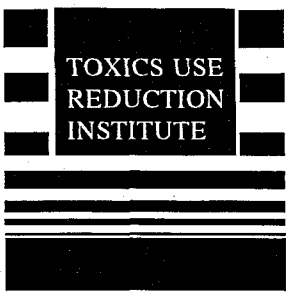

THE MASSACHUSETTS
TOXICS USE REDUCTION INSTITUTE

POLLUTION PREVENTION AND WASTE REDUCTION PLANNING

A QUICK LOOK AT INITIAL STATE EXPERIENCE

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University of Massachusetts Lowell

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Ken Geiser

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The Toxics Use Reduction Institute
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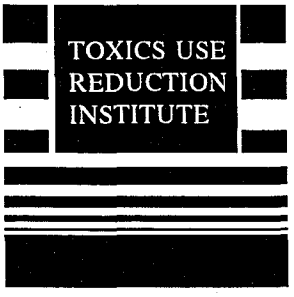

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1. Introduction

Facility-specific pollution prevention and waste reduction plans are central program elements of many new state pollution prevention programs. Of twenty-six states that have enacted legislation in the past four years to promote pollution prevention or waste reduction, twenty specify or suggest that a facility plan be completed by those who manage the facility. Of the twenty states that describe planning requirements, fourteen make plans mandatory (see Table 1).

Table 1. States Mandating Pollution Prevention or Waste Reduction Plans.

State	Law	Year
Arizona	Pollution Prevention Act	1991
California	Hazardous Waste Source Reduction and Management Review Act	1990
Georgia	Amend. to the Hazardous Waste Management Act	1990
Maine	Toxics Use and Hazardous Waste Reduction Act	1990
Massachusetts	Toxics Use Reduction Act	1989
Minnesota	Toxics Pollution Prevention Act	1990
Mississippi	Comprehensive Multi-media Waste Minimization Act	1990
New Jersey	Pollution Prevention Act	1991
New York	Hazardous Waste Management Act	1989
Oregon	Toxics Use Reduction and Hazardous Waste Reduction Act	1989
Tennessee	Hazardous Waste Reduction Act	1990
Texas	Pollution Prevention and Waste Reduction Act	1991
Vermont	Toxic Substances and Hazardous Materials Act	1991
Washington	Reduction of Hazardous Substances and Waste Act	1990

As each of the state programs differ, so, too, do the requirements for plan making. Some states are quite prescriptive, providing a list of elements that must be addressed in a plan,

while others are looser offering simply generalized guidelines. Some states focus only on hazardous wastes as defined under the federal Resource Conservation and Recovery Act, while other focus on those substances listed in the federal Toxics Release Inventory (Section 313, Emergency Planning and Community Right to Know Act). Some states require periodic up-dating of plans, while others are satisfied with the preparation of a single plan. Yet, planning for pollution prevention is increasingly emerging as an effective process that promotes a positive link between improved environmental performance and conventional business goals such as production efficiency, performance quality, and cost reduction.

Over the past two years the first round of state-mandated waste reduction and pollution prevention plans has been completed. Table 2 lists those states where plans have been completed.

Table 2. States Where Facility Plans Have Been Completed

State	Date First Plans Were Required
California	Sep, 1991
Georgia	Mar, 1992
Minnesota	Jul, 1991
Mississippi	Jan, 1992
New York	Jul, 1991
Oregon	Sep, 1991
Tennessee	Jan, 1992
Vermont	Jul, 1992
Washington	Sep, 1992

Even with the minimal experience currently available it is useful to consider what has been learned. A broad overview can be gained from a survey of states. This study focused on five states all of which require facility plans. The data for the survey were collected through phone interviews with state agency staff in October of 1992.

The states programs in this survey include:

California
Minnesota
New York
Oregon
Washington

The states identified for this survey were selected to indicate a range of different approaches. Plans in Minnesota, Oregon and Washington are true "multi-media" pollution prevention plans. The plans produced in California and New York focus more on "single media" waste or emission reductions. Washington provided a significant amount of state technical assistance, while New York provided very little.

