	12	851,764
HAWAII	47	37	0.2	50	1,456
DISTRICT OF COLUMBIA	48	30	0.1	52	1,167
MONTANA	48	30	0.1	41	23,986
WYOMING	50	22	0.1	47	4,746
SOUTH DAKOTA	51	21	0.1	53	1,074
NORTH DAKOTA	52	16	0.1	49	2,675
NAVAJO NATION	53	6	0.0	56	89
TRUST TERRITORIES	54	4	0.0	54	827
GUAM	55	3	0.0	55	896
VIRGIN ISLANDS	56	1	0.0	43	12,511

No. 415. Environmental Industry—Revenues and Employment, by Industry Segment: 1980 to 1998

[59.0 represents \$59,000,000,000. Covers approximately 59,000 private and public companies engaged in environmental activities]

Industry segment	Revenue (bil. dol.)					Employment (1,000)				
	1980	1990	1995	1997	1998	1980	1990	1995	1997	1998
Industry total	59.0	150.3	179.5	186.1	191.5	462.5	1,174.3	1,327.0	1,348.0	(NA)
Analytical services ¹	0.4	1.5	1.2	1.1	1.1	6.0	20.2	14.1	12.7	(NA)
Wastewater treatment works ²	10.9	20.4	23.4	24.4	25.3	53.9	95.0	101.5	104.8	(NA)
Solid waste management ³	11.2	26.1	32.5	34.9	35.9	83.2	209.5	243.4	249.9	(NA)
Hazardous waste management ⁴	0.6	6.3	6.2	5.8	5.7	6.8	56.9	52.5	49.4	(NA)
Remediation/industrial services	2.4	11.1	11.1	11.2	11.4	6.9	107.2	98.1	95.0	(NA)
Consulting & engineering	1.7	12.5	15.5	15.3	15.2	20.5	144.2	180.2	174.4	(NA)
Water equipment & chemicals	6.9	13.5	16.5	18.2	19.1	62.4	97.9	110.2	117.0	(NA)
Instrument manufacturing	0.2	2.0	3.0	3.3	3.4	2.5	18.8	26.2	28.7	(NA)
Air pollution control equipment ⁵	3.3	13.1	14.8	15.7	16.2	28.3	82.7	107.2	111.2	(NA)
Waste management equipment ⁶	3.5	8.7	9.9	9.8	10.0	41.9	88.8	93.8	94.2	(NA)
Process & prevention technology	0.1	0.4	0.8	0.9	1.0	2.1	8.9	19.5	21.2	(NA)
Water utilities ⁷	11.9	19.8	25.3	27.6	28.5	76.9	104.7	118.2	121.3	(NA)
Resource recovery ⁸	4.4	13.1	15.9	15.3	15.9	48.7	118.4	136.0	141.2	(NA)
Environmental energy sources ⁹	1.5	1.8	2.4	2.7	2.9	22.4	21.1	26.1	26.4	(NA)

NA Not available. ¹ Covers environmental laboratory testing and services. ² Mostly revenues collected by municipal entities. ³ Covers such activities as collection, transportation, transfer stations, disposal, landfill ownership, and management for solid waste. ⁴ Transportation and disposal of hazardous, medical, and nuclear waste. ⁵ Includes stationary and mobile sources. ⁶ Includes vehicles, containers, liners, processing, and remediation equipment. ⁷ Revenues generated from the sale of water. ⁸ Revenues generated from the sale of recovered metals, paper, plastic, etc. ⁹ Includes solar, wind, geothermal, and conservation devices.

Source: Environmental Business International, Inc., San Diego, CA, *Environmental Business Journal*, monthly (copyright).

PRODUCTION, MOVEMENT AND DISPOSAL OF HAZARDOUS WASTE (a)
PRODUCTION, MOUVEMENTS ET ÉLIMINATION DE DÉCHETS DANGEREUX (a)

	Year/ Année	(b)	Production A	Imports / Importations (c) B	Exports / Exportations (c) C	Amounts to be managed / Quantités à gérer A+B-C	Treatment & disposal / Traitement et élimination			
							Physico-chem. Tr. physico-chim. & biologique	Thermal tr / Tr. thermique	Recovery / Récupération	Land Mise déchet
Ireland/Irlande	1988	-	73	-	12	61	1	18	31	
	1990	-	66	-	14	52	..	..	..
	1992	-	90	-	20	80	5	26	47	
	1995	N	248	-	16	231	71	50	103	
Italy/Italie	1990	-	3 246	-	20	3 226	..	..	..
	1991	-	3 387	-	13	3 374	3 090	-	-	
	1995	-	2 708	..	..	..	..	112	125	
Luxembourg	1993	N	86	-	12	74	..	..	..
	1995	N	181	-	181	-	..	..	..
	1996	N	157	-	157	-	..	..	..
	1997	N	139	-	139	-	..	..	..
Netherl./Pays-Bas	1990	N	1 040	199	195	1 044	143	212	41	
	1992	N	1 513	250	173	1 590	176	205	106	
	1993	N	1 520	237	163	1 593	255	160	130	
	1996	-	511	..	..	..	..	..	..
Norway/Norvege	1990	-	200	-	17	183	2	3	30	
	1994	N	500	4	33	472	10	19	83	
	1996	..	..	34	29	..	17	30	76	
	1997	-	683	..	..	..	..	..	..
Poland/Pologne	1992	N	3 444	..	..	..	..	..	..
	1994	N	3 188	..	..	..	..	..	..
	1995	N	3 866	..	..	..	..	..	..
	1996	N	5 164	..	..	..	..	..	..
	1997	N	4 007	..	..	..	..	..	..
Portugal	1987	-	1 043	-	2	1 041	..	..	..
	1994	-	1 365	3	1	1 368	..	..	..
	1997	-	..	3	32	..	..	..	..
	1998	-	..	5	45	..	..	..	..
Spain/Espagne	1994	N	3 394	94	46	3 442	488	246	..	
Sweden/Suede	1980	-	500	..	..	..	..	..	..
	1990	..	..	47	43	..	..	..	..
	1995	..	..	109	25	..	..	..	..
Switzerland/Suisse	1991	N	730	6	127	610	204	224	40	
	1992	N	826	10	132	704	231	266	38	
	1993	N	829	8	126	711	231	254	56	
	1994	N	853	17	117	754	220	289	38	
	1995	N	831	25	119	739	228	282	51	
	1996	N	888	-	121	764	246	298	47	
United Kingdom	1990	N	2 936	35	0.5	2 970	..	..	..
	92/93	N	2 452	46	-	2 342	512	158	168	1
	93/94	N	2 077	66	-	1 957	620	185	195	
	1996	..	..	76	12	..	..	..	..
Slovak R./R.slovaq.	1995	N	1 353	-	6	1 347	818	167	154	
	1996	N	1 441	1	14	1 428	831	168	182	
	1997	N	1 500	2	1	1 501	870	240	190	
Russ.Fed./Fed.Rus.	1993	N	67 520	..	..	..	..	..	..
	1996	N	82 590	..	..	..	..	..	..
	1997	N	89 390	229	194	89 425	..	..	..

Table 1. **Summary Statistics for the United States: 1997—Con.**

[Includes only establishments with payroll. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see App

NAICS code	Kind of business	Establishments (number)	Receipts (\$1,000)	Annual payroll (\$1,000)
	UNITED STATES—Con.			
56	Administrative & support & waste management & remediation services—Con.			
562	Waste management & remediation services	16 368	39 345 605	8 898 908
5621	Waste collection	8 324	20 144 673	4 565 951
56211	Waste collection	8 324	20 144 673	4 565 951
562111	Solid waste collection	7 083	18 211 495	4 048 032
562112	Hazardous waste collection	414	1 036 553	317 464
562119	Other waste collection	827	837 625	200 454
5622	Waste treatment & disposal	2 314	10 250 994	1 933 074
56221	Waste treatment & disposal	2 314	10 250 994	1 933 074
562211	Hazardous waste treatment & disposal	512	2 877 982	745 132
562212	Solid waste landfill	1 403	5 493 433	887 071
562213	Solid waste combustors & incinerators	105	1 128 551	132 592
562219	Other nonhazardous waste treatment & disposal	264	751 028	168 274
5629	Remediation & other waste management services	5 730	8 949 938	2 399 875
56291	Remediation services	1 677	5 689 662	1 500 362
562910	Remediation services	1 677	5 689 662	1 500 362
56292	Materials recovery facility	765	1 299 033	283 470
562920	Materials recovery facility	765	1 299 033	283 470
56299	All other waste management services	3 288	1 961 243	616 041
562991	Septic tank & related services	3 101	1 580 843	513 966
562998	All other miscellaneous waste management services	187	380 400	102 075

¹Includes receipts information obtained from administrative records of other Federal agencies.²Includes receipts information which was imputed based on historic company ratios or administrative records, or on industry averages

PRODUCTION, MOVEMENT AND DISPOSAL OF HAZARDOUS WASTE (a)
PRODUCTION, MOUVEMENTS ET ÉLIMINATION DE DÉCHETS DANGEREUX (a)

	Year/ Année	(b)	Production A	Imports / Importations (c) B	Exports / Exportations (c) C	Amounts to be managed / Quant à gérer A+B-C	Treatment & disposal / Traitement et élimination			
							Physico-chem & biol./ Tr. physico/chim. & biologique	Thermal tr./ Tr. thermique	Recovery/ Récupération	Land Misc. déchet
Canada	1991	-	5 896	135	223	5 808	155	225	276	2
	1994	-	..	342	168	..	..	..	..	..
	1995	-	..	383	226	..	..	..	..	..
	1996	-	..	198	467	..	304	227	..	3
	1997	-	..	251	487	..	..	..	..	..
Mexico/Mexique	1990	..	5 657	..	..	..	..	..	..	..
	1995	..	8 000	159	6	8 153	..	..	..	..
	1996	..	8 000	230	5	8 225	..	..	..	2
	1997	..	12 700	224	10	12 914	..	..	..	4
USA/Etats-Unis	1991	N	159 125	..	..	101 817	92 574	755	2 340	4
	1993	N	104 987	..	222	99 091	92 773	535	4 815	2
	1995	N	172 732	..	..	211 075	174 777	6 214	3 829	26 2
Japan/Japon	1995	..	..	1	3	..	..	..	..	..
Korea/Coree	1992	N	7 804	-	-	7 804	-	1 003	3 702	2 2
	1995	N	1 622	-	-	1 622	234	252	781	..
	1996	N	1 912	-	-	1 912	..	257	888	1
Australia/Ale	1992	-	426	-	3	423	96	22	85	3
N.Zealand/N.Zel.	1993	-	110	-	10	100	..	..	..	..
	1995	-	479	15	15	479	..	..	..	..
Austria/Autriche	1989	N	215	..	24	..	..	140	..	..
	1992	N	423	13	18	418	..	95	..	..
	1994	N	513	16	32	497	..	90	..	..
	1995	N	577	18	40	555	..	106	..	..
	1996	N	606	20	40	586	..	105	..	..
Belgium/Belgique	1994	-	776	420	103	1 093	182	64	500	1
Czech R./R.cheque	1994	-	1 867	6	1	1 872	129	81	401	1 1
	1996	-	1 265	1	2	1 265	..	..	..	..
Denmark/Danemark	1990	N	106	2	13	95	..	..	..	..
	1994	N	194	24	34	184	108	-	24	..
	1995	N	252	64	30	286	116	-	84	..
	1996	N	269	65	65	269	114	-	95	..
	1997	N	254	55	114	195	107	-	100	..
Finland/Finlande	1987	-	314	5	24	295	200	32	25	..
	1992	N	559	5	22	542	450	44	202	..
	1997	..	..	11	42	..	..	..	..	..
France	1990	N	7 000	458	16	..	377	899	..	6
	1993	..	..	328	82	..	344	1 022	..	7
	1995	..	..	479	49	..	324	1 193	..	7
	1996	..	..	..	..	..	319	1 288	..	6
Germany/Allemagne	1990	N	16 010	63	522	15 523	933	2 431	4 016	4 6
	1993	N	10 780	89	612	10 168	1 614	2 023	3 267	3 2
	1994	-	..	71	336	..	..	..	..	..
	1995	-	..	241	740	..	..	..	..	..
	1996	-	..	254	822	..	..	..	..	..
	1997	-	..	267	601	..	..	..	..	..
Greece/Grece	1992	..	450	-	0.1	450	..	..	98	..
	1997	..	290	..	1.1	..	7	-	96	1
Hungary/Hongrie	1990	N	4 691	..	..	..	1 964	1 709	348	2 3
	1994	N	3 537	0.7	10	3 527	1 005	1 517	499	1 4

COLLECTION AND DISPOSAL OF MUNICIPAL WASTE, selected countries, latest year available
COLLECTE ET ÉLIMINATION DES DÉCHETS MUNICIPAUX, pays sélectionnés, dernière année disponible

	Year/ Année	Total amounts/ Quantités totales (a)	Pop. served by municipal waste services/ pop. desservi par un service des d. municipaux (%)	Composting/ Compostage	Incineration / Incinération		L M dec
					Total	with energy recovery / avec récupération d'énergie (%)	
Canada	1996	20598	99.0	576	1030	..	1
Mexico/Mexique	1997	29272	77.0	.	.	.	2
USA/États-Unis	1996	190204	100.0	10270	32741	96.0	10
Japan/Japon	1993	50304	99.9	19	38013	..	1
Korea/Coree	1996	18223	97.6	.	995	40.5	1
N.Zealand/N.Zélande	1995	1270	..	..	..	..
Austria/Autriche	1996/97	2775	100.0	360	431	100.0	
Belgium/Belgique	1996	2893	100.0	428	715	71.0	
Czech Rep./Répub. tchèque	1994	1992	85.0	2	2	..	
Denmark/Danemark	1997	2 776	100.0	428	1602	100.0	
Finland/Finlande	1994	2100	100.0	70	50	100.0	
France	1995	20900	99.5	1716	10352	73.9	
Germany/Allemagne	1993	36976	100.0	2013	6429	..	1
Greece/Grèce	1997	3900	85.0	3	..	..
Hungary/Hongrie	1996	5000	85.0	.	235	100.0	
Iceland/Islande	1997	150	99.0	.	16	25.0	
Ireland/Irlande	1995	1550	..	..	..	..
Italy/Italie	1997	26605	..	..	1400	..	2
Luxembourg	1996	192	100.0	7	98	100.0	
Netherlands/Pays-Bas	1996	8716	100.0	2150	2693	..	
Norway/Norvège	1997	2721	98.0	124	367	70.1	
Poland/Pologne	1996	12183	..	219	.	.	1
Portugal	1997	3900	98.0	190	.	.	
Spain/Espagne	1996	15307	..	2394	705	89.0	1
Sweden/Suède	1994	3200	100.0	100	1300	..	
Switzerland/Suisse	1996	4277	99.0	400	2002	74.4	
Turkey/Turquie	1996	20253	72.0	131	..	..	1
UK/Royaume-Uni	1996	26000	100.0	300	2200	70	2
Slovak Rep./R.Slovaq.	1997	1900	96	38	190	80	
Russian Fed./F.Russie	1992	26000	73	350	950	..	2

Notes:

a) Total amounts refer to total waste generated. This figure may be lower than the total of all disposals, because residues of some treatments (incineration, composting) are landfilled.

CAN) Includes construction and demolition waste (891 443 t) and sewage sludge (976 289 t).

MEX) Landfill includes also open landfill and illegal dumping.

USA) Landfill: after recovery and incineration; energy recovery refers to 1994.

KOR) % with energy recovery: 1995 data.

AUT) Household waste only. Amounts landed to facilities.

BEL) Flanders only; includes 330 000 t of construction waste.

CZE) Near survey relating to about 90% of municipal w. generated.

DNK) Household waste only.

FIN) Data are expert estimations and might include some w. from demolition sites and w. from sewerage and water treatment.

FRA) Household (excluding bulky w.) only.

ISL) Other: minimize open pit burning of waste.

IRL) Data refer to the total municipal waste collected.

ITA) Disposal: 1995 data.

LUX) Total amount excludes separate collection.

NOR) Includes const. and demolition w.; % with energy recovery: 1995 data.

CHE) % with energy recovery: 1994 data.

TUR) Other: lake, sea, river disposal and burning of waste in open areas.

UK) Data refer to the total municipal waste collected.

Notes:

a) Les quantités totales se rapportent aux déchets p inférieures à la somme des quantités éliminées lors traitements incinération, compostage sont ensuite

CAN) Inclut les déchets de construction et démolition (d'épuration) (976 289 t).

MEX) Mise en décharge: sites d'enfouissement et décharge

USA) mise en décharge: après récupération d'incinération données 1994.

KOR) % avec recup. d'énergie: données 1995.

AUT) D. des ménages uniquement. Quantités déchargées

BEL) Flandre uniquement; comprend 330 000 t de d. de c

CZE) Nouvelle enquête portant sur environ 90% des d. mu

DNK) Déchets des ménages uniquement.

FIN) Estimations pouvant inclure des d. de constur

FRA) Ordures ménagères uniquement.

ISL) Autres: fosses ouvertes de brûlage des déchets.

IRL) Les données se réfèrent au total des déchets municip

ITA) Élimination: données 1995.

LUX) Quantités tot.: excluent la collecte sélective.

NOR) Fraich. des d. de const. et démolition; % avec recup.

CHE) % avec récup. d'énergie: données 1994.

WASTE TREATMENT AND DISPOSAL INSTALLATIONS, latest year available
INSTALLATIONS DE TRAITEMENT ET D'ÉLIMINATION DES DÉCHETS, dernière année disponible

Year/ Année	Landfill sites /Décharges				Incineration Plants /Usines d'incinération				
	Total number/ nombre	Total capacity/ capacité (1 000 t)	of which/dont: controlled/contrôlées		number/ nombre	annual capacity/ capacité annuelle (1 000 t)	% with energy recovery / % avec recup. énergie		
			number/ nombre	capacity/ capacité (1 000 t)			number/ nombre	capacity/ capacité	
Installations for non-hazardous waste / Installations pour déchets non dangereux									
Canada	1996	501	..	..	..	28	1 200	40.0%	91.7%
Mexico/Mexique	1997	97	11 927	..	..	..	..	..	..
USA/Etats-Unis	1995	6 840	..	6 840	..	148	28 486	81.8%	95.9%
Japan/Japon	1995	2 641	207 994	988	128 784	5 470	99 578	..	..
R. of Korea/R. Corée	1996	451	419 787	..	..	10	900	90.0%	96.7%
Australia/Australie	1992	1 129	190 399	..	..	..	..	..	..
N. Zealand/N. Zel.	1995	..	..	327	3 180	..	..	..	..
Austria/Autriche	1996/97	61	25 000	61	25 000	56	1 630	100.0%	100.0%
Belgium/Belgique	1996	96	..	96	..	19	..	..	..
Czech R./R. tchéq.	1997	288	148 577	..	..	2	550	100.0%	100.0%
Denmark/Danemark	1996	176	37 600	..	..	32	2 532	100.0%	100.0%
Finland/Finlande	1996	544	..	544	..	3	..	100.0%	..
France	1995	467	20 575	467	20 575	273	11 288	31.1%	74.7%
Germany/Allemagne	1993	3 963	1 427	3 954	..	138	..	..	..
Greece/Grece	1997	2 380	3 560	13	1 791	..	..	..	..
Hungary/Hongrie	1996	2 500	..	..	..	1	310	100.0%	100.0%
Iceland/Islande	1995	12	121	8	117	5	23	40.0%	13.0%
Ireland/Irlande	1995	118	10 450	118	10 450	..	..	..	..
Italy/Italie	1991	1 463	33 681	23	..	204	1 912	..	..
Luxembourg	1998	2	1 000	2	1 000	1	0.15	100.0%	100.0%
Netherl./Pays-Bas	1996	47	76 205	47	76 205	13	4 700	..	..
Norway/Norvege	1995	196	..	..	..	12	..	..	..
Poland/Pologne	1997	1 455	..	..	..	..	..	..	..
Portugal	1997	350	3 610	17	1 634	..	..	..	..
Spain/Espagne	1996	..	11 901	192	9 989	19	705	68.4%	88.9%
Sweden/Suède	1998	274	7 300	..	..	21	1 800	100.0%	100.0%
Switzerland/Suisse	1996	55	..	55	..	28	2 960	..	..
Turkey/Turquie	1996	..	..	6	127 027	..	..	..	..
UK/Royaume-Uni	1993	3 435	..	..	..	214	..	..	..
Slovak R./R. slovaq.	1997	5 380	..	510	..	40	280	5.0%	85.7%
Installations for hazardous waste / Installations pour déchets dangereux									
Canada	1996	14	..	14	..	22	..	..	..
Mexico/Mexique	1997	4	1 238	..	..	10	15	70.0%	..
USA/Etats-Unis	1995	68	..	68	..	162	3 190	..	..
Japan/Japon	1995	40	20	40	20	..	..	..	..
R. of Korea/R. Corée	1996	4	793	4	793	2	14	..	..
Australia/Australie	..	..	..	..	..	..	..	..	..
N. Zealand/N. Zel.	1995	..	..	..	..	5	..	..	..
Austria/Autriche	1996/97	0	..	..	..	9	174	100.0%	100.0%
Belgium/Belgique	1996	20	..	20	..	7	..	..	..
Czech R./R. tchéq.	1997	65	24 580	..	..	76	130	62.0%	77.0%
Denmark/Danemark	1996	13	..	13	..	37	..	100.0%	..
Finland/Finlande	1996	11	..	..	..	1	150	100.0%	100.0%
France	1996	12	693	..	..	51	1 288	..	..
Germany/Allemagne	1993	205	..	205	..	68	..	..	..
Greece/Grece	..	..	..	..	..	..	..	..	..
Hungary/Hongrie	1992	1	10	1	10	1	25	100.0%	100.0%
Iceland/Islande	..	..	..	..	..	..	..	..	..
Ireland/Irlande	1995	..	..	..	..	7	..	..	..
Italy/Italie	..	..	..	..	..	..	..	..	..
Luxembourg	1998	1	..	..	..	..	..	..	..
Netherl./Pays-Bas	1996	..	..	..	..	2	..	..	..
Norway/Norvege	1997	1	8 000	1	8 000	1	20	..	..
Poland/Pologne	..	..	..	..	..	..	..	..	..
Portugal	1998	..	..	..	..	..	..	..	..
Spain/Espagne	1996	..	..	17	..	27	..	91.5%	..

Landfills

U.S. Methane Emissions from Landfills, 1990-2001

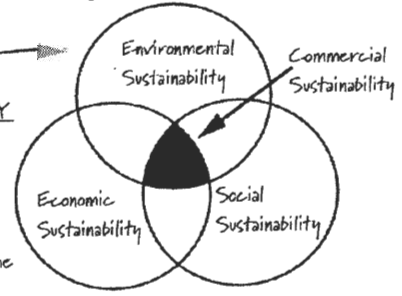
Estimated 2001 Emissions (Million Metric Tons Methane)	8.0
Change Compared to 2000 (Million Metric Tons Methane)	0.1
Change from 2000 (<i>Percent</i>)	1.4%
Change Compared to 1990 (Million Metric Tons Methane)	-3.2
Change from 1990 (<i>Percent</i>)	-29.0%

INTRODUCTION TO SUSTAINABLE DEVELOPMENT

- SOME DEFINITIONS
- A HOLISTIC VIEW
- COMMERCIAL SUSTAINABILITY
- LOCAL AGENDA 21
- ECOLOGICAL FOOTPRINTS
- BARRIERS TO SUSTAINABILITY
- WHAT SUSTAINABILITY NEEDS

SUSTAINABLE DEVELOPMENT is
 "development which meets the needs of the present without compromising the ability of future generations to meet their own needs."
 (Brundtland Commission's Report for the World Commission on Environment and Development 1987)

The word 'SUSTAIN' means:
 'to hold up; enable to last out; keep going continuously'.
 Therefore 'Sustainable Development' is development that can continue indefinitely without damaging the environment or using up resources unnecessarily.



A HOLISTIC VIEW
 A long sighted view of sustainability needs to take all environmental, social and economic issues into account to continue to improve quality of life. Sustainable Development is social progress with continuous economic growth.

COMMERCIAL SUSTAINABILITY
 The concept is that there are 3 aspects to an organisations sustainability - economic, social, environmental.
 The 3 need to be in balance for the organisation to be sustainable in the long term.

LOCAL AGENDA 21
 LA21 is an approach to sustainable development and is:
 - a programme of action needed throughout the world, but carried out on a local scale
 - a set of actions designed to improve the quality of peoples lives as well as the environment.
 - an increasingly important part of the policies of many local councils throughout the world

a product of the 1992 Rio Earth Summit

The LA21 slogan: 'think global, Act Local' is an essential first step to sustainability.

- BARRIERS TO SUSTAINABILITY**
- Lack of planning
 - Lack of support
 - Perceived high cost
 - Lack of understanding of problems and solutions
 - Inertia and reluctance to change.
 - Attitudes of government and public
 - Short-sightedness

- SUSTAINABILITY NEEDS.....**
- Major change and innovation
 - Shared ideas
 - Excellent infrastructure & facilities
 - Education & training
 - Culture change
 - Reinvestment into the environmental & people
 - Community involvement
 - Long term vision
 - Commitment from all
 - Local Authority support & resources
 - Awareness raising

- SUSTAINABILITY SHOULD BE ...**
- central to government policy
 - a central plank of an organisation's CSR policy
 - a matter of life-long, instinctive behaviour

ECOLOGICAL FOOTPRINTS
 The term used to describe the land area required for a person, population, city or country to provide its
 - food, energy, housing, transport, consumer goods
 - to assimilate its waste.
 It is a measure of how sustainable our life-styles are.

The average Westerner requires 4.5 hectares. If everyone in the world needed this amount of land to live, then we would need 3 earths!

The ecological footprint for London is at least 120 times the size of the city.

We are only able to live so unsustainably because 4/5 of the world consume only a quarter of the worlds resources. To be sustainable, we must live within the carrying capacity of the earth.

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Achieving Building Sustainability Through Innovation

While equipment like ultraclean burners help efficiency, real progress also waits in the form of improved accuracy: in predicting energy use through inverse modeling, and in heat gain information published for specific equipment. Sustainability will require not only adjusted attitudes, but adjusted algorithms as well. Start with a look at the concept in general, and finish with some interesting office building research.

BY MILTON MECKLER, P.E., CPC

Achieving sustainability in today's increasingly complex and cost-constrained working environment requires a greater appreciation and knowledge of related environmental impacts (e.g., greenhouse gases), and their associated societal costs, related uncertainties, and achievable benchmarks for demonstrating improved performance across the whole range of building types and occupancies that our HVACR industry impacts.

To better understand the term "sustainability," I recall reading a quote that I liked from Ray Anderson, chairman of Interface, Inc. He said: "Sustainability implies allowing a generation to meet its needs without depriving future generations of a way to meet theirs." What, then, is building sustainability?

ASHRAE's recently adopted policy statement supporting building sustainability defines it as a means to provide a safe, healthy, comfortable indoor environment while simultaneously limiting the impact on the Earth's natural resources.

ASHRAE plans to do this by integrating building sustainability principles, effective

practices, and emerging concepts into all of its appropriate standards, guidelines, handbook chapters, and society publications. Additional methods include actively participating with internationally recognized building sustainability groups where deemed appropriate, and promoting and providing educational materials on building sustainability to its members and society at large through the ASHRAE Learning Institute as well as through grassroots college student chapter activities.

Furthermore, the goal of newly formed ASHRAE Technical Committee (T.C.) 2.8, Building Environmental Impacts and Sustainability, is to give added emphasis to finding ways to reduce the impact of buildings on the environment. These impacts include:

- Biological and mineral resource depletion;
- Environmental impacts of energy production, conversion, delivery, and use;
- Availability of future energy resources;
- Pollution of air, water, and soil; and
- Encroachment on sensitive habitats and ecosystems.

Achieving Building Sustainability

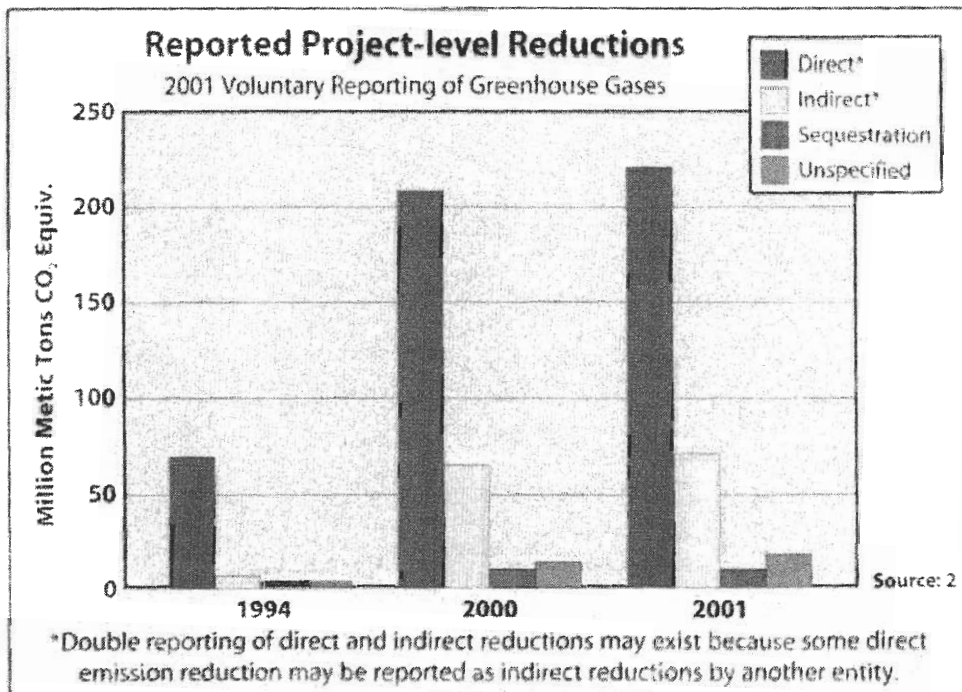


FIGURE 1. The progress thus far in reducing direct and indirect greenhouse gases.

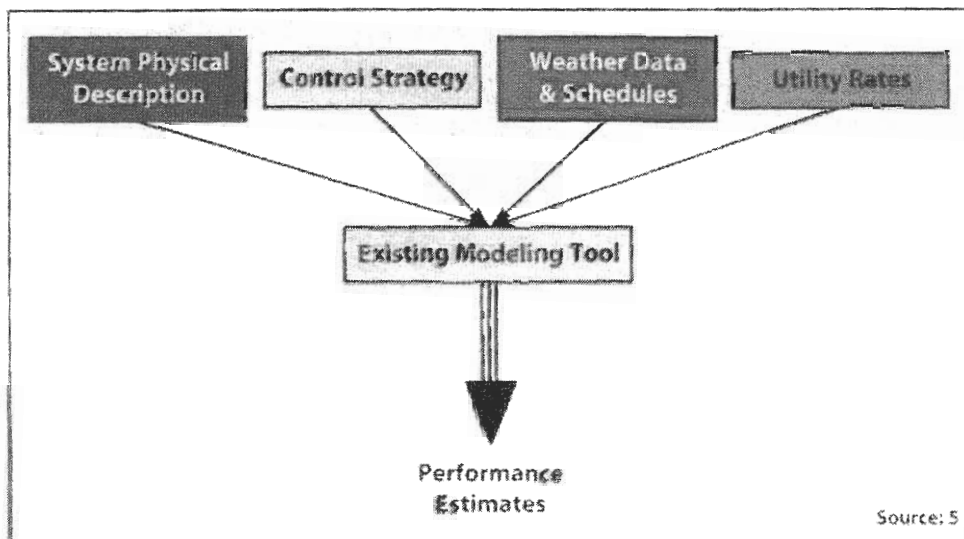


FIGURE 2. An application of forward building system modeling.

The committee also intends to continue working on its planned ASHRAE Green Guide, which will provide practical information for owners, consulting engineers, and others on the design and operation of environmentally friendly buildings.

Perhaps our most important strength in dealing effectively with the essential "spirit" of building sustainability is our industry's ability to innovate, and, in the process, to create new methods and processes leading to improved sustainable buildings that can serve as next year's benchmarks to beat. Taking another look at how we model energy use in our buildings is what is now needed if we are to surpass last year's "status quo" energy budget goals.

DEFINING THE CHALLENGE

The demand for innovation in our current fast-paced and globalized HVACR industry remains ever constant in both HVACR product and design process.

Building MEP consultants, constructors, and operators must be more actively engaged with building owners if building sustainability is to be achieved. This involves active engagement extending beyond initial project conceptualization, design development, and contract document preparation as part of a professionally managed construction process — including commissioning, and hands-on training of building operators in whose hands a building's actual vs. planned sustainable performance will depend.

