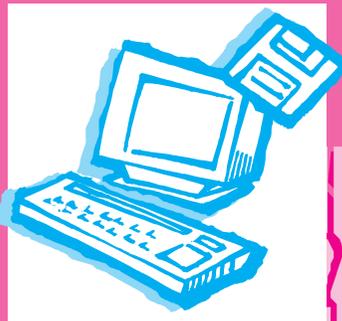




# Pollution Prevention Incentives for States (PPIS) Grant Program Assessment Study



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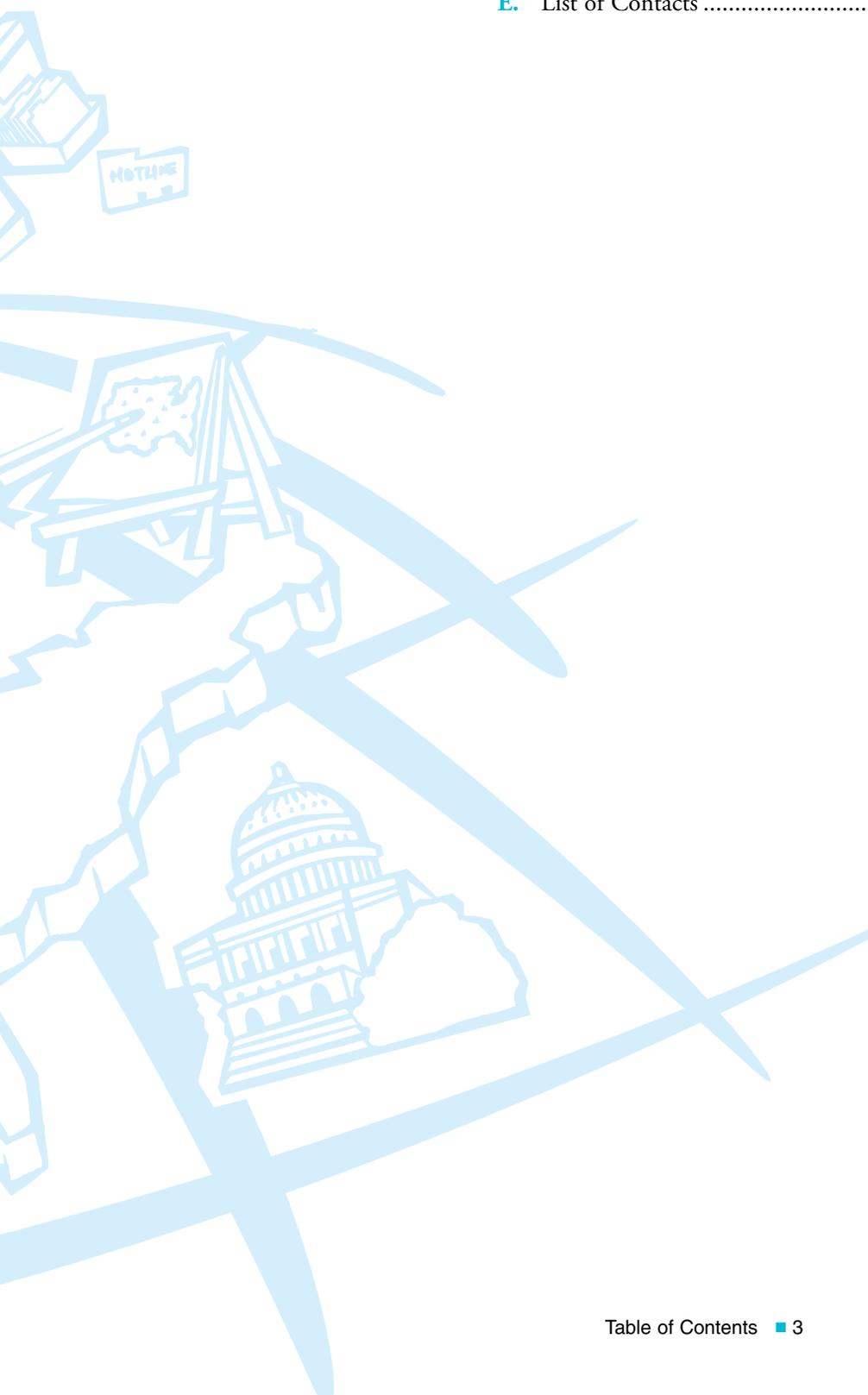
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## Chapter I

# Introduction

**A**s an initial step in EPA's long-term strategy to evaluate the Pollution Prevention Incentives for States (PPIS)<sup>1</sup> grant program, this report documents the full range of activities funded by the PPIS grant program during the first five years. All of the information presented in this report is based solely on interviews or materials prepared by the grantees themselves. This report does not attempt to compare or rate state programs, nor is the study designed to evaluate the effectiveness of specific activities funded by the grant. This report represents an accounting of how grantees used EPA funds to stimulate and enhance pollution prevention awareness and initiatives throughout the country.

In 1994, the General Accounting Office (GAO) studied 107 state programs that were funded, in part, by PPIS funds to assess how well these programs are implementing the federal pollution prevention strategy.<sup>2</sup> While it is not EPA's formal response to the GAO study, this report does attempt to answer similar questions to those raised by GAO, such as:

- Are states using PPIS funding to support activities that promote pollution prevention?
- How are states combining regulatory and voluntary approaches towards pollution prevention?
- Do PPIS grants support the establishment of sustainable pollution prevention programs at the state level?

The conclusions from this report and GAO's report may differ given the different people interviewed. While the GAO report surveyed contacts from state programs from a list provided by the National Pollution Prevention Roundtable, this study draws on material obtained from the grant recipients themselves. Furthermore, the GAO report failed to link the different activities at the pollution prevention programs to specific funding sources. For example, states may provide recycling assistance, but

this activity is not necessarily funded with PPIS funds. This report only looks at the PPIS-funded portion of state programs to answer the above-mentioned questions.

The remainder of this chapter presents background information on the PPIS grant program, describes the purpose and scope of the study, recounts the methodology and data sources used, identifies study limitations, and overviews the contents of the remainder of the report.



## A. Background on PPIS Grant Program

EPA established the PPIS grant program with the philosophy that states should play a primary role in encouraging industry, small and medium-sized businesses, local governments, and the public to shift priorities from pollution control to pollution prevention. Because states have more direct contact with generators and hence are more aware of their needs and problems, EPA believes that state-based environmental programs can make a unique contribution to the national effort to promote source reduction.

At the outset of the program in 1989, EPA established several goals, including:

- Empowering states to build a pollution prevention infrastructure;
- Learning from and building upon innovative means of implementing pollution prevention at both state and facility levels;

- Providing resources for pollution prevention technical assistance and training;
- Supporting states in establishing and expanding pollution prevention programs; and
- Fostering federal and state information-sharing and communication.

From these broad goals, EPA developed specific criteria to evaluate grant proposals received from states. According to these criteria, state grant proposals should:

- Target areas for risk reduction and integrate these areas in the state's overall pollution prevention goals and strategies;
- Identify multimedia opportunities;
- Leverage pollution prevention activities of other pollution prevention programs or organizations in the state;
- Identify measures of success;
- Identify a plan for dissemination of results; and
- Identify plans for funding the pollution prevention program over time.

The PPIS grant program has evolved to meet changing needs and priorities. The initial grants awarded in 1989 funded state programs to implement source reduction and recycling programs. After the passage of the 1990 Pollution Prevention Act, EPA changed the name of the program from the Source Reduction and Recycling Technical Assistance (SRRTA) program to the Pollution Prevention Incentives for States (PPIS) program. The new name reflects EPA's increased emphasis on pollution prevention.

In 1992, EPA began encouraging states to build upon and

expand their existing pollution prevention programs. To receive additional funds under PPIS, states would need to show EPA that they were either:

- Integrating pollution prevention into state regulatory programs; or
- Establishing a statewide pollution prevention infrastructure involving all levels of state government, including promoting interagency pollution prevention initiatives with state departments of agriculture, transportation, energy, commerce, and development, and defining the roles of county and municipal governments.

As most states have now developed basic pollution prevention programs, EPA has shifted responsibility for implementing the grant program from EPA Headquarters to the EPA Regions. This shift gives Regions flexibility to focus resources on local priorities. Some regional priorities include:

- **Nonindustrial sectors.** To build a strong pollution prevention infrastructure, some Regions encourage applicants to establish partnerships with state agencies in nonindustrial sectors such as agriculture, energy, health, and transportation.
- **Indoor air quality.** Because people spend as much as 90 percent of their time indoors, some Regions encourage states to demonstrate solutions to indoor air quality problems in both industrial and nonindustrial settings.
- **Environmental justice.** Preventing pollution in low-income and minority neighborhoods is a priority for several EPA Regions. These Regions

give extra weight to grant proposals that plan to integrate pollution prevention and environmental justice.

As the PPIS grant program matures, EPA will place increasing emphasis on evaluation—determining which program components might be most effective in achieving pollution prevention, and establishing measures of program effectiveness. This report represents a first step in measuring pollution prevention progress by documenting grant-funded pollution prevention activities underway in the states. Over the next few years, EPA will continue to measure and evaluate program effectiveness. Specifically, EPA plans to offer technical assistance to the states in pollution prevention measurement and narrow PPIS award criteria to fund the development of measurement methodologies in fis-

cal year (FY) 1996. As EPA awards these grants, the Agency will develop criteria to assess the success of different measurement methodologies. EPA will then use these criteria to evaluate the impact of the PPIS grant program in preventing pollution nationwide.

Measuring program effectiveness and pollution prevention progress has been a persistent problem for state pollution prevention programs. Finite resources, the inherent difficulty in developing measurement methodologies, and limited data have constrained the ability of the states to measure progress. For a more in-depth look at the ways EPA traditionally evaluates program effectiveness and the difficulties in measuring pollution prevention, please see Chapter IV on Measurement.



## B. Purpose and Scope of Report

This report marks the first time that EPA has taken a comprehensive look at state pollution prevention activities funded by the PPIS grant program. Given that the states themselves have only just begun to measure their progress, the purpose of this report is to identify what is happening in the states right now. The next three chapters of this report seek to answer the following questions:

- How much money has EPA invested in state pollution prevention programs and how has this funding changed over time?
- What types of organizations have received funding and where are they located?
- Are the funded programs regulatory or voluntary in nature?

## Redefining the State/EPA Grant Relationship

As part of the Agency's commitment to continually improving government, EPA has established the Performance Partnership Grant (PPG) program. This program will enable states and tribes to combine funds from two or more categorical grants (including PPIS) into a multi-program grant or PPG. Benefits of PPGs include:

- **Increased flexibility.** States and tribes will have the flexibility to address their highest environmental priorities across all media and to establish resource allocations based on those priorities, while continuing to address core program commitments.
- **Improved environmental performance.** States and tribes can more effectively link program activities with environmental goals

and program outcomes as well as develop innovative pollution prevention, ecosystem, and community-based strategies.

- **Administrative savings.** Recipients and EPA can reduce administrative burdens and costs by greatly reducing the numbers of grant applications, budgets, workplans, and reports.
- **Strengthened partnerships.** EPA will develop partnerships with states and tribes where both parties have the same environmental and program goals and deploy their unique resources and abilities to accomplish these goals.

EPA will begin piloting the PPG program in FY96.