Before examining the state experience with these plans, it is useful to consider the virtues (and limitations) of planning.

2. Planning and Plan Making

Planning is conventionally defined as a practice that guides future action in order to achieve desired ends. Conventionally, planning involves a set of steps that include problem characterization, goal identification, option development, option analysis, solution characterization, and implementation. Planning can be goal directed or problem avoiding in approach. Good planning often consumes large amounts of information, takes considerable time, and produces a written "plan" as an artifact of the planning process. The planning effort is typically justified by the improved quality of the end result and planning is often required where actions involve significant investments of time or resources.

There is a broad range of experience in planning that has developed in military programs, land use development, business financing and government service program design. This experience suggests several criteria that are hallmarks of successful planning processes. These include:

> Planning is comprehensive. Good planning takes into consideration a broad range of problem characteristics, option ideas and available information. Planning is improved when built on a solid base of technical information and a thorough survey of the potential options.
>
> Planning is distinct from plan-making. Planning is a process. Plan-making is part of the process. A plan is a tool for communication, but the plan is only an artifact of the process. The process is much more enduring, integrative, inclusive, and dynamic than the mere the preparation of a plan.
>
> Planning is iterative. Once through a planning process is seldom enough. One round of planning is usefully followed with another round, built upon learning from the first time through. Follow-up, evaluation, up-dating and adjustment are all part of an on-going planning process.
>
> Planning is implementation-driven. Good planning must anticipate and include from the beginning those persons, organizations and resources that will carry out the

recommendations of a plan. An effective plan must be technically, economically and politically feasible, and desirable, and often must be persuasive in its own logic and conclusions.

These criteria are highly generalizable. Where planning is used to enhance environmental values, it should be guided by these same principles. It is useful to remember these criteria in efforts to import the concept of planning into state pollution prevention programs.

3. State Pollution Prevention Planning Programs

Table 3 summarizes data on the requirements for facility plans for each of the states covered in this study.

Table 3. State Pollution Prevention or Waste Reduction Plan Requirements

	CA	MN	OR	NY	WA
Plan required?	yes	yes	yes	yes	yes
First plan due	1991	1991	1991	1991	1992
Period	4 yr	2 yr	none	2 yr	5 yr
Certified?	yes	no	no	no	no
Plan made public?	no	no	no	yes	no
Plan multi-media?	no	yes	yes	no	yes
Penalties?	yes	yes	yes	yes	yes
Progress Report?	yes	yes	yes	yes	yes
Components					
Data report	yes	yes	yes	yes	yes
Goals	no	yes	yes	yes	yes
Options	yes	yes	yes	yes	yes
Schedule	no	yes	yes	yes	yes
State Manual?	yes	yes	yes	yes	yes

Most of these plans were due during the past year, and most require an up-date during the next two to five years. Only Oregon does not require an up-date. With the exception of New York, most states require that plans are kept on-site to protect confidentiality. All of the states provided some technical assistance if no more than a guidance manual. Each state had authority to levy a financial penalty for failure to prepare a plan and all of the states required some kind of periodic reporting on progress in meeting the goals of the plan.

3.1 California

The first plans were due in 1991 and are to be updated every four years. Progress reports are due every two years. Well over a thousand firms have completed plans. These plans are media specific descriptions of source reduction activities. (A new law passed this fall requires goals and schedules.) To assist in the planning the state produced a guidance manual, various workshops, and a tele-conference that reached over 4000 participants. Many local communities and counties have set regulations tighter than the state regulations for implementing the plans. State agency staff have reviewed over fifty plans primarily in the aerospace and petroleum refining industries. These reviews have included site visits.