GREENHOUSE GAS EMISSIONS REDUCTIONS

The Voluntary Reporting of Greenhouse Gases Program, required by Section 1605(b) of the U.S. Energy Policy Act of 1992, is part of the U.S. government's effort to develop innovative, low-cost, and non-regulatory approaches to limit emissions of greenhouse gases (Greenhouse gases, which include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6), absorb infrared energy and prevent it from leaving the atmosphere).

A total of 228 U.S. companies and other entities reported to the Energy Information Administration's (EIA) Voluntary Reporting of Greenhouse Gases Program that they had undertaken 1,705

projects to reduce or sequester greenhouse gases in 2001.

The electric power sector, with 103 companies reporting, has continued to provide the largest number of participants to the program. Reporters included nearly all of the largest electricity generating utilities. The companies reported projects such as improved plant efficiencies, cogeneration, use of non-fossil fuels such as nuclear and renewable fuels, and demand-side management programs that reduce power use by their customers. Other projects cover many different approaches to reducing or offsetting emissions, including activities such as methane recovery projects at landfills, urban forestry, and worldwide tree planting projects.

The number of participants from outside the electric power sector (125 reporters) was ten times the number reported for 1994, the first year of the program. These companies now comprise more than half (55%) of the reporters to the program and include firms engaged in automobile manufacturing, petroleum production and refining, coal mining, food processing, and the chemical industry. Also reporting on projects were alternative energy providers, agriculture and forestry organizations, and organizations in other sectors (government, commercial, and residential).

Reported emission reductions included 222 million metric tons of carbon dioxide equivalent (MMT_{CO2e}) in direct emissions reductions, 71 MMT_{CO2e} in indirect emission reductions, and 8 million metric tons of reductions from carbon sequestration. In addition, 15 million metric tons of reductions were reported. Relative to 2000 levels, direct emission reductions increased by 5.2%, indirect reductions grew by 14.4% and unspecified reductions expanded by 20.9%, while carbon sequestration fell by 11.7%.

Figure 1 illustrates the growth in reported reductions since the program's inception in 1994. Imple-

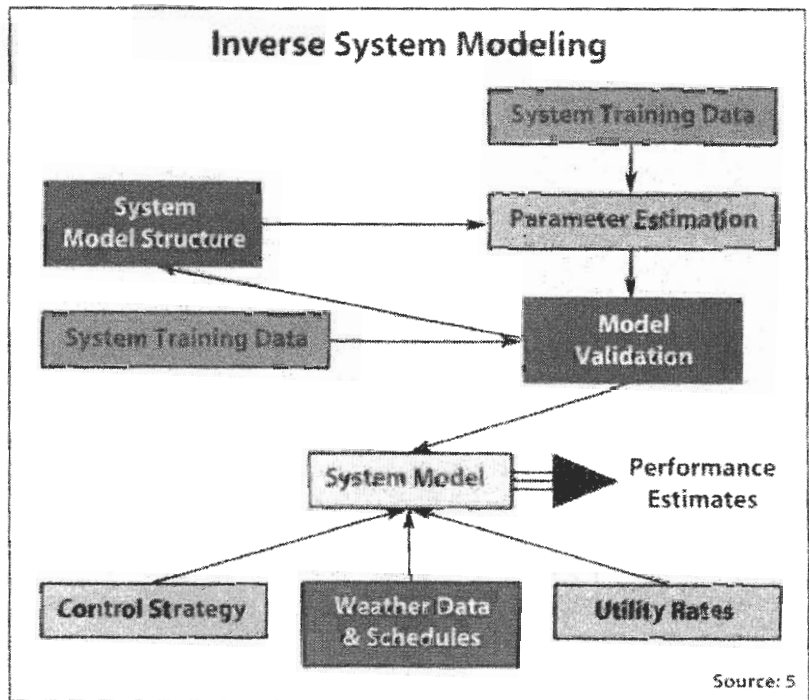


FIGURE 3. An example of inverse building system modeling methods.

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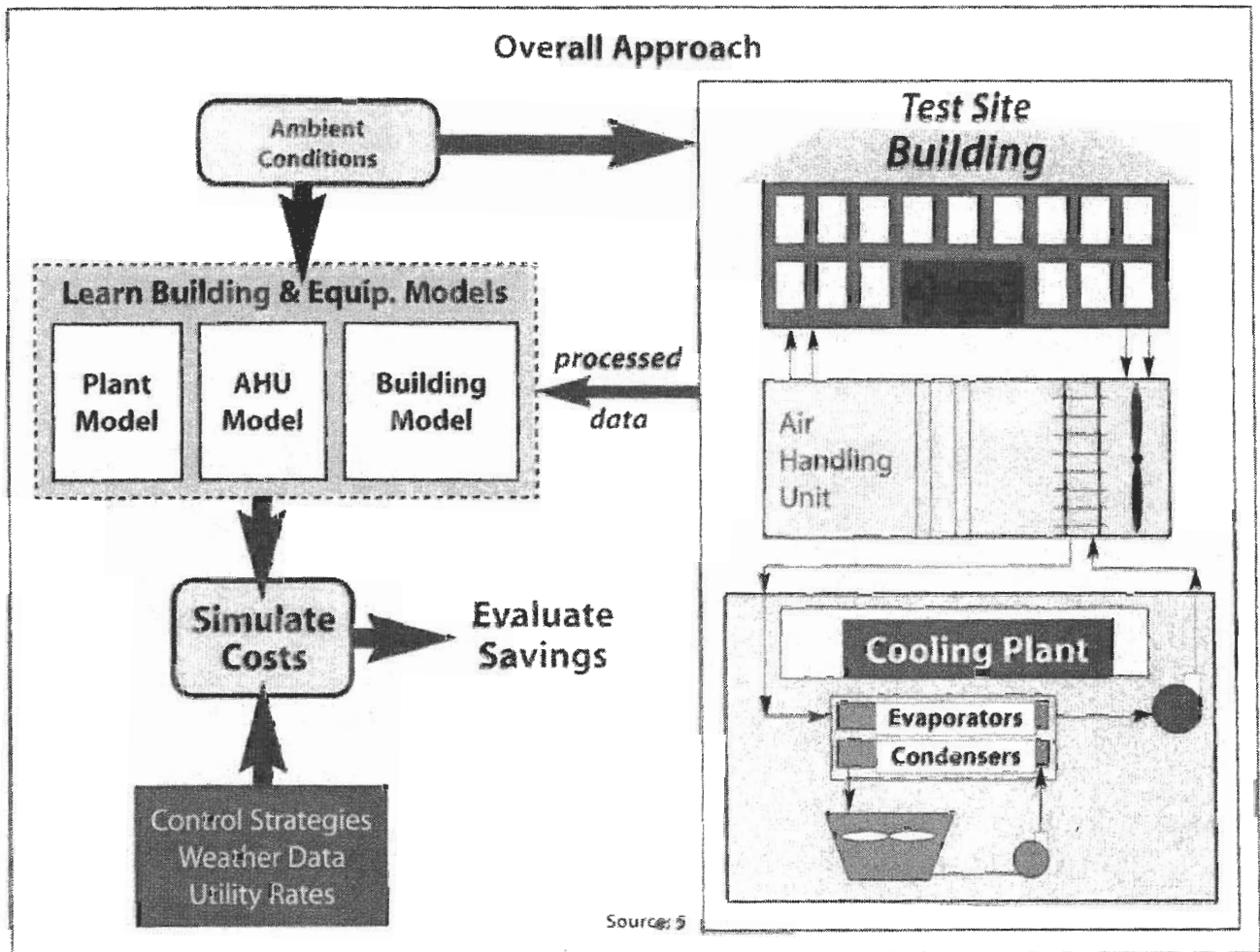


FIGURE 4. The overall approach to test site inverse modeling.

vention of new clean burning combustion technology called ultra-clean low-swirl combustion—developed by Lawrence Berkeley Laboratory, and which research confirms emits 10 to 100 times less nitrogen oxide than conventional burners—should in time have a significantly more pronounced effect upon such voluntary reductions.

SUSTAINABILITY BENEFITS FROM RESEARCH

ASHRAE continues to publish the results of useful field studies that affect its practitioner members in meaningful ways. For example, take the results of two such research projects, namely RP-822 and RP-1055, both undertaken at the Institute of Environmental Research at Kansas State University. Their goal was to seek field data guidance in identifying actual patterns of equipment heat gains for common applications in office buildings, laboratories, and hospitals. What they found was quite interesting. Whereas the field data test results in laboratories and hospitals were too diverse for generalization, the very opposite was true for office building occupancies. What they found was:

- Office equipment energy intensity had been increasing through 2002;
- Office equipment energy intensity would be increasing slowly

from 2002 through 2010;

- There was a disparity between heat gains taken from equipment nameplates provided by manufacturers and measured heat gains both with and without diversity considerations;
- Assuming no diversity, approximately 50% of listed nameplate heat gain values were confirmed by field measurements taken over time; and
- Actual heat gains (with diversity accounted for) amounted to approximately 20% of manufactured listed nameplate heat gain values.

Accordingly, we now realize that we need to better communicate this information to manufacturers who appear to be overstating equipment heat gains. Such misinformation results in significant oversizing of HVAC/R system equipment, distribution ductwork, and piping, with the resulting waste of both material and energy cost further impacting building owner profitability and resulting in excessive generation of greenhouse gases.

BUILDING SUSTAINABILITY BENCHMARKS

With buildings now responsible for a third of the world's energy use, the HVAC/R industry needs to establish comparable energy use

and greenhouse emissions equivalents to that illustrated in Figure 1. This may be possible by incorporating, for example, representative benchmark energy budgets for various occupancy types. This information could be determined from a statistical weighting of climatically normalized average building type values developed from monitored building data employing inverse modeling methods.

Collateral benefits of improved HVACR design methods can include lower emission rates of harmful pollutants entering our atmosphere, thereby improving air quality while reducing the potential for climate change. Similar concerns parallel to these above become the "driver" for improved worldwide automotive standards for increasing company average fleet efficiency (or CAEE) standards achieved by the design of more efficient and hybrid gas/electric engines, lower vehicle weight through material substitution, as well as lower cost recycling potential that such lighter weight material substitutions also afford.

The construction industry may also someday find itself embracing the benefits of construction material substitution should the cost of energy rise to the point where the energy cost to fabricate and assemble on-site various exterior and interior building materials, along with the cost of construction equipment operation, result in fundamental changes to the building design, and construction process. This would encourage recycling and more efficient on-site assembly and/or construction methods, including a greater reliance on prefabrication.

Being more actively and personally involved in HVACR work to achieve building sustainability is no longer optional; it is a mandate for continued innovation and a constant challenge for the HVACR industry in the years ahead.

USE OF ADVANCED INVERSE MODELS

Improvements to the performance of, along with significant reductions in the first cost of, commercially available HVAC sensors, controllers, and networking hardware have contributed to the development of smart building features (e.g., optimal supervising control, continuous performance control, real-time utility pricing, and automated diagnostics).

As an example of advancing the best use of available building materials, HVACR designers need to take advantage of a building's inherent thermal massing effect. To do this, one must first accurately predict transient cooling and heating building requirements and/or total building energy consumption using inverse models that are "trained" through better use of on-site data.

The 2001 ASHRAE Handbook, for example, separates modeling

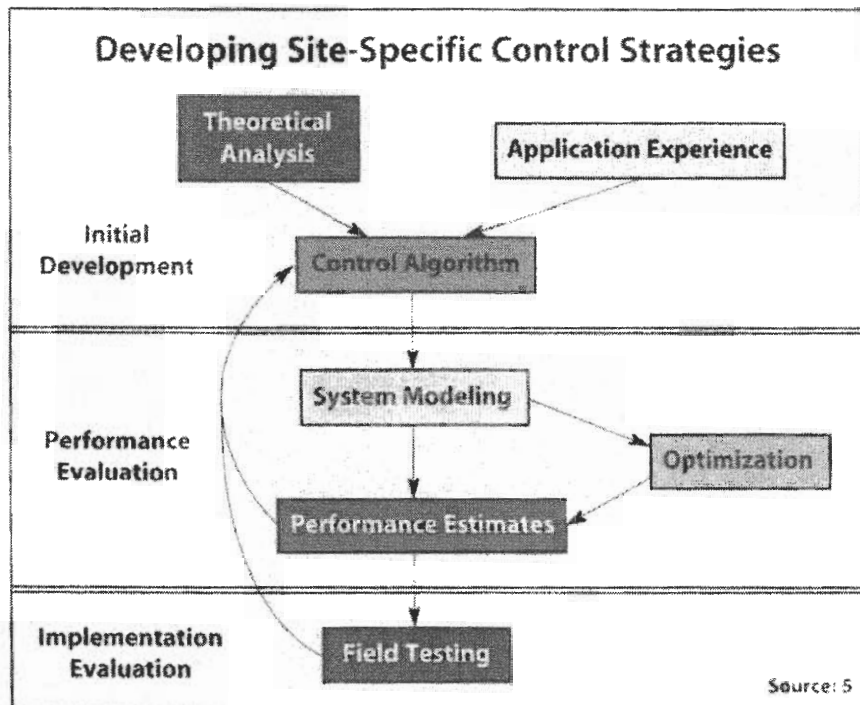


FIGURE 5. Evolution of site-specific control strategies.

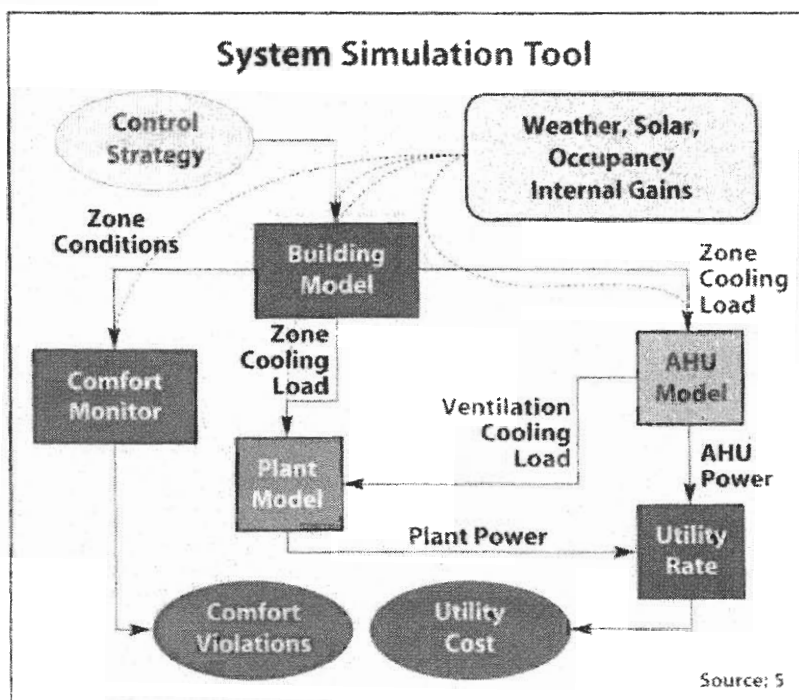


FIGURE 6. A system simulation tool taking into account real-time data and energy costs.

into two basic categories: namely, forward modeling and inverse modeling. Forward system modeling (Figure 2) commences with a physical description of a building, e.g., construction materials, geometry, physical location, microclimatic data, type of HVAC system proposed, and so forth, as typically employed by HVAC system designers.

Achieving Building Sustainability

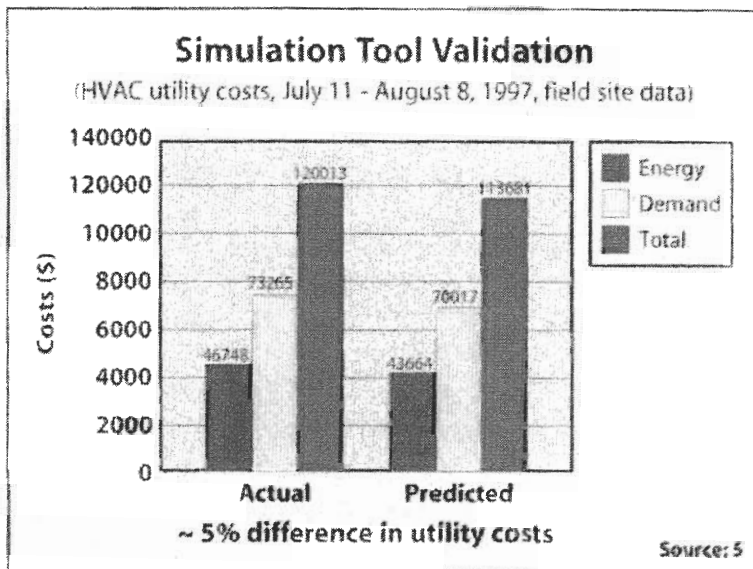


FIGURE 7. Comparison of actual vs. predicted building HVAC utility costs.

Inverse system models (Figure 3), on the other hand, are derived from empirical behavior and are generally expressed in terms of one or more driving forces and a set of empirical parameters'. Hybrid or

gray box models proposed by Braun, et al. employ transfer functions where parameters are constrained to satisfy a simple physical representation of energy flows in a building, including a methodology for training parameters of the constrained model by which initial values of, and limits on, physical parameters are estimated from a rough building description (Figure 4).

Better estimates are then obtained using search and non-linear regression algorithms while incorporating site-specific control strategies as illustrated in Figure 5. Algorithms used to identify optimal parameters by means of Braun's proposed system tool are illustrated in Figure 6.

Finally, Braun reported finding that only two weeks of accumulated on-site data were sufficient to train an inverse model to accurately predict transient heating or cooling requirements. He had extensively tested his above-described inverse modeling and parameter training methods for different buildings and locations using data generated from use of a detailed (forward model) simulation program along with data obtained from a field test site located near Chicago.

Subsequently, Braun reported assessing load shifting and peak shaving potentials through the control of building thermal mass for a 1.4-million-sq-ft building employing four nominal 900-ton chillers using similar robust inverse models resulting in less than a 5% difference in utility cost prediction (Figure 7).

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As an example of advancing the best use of available building materials, HVACR designers need to take advantage of a building's inherent thermal massing effect. To do this, one must first accurately predict transient cooling and heating building requirements and/or total building energy consumption using inverse models that are "trained" through better use of on-site data.

CONCLUSIONS

Braun's conclusions of the latter major office building field test follow in Figure 8 and demonstrate the need to better calibrate our models. Using inverse modeling of our buildings for reasons summarized in Figure 9, as opposed to the widespread use of our more conventional forward modeling approaches, would suggest that if we are to achieve lower building energy usage, we must first improve the selection of building materials, reduce harmful emissions, and predict annual energy consumption with greater accuracy.

Achieving Building Sustainability

Conclusions From Case Study

- **Inverse modeling:**
 - Robust;
 - Requires about a week of training; and
 - Requires basic design information for initial parameter estimates.
- **System utility cost predictions were within 5%. Source: 5**
- **Significant savings potential for field site (20% to 40%).**

FIGURE 8. Conclusions drawn from the case study.

Inverse Modeling

Advantages

- Doesn't require detailed physical description.
- More accurate predictions than forward models.
- Variety of uses:
 - Development of site-specific control strategies;
 - Savings verification; and
 - Online optimal control.

Disadvantages

- Requires detailed short-term measurements.

Primary issues

- Appropriate model structures.
- Training requirements — methods and training data. Source: 5

FIGURE 9. Discussion of inverse modeling.

Through continued HVACR research, including field studies in actual buildings, more accurate predictions of the probable cost of operating our buildings is achievable. This should result in greater client profitability, HVACR innovation, and other related societal benefits in the coming years. Figure 10 describes, in general, the benefits to be achieved — including more predictable, sustainable buildings — by employing whole-building design, which is made possible through greater use of Braun's proposed inverse modeling methods. **ES**

Meckler currently serves as president/CEO of Design Build Systems (DBS), based in Los Angeles. He has published over 300 feature and technical articles, books, handbooks, videos, design and policy manuals including seven professional engineering books on energy conservation, IAQ, cogeneration, and BCHP. In 1995 he was elected as chairman of International Standards Committee ISO/TC 205: Building Environment Design, involving development of international standards for lighting, acoustics, energy, air quality, and building control systems repre-



sented by 33 participating nations until 2001. Contact him at mmeckler@pacbell.net.

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"Whole Building" Strategy:

Existing R&D programs, building technologies, and components tied together by systems integration and computerized design tools.

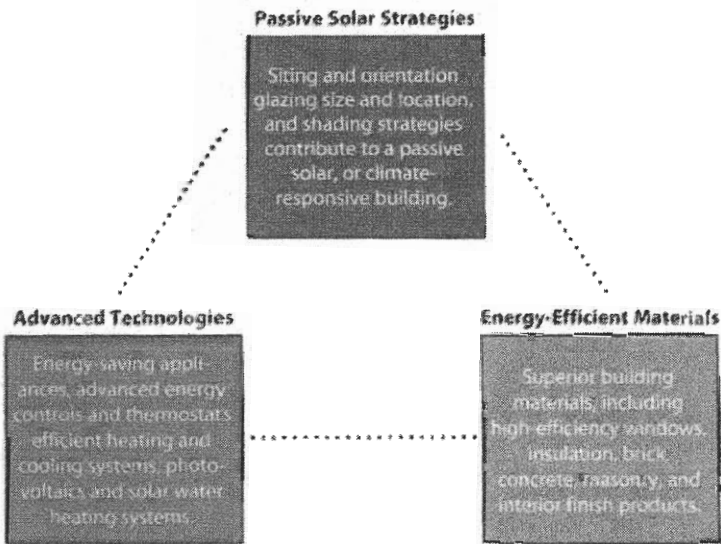


FIGURE 10. Benefits achieved using inverse modeling.

SPECIAL REPORT

ENVIRONMENT AND SUSTAINABILITY

Smart organisations have always realised the public relations advantages of taking care of the environment, even if only as a token gesture. The occasional eco-friendly soundbite always goes down well with Joe Public, especially in the local media, but a soundbite will soon be insufficient.

With a packaging directive already in force, landfill, waste electrical and electronic equipment, and hazardous waste directives on their way, and a chemicals directive under discussion, the EU has clearly stated its intentions. Companies will soon be obliged to design, manufacture, distribute, take-back and dismantle products, and performance will be measured according to environmental, not financial, benchmarks.

Companies that take their obligations seriously and take action early will be rewarded, however. By taking the time to optimise processes and procedures now, there is scope for significant savings in the future.

CONTENTS

- 36** TOWARDS INDUSTRIAL SUSTAINABILITY
- 40** TAKING THE WEEE
- 42** WASTING AWAY
- 44** PREPARING FOR LIFE WITHOUT LEAD

Strategic Environmental Assessment

The EC Directive on Strategic Environmental Assessment: A Much-Needed Boost for Environmental Integration

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Summary: *Environmental assessment has long been held to be a key tool in achieving one of the cornerstones of European Community environmental policy, that of environmental integration. However, it has taken the best part of 30 years to get to the point of implementation of the Strategic Environmental Assessment (SEA) Directive, due in 2004. Securing legislation for environmental assessment at strategic decision levels as well as project level EIA has been a symbolic milestone for environmentalists. This paper explores the background to the SEA Directive and analyses in detail its key requirements and implications for implementation. The paper also examines the relationship between the SEA Directive and the changing policy context over the period of its long gestation. It concludes that the SEA Directive has arrived at an opportune time to reinvigorate the environmental integration agenda, currently beleaguered by the much stronger social and economic agenda dominant in current EU conceptions of sustainable development. While there has been positive formalisation and strengthening of EU environmental policy over the past 30 years, arguably there has been inadequate real change in terms of the effective integration of the environment into decision-making on the ground.*

I. Introduction

The SEA Directive (2001/42/EC)¹ was agreed by EU Member States in June 2001 and is due to come into force on 21 July 2004. The EU's Fifth Environmental Action Programme ("Towards Sustainability")² provides a rationale for the SEA Directive stating (Part I-Section 7.3):

Given the role of achieving sustainable development, it seems only logical, if not essential, to apply an assessment of the environmental implications of all relevant policies, plans and programmes.

While the SEA Directive, as finally agreed, applies only to plans and programmes (that set the context for development projects), it is already bringing greater attention to higher policy level decision-making, since decisions made at this level are likely to be increasingly exposed as EIA/SEA moves up the decision-making tiers.³ Policy making was deemed too difficult politically to address at the same time as plans and programmes. While the main development of the SEA Directive occurred primarily over the last ten years, its origins lie somewhat earlier in the original debates in the mid-1970s on legislating for environmental impact assessment (EIA). Indeed, the SEA Directive cannot, nor should it, be considered in isolation from the EIA Directive 85/337/EEC.⁴ The EIA Directive was intended to establish procedures for requiring EIA of certain public and private projects. This position had not been arrived at without considerable controversy, not least over whether project-level assessment was really the best place to start on an EIA initiative, or whether plans and programmes would not have been a more effective and appropriate level for Community-wide action.

The European Commission was at pains to secure a firm legal foothold for the EIA Directive since it was seen as the cornerstone of the Third Action Programme, and because it was intent on avoiding the weight of litigation experienced in the United States. It was felt that development at the project level had a more direct impact in terms of distortion of competition than did plans and programmes and therefore more readily justified under the Treaty of Rome.⁵ There were, of course, other reasons why plans and programmes were not included. At the time there was little methodological expertise in assessing plans and programmes (though that was also to some extent true of projects) and the procedures for formulating plans and programmes were seen as being too disparate across Member States. However, this is not necessarily a good reason for failing to press ahead with legislation:⁶ it is often legislation that leads to the development of appropriate methodologies rather than the other way around. This was certainly true for the EIA Directive, and in the early 1990s local authorities in the UK

¹ OJ 21.7.2001 L197/30, Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the 'SEA Directive'), also available at <http://europa.eu.int/comm/environment/eia/sea-legalcontext.htm#adopt>.

² 5th Environmental Action Programme 1993-2000 OJ 17.5.93 C138.

³ Sheate, W.R., Dagg, S., Richardson, J., Aschemann, R., Palerm, J. and Steen, U 'Integrating the Environment into Strategic Decision-Making: Conceptualizing Policy SEA' (2003) *European Environment*, 13 (1), 1-18.

⁴ Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, OJ 05.7.1985 L175/40.

⁵ Stuffman, C. (1979). Minutes of evidence taken before the European Communities Committee (UK House of Lords, Subcommittee G, Environment), 23.1.79, evidence heard in private.

⁶ G. Wandesforde-Smith 'Environmental Impact Assessment in the European Community' (Pre-print to publication (in 1979) in *Zeitschrift für Umweltpolitik*, 1978).

were left to work out how to implement environmental appraisal of development plans.⁷

In many ways it has been a tortuous path to the SEA Directive, but there are a number of reasons why environmentalists can feel vindicated that securing the SEA Directive was a noble, if winding, path to tread. And, as we shall see, it has been environmentalists, with the European Commission and European Parliament, that have been in the vanguard of pushing this legislation along,⁸ and through challenges in the courts over inadequacies arising from having an EIA Directive without SEA (especially the fact that the assessment was coming too late in the decision-making process, after key decisions have already been taken).⁹ Many Member States, in contrast, have been dragged more or less reluctantly to recognize its importance, and its lengthy gestation is due to political rather than substantive practical or methodological reasons. While the context for SEA has changed over 30 years, from environmental protection to environmental integration to sustainable development, in many ways SEA is as necessary as it ever was, if not more so. That contextual change has not been a linear, progressive one. Indeed, it might be viewed more as "coming full circle" in returning to the days when strong environmental protection measures were being challenged by demands for economic growth. The SEA Directive has been a significant achievement for environmental integration, consistent with the ongoing "Cardiff process",¹⁰ but needs to be seen against the backdrop of the recent dominance of the economic and social agendas of the Lisbon process.¹¹

This paper analyses the Directive in some detail, first by a brief historical perspective of the development of the SEA Directive, which provides an important understanding of the driving forces underlying its development. A brief examination of the lengthy preamble then follows, which provides the policy and legislative context and justification for the Directive. Each article of the Directive is then tabulated against detailed annotation and commentary. Key issues that have emerged during the Directive's development and from the tabulated analysis are then discussed and implications of the SEA Directive for implementation and EU environmental policy considered.

II. The Development of the SEA Directive

Rather than having a separate SEA Directive, there is actually considerable logic in incorporating project EIA and SEA into the same body of legislation,^{12,13} this was very much part of the original debates over the draft EIA Directive in the 1970s and 1980s. In environmental assessment practice there is a clear continuum and a tiered relationship between project EIA and SEA at progressively more strategic levels, from programmes (groups of projects) to plans and policies. Divorced from SEA, project EIA frequently serves only to appraise irreversible impacts, not to remove or reduce them from the start. Early SEA, however, is well placed to anticipate and, therefore, avoid environmental problems.¹⁴

In fact, it is not too difficult in drafting terms to link EIA

and SEA by amending the EIA Directive,¹⁵ and as examined

⁷ Town and Country Planning (Development Plan) Regulations 1991, SI 1991 No 2794; and see UK Department of the Environment (1993) *Environmental Appraisal of Development Plans: A Good Practice Guide* (HMSO: London, 1993).

⁸ For example, Council for the Protection of Rural England (CPRE) (1992), 'Mock' EC Directive on Environmental Assessment: *Proposals for amending EC Directive 85/337/EEC* (CPRE: 1992); CPRE *Proposed Directive on Strategic Environmental Assessment: A Campaign Briefing Pack* (CPRE: 1997); Birdlife International, CPRE, EEB and T&E, *Comments by CPRE, EEB, Birdlife International and T&E to the Common Position on an Amended proposal for a Council Directive on the assessment of the effects of certain plans and programmes on the environment* (2000); EEB/CPRE *Recommendations for Second Reading of the Council Directive on the Assessment of the effects of certain plans and programmes on the environment: EEB Comments on the report of the European Parliament Committee on the Environment, Public Health and Consumer Protection* (2000).

⁹ See for example, Case C392/92 - *Bund Naturschutz and others v Bavarian Higher Regional Court* [1994] ECR I-3717.

¹⁰ At the Heads of Government Cardiff Summit in June 1998 the EU committed itself to the integration of the environment into all EU policies (Commission of the European Communities (1998), *Partnership for Integration - A Strategy for integrating the Environment into European Union Policies*, COM (98) 333). The Cardiff Summit set off a process of developing strategies for environmental integration for the various formations of the Council of Ministers. This was followed up by the Vienna Summit in December 1998, the 'Best Practices' workshop held in Bonn in 1999 (Commission of the European Communities (1999), *Conclusions of the German Presidency of the EC Council of Ministers on the International Workshop on "Best Practices for Integration of Environmental Protection Requirements into Other Policies"*, Bonn, 25&26 May 1999), and the meetings of the European Council in Cologne in June 1999, Helsinki in 2000 and Göteborg in June 2001. It had been hoped at Helsinki that the Göteborg Summit would result in the conclusion to the process (Fergusson M, Coffey, C, Wilkinson, D, Baldock, D, Farmer, A, Kraemer, R A and Mazurek, A-G *The Effectiveness of EU Council Integration Strategies and Options for Carrying Forward the 'Cardiff' Process* (IEEP/Ecologic: 2001)). However, Göteborg concluded that section strategies should be finalised and further developed and implemented as soon as possible and reported at the Spring European Council in 2002. The Cardiff process was also given a wider dimension within the framework of the Sustainable Development Strategy, which was also adopted at Göteborg in June 2001 (European Council (2001), Göteborg Presidency Conclusions 15 and 16 June 2001). This included adding in the environmental pillar to the Lisbon process of social and economic reforms. The EU's Sustainable Development Strategy was set to be reviewed regularly at the annual Spring Environment Council meeting.

¹¹ The 'Lisbon process' was agreed at the European Council held in Lisbon in 2000 and aims for the EU "to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable growth with more and better jobs and greater social cohesion" (European Council (2000) Lisbon Presidency Conclusions 23 and 24 March 2000).

¹² Cerny, R. J and Sheate, W.R 'Strategic Environmental Assessment: Amending the EA Directive' (1992) *Environmental Policy and Law*, 22/3:154-159.

¹³ Sheate, W.R. *Making an Impact: A Guide to EIA Law and Policy* (Cameron May: London, 1994)

¹⁴ Above n. 12.

¹⁵ See for example CPRE 'Mock' EC Directive on Environmental Assessment, above n. 8.