- What return did EPA receive on its investment (measured by what activities the grantees implemented)?
- How many people were the grantees able to reach?
- How are grantees currently evaluating their programs?
- Are any grantees measuring actual reductions in pollution?

The final chapter—case studies of five state pollution prevention programs—examines the role of PPIS funding in each of these states and places PPIS funding in the greater context of state pollution prevention activities. The chapter also evaluates whether or not EPA achieved, in each of these states, the objectives established at the outset of the grant program.

This study does not attempt to compare state programs or rank states in any manner. Descriptions of different programs are provided to illustrate alternative models of implementing pollution prevention programs. This report is not intended to rate state programs, neither does it evaluate the effectiveness of specific activities (such as a newsletter, manual, or training session) conducted under the grant. Rather, EPA seeks to narrate grant activities as reported by the grantees.

The report covers SRRTA and PPIS grants awarded from 1989 through 1993. Other EPA pollution prevention sector grants were excluded, such as the National Industrial Competitiveness through Efficiency: Energy, Environment, and Economics (NICE3); Agriculture in Concert with the Environment (ACE); Risk

Reduction through Pollution Prevention (R2P2); Municipal Water Pollution Prevention (MWPP); and grants awarded through EPA's media programs. In addition, because grants awarded in FY94 were in the early stages of implementation during the data-collection phase of this study, they were not included.



## C. Methodology and Data Sources

EPA employed the following methodology to collect information on PPIS-supported activities. For Chapters II through IV, which examine PPIS-funded activities nationwide, EPA conducted comprehensive interviews with each grant recipient. These interviews enabled EPA to catalogue the activities supported by the grant, accomplishments, and barriers to implementation. Where possible, EPA collected quantitative measures of activity level for each area of funding. For example, EPA collected data on the number of audits conducted, case studies developed, training sessions held, and other parameters. EPA also asked questions designed to elicit information on the impact of these activities. For example, if states conduct waste audits for industrial facilities, EPA asked if they track whether or not the facilities actually implement state-recommended pollution prevention measures. Furthermore, for those states that do track whether or not the facilities implement recommendations, EPA also asked the states to describe the

fiscal and environmental impact of implementing the recommendations, as reported by the facilities. To determine why states might not conduct such follow-through activities, EPA asked states to describe the barriers to facility followup. In addition to the quantitative measures described above, EPA asked grant recipients to describe examples of successes they had in implementing their grants. The interviews also tracked the industries or sectors (e.g., electroplating, agriculture, small businesses) that different grant activities targeted.

Before conducting the interviews, EPA reviewed all available in-house information contained in EPA's Pollution Prevention Information Tracking System (PPITS). This system contains data from the grant application and semiannual progress reports, including award amount, activities funded, and accomplishments. EPA also reviewed, where available, final reports and other documentation that grant recipients supplied.

Five Regions participated in the development of the case studies. The pollution prevention coordinator from each of these Regions selected a representative state from their region. For each case-study state, EPA reviewed in-house information and conducted comprehensive interviews to assess the impact of PPIS grant funding. In these interviews, EPA used a standard list of questions to assess:

- The organizational structure of each program;
- The current budget and sources of funding;
- Pollution prevention legislation and strategies in place;

- The activities accomplished with PPIS funding;
- The impact of PPIS funding on developing a self-sustaining program, integrating pollution prevention into the regulatory program, and evaluating success; and
- The future direction of the program.



## C.1 Limitations

The reader should keep in mind some limitations when considering the findings presented in this report. One limitation relates to the type of data that EPA collected. Not all states track the same information. Some states have much more detailed information, on both the number of activities supported and the impacts of these activities on preventing pollution. For example, one state might collect detailed data on the number of workshops sponsored, record the exact number of attendees, and follow-through to determine whether or not the attendees actually implemented any pollution prevention actions as a result of the workshop. Other grant recipients, however, may track only the number of workshops and a range of attendees. Implications of this situation

are twofold. First, the report might underestimate the number of activities supported by PPIS funds. Second, the report presents a quantitative measure as a range of activity because EPA does not have exact numbers. Additional data limitations include the following:

- Four states representing six grants could not be interviewed for the study due to scheduling difficulties;
- Some progress reports and final reports could not be obtained; and
- Some of the grants were still in progress at the time the study was concluded, and thus all tasks were not completed.



## D. Outline of Report

The remainder of this report presents EPA's assessment of the PPIS grant program, and it is organized as follows:

- **Chapter II** provides an overview of the distribution of PPIS funds from 1989 to 1993. To frame the context of PPIS funding, the chapter also briefly examines other state pollution prevention funding sources, such as state general funds and hazardous

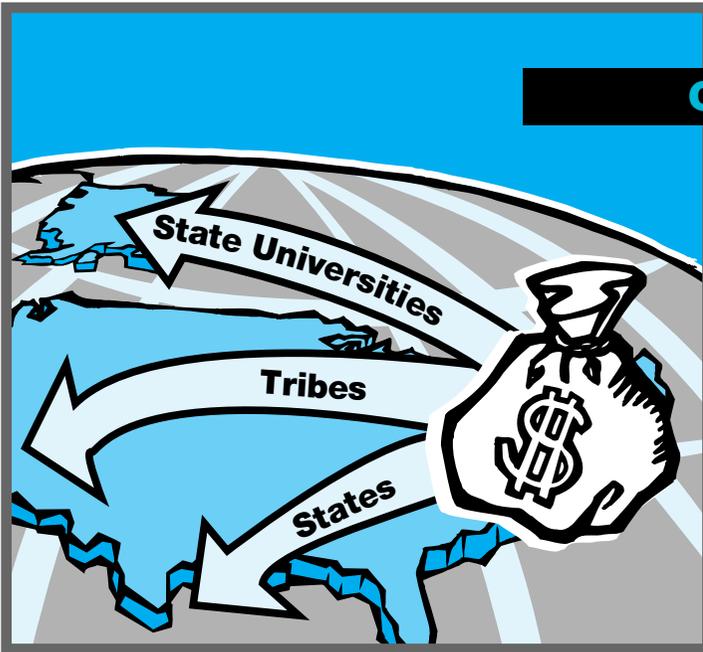
waste fees. The distribution of grant funding across EPA Regions, states, and organization type is also described.

- **Chapter III** identifies the types of businesses and industry sectors that the state programs target, and summarizes the activities that the PPIS program supports (e.g., workshops, demonstration projects, clearinghouses) and the types of programs supported (e.g., voluntary, regulatory).
- **Chapter IV** examines how grantees measure the effectiveness of their programs, including the actions they take to follow up on their program activities (e.g., audits, training) to see if facilities actually implement pollution prevention measures. The chapter also describes the barriers and problems that grant recipients face in conducting followup activities.
- **Chapter V** illustrates how the PPIS grants supported pollution prevention activities in five states. These in-depth case studies examine how the PPIS grants were integrated into the states' pollution prevention programs and highlight the effectiveness of the grants in building infrastructure and self-sustaining programs.

<sup>1</sup> EPA initially called the grant program the Source Reduction and Recycling Technical Assistance (SRRTA) program. Throughout this report, PPIS refers to both PPIS and SRRTA grants.

<sup>2</sup> General Accounting Office. 1994. Pollution prevention: EPA should reexamine the objectives and sustainability of state programs. GAO/PEMD-94-8. January.

# Allocation of PPIS Grant Awards



Since the inception of the grant program in 1989, EPA has awarded approximately \$24 million through 1993. Grant recipients and other partners (e.g., local governments, industry) have supplied over \$16 million in matching funds for a total funding amount of approximately \$40 million.

This chapter overviews the distribution of PPIS funds from 1989 to 1993 and is divided into the following sections:

- Organizations funded;
- Types of programs funded; and
- Distribution of grant funding by EPA Region and state.



### A. Organizations Funded

Applicants eligible for PPIS funding include:

- The 50 states;
- The District of Columbia;
- The U.S. Virgin Islands;
- The Commonwealth of Puerto Rico;
- Any territory or possession of the United States;
- Any agency or instrumentality of the states, including state universities; and
- Federally recognized Indian tribes.

Although local governments, private universities, private non-profits, private businesses, and individuals are ineligible for PPIS funding themselves, EPA strongly encourages them to team up with eligible applicants in developing proposals.

Over the 5-year grant period, PPIS funds were distributed to four categories of recipients:

- **State environmental/health agencies**, such as state departments of environmental quality

and protection and state health departments;

- **Other state agencies**, such as state departments of education;
- **Universities** that manage research-oriented grants, work through extension programs, or operate their own technical assistance programs;
- **Indian tribes**, which include the Navajo EPA, the All Indian Pueblo Council, and many individual tribes; and
- **Other** nonstate groups or organizations, such as the New England Waste Management Officials Association (NEW-MOA), the District of Columbia, and the American territories.

State environmental and health agencies received the most funding by far (see Exhibit II-1); their 5-year total reaches close to \$18 million, or 71 percent of all PPIS funds. Universities received the second greatest portion of grant monies (approximately \$3 million, or 13 percent of total funds). Other state agencies received 7 percent of total funding, and Indian tribes and other nonstate organizations (such as regional organizations and territories) received 3 and 6 percent of PPIS grant funds, respectively.

The distribution of PPIS funding to these categories of recipients fluctuated somewhat over time. State environmental and health agencies, however, accounted for the majority of all grant monies issued each year. In 1989, PPIS grants were distributed almost exclusively to state environmental and health agencies with only one

exception: the New England Waste Management Officials Association received a \$305,525 grant to develop the Northeast States Pollution Prevention Roundtable. Over time, other organizations began to receive more funding. For example, in 1990, university programs received a substantial quantity of funding and have continued to receive PPIS monies every year since. Not until 1992 did Indian tribes begin to receive funding to establish pollution prevention programs. In 1993, the amount of grant monies awarded to tribal organizations more than doubled from the previous year and exceeded the funds issued to all other nonstate groups. In addition, the number of tribal organizations receiving PPIS funds increased from one tribe in 1992 to seven in 1993.



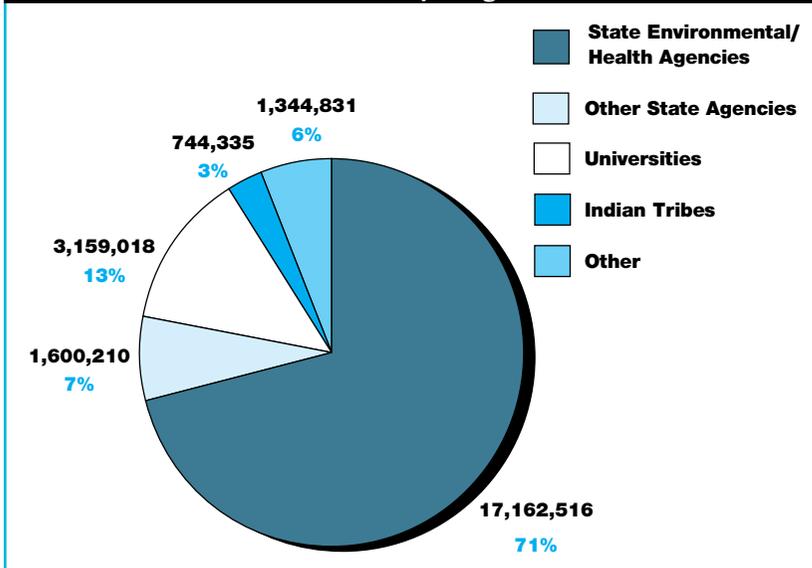
## B. Types of Programs Funded

As described in Chapter I, one of the initial goals of the grant program was to fund states to provide technical assistance and outreach to targeted industries on pollution prevention. EPA designed the program to concentrate early efforts on publicizing pollution prevention, believing that businesses would reduce waste voluntarily once they learned the benefits and cost savings associated with pollution prevention. Thus, voluntary programs that either provide their services (e.g., technical assistance audits, training, presentations) upon request or offer them to industry and the public on an elective basis received the most funding. These programs accounted for 62 percent of PPIS funds awarded between 1989 and 1993.