Strategic Environmental Assessment

later in this paper, there are many very close similarities between the two Directives that could be strengthened by one piece of consolidated legislation. However, politically, this was seen as too great a leap to be achieved at once, and the Commission was at pains to keep the draft SEA Directive completely separate from amendments to the project EIA Directive during the 1990s.¹⁶ The SEA Directive has, then, had almost as tortuous a history as the EIA Directive: early drafts, applying to policies, plans and programmes, were under discussion within the Commission in 1990 and 1991 only to be abandoned at the Edinburgh Summit at the end of 1992 due to a UK veto.¹⁷ The Commission resurrected the idea a couple of years later and consulted publicly on a draft in the summer of 1995, though by that time any reference to policies had been removed, with the proposed Directive applying only to plans and programmes. This was redrafted yet again in early 1996 and the Commission secured internal agreement on the new version at the end of 1996 (COM (96) 511 final)^{18,19}

This proposal sat rather at odds with the spirit of earlier drafts, since it was not only restricted to plans and programmes, but rather more obscurely to 'town and country planning' plans and programmes. This resulted in a very narrow definition of plans and programmes, and some degree of confusion since town and country planning has a very specific legislative context in the UK which is not necessarily the same as land use and spatial planning elsewhere in the European Union. This may have been an attempt to appease the UK, which had continued to object to a formal SEA Directive even while encouraging the development of environmental appraisal of local authority development plans.²⁰ It was also the only version that was able to secure agreement across the whole of the European Commission. If the SEA Directive had applied only to "town and country" plans and programmes, it would have resulted in little impact upon UK practices. If this was the reason, it was unsuccessful since the (then Conservative) UK Government continued to object to the European Union imposing legislation on environmental assessment at more strategic decision levels.

The proposal came before the European Parliament for its first reading in October 1998.²¹ This resulted in a number of significant amendments which, after consideration by the Commission, resulted in an amended proposal for an SEA Directive (COM (99) 73 final).²² The most significant changes occurred to Art. 2, though these were also reflected elsewhere in the proposals, e.g. in the preamble recitals, as was the explicit inclusion of sustainable development (Art. 1). Amendments to Art. 2 placed town and country planning plans and programmes simply as one of many categories, rather than as the defining criterion for determining which plans and programmes would be affected. Transport plans and programmes, for example, were clearly identified. The Commission also commissioned a number of reports on SEA in practice and held a number of workshops on the subject²³ as a means to advance debate.

By December 1999 the Environment Ministers of the 15 Member States had reached a political agreement on a common text for the future Directive (the Common Position). The Common Position was formally adopted on 30 March 2000. As co-legislator, the European Parliament

subject to the amendments voted at its plenary session (Second Reading).²⁴ The Commission published its opinion on the amendments to the Common Position voted by the European Parliament on 16 October 2000.²⁵ It was able to accept a number of the Parliament's amendments in principle, but not others. Significant differences between the Council and Parliament resulted in the draft Directive going to the Conciliation Committee during early 2001. For example, there were attempts by German Christian Democrat MEPs to weaken the requirement for tiering of SEA at different decision making levels, and differing views between the Council, Commission and European Parliament as to whether future Structural Funds were covered by the Directive (see below).

III. The SEA Directive – Legal Basis

The legal basis for the SEA Directive was far more secure in 2001 than that for the EIA Directive in 1985, which had to be justified under the approximation of laws as part of the completion of the single market under the Treaty of Rome, as pertaining to the European *Economic* Community at the time. The first recital of the Preamble to the SEA Directive refers to Art. 174 (environmental protection) and Art. 6 of the Treaty (environmental integration and sustainable development) as the legal basis on which the Directive is set out:

¹⁶ Council Directive 97/11/EC amending Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment OJ 14.03.1997 L73/5.

¹⁷ Above n. 12.

¹⁸ Commission of the European Communities (1996), *Proposal for a Council Directive on the assessment of certain plans and programmes on the environment*, COM (96) 511 final, 4 December 1996.

¹⁹ Von Seht, H. and Wood, C. 'The Proposed European Directive on Environmental Assessment: Evolution and Evaluation' (1998) *Environmental Policy and Law*, 28 (5), 242-250.

²⁰ UK Department of the Environment *Environmental Appraisal of Development Plans: A Good Practice Guide* (HMSO: London, 1993).

²¹ EP Minutes of 20/10/98, A4-0245/98

²² Commission of the European Communities (1998a), *Amended Proposal for a Council Directive on the assessment of certain plans and programmes on the environment*, COM (99) 73 final, December 1998.

²³ Commission of the European Communities (1998b), *Strategic Environmental Assessment: Report of the Workshop*, Semmering, Austria, 5-7 October 1998; Commission of the European Communities (1998c), *Strategic Environmental Assessment (SEA) in Europe*, 4th European Workshop on Environmental Impact Assessment, DGXI; see also European Commission DG Environment web site for further information on the range of SEA studies, at <<http://europa.eu.int/comm/environment/eia/sea-support.htm>>.

²⁴ European Parliament, Opinion of 6 September 2000, Verbatim Report of Proceedings, Second Reading A5-0196/2000, available at <http://www3.europarl.eu.int/omk/omnsapir.so/debatsLS?FILE=20000906EN&LANGUE=EN&LEVEL=2>

²⁵ November 2000, COM (2000) 056 final.

Strategic Environmental Assessment

Whereas:

(1) Article 174 of the Treaty provides that Community policy on the environment is to contribute to, inter alia, the preservation, protection and improvement of the quality of the environment, the protection of human health and the prudent and rational utilisation of natural resources and that it is to be based on the precautionary principle. Article 6 of the Treaty provides that environmental protection requirements are to be integrated into the definition of Community policies and activities, in particular with a view to promoting sustainable development.

The Directive cites Art. 175(1) as the Article that enables the Council and European Parliament to take action to achieve the objectives set out in Art. 174. The legislative procedure for Art. 175(1) is co-decision with qualified majority voting. The co-decision procedure applies to all actions taken in pursuit of the Art. 174 objectives, unless one of the derogations in Art. 175(2) applies, in which case the legislative procedure is co-operation with unanimous voting. The derogations in Art. 175(2) include:

- “provisions primarily of a fiscal nature” and
- “measures concerning town and country planning, land use with the exception of waste management and measures of a general nature, and management of water resources”.

There was some dispute over whether Art. 175(2) should have been cited instead, but SEA, for example, of Structural Funds would not constitute a provision primarily of a fiscal nature, and SEA relates to sectors well beyond just town and country planning.²⁶

Historically, environmental assessment has been a key tool through which the EC has sought to achieve its key environmental policy principle, that of environmental integration, and has featured in some shape or form throughout its Environment Action Programmes.²⁷ The second recital of the preamble cites the Fifth Environment Action Programme in support of the Directive:

(2) The Fifth Environment Action Programme: Towards sustainability – A European Community programme of policy and action in relation to the environment and sustainable development,²⁸ supplemented by Decision No 2179/98/EC²⁹ on its review, affirms the importance of assessing the likely environmental effects of plans and programmes.

Further international justification is provided by reference to the Convention on Biological Diversity (CBD) in the third recital:

(3) The Convention on Biological Diversity requires Parties to integrate as far as possible and as appropriate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans and programmes.

The CBD at Art. 14(b) stresses the importance of applying appropriate environmental assessment processes for programmes and policies to ensure that likely significant effects on biodiversity are taken into account.³⁰

Recitals 4–6 of the preamble highlight the importance of environmental assessment for integrating the environment into plans and programmes, and that SEA will provide a more consistent framework in which to operate. It also emphasises the need for common procedural requirements

in all Member States in order to achieve a high level of environmental protection. Recital 7 refers to the Espoo Convention on Environmental Impact Assessment in a Transboundary Context of February 25 1991 and the (as then) proposed SEA protocol, and the need for adequate transboundary consultations over plans and programmes likely to have significant effects.

Recitals 8–9 stress the importance of subsidiarity (recital 8) in laying down a minimum environmental assessment framework that sets out broad principles and leaves the detail to Member States as to whether its requirements should be integrated into existing procedures or specific procedures should be established. Given assessment is to take place at different levels, duplication should be avoided. Recital 10 outlines the relationship of the SEA Directive to other legislation, specifically all plans and programmes which set the framework for future development consents of projects under the EIA Directive 85/337/EEC,³¹ and plans and programmes under the Habitats Directive 92/43/EC.³² Where the area affected is small or only a minor modification is proposed, it is left to Member States to decide if such actions are likely to have significant effects.

Recitals 11–19 summarise the SEA process and make provision (Recital 19) for joint procedures between the Birds Directive 79/409/EEC³³ or the Water Framework Directive 2000/60/EC.³⁴ Recital 20 requires a first report on the application and effectiveness of the Directive be carried out by the Commission five years after its entry into force, and subsequently at seven-year intervals.

IV. The SEA Directive – Detailed Analysis

The SEA Directive defines “environmental assessment” (and therefore SEA) for the purposes of the Directive in procedural terms in Art. 2:

“environmental assessment” shall mean the preparation of an environmental report, the carrying out of consultations,

²⁶ Birdlife International *Justification for the legal basis of the Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive)* (Birdlife International Briefing Document: 2001).

²⁷ Sheate, W.R. ‘Environmental Integration and Sustainable Development in the EU: Changing Conceptions and Potential for Conflict in Environmental Assessment’ (2003) *Environmental Policy and Law*, 33 (5): 222-233.

²⁸ 5th Environment Action Programme 1993-2000 OJ 17.5.93 C138/5.

²⁹ OJ 10.10.1998 L275/1.

³⁰ Byron, H. *Biodiversity and Environmental Impact Assessment: A Good Practice Guide for Road Schemes* (The RSPB, WWF-UK, English Nature and the Wildlife Trusts: Sandy, 2000).6.

³¹ OJ 5.7.1985 L175/40, as amended by Directive 97/11/EC (OJ 14.3.1997 L73/5).

³² OJ 22.7.1992 L206/7. Directive as last amended by Directive 97/62/EC (OJ 8.11.1997 L305/42).

³³ OJ 25.4.1979 L103/1., as last amended by Directive 97/49/EC (OJ 13.8.1997 L223/9).

³⁴ OJ 22.12.2000 L327/1.

Strategic Environmental Assessment

the taking into account of the environmental report and the results of the consultations in decision-making and the provision of information on the decision in accordance with Articles 4 to 9;

Other than not relating to policies, this definition in conjunction with Arts 4 to 9, would appear to compare quite favourably with a comprehensive definition of SEA³⁵ that combines the essential parts of two well-known definitions,^{36,37}

SEA is a systematic, decision aiding procedure for evaluating the likely significant environmental effects of options throughout the policy plan or programme development process, beginning at the earliest opportunity, including a written report and the involvement of the public throughout the process.

The key elements of a report and public involvement and their role in informing the decision-making process are included. The extent to which the SEA Directive, when implemented, will meet best practice in SEA remains to be

seen, and inevitably there are likely to be significant variations among Member States.

Table 1 below sets out the full text of the Articles and Annexes of the SEA Directive (excluding the preamble). Against each Article are provided annotations highlighting significant relationships with the EIA Directive, and providing commentary on the origins and implications of the specific text. In this way key issues are identified and highlighted for subsequent discussion.

³⁵ Above n. 3 at p. 4.

³⁶ Therivel, R., Wilson, E., Thompson, S., Heaney, D. and Pritchard, D. *Strategic Environmental Assessment* (Earthscan: London, 1992).

³⁷ Sadler, B. and Verheem, R. *Strategic Environmental Assessment: Status, Challenges and Future Directions* (Ministry of Housing, Spatial Planning and the Environment of the Netherlands: 1996).

Table 1: Annotated Text of the SEA Directive 2001/42/EC

Text of Articles (OJ L 197, 21.7.2001, p.30-37)	Relationship to EIA Directive 85/ 337/EEC as amended by 97/11/ EC	Commentary
<p>Article 1 – Objectives</p> <p>The objective of this Directive is to provide for a high level of protection of the environment [1] and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development [2], by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.</p>	<p>This compares with Art. 2 of the EIA Directive:</p> <p>“1. Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue. <i>inter alia</i>, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects...”</p>	<p>i High level of protection (see V. below on Scope of Application (<i>Set the framework</i>))</p> <p>ii Environmental integration defined as in Art. 6 of the Amsterdam consolidated Treaty, in association with promoting sustainable development – see V. Environmental Integration below.</p>
<p>Article 2 – Definitions</p> <p>For the purposes of this Directive:</p> <p>(a) “plans and programmes” shall mean plans and programmes [3], including those co-financed by the European Community, [4] as well as any modifications to them:</p> <ul style="list-style-type: none"> – which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government, and – which are required by legislative, regulatory or administrative provisions; [5] <p>(b) “environmental assessment” shall mean the preparation of an environmental report [6] the carrying out of consultations, the taking into account of the environmental report and the results of the consultations in decision-making and the provision of information on the decision in accordance with Articles 4 to 9;</p> <p>(c) “environmental report” shall mean the part of the plan or programme documentation containing the information required in Article 5 and Annex I;</p> <p>(d) “The public” shall mean one or more natural or legal persons and, in accordance with national legislation or practice, their associations, organisations or groups. [7]</p>	<p>vi (b) (c) Unlike the EIA Directive the production of an environmental report is explicit – the EIA Directive refers instead to the “information to be provided” [Art. 5 (3), 85/337/EEC] – see V. Environmental Report below.</p> <p>vii (d) The “public concerned” is not defined in the EIA Directive [Art. 6].</p>	<p>iii Not policies – dropped by COM (96) 511 final, after early attempts to include policies in the early 1990s – see V. Scope of application below.</p> <p>iv Structural Funds addressed during conciliation January 2001 (by Birdlife, CPRE, EEB) – see V. Scope of application below.</p> <p>v Administrative provisions are important as spreads net wider, and has given rise to debate over which plans are subject to SEA.</p>

Strategic Environmental Assessment

Article 3 – Scope

1. An environmental assessment, in accordance with Articles 4 to 9, shall be carried out for plans and programmes referred to in paragraphs 2 to 4 which are likely to have significant environmental effects. [xii]
2. Subject to paragraph 3, an environmental assessment shall be carried out for all plans and programmes, (a) which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use and which set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC, [x] or (b) which, in view of the likely effect on sites, have been determined to [x] require an assessment pursuant to Article 6 or 7 of Directive 92/43/EEC.
3. Plans and programmes referred to in paragraph 2 which determine the use of small areas at local level and minor modifications to plans and programmes referred to in paragraph 2 shall require an environmental assessment only where the Member States determine that they are likely to have significant environmental effects. [x]
4. Member States shall determine whether plans and programmes, other than those referred to in paragraph 2, which set the framework for future development consent of projects, are likely to have significant environmental effects. [x]
5. Member States shall determine whether plans or programmes referred to in paragraphs 3 and 4 are likely to have significant environmental effects either through case-by-case examination or by specifying types of plans and programmes or by combining both approaches. [x] For this purpose Member States shall in all cases take into account relevant criteria set out in Annex II, in order to ensure that plans and programmes with likely significant effects on the environment are covered by this Directive.
6. In the case-by-case examination and in specifying types of plans and programmes in accordance with paragraph 5, the authorities referred to in Article 6(3) shall be consulted. [x]
7. Member States shall ensure that their conclusions pursuant to paragraph 5, including the reasons for not requiring an environmental assessment pursuant to Articles 4 to 9, are made available to the public. [x]
8. The following plans and programmes are not subject to this Directive:
 - plans and programmes the sole purpose of which is to serve national defence or civil emergency,
 - financial or budget plans and programmes.
9. This Directive does not apply to plans and programmes co-financed under the current respective programming periods* for Council Regulations (EC) No 1260/99** and No 1257/99***. [xvi]

* The 2000-2006 programming period for Council Regulation (EC) No 1260/99 and the 2000-2006 and 2000-2007 programming periods for Council Regulation (EC) No 1257/99.

** Council Regulation (EC) No 1260/99 of 21 June 1999 laying down general provisions on the Structural Funds. (OJ L 161, 26.6.1999, p. 1.)

*** Council Regulation (EC) No 1257/99 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and amending and repealing certain regulations. (OJ L 160, 26.6.1999, p. 80.)

Article 4 – General obligations

1. The environmental assessment referred to in Article 3 shall be carried out during the preparation of a plan or programme and before its adoption or submission to the legislative procedure. [xvii]
2. The requirements of this Directive shall either be integrated into existing procedures in Member States for the adoption of plans and programmes or incorporated in procedures established to comply with this Directive.

viii The SEA Directive makes no reference to direct and indirect effects, unlike Art. 3 of the EIA Directive:

“The environmental impact assessment shall identify, describe and assess, in an appropriate manner, . . . the direct and indirect effects of a project on the following factors. . . .” – see V. **Environmental report** below.

xi 3. Similar to Annex II category of the EIA Directive, but potentially has more far reaching effects – see V. **Scope of application (Screening)** below.

xii 4. No such catch-all category exists in the EIA Directive (though has been proposed in the past, e.g. CPRE, 1992). The lack of such a category has, in the past, led to an inability to require EIA in the UK – wind farms, golf courses, trout farms (“salmonids”).

xiii 5. Screening – similar approach to EIA Directive, and has learnt from the lessons of the EIA Directive (Art. 4).

ix 2. Much debate and change over the course of the proposal. Exactly what is meant by “set the framework for. . .” is still unclear – see V. **Scope of application** below.

x “have been determined to” – Birdlife International tried to get this phrase deleted after the Common Position (April 2000), since under the Habitats Directive such an assessment is required for any plan or programmes likely to have a significant effect on a protected site. There is no qualification for such an effect “to have been determined”.

xii 4. This is a catch-all category – i.e. allows extension to plans and programmes not listed – see V. **Scope of application (Screening)** below.

xiii 5. Belt & braces approach to ensure that primary objective of subjecting plans and programmes likely to have significant effects to SEA is met, and whole classes of PPs having significant effects are not excluded (achieved as a result of proposals by Birdlife International, January 2001) – see V. **Scope of application (Screening)** below.

xiv 6. Environmental authorities given significant role, but not the public, as lobbied for by NGOs – see V. **Public consultation** below.

xv 7. Reasons for not requiring SEA secured by NGOs e.g. Birdlife. April 2000 after Common Position.

xvi 9. NGO action secured the possible application of the Directive to future Structural Fund rounds – see V. **Scope of application (Structural Funds)** below.

xvii “during” is significant as it relates to Art. 6 below on consultation. As the assessment must take place during the preparation of the plan or programme, so must public consultation – see V. **Public consultation** below.

Strategic Environmental Assessment

3. Where plans and programmes form part of a hierarchy, Member States shall, with a view to avoiding duplication of the assessment, take into account the fact that the assessment will be carried out, in accordance with this Directive, at different levels of the hierarchy. For the purpose of, *inter alia*, avoiding duplication of assessment, Member States shall apply Article 5(2) and (3). [xviii]

Article 5 – Environmental report [xix]

1. Where an environmental assessment is required under Article 3(1), an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives [xx] taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated. The information to be given for this purpose is referred to in Annex I.

2. The environmental report prepared pursuant to paragraph 1 shall include the information that may reasonably be required taking into account current knowledge and methods of assessment, the contents and level of detail in the plan or programme, its stage in the decision-making process and the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment. [xxi]

3. Relevant information available on environmental effects of the plans and programmes and obtained at other levels of decision-making or through other Community legislation may be used for providing the information referred to in Annex I. [xxii]

4. The authorities referred to in Article 6(3) shall be consulted when deciding on the scope and level of detail of the information which must be included in the environmental report. [xxiii]

Article 6 – Consultations

1. The draft plan or programme and the environmental report prepared in accordance with Article 5 shall be made available to the authorities referred to in paragraph 3 of this Article and the public.

2. The authorities referred to in paragraph 3 and the public referred to in paragraph 4 shall be given an early and effective opportunity [xxiv] within appropriate time frames to express their opinion on the draft plan or programme and the accompanying environmental report before the adoption of the plan or programme or its submission to the legislative procedure.

3. Member States shall designate the authorities to be consulted which, by reason of their specific environmental responsibilities, are likely to be concerned by the environmental effects of implementing plans and programmes.

4. Member States shall identify the public for the purposes of paragraph 2, including the public affected or likely to be affected by, or having an interest in, the decision-making subject to this Directive, including relevant non-governmental organisations, such as those promoting environmental protection and other organisations concerned. [xxv]

5. The detailed arrangements for the information and consultation of the authorities and the public shall be determined by the Member States.

Article 7 – Transboundary consultations

1. Where a Member State considers that the implementation of a plan or programme being prepared in relation to its territory is likely to have significant effects on the environment in another Member State, or where a Member State likely to be significantly affected so requests, the Member State in whose territory the plan or programme is being prepared shall, before its adoption or submission to the legislative procedure, forward a copy of the draft plan or programme and the relevant environmental report to the other Member State. [xxvi]

xviii 3. Tiering also relates to EIA Directive, i.e. tiering between plans, programmes and projects.

xix Unlike the EIA Directive the production of an environmental report is explicit (see note vi above).

xx Alternatives more explicitly and stronger than required in the EIA Directive, and requires reasonable alternatives to be considered – see V. **Environmental report** below.

xxiii 4. Scoping still only optional in EIA Directive.

xxiv Unlike the EIA Directive, this emphasizes “early” consultation in (2), as assessment process is “during” plan preparation, consultation in PP could be akin to consultation during scoping, baseline gathering, and identification and assessment stages.

xxvii Provisions very similar to those implementing Espoo for the EIA Directive.

xviii 3. Tiering – debate during development of Directive on this as German Christian Democrats sought to defeat the whole concept of tiering by having only one assessment – see V. **Tiering** below.

xxii 2. Wording in first part is similar to EIA Directive, except then refers to tiering, i.e. appropriate level of detail for the level of decision-making.

xxiii 3. this cross referencing of decision levels reinforces tiering

xxiii 4. Formal mandatory scoping, but not including the public (as sought by NGOs) – see V. **Scoping** below.

xxv The public is defined quite widely and explicitly, not just those affected, but also those having an interest in, and NGOs – see V. **Public consultation** below.

xxvi Implements requirements of the SEA Protocol to the Espoo convention on transboundary impacts. See V. **Espoo and SEA Protocol** below.

Strategic Environmental Assessment

2. Where a Member State is sent a copy of a draft plan or programme and an environmental report under paragraph 1, it shall indicate to the other Member State whether it wishes to enter into consultations before the adoption of the plan or programme or its submission to the legislative procedure and, if it so indicates, the Member States concerned shall enter into consultations concerning the likely transboundary environmental effects of implementing the plan or programme and the measures envisaged to reduce or eliminate such effects. Where such consultations take place, the Member States concerned shall agree on detailed arrangements to ensure that the authorities referred to in Article 6(3) and the public referred to in Article 6(4) in the Member State likely to be significantly affected are informed and given an opportunity to forward their opinion within a reasonable time-frame. [xxvii]
3. Where Member States are required under this Article to enter into consultations, they shall agree, at the beginning of such consultations, on a reasonable time-frame for the duration of the consultations.

Article 8 – Decision making

The environmental report prepared pursuant to Article 5, the opinions expressed pursuant to Article 6 and the results of any transboundary consultations entered into pursuant to Article 7 shall be taken into account during the preparation of the plan or programme [xxviii] and before its adoption or submission to the legislative procedure.

“xxviii Taking into account” requirement is similar to the EIA Directive, but its effect is very different because it occurs before the “decision-making process”. The equivalent in EIA would be to take into account consultations and the assessment during the preparation of the environmental impact statement, i.e. by the developer, before the application and EIS is submitted

xxviii “Taking into account” during the preparation of the plan, before adoption, provides for earlier public influence on the planning process than in the EIA Directive.

Article 9 – Information on the decision

1. Member States shall ensure that, when a plan or programme is adopted, the authorities referred to in Article 6(3), the public and any Member State consulted under Article 7 are informed and the following items are made available to those so informed:
- the plan or programme as adopted,
 - a statement summarising how environmental considerations have been integrated [xxix] into the plan or programme and how the environmental report prepared pursuant to Article 5, the opinions expressed pursuant to Article 6 and the results of consultations entered into pursuant to Article 7 have been taken into account in accordance with Article 8 and the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with [xxx], and
 - the measures decided concerning monitoring [xxxi] in accordance with Article 10.
2. The detailed arrangements concerning the information referred to in paragraph 1 shall be determined by the Member States.

xxix (b) this implies more than just environmental considerations being taken into account; they should be fully integrated into the plan or programme.

xxx Reasons for decision provision is stronger than the EIA Directive requirement? See V. Reasons for decision below.

xxx (c) No monitoring in EIA

xxxi (c) reinforces monitoring requirement in Art. 10.

Article 10 – Monitoring

1. Member States shall monitor the significant environmental effects of the implementation of plans and programmes in order, inter alia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action. [xxxii]
2. In order to comply with paragraph 1, existing monitoring arrangements may be used if appropriate, with a view to avoiding duplication of monitoring.

xxxii No monitoring in EIA Directive – strongly resisted during 97/11/EC development. Latest 5 year review report 2003 recommends introducing a post-decision monitoring system as a tool for improving quality control. (see V. Monitoring below). Little justification now for not having it in EIA (though applies to developer, cf. authorities for SEA)

xxxii Monitoring with a clear purpose – to be able to act to remedy problems. However, monitoring is only of the significant environmental effects of implementation of the plan/programme and is potentially restrictive.

(2) This requires a new process if not available already – important link to tiering though not mentioned as such, i.e. tiered plans provide a means of and reason for monitoring.

See V. Monitoring below.

Strategic Environmental Assessment

Article 11 – Relationship with other Community legislation

1. An environmental assessment carried out under this Directive shall be without prejudice to any requirements under Directive 85/337/EEC and to any other Community law requirements.^[xxxiii]
2. For plans and programmes for which the obligation to carry out assessments of the effects on the environment arises simultaneously from this Directive and other Community legislation, Member States may provide for coordinated or joint procedures fulfilling the requirements of the relevant Community legislation in order, *inter alia*, to avoid duplication of assessment.
3. For plans and programmes co-financed by the European Community, the environmental assessment in accordance with this Directive shall be carried out in conformity with the specific provisions in relevant Community legislation.

Article 12 – Information, reporting and review

1. Member States and the Commission shall exchange information on the experience gained in applying this Directive.
2. Member States shall ensure that environmental reports are of a sufficient quality^[xxxiv] to meet the requirements of this Directive and shall communicate to the Commission any measures they take concerning the quality of these reports.
3. Before 21 July 2006 the Commission shall send a first report on the application and effectiveness of this Directive to the European Parliament and to the Council. With a view further to integrating environmental protection requirements, in accordance with Article 6 of the Treaty, and taking into account the experience acquired in the application of this Directive in the Member States, such a report will be accompanied by proposals for amendment of this Directive, if appropriate. In particular, the Commission will consider the possibility of extending the scope of this Directive to other areas/sectors and other types of plans and programmes. A new evaluation report shall follow at seven-year intervals.
4. The Commission shall report on the relationship between this Directive and Regulations (EC) No 1260/1999 and No 1257/1999 well ahead of the expiry of the programming periods provided for in those Regulations, with a view to ensuring a coherent approach with regard to this Directive and subsequent Community Regulations.

Article 13 – Implementation of the Directive

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive before 21 July 2004. They shall forthwith inform the Commission thereof.
2. When Member States adopt the measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.
3. The obligation referred to in Article 4(1) shall apply to the plans and programmes of which the first formal preparatory act is subsequent to the date referred to in paragraph 1. Plans and programmes of which the first formal preparatory act is before that date and which are adopted or submitted to the legislative procedure more than 24 months thereafter, shall be made subject to the obligation referred to in Article 4(1) unless Member States decide on a case by case basis that this is not feasible and inform the public of their decision.^[xxxv]
4. Before 21 July 2004, Member States shall communicate to the Commission, in addition to the measures referred to in paragraph 1, separate information on the types of plans and programmes which, in accordance with Article 3, would be subject to an environmental assessment pursuant to this Directive. The Commission shall make this information available to the Member States. The information will be updated on a regular basis.

xxxiii 1. Proposed amendments by Christian Democrat MEPs could have prejudiced 85/337/EEC – see V. Tiering below

xxxiv Not covered by EIA Directive as environmental report/EIS not explicit in EIA Directive. Poor quality control highlighted by recent five –year report.

xxxiv Clear obligation to put in place procedures for ensuring quality control (again has potential links to tiering as subsequent tier provide means of monitoring and therefore auditing quality of previous stage) – see V. Environmental report. below.

Strengthened after Common Position Birdlife April 2000.

xxxv Transitional arrangements, to avoid “pipeline” problems:- Where adoption of a plan or programme that had been initiated before 21 July 2004 does not occur until after 21 July 2006, the Directive shall apply unless it is not feasible. See V. Implementation below.

Strategic Environmental Assessment

Article 14 – Entry into force

This Directive shall enter into force on the day of its publication in the Official Journal of the European Communities.

Article 15 – Addressees

This Directive is addressed to the Member States.
Done at Luxembourg, 21 June 2001

For the European Parliament	For the Council
The President	The President
N. FONTAINE	B. ROSENGREN

ANNEX I

Information referred to in Article 5(1)

The information to be provided under Article 5(1), subject to Article 5(2) and (3), is the following:

- | | |
|---|---------------------------------|
| (a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes; | ✓ |
| (b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme; | Zero option not explicit in EIA |
| (c) the environmental characteristics of areas likely to be significantly affected; | ✓ |
| (d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC; | ✓ |
| (e) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation; | x |
| (f) the likely significant effects on the environment, including on issues such as biodiversity ^{xxxvi} , population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors; | ✓ except xxxvi |
| (g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme; | ✓ |
| (h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information; | ✓ |
| (i) a description of the measures envisaged concerning monitoring in accordance with Article 10. | x |
| (j) a non-technical summary of the information provided under the above headings. | ✓ |

§ these effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects. ^{xxxvii}

Equivalent in EIA Directive (as amended) Annex IV?

xxxvi Biodiversity reference pushed by Birdlife after Common Position.

xxxvii No reference to direct and indirect effects. While secondary, cumulative etc. effects are mentioned, it is curious that indirect effects are not. Birdlife tried to insert an amendment to include this, in October 1999 – see V. **Environmental report** below.

ANNEX II

Criteria for determining the likely significance of effects referred to in Article 3(5)

- | | |
|---|---|
| 1. The characteristics of plans and programmes, having regard, in particular, to ^{xxxviii} | |
| – the degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources; | x |
| – the degree to which the plan or programme influences other plans and programmes including those in a hierarchy; | x |
| – the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development; | x |
| – environmental problems relevant to the plan or programme; | |

Equivalent in EIA Directive (as amended) Annex III?

xxxviii Clearly characteristics of the plan or programme relate to different factors compared to EIA Directive. This paragraph reinforces the importance of tiering in particular – see V. **Tiering** below.

Strategic Environmental Assessment

- the relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste-management or water protection). x
- 2. Characteristics of the effects and of the area likely to be affected, having regard, in particular, to
 - the probability, duration, frequency and reversibility of the effects; ✓
 - the cumulative nature of the effects; ✓
 - the transboundary nature of the effects; ✓
 - the risks to human health or the environment (e.g. due to accidents); ✓
 - the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected); ✓
 - the value and vulnerability of the area likely to be affected due to:
 - special natural characteristics or cultural heritage; ✓±
 - exceeded environmental quality standards or limit values;
 - intensive land-use;
 - the effects on areas or landscapes which have a recognised national, Community or international protection status. ✓

V. Discussion

Environmental Integration

There is widespread agreement in the European Union that the concept of integrating the environment into policy making is a key principle of moving towards sustainable development.³⁸ Since 1998 this principal of EU environmental policy making has been enshrined in the so-called "Cardiff Process",³⁹ representing what the Commission identifies as the start of the third of three "waves" of environmental integration since 1992.⁴⁰

The European Union's Sustainable Development Strategy,⁴¹ however, emphasises economic and social progress above environmental integration – it is the Lisbon process on economic and social reform⁴² that headlines the strategy (and is also annexed) rather than the Cardiff Process on environmental integration. Remarkably, the entire strategy avoids use of the term "environmental integration". Moreover, it contains an essentially "weak" (very weak) interpretation of sustainable development:

"Achieving this [sustainable development] *in practice requires that economic growth supports social progress and respects the environment, that social policy underpins economic performance, and that environmental policy is cost-effective.*"⁴³

This theme of an essentially weak interpretation of sustainable development is further continued in the draft European Constitution^{44, 45} which again has further elevated sustainable development, this time to being part of the Union's Objectives (Art. I-3), while environmental integration continues to be seen separately, in the same form as Art. 6 of the Amsterdam Treaty, now in Part III of the Draft Constitution – The Policies and Functioning of the Union – as Art. III-2:

"Environmental protection requirements must be integrated into the definition and implementation of the Union policies and activities referred to in this Part, in particular with a view to promoting sustainable development."⁴⁶

The adoption of the SEA Directive, therefore, emerging as it did out of a strong historical environmental integration philosophy, provides an important counterpoint to the

continued weakening of the conception of sustainable development elsewhere in EU policy. Article 1 of the SEA Directive also emphasizes the importance of integrating the SEA process (the "environmental considerations") with the preparation as well as the adoption of plans and programmes, i.e. the plan and programme making process.

³⁸ Wilkinson, D (1998), Steps Towards Integrating the Environment into Other EU Policy Sectors, in O'Riordan, T and Voisey, H (eds.) (1998), *The Transition to Sustainability: The Politics of Agenda 21 in Europe*, Earthscan, London.

³⁹ Above n. 10.

⁴⁰ Commission of the European Communities (2003) at http://europa.eu.int/comm/environment/integration/integration_history.htm, accessed 18 May 2003. The first wave was 1992-1997 with the commitment to sustainable development, focused on the 1992 Rio de Janeiro Earth Summit and the Maastricht Treaty. The second wave was 1997-1998, with the strengthening of integration through the Amsterdam Treaty and the agreement at the Cardiff Summit in 1998 on the Commission's Communication to the European Council "Partnership for Integration", which began the so-called Cardiff process. The Cardiff process was the focus for the third wave from 1998-2001 and the build up to the Helsinki and Göteborg Summits and the publication of the EU's Sustainable Development Strategy.

⁴¹ Commission of the European Communities (2001), Communication from the Commission COM (2001) 264 final, A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development, Brussels. 15.5.2001.

⁴² Above n. 11.

⁴³ Above n. 41, p.2.

⁴⁴ European Convention, Draft Constitution Volumes I-II, CONV 724/03 and 725/03, The European Convention Secretariat, Brussels, 26/27 May 2003.

⁴⁵ Sheate (2003): above n. 27.

⁴⁶ The qualification "... *in particular with a view to promoting sustainable development*" arguably weakens environmental integration if the conception of sustainable development is weak, i.e. dominated by economic and social considerations. This phrase has also crept into Annex II of the SEA Directive as a potential qualification to the criterion of "relevance of the plan or programme for the integration of environmental considerations ...".

Strategic Environmental Assessment

Scope of application

Policies:

The application of the SEA Directive to policies was dropped by the time the first formal draft was published as COM (96) 511 final. Earlier attempts to include policies in the early 1990s fell by the wayside as various Member States objected to what was seen as potential interference in the political process.⁴⁷ NGOs, that had been instrumental in promoting SEA at all levels in the early 1990s,⁴⁸ did not seek to reinstate policies in early campaigns on the proposal (COM (96) 511 final) because of the political risk that even a directive for plans and programmes might be lost under the prevailing de-regulation agenda of the mid-1990s.⁴⁹ They did attempt, unsuccessfully, to insert policies into future consideration under the five year review process. However, the logic of "tiering" (see below) recognized by the SEA Directive is that SEA should also be applied to policy level decisions. The European Commission, recognizing this, commissioned research during 2000–2001 into the application of SEA to the most strategic decision-making levels, including policies.⁵⁰ In practice, a variety of forms of SEA are already being applied at policy level in some Member States,⁵¹ but without the consistency that would be ensured by EC legislation.

Set the framework:

There was considerable debate over the scope of application of the SEA Directive during its development. From only covering land use plans and programmes, to town and country planning, to any plans or programmes that set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC. The challenge for Member States in implementing the Directive is to work out what plans and programmes come within the ambit of "set the framework for". It could be argued that this is very broad, and given the directive applies not just to legislative provisions, but also administrative measures, the Directive may be applicable to a range of non-statutory plans, programmes, and strategies, if it can be argued that they set the framework for subsequent projects. The European Commission's guidance on implementing the Directive⁵² recognizes that the EIA Directive was seen by the ECJ in case C-72/95 *Kraaijeveld* to have wide scope and a broad purpose,⁵³ and suggests that a similar approach should be adopted by Member States for the SEA Directive.

An example from the UK might be the national and regional water resource strategies produced by the Environment Agency (for England and Wales), which set the policy context in which future project decisions will be taken, e.g. new reservoirs, water abstraction, and water transfer schemes, all of which will be subject to the EIA Directive. However, the Environment Agency is only a consultee in the development consent process for such projects. But it is the licensing authority for abstractions and discharges and has a duty to ensure adequate distribution of water resources. Water companies, therefore, are unlikely to come forward with water resource schemes that have no chance of licensing by the Environment Agency. Indeed, the Commission guidance (referring to case C-188/89 *Foster and others v British Gas*) suggests that privatized utility companies may also be required to undertake SEA where they undertake

long-term planning, e.g. for water resources, where under non-privatised regimes such plans would be carried out by authorities.⁵⁴ By their nature water resource strategies could result in significant effects on the environment, e.g. by promoting groundwater abstraction or new reservoirs. So water resource strategies would appear to set the framework for future development consent of projects under the EIA Directive, albeit indirectly.⁵⁵ Indeed, that is the key purpose behind the strategies' development and forms of SEA have already been applied by the Agency.⁵⁶ The intention is to provide a strategic environmental context within which water company investment decisions come forward and therefore any applications for subsequent development projects. The Agency and the UK Government have yet to finalise the list of Agency strategies to which the SEA Directive is likely to apply. In Scotland, by contrast, the Scottish Executive has announced that it will require all public sector generated plans and programmes to be subjected to SEA.⁵⁷

The relationship between different levels of plans, of course, introduces the concept of tiering (see below), though this would not appear to have to be a direct relationship, e.g. a water resource strategy might set the framework indirectly (in terms of water availability) for subsequent decisions on housing development.

Structural funds:

EIA and SEA have, in response to problems caused by the funding of damaging projects, been integrated in a limited

⁴⁷ Above n. 12.

⁴⁸ e.g. CPRE (1992), above n. 8.

⁴⁹ CPRE (1997), Birdlife International, CPRE, EEB and T&E (2000), above n. 8.

⁵⁰ Sheate, W.R., Dagg, S., Richardson, J., Aschemann, R., Palerm, J. and Steen, U. (2001). *SEA and Integration of the Environment into Strategic Decision-Making* (Volumes 1-3), Final Report to the European Commission, DG XI, Contract No. B4-3040/99/136634/MAR/B4, available at <http://europa.eu.int/comm/environment/eia/sea-support.htm#int>, Office for Official Publications of the European Communities, Luxembourg; Sheate, W.R., Dagg, S., Richardson, J., Aschemann, R., Palerm, J. and Steen, U. (2003), *Integrating the Environment into Strategic Decision-Making: Conceptualizing Policy SEA*, *European Environment*, 13 (1), 1-18.

⁵¹ Sheate (2003): above n. 27.

⁵² Commission of the European Communities, (2003), *Implementation of Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment*, DG Environment 23 September 2003, available at http://europa.eu.int/comm/environment/eia/030923_sea_guidance.pdf.

⁵³ Op. cit at para. 3.4.

⁵⁴ Op. cit at para 3.12.

⁵⁵ Op. cit at para 3.23: the Commission recognizes that 'setting the framework' may be indirect, e.g. the plan or programme contains criteria or conditions which guide the way the consenting authority decides an application for development consent (for projects under the EIA Directive), such as placing limits on the type or extent of activity.

⁵⁶ Environment Agency (2001), *Water Resources for the Future: A Strategy for England and Wales*, Environment Agency, Bristol.

⁵⁷ Scottish Executive (2003), *Strategic Environmental Assessment*, News Release SENW532/2003, 28 May 2003, available online at <http://www.scotland.gov.uk/pages/news/2003/05/SENW532.aspx>, accessed 15 October 2003.

Strategic Environmental Assessment

form into the EU Structural Funds process. Key case law⁵⁸ in the early 1990s concerning the lack of environmental sensitivity with which the first (1989-1993) tranche of Structural Funds had been deployed meant that the European Commission could no longer ignore the potential for Community funds to result in environmentally damaging schemes. Consequently, environmental appraisal of regional development plans in the context of the Structural Funds was made a mandatory obligation in 1993, when the European Commission amended the existing Structural Fund Regulations⁵⁹.⁶⁰ The amended regulations⁶¹ required Regional Development Plans (RDPs) submitted under objectives 1, 2 and 5b to include an assessment of their impact on the environment. This constituted a binding, quasi-strategic environmental assessment requirement. In recognition of methodological problems encountered, the European Commission published *A Handbook on Environmental Assessment of Regional Development Plans and EU Structural Funds Programmes*.⁶² The regulations governing the Structural Funds regulations were revised again in 1999⁶³ and emphasised the need to assess the compatibility of RDPs with national, regional and local environmental management objectives.⁶⁴ The requirement for environmental appraisal is set out in Art. 41(2) of these regulations.

The SEA Directive, therefore, was seen by a number of NGOs as a key vehicle for strengthening the environmental assessment requirement of the structural funds. Organisations such as Birdlife International, European Environmental Bureau and the Council for the Protection of Rural England were particularly active in promoting the need for the SEA Directive to apply to the Structural Funds.⁶⁵ The final text of the Directive in Arts 3 and 12 ensures that the SEA Directive does not apply to the current programming periods of the Structural Funds (2000-2006/7). The Commission is, however, required to report on the relationship between the Structural Funds and the SEA Directive, with the implication (though it is not necessarily much stronger than this) that subsequent programming periods may come under the SEA Directive should the first review of the Directive so decide (Art. 12 (4)):

"4. The Commission shall report on the relationship between this Directive and Regulations (EC) No 1260/1999 and No 1257/1999 well ahead of the expiry of the programming periods provided for in those Regulations, with a view to ensuring a coherent approach with regard to this Directive and subsequent Community Regulations."

The suggestion of a coherent approach in Art. 12 (4) implies that the SEA Directive would be applied to future programming periods for the Structural Funds (the exemption from the Directive only applies to the current programming periods⁶⁶). That was certainly the desire and expectation of the NGOs seeking to secure this amendment during 2000, following agreement of the Common Position.⁶⁷ However, a coherent approach does not necessarily mean the same approach, and much will depend upon the reporting and review process and the political context pertaining at the time. It may well be that NGOs will need to argue the case just as strongly during the Directive's review process as during its development, if the full application of the SEA Directive to Structural Funds is to be brought about.

Screening:

Screening is required on a case by case basis or by specifying types of plans or programmes, or a combination of both, as for the EIA Directive. Annex II provides criteria to be taken into account in deciding which plans and programmes are likely to have significant effects and therefore subject to SEA. Where a case-by-case approach is adopted, the environmental authorities must be consulted (Art. 3 (6)). Reasons for not requiring an assessment, as well as where one is required, must also be given (Art. 3 (7)). This requirement was secured by NGOs after the Common Position. Plans and programmes affecting small areas at the local level and minor modifications to plans and programmes covered by the SEA Directive will require assessment only where Member States determine they are likely to have significant environmental effects (Art. 3 (3)). The rigorous application of the Annex II criteria will be essential to ensure potentially damaging plans and programmes do not slip through the net.

Most interesting though is the "catch-all" provision (Art. 3 (4)) for applying SEA to any plans and programmes, over and above those defined, that set the framework for future development consents:

"4. Member States shall determine whether plans and programmes, other than those referred to in paragraph 2, which set the framework for future development consent of projects, are likely to have significant environmental effects."

This will allow Member States to apply the SEA Directive to plans in sectors not already mentioned by the SEA Directive in Art. 3 (2). The Art. 3 (2) definition refers specifically to plans and programme that set the framework for future development consent of projects listed in Annexes I and II of 85/337/EEC. The Commission guidance makes clear this will also include projects in those sectors not listed in Art. 3 (2) as well as projects which are in those sectors, but are not listed in the annexes to the EIA Directive.⁶⁸ Effectively, therefore this would appear to extend the catch-all beyond the scope current scope of the EIA Directive, so long as

⁵⁸ For example: *An Taisce and World Wild Fund for Nature v Commission of the European Communities*, European Court of First Instance, Case Number T-461/93, 23 September 1994; *Stichting Greenpeace Council (Greenpeace International) and Others v Commission of the European Communities*, European Court of First Instance (First Chamber), Case Number T-585/93, 9 August 1995.

⁵⁹ Council Regulation (EEC) No. 2052/88

⁶⁰ Bradley, K (1999), *Environmental Appraisal of Regional Development Plans in the Context of the Structural Funds*, *Environmental Impact Assessment Review*, 19:245-257.

⁶¹ Council Regulation (EEC) No. 2081/93

⁶² Commission of the European Communities (1998), *A Handbook on Environmental Assessment of Regional Development Plans and EU Structural Funds Programmes*, European Commission.

⁶³ Council Regulation (EC) No. 1260/1999

⁶⁴ Clement, K (2001), *Strategic Environmental Awakening: European Progress in Regional Environmental Integration*, *European Environment*, 75-88.

⁶⁵ Above n. 49

⁶⁶ Above n. 52. at para. 3.8

⁶⁷ Above n. 8.

⁶⁸ Above n. 50, at para. 3.37.

Strategic Environmental Assessment

there is an appropriate plan or programme setting the framework, even though there has been no similar catch-all provision in the EIA Directive up to now. This has caused problems in the past in Member States not being able to apply the EIA Directive to new technologies or forms of development not listed in the annexes.⁶⁹ Attempts by NGOs in the past to amend the EIA Directive to make such a provision have not been successful.⁷⁰

Environmental report

Article 5 of the SEA Directive requires the production of an environmental report, to be taken into account along with the results of consultations during the SEA process. This is an important departure from the EIA Directive, where the Commission and Member States were at pains to avoid the requirement for a single document (environmental impact statement, EIS), given the litigious history of EIA in the United States of America. In practice, of course, the "information to be provided" by the developer is invariably presented as an EIS. The acknowledgement that there needs to be a written output to the assessment process leaves the EIA Directive somewhat out of phase with the SEA Directive and now seems even less justified than at the time. Critically, a formal written output requires and enables a quality control mechanism to be implemented (see below). Key aspects of the content of the environment report are discussed below.

Alternatives:

The SEA Directive is stronger than the EIA Directive in requiring "reasonable alternatives" (taking into account the objectives and the geographical scope of the plan or programme) to be identified, described and evaluated (cf. alternatives studied by the developer in the EIA Directive). It is particularly important that the Directive should promote the consideration of alternatives since it is at strategic decision levels that alternative options need to be properly assessed, before the direction and nature of subsequent projects is determined. It is important that this requirement is not interpreted too narrowly and that, for example, "need" is questioned by the consideration of demand management options.

Direct and indirect effects:

Intriguingly, unlike the EIA Directive, there is no reference to direct and indirect effects, only significant effects, which include secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative effects (Annex If). Indirect effects imply a wider scope of potential effects including geographically distant effects. There is considerable confusion over the definition of cumulative effects,⁷¹ but Cooper⁷² defines indirect effects as:

*"effects which are not a direct result of the plan [or programme/project], often occurring away from the action (e.g. quarrying aggregates for road building) or as a result of a complex pathway..."*⁷³

At the strategic level it would seem particularly appropriate to be considering indirect effects – effects that occur away from the immediate action in time or space, such as the aggregates example quoted above – and possibly even more so than at the project level. In practice, indirect effects are

often poorly addressed at project level EIA in part at least because they are often likely to be associated with separate consent processes from the project under consideration. During the passage of the draft SEA Directive Birdlife International tried unsuccessfully to insert an amendment to include reference to indirect effects.⁷⁴

Quality control:

The lack of EIA quality control is recognized in the latest EIA Directive five year report.⁷⁵ In the SEA Directive the importance of quality control is recognised, though achieved only following strengthening amendments promoted by NGOs,⁷⁶ which resulted in the Directive requiring Member States to "ensure that environmental reports are of a sufficient quality to meet the requirements of the Directive" (Art. 12 (2)). The exact mechanism for achieving this quality control will be down to the Member States, but could (ideally) include some form of independent body, especially important for scrutinizing authorities adopting their own plans and programmes.

Public consultation

The Directive is an advance on the EIA Directive in that it recognises the need for early consultation during the plan or programme's preparation process, and not just in the final stages. How this will be implemented remains to be seen. For some sectors there will be existing plan/programme processes that already provide the opportunity for public involvement (e.g. land use and spatial planning in some Member States), but for others new opportunities may need to be created. Draft UK Guidance on the SEA Directive for land use planning,⁷⁷ for example, is somewhat ambivalent about wider public involvement (other than the production of a scoping report and the environmental report being made available),⁷⁸ referring to the use of NGOs and interest groups as effective proxies for the wider public at strategic

⁶⁹ See CPRE *Mock Directive*, Above n. 8

⁷⁰ *Ibid.*

⁷¹ Cooper, L. M. and Sheate, W. R. (2003), *Integrating Cumulative Effects Assessment into UK Strategic Planning: Implications of the EU SEA Directive, Impact Assessment and Project Appraisal*, 21 (4) (in press, December 2003).

⁷² Cooper, L. M. (2003), *Draft Guidance on Cumulative Effects Assessment of Plans*, EPMG Occasional Paper 03/LMC/CEA, Imperial College London, available at <http://www.env.ic.ac.uk/research/epmg/CooperCEAGuidance.pdf>.

⁷³ *Op cit*, p. 50.

⁷⁴ Birdlife International (1999), *The Amended Proposal for a Council Directive on Assessment of the Effects of Certain Plans and Programmes on the Environment (COM (96) 511 and COM (99) 73) – Comments by Birdlife International October 1999*, p.1.

⁷⁵ Commission of the European Communities (2003), *Report from the Commission to the European Parliament and the Council on the Application and Effectiveness of the EIA Directive 85/337/EEC (as amended by Directive 97/11/EC): How Successful are the Member States in Implementing the EIA Directive?*, June 2003.

⁷⁶ e.g. after Common Position by Birdlife International, April 2000.

⁷⁷ Office of the Deputy Prime Minister (2002), *Draft guidance on the strategic environmental assessment Directive*, ODPM October 2002, available at http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_605912.hcsp.

⁷⁸ *Op cit*, ss 3.5.6 and 3.9.3.

Strategic Environmental Assessment

levels. For some strategic decisions, particularly where controversial, more imaginative approaches to engagement may be needed, e.g. deliberative techniques such as citizens' juries or consensus conferences.

The context of consultation and participation has evolved over recent years, especially given the agreement of the Aarhus Convention.⁷⁹ The Directive encourages early consultation during the SEA process, which incorporates the Aarhus provisions encouraging participation at the earliest opportunity, though it is not specified at the scoping stage, only consultation with environmental authorities is required at that point. Aarhus, in fact, is not referred to explicitly in the SEA Directive, but is the subject of a separate Directive which impacts directly upon the EIA Directives – Directive 2003/35/EC on Public Participation.⁸⁰ However, since Aarhus is already incorporated into the SEA Directive, Art. 2 (5) of 2003/35/EC regarding public participation concerning plans and programmes, only applies to those plans and programmes not already covered by the public participation procedures of the SEA Directive.

Tiering

The concept of tiering is explicit and reinforced throughout the SEA Directive, but particularly in Art. 4 (3), Art. 11 and Annex II. During Conciliation, German Christian Democrat MEPs sought to defeat the concept of tiering by requiring only one assessment (if both SEA and EIA applied) as an extreme means of avoiding duplication. This proposal failed to understand the importance of undertaking assessment at the appropriate level of detail according to the level of decision-making, and was fortunately defeated.⁸¹

It is unclear how the SEA Directive will affect those programmes/projects where there have been issues over project definition under the EIA Directive, i.e. whether a project is a project or a programme. Examples include, *inter alia*, power stations and many road schemes that suffer from "salami-slicing". In a particular example, that of the Wilton power station in the UK in the early 1990s, an EIA was carried out and consent subsequently granted.⁸² The EIS made it clear that the power station was only one part of the 'project' and that other component 'projects' would be subject to separate EIAs (after the main power station consent was granted) under various separate consent processes. This included 90km of 400kv power line upgrades, a gas pipeline, and a combined heat and power pipeline. A concern with the Amendment Directive (97/11/EC) was that it still failed to resolve this issue of project definition, continuing to leave it for the courts to decide.⁸³ In this case the power station project is more strategic than just a single project – it is more like a programme, and sets the framework for the power line upgrades, gas pipeline etc. (they wouldn't be needed otherwise), but it is not coming forward as part of a strategic planning framework (under the privatized electricity regime proposed schemes come forward in a very ad hoc, speculative manner). (The European Commission at the time said that where power lines would have a significant effect then, in principle at least, they should be considered at the time of the power station application as part of the power station EIA.)⁸⁴ Since the powerlines and gas pipeline were not addressed under the power station EIA, now the SEA Directive will

apply to programmes and plans (and recognises the importance of tiering), it seems reasonable to believe it ought to provide the solution to this problem in future. A key problem here is that the "sub-projects" could have a very significant bearing on whether the site selected is the most appropriate.

How will the SEA Directive apply in these cases, since for many power stations it is not possible to point to a specific strategic process that would set the framework (for renewable energy schemes and roads on the other hand there are possible strategic processes that might be appropriate)? The problem would appear to depend on whether the framework is truly "strategic", i.e. a top down approach to setting the framework (such as exists in the UK or Netherlands in land use planning), or a bottom up "incremental" approach to SEA where a collection of projects is seen as constituting a programme or plan (as in Portugal⁸⁵). The former represents what is probably most commonly conceived of as strategic (but is non-existent in the UK for most power stations⁸⁶), while the latter clearly has more immediate conceptual ties to project level EIA and the EIA Directive. However, with the incremental approach, there may be no adequate mechanism for making the assessment happen when widely different consent processes are involved in a "collection of projects". SEA has always been seen as the answer to this problem, since those more strategic issues at the programme level ought to be addressed by the SEA, prior to the individual EIAs. If the SEA Directive cannot address this problem it will be a continuing loophole between EIA and SEA.

"Scoping"

Formal mandatory scoping is required, unlike the EIA Directive where it is optional on the developer. Scoping is

⁷⁹ UNECE (1998), Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, 23-25 June 1998, Aarhus, Denmark.

⁸⁰ OJ 25.6.2003 L156.

⁸¹ WWF and Birdlife International (2001), Recommendations for conciliation on the proposed SEA Directive, January 2001, p.1.

⁸² Sheate, W. R. (1996), *Environmental Impact Assessment: Law and Policy – Making an Impact II* (2nd edition), Cameron May, London, pp 140–147.

⁸³ The ECJ, with respect to an important motorway case in Germany – *Bund Naturshutz and others v Bavarian Higher Regional Court* (Case C392/92) – was able to avoid addressing this question of project definition. The Advocate General in his Opinion to the Court (3 May 1994), however, did consider it:

"...the purpose of the directive should not be lost by the projects which should be subject to an environmental impact assessment being given a form which renders an environmental impact assessment meaningless. The Member States must ensure that the obligation to carry out an environmental impact assessment is not circumvented by a definition that is over-strict or otherwise inappropriate, in the light of the purpose of the directive" (para.70).

⁸⁴ Letter from the European Commission to CPRE, 26 June 1992.

⁸⁵ Maria do Rosario Partidario (2003), personal communication 19.10.03.

⁸⁶ Byron, H. and Sheate, W.R. (1997), Strategic Environmental Assessment: Current Status in the Water and Electricity Sectors in England and Wales, *Environmental Policy and Practice* 6 (4), 155–165.

Strategic Environmental Assessment

widely recognised as one of the most important stages in EIA and SEA and so this mandatory requirement is to be welcomed. However, while environmental authorities are to be consulted on the scope of the assessment (Art. 5 (4)), the public is not required to be consulted. NGOs sought to require this, to no avail.⁸⁷ The presence of mandatory scoping for SEA, though, and the desire in the Directive for tiering, brings into question how the lack of mandatory scoping under the EIA Directive can continue to be sustained.

Espoo and the SEA protocol

Article 7 requires Member States to put in place provision for consultation with other Member States where any of their plans and programmes are likely to have significant effects in other Member States. The Directive follows the approach of the Espoo Convention on EIA in a Trans-boundary Context, and the recent SEA protocol⁸⁸ to the Espoo Convention extending consultation provisions to plans and programmes.

Reasons for decision

The provision for giving reasons for the decision is stronger than in the EIA Directive, in that a statement is required summarising how environmental considerations have been integrated into the plan or programme and how the environmental report and the results of consultations have been taken into account. The reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with, must be given. Clearly it is especially important at strategic levels to justify why a particular option has been selected as opposed to other possible alternative options. The Directive thereby also promotes the integration of the assessment with the planning and decision-making process.

Monitoring

Prior to the Common Position there was no monitoring article provision in the draft Directive. This was pushed for by NGOs, such as Birdlife International during April 2000. The importance of monitoring should not be underestimated. It has been missing from the EIA Directive largely because it was often seen as imposing an additional burden on developers and competent authorities.⁸⁹ Indeed the latest Commission five year review report in 2003 recommended introducing a post-decision monitoring system as a tool for improving quality control.⁹⁰ However, in the context of the SEA Directive monitoring is now required (Art. 10), and this ties in well with the requirement for tiering, since the latter enables and provides a reason for monitoring.

Monitoring under the Directive is also required for a clear purpose: that of being able to act to remedy problems. However, monitoring is to be carried out only of the significant environmental effects of implementation of the plan/programme and is therefore potentially very restrictive.⁹¹ This is linked to the lack of consideration of "indirect" effects in the SEA, although cumulative effects are supposed to be covered ("indirect" implies a wider scope of potential effects, including geographically distant effects). Monitoring of a wider range of indicators⁹² may be important in order to pick up small but synergistic or

additive cumulative effects, which on their own would not be considered to be "significant". Paragraph 2 of Art. 10 allows existing monitoring arrangements to be used if appropriate, in order to avoid duplication. However, if no existing monitoring arrangements are appropriate a new process will be needed.

Implementation

The Directive shall apply to plans and programmes of which the first formal preparatory act occurs after 21 July 2004. Transitional arrangements are provided in Art. 13 to attempt to avoid the "pipeline" problems experienced by the original EIA Directive. Where the adoption of a plan or programme that had been initiated before 21 July 2004 does not occur until after 24 months, the Directive shall apply unless a Member State judges on a case by case basis that it is not feasible and informs the public. There is potential for some ambiguity over this requirement, i.e. is the 24 month period from 21 July 2004 or from the first preparatory act where that occurs prior to 21 July 2004. Some commentators, e.g. NGOs campaigning for the fullest implementation of the Directive, would no doubt prefer it be the first preparatory act, since this would bring the implementation date for such transitional plans and programmes as near as possible to 21 July 2004. However, the 21st July 2004 would appear to be the only date that provides sufficient legal certainty⁹³, since the exact definition of the first preparatory act will vary across the plans and programmes of different sectors and Member States. There will be no universally recognisable date of application, as is understood for the EIA Directive.

VI. Conclusion

So why do we need SEA and will it make a difference? Too many important decisions are made at a strategic level that bind project level decisions, foreclosing options. EIA alone, therefore, is not enough. Tiering is critical and the SEA Directive makes this explicit, and includes provision for avoiding duplication. However, tiering does not mean that EIA is not required if SEA has been carried out at plan and

⁸⁷ Birdlife International, Proposed Amendments to Common Position, April 2000; and CPRE/EEB/Birdlife, May 2000 - above n. 8.

⁸⁸ ECE Protocol on strategic environmental assessment to the Convention on Environmental Impact Assessment in a Trans-boundary Context (the Espoo Convention), opened for signature 21 May 2003 at the Fifth Ministerial Conference 'Environment for Europe' in Kiev, Ukraine.

⁸⁹ Above n. 82, at p. 112.

⁹⁰ Above n. 75 at p. 7.

⁹¹ Risse, R, Crowley, M, Vincke, P and Waaub, J-P (2003), Implementing the European SEA Directive: The Member States' Margin of Discretion, *EIA Review*, 23, at p. 466.

⁹² *Ibid.*

⁹³ As found by the ECJ with respect to 'pipeline cases' in *Bund Naturshutz*, (above n. 9) and *Grosskrotzenburg* (Commission of the European Communities v Federal Republic of Germany, European Court of Justice, Case Number C-431/92, 11 August 1995).

Strategic Environmental Assessment

programme level, although it may if more environmentally benign options have been chosen and no significant environmental effects from resulting projects are likely. In most cases however, EIA will still be required (but may be more focused) and iteration will then be possible back up the decision levels to inform the strategic planning processes. Tiering should be a two way process and not simply top down.

Key advances of the SEA Directive on the EIA Directive include: mandatory scoping, monitoring, catch-all screening, improved consideration of alternatives, and earlier public participation. Implementation provides a challenge for the Member States. The UK, for example, is still working out how, but intends to use one overarching Regulation under the European Communities Act 1972 to apply across all sectors in England and Wales, while the Scottish Executive intends to apply the SEA Directive to all public sector plans and programmes in Scotland. The UK Government intends consulting on a draft of the England and Wales Regulation in the autumn of 2003.

Arising out of the discussion above is the continuing anomaly of having separate legislation for EIA and SEA. The next amendment process of the EIA Directive is due over the next two years (2004/5) following the latest review,⁹⁴ and the first review of the SEA Directive will be due in 2006. This coincidence of the review processes provides an early opportunity to consider the consolidation of both Directives as a coherent whole. The analysis above has highlighted the strong similarities between the two directives (wording has in many cases simply been transferred across), and it seems difficult to sustain the original argument for separation, which was the political difficulty of trying to address both together. Since we now have both directives the review process should be seen as the opportunity to provide much-needed coherence and reinforce the desire of the SEA directive for tiering and subsidiarity.

NGOs have had significant impact on the development of the SEA Directive and therefore will need to be ever watchful that Member States implement the requirements of the Directive properly. One of the reasons for delay in agreeing the Directive was the natural desire of Member States to secure a sufficiently robust legal basis in order to avoid subsequent challenges and complaints. But such challenges may be unavoidable and indeed necessary to ensure proper compliance.

So, what has happened to policies? The agenda has changed somewhat in light of the Cardiff and Lisbon processes during the late 1990s and early 2000s. Historically there has been considerable political opposition to including policies in any SEA Directive. Most recently (2002) the Commission Impact Assessment tool⁹⁵ has been introduced and is being applied to the development of Commission policies and strategies. This tool is a form of sustainability appraisal (though with considerable emphasis on quantifi-

cation) and has emerged from the EU's Sustainable Development Strategy. Consequently it represents an essentially weak interpretation of sustainable development,⁹⁶ and it is therefore worrying that EU policy level decisions may be subject to a much weaker standard of "sustainability" appraisal than plans, programmes and projects subject to the stronger environmental SEA and EIA. Some Member States are also going down the sustainability appraisal route (and have influenced the development of the Commission's Impact Assessment tool). This is particularly significant as the most strategic decisions need to ensure the most environmentally sustainable options are provided for lower level tiers. Otherwise SEA will be applied to less than environmentally optimum options dictated by policy level decisions where environmental considerations may already have been compromised to economic and social priorities. On the other hand, SEA may be seen as an important counter balance to the onward march of weaker sustainability approaches to assessment, and perhaps provide a useful opportunity to stop and reflect on how such assessment approaches should continue to evolve.

The SEA Directive has, then, arrived at an opportune time to reinvigorate the environmental integration agenda, that of the Cardiff process currently beleaguered by the much stronger social and economic agenda of Lisbon that is dominant in current EU conceptions of sustainable development.⁹⁷ While there has been positive formalisation and strengthening of EU environmental policy over the past 30 years, arguably there has been far less real change in terms of the effective integration of the environment into decision-making on the ground. While environmental integration may still be explicit in policy statements, this needs to be more than rhetoric. It is the way in which the environment is integrated that matters. If environmental considerations are forced to give way to economic growth, then the environment may have been integrated into policymaking only to be de-prioritised and effectively little more than "taken into account". This would represent effectively the loss of 30 years of progress for environmental integration. There would seem to be an urgent need to re-emphasise the environment in the wider sustainability agenda before it is permanently sidelined among the other priorities of the expanding European Union. The SEA Directive may, it is hoped, provide a much-needed boost for environmental integration.

⁹⁴ Above n. 75.

⁹⁵ Commission of the European Communities (2002), Communication from the Commission on Impact Assessment, COM (2002) 276 final, Brussels, 5.6.2002.

⁹⁶ Above n. 27.

⁹⁷ Ibid.



25 Years of RCRA: Building on Our Past To Protect Our Future



The year 2001 was an important milestone in environmental protection: the 25th anniversary of the Resource Conservation and Recovery Act (RCRA). The RCRA statute, regulations, and programs were created at a time when we did not know how much waste was produced or what happened to it. What we knew for certain was that waste needed to be safely managed.

Since that time, we have witnessed a sea of change in pollution prevention, waste minimization, and cleanup. As a society, we have changed over time, and so have the types of wastes we produce and how we manage them. Businesses, individuals, and organizations have made a conscious effort to prevent or reduce the amount of waste they generate. As technology has advanced, we have also updated and improved our methods of safe waste management and cleanup. These sound waste practices and controls allow us to continue to protect human health and the environment from the risks of waste well into the future.

From the beginning, many dedicated people made—and continue to make—invaluable contributions to the RCRA program. Many have spent their lives working to safeguard our natural environment from waste pollution. I tip my hat to each and every one of these individuals for jobs well done. I especially want to single out Nicholas Humber, who served as Director of EPA's Resource Conservation and Recovery Division from 1973-1978. Humber died September 11, 2001 at the World Trade Center.

The events of September 11, 2001 showed us that our roles in environmental protection are ever-changing. We must anticipate potential harm and adapt to new ways of doing business. And, we must continue to work side-by-side with other federal agencies, states, tribes, industry, and the public to improve waste minimization, recycling, and waste management. In this endeavor, we must remember the importance of the message on this publication's cover, "Don't Waste Another Day." It is our responsibility to make environmentally sound decisions every day. It really does affect our children's future.