As state programs gained experience, they discovered that to build successful programs they

**Exhibit II-1**

**Distribution of PPIS Funds, by Organization**

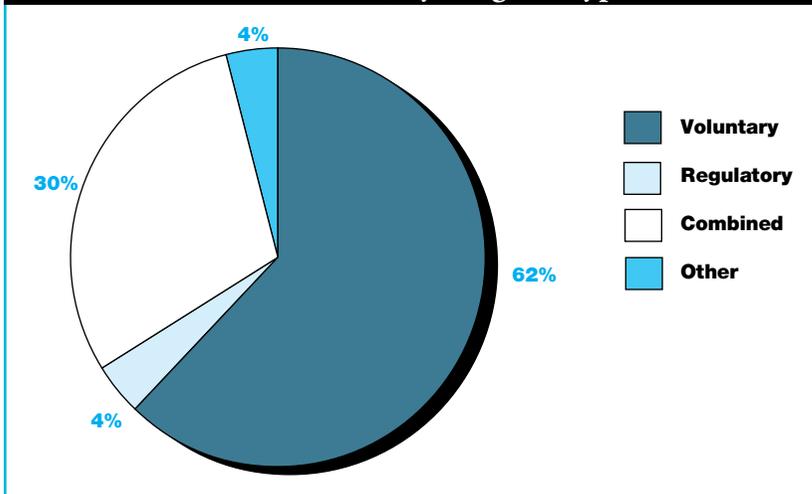


would need to better educate their own regulatory staff. By training state regulatory staff, many states believed that they could provide pollution prevention incentives through regulatory mechanisms. Thus, many programs contained both voluntary and regulatory elements. For example, the Connecticut Department of Environmental Protection (DEP) used its 1991 PPIS grant to fund several outreach activities, such as making presentations to industry, developing fact sheets, and training permit writers in pollution prevention. Over a quarter of PPIS funds supported these combined programs. Since most grantees combined regulatory integration projects with voluntary activities, strictly regulatory programs received only 4 percent of total grant monies.

PPIS monies also funded research programs (4 percent). For example, the Iowa Waste Reduction

### Exhibit II-2

#### Distribution of PPIS Funds, by Program Type



Center studied the impact of toxic waste on stream life as part of a project to identify and reduce toxic industrial discharges to small wastewater treatment systems. Exhibit II-2 shows the distribution of PPIS grants among various program types.

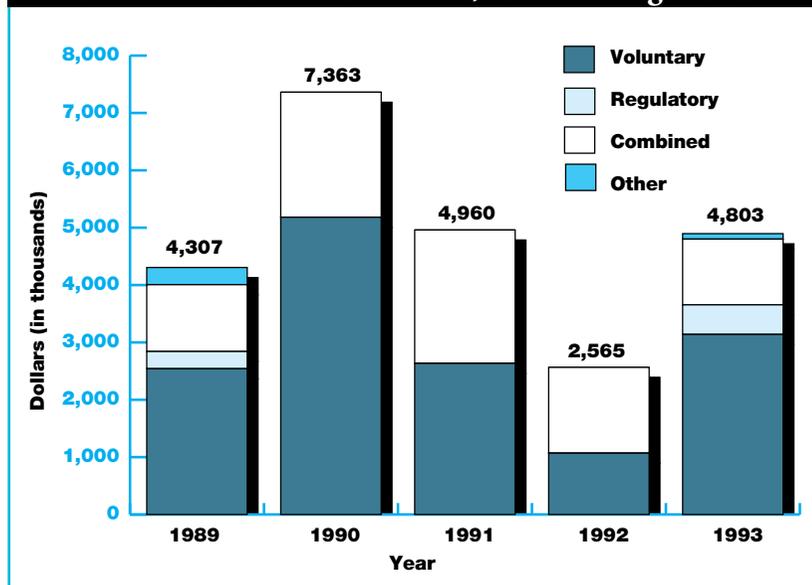
From 1989 to 1993, funding allocated for regulatory integration

projects increased (see Exhibit II-3). In 1993, a total of \$516,000 was allocated for four regulatory projects (e.g., attempts by the Louisiana Department of Environmental Quality [DEQ] to incorporate pollution prevention into inspections), while in 1989, only one grant of \$300,000 was allocated for similar projects.

Although the 1993 allocation supporting regulatory integration initiatives is not substantially higher than the 1989 award, the 1993 grants were awarded to multiple projects across several states rather than to one program. The trend over the first five years suggests a movement away from strictly voluntary or technical assistance and outreach programs and toward increased regulatory integration. This trend continued throughout 1994 and 1995: nearly 20 percent of PPIS grants awarded in each of these years supported regulatory integration projects.

### Exhibit II-3

#### Nature of PPIS Grants Over Time, 1989 Through 1993



### C. Distribution of Grant Funding by EPA Region and State

Exhibit II-4 illustrates the total PPIS funding by year. EPA funding peaked in 1990, when over \$7 million in grant monies were awarded. Funding was more moderate in 1991 (approximately \$5 million), a trend that continued in 1993. This gradual increase in funding over the 1989 level was, however, broken in 1992, when only \$2,565,000 was awarded. During 1992, EPA reduced the PPIS grant funding to support pollution prevention in other targeted sectors in the states. For example, EPA awarded \$450,000 to five states to support pollution prevention at publicly owned treatment works (POTWs).

Just as the total amount of PPIS dollars distributed each year has increased, so has the total number of grants awarded. In fact, the number of grants awarded annually has increased substantially from 14 in 1989 to 52 in 1993. Within the past five years, EPA has awarded grants to 124 organizations.

At the outset of the program, EPA funded fewer organizations with larger grants (most were approximately \$300,000). As EPA began funding more programs per year, the amount of each grant awarded decreased. Whereas the majority of the early grants provided seed money for nascent pollution prevention programs, more recent grants have helped states implement special pollution prevention projects.

Exhibit II-4

Total PPIS Funding by Year

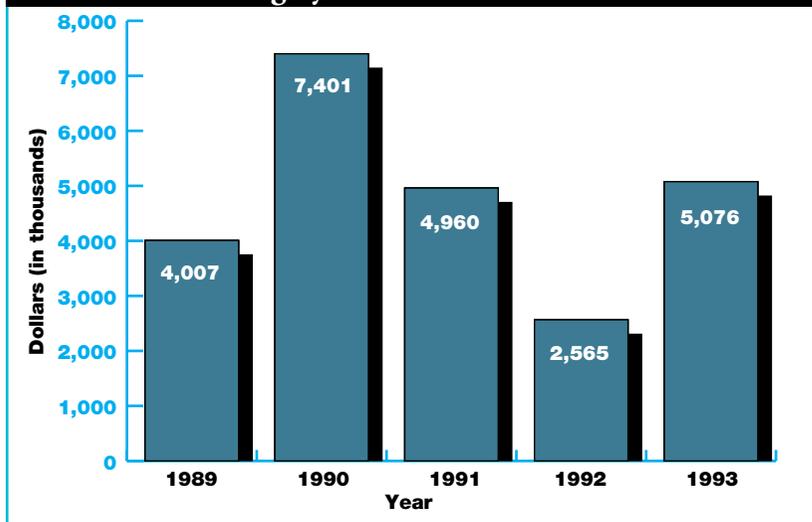


Exhibit II-5 depicts the Regional distribution of PPIS funds from 1989 through 1993. With the exception of Region 1, total grant funding by Region was relatively equal. Most Regions received between \$1 and \$3 million in total grant funding. Region 1 received slightly more grant funding than other states since many of its states have been on the forefront of the pollution prevention movement. States in this Region received several early grants to test innovative ideas. This trend continued over the years as EPA continued to fund the expansion of these programs.

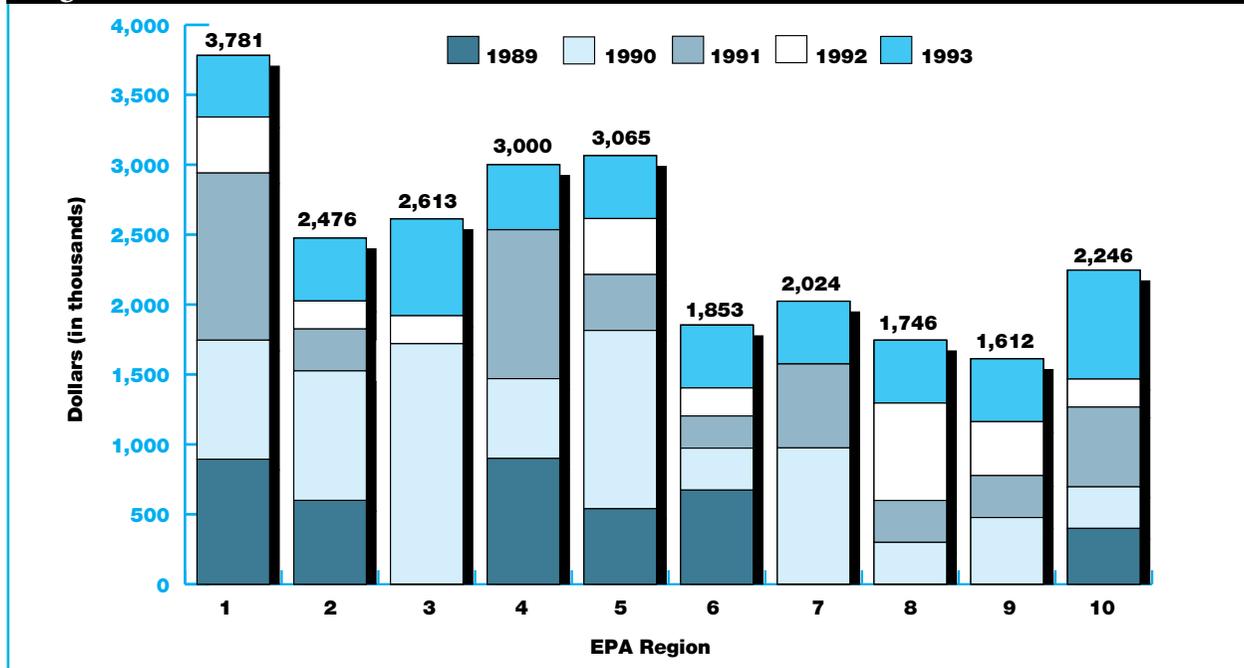
The distribution of grant funding in any particular year was less balanced. An understanding of the award process can explain disparities among the EPA Regions in any given year. In the first four years of the program, EPA Headquarters distributed the grants through a centralized, competitive process. An expert review panel (consisting

of Headquarters and Regional staff) evaluated all proposals. For the 1993 grants, EPA decentralized the grant award process and delegated responsibility to each Regional office to enable the Regions to fund regional pollution prevention priorities.

EPA awarded some level of PPIS funding to all 50 states over the 5-year period under consideration. Early leaders, such as New York and New Jersey, received proportionately more funding due to their pioneering efforts developing innovative pollution prevention programs. New York and New Jersey, as well as Rhode Island and Massachusetts, were among the first states in the country to establish broad-based pollution prevention programs. Consequently, these states applied for and received funding in the first year of the PPIS program. These states continued to build and expand their pollution prevention programs, thereby receiving addi-

## Exhibit II-5

### Regional Distribution of PPIS Funds



tion grant support in subsequent years. Note that, in addition to state environmental agencies, other groups such as state universities, Indian tribes, and other state government organizations received funding in each of the states receiving the most funding. Exhibit II-6 shows the five states that received the most funding, accounting for over 15 percent of total funding.

In contrast, other states received more limited funding from 1989 to 1993. For example, New Mexico received \$58,000 over the entire 5-year period. Similarly, Hawaii received \$185,000 in total funding between 1989 and 1993. In addition to the reasons given above, disparities in funding to individual states may be attributed to several factors, including:

- States' budgets could not meet the matching requirements necessary for a large PPIS grant,

particularly when the matching requirement was raised by Congress to 50 percent in 1992;

- Some states are more industrial than others, making pollution prevention a more salient issue and thus prompting requests for large grants; and
- The competitive award process used by EPA before 1993 gave an advantage to states who had

begun their pollution prevention programs first.

Appendices A-C show the distribution of funding to each state by Region and include detailed breakdowns of annual funding awards.



## Exhibit II-6

### Top Five Recipients of Total Funding, 1989 Through 1993

State	Number of Grants	Total Funding
New York	6	\$1,342,548
New Jersey	4	\$1,132,944
Rhode Island	3	\$800,000
Massachusetts	5	\$791,294
Iowa	4	\$724,378

# Summary of PPIS Grant Activities

This chapter documents the wide range of pollution prevention activities implemented by PPIS grantees. In the time period of the study, PPIS grant monies funded nearly 5,000 assessments, more than 850 workshops, and the development of 370 pollution prevention case studies. In addition, PPIS grantees' efforts reached companies in 35 industry sectors, as well as many other groups. Such a breadth of activities illustrates not only the efforts of grantees to disseminate the pollution prevention message to a wide and varied audience, but also the aggressive role states have assumed at the forefront of the pollution prevention movement. The diversity of projects implemented also indicates that grantees addressed several different areas of need within their particular states, thereby fulfilling the intent of the 1990 Pollution Prevention Act.

According to the grantees interviewed for this study, PPIS grants also helped businesses improve the environmental and economic effects of their operations. In some cases, PPIS grantees's efforts achieved substantial cost savings for businesses. For example:

- Businesses that received assistance from Kentucky Partners were able to save approximately \$3 million annually by implementing pollution prevention measures;<sup>1</sup>
- Florida's Waste Reduction Assistance Program (WRAP) has saved businesses \$3.7 million;<sup>2</sup>
- Companies receiving technical assistance from Alabama's Waste Reduction and Technology Transfer (WRATT) program save an average of \$160,000 each;<sup>3</sup> and
- Iowa WRAP has helped businesses in Iowa save more than \$1.5 million annually.<sup>4</sup>

In terms of environmental benefits, some PPIS grantees demonstrated significant results. For example:

- Tennessee showed a decrease in toxic releases of up to 42 percent;<sup>5</sup>
- West Virginia experienced a 53-percent decrease in toxic releases;<sup>6</sup> and
- Rhode Island's PPIS program eliminated 3.4 million pounds of liquid waste and 20,000 pounds of solid waste.<sup>7</sup>

This chapter describes in detail the groups targeted and activities conducted.



## A. Targeted Groups

The 1990 Pollution Prevention Act required that all grants awarded through the matching grant program be targeted to the groups most in need of pollution prevention assistance. Overall, the majority of PPIS grants have been targeted to small and medium-sized businesses and industries, on the assumption that these organizations often do not have the resources to identify and evaluate pollution prevention opportunities on their own. From 1989 through 1993, PPIS grants reached over 35 industry sectors, as well as nonindustrial groups such as universities, Indian tribes, trade associations, and schools. The industry sectors most commonly targeted by PPIS grants include:

- Automotive;
- Printing;
- Dry cleaning;
- Metals manufacturing;
- Agriculture; and
- Painting.

For a detailed breakdown of groups targeted by PPIS grantees see Appendix D.

The grantees commented that by focusing on high-priority industry sectors, they can target their efforts and resources effectively. Many grantees believe that educating industry about stopping the generation of waste at its source is the key to pollution prevention. The grantees also indicated that targeting nonindustrial groups, such as schools and environmental groups can also be useful for disseminating information and instilling the pollution prevention ethic in the general population. As shown below, PPIS-funded activities from 1989 to 1994 attempted to address a wide range of audiences by implementing a diverse mix of program activities.

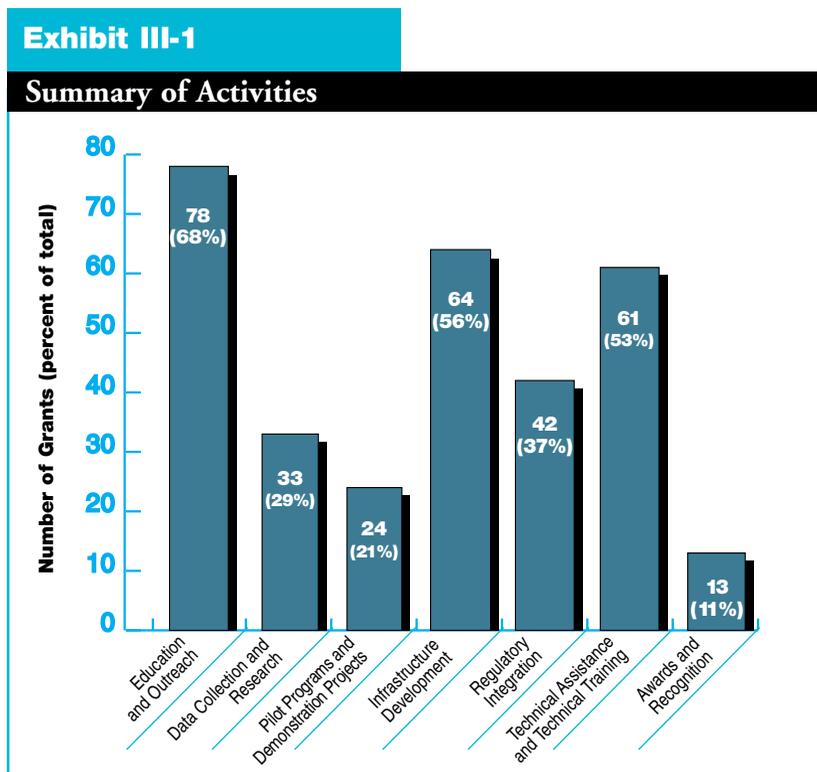


## B. Range of Activities Conducted

This section describes the range of activities conducted by PPIS grant recipients.<sup>8</sup> Categories of activities include:

- Education and Outreach;
- Data Collection and Research;
- Infrastructure;
- Technical Assistance and Technical Training;
- Pilot Programs and Demonstration Projects;
- Awards and Recognition; and
- Regulatory Integration.

Exhibit III-1 shows the percentage of grant recipients implementing each type of activity. The remainder of this chapter describes each activity in detail.



## B.1 Education and Outreach

As shown in Exhibit III-1, nearly all programs dedicate some resources to education and outreach activities. These initiatives, designed to heighten public awareness of pollution prevention, are implemented through a variety of projects, as illustrated in Exhibit III-2.

As shown in Exhibit III-2, workshops and seminars are the most frequently implemented form of education and outreach activities, conducted by 66 grantees (57 percent). These workshops may educate participants on topics such as conducting pollution prevention audits, current hazardous waste regulations, and cost savings through pollution prevention.

Presentations are also an extremely popular outreach activity, conducted by 41 grantees (36 percent). Presentations frequently target various industry sectors (see Appendix D for a description of industries targeted), state environmental managers, and trade associations. Topics are similar to those of PPIS-funded workshops and seminars. The prevalence of these activities is most likely attributable to the fact that they are quick, easy ways to directly disseminate pollution prevention information to businesses, industries, and the general public.

Grantees also developed and distributed a large quantity of printed outreach materials such as case studies and fact sheets. These materials might document the pollution prevention and cost-savings successes of companies, or provide

general suggestions for how facilities can reduce hazardous waste at its source. Grantees noted that outreach documents are relatively simple methods of sharing pollution prevention information.

Some grantees have placed particular emphasis on such education and outreach areas as developing targeted materials or sponsoring teleconferences. For example, the Virginia Department of Environmental Quality's (DEQ's) Office of Pollution Prevention (OPP) has taken a broad approach to developing outreach materials and tries to tailor each item for its intended audience. OPP has produced two videos—one for medium-sized lithographic printers and one for manufacturers in Virginia—which have been distributed to over 450 companies throughout the

state. In addition, OPP used PPIS funds for two large pollution prevention posters targeted to automotive industries and general industrial audiences. The program has distributed over 10,000 posters to date.<sup>10</sup>

The Montana State University Extension Service (MSUES) targeted its 1992 and 1993 PPIS grants to the automotive and drycleaning industries. To educate these industries about pollution prevention opportunities, MSUES has produced a set of fact sheets, a video, and vendor and product lists targeted to each industry. In addition, the grantee conducted two demonstration assessments and held 22 workshops (attended by a total of 443 people) for the industries.<sup>11</sup>

Two of the more innovative outreach materials that MSUES developed are self-assessment checklists

### Exhibit III-2

#### Education and Outreach Summary

Education and Outreach Activities	Number of Grants	Number Developed With PPIS Funds
Brochures/Pamphlets/ Fact sheets	55	180
Case studies	36	370
Curricula	12	63
Conferences/ Teleconferences	57	81
Directories	7	8
Guidance materials/ Worksheets	57	91
Newsletters/Articles	33	84
Presentations	41	769
Public service announcements	4	175 <sup>9</sup>
Videos	22	73
Waste exchanges	5	6
Workshops/Seminars	66	858

for drycleaners and automotive workers. The checklists assist the targeted groups in evaluating pollution prevention opportunities in their facilities and provide helpful hints for hazardous waste avoidance.

The Tennessee Department of Environment and Conservation, through the University of Tennessee's Center for Industrial Services, concentrated its PPIS outreach efforts through video teleconferencing. The program developed and produced three national teleconferences on the following pollution prevention topics: solvents alternatives, painting challenges of the 1990s, and promotion of landfill alternatives for solid waste. Each teleconference was downlinked by at least 40 states, thereby reaching 3,000 people per event. According to the grantee, the teleconferences were very well received. Based on feedback from the attendees, the Department of Health and Environment believes that the conferences had a significant impact on pollution prevention, not only in the state but nationally as well.<sup>12</sup>

Newsletters also are a popular way for state pollution prevention programs to disseminate information to industry, other programs and agencies, and other states. Erie County, for example, sends its newsletter to both small and large businesses in targeted industry groups. The county developed its mailing list from community sources including chamber of commerce directories, business indexes, and standard "yellow pages." In addition, the county used regulatory databases to target larger businesses and industries.<sup>13</sup>

Frequently, newsletters feature case studies of companies that have benefitted from pollution prevention program efforts, articles about pertinent regulations and legislation, and notices of upcoming educational and outreach events. These newsletters are generally free to interested parties within the grantees' states and offered either at no cost, or for a nominal fee, to out-of-state subscribers. Approximately 25 percent of PPIS grant recipients published newsletters, many with remarkably high circulations.