Marianne Lamont Horinko
Assistant Administrator
Office of Solid Waste and Emergency Response

[Hazardous waste disposal is] one of the highest priority environmental problems confronting the Nation.

—President Gerald Ford
when signing RCRA into law

The Need for RCRA

Waste. In 1969, the *New York Times* called waste “the third pollution.” It’s a bit more fitting to call it the first pollution. It’s the first pollution because left unchecked, waste pollutes the air, the water, and the land, and it changes the Earth’s climate. Look at 1960s America.

So widespread was pollution from waste that favorite “swimming holes” were no longer safe for swimming and town well water was no longer safe for drinking. Unsightly dumps marred the countryside and waterways. Dumps not only spoiled the land and the water, but they also were vectors for disease, providing safe habitats for rats, flies, mosquitoes, and other vermin. They frequently burned or caused extensive damage to surrounding areas.

Taking stock of all this environmental damage, Congress passed the Solid Waste Disposal Act (SWDA) in 1965. It formed the framework for states to better control the disposal of trash from all sources. SWDA set minimum safety requirements for local landfills. Even with SWDA in place, trash still overflowed from landfills and dumps. In the decade between 1950 and 1960, the amount of trash individuals created increased 60 percent. In 1969, the *New York Times* declared: “An avalanche of waste and waste disposal problems is building up around the nation’s major cities in an impending emergency that may parallel the existing crises in air and water.”

In the 1960s, America also discovered another dimension to waste—hazardous waste. In 1965, more than four million chemicals were being produced in the U.S., and synthetic chemical manufacturing was on the rise. Manufacturing these chemicals often created toxic by-products that needed to be disposed of, and that disposal went largely unregulated.

The formation of EPA in 1970 expanded the federal role in waste management. The Agency worked with the states and industry to collect and analyze information on resource recovery, and on waste types and volumes. It looked at the risks posed by waste and at the likelihood of harm to human health and the environment. By 1974, it was apparent that the Solid Waste Disposal Act was not strong enough to address the dangers posed by the increasing volume of solid and hazardous waste.

Waste management in the United States was fundamentally changed on October 21, 1976 when Congress passed the Resource Conservation and Recovery Act (RCRA). Although it actually amends

the Solid Waste Disposal Act, the legislation is so comprehensive, it is generally referred to simply as "RCRA," without reference to the original Act.

Congress established RCRA's goals, which are to:

- Ensure that wastes are managed in a manner that protects human health and the environment;
- Reduce or eliminate, as expeditiously as possible, the amount of waste generated, including hazardous waste; and
- Conserve energy and natural resources through waste recycling and recovery.

RCRA is a significant departure from the end-of-the-pipe pollution control statutes Congress previously passed. It is intended to be a pollution prevention measure. It also is intended to be a joint federal and state enterprise. The federal program provides basic requirements that give consistency to systems that states implement. States implement their own waste management programs, so that they can design programs that fit their needs, resources, and economies.

RCRA banned open dumping. It provided a comprehensive national program to encourage source reduction, recycling, and safe disposal of municipal wastes. What's more, RCRA mandated strict requirements for treatment, storage, and disposal of hazardous waste to minimize present and future risks. This booklet looks at 25 years of RCRA.

In 1976, the House Committee on Interstate and Foreign Commerce summarized: Current estimates indicate that approximately 30-35 million tons of hazardous waste are literally dumped on the ground each year. Many of these substances can blind, cripple, or kill. They can defoliate the environment, contaminate drinking water supplies, and enter the food chain under present, largely unregulated disposal practices.

25 Years of Protection

The new expansion of the hazardous waste management program which the President has signed presents a major challenge for EPA and the nation, but it is one which we cannot fail to meet if we are to protect our citizens' health and our country's environment from the dangers of uncontrolled hazardous waste disposal.

—Former EPA Administrator
William D. Ruckelshaus

The Early Years

Tackling waste management on a national scale proved to be a formidable task. First, in 1979, the Agency laid out design and operating conditions for sanitary landfills receiving municipal waste and garbage. These conditions were the first step toward closing all open garbage dumps, and to ensure that disposal facilities posed no threats to human health and the environment. States had to incorporate these provisions into their solid waste management programs.

At the same time, EPA began the challenging task of creating hazardous waste regulations to achieve RCRA's goals. EPA had to overcome the fact that it had little or no data on or experience in such waste management. In 1980, EPA achieved a significant milestone in hazardous waste program development by publishing the "Hazardous Waste and Consolidated Permit Regulations," in the *Federal Register*.

The RCRA regulations are a cradle-to-grave management system that uses tracking and permitting to monitor and control hazardous waste. They define solid and hazardous waste, but also impose strict standards on anyone who generates, recycles, transports, treats, stores, or disposes of hazardous waste.

The universe of hazardous waste is large and diverse, as is the RCRA regulated community. Not only does it include typical "heavy" industry that we think of as hazardous waste producers, but also government facilities, local small businesses, hospitals, universities, and many other entities. Some common examples of hazardous waste are used solvents, battery acid, chemical wastes, and various pharmaceutical wastes.

After creating the basic regulations, EPA focused its energy on authorizing states to implement the RCRA hazardous waste program. EPA authorizes states to operate their own hazardous waste programs when those programs are at least equal to and consistent with federal standards. By March 1981, EPA had authorized the first 16 states to manage their own RCRA programs. Now, 48 states, one territory, and the District of Columbia are authorized to operate their own hazardous waste management programs covering gen-

The Formative Years

- ✓ Established protective "cradle-to-grave" hazardous waste structure
- ✓ Implemented permitting and tracking system
- ✓ Developed TSDFs design and performance standards
- ✓ Initiated state authorization program

crators, transporters, and treatment, storage, and disposal facilities (TSDFs).

After 1980, the Agency continued to refine and develop the "base" hazardous waste regulations. On October 1, 1981, EPA issued the first RCRA hazardous waste permit—ensuring that the facility managed wastes according to RCRA technical standards and operating procedures. The Agency enhanced the design and performance requirements for hazardous waste TSDFs in 1982.

Hazardous and Solid Waste Amendments (HSWA)

In November 1984, Congress significantly expanded and reinforced RCRA's protective framework. The Amendments established over 70 statutory provisions requiring EPA action. Among other things, HSWA:

- Created RCRA's Land Disposal Restrictions (LDR) program.
- Established the RCRA Corrective Action requirements.
- Specified permitting deadlines for hazardous waste facilities.
- Regulated businesses that generated even small amounts of hazardous waste.
- Required a nationwide look at the conditions of solid waste landfills.



Cleanups Resurrect Communities

RCRA Works for *Bethlehem Works*

In 1998, Bethlehem Steel Company (BCS) closed a steel-making plant that had been operating for more than 100 years. The former plant borders the Lehigh River and contained a coke production facility; a steel and iron-making, finishing, and forging operation; and a chemical plant. To revitalize the area in South Bethlehem, Pennsylvania, BCS designed an ambitious project called *Bethlehem Works*.

Because the soil and ground water on the 2000-acre site were contaminated by hazardous waste, the site is subject to RCRA corrective action. BCS, the Pennsylvania Department of Environmental Protection, and EPA formed a team to facilitate cleanups and remediation liability. Working together, the team devised and approved ways to clean up contaminants, address potential liabilities, and eliminate avenues of exposure. BCS also is working closely with the community to complete this \$400 million redevelopment project. *Bethlehem Works* will include the National Museum of Industrial History (in association with the Smithsonian Institution); an iron and steel showcase; a 250-room hotel and conference center; multiplex cinema; family fun center; swimming pool; ice skating center; and retail stores.

Promoting Revitalization

EPA uses various tools in its continuous effort to promote and streamline cleanups of contaminated sites. A prospective purchaser agreement (PPA) is an agreement where EPA conditionally releases a buyer from liability for contamination that existed before the buyer began work on the site. In return, the buyer agrees to help EPA with its mission of protecting human health and the environment.

Such a PPA was used with a company in Virginia. This one centered around the exchange of land in Virginia, that had been marred by pollution left behind from 43 years of manufacturing. EPA determined the company's intended uses of the facility would not aggravate existing contamination or interfere with on-going cleanups. A PPA allowed the Virginia community to reap the benefits—which included new employment opportunities—of keeping the commercial property in productive use.

RCRA Helps Restore Waterfront Property

Under the direction of EPA and state RCRA programs, a former waste facility cleaned up a 22-acre peninsula contaminated with chrome ore tailings and wastes from 140 years of chemical manufacturing. The site discharged 62 pounds a day of hexavalent chromium, a carcinogen, into nearby ground water.

The facility paid for the entire cleanup, estimated to be \$70 million, as part of one RCRA consent decree involving corrective action. The waterfront property is now being redeveloped.

No More Land Disposal

In 1984, about 25 million tons of hazardous waste were land-disposed annually. To protect the nation's ground water and soil from hazardous waste contamination, HSWA established treatment requirements that must be met before waste can be disposed of in land units. All hazardous waste must be chemically or physically treated so that the toxicity or mobility of the waste is reduced. Between 1986 and 1998, the LDR program issued treatment standards specifying the method or level of treatment for all hazardous waste. As technology and industry advance, and as new hazardous wastes are identified, treatment standards continue to be developed.

The LDR program serves as an incentive for businesses to implement waste minimization plans. Some ways that hazardous waste generators minimize their waste is by reusing and recycling it—or by not creating it in the first place. RCRA's tough LDR requirements, coupled with its emphasis on sound waste minimization practices, have dramatically reduced both the number of hazardous waste generators and the amount of waste they generate.

In 1980, nearly 50,000 businesses generated hazardous waste, and about 30,000 businesses ran waste treatment, storage, or disposal facilities (TSDFs). In 1999, only 20,000 businesses produced hazardous waste, with about 2,000 TSDFs managing that waste. What's more, the amount of hazardous waste disposed of in landfills has gone from 3 million tons to less than half that amount—nearly a 60 percent reduction.

More Cleanups

In 1980, nearly 60,000 businesses notified EPA that they treated, stored, or disposed of hazardous waste. Many of these facilities followed outdated practices, which caused contamination to areas within and around these businesses that needed to be cleaned up. The number of such sites needing cleanup was estimated to be more than three times the number of sites on the national Superfund list.

HSWA greatly expanded EPA's authority to require cleanups at TSDFs. It created EPA's Corrective Action Program. Under Corrective Action, cleanups are required for all waste leaking into the environment from any source at a hazardous waste facility.

Stronger Permitting for Hazardous Waste Facilities

HSWA reestablished permitting deadlines for hazardous waste landfills, incinerators, and storage facilities. On November 8, 1985, hazardous waste landfills and surface impoundments that failed to comply with financial assurance and ground-water monitoring requirements were forced to close.

Since the start of the LDR program, a significant volume of hazardous waste has been directed away from land-based management. Landfilling decreased about 94 percent, and underground injection decreased about 70 percent.

Corrective Action Provides Solutions

Housatonic River Regains New Life

The Housatonic River in Massachusetts was once known primarily by local sportsmen. It was also a disposal system for a local transformer manufacturer. Over the years, the River became contaminated with polychlorinated biphenyls (PCBs) and other hazardous waste, creating a major risk to the health of local residents, and to the environment.

Thanks to a RCRA Corrective Action permit issued in 1991, over 10,000 cubic yards of contaminated sediments have been removed from the Housatonic River; more than 50 million gallons of ground water have been removed and treated; and another 1 million gallons of PCB-contaminated oil have been recovered. In addition, more than 100,000 cubic yards of contaminated sediment and bank soil will be removed over the next few years. This river and floodplain remediation, and \$50 million allocated toward redevelopment work, will not only protect commercial, industrial, undeveloped, recreational, and residential properties, but also allow the old transformer manufacturing plant to open for reuse.

Major Tire Pile Cleaned Up

When a 1998 fire ignited a mountain of abandoned tires on the Gila River Indian Community Reservation in southern Arizona, the fire wasn't the only hot topic to resolve.

The abandoned tire pile that caught on fire and forced the evacuation of more than 300 residents contained waste tires from 13 Arizona counties. The counties had arranged for disposal with a private company that collected and temporarily stockpiled the tires on the Gila River Reservation before going to a disposal facility. When the company responsible for disposing of the tires breached its contract with the counties, the tires were left abandoned on the reservation.

EPA used a combination of RCRA enforcement procedures to get the site cleaned up. In September 2001, the counties completed the cleanup of both burned and unburned tires.

RCRA Works with Community

When a community of Denver residents became aware of the indoor air risks associated with releases from a plume of contaminated ground water that migrated from a facility in their area, they took action.

As a result of RCRA Corrective Action, the community participated in a series of "Open Houses," and worked closely with EPA and the facility to get over 100 homes tested for possible contamination. Over 50 homes now have new ventilation systems. In addition, indoor air risks are within acceptable levels. The community is still working with EPA to test the remaining homes in the area.

The affected community is made up of more than 30 percent lower-to-middle income minority residents, which include Hispanic and East Asian Americans.

As a result of these requirements, virtually all operating hazardous waste landfills and incinerators came under state and EPA permits within a few years, and many were closed down. For example, industrial facilities managing waste in ponds, lagoons, and impoundments have gone from 1,000 to fewer than 50 over the last 25 years.

In all, RCRA's tough requirements for safe design and operating standards for hazardous waste facilities led industry to better management practices.

A Closer Look at Solid Waste Landfills Leads to Better Municipal Solid Waste Management

HSWA required EPA to research and report on the environmental soundness of municipal solid waste landfills, and on amounts of waste being processed by them. In October 1988, the Agency reported that Americans generated 160 million tons of municipal solid waste (MSW) each year. Of that, 131 million tons were sent to 6,500 municipal solid waste landfills (MSWLFs). The Agency also found that these landfills inconsistently used environmental controls, and that they posed significant threats to ground and surface water resources.

Just a few months later, in February 1989, EPA published its *Agenda for Action*, which outlined goals and recommendations for municipal solid waste management. To make solid waste management more effective, federal, state, tribal, and local governments adopted an integrated approach to waste management. This approach combines complementary waste management techniques that include source reduction and recycling.

Integrated Waste Management

- ✓ **Source reduction, which prevents waste generation in the first place, and encourages reuse**
- ✓ **Recycling and composting, which promotes recovery over disposal**
- ✓ **Landfilling and combustion, which provides safer disposal capacity and waste-to-energy**

EPA established a national goal for source reduction and recycling. The goal was to achieve 25 percent recycling and source reduction rates by 1992. Most states met or exceeded that rate by then. Today, nearly all states and many Native American communities practice integrated waste management, and average a 28 percent recycling rate nationally.

The Agency documented and measured the benefits

HSWA

- ✓ **Established treatment standards to prevent the disposal of untreated wastes into and onto the land**
- ✓ **Led to permitting of more than 900 hazardous waste management facilities**
- ✓ **Established an enforcement presence in the field, including a strong criminal enforcement program**
- ✓ **Closed substandard landfills and incinerators**

In 1988, 131 million tons of municipal solid waste went to 6,500 landfills. Today, fewer than 2,500 landfills remain open.

from source reduction and recycling. For example, EPA has found that increasing the national recycling rate to 35 percent would reduce greenhouse gas emissions by an estimated 17 million metric tons. Such reduction roughly equals the carbon dioxide emissions from 12 million cars.

1990s

The Agency spent the final decade of the 20th century following up HSWA mandates, and looking at more and better ways to prevent risks from waste. Bringing more than half of all hazardous waste under regulatory controls, EPA added another dimension to the definition of hazardous waste, and devised a new and improved procedure to evaluate wastes that are likely to leach toxic constituents into ground water.

By refining and streamlining regulations, loopholes were closed while economic burdens were eased. Industry and waste management data continued to be collected and analyzed, and regulatory barriers to recycling were eliminated. A number of additional waste streams were identified for specific listing as hazardous waste. Specific wastes from petroleum refining, coke products, and some organic chemicals also were added to the hazardous waste list, marking more than 500 known hazardous wastes on this list.

RCRA Implementation Study Sets Focus for the 1990s

- ✓ Establish and communicate clear priorities
- ✓ Balance prevention and cleanup efforts
- ✓ Develop clear and concise regulations
- ✓ Emphasize waste minimization
- ✓ Support compliance and enforcement activities
- ✓ Develop better environmental management data
- ✓ Accelerate scientific and technological development

Safer Municipal Solid Waste Landfills

New federal standards were established for municipal solid waste landfills (MSWLFs) in October 1991. These regulations establish a protective, practical system for disposing of the nation's trash. They specify design, operating, and closure standards; restrict landfill locations; and require liners and ground-water monitoring. State and tribal regulatory agencies provide the primary oversight and issue permits, according to the federal criteria. Today, 40 states and one territory have approved MSWLF permit programs.

1991 MSWLF Criteria

- ✓ Maximize landfill life by encouraging source reduction and recycling
- ✓ Protect ground water from contamination
- ✓ Specify design and operating practices that protect human health
- ✓ Protect future generations with strict conditions for landfill closure

Recycling is Working

Alternate Disposal Program Increases Recycling

EPA's Pay-As-You-Throw program (also known as unit pricing or variable-rate pricing) is a household trash disposal system that charges residents based on the amount of solid waste that they throw away. Residents in communities with Pay-As-You-Throw programs have direct economic incentives to produce less waste and recycle more.

Traditionally, residents pay for waste collection through property taxes or a fixed fee, regardless of how much (or how little) trash they generate. Pay-As-You-Throw breaks with tradition by treating trash services just like utilities. Households pay a variable rate depending on the amount of service they use.

Fort Collins, Colorado found that its Pay-As-You-Throw system significantly boosted household recycling efforts and helped the city reach its recycling goals. By July 1996, recycling had increased to 79 percent participation in single-family and duplex households, up from 53.5 percent the previous year. The program has been so successful that the residents of Fort Collins looked for opportunities to increase their recycling, by adding new materials to their recyclables.

Recycling Is Working Across America

Recycling offers widespread benefits to the U.S. economy. In 2001, the U.S. recycling and reuse industry supported more than 56,000 recycling and reuse establishments that grossed over \$236 billion in annual revenue. The industry employed over 1.1 million people with payrolls of nearly \$37 billion.

Besides being good for the economy, recycling obviously is good for the environment. When a recycled product is manufactured, less energy is used than when virgin or raw materials are used to make the same product. For example, annual energy savings from recycling aluminum cans are nearly 186 million BTUs per ton; plastics saves about 22 million BTUs per ton a year; and recycling steel cans, paper, and glass saves around 52 million BTUs per ton annually.

Partnerships Lead to Newspaper Reuse, New Jobs

In 1989, EPA joined the Northeast Recycling Council (NERC) in an effort to get the newsprint industry and newspaper publishers to recycle old newspapers. NERC worked with 10 northeastern states, newspaper publishers, and newsprint paper mills, and came up with an agreement to increase the production of recycled-content newsprint. Shortly after, the demand for old newspapers and magazines in the Northeast and throughout the United States increased. In fact, the average recycled content in newsprint more than doubled in the United States. Between 1990 and 1997, it jumped from 20 to 45 percent. Today, 27 states have agreements with newspaper publishers to invest in newsprint with recycled content.

Besides helping to preserve our natural resources, EPA's partnership with NERC is also an example of the Jobs Through Recycling (JTR) program, which benefits both the environment and the economy. Through JTR, EPA enhances business development, technical assistance, and financing efforts for recycling-related business in local communities. Since its inception, JTR has helped create more than 8,500 jobs, generated \$640.5 million in capital investment, created 15.3 millions tons of capacity, and used 13.9 million tons of recovered materials.

Federal Procurement Guidelines

Reinforcing the federal role in resource recovery, EPA designated products containing recovered materials and made recommendations for buying these products. On October 20, 1993, a Presidential Executive Order called for an expedited process to increase the federal government's use of recycled-content products. Consequently, the Guidelines currently designate 54 products containing recycled content.

1994 Waste Minimization National Plan

- ✓ **Aims to reduce by half, the most problematic chemicals in hazardous wastes by 2005**
- ✓ **Emphasizes source reduction and environmentally sound recycling over treatment and disposal**
- ✓ **Prevents transfers of chemical releases from one medium to another, such as air to water or land to water**

Creating More Partnerships

A shift to fewer regulatory and more voluntary actions occurred in the 1990s. An outgrowth of this philosophy was EPA's **WasteWise** program, which was launched in 1994. WasteWise recruits and cultivates partners to reduce waste. Partners range from small businesses, tribes, governments, and universities, to Fortune 500 corporations. WasteWise now has nearly 1,200 partners who are committed to cutting costs and conserving resources by reducing waste.

WasteWise partners eliminated 35 million tons of municipal solid waste

Throughout the decade, partnerships with Native American tribes were expanded, and other partnerships have enhanced tribes' capabilities to develop and implement their own hazardous and solid waste management programs. The Agency also is working closely with tribes to close open dumps in Indian country. EPA is providing technical and financial assistance not only to close those dumps, but also to establish and manage sustainable alternatives to them.

Industrial Waste Management

The Agency increasingly turned its attention to the largest component of the U.S. waste stream—industrial waste. Industrial waste is mainly nonhazardous waste that comes from 12,000 manufacturing facilities that generate 7.6 billion tons of this waste a year.

EPA is collaborating with key stakeholders to design a safe and practical waste management system for industrial waste. The culmination of this effort is voluntary guidance designed to assist facility managers, state and tribal environmental managers, and the public to evaluate and choose protective practices for managing industrial waste. Currently, 30 states run industrial waste management programs.

Tight Hazardous Waste Combustion Standards

Throughout the decade, EPA reinforced hazardous waste combustion standards and reinforced waste minimization objectives.

- Strict emission standards were imposed on boilers and industrial furnaces (BIFs) burning hazardous waste.
- In 1993, EPA released the Hazardous Waste Minimization and Combustion Strategy. The Strategy aimed to achieve greater reductions in hazardous waste generation and, to improve the safety and reliability of incinerators and BIFs.

Environmental Commitments Make a Difference

New Partnerships Encourage Faster Brownfields Cleanup

"Brownfields" are abandoned, idle, or underused industrial and commercial properties where expansion or redevelopment is complicated by real or perceived environmental contamination. About 600,000 brownfield sites are estimated to be around the country.

EPA launched several efforts to encourage and expedite the cleanup of brownfield sites and move these lands into productive use. Since March 2000, EPA has selected nine RCRA brownfield prevention pilot projects. The selected pilots proposed a variety of innovative solutions, ranging from increasing community involvement in future land-use decision-making to using legal authorities to deal with bankrupt sites.

Doing It Right the First Time

In 1991, workers at the Ford Motor Company's plant in Ypsilanti, Michigan decided they wanted to help rid the environment of hazardous waste. Plant engineers accomplished this mission by replacing toxic cleaning and drawing chemicals with a water-based compound. The change eliminated 30,000 pounds of trichloroethylene (TCE) and 5,000 pounds of methylene chloride releases annually. The plant also stopped disposing of liquid hazardous wastes from the plant's dip tank. When commenting on their success, Ford officials stressed the importance of implementing waste prevention early in the process.

The nine RCRA brownfield prevention pilot projects are: CBS/Viacom (Bridgeport, CT); Bethlehem Steel Corporation (Lackawanna, NY); PECO (Chester, PA); Blue Valley Redevelopment (Kansas City, MO); Pharmacia & Upjohn Company (North Haven, CT); Union Carbide Caribe (Guayanilla, Puerto Rico); Safety-Kleen (Muskegon Heights, MI); BP Refinery (Wood River, IL); and Milt Adams (Denver, CO).

Partnering to Reduce Waste

Seattle University was named EPA's WasteWise Partner of the Year 2001. In the university/college category, the award recognizes the efforts of the University's Environmental Services Office and the campus community to minimize waste (including recycling paper and plastic products and reusing products, such as furniture and office equipment) that may otherwise go into a landfill. The University recycled more than 500 tons of material, saving nearly \$25,000 in disposal costs.

RCRA Reinvention Efforts

- ✓ **Risk-based regulations that match the levels of risk posed by specific hazardous wastes**
- ✓ **Regulations that are easily understood to facilitate compliance and foster community relations**
- ✓ **Identify and reduce record-keeping burdens**

Reinventing the RCRA Program

EPA continually looks for ways to improve RCRA regulations. RCRA's regulatory process evolved and changed with the acquisition of new information and technological advances. The current RCRA philosophy is to provide flexibility in achieving desired regulatory results; to make sure information and decision-making are shared with everyone involved; to create environmentally sound incentives for achieving regulatory compliance; and to strive for a better interface with other environmental laws and regulations. Some examples of RCRA's reinvention efforts:

- encourage safe management and recycling of common products, such as batteries and pesticides, that are hazardous when they're discarded;
- make cleanups faster by tailoring regulations to site-specific situations;
- eliminate duplicate regulatory controls on radioactive hazardous waste; and
- change paperwork requirements from multiple notifications to a single notification.

Public Involvement

The public plays a prominent and important role in the RCRA program. Few environmental issues are of more concern to the public than waste management in their communities. Therefore, EPA requires waste management facilities to involve the public and the local community throughout the RCRA permitting process. Any time during the process, the public can submit comments and request public hearings to clarify information or voice objections.



RCRA guarantees that the public has a role in facility clean-up processes. Under corrective action, for example, the local community can access a facility's inspection information, and participate in remedial decisions and processes.

Environmental justice is a priority in RCRA waste management. EPA's goal is to ensure that all Americans are protected from environmental pollution, and that minorities do not bear disproportionate effects of that pollution. RCRA requires full public participation in hazardous waste permits. EPA works cooperatively with tribes to control open dumps in Indian Country, and it works closely with minority communities to develop guidance in areas of special interest. EPA has issued guidance for the management of municipal waste transfer stations and for siting new hazardous waste facilities.

EPA's commitment to providing public access under RCRA is further evidenced through its outreach initiatives to tribal, Hispanic, and other minority communities, and through widespread distribution of products in print and on the Internet.

Creating Clean-up Goals and Corrective Action Reforms

Facilities managing hazardous waste must clean up contamination resulting from past mismanagement. Cleanup requirements under RCRA are managed through the Corrective Action Program. Throughout the 1990s and today, EPA has focused on establishing priorities to accelerate cleanups. EPA is focusing corrective action resources on preventing human exposure to, and migration of, contaminated ground water at more than 1,700 facilities where early cleanup progress is appropriate. EPA also has launched corrective action reform efforts aimed at accelerating cleanups by promoting greater flexibility; making regulatory changes to remove disincentives to cleanups; focusing on near-term goals for cleanups; and stressing results-based approaches, instead of process-based systems. As a result of these reforms, EPA and the states now have brought hundreds of RCRA facilities under control. Nearly 40 percent of the RCRA corrective action facilities have either completed or made significant progress in their cleanups.

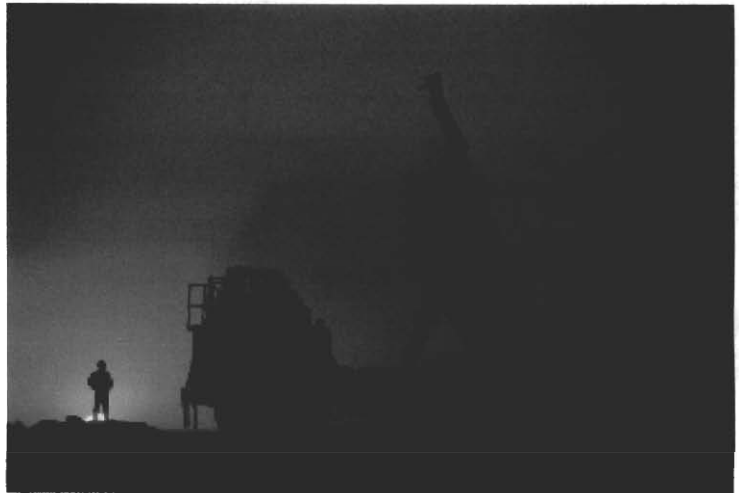
RCRA Cleanup Reforms Focus on Results

- ✓ **Conduct faster, more focused, flexible cleanups**
- ✓ **Pilot innovative approaches to cleanups**
- ✓ **Connect communities and capitalize on redevelopment potentials**

At 25...

Since RCRA was enacted in 1976, great strides have been made in keeping our environment safe from the waste we produce. A broad range of hazardous waste streams have been identified; treatment standards have been developed and refined as new technology is developed. Systems and processes have been polished and streamlined to keep requirements flexible, but safe. Hazardous waste generation has been reduced from nearly 300 million tons to around 40 million tons. All but two states are authorized to operate their own hazardous waste programs, and more than 1,000 facilities are in the RCRA operating permit baseline. Nationwide recycling and solid waste reduction efforts have kept about 62 million tons of trash a year from being disposed of—keeping that material in use and out of landfills. These waste reduction efforts resulted in a national recycling rate of 28 percent.

RCRA works—and it has worked for 25 years—to protect human health and the environment by reducing risk from waste. It remains effective because it is intricately connected to our American way of life, with our heavy reliance on industry and technology. Hazardous and solid waste management standards are continually being refined and updated in response to local needs, new research, and new technologies. For 25 years, RCRA has responded to environmental challenges on all fronts—air, water, and land—by pursuing and promoting partnerships with states, tribes, industry, and the public.



The Challenge Ahead

We have numerous environmental challenges ahead of us. Each provides an opportunity to renew our commitment to increased cooperation, and the chance to provide our children and grandchildren with a cleaner and safer place to raise a family. I...am confident that together we can raise the bar of environmental achievement- and clear it by a wide margin.

—EPA Administrator Christine Todd Whitman

program is expected to change. While strong oversight of regulatory provisions will continue, EPA wants to champion voluntary pollution prevention activities that go beyond compliance. The Agency will continue to explore more proactive tools, including partnerships with industry and government, to set goals for pollution prevention, as well as to help the nation to move toward these goals.

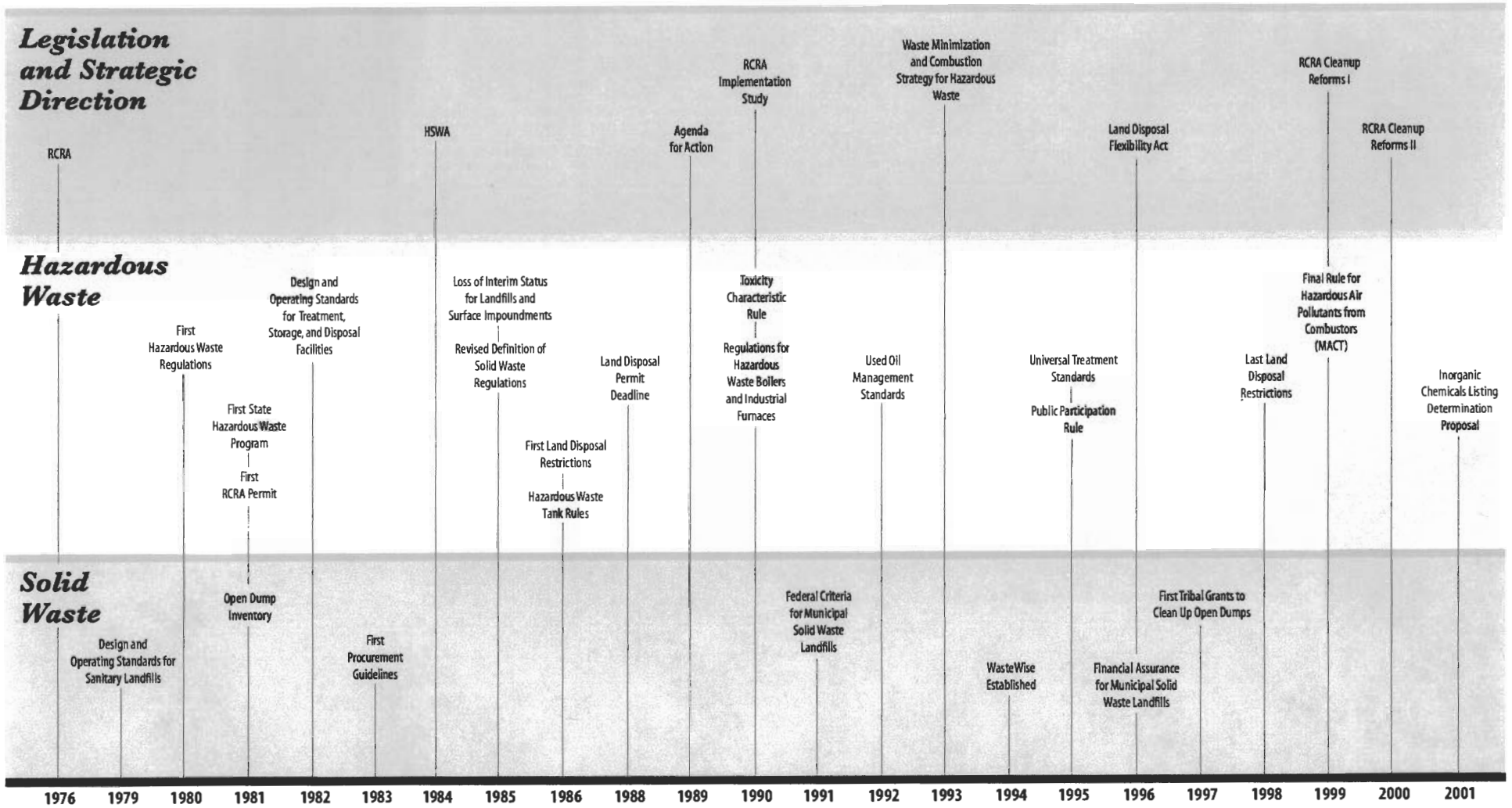
The next decade will require much-needed cooperation between EPA and its partners. The Agency must continue to work side-by-side with other federal agencies, states, tribes, industry, and the public in achieving safe waste management. The challenges facing the RCRA program in the new millennium are great. Technological changes, population growth, economic expansion, and national security concerns are just a few.