For example, Kentucky Partners, Kentucky's state pollution prevention center, published over 27 issues of their newsletter, "The Waste-Line," and distributed each issue to a mailing list of approximately 7,000 people.<sup>14</sup> Similarly, the Erie County Department of Environment and Planning distributed five industry-specific and one general pollution prevention newsletter to 4,500 people quarterly.<sup>15</sup> Finally, the New York State Department of Environmental Conservation's newsletter, published twice yearly, is distributed to a mailing list of 8,000 people.<sup>16</sup>



## B.2 Data Collection And Research

PPIS supports a variety of data collection and research initiatives to evaluate the usefulness of current pollution prevention methods and to increase knowledge about new pollution prevention technologies. The research projects PPIS has funded may eventually help grantees further pollution prevention efforts, both in their states and nationally. These efforts frequently include the activities shown in Exhibit III-3.

PPIS funds support research both in the laboratory and in the field. For example, inspired by the terms of the Montreal Protocol, which will effectively eliminate the use and manufacture of chlorofluorocarbon (CFC) based cleaning solvents by 1995, the Navajo Nation is researching alternative cleaning solvents. The proposed research and development work will be performed to identify, quantify, and implement the best alternatives to chlorinated and fluorinated cleaning industrial solvents. The goal is

### Exhibit III-3

#### Data Collection and Research Summary

Data Collection and Research Activities	Number of Grants	Percent of Total Grantees
Data collection and analysis	23	20
Database development	16	14
Studies	12	10
Surveys	19	17

to develop an alternative, environmentally benign industrial solvent to eliminate industrial contaminants such as solder flux, mold release, resins, curing agents, cover coats, waxes, greases, oils, lubricants, and other similar contaminants found in a typical manufacturing environment. The Navajo Nation hopes that this research will eventually help prevent pollution within Navajo lands as well as in other areas across the country.<sup>17</sup>

On the other hand, Rhode Island's PPIS-funded research focuses more on the issues affecting one specific industry—the textile industry. The research, conducted by the Rhode Island Department of Environmental Management (DEM), included the following research components:

- Researching and identifying regulatory and policy initiatives that would encourage textile companies to incorporate source reduction measures and technologies into their process and facility operations;
- Identifying Rhode Island textile plants that represent the greatest potential risk to health and the environment through a comprehensive statewide survey, analysis of chemical release and offsite transfer data, and a review of the regulatory history of facilities;
- Researching, identifying, and evaluating cost-effective management and process operational methods, material substitutions, and technologies that could be used to reduce air/water releases and offsite transfers in facilities that represent the highest potential environmental risk; and

- Analyzing textile industry discharges for toxicity.<sup>18</sup>

The DEM hopes that these research endeavors will expand the knowledge base and technical resources available to Rhode Island textile companies to reduce pollutants at their source.<sup>19</sup>

The focus of the West Virginia Department of Environmental Protection's PPIS grant is to produce the annual *West Virginia Scorecard*. *Scorecard* is a document designed to provide the public with an annual review and analysis of Toxic Release Inventory (TRI) data from all reporting industries, highlighting the 28 major chemical companies in the state. It examines trends in toxic chemical releases across the state by region, industry sector, and medium of release. Information on the release of known or suspected carcinogens as a subset of total releases is also provided.

Collection and analysis of the data are voluntary efforts jointly conducted by chemical industry representatives, state environmental personnel, nongovernmental organizations, and citizen activists. In addition to reporting emissions data, companies participating in the *Scorecard* project also provide narrative statements about their facilities, in which they enumerate their goals for environmental performance and are given the opportunity to explain how these goals were achieved or why they may not have achieved their release reduction goals. West Virginia believes that *Scorecard* assists both the public and industry in identifying opportunities for further reductions

in the generation, treatment, and disposal of toxic chemicals.<sup>20</sup>



## B.3 Infrastructure

A major goal of the PPIS grant program was to help states develop the infrastructure necessary to establish a sustainable pollution prevention program. Infrastructure includes time and resources spent on hiring and training staff, developing legislation and regulations that promote pollution prevention, evaluating program effectiveness, and securing funding for the program's future endeavors. EPA believes that developing program infrastructure is critical because it ensures a solid base and continuous support for a state's pollution prevention efforts. Exhibit III-4 lists the range of infrastructure activities conducted through the PPIS grant program.

PPIS funding enabled grantees to build program infrastructure by:

- Hiring 60 staff members;
- Hiring and training 70 interns; and
- Providing 40 internal training sessions.

In addition, many grantees established an advisory committee or workgroup to oversee the establishment of the pollution prevention program. These committees consist of staff from all program areas to give the pollution prevention program a true multimedia perspective and to promote linkages between the programs.

A large component of Georgia's PPIS-funded program involved a

series of task force and advisory committee meetings, which eventually led to the institutionalization of the program in 1993. Three different groups were central to Georgia's infrastructure-building endeavors. One group, the Environmental Protection Division (EPD) New Industry Team, was used to foster a working relationship with Georgia businesses. The team informed new industries of the state's pollution prevention efforts and of available technical assistance to encourage new industry prospects to design facilities that incorporate pollution prevention and waste minimization into their operations.

Another Georgia group supported by PPIS funding was EPD's Pollution Prevention Strategy Task Force. Throughout its 16 meetings, the task force developed EPD's strategy for integrating pollution prevention into regulatory programs. Eleven multimedia staff participated in a survey to assess EPD-wide pollution prevention training, information distribution, and relevant regulatory actions. The result of the task force's efforts was a

strategy that included an emphasis on a multimedia pollution prevention approach to regulatory action, increased staff training, and creation of a new EPD culture that promotes pollution prevention over pollution control.

EPD's Pollution Prevention Advisory Committee, a group consisting of representatives from several key organizations in state government, was active in evaluating the pollution prevention efforts of EPD. After frequent meetings, the committee produced a matrix of statewide pollution prevention and waste minimization activities. The matrix examined activities across seven sectors of the division, assessed each one, and assigned an effectiveness rating. The committee then made recommendations to improve the function of Georgia's pollution prevention efforts.

The efforts of EPD's various committees served to create and strengthen its pollution prevention program. In 1993, legislation was passed creating the Pollution Prevention Assistance Division (P2AD) in the Georgia Department of Natural Resources.

According to the grantee, "whereas the purpose of the PPIS grant was to offer seed money to states to develop pollution prevention programs, this [legislation] is a culmination of efforts initiated over the last four years. The activities implemented by EPD under this grant provide a strong foundation for the new Pollution Prevention Assistance Division."<sup>21</sup> Long-term funding has also been addressed in creating P2AD. Although it will receive some funding from the federal government, the new division is primarily funded through state-appropriated funds and solid waste and hazardous waste generator fees.<sup>22</sup>

Other grantees have taken different approaches to developing program infrastructure. For example, the focus of the Alabama DEM's 1991 PPIS grant was the institutionalization of the Waste Reduction and Technology Transfer (WRATT) program. As a result of PPIS funding, the WRATT program, Alabama's free, nonregulatory vehicle for technical assistance, became the WRATTLER Foundation, a stand-alone, non-profit organization. In institutionalizing the WRATT program, Alabama enabled its technical assistance program to receive private funding; the WRATTLER Foundation is now funded 50 percent by state monies and 50 percent by private funds. WRATTLER receives its private funding primarily from facilities that donate to the foundation after saving money by implementing recommendations made during free waste audits. In addition, the Foundation has applied for several grants from private foundations and to date has

### Exhibit III-4

#### Infrastructure Summary

Infrastructure Activities	Number of Grants
Securing funding sources	9
Hiring interns	15
Developing legislation	8
Developing pollution prevention policy	15
Program evaluation	30
Hiring staff	25
Training staff	32
Forming workgroups/committees	41

received \$350,000 in grant funding. With the WRATTLE Foundation supporting it, the WRATT program is able to continue to provide technical assistance to Alabama businesses.<sup>23</sup>

The activities of the WRATT program are also infrastructure oriented. For example, one goal of the program was to develop strategies for 1) promoting and facilitating the incorporation of pure pollution prevention techniques in the planning and design process for new and expanding companies; 2) making technical assistance more relevant and more accessible to small businesses in Alabama; 3) improving public awareness of waste reduction issues; and 4) measuring the effectiveness of pollution prevention activities in reducing waste generation. Another infrastructure element of Alabama's program focused on program evaluation. The DEM commissioned two studies to determine the effectiveness of the program's technical assistance efforts and the associated cost savings to participating businesses. Further details about the WRATT program's measurement initiatives, as well as the efforts of other PPIS grantees to measure program success, are presented in Chapter IV.



## B.4 Technical Assistance and Technical Training

A major component of many PPIS-funded programs is technical

assistance. Grantees believe that through onsite visits, assessments, hotline and clearinghouse information, and training, state pollution prevention programs can help industry and other groups better understand and incorporate pollution prevention technologies into their everyday operations. Exhibit III-5 shows the technical assistance and training activities that PPIS funds support.

A primary goal of the PPIS grant program was to allocate resources to the states to provide technical assistance to businesses in accordance with the 1990 Pollution Prevention Act. Many states provided technical assistance through onsite waste assessments or audits. In many cases, PPIS technical assistance programs offer confidential, onsite pollution and waste assessments for both large and small businesses. These assessments take place outside the regulatory environment, and participation on the part of businesses is strictly voluntary. Grantees believe that through the assessments, businesses learn how to save money, increase effi-

ciency, and build a good public image. During a waste assessment, engineers review all business operations to uncover potential waste reduction strategies and opportunities. Later, the company receives a detailed report that identifies and evaluates waste reduction opportunities and provides specific recommendations for action. The decision to implement any recommended option is entirely the decision of the company.

Some grantees have made onsite visits a central component of their pollution prevention programs. For example, the Washington State Department of Ecology has performed site assessments of 1,700 businesses, including lithographers, screen printers, and photoprocessors.<sup>24</sup> The South Carolina Department of Health and Environmental Control conducted more than 250 assessments.<sup>25</sup> By providing onsite assistance, many PPIS grantees have helped businesses realize substantial cost savings. For example, the Massachusetts Office of Technical Assistance helped companies save

### Exhibit III-5

#### Technical Assistance and Technical Training Summary

Technical Assistance and Technical Training Activities	Number of Grants	Number Developed With PPIS Funds
Assessments/Audits/Site visits	61	4,700
Bulletin boards	5	5
Clearinghouses/Libraries	32	32
Grants	4	22
Hotlines	20	20
Technical training	13	55

an annual average of \$35,000 per company.<sup>26</sup> Kentucky Partners helps Kentucky businesses save an estimated total of \$3,000,000 per year.<sup>27</sup> More results of this nature are presented in Chapter IV.