At the same time, there is plenty of room to refine, improve, and build on the success already achieved. Better protection of human health and the environment is guaranteed by partnering with states, tribes, industry, and the public in waste prevention, safe waste management, and cleanups.

In these relatively short 25 years, EPA has made significant progress in safe waste management. The result: a cleaner environment. Looking ahead to the next decade and beyond, America will still need to manage wastes, but probably differently.

EPA's role in implementing the RCRA

25 Years: Preserving, Preventing, Protecting



Solid Waste and Emergency Response
(5305W)

EPA-K-02-027
April 2002
www.epa.gov/osw

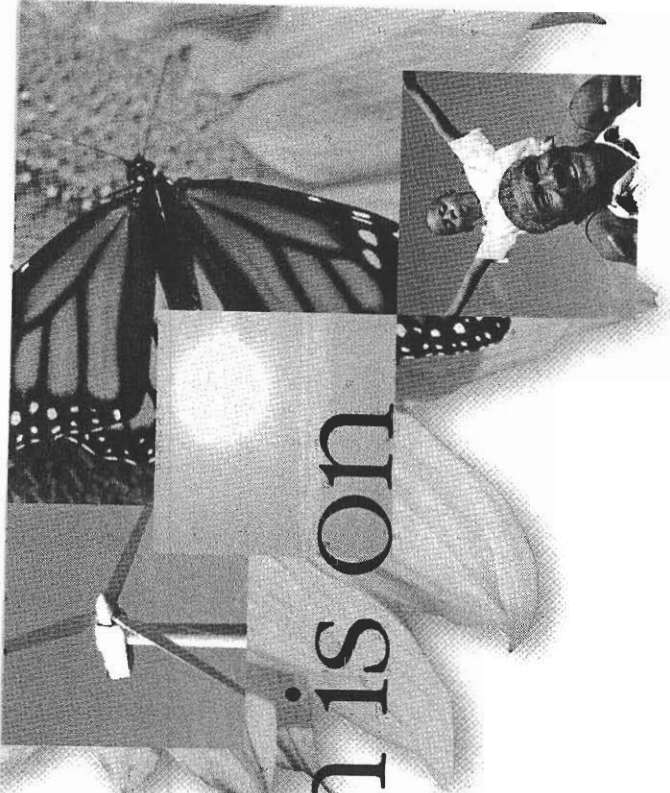
WHAT YOU NEED TO KNOW

Carbon Monoxide:

Carbon Monoxide:
WHAT YOU NEED TO KNOW

The way power is produced in the Tennessee Valley is changing. Now you can choose cleaner, greener electricity generated from wind, solar power, and landfill gas.

the switch is on



Read Your Own Water Meter

Concerned about how much water your household uses? You can track your usage easily by reading your own water meter, which is housed in a metal case in your yard.

If you read your meter each time you receive your bill, your reading should always be higher than the one on your bill because of the time lapse between the meter reader's visit and when your bill arrives in the mail.

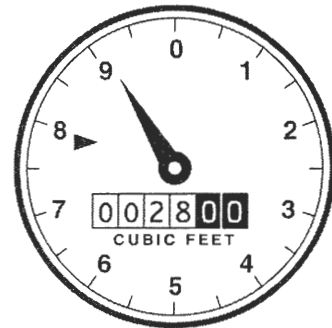
You can record your own water meter readings on the other side of this page.

Here's How:

Study the household water meter below. You take the reading from the set of dials that looks like a car's odometer.

To read the meter, start from the left-hand side and read only the first four digits.

This meter shows 28 units of water (one unit equals 100 cubic feet, or 750 gallons).



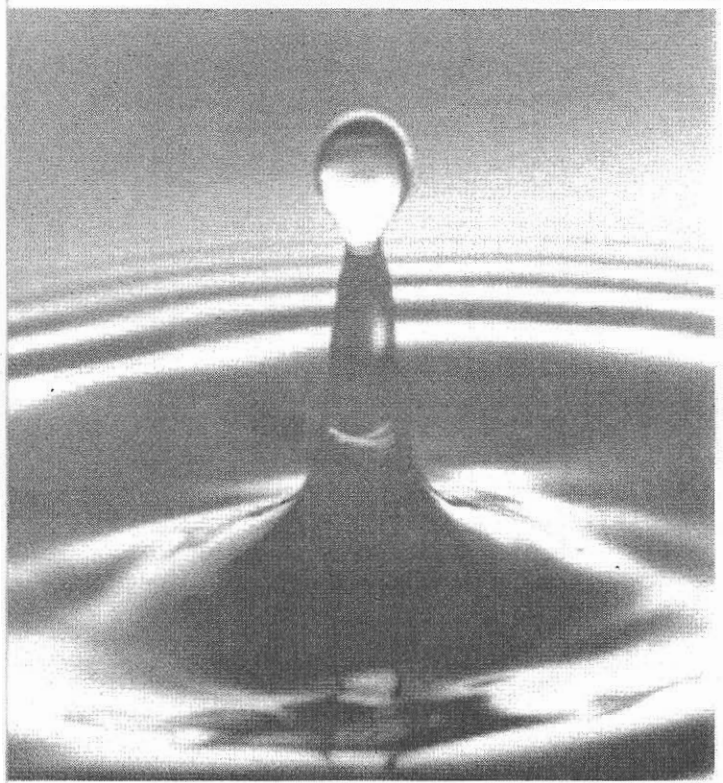
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KUB

Knoxville Utilities Board

The Quality Is Clear.

Water Quality Report 2004



KUB

Plug-In To eCycling



It's Smart!

Tossing once expensive things like your old computer into the trash doesn't feel smart. But reusing or recycling your computer or TV is smart. By reusing or recycling your unwanted electronics, you can provide your old friends with a second chance and help ensure that these materials are managed safely.

It's Good for the Environment!

Donating or recycling your outdated electronics encourages the safe management of their potentially hazardous components and supports the recovery and reuse of valuable materials. It also helps reduce the pollution and energy use tied to the production of new electronics. Finally, it can put a computer, TV, or cell phone in the hands of someone who really needs it.

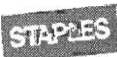
And You Can Do It!

Many communities and businesses offer programs to collect and reuse or recycle electronics, making it easier and easier to do the smart thing. Some cities run continuous collections for electronics or pick these goods up on an advertised day. Other communities have a collection site that you can take your electronics to. In addition, a number of computer and TV manufacturers invite you to send back old electronics. Finally, in select areas, a retailer or a non-profit may accept your electronics for recycling or reuse. Log onto www.plugintorecycling.org for a list of programs in your area.

For more information go to
www.plugintorecycling.org
or e-mail us at oswchallenge@epa.gov

Thanks to our Campaign Leadership Partners*

EPA thanks our Leadership Partners for their generous support of the Plug-In To eCycling Campaign. To learn more about becoming a Plug-In To eCycling Partner, log on to www.plugintorecycling.org.



EARTH 911

*Please refer to www.plugintorecycling.org for a complete listing of all current partners.

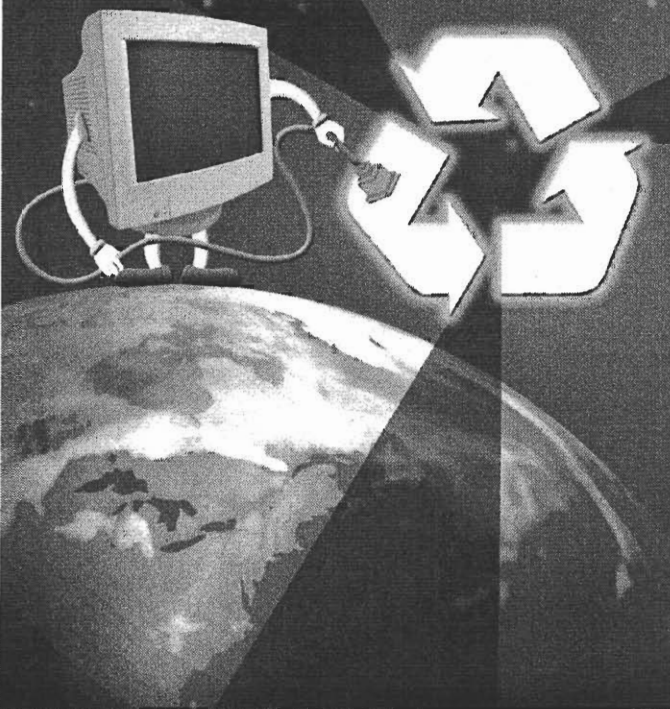


When purchasing electronics, be sure to look for the ENERGY STAR logo. The ENERGY STAR identifies electronics that protect the environment through superior energy efficiency. Only products that meet strict energy efficiency guidelines set by EPA earn the ENERGY STAR. For a complete list of product models, visit www.energystar.gov.

EPA's Resource Conservation Challenge: What Can You Save Today? The Plug-In To eCycling Campaign is one of many new efforts under EPA's Resource Conservation Challenge, which seeks to increase recycling nationwide and cut the generation of 30 harmful chemicals by 2005.

EPA thanks the Institute for Local Self Reliance and Minnesota Office of Environmental Assistance for sharing the campaign name "Plug-In To Recycling."

Plug-in To e-Cycling WITH U.S. EPA



Why Recycle Electronics?

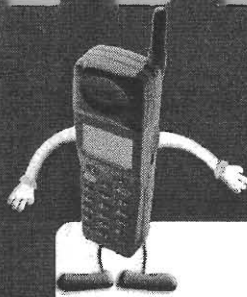
In the past decade, our growing reliance on electronics has given rise to a new environmental challenge: safe and resource-wise management of electronic waste. Electronics are a fast growing portion of America's trash—with 250 million computers destined to become obsolete by 2005. And electronics are made with valuable materials. In 1998, over 112 million pounds of materials were recovered from electronics including steel, glass, plastic, and precious metals. Plus, electronics can present an environmental hazard if they are disposed of improperly. With an average of four pounds of lead in many older TV picture tubes or computer monitors, along with other potentially hazardous materials, electronics call for special handling at the end of their lives.

You Can Help!

Bring unwanted electronic products to collection sites for reuse or environmentally sound recycling.

- Computers
- Televisions
- Cell Phones
- VCRs
- And more!

Learn more at: www.plugintorecycling.org



Give Used Electronics a Second Chance! Reuse or Recycle Them!

Americans are plugging-in to eCycling all over the country!

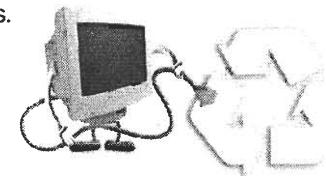
Our electronics retail, manufacturing, and recycler partners offer recycling/reuse opportunities to consumers through programs across the country. For information on programs in your area, go to www.plugintorecycling.org.

Communities care! With more than 175 electronic recycling programs already in place, plugging-in to recycling is easier than ever! The Mid-Atlantic region of the United States alone has diverted more than 2,700 tons of electronic waste from the municipal waste stream!

You can also help others by donating your old electronics. Numerous non-profits will gladly accept your computers, computer components, and cell phones. They may refurbish or upgrade them and then donate them, enabling libraries in disadvantaged communities to have internet access or victims of domestic violence to have phones. They may also sell your refurbished equipment and use the profits to do good like purchasing and protecting acres of rainforest. Donating your electronics for recycling and reuse keeps them out of landfills too. One Northwest organization alone diverted over 1,000 tons of electronic waste from landfills in the past year.

Why Is Electronics Waste a Problem?

- More than 3.2 million tons of electronic waste is laid to rest in landfills each year.
- Nearly 250 million computers will become obsolete in the next 5 years.
- Many people discard computers every 3 to 5 years.
- In 2001, only 11 percent of personal computers retired in the US were recycled.
- Mobile phones will be discarded at a rate of 130 million per year by 2005, resulting in 65,000 tons of waste.
- TVs and computers can contain an average of 4 pounds of lead (depending on their size, make, and vintage) as well as other potential toxics like chromium, cadmium, mercury, beryllium, nickel, zinc, and brominated flame retardants. These materials need to be handled carefully.
- Cell phones also need special handling because they contain lead and brominated flame retardants.





Plug-In To eCycling










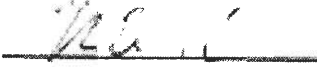











Partnership Agreement Between Staples, the Product Stewardship Institute, U.S. EPA, Envirocycle, and Leading Electronics Manufacturers

On this day, January 10, 2004, the following leading electronics manufacturers join together in partnership with Staples, the Product Stewardship Institute, and the U.S. Environmental Protection Agency, to pilot a voluntary shared responsibility approach for electronics recycling. All electronics collected

through this pilot will be processed by Envirocycle in an environmentally sound manner and paid for by participating manufacturers and Staples. EPA applauds each of these organizations for their commitment to testing approaches to building a national infrastructure for electronics recycling.

Partnership Agreement Signatories

	<u></u>	Date: <u>1/10/04</u>		<u>Chelly Howarth</u>	Date: <u>1/10/04</u>
	<u>Michael Paparini</u>	Date: <u>1/10/04</u>		<u>Ullrich</u>	Date: <u>1/10/04</u>
	<u></u>	Date: <u>1/10/04</u>		<u>Jim Spoto</u>	Date: <u>1/10/04</u>
	<u></u>	Date: <u>1/10/04</u>		<u>Frank Marello</u>	Date: <u>1/10/04</u>
	<u></u>	Date: <u>1/10/04</u>		<u>David Pagan</u>	Date: <u>1/10/04</u>
	<u></u>	Date: <u>1/10/04</u>		<u></u>	Date: <u>1/10/04</u>
	Apple <u></u>	Date: <u>1/10/04</u>			

NAPA E-WASTE RECYCLING EVENT

Page 2

“We are excited to take a leadership role in recycling electronic waste,” stated Ed Henderson, Mayor of the City of Napa. “We are employing a community-based approach to solve a 21st century problem of increasing amounts of electronic products entering the waste stream.”

Last year’s e-waste collection event in Napa reaped a record harvest of computers and other electronic scrap. Local residents and businesses dropped-off over 140,000 pounds of old computer and electronic equipment, including working and non-working PCs and laptops, computer monitors, printers and other peripherals, televisions, telephones and fax machines, and consumer electronics such as radios/stereos/VCRs. Over 1,000 vehicles unloaded material over the course of the free two-day collection event.

“We had a tremendous response from the community, almost an overwhelming response,” remarked Kevin Miller, Waste Reduction and Recycling Coordinator for the City of Napa. “The two-day event provided an excellent opportunity for both residents and businesses to participate.” At the time, the 140,000 pounds collected stood as a record for such events in Northern California and was comparable to the City of San Diego’s first collection event that garnered over 72 tons of material. San Diego’s next collection event received over 165 tons of materials, so Napa has taken note and event organizers are gearing up for an even larger turnout this year.

Napa Garbage Service (NGS) will again partner with Computer Recycling Center (CRC) to provide the collection and recycling services for the two-day event. Working or reusable items will be handled by CRC, California’s largest nonprofit organization dedicated to refurbishing and donating working equipment to schools, community organizations and others in need. Last year, CRC recovered 13,215 pounds of materials for reuse, which represented nearly 10% of the total material dropped-off at the event. Additional information on CRC can be accessed through their web site: www.crc.org

NGS will handle the “end of life” or non-working items in partnership with a sister company, Waste Management Recycle America’s Asset Recovery Group (ARG). ARG will provide technical assistance to help design the event and will process the materials at its Phoenix, Arizona recycling plant. The Napa Valley Personal Computer Users Group provided 17 volunteers at last year’s event and will again be at this year’s event to assist Napa residents and businesses.

###



Computer equipment awaits sorting at Napa County's 2001 collection event.

TO: Pub Info Coord email
Assistant Public Works Director
Help Desk email
Napa Valley Register
Napa Sentinel
KVON/KVYN - News Director
Channel 28 Public Access TV
Napa Valley Personal Computer Users Group - email
Napa Valley College - email
Chamber of Commerce
NVUSD Bus Dispatch
NCTPA
City Manager
Assistant City Manager email
City Clerk
Mayor and Council
Central Dispatch
Police Chief
Fire Chief

By-Product Synergy Supports Sustainable Development

Case Study

Summary

By-product synergy (BPS) is the practice of matching under-valued waste or by-product streams with potential users. This practice helps to create new revenues or savings for the companies involved while simultaneously generating social and environmental benefits. In 2002, three Dow Chemical Company plants in New Jersey and Pennsylvania joined 12 other companies to take part in a BPS project. The New Jersey Department of Environmental Protection and Andy Mangan of the U.S. Business Council for Sustainable Development are leading this effort with support from CH2M HILL, an engineering consulting firm. Dow Chemical also plans to implement BPS at several of its facilities on the Gulf Coast, including the Texas Operations facility. Concurrently, Dow Chemical will initiate a traditional multi-company BPS project with a diverse set of companies in the Houston/Freerport area. Experience gained from the internal Dow greater synergy program will be leveraged to the benefit of the external project, in which greater diversity is expected to produce a wider range of opportunities for by-product synergies. The two-pronged Gulf Coast BPS effort will be led by Andy Mangan with support from CH2M HILL and the Dow Environmental Technology Center as part of the U.S. DOE-sponsored BestPractices Plant-Wide Assessment program.

By-Product Synergy: A Win-Win Strategy

As defined by the U.S. Business Council for Sustainable Development, BPS is "the synergy among diverse industries, agriculture, and communities, resulting in profitable conversion of by-products and wastes to resources promoting sustainability." BPS transforms wastes or by-products for which companies may have to pay disposal costs into sellable commodities that create a flow of income. The wastes may serve as raw materials for existing products or as the basis for an entirely new product.

Benefits

- New uses for waste/by-product streams.
- Reduced environmental impacts.
- Positive flow of income for producers and users of waste/by-products.
- Potential for new products.

The practice of BPS helps to foster sustainable development and brings companies closer to a synergy between environmental quality and economic growth.

While the economic and environmental benefits of BPS vary from case to case, previous studies have shown significant energy and cost savings in addition to reduced environmental impact.

By-Product Synergy Success Stories

One of the earliest companies to adopt BPS was the Chaparral Steel Company. In the early 1990s, managers of Chaparral Steel began exploring synergies between the company's operations and those of its parent company, Texas Industries, a manufacturer of Portland cement. The most successful synergy discovered was the potential for steel slag to be used as a raw material for cement. As a result of the high temperatures of the steelmaking process, steel slag contains dicalcium silicate, a building block of Portland cement. By using the steel slag instead of purchased lime (that would then have to be heated to calcination), the cement-making operation at Texas Industries reduced energy requirements and related emissions—carbon dioxide (CO₂), oxides of nitrogen (NO_x), and sulfur dioxide (SO₂). Profits for both companies also increased.



U.S. Department of Energy
Energy Efficiency
and Renewable Energy



Texas Industries of the Future

The Chaparral Steel Company is one example of a handful of companies that have successfully developed synergies. Other BPS studies, such as the Business Council for Sustainable Development projects—Tampico (Mexico), Alberta (Canada), North Texas, and Montreal (Canada)—have been larger, involving up to 20 companies and

organizations that cut across several industries. A sampling of successful synergies is shown in Table 1. As the numbers indicate, BPS presents a large opportunity for reducing raw material consumption, energy use, emissions, and waste generation, while also decreasing costs.

Table 1. Annual Cost and Environmental Benefits of Successful Synergies

Implemented Synergies	Ecological/Biological	Energy Savings	Residue Reduction	Cost Savings
Steel slag used in place of lime in cement-making	<ul style="list-style-type: none"> Reduced SO₂ (acid rain) through coal displacement 	<ul style="list-style-type: none"> Displacement of 11,800 tons of coal used to calcine lime (3.5 billion Btu) 	<ul style="list-style-type: none"> 130,000 tons of steel slag kept out of landfills Emission reductions from coal displacement: 65,000 tons of CO₂, 800 tons of NO_x, 33 tons of hydrocarbons 	<p><u>Steel producer:</u></p> <ul style="list-style-type: none"> Value added to steel slag Reduced/eliminated steel slag treatment/disposal costs <p><u>Cement producer:</u></p> <ul style="list-style-type: none"> Less costly raw material Calcination is not required; reduces energy consumption and associated emissions for cement production
Auto Shredder Residue (ASR) mined for metal reclamation, and used for power generation	<ul style="list-style-type: none"> Reduced SO₂ (acid rain) through coal displacement 	<ul style="list-style-type: none"> 18,000 tons of metals (Al, Cu, Mg, Sn) received through ASR as opposed to mining 98,000 tons of carbon-based ASR displaces 66,000 tons of coal for power generation (20 billion Btu) 	<ul style="list-style-type: none"> 120,000 tons of ASR kept out of landfills Energy savings associated with metal recovery versus mining prevent 151,000 tons of CO₂ emissions SO₂ emissions reduced by substitution of ASR for coal 	<p><u>ASR producer:</u></p> <ul style="list-style-type: none"> Reduction/elimination of ASR disposal fees Increased revenue from recovered metals Revenue from sale of ASR as alternative fuel <p><u>ASR consumers:</u></p> <ul style="list-style-type: none"> Lower cost, less energy-intensive method of obtaining metals Lower cost fuel
Copper recovered from graphite/copper sludge	<ul style="list-style-type: none"> Landfill biota saved from exposure to toxicity of copper waste 	<ul style="list-style-type: none"> 18,750 pounds of copper recovered and not mined (5.6 million Btu) 	<ul style="list-style-type: none"> 37,500 pounds of graphite/copper sludge not landfilled 412,500 gallons of graphite/copper-tainted wastewater kept out of municipal wastewater treatment 	<p><u>Sludge producer:</u></p> <ul style="list-style-type: none"> Reduced/eliminated waste-disposal fees Revenue from sale of sludge to copper-extraction company <p><u>Metal recovery company:</u></p> <ul style="list-style-type: none"> Lower cost source of copper

New Jersey Project

The most recent BPS project, launched in 2002, involves 3 Dow Chemical plants in New Jersey and Pennsylvania plus 12 New Jersey companies. These companies represent a range of industries and processes, which is key to expanding synergy opportunities.

- Burlington County Resource Recovery Complex
- The Dow Chemical Company (3 facilities)
- Ferro Corporation
- Hercules
- Mannington Mills
- Merck
- Motiva Enterprises
- NJ American Water
- OTC-Burlington County
- Public Service Enterprise Group
- Shield Alloy
- US Pipe
- Winzinger Corporation

The U.S. Environmental Protection Agency (EPA) is working in conjunction with the New Jersey project to understand the BPS process and verify BPS benefits for the environment. The EPA is funding the Center for Clean Air Policy, a non-governmental organization, to select and analyze a representative sample of the synergies to determine the environmental benefits versus current methods for handling and disposal.

In the past, regulatory issues such as the definition of "waste" and subsequent rules on the storage, transportation, and disposal of the waste material have limited the potential for reuse. One benefit of EPA's involvement is that the agency will be in a position to address these issues. Results of the case studies may also strengthen the case for BPS and provide a firm foundation upon which to promote its use.

The facilities have explored more than 50 promising synergies and are now evaluating the characteristics of the waste streams to determine their composition and day-to-day consistency. The companies are actively pursuing approximately 12 of the synergies identified. Dow Chemical plants are pursuing the use of a latex emulsion stream (from paint production), off-grade polyethylene or polyethylene scraps, and rigid polyurethane foam scraps.

The production of latexes used in paints generates a wastewater stream containing latex. Ultrafiltration is used to recover much of the polymer, but a small amount remains in the wastewater sent to a treatment plant. Also referred to as "white water" because the oil-based latex is insoluble in water, the latex adds a "stickiness" that can be used in road construction and agricultural operations to control dust. The Public Service Enterprise Group, an electric company participating in the New Jersey project, has expressed interest in using the "sticky" water.

One of the Dow Chemical facilities has a polyethylene (PE) compounding plant that makes insulation and jacketing for the wire cabling industry. PE compounds that do not meet material specifications, as well as scraps, are often landfilled, but Dow Chemical is hoping to match these waste materials with a potential consumer. In the past, such material has been used in countries such as China to manufacture shoe soles. Because shipping costs can be prohibitive, the key to implementing this synergy is the identification of local customers.

The third promising synergy is the use of waste cuttings generated in the production of rigid polyurethane foam boards for building insulation. Approximately 5% of the foam board is lost when cut down to size. The foam scraps can be shredded and added to potting soil to increase aeration.

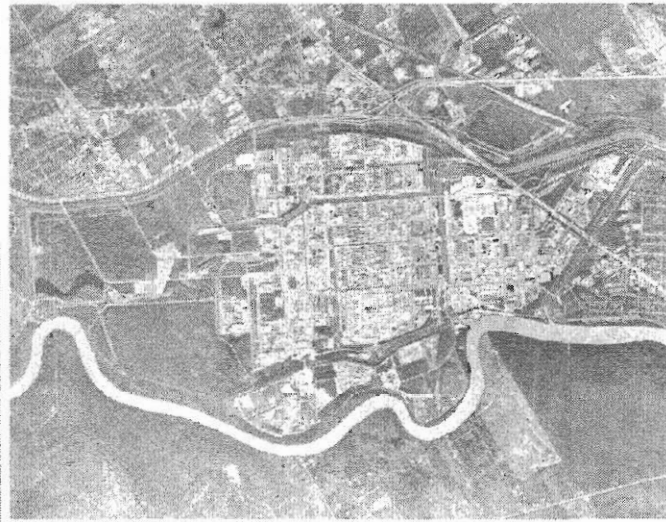
Gulf Coast By-Product Synergy Project

The New Jersey project has enabled Dow Chemical to become familiar with the BPS process and to gauge the success of BPS firsthand. Through its participation in the project, the company has recognized the potential cost savings and environmental benefits associated with by-product synergy. The company will build on the experience gained through the New Jersey project in sponsoring its Gulf Coast BPS project.

The Gulf Coast project will consist of two phases to be carried out simultaneously: an internal Dow Chemical BPS project between the Texas Operations facility and other nearby Dow Chemical facilities, and a traditional multi-company BPS project. The two-phase project will be carried out as part of the DOE-sponsored BestPractices Plant-Wide Assessment program. The multi-company BPS project will involve 10 to 15 companies within a 100-mile

radius of the Freeport/Houston area. Andy Mangan, Executive Director of the U.S. Business Council for Sustainable Development, will lead the teams, with support from cross-functional experts at CH2M HILL and the Dow Environmental Technology Center.

Figure 1: Aerial View of Plant B, Texas Operations Facility



The Texas Operations facility is Dow Chemical's largest integrated site, composed of three major complexes: Plant A, Plant B, and Oyster Creek. Together, the three complexes serve all eight of Dow Chemical's Global Business Groups. The Texas Operations facility manufactures approximately 40 billion pounds of chemicals and other products annually, ranging from performance chemicals and plastics to fuels and agricultural products. Of the products manufactured at the Freeport site, 23 billion pounds are consumed internally, and the remaining

17 billion pounds are sold to customers. The facility runs 75 individual production processes. Several opportunities may exist for creating synergies between these processes and other Dow facilities in the area.

The Houston area is home to many chemical, petroleum refining, and electronics companies, with manufacturing processes that offer potential synergies among facilities. Dow Chemical hopes to take advantage of the breadth of industries concentrated in the Houston area to create exchanges of waste and by-product streams that will be economically and environmentally beneficial to both parties.

The Office of Energy Efficiency and Renewable Energy of the U.S. Department of Energy conducts technology showcases to encourage industry adoption of energy efficiency technologies and practices. Replication throughout industry can boost productivity and help achieve National goals for energy, the economy, and the environment.

For more information, please visit our Web site: www.eere.energy.gov

For more information on this project, please contact:

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**Chapter 1: Sustainable
Development – What and Why?**

- :: Mission Impact**
- :: Vision for Sustainable Development**
- :: Sustainable Development at LANL**
- :: Purpose of the LANL Sustainable
Design Guide**
- :: Organization of the LANL Sustainable
Design Guide**

Chapter 1

Sustainable Development – What and Why?

“It is not what we have that will make us a great nation; it is the way in which we use it.”

– Theodore Roosevelt

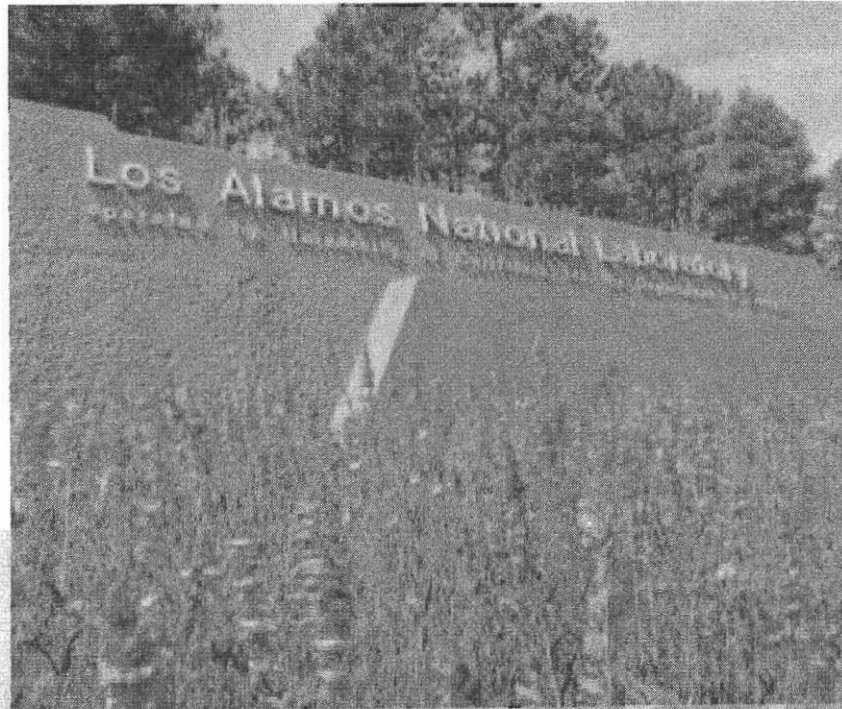
Mission Impact

As the nation increases its emphasis on security, the Los Alamos National Laboratory (LANL) stands as a center of excellence, bringing forth unique facilities and capabilities on issues of national significance. LANL's infrastructure and most facilities were constructed during a period that extended from 1943 to the early 1960s. These facilities are now being targeted for replacement. In addition, new mission assignments are demanding state-of-the-art facilities to extend capabilities for the next 50 years. LANL's population is also aging, creating the need for significant recruitment in response to increasing retirements. Such factors present LANL with a unique opportunity to form and foster an exceptional work

environment that supports its mission and attracts and retains the people most qualified to fulfill that mission.

What is an “exceptional work environment?” This work environment includes and must consider the:

- Individual laboratory and/or office space.
- Tools and equipment used by an individual and the ease of the human/machine interface.
- Surrounding structure or building and its created climate.