Other states have taken innovative approaches to site assessments. With its 1989 PPIS grant, the Georgia Environmental Protection Division initiated the Pollution Prevention Mentor (PPM) program, whereby EPD employed retired engineers, working in conjunction with graduate student teams, to provide industry with the technical expertise and support necessary to implement source reduction techniques and technologies. The teams spent five days on site per facility, then submitted pollution prevention recommendations. The final product of these visits was a site-specific report outlining source reduction options for each company. The PPM Program conducted over 30 assessments.<sup>28</sup>

With later grants, the Georgia Hazardous Waste Management Authority (GHWMA) started the Seniors' Assessment Technical Assistance Program (SATAP), once again combining the talents of retired engineers with graduate students at Georgia Technology Institute. The SATAP program conducted 20 site assessments.<sup>29</sup> Many other states, such as Tennessee, Florida, Alabama, Vermont, and New Hampshire have also enlisted the help of retired engineers for their technical assistance programs.

Several grant recipients operate clearinghouses, which provide businesses and the general public with technical information on an as-

requested basis. For example, the clearinghouse that the Virginia DEQ maintains houses more than 3,000 books, articles, papers, and videos that cover all aspects of pollution prevention. The clearinghouse is open to other organizations, and DEQ is arranging for the information clearinghouse index to be available online so that the library is accessible for searching and requesting by other department staff and the general public. DEQ hopes that this capability will greatly enhance both the utilization and the usefulness of the information clearinghouse.<sup>30</sup>



## **B.5 Pilot Programs And Demonstration Projects**

EPA encourages states to initiate pilot and demonstration projects that test and support innovative pollution prevention approaches and methodologies. The funding of pilot and demonstration projects allows EPA and the states to learn how new initiatives will work before businesses or the government invest a significant amount of time and resources. Twenty-one percent of PPIS grants were used to fund either demonstration or pilot projects that tested innovative pollution prevention techniques. Some projects were conducted by the grantees themselves, while others were carried out by contractors or through minigrants channeled to industry through state programs.

Many of these projects have demonstrated remarkable successes, including a project conducted by Cornell University's Water Resources Institute. The Water Resources Institute used its 1990 PPIS grant as seed money for a holistic farm planning demonstration project aimed at nonpoint source pollution in agriculture. The project was the foundation of what is now a \$35 million, statewide, multiagency initiative for New York, and has been adopted as a model for many other states as well. The grantee hopes that this project will assist water districts in maintaining water quality through watershed control rather than through the installation of costly filtration systems. The project was piloted in upstate New York, where it is expected to save local water systems more than \$5 billion in construction costs and \$300 million in annual operating costs (related to a proposed filtration system) by encouraging the adoption of farming practices to protect water quality.<sup>31</sup>

Two PPIS grants were awarded to assist in the formation and piloting of Wisconsin's Farmstead Pollution Potential Assessment System (Farm\*A\*Syst). Farm\*A\*Syst, a joint effort between EPA and the U.S. Department of Agriculture (USDA), was designed to help farmers and rural residents voluntarily assess well water pollution risks at the farmstead (house, farm buildings, and surrounding land). The system identifies best management practices and structures at a specific site that present pollution risks. It then recommends actions to reduce or elimi-

nate identified pollution risks. Ultimately, the system is intended to increase users' knowledge and understanding of their farmstead environment, as well as existing policies, regulations, and recommendations that relate to their activities and structures, with the goal of helping users take voluntary actions to reduce and prevent pollution risks. The grantee used PPIS funds for initial development of the assessment tool, which consists of 12 workshops and 10 fact sheets. Using PPIS funds, the program was first piloted in Wisconsin and Minnesota. After 3 years, all 50 states have now developed a Farm\*A\*Syst program based on the Wisconsin model.<sup>32</sup>



## B.6 Awards and Recognition

Some PPIS grantees have instituted awards programs to recognize outstanding achievements, usually by industry, in the realm of pollution prevention. The winners generally receive free publicity for their efforts and many programs have developed case studies based on the accomplishments of award winners.

Certain programs have placed particular emphasis on awards. Alaska's Office of the Governor used its 1991 PPIS grant to establish a "Green Star" program that targets businesses and industries across the state. To receive the Green Star, participants in the program must complete a minimum of 12 of 18 possible source reduction standards. Six of the standards

are required for a company to receive its Green Star, while the remaining six can be selected from a pool of 12 possibilities. Examples of the standards include double-sided copying, yearly waste assessments, and assisting at least one other business in becoming a Green Star member. To date, over 183 businesses are enrolled in the Green Star program, and 40 have earned their Green Stars.<sup>33</sup>



## B.7 Regulatory Integration

Many states have chosen to use PPIS funds to integrate pollution prevention into their regulatory programs. While strictly voluntary initiatives focusing on outreach and technical assistance characterized the activities of most earlier PPIS

grantees,<sup>34</sup> regulatory integration is a growing trend. Exhibit III-6 shows the approaches that grantees have employed to inject pollution prevention into state regulatory structure.

Compared with the level of regulatory integration in 1989, several states have made great strides toward regulatory integration with PPIS funding. For example, one of the primary objectives of the Illinois EPA (IEPA) was to automatically integrate pollution prevention concepts in IEPA permit decisions, compliance agreements, and regulatory actions across all media programs. A major goal of the grant was to produce a pollution prevention guidance manual for IEPA permit and inspection staff in all bureaus. The manual currently contains instructions useful to Agency personnel but will continue to evolve as successful pollution prevention projects occur and are documented.

**Exhibit III-6**

### Summary of Regulatory Activities

Activity	Number of Grants	Percent of Total Grantees
Incorporate pollution prevention reviews in permitting	15	13
Perform mandatory waste audits	2	2
Incorporate pollution prevention into enforcement and compliance orders	12	10
Develop pollution prevention checklists for inspectors	12	10
Develop pollution prevention policy statements regarding regulatory integration	7	6
Place pollution prevention requirements in ordinances and regulations	3	3

Thus far, the manual has been used to train over 200 technical and legal staff members in seven field offices and headquarters. IEPA also drafted a guidance document, based on U.S. EPA guidance, for incorporation of pollution prevention and Supplemental Environmental Projects (SEPs) into enforcement settlements.

IEPA also launched a voluntary technical assistance program for industry whereby participating companies worked with the agency on pollution prevention initiatives. In return, IEPA provided both technical regulatory assistance (including expedited permits and variance support) and adjusted standard support. Over 130 companies participated in the program.<sup>35</sup>

According to the grantee, “Illinois regulators and companies forged a more cooperative working and learning relationship as a result of the PPIS grant. Permit writers, inspectors and [lawyers] are beginning to incorporate P2 into their work and learn more about the intricacies of manufacturing processes.”<sup>36</sup>

The Narragansett Bay Water Quality Management District Commission (NBC) provides another example of how pollution prevention ideas can be integrated into state regulations. NBC owns and operates Rhode Island’s two largest municipal wastewater treatment plants. As part of its operations, NBC operates an Industrial Pretreatment (IPT) program that permits, monitors, and regulates industrial and commercial discharges. One aspect of NBC’s 1991 PPIS grant focused on integrating pollution prevention into IPT. The IPT program expanded its policy of referring all noncompliant companies to the NBC’s Pollution Prevention Program for assistance. Furthermore, IPT refers new permit applicants to NBC’s pollution prevention program.

In addition, NBC has incorporated pollution prevention into settlement practices, including implementation of a pollution prevention project to offset assessed fines. To be eligible as a pollution prevention project, a proposal must go beyond compliance and result

in an environmental benefit not currently required by law. This approach presents certain advantages to facility owners who find themselves involved in enforcement action: 1) the use of company funds to purchase and install pollution prevention equipment can result in positive tax consequences, as opposed to the direct payment of fines; 2) the use of pollution prevention equipment can increase efficiency; and 3) the use of pollution prevention equipment often results in decreased water usage, which can substantially lower consumption bills and/or permit fees.

For these reasons, an increasing number of Rhode Island companies are opting to implement pollution prevention projects in lieu of cash settlements. According to the grantee, instituting pollution prevention projects can also benefit a company’s public image while helping the environment.<sup>37</sup>



<sup>1</sup> Kentucky Partners Fact Sheet, January 1994.

<sup>2</sup> *Pollution Prevention Incentives for States*, Spring 1994, U.S. EPA.

<sup>3</sup> Alabama Pollution Prevention Program Final Progress Report, 1994, Alabama Department of Environmental Management.

<sup>4</sup> *Pollution Prevention Works for Iowa: Case Studies*, April 1993, Iowa Department of Natural Resources.

<sup>5</sup> Personal communication in May 1995 with George Smelcer, University of Tennessee Center for Industrial Services.

<sup>6</sup> *West Virginia Scorecard*, 1992, National Institute for Chemical Studies.

<sup>7</sup> *Pollution Prevention in Rhode Island: Final Report on DEM’s Pollution Prevention Program*, June 1994, Rhode Island Department of Environmental Management.

<sup>8</sup> The data presented in this section were gathered through a series of telephone interviews, during which many grantees were unable

to precisely quantify their activities. Many grantees presented numbers for their activities in range format. In such circumstances, EPA used the low end of the range to calculate totals. Therefore, the numbers presented in this chapter most likely underestimate the true level of activity of PPIS grant recipients.

<sup>9</sup> This number is particularly high because Utah used PPIS funds to develop a 4-month campaign of “Enviro-Minutes.” These Enviro-Minutes were 30- to 60-second spots highlighting what citizens can do to prevent pollution.

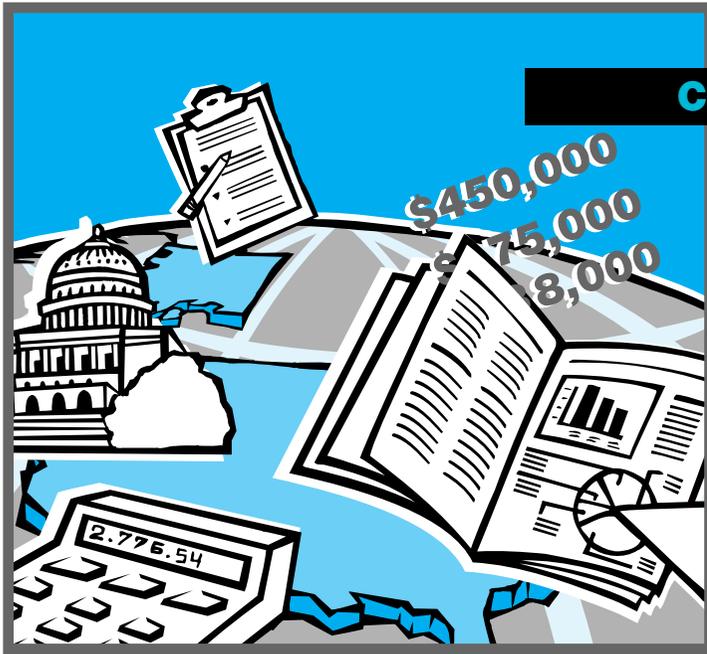
<sup>10</sup> 1994 Pollution Prevention Evaluation Report, Virginia Department of Environmental Quality.

<sup>11</sup> Personal communication in November 1994 with Karen Bucklin Sanchez, Montana State University Extension Service.

<sup>12</sup> Personal communication in May 1995 with George Smelcer, University of Tennessee Center for Industrial Services.

<sup>13</sup> Erie County Pollution Prevention Program Evaluation, April 1993.

- 14 Personal communication in December 1994 with Joyce St. Clair, Kentucky Partners.
- 15 Erie County Pollution Prevention Program Evaluation, April 1993.
- 16 Personal communication in November 1994 with John Iannotti, Pollution Prevention Unit, New York State Department of Environmental Conservation.
- 17 PPIS Grant Assessment Study Report, November 1994, Navajo Nation Environmental Protection Agency.
- 18 Assessment of Regulatory and Non-regulatory Approaches to Source Reduction in the Rhode Island Textile Industry, Progress Report #3, April 30, 1994, Rhode Island Department of Environmental Management.
- 19 Assessment of Regulatory and Non-regulatory Approaches to Source Reduction in the Rhode Island Textile Industry, Progress Report #3, April 1994, Rhode Island Department of Environmental Management.
- 20 Personal communication in November 1994 with Dr. Jan Taylor, National Institute for Chemical Studies (West Virginia Department of Environmental Protection's partner in producing the Scorecard).
- 21 Georgia Pollution Prevention Incentives for States Grant Final Report, September 1993, Georgia Department of Natural Resources.
- 22 Georgia Pollution Prevention Incentives for States Grant Final Report, September 1993, Georgia Department of Natural Resources.
- 23 For more information on WRATTLER, call the WRATT Foundation, (205) 386-3633.
- 24 Personal communication in November 1994 with Darin Rice, Washington Department of Ecology.
- 25 Personal communication in November 1994 with Bob Burgess, Center for Waste Minimization, South Carolina Department of Health and Environmental Control.
- 26 The Central Massachusetts Pollution Prevention Project Summary Report, 1992, Massachusetts Office of Technical Assistance.
- 27 Kentucky Partners Fact Sheet, January 1994.
- 28 Pollution Prevention Technical Assistance for Selected Industries Final Report, September 1991, Georgia Tech Research Institute (Georgia Environmental Protection Division's partner).
- 29 Pollution Prevention Incentives for States Program Semi-Annual Progress Report, April 1993, Georgia Hazardous Waste Management Authority.
- 30 1994 Pollution Prevention Evaluation Report, Virginia Department of Environmental Quality.
- 31 "New York City: Case of a Threatened Watershed," Keith S. Porter. EPA Journal, Summer 1994.
- 32 For more information on the Farm\*A\*Syst program, call 608 262-0024.
- 33 Personal communication in November 1994 with Sara Peacock, Alaska Office of the Governor.
- 34 Massachusetts Department of Environmental Management received a grant in 1989 to begin integrating pollution prevention into the regulatory program.
- 35 1989 Pollution Prevention Incentives Grant Final Report, May 1993, Illinois Environmental Protection Agency.
- 36 Activate the State/Lead by Example Final PPIS Grant Report, October 1994, Illinois Environmental Protection Agency.
- 37 Narragansett Bay Commission Pollution Prevention Incentives for States Third Status Report, September 1994.



## Chapter IV

# Measurement and Evaluation

The purpose of this chapter is to document activities underway in the states to measure the effectiveness of grant-funded activities. This chapter highlights different measurement methodologies used by the grant recipients, without judging the effectiveness of any particular methodology. As stated in the Introduction (Chapter I) of this report, documenting grant-funded activities, including program evaluation and measurement, is EPA's first step in the evaluation of the PPIS grant program. Understanding how states are approaching measurement issues will help EPA determine an appropriate long-term strategy to evaluate PPIS-funded programs. This chapter begins with a description of how EPA traditionally monitors and evaluates its media programs, which provides a context for appreciating the limitations associated with current tracking efforts as applied to the PPIS grant program. The following section summarizes how states have begun to measure the effectiveness of their programs. The final section outlines EPA's efforts to improve program evaluation in the future.



### A. Monitoring and Evaluating EPA Media Program Grants

EPA issues approximately \$600 million in grants to the states each year to help the states develop state program capacity and fund ongoing activities. EPA issues these grants under the authority of the environmental statutes such as the Clean Air Act, Clean Water Act, Safe Drinking Water Act, and

Resource Recovery and Conservation Act. In cases where states are willing and able to implement portions of the federally-mandated requirements under these statutes, EPA delegates authority for implementation to the states. Given that the Agency is ultimately responsible for implementation of the law, EPA oversees state activities to ensure that Congressional requirements are met.

Traditionally, EPA has monitored both the federal and the state-delegated programs primarily by counting the number of activities underway. The media programs (air, water quality, drinking water, and waste) track a variety of indicators in the following regulatory based categories:

- The number of permits issued;
- The number of compliance monitoring inspections; and
- The number of enforcement actions or formal consent decrees.

While the names and numbers of indicators tracked differ from program to program, the basic concept remains the same. Programs track concrete administrative actions (e.g., permits, inspections) to ensure that annual targets set by program managers (or the legislature) will be met.

Unlike other environmental statutes, the Pollution Prevention Act of 1990 does not establish a regulatory framework. Consequently, the traditional measurement approach cannot be easily applied to the PPIS program or to the pollution prevention program as a whole. Not only are there no administrative measures, such as permits or inspections, there are also no federal models by which to evaluate state pollution prevention programs. In fact, EPA designed the pollution prevention program to be as flexible as possible to accommodate individual state program needs and priorities.

The traditional “bean-counting” approach is limited by its focus on simple counts of actions, rather than trying to capture environmental results. The Agency recognizes

the need to move forward in measuring results and away from administrative measures. The media programs are grappling with this issue and the difficult questions of how to define environmental results. In the future, EPA hopes to improve the documentation of environmental results achieved through the grant program.

Recently, the National Association for Public Administration (NAPA) studied EPA’s programs and policies, including its approach toward program evaluation. The study found that program evaluations are not consistently conducted by EPA’s media programs. According to the NAPA study, “There is no Agency policy for the frequency of program evaluation or for the conditions under which it is performed.”<sup>1</sup> Furthermore, “The EPA program offices have not taken on the responsibility of conducting their own rigorous [program] evaluations. . . They do not know how well activities were performed nor how well those activities were evaluated. None of EPA’s ten regional offices has done extensive evaluation work either.”<sup>2</sup> Given that the Agency lacks “a sound system for conducting program evaluations on a routine basis,”<sup>3</sup> it should come as no surprise that EPA has not previously conducted a rigorous evaluation of the PPIS grant program. This assessment study, however, represents an initial step toward understanding and evaluating the PPIS grant program.



## B. State Strategies To Measure Effectiveness

While many states are just beginning to evaluate elements of their pollution prevention programs, a few have successfully evaluated their programs. Some state legislatures require the programs to report on activities conducted with state funding. PPIS grantees have used a variety of techniques to evaluate their programs, ranging from surveys to followup site visits. As a result, many states have been able to gauge the level of satisfaction with particular services and a few have been able to quantify the results of their pollution prevention endeavors in terms of actual waste reductions and cost savings.

As detailed in David Wigglesworth’s 1993 book, *Pollution Prevention: A Practical Guide*,<sup>4</sup> there are both internal and external approaches to measuring progress. The internal approach is a basic accounting or assessment of the program’s activities. The external approach uses input from outside the pollution prevention program to evaluate the program’s services, either from “clients” of the program or independent sources. Generally, methods for measuring PPIS-funded programs fall into three categories:

- Overall evaluation of program effectiveness;
- Evaluation of specific services, either by amount of pollution prevented or by level of customer satisfaction; and
- Measures of activity level.



## B.1 Overall Evaluation

Overall evaluations enable state programs to assess the effectiveness of their entire pollution prevention program. Usually, state programs examine a range of data points such as level of client satisfaction, implementation rate of technical recommendations, and amount of pollution prevented. These evaluations can help program managers to understand the effectiveness of different program elements and relationships between the program activities. They can be used to justify funding from state and federal legislatures and help secure private funding by demonstrating effectiveness. One of the drawbacks of conducting such evaluations is that they are often resource-intensive. For this reason, only a few PPIS grant recipients have conducted such an evaluation. Examples of programs that have conducted overall program evaluations include Alabama, Massachusetts, and Erie County, New York.

The Alabama Department of Environmental Management contracted with the Alabama Universities TVA Research Consortium (AUTREC) to provide an evaluation of the Waste Reduction and Technology Transfer (WRATT) program services. The evaluation entailed contacting companies that had received technical assistance from the WRATT program and conducting a survey regarding WRATT services and confidentiality. This process revealed that clients were pleased with the program, and 90 percent would recommend WRATT's services to oth-

ers. AUTREC performed an additional study to determine the cost savings and waste reductions derived from WRATT's services.

Information for this study was collected by monitoring companies' progress in implementing WRATT's pollution prevention recommendations. While the data are still preliminary, each company that received technical assistance from WRATT appears to have saved approximately \$160,000. This translates to a 1:60 ratio—for every dollar WRATT spends on conducting the assessments, industry saves 60 dollars.<sup>5</sup>

The Massachusetts Office of Technical Assistance (OTA) also used the services of an outside consultant to evaluate its program. The goal of OTA's PPIS grant was the expansion of the Central Massachusetts Pollution Prevention Project, a relatively new technical assistance program. When the project was complete, the consultant interviewed, by telephone, 110 companies (62 companies within the project area and 58 similar firms outside the project area as a control group) to determine the awareness of, usage of, and attitudes about OTA services. Eighty-seven percent of the firms that used program services were actively reducing toxics, as opposed to only 39 percent of firms that did not use program services.

In-depth personal interviews were also conducted at 28 companies to evaluate the firms' Toxics Use Reduction (TUR) performance and to collect additional data on OTA effectiveness. On average, those who received OTA assistance

“In addition to being a requirement of the P2 Act, it is important to evaluate the program to demonstrate its effectiveness to the legislature, to industry, and to the general public in order to continue the program. Another function of program evaluation is to help determine how the program should evolve over time to meet changing needs.”

—Colorado Department of Public Health and Environment

reduced toxics by 65 percent. Twenty firms that received OTA assistance eliminated 1,250,000 pounds of chemical use through TUR modifications. OTA technical assistance recipients reduced an average of 45,000 pounds per chemical targeted. At seven firms, OTA documented a combined annual cost reduction of \$248,000, or an average annual cost savings of more than \$35,000 per company.<sup>6</sup>

Western New York Economic Development Corporation (WNYEDC) also used an integrated approach to program measurement.<sup>7</sup> The purpose of WNYEDC's PPIS grant was to evaluate the effectiveness of a county-level technical assistance program, using the Erie County Office of Pollution Prevention (ECOPP) as a model. The grantee attempted to quantify pollution prevention and the associated economic benefits on a case-by-case basis in order to assess the impact of the program. This effort focused on companies to whom the program had provided onsite technical assistance. ECOPP established a routine call-back program for onsite assistance clients.

Approximately 6 months after a site visit is completed, ECOPP staff telephone a representative from the facility and complete a telephone survey designed for program evaluation. Companies that implemented ECOPP's technical assistance recommendations, achieved quantifiable economic benefits, and reduced or prevented waste were asked to be the subject of case studies.

In addition to these quantitative self-evaluation efforts, WNYEDC retained a private company to review and independently evaluate the efficacy of each element of the program, and to produce an evaluation report of the results. This outside contractor measured a range of elements, including:

- Perceived clarity of technical information provided by ECOPP;
- Quality of ECOPP's service;
- Implementation rate of the program's recommendations; and
- Perceived waste reductions as a result of the program's assistance.