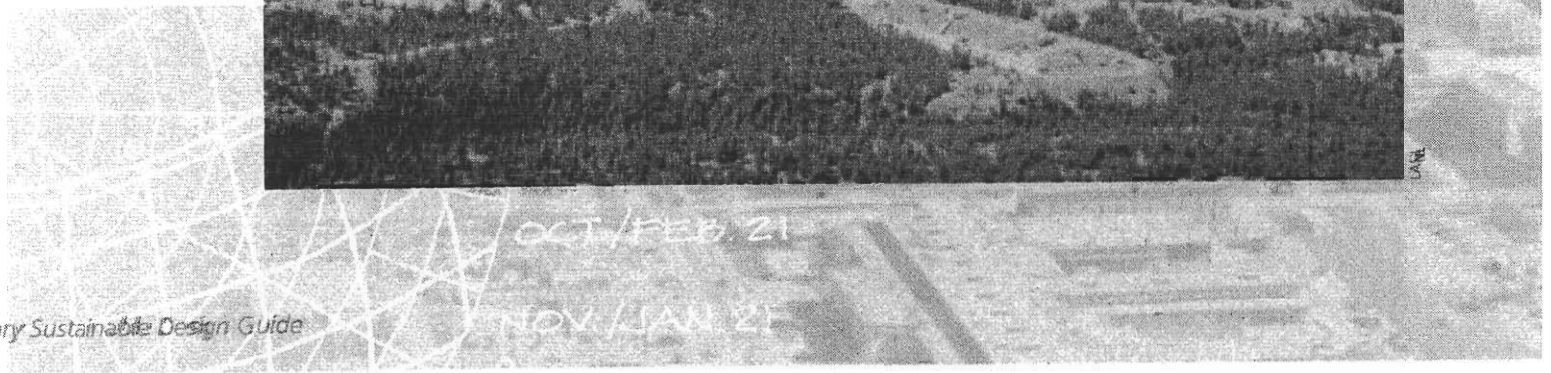
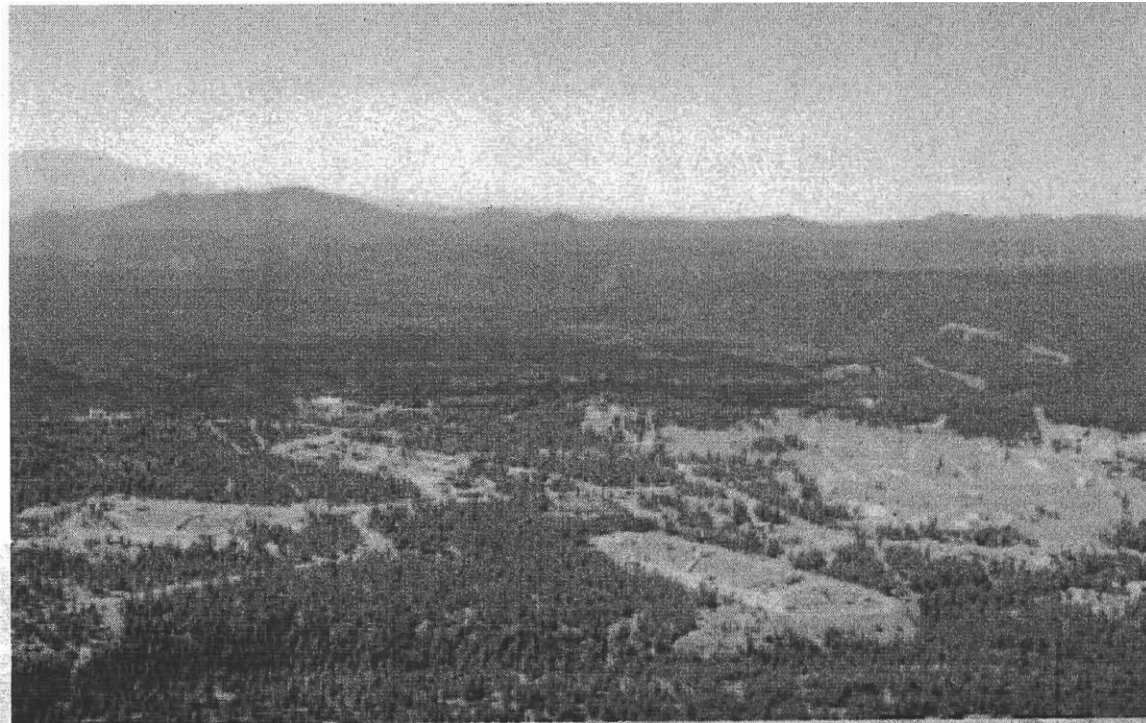
*Sustainable development is
"...developing the built environment
while considering environmental
responsiveness, resource efficiency,
and community sensitivity."*

*– Sustainable Design Report for the Los Alamos
National Laboratory Strategic Computing Complex,
LANL document LA-UR-01-5547.*

- ■ ■ Interstitial or common space that facilitates population massing and encourages cross communication.
- ■ ■ Transportation (pedestrian and vehicular) options that provide ease of access.
- ■ ■ Natural environment in which the work environment is established.

An exceptional work environment supports and encourages interconnectedness among these elements contributing to efficiencies and productivity. The process of Sustainable Development will be a key element to establishing LANL's exceptional work environment.

The sustainable development concept encompasses the materials to build and maintain a building, the energy and water needed to operate the building, and the ability to provide a healthy and productive environment for occupants of the building. Often, sustainable development has been referred to as climate-sensitive design, whole-building design, or high-performance buildings. Much of the original work in this field was done under the auspices of passive solar design – for which LANL was a national and international leader.



Vision for Sustainable Development

In furthering its commitment to a safe and comfortable working environment that meets its program requirements and is responsive to environmental issues, LANL has established a vision for sustainable development.

Sustainable design of LANL facilities is one of the most cost-effective strategies available for ensuring the high level of research output from the Laboratory upon which our nation depends. Buildings in the United States consume 37 percent of the nation's primary

energy. With advanced design strategies, a 50 percent reduction in energy consumption can become the standard practice for a new generation of buildings.

Leading-edge federal buildings demonstrate that far greater reductions in energy consumption – 50 percent or more – are both possible and cost-effective. Buildings that consume fewer resources to construct and operate will have lower environmental impact than today's conventional buildings. This lower impact leads to less air and water pollution, reduced water consumption, improved human comfort, and higher creativity, productivity, and job satisfaction for employees.

As a leader in sustainable development, Los Alamos National Laboratory commits to employing design and construction approaches that maximize productivity within the built environment, minimize impact to the natural environment, and assure good stewardship of public funds and resources.

“The vision for the physical development of the Laboratory is to create an exceptional work environment that supports the mission, and attracts and retains the quality personnel needed to meet the mission.”

– Site and Architectural Design Principles



Case Study Thermal Test Facility

Project Details:

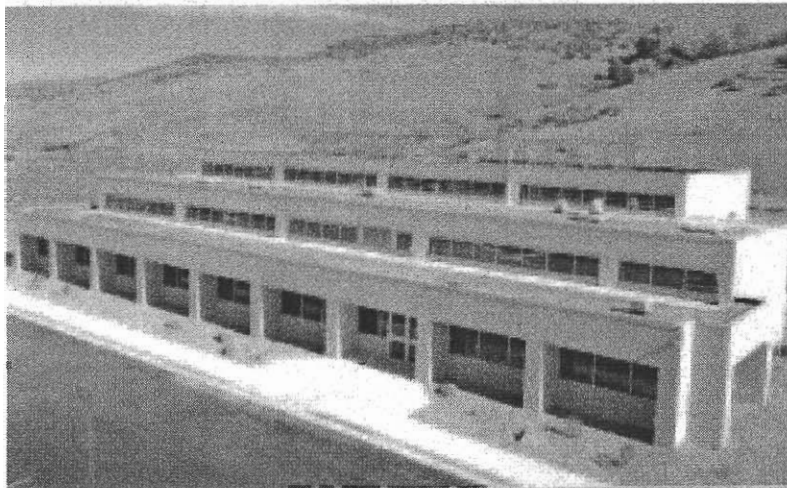
- **Project funding:** GPP
- **Project description:** Research and Office Building
- **Size:** One story with high-ceiling bays, 10,000 square feet
- **Location:** Golden, Colorado
- **Heating degree-days:** 6020
- **Cooling-degree days:** 679
- **Construction cost:** \$1,127,000
- **Date completed:** June 1996
- **Energy cost savings:** \$3,475 per year
- **Energy cost savings:** 63% over base-case building

The National Renewable Energy Laboratory's Thermal Test Facility (TTF) is an open-plan laboratory/office building designed using a high-performance, whole-building approach. The building is a showcase for integrated energy-efficiency features that significantly reduce energy costs, and it is a good example of how it pays to incorporate sustainable design features. Additional costs for the sustainability design features increased construction costs by only 4%. The energy costs for the TTF are 63% less than a building built to the Federal Energy Code

(10CFR435). The energy cost saving includes a 50% reduction in energy consumption and a 30% peak power reduction. Approximately 75% of the lighting needs are met by daylighting. The main design features that made the TTF such an efficient building are:

Energy-Efficient Features:

- Building orientation
- Energy-efficient lighting (T-8 fluorescent) with daylighting controls
- Energy management system
- Daylighting
- Overhangs and side fins to block summer sun
- Direct/indirect evaporative cooling (two-stage evaporative cooling)
- Low-e window glazings
- Separate fresh air system with air-to-air heat recovery



"Sustainability is basically a concept about the interconnectedness of the environment, the economy, and social equity. It is a journey – a path forward – through which we demonstrate responsibility for our future legacy. It is a vision – an aspiration – for a better life for our children and our children's children."

– Statement of Unity, Federal Network for Sustainability, a project of the Federal Energy Management Program, Earth Day April 22, 2002



Robb Williamson

Why build sustainable buildings?

- Lower cost to maintain
- Reduced energy to operate
- Lower air pollution release
- Healthier and more productive occupants
- Greater stability of national energy supplies
- Less material usage
- Longer building life

Sustainable Development at LANL

This document provides insight and guidance for making LANL's sustainable principles and goals a reality. LANL embraces the following principles and goals to achieve its vision for sustainable development.

Principles –

- Maximize use of natural resources in the created building environment.
- Minimize energy and water use and the environmental effect of buildings.
- Ensure processes to validate building system functions and capabilities for proper maintenance and operations.

Goals –

- Integrate Sustainable Design into project development and execution processes.
- Construct sustainable high-performance buildings that are productive, inexpensive to operate, easy to reconfigure, sparing on their use of natural resources, and inherently protective of the natural environment.
- Provide LANL with sustainable buildings that offer a safe and secure work environment.
- Provide LANL with sustainable buildings that link together to form a sustainable campus.

The *LANL Sustainable Design Guide* describes the process of developing leading-edge energy and environmentally sensitive buildings. Prepared by the National Renewable Energy Laboratory (NREL) in conjunction with LANL, the *LANL Sustainable Design Guide* demonstrates how to design and construct new-generation buildings. The goals of the earlier *LANL Site and Architectural Design Principles* are a springboard for specific guidance for sustainable building design.

Sustainable design can minimize the environmental impact of new buildings and other facilities on the LANL campus and help retain the Laboratory's most important asset: the LANL staff. Sustainable buildings can improve the overall health, comfort, and productivity of building occupants. Improving human comfort in staff workspaces allows LANL to attract and retain the best and brightest workforce required to meet the Laboratory's core missions.

What are high-performance buildings?

High-performance buildings are designed and built to minimize resource consumption, to reduce life cycle costs, and to maximize health and environmental performance across a wide range of measures – from indoor air quality to habitat protection. For example, high-performance buildings can:

- Achieve energy savings in excess of 50% compared with conventional buildings
- Achieve higher employee productivity and longer job retention
- Reduce water consumption, maintenance and repair costs, capital costs in many cases, and overall environmental impacts.

Purpose of the LANL Sustainable Design Guide

The purpose of the *LANL Sustainable Design Guide* is to:

- ❖ Set forth a specific planning and design process for creating and meeting LANL sustainability goals, including energy reduction, indoor environmental quality, water quality, and site preservation.
- ❖ Guide the planners, designers, contractors, and groups responsible for the physical development of the Laboratory.
- ❖ Provide a tangible process for evaluating progress toward sustainability in the long-range physical development of the Laboratory.
- ❖ Provide leadership to the DOE laboratory system, as well as to the nation, for maintaining energy security and economic growth through sustainable design principles and practices.

The scope of the *LANL Sustainable Design Guide* includes the building envelope, interior functions, and building design. For example, site or material selection can affect the building's overall environmental impact and should be considered in a broader sense. (The guidance provided in this document covers the entire design and construction processes, from the early planning phases to the operation and maintenance phase.)

The *LANL Sustainable Design Guide* is one of a series of planning documents that guide project development and site improvements at the Laboratory. It is a companion document to the *Site and Architectural Design Principles*. (As shorthand, the *LANL Sustainable Design Guide* refers to the *Site and Architectural Design Principles* as the *Design Principles*.) The *Design Principles* establish broad planning principles and guidelines for site and architectural development at the project scale.

The *LANL Sustainable Design Guide* provides specific guidance regarding the “how-to” in implementing building sustainability goals defined in the *Design Principles*. The *LANL Sustainable Design Guide* provides detailed information required to design, construct, commission, and operate buildings and it charts the course for meeting most of the “architectural character” principles outlined in the *Design Principles*.

The primary audience for this document is the architectural and engineering design teams who are contracted to design and construct new LANL buildings. The *LANL Sustainable Design Guide* is also a valuable reference for members of the LANL Project Management Division and the building owners, operators, managers, and tenants.

Organization of the LANL Sustainable Design Guide

The *LANL Sustainable Design Guide* parallels the LANL design process. It provides guidance for integrating sustainability at all levels of the current LANL building design and construction process, beginning with the planning phases and continuing through the operations phase.

Why is sustainable design important?

Buildings consume more than two-thirds of the total electricity consumed annually in the U.S.

No matter what the source, using energy carries a burden. This burden can be from mining and extraction of fossil fuels, air pollutants released in the burning of these fuels, or the production and disposal of nuclear materials. Saving energy minimizes a wide range of environmental impacts and potential health risks. Sometimes the price is political. Our need for energy resources has caused political turmoil in the past, and ensuring continued access to these resources will long continue to carry strong economic consequences.

Sustainable buildings have benefits far beyond reducing our national dependence on fossil fuels. Occupants of sustainable buildings are more productive, more creative, and in general, healthier. These benefits contribute to LANL's ability to attract and retain the caliber of employees required to better meet its mission.



DOE Public Affairs

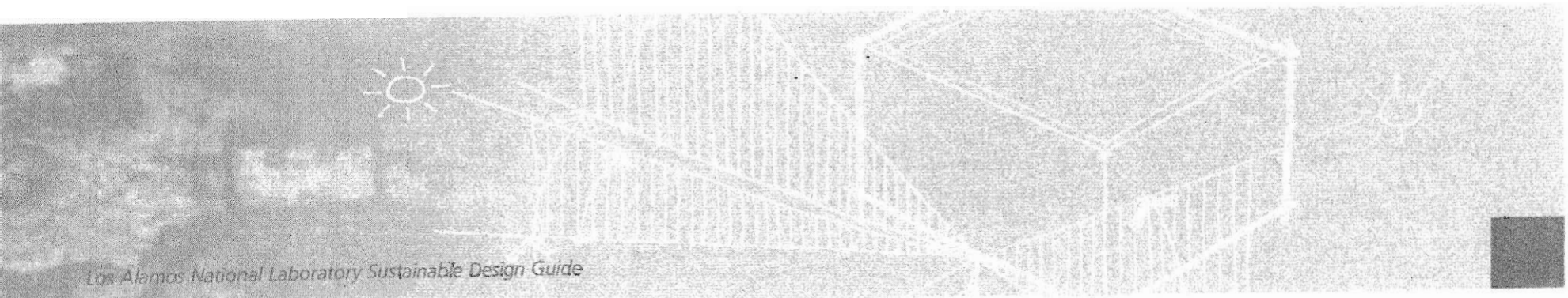
Spencer Abraham,
Secretary of Energy

“With respect to the pursuit of efficiency and the use of renewable resources, we have a responsibility to lead by example... We as a nation have to keep in mind how essential conservation and energy efficiency are to meeting what is projected to be a huge increase in energy demand over the next two decades.”

– Secretary of Energy Spencer Abraham
13th Annual Energy Efficiency Forum, National Press Club, Washington, DC, June 12, 2002

Summary of Topics Presented in the LANL Sustainable Design Guide

Chapter 1: Sustainable Development – What and Why?	Why is sustainable building design important to LANL?
Chapter 2: The Whole-Building Design Process	How does sustainability fit into the LANL building design, construction, and operation processes and what are the first steps the architectural and engineering design team take in a sustainable design process for LANL buildings?
Chapter 3: Building Siting	What siting issues relate to LANL building design?
Chapter 4: Building Architectural Design	What are the architectural guidelines for sustainable buildings at LANL?
Chapter 5: Lighting, HVAC, and Plumbing Systems Design	What are the engineering guidelines for sustainable buildings at LANL?
Chapter 6: Materials	What material issues should designers consider for sustainable buildings at LANL?
Chapter 7: Exterior Landscape Design and Management	How can LANL building sites be more responsibly landscaped and managed?
Chapter 8: Constructing the Building	What can LANL do to ensure that sustainability objectives are followed during construction?
Chapter 9: Commissioning the Building	Why and how should LANL buildings be commissioned to ensure optimal performance?
Chapter 10: Education, Training, and Operation	Why and how should the users and operators be educated about LANL sustainable buildings?



Designing for Productivity

Why don't more architectural teams design specifically to increase the productivity of building occupants? There are two reasons. One is that they are rightly concerned about keeping initial costs down. Design methods to increase occupant health, comfort, and productivity – such as increasing natural lighting and indoor air quality – do indeed often add initial costs to the design. Second, even if a design team is aware that productivity increases – and other benefits such as energy savings from better lighting – can offset these initial costs, human productivity can be a hard thing to measure. Employees who work in buildings with abundant daylight may say they have a better attitude at work, but how does that really affect the bottom line? Meaningful productivity increases can be measured in increases in output, lower absenteeism, fewer errors, and fewer workers compensation claims. Increasingly, companies interested in capturing savings and increases in profitability have begun to make the connection between increased employee productivity and high-performance building design.

Here are a few examples of private companies who feel their bottom line benefited from incorporating more expensive building designs that aimed to increase the health and comfort of the building occupants. These examples are provided by the non-profit Center for Energy and Climate. For more detailed information and examples of correlations between productivity and design, see the book *Cool Companies* by California Energy Commission analyst, Joseph Romm (Island Press, 1999). A recent study funded by Pacific Gas & Electric and carried out by the Hescong Mahone Group correlating daylighting with higher test scores in middle school students is available for downloading at www.h-m-g.com/.

- Mail sorters at the main U.S. Post Office in Reno, Nevada became the most productive and error-free in the western half of the U.S. after a major

energy and lighting upgrade in their building. A main feature of the overhaul was a new ceiling and lighting system. Before completing the \$300,000 renovation, managers installed the new system above one of their two sorting machines. In five months, productivity on that machine rose almost 10 percent, while the other showed no change. A year later the increase stabilized at about six percent. Working in a quieter and better lit area, employees did their jobs better and faster. The error rate by machine operators in the renovated area dropped to only one mistake per thousand letters. Energy savings projected for the whole building come to about \$22,400 a year. The new ceiling also saved \$30,000 a year in maintenance costs. Combined energy and maintenance savings came to \$50,000 a year, a six-year payback. But the productivity gains were worth \$400,000 to \$500,000 annually, paying for the renovation in less than 12 months.

- Hyde Tools is a Southbridge, Massachusetts, manufacturer of industrial cutting blades. Recently, the company did a \$98,000 lighting upgrade from old fluorescents to new high-pressure sodium-vapor and metal-halide lighting fixtures (with \$48,000 paid for by the local utility). Estimated annual energy savings are \$48,000, for a payback of one



Robb Williams

A daylit classroom at Oberlin College's Adam Joseph Lewis Center for Environmental Studies in Oberlin, Ohio.

year. But with the new lighting, workers were able to see small particles that were causing defects in their high-precision blades. Hyde Tools estimates the improved product quality is worth another \$25,000 a year. Hyde says every dollar saved on the shop floor is worth \$10 in direct sales, meaning the quality improvements were worth the equivalent of \$250,000 in added sales.

- Verifone, a subsidiary of Hewlett-Packard in Costa Mesa, California, renovated a building housing offices, a warehouse, and light manufacturing. The renovation beat California's strict Title 24 building code by 60% with a 7.5-year payback. Verifone experienced a 45% drop in absenteeism following the renovation.

References

Energy Information Agency, www.eia.doe.gov

High-Performance Commercial Buildings, a Technology Roadmap, www.eren.doe.gov/buildings/commercial_roadmap

Site + Architectural Design Principles, www.lanl.gov/orgs/flf6/pubf6stds/engrman/4arch/htmls/site_arch.htm

Cool Companies, Center for Energy and Climate, www.cool-companies.org

Additional Resources

“Building Sustainability Position Statement,” American Society of Heating, Refrigerating, and Air-Conditioning Engineers, www.ashrae.org

High-Performance Buildings Research Initiative, www.highperformancebuildings.gov

LEED™ Reference Guide. U.S. Green Building Council. Version 2.0, 2001, www.usgbc.org

Sustainable Design Report for Los Alamos National Laboratory's Strategic Computing Complex, http://emeso.lanl.gov/useful_info/publications/SCC_SD.pdf

“Guiding Principles of Sustainable Design,” U.S. Department of Interior, National Park Service. GPO, 1993. www.nps.gov/dsc/dsgncnstr/gpsd

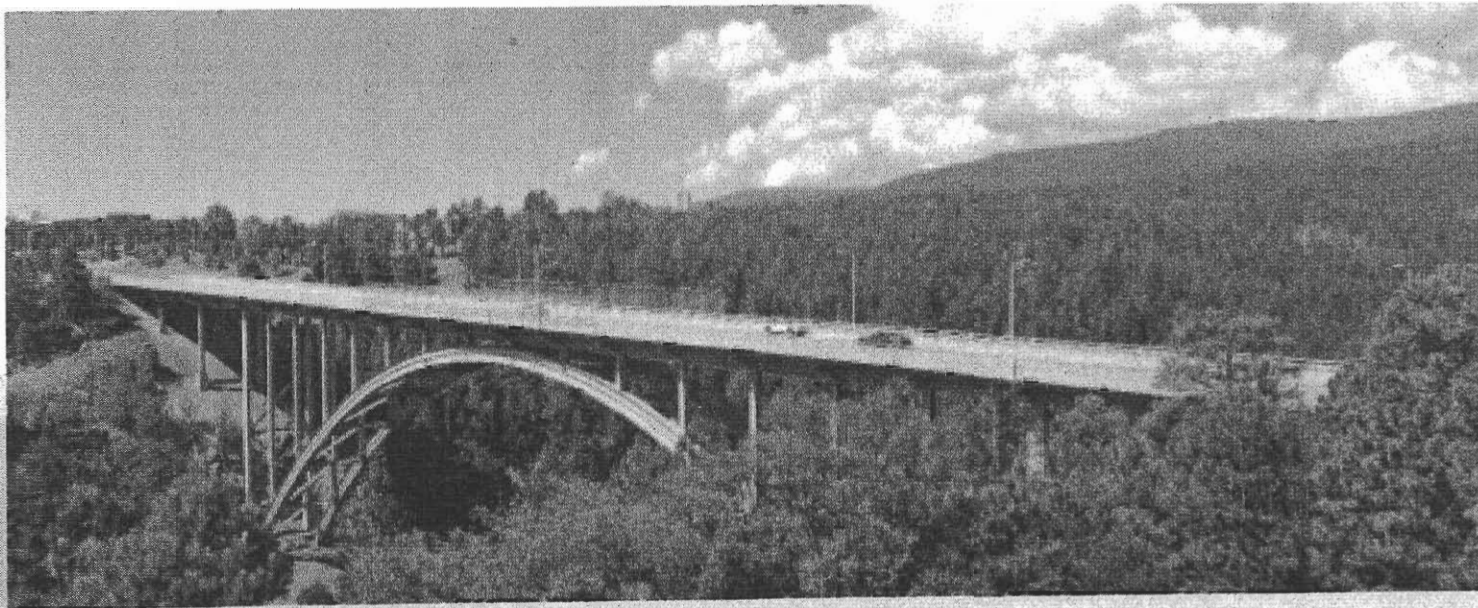
Whole Building Design Guidelines, www.wbdg.org
Department of Energy – Energy Efficiency and Renewable Energy Network, www.eren.doe.gov

Center of Excellence for Sustainable Development, www.sustainable.doe.gov

“Sustainable Federal Facilities: A Guide to Integrating Value Engineering, Life-Cycle Costing, and Sustainable Development,” Federal Facilities Council Technical Report No. 142, National Academy Press, 2001.

The Practice of Sustainable Development. Urban Land Institute, 2000, www.uli.org

GSA Real Property Sustainable Development Guide, www.gsa.gov/realpropertypolicy



The Los Alamos Canyon Bridge opened the way for LANL growth onto the South Mesa.

FOR IMMEDIATE RELEASE
June 3, 2002

CONTACT:

Napa Valley's Second Annual Computer & Electronics Recycling Event

When: Friday, June 7th & Saturday, June 8th, 9 a.m. – 2 p.m.
Where: Napa Valley College (Napa Campus) South Parking Lot

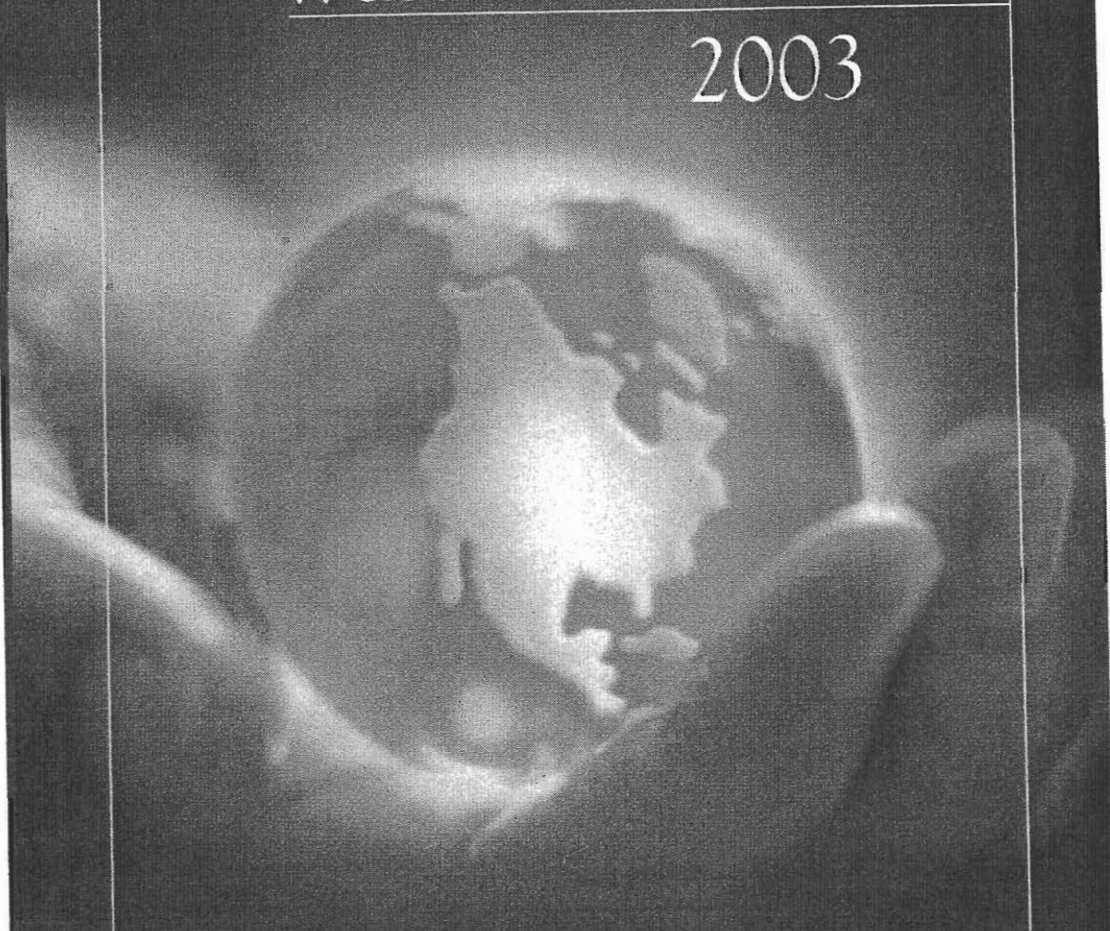
The City and County of Napa have joined forces to help local residents and businesses recycle old computer and electronic equipment through a two-day special collection event to be held on June 7-8 from 9 a.m. to 2 p.m. at Napa Valley College (Napa Campus). A wide variety of working and non-working electronic equipment will be accepted free of charge including: PCs and laptops, computer monitors, printers and other peripherals, televisions, telephones and fax machines, and consumer electronics such as radios/stereos/VCRs. The collection event is limited to residential and commercial customers in Napa County serviced by Napa Garbage Service, Napa Valley Disposal, American Canyon Disposal, and Upper Valley Disposal Service.

The term "e-waste" refers to the wide range of electronic waste from more traditional consumer electronics (such as TV's, VCR's and stereos) to computers and computer peripherals (including printers, keyboards, scanners, etc.) and to newer technology products such as cellular phones, digital cameras, and personal digital assistants. Currently, it is estimated that about 50% of US households own a computer and that 315 million computers will become obsolete in the United States by the year 2004. This is a result of rapid advancements in technology and greater consumer use of computer products. Some e-waste also contains hazardous materials that may harm the environment if disposed of improperly. Last year, a ruling by the California Department of Toxic Substances Control (DTSC) stated that products containing cathode ray tubes (CRTs), namely computer monitors and televisions, are considered hazardous waste. Each CRT is estimated to contain five to eight pounds of lead and are currently banned from California landfills. Currently, legislation (SB 1523 - Sher) is being considered to place a \$30 surcharge on every new CRT sold in California to help pay for the cost of proper disposal and recycling.

(more)

Waste Wise

2003



Celebrating
Our
Partners



*E*PA congratulates the 2003 WasteWise award winners!
In particular, EPA recognizes Eastman Kodak Company, Public Service Enterprise Group, and Virco Mfg. Corp. for their outstanding achievements and commitments and hereby inducts these organizations into the WasteWise Hall of Fame. EPA established the WasteWise Hall of Fame to recognize partners that continually excel in waste reduction efforts, provide ongoing support for the WasteWise program, and that serve as role models for other partners.

Eastman Kodak Company



Since joining WasteWise as a charter member in 1994, Eastman Kodak Company has been a picture perfect partner. By exploring innovative waste reduction ideas and sharing successful strategies with others, the company earned five WasteWise Awards between 1998 and 2002. The hallmark of Kodak's waste reduction program is its One-Time-Use Camera reuse and recycling program. Since the program's inception, the camera reuse/recycling rate has soared to 77 percent domestically and 67 percent worldwide. Camera recycling is flashy, but Kodak's construction and demolition debris management program also deserves the spotlight. Kodak reused more than 30,000 tons of aggregate made from debris to build new roads and buildings, saving \$2 million. The company's major manufacturing site in Rochester, New York, also recycles and reuses more than 600 million pounds of materials per year. A comprehensive tracking system contributes to Kodak's waste reduction success by enabling quantification of cost

"WasteWise offers us an excellent opportunity to benchmark our waste reduction and recycling programs against the best in the country. It also provides a steady stream of new ideas that help us sustain and improve our programs."

R. Hays Bell, Director, Health, Safety, and Environment and Vice President

savings and environmental results throughout the year. Reporting precise waste reduction figures and using EPA's Project XL pollution prevention tools helped the company earn national recognition for its efforts.

WASTE WISE

Hall *of* Fame

*Public Service
Enterprise Group*



PSEG

We make things work for you..

After joining WasteWise as a charter partner, Public Service Enterprise Group (PSEG) worked to achieve electrifying results by incorporating waste reduction into its company culture and business practices. As one of the nation's major electric power and natural gas providers, PSEG excels in waste reduction and promoting the climate benefits of these activities. In 1993, PSEG instituted an innovative materials management process for handling waste by forming the Resource Recovery Group. The group aimed to incorporate waste prevention into every aspect of energy production and achieved this goal through resource management—a strategic alternative to traditional disposal contracts. PSEG offered its waste management suppliers financial incentives to identify waste reduction opportunities. In just 18 months, the company implemented new materials management practices and saved nearly \$2 mil-

“At PSEG, we believe we have made substantial progress in terms of minimizing our environmental footprint, but we recognize how far we have to go and how many opportunities await us.”

Al Fralinger, Resource Recovery Group Manager

lion in waste management costs and reduced tons of waste. Since 1995, PSEG's recycling rates have consistently exceeded 90 percent. The utility's new goal is to maintain or exceed a 94 percent recycling rate for all waste material generated. Impressively, PSEG recycled more than 96 percent of its municipal solid waste in 2002!



Virco Mfg. Corporation



Although Virco Mfg. Corporation designs chairs, company employees don't sit still when it comes to protecting the environment. Virco, which manufactures school and office furniture in Conway, Arkansas, joined WasteWise as a charter member in 1994 and quickly achieved success. Since 1994, Virco has diverted more than 160 million pounds of waste and received six WasteWise awards in recognition of its achievements. Virco's waste reduction efforts contribute to its success in the marketplace. By preventing man-

"The final piece of the puzzle is educating others and inspiring them to be stewards for the environment and their communities."

Don Curran, Resource Recovery and Recycling Manager

ufacturing waste, the company purchases fewer raw materials and transfers the savings to consumers. Waste reduction efforts also save Virco thousands of dollars in disposal fees. While cost savings are important, Virco is committed to protecting the environment regardless of financial benefits.