This information was gathered both through telephone survey questions and a focus group meeting, which entailed a brainstorming session of 12 former and ongoing ECOPP clients from a cross section of industry groups.

Overall, 77 percent of the survey respondents had, at the time of the survey, implemented at least one of the recommendations made by ECOPP representatives. Sixty-eight percent of the respondents perceived a reduction in the amount of waste generated, while

43 percent perceived a reduction in operating cost. In addition to the recommendations implemented to date, 78 percent of the respondents indicated that they anticipate implementing ECOPP recommendations in the future.



## B.2 Evaluation of Specific Services

Some PPIS grantees evaluate priority services such as technical assistance or outreach. These evaluations are more limited in scope than overall evaluations, and often focus on a single area of service delivery. To evaluate technical assistance services, some grantees conduct spot assessments and followup visits to client companies. These onsite visits can provide valuable information about the implementation rate for a technical assistance program's pollution prevention recommendations, as well as specific data on waste reductions and cost savings, useful for the development of case studies. Other benefits of this approach include the deepening of the relationship between the state and the facility, an opportunity to help the facility overcome difficulties implementing pollution prevention methods, and motivating the facility to implement additional measures.

Grantees also evaluate the quality of technical assistance and other services such as workshops or training sessions by surveying clients. This approach enables the grantee to assess whether or not

priority services are perceived as useful and sometimes document cost savings and waste reduction. Program managers can use the results of the assessment to make changes in services to better meet client needs. Neither of the above approaches are as resource-intensive as a comprehensive evaluation. On the other hand, these evaluations do not provide the same level of detail and documentation as a comprehensive evaluation, particularly for cost savings or pollution reductions. Examples of states that have conducted evaluations of specific program services include Rhode Island, Iowa, Missouri, Alaska, Colorado, and New Jersey.

The Rhode Island DEM used PPIS monies to conduct technical assistance assessments at 125 Rhode Island companies. Each company visited received a written report listing pollution prevention options available, including process and operational changes and recovery/reuse technology. Once a company's projects started, DEM continued to periodically visit the facility to check on operations and note improvements. Approximately 40 to 50 percent of the companies DEM assisted implemented source reduction measures.

Many companies achieved substantial cost savings as a result of DEM's technical assistance. For example, a jewelry manufacturer realized an annual savings of \$26,000 in feedstock, treatment, and disposal costs by implementing a recommendation to replace trichloroethylene with an aqueous cleaner. Similarly, a fastener manufacturer anticipates saving \$17,000

annually by changing its paint mixing process.<sup>8</sup>

The Iowa Waste Reduction Assistance Program (WRAP) also evaluated its technical assistance efforts quantitatively and produced a series of case studies containing the results. Program staff visited 16 client companies' facilities by prior agreement and interviewed responsible officials to obtain as much detail on successful pollution prevention projects as was feasible. A seventeenth client was a Governor's Waste Reduction Award winner, and WRAP used this client's award application to obtain information about its pollution prevention efforts. WRAP compiled the pollution prevention results of 14 companies into 32 case studies.<sup>9</sup> Together, these companies showed a recurring cost savings of \$1.5 million per year and reduced over 10,000 tons of waste per year. A sample WRAP case study appears on page 34.

As seen in Chapter III, PPIS grantees commonly conduct outreach activities, such as workshops and presentations. Grantees indicated that evaluating these activities helps them gauge the effectiveness of their targeting efforts, as well as the level of customer satisfaction with the events. Several grantees, such as the University Extension at the University of Missouri-Columbia, distribute questionnaires or surveys to workshop attendees to evaluate the workshops' impact.

The program used its PPIS funds to conduct three 3-day courses based on a model developed by EPA. Twenty-eight representatives from manufacturing

organizations, government agencies, and the armed forces attended the workshops. At the end of each course, participants completed an evaluation form which asked attendees such questions as:

- "Which parts of the course will be most useful?"
- "What subject matter would you recommend be added to the course?"
- "Would you recommend this course to other professionals?"

University Extension then compiled all responses and produced an evaluation summary for each workshop. This process allowed the grantee to gauge the perceived usefulness of the training course and make improvements to course content.

Several PPIS grantees also use short survey forms to evaluate specific aspects of their programs. For example, the Alaska Department of Environmental Conservation developed a one-page questionnaire asking respondents to evaluate the usefulness of assistance and information that the program provides. The Colorado Department of Public Health and Environment (CDPHE) sent a multiple-choice survey to businesses that had used CDPHE's pollution prevention library. Similarly, the New Jersey Institute of Technology (NJIT) distributed a two-page survey asking recipients of technical assistance services to evaluate their experiences with the program. New Jersey's survey results showed that 83 percent of the program's clients ranked NJIT's service between very good and excellent, and over half of the respondents found that the pro-

## Rhode Island DEM Technical Assistance Results

Total amount of waste reduced:  
3,375,000 pounds liquid waste  
20,800 pounds solid waste

gram's technical recommendations were very helpful.

These measures of effectiveness are valuable to the grantees in that they help program managers understand the perceived benefits of the services delivered.



### B.3 Measures of Activity Level

The majority of state pollution prevention programs account for resources expended simply by tracking the level of activity of the program. This approach includes tracking the number and types of assessments completed, the size and types of audiences at presentations, or the number of phone calls for assistance received. Some programs also examine the number of newsletters written, facilitywide permits granted, grants dispersed, or case studies generated. For formal reporting, grantees also add narrative descriptions of accomplishments. Such an accounting of resources fills legislative reporting requirements.

Examining the quantities of services a program provides is a rela-

tively simple process that does not require the same level of energy or resources as an overall program evaluation or evaluation of specific services. The disadvantage of this approach is that it does not enable the program to assess environmental results nor the quality of services. Measures of PPIS grantees' activity levels from 1989 to 1993 can be found in Chapter III.



## C. Improving Future Measurement Efforts

EPA's success in measuring the effectiveness of the grant program depends, in part, on the states' ability to measure their own progress. In turn, their ability to measure progress depends on the ability and/or willingness of participating facilities to measure pollution reductions. EPA began its effort to improve measurement and evaluation by writing this study, which documents current efforts. Grantees identified barriers to measurement

during the course of EPA's study. Barriers identified by the grant recipients include the following:

### ■ Limited time and resources.

During the early development of state pollution prevention programs, the states devoted little effort to evaluating the effectiveness of program elements. States focused their limited resources on program delivery, rather than on program evaluation. While some of the mature programs have now begun to evaluate their programs, developing programs may not have the resources to conduct full-scale evaluations.

### Sample WRAP Case Study

**Company:** Douglas and Lomason Company

**Product/Industry:** Automotive hardware

**Waste stream:** Wastewater and sludge

**Modifications:** Source reduction/technology changes and procedural changes. Eliminated zinc phosphating processing and improved autophoretic deposition process. Improved wastewater treatment operation.

**Benefits:** Reduced wastewater treatment and sludge disposal costs, and eliminated the materials cost of an entire process. Saved over \$145,000 per year.

**Opportunity:** Douglas and Lomason manufactures automotive hardware for several national accounts. The company requested that WRAP perform an onsite assessment to assist it in implementing a waste reduction program. Previously many parts and sub-assemblies were coated in a zinc phosphating process that involved multiple stages and used immersion tanks. The process was costly, experienced some operational difficulties,

and generated considerable wastewater and sludge that required treatment and disposal.

**Change:** Douglas and Lomason eliminated the zinc phosphating process by changing the manufacturing process and adding protective measures. The wastewater and sludge from this process are no longer being generated, and the equipment and tanks are being removed. The company also finalized options to reduce the usage and sludge generation in an existing autophoretic deposition coating process.

**Savings/Benefits:** The elimination of zinc phosphating has drastically reduced the load on the in-plant wastewater treatment facility and thus reduced its operating costs. The reduction in treatment operating costs and sludge disposal costs is approximately \$20,000 per year. The material cost savings for eliminating the process totals over \$125,000 annually. Improvements to the autophoretic deposition process have reduced sludge generation by 85 percent.

■ **Linking reductions to elements of state pollution prevention programs.**

Isolating a grantee's efforts from overall influences that encourage waste-reducing behaviors is difficult. For example, much of the pollution prevention process originates in the private sector, making it difficult for state programs to measure overall results derived solely from their PPIS-funded initiatives.

■ **Obtaining data from facilities on pollution reductions.**

Some facilities that receive technical assistance from the state are reluctant to share information on results obtained. Such facilities view this information as confidential, proprietary information. Other facilities lack the time and resources to measure progress.

■ **Use of unsuitable data.** Certain methodologies used by the states may yield inconclusive results. Some PPIS grantees, for example, attempt to evaluate their programs using overall state quantitative data on emissions and wastes, such as the TRI. This type of measure, however, may not accurately consider the possibility of multiple causes for

changes in generation or release rates, such as:

- Fluctuations in production levels or economic activity;
- New treatment techniques that reduce the amounts reported while leaving generation rates unchanged;
- Increases in overall education efforts and awareness of pollution prevention;
- Changes that shift releases to different media; and
- Material substitutions that may result in new types of wastes or releases that are regulated differently or not at all.

■ **Lack of measurement methodologies and EPA guidance.**

Given that it is difficult to measure something that does not exist (i.e., pollution not made), states have had trouble developing measurement methodologies. A number of PPIS grantees cited lack of EPA guidance on measurement as an impediment to program evaluation. Specifically, grantees believe that EPA did not provide adequate direction for measuring progress outside the traditional "bean count"

methodology used by other media programs.

While EPA cannot address all of the barriers described above, it is making efforts to help grantees measure progress. In recent years EPA has provided evaluation assistance to an increasing number of programs. The Agency will continue to increase its measurement support to the states in the future.

For example, in FY96, EPA plans to narrow PPIS award criteria to fund states to develop measurement methodologies. Additionally, EPA plans on pilot-testing block grants to states that will enable the states to measure progress according to environmental performance, rather than activity measures alone. Over time, as the states gain more experience and knowledge about measurement and begin sharing this information, EPA will learn more about what works and what does not work. EPA will then facilitate the exchange of information on lessons learned between the states to improve subsequent measurement efforts.



<sup>1</sup> National Association for Public Administration, *A New Direction for EPA*, p. 168.

<sup>2</sup> National Association for Public Administration, *A New Direction for EPA*, p. 169.

<sup>3</sup> National Association for Public Administration, *A New Direction for EPA*, p. 168.

<sup>4</sup> Wigglesworth, D.T., ed. 1993. *Pollution prevention: A practical guide for state and local government*. Boca Raton, FL: Lewis Publishers.

<sup>5</sup> Figures based on telephone interview with Alabama DEM staff.

<sup>6</sup> Massachusetts Office of Technical Assistance for Toxic Use Reduction. 1994. *The Central Massachusetts Pollution Prevention Project summary report*.

<sup>7</sup> Further details of measurement procedure and results may be found in the Erie County Pollution Prevention Program evaluation (April 1993).

<sup>8</sup> More information about these examples and other Rhode Island case studies are available in *Pollution Prevention in Rhode Island: Case Studies of the Rhode Island On-Site Technical Assistance Program*, a document published by the Rhode Island Department of Environmental Management, Office of Environmental Coordination.

<sup>9</sup> Further examples of pollution in Iowa may be found in *Pollution Prevention Works for Iowa: Case Studies*, an April 1993 document published by the Iowa Department of Natural Resources.