Dedicated to improving the local community, the company launched a "Cash for Cardboard" program. Virco collects, bales, and sells corrugated cardboard from 27 local schools, ships it to a recycling company, and donates the proceeds back to the schools. In addition, Virco personnel deliver presentations on WasteWise at business meetings and other events, educating attendees about the greenhouse gas emissions generated by waste decomposing in landfills.

2003 Partners of the Year

VERY LARGE BUSINESS and CLIMATE:

General Motors Corporation

General Motors Corporation (GM) incorporates waste reduction into every aspect of automobile production, reducing greenhouse gas emissions. For example, the company uses higher strength steel grades to reduce automobile mass and improve fuel economy. In 2002, GM U.S. employees prevented more than 3,000 tons of waste and recycled more than 2 million tons of materials, reducing greenhouse gas emissions by 4.3 million metric tons of carbon equivalent.

LARGE BUSINESS: Pitney Bowes Inc.

In addition to engineering mailing and document technologies, **Pitney Bowes Inc.** protects the environment by developing innovative waste reduction strategies. In 2002, the company prevented more than 3,400 pounds of paper waste by asking employees to view their pay stubs on a secure Web site and completing requisitions electronically. The company also incorporated waste prevention into the manufacturing process, creating new parts from plastic waste.

MID-SIZE BUSINESS: NEC Electronics America, Inc.—Roseville Facility

In 2002, **NEC Electronics America, Inc.** (NECELAM) reduced waste by 6 percent at its Roseville Facility. The company attributes this impressive accomplishment to its employees, who reused more than 21 tons of equipment and recycled nearly 300 tons of materials. NEC uses an Environmental Health & Safety Intranet site to communicate waste reduction goals to employees. The site lists contact information for recycling personnel, identifies recycling drop-off sites, provides waste prevention ideas, and highlights company progress.

SMALL BUSINESS:

Aaron's Bicycle Repair

The waste reduction atmosphere at **Aaron's Bicycle Repair** is contagious. In 2002, this small shop employed innovative waste reduction techniques to reduce its waste by 10 percent. Company employees refused to purchase products with excessive packaging,

prevented paper waste by paying bills online, and recycled everything from glass bottles to bike gears. Aaron's Bicycle Repair created a Web site <www.rideyourbike.com> to educate customers about these practices and encourage them to become environmental stewards.

CHALLENGE: Panasonic

With public concern growing about the potential environmental impacts of discarded electronics, **Panasonic** is leading efforts to develop a national collection and recycling infrastructure for used electronic products. In 2002, the company sponsored programs that collected more than 1,500 tons of used electronic equipment at more than 100 locations. In addition, Panasonic partnered with an electronics recycler and one of its suppliers to manufacture televisions with cathode ray tubes that contain 10 percent post-consumer recycled content glass.

NON-PROFIT: United Way of America

In addition to serving communities' needs across the country, **United Way of America** integrated waste reduction into its ethos through diligent waste reduction activities and continuous education efforts. In 2002, United Way developed a WasteWise Web page, placed recycling signs throughout the office, integrated an "Environmentally Friendly Work Environment" into new employee training, and prevented more than 7,500 pounds of paper waste by moving catalogues, confirmations, and member surveys online. United Way also made a significant change to their procurement practices by purchasing and using recycled content office paper (30% post-consumer) and encouraging local United Ways to follow suit.

FEDERAL GOVERNMENT: U.S. Postal Service—Northeast Area

The **U.S. Postal Service—Northeast Area**, demonstrates a fierce commitment to pollution prevention and WasteWise ideals, resulting in constant improvement and innovation. In 2002, the organization completed the release of environmental compliance guidebooks to all 3,200 postmasters in the Northeast, provided postmaster training on waste reduction and buying recycled, and

expanded its lamp recycling programs. In addition, postal service workers reused shipping boxes up to five times, preventing tons of corrugated cardboard from reaching landfills. The organization also avoided more than \$2.6 million in annual landfill disposal costs through its recycling programs.

STATE GOVERNMENT and ENDORSER:
South Carolina Department of
Health and Environmental Control

It is exciting to encounter an institution as committed to practicing what it preaches as the South Carolina Department of Health and Environmental Control (DHEC).

As a WasteWise partner and endorser, the department implements many waste reduction activities internally as a backdrop to a cadre of outreach activities, workshops, and presentations. In 2002, DHEC incorporated WasteWise into its Business Recycling Assistance Program, hosted a WasteWise satellite forum, recycled 331 tons of materials, and purchased 26 percent of total supplies and materials with recycled content.

TRIBAL GOVERNMENT: Oneida Tribe
of Indians of Wisconsin

The Oneida Tribe of Indians of Wisconsin strives to impart its environmental ethic to all tribal members, especially its children. The tribe implemented a composting program at the Turtle Elementary School in which children composted cafeteria food scraps and applied the compost to vegetable gardens. In addition, the Oneida Tribe held a clothing and small household item exchange, taught a "Make It Second Nature" class to help community members reduce their environmental footprints, and provided incentives for vendors to offer recycling at its annual Pow-Wow.

LOCAL GOVERNMENT:
King County, Washington

In 2002, as part of a repertoire of activities that makes the county a national leader in waste reduction, King County, Washington chose to renovate 100 solid waste hauling trailers instead of purchasing new ones, saving \$250,000 in the first year. The county also reduced waste generation

by nearly 10 percent per employee in one large county office building, greatly expanded county "green building" projects, collected 2,450 tons of materials internally for recycling, and purchased \$2.8 million worth of recycled paper products.

SCHOOL/SCHOOL DISTRICT: Desert
Sands Unified School District

Desert Sands Unified School District, a district of 27 schools located 100 miles east of Los Angeles, California, integrates service-learning opportunities for students into a comprehensive waste reduction program. In 2002, for example, members of a school environmental club collected abandoned tires that were scattered in the nearby desert. The students delivered the tires to a local company that recycled them. In addition to implementing a broad recycling program, the school district provides surplus items to a sister school in Mexico, uses recycled tires for playground replacement lining, and purchases carpeting that is composed of recycled plastic.

COLLEGE/UNIVERSITY:
Youngstown State University

The energy of Youngstown State University's Support Services (YSU) waste reduction staff extends beyond the boundaries of campus into the community of Youngstown, Ohio. In 2002, YSU donated more than 6.5 tons of art, theatrical, and other supplies to schools and non-profit organizations in the community and also recruited local companies to join WasteWise. In addition, YSU downsized trash collection roll-offs by nearly 75 percent by holding a move-out donation drive, hosted a month-long lecture series and an Earth Day symposium, and recycled a variety of non-traditional items such as mattresses, computers, polystyrene, tires, and batteries.

PROGRAM CHAMPIONS

<i>Very Large Business:</i>	Anheuser-Busch Companies, Inc.
<i>Large Business:</i>	Canon U.S.A., Inc.
<i>Mid-Size Business:</i>	Fisher-Titus Medical Center
<i>Small Business:</i>	Guardian Industries—Ligonier Plant
<i>Non-Profit:</i>	Peggy Notebaert Nature Museum
<i>Federal Government:</i>	U.S. Postal Service—Alabama District
<i>State Government:</i>	Tennessee Department of Environment and Conservation
<i>Tribal Government:</i>	Confederated Tribes of the Umatilla Indian Reservation
<i>Local Government:</i>	Kitsap County, Washington
<i>School/School District:</i>	Los Angeles Unified School District
<i>University/College:</i>	Seattle University
<i>Challenge:</i>	Genzyme Corporation
<i>Climate:</i>	Constellation Energy Group
<i>Endorser:</i>	Commonwealth of Massachusetts

HONORABLE MENTIONS

<i>Very Large Business</i>	<i>Small Business</i>	Novartis Pharmaceuticals Corporation
Albertsons, Inc.	Evelyn Hill Inc.	Seattle University
Target Stores	Kessler Consulting, Inc.	<i>Climate</i>
The Walt Disney Company	The Seydel Companies	Aaron's Bicycle Repair
Verizon	<i>Federal Government</i>	Crown Cork & Seal Company, Inc.
<i>Large Business</i>	Sandia National Laboratories	Kaiser Permanente
Advanced Micro Devices, Inc.	U.S. Government	Pepco
Alliant Energy	<i>Printing Office</i>	The Seydel Companies
Battelle	<i>State Government</i>	<i>Endorser</i>
Constellation Energy Group	Virginia Department of Environmental Quality	City of Clifton, New Jersey Recycling Program
Genzyme Corporation	<i>University/College</i>	Georgia Pollution Prevention Assistance Division
Herman Miller, Inc.	Miami University	Rotary Club of Clifton
Louisiana-Pacific Corporation	Ohio University	United Way of America
Pepco	Facilities Management	Utility Solid Waste Activities Group
Spartech Corporation	University of Virginia	
Steelcase Inc.	<i>Challenge</i>	
	Motorola, Inc.	



United States
Environmental Protection Agency
Waste/Wise (3306W)
Washington, DC 20460
Official Business
Penalty for Private Use \$300

October 2003
EPA530-R-03-014

Recycled/Recyclable—Printing with Vegetable Oil Based Inks on 100% Postconsumer Process Chlorine Free Recycled Paper



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Welcome to the Environmental Communication Network

The Environmental Communication Network (ECN) is a community of scholars, professionals and activists concerned with the role of communication in environmental affairs. We call this field "[environmental communication](#)" (EC).

The ECN web site aims to be the best place to start when looking for information about [environmental communication](#). Here you'll find resources on a variety of aspects of environmental communication. Use the links at the top of the page to navigate or check out the [site map](#) for more detail about what's here.

The ECN also incorporates the old Conference on Communication and Environment (COCE) web site and expands on it. The ECN mailing list replaces the old COCE-L. However, this is still the place to find out about [COCE](#).

The ECN web site is also home to the web pages of the [Environmental Communication Commission](#) (ECC) of the National Communication Association.

I hope you find this useful. Please [let me know](#) what you think and by all means [send me suggestions](#) for updates and changes you would like to see here. Thanks for stopping by.

- [mark meisner](#), ECN Founder



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 This page: <http://www.esf.edu/ecn/>
 Updated: Monday, May 31, 2004





C
To:

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- [Goals & Philosophy](#)
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- [VISION archives](#)
- [Land Conservancy](#)
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The Windstar Foundation was founded in 1976 by singer/songwriter and environmentalist John Denver along with Aikido Master Tom Crum. Wind profit environmental education organization which promotes a holistic approach addressing environmental concerns. It is the recognition and demonstration of us is part of, and responsible for, the quality of life on planet Earth; an affects any one of us, affects us all.

General Symposium Information

**"New Choices for Your Future" Symposium
Friday September 24, 2004**

Snowmass Information and Registration Form

**An On-line / On-site
Environmental Education Symposium
for Students, Teachers and Public**

A Day that will Educate, Inspire and Entertain

On-Line Curriculum

Symposium Presenters...

Viewing and On-Line Information

Amory Lovins ... Rocky Mountain Institute
Bill Nye ... the "Science Guy"
Jeanne McCarty ... Jane Goodall Institute
Tracy Fisher ... Center for a New American Dream
Al Worden ... Apollo 15
Thomas Zung ... Buckminster Fuller Institute
John Passacantando ... Greenpeace
Dr. Richard Murphy ... Ocean Futures

Field Trip Information for Local Schools

Frequently Asked Question:

• **Connecting Connections Newsletter [Spring 2004](#)**

**What's the
difference between
the
Windstar
Foundation
and the Windstar
Land Conservancy?**

**Windstar Global
Family Members!!**

SKILLS ROSTER

**Please sign up for
the Windstar Skills
Roster. We may be
calling you to help
the Foundation with
a variety of tasks!**



Website updated 08/05/04
[Windstar Privacy Statement](#)

**Receiving our
VISION?**

If you are a Windstar member and have not been receiving your quarterly newsletter, the VISION, please contact the Windstar office at windstarco@wstar.org or by phone at 866-927-5430 to verify your address.

- **Transcript of On-Line Chat with Windstar President Ron Deutscher 2004**
- **Windstar Day! October 23, 2004**
Windstar Day will be a special day for Windstar members and friends as to get together and do something positive for the environment on a local



Gallery-quality bronze maquettes, entitled SPIRIT, are now available to order at the Windstar Shop and will soon be available in selected art galleries across the States. These maquettes are reproductions of the study which preceded the statue, now in place at the Windstar Land Conservancy, designed by not DiCicco.

For more information on how you can contribute to the John Denver Inspiration Monument, please see our flyer available in a printable [PDF form](#) or contact the Windstar Foundation at 866-927-5430.

E-Mail Alert:

**WARNING OF
POSSIBLE VIRUS *FALSELY* BEING SENT FROM
WSTAR.ORG ADDRESSES**

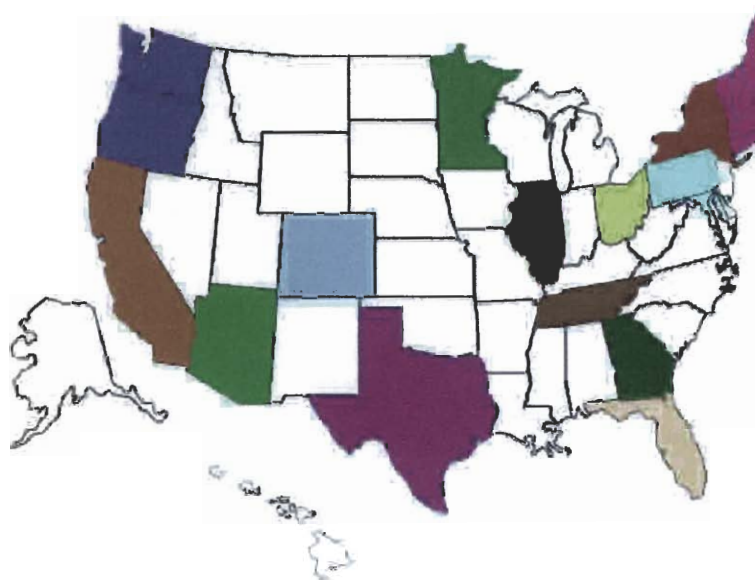
Our wstar.org e-mail system has been "spoofed". We are looking into clearing this frustrating situation.

Thank you for your patience!

**"If Peace is
Our Vision...
Let Us Begin"**
John Denver,
cofounder
Windstar Foundation

**Windstar
Foundation
PO Box 656
Snowmass, CO
81654**

**WindstarCO@wstar.org
Phone: 970-927-
5430 / 866-927-5430**



Contact your local Windstar Connection Group



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News Headlines

CO2 rules set for California's cars - California released its final plan Friday to reduce greenhouse gas emissions from cars and trucks ... (posted 08/10/2004 from Reuters)

Brazil Calls Army to Battle

Deforestation - Deforestation of the Amazon destroyed over 23 7 thousand square kilometers of forest last year ... (posted 08/10/2004 from Brazzil)

US clashes with Canada over pollution at the border

While the US has long been embroiled in disputes on the border it shares with ... (posted 08/10/2004 from Christian Science Monitor)

Occidental Signs Controversial \$50 Million Peru Oil Deal

North American oil companies Occidental Petroleum Corp Amerada Hess Corp and Talisman Energy Inc agreed ... (posted 08/10/2004 from Reuters)

U.S. Barred From Weakening

Dolphin Rules - In a victory for environmentalists a federal judge ruled Tuesday that the Bush administration cannot ... (posted 08/10/2004 from Associated Press)

More News Headlines | Discuss the News

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EnviroLink Forum

Join the discussion! Debate environmental issues in the **EnviroLink Forum** with other members of the EnviroLink



Environmental Resources

The EnviroLink Network is a non-profit organization which has been providing access to thousands of online environmental resources since 1991. **Suggest a new resource.**

Resources by Topic:

- [Agriculture](#)
- [Air Quality](#)
- [Climate Change](#)
- [Ecosystems](#)
- [Energy](#)
- [Environmental Disasters](#)
- [Environmental Economics](#)
- [Environmental Education](#)
- [Environmental Ethics](#)
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- [Forests](#)
- [Ground Pollution](#)
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- [Natural History](#)
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EnviroLink US Atlas™

In partnership with [LocalHarvest.org](#), the EnviroLink Network has created interactive maps of all of the US-based resources in its database. Click on the map below or type in a US zip code or city name to browse for resources by location.



Frequently Searched

community.



Animal Concerns

A project of EnviroLink, **Animal Concerns** is the online community for people concerned about the welfare and rights of animals.



About EnviroLink

The EnviroLink Network is a non-profit organization founded in 1991. EnviroLink maintains a database of thousands of environmental resources and provides internet services to non-profit organizations. **Learn more about EnviroLink.**

Cities:

- 1) [Washington, DC](#)
- 2) [San Francisco, CA](#)
- 3) [New York City, NY](#)
- 4) [Seattle, WA](#)
- 5) [Chicago, IL](#)

Other places on the map: [Alaska & Hawaii](#)

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www.seaviewer.com

Natural Resources Study

Two new reports detail impact of global warming on natural resources
www.pawirusis.org

Technology for Nonprofits

Dell, Microsoft Charity Lic & more Save big on hardware and software!
www.TechFoundation.org

Natural Resource

Tropical rainforests are a precious and vital natural resource!
tropicalreefarms.com

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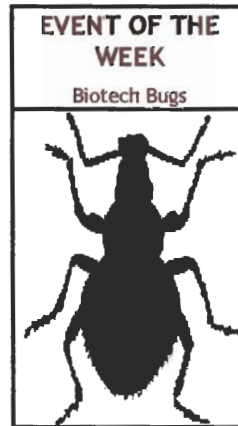
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THE BILLBOARD

- **NEW!** Online donations now accepted!
- **NOW AVAILABLE!** Online membership renewal
- **Link of the week:** Canadian Biotechnology Advisory Committee
- **NEW!** *SEJournal's* Inside Story: Proving that a neighborhood is polluted and dangerous
- SEJ voices concern on **journalist visa restrictions**
- Pittsburgh conference agenda – **updated daily**
- **Breaking news** from 2004 SEJ annual conference site
- **Help!** SEJ's Mentor Program needs...mentors!
- Resources for **EJ teachers & students**
- **SEJ wants you:** how to get involved and make a difference for environmental journalism



EVENTS & OPPORTUNITIES:

- **Early discount conference registration deadline approaching!**
- SEJ Ohio conference fellowships
- ONA Online Journalism Awards
- New Horizons Traveling Fellowships
- IRP Fellowships in Int'l Journalism
- Alicia Patterson Fndn. Journalism Fellowships
- Bosch Foundation newspaper & TV fellowships
- National Humanities Center Fellowships
- Canada-U.S. Fulbright Awards

Story ideas from *TipSheet*

NEW 8/4/04

With the new school year just around the corner, lead-contaminated water in drinking fixtures and toxic PCBs in caulk used to seal school buildings are two issues emerging as potential threats to children's health. You'll find these, as well as other environmental story ideas, in the latest issue of *TipSheet*.

Inside Story: an excerpt from *SEJournal*

NEW 8/9/04

Proving that a neighborhood is polluted and dangerous

By MIKE DUNNE

Comparing databases on environmental risk and deaths helped *The Indianapolis Star* document a difficult story – that a community surrounded by industry is "a dangerous neighborhood to live in."

It's the kind of story that can be difficult for reporters to document but computer-assisted reporting coordinator Mark Nichols and environment reporter Tammy Webber, along with reporter Bill Theobald, used several databases and lots of shoe-leather to produce "Neighborhood at Risk" Feb. 22-23, 2004. Inside Story reports on how they pulled it all together. [Full story...](#)

NOTE: All of the other articles in the Summer 2004 *SEJournal* are [available to members only here](#). If you are interested in joining SEJ, please visit [this page](#) for information. Previous issues of *SEJournal* are [available to both members and non-members here](#).



Dams – remove or repair?

[Resources.](#)

SEJ CONFERENCE EARLYBIRD DISCOUNT: [Early discount registration for SEJ's 14th annual conference in Pittsburgh ends August 16th](#). Don't delay – [register now](#) to get the tour of your choice AND save money! Need a roommate? Members can [use this interactive roommate matching page](#).

SEJ CONFERENCE FELLOWSHIPS: SEJ is still accepting

SEJ tracks threats to freedom of information

NEW 7/28/04

On July 28, 2004, the Society of Environmental Journalists joined two other journalism groups in protesting restrictions on the entry of foreign journalists into the US that go far beyond those imposed on ordinary tourists. The practice could skew coverage of global environmental issues from venues like the United Nations.

[More.](#)



Also, check out the latest issue of SEJ's award-winning FOI publication, [WatchDog Tipsheet](#), with searchable archives of story ideas, articles, updates, events and other information with a focus on FOI issues of concern to environmental journalists in both the United States and Canada. It includes a database of State FOI Resources and Actions. If you're begging for more between published issues, access it any time you like via [web log](#), updated as the news breaks.

Please support SEJ

As a 501(c)(3) non-profit organization dedicated to improving the quality, accuracy and visibility of environmental journalism, SEJ relies on the generosity of its supporters to keep its programs running and its dues low. SEJ's leaders are committed to moving our organization off of the yearly fundraising treadmill by building an endowment large enough to ensure that, whatever the future brings, there will always be enough money to keep valuable SEJ programs going. To learn how you can help secure SEJ's future with a tax-deductible gift to the [21st Century Fund](#), please see [this special appeal from SEJ President Dan Fagin](#).



SEJ's 14th annual conference



SEJ is planning a smokin' [annual conference](#) in Pittsburgh, PA, October 20-24, 2004. Hosted by Carnegie Mellon University, we'll learn how the ex-"Smoky City" cleaned up its air and water act, invested in innovative building techniques, protected its old growth forests, and as usual, visit some cool sites such as glacial lakes, wind farms and large-scale agricultural operations, Three Rivers Park, modern coal mining!



applications for the [2004 Annual Conference Fellowships](#) for Ohio journalists, to underwrite costs of attending SEJ's [14th Annual Conference](#), October 20-24, 2004, in Pittsburgh, PA.

ONA AWARDS:

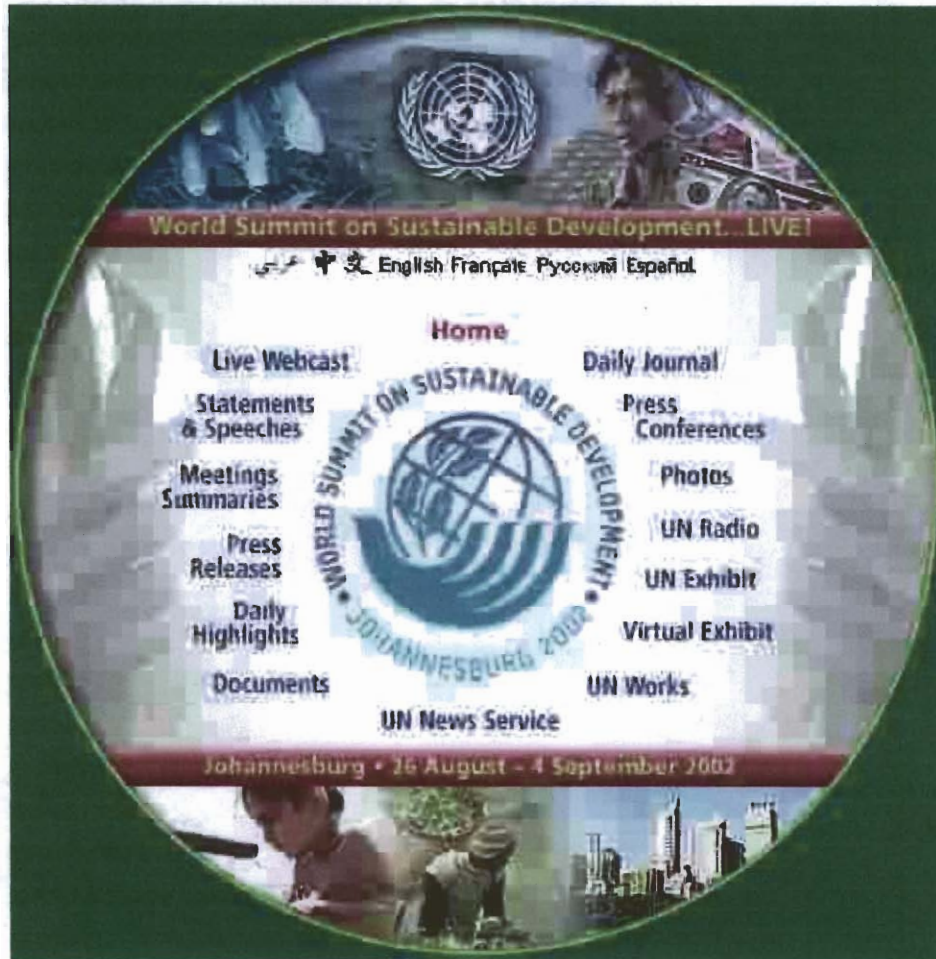
The Online News Association invites entries in nine categories for the [5th Annual Online Journalism Awards](#), presented through a partnership between the ONA and the University of Southern California's Annenberg School for Communication. Open to both media institutions and individuals worldwide; work must have been published online between July 1, 2003 and June 30, 2004. Deadline extended to **August 10, 2004**.

NEW HORIZONS FELLOWSHIPS:

The Council for the Advancement of Science Writing offers [traveling fellowships](#) of up to \$1,000 each to cover the cost of attending its annual [New Horizons in Science Briefing for Journalists](#), taking place this year in Fayetteville, AR, November 6-10. Intended for journalists from publications and broadcast outlets that do not routinely cover major science meetings or employ a full-time science writer. **Deadline:** September 13, 2004.

IRP FELLOWSHIPS:

Early- and mid-career U.S. journalists: apply by **October 1, 2004** for the





United Nations Environment Programme

Division of Technology, Industry, and Economics [DTIE]

Providing an integrated response to environmental issues

About the Division

- *Office of the Division Director*
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- **International Environmental Technology Centre**
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- **Chemicals Branch**
- **Energy and OzonAction Branch**
- **Economics and Trade Branch**

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DTIE Highlights

Seed Awards: APPLY NOW ! deadline 15 August
- *Supporting Entrepreneurs for Environment and Development.*





UNEP Launches Project to Restore Iraqi Marshlands - a multi-million dollar project to restore the environment and provide clean drinking water in the Marshlands of Mesopotamia.
>> Project **vacancy announcement.**

Tracking Progress: Implementing sustainable consumption policies - second edition 2004 published.



Previous highlights ...

DTIE Activities

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- Cleaner Production
- Construction
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Global Environmental Change: Re-thinking the questions

Preface

Risky choices, soft disasters

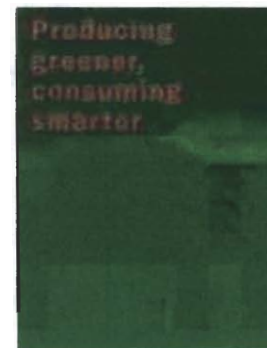
Who governs the global environment?

Producing greener, consuming smarter

The programme

Welcome to the Global Environmental Change Programme, the largest ever social science research initiative in the UK on any issue.

The main feature of this web site is a set of three documents. These summarise, in an accessible form, the most important insights to have emerged from our research. The documents, which can be accessed by clicking on the images below, are organised around the following themes:



You can read the preface to the three documents [here](#). There are **also** PDF versions of the three documents and you can also view a short **video** documentary on each of the three themes.

This site is also an archive of more detailed information about the Programme, with full **search** facilities. This includes:

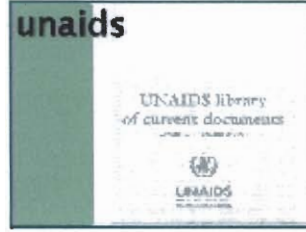
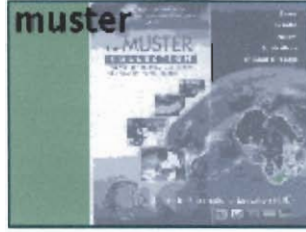
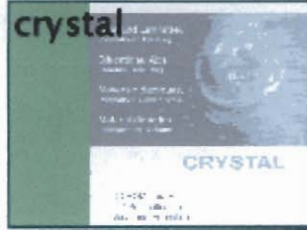
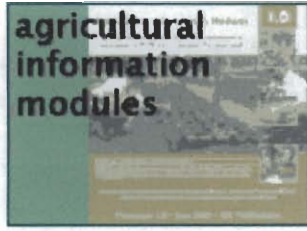
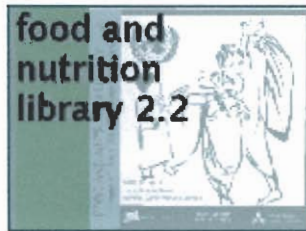
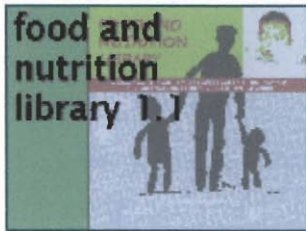
- one page summaries of each of the 150 empirical research projects and Fellowships
- details of over 1000 publications that have been produced as a result of the research
- Programme responses to Government consultations and Parliamentary inquiries
- and a host of other material.

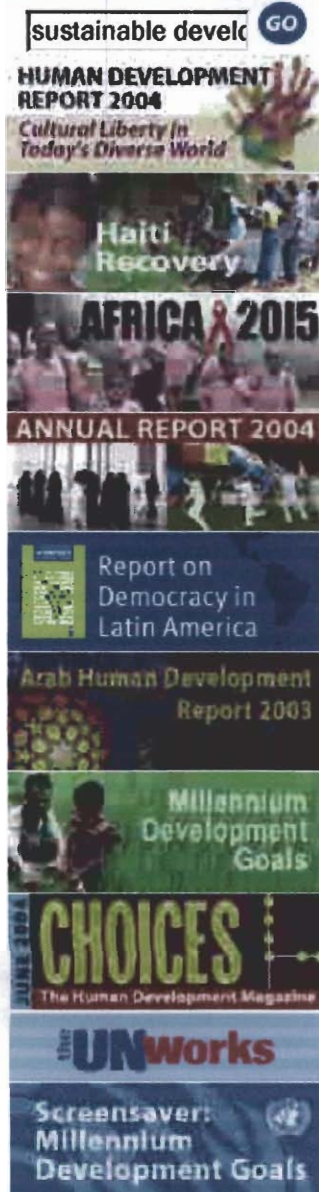
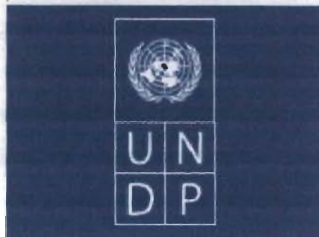


THE NEW ZEALAND DIGITAL LIBRARY

The University of Waikato

humanitarian and UN collections





11 August 2004: **Newsfront will be back in September**

Knowledge Services: Real-time solutions for a developing world

Communities of Practice: Democratic Governance • Poverty Reduction • Crisis Prevention and Recovery • Energy and Environment • HIV/AIDS

Cross-cutting areas: Capacity Development • Gender in Development • Information & Communications Technology

In Brief:

• **World community appeals for \$97 million to provide food for Kenya - 11 August 2004:** UN agencies and Kenya appealed for US \$97 million to buy food and other relief supplies for the estimated 2.3 million people in the country facing acute food shortages brought about by irregular rainfall. The request covers the next six months with relief efforts focusing on food, health, water and sanitation, education, agriculture and livestock and coordination and support services. UNDP is among the UN agencies working with the Kenyan Government to improve the situation. [More...](#)

• **Azerbaijan de-mining programme builds on experience – 11 August 2004 :** Azerbaijan is introducing a remote-controlled mechanical mine sweeper to clear lands for agriculture and cattle-breeding that will significantly speed up the de-mining process. Supported by the European Commission, Italy and UNDP, the Azerbaijan initiative has built on Croatia's experience in mine clearance, and, according to Emil Gasanov, Operations Manager for the Azerbaijan National Agency for Mine Action, "it will take us a day now to clear mines from a territory that in the past took us a week to clean up." [More...](#)

• **Bosnia and Herzegovina film award to boost environment - 10 August 2004:** The Sarajevo Film Festival, in cooperation with UNDP, will award US\$5,000 for the best short film promoting the environment. Aiming to spur support for environmental protection, the award will be presented on 28 August at the closing ceremony of the 10th Sarajevo

UNDP Worldwide

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- UNIFEM
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- Online Volunteering
- South-South Cooperation
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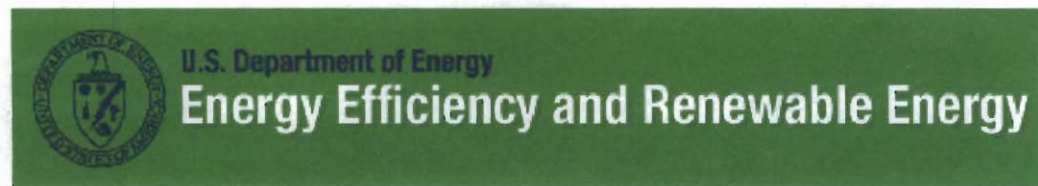
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