3.2 Minnesota

The first round of plans were due in 1991 and are to be updated every two years. Plans are proprietary, but annual progress reports are submitted to the state. Nearly 500 firms have completed first round plans. First progress reports were due in July, 1992. Minnesota staff prepared a widely distributed manual, conducted 13 workshops around the state and convened two annual conferences to assist firms in planning. It is estimated that nearly three quarters of the regulated firms attended at least one of these events. State staff have seen few of the plans, but have gathered substantial anecdotal information.

3.3 New York

The New York law focuses on waste reduction; the plans are not multi-media in coverage. Plans were required of the largest waste generators (1000+ tons/year) in 1991 and a second group of the next largest waste generators (500+ tons/year) in 1992. In 1991, 110 plans have been completed and 30 more were completed in 1992. Plans are directly submitted to the state. About 20 per cent of the first year submittals were considered "good with minor deficiencies." The state published and distributed a guidance manual and convened conferences, but did not provide training. The six professionals on the state staff have visited all facilities submitting plans to assess their completeness.

3.4 Oregon

The first plans were completed in 1991. Plans are kept on site, but can be reviewed by a visiting state inspector. Performance reports are due each year following plan completion. 250 firms completed plans during the first round. Of the expected universe only 3 firms resisted compliance. The state prepared a guidance manual and offered several training sessions. The state staff of five professionals has conducted a formal review of 39 of the plans from the paper, aluminum, electronics and wood products industries. While all of these were reported to be "very good", 19 were still found to contain important deficiencies.

3.5 Washington

Plans are due in three "waves". The first wave (those 50,000+ pounds of hazardous waste per year) were due September 1, 1992. Plans are to be kept on site and updated every 5 years. Annual plan summaries are sent to the state (although many firms sent in their plans instead of summaries). Roughly 300 plans were completed this year (this was about 90 per cent of those required to complete plans). The state held workshops, provided regional "open houses", conducted site visits, made phone contacts, sent out a newsletter, and prepared a guidance manual to assist with the planning and promote compliance. State staff which includes 35 professionals are now reviewing the submittals and preparing for the next "wave" (7,000 to 50,000 pounds per year).

4. Results of Initial Reviews of Pollution Prevention Plans

The state staff interviewed in each of the states reported positive experiences with the planning process in general. Most reported that compliance with the requirement to complete a plan was exceptionally high, even as quality and completeness varied significantly. Ninety percent of those required to submit plans met the deadline in Washington. In Oregon, only three firms refused to submit plans. Yet, only one of the first 110 plans completed in New York was accepted without revision.

A common story among interviewees involved firms overcoming resistance to planning. Many firms reported initial skepticism and resistance to preparing plans only to find out that the planning exercise produced noteworthy benefits in terms of waste reduction and cost savings. A follow-up survey in California found that 78 percent of those responding found the planning process worthwhile. In a sample of follow-up interviews Oregon staff found that over half of those preparing plans were initially resistant. As one Oregon plant manager told the state inspector, "I thought this was going to be so difficult--it really wasn't. We never had developed a real feel for waste, use and process issues."

Yet, most of the state staff interviewed found that the first round of pollution prevention

plans revealed as much about the problems associated with a learning curve as they were accurate reflections of a firm's acceptance of the concepts of pollution prevention. Deficiencies in the plans abounded. Some states found that most of plans had to be corrected or sent back for completion. Many plans were devoid of any consideration of implementation. Indices developed for evaluation were often inconsistent and poorly calculated.

5. Plan Deficiencies

In reviewing the plans the state personnel noted several typical deficiencies. These included:

Failure to Adequately Characterize Planning Elements. The physical units of planning may include waste streams, production units, products, etc. If planners can not adequately identify and specify these physical units, they are unlikely to build consistency into their plan or adequately measure progress. Plans in California were found to include waste treatment and off-site recycling as elements of source reduction.

Failure to Consider Enough Options. Plans that present narrow fields of option development lack comprehensiveness and limit the potential for unanticipated solutions. The plans reviewed in Minnesota tended to be narrowly focused on technological options, with less developed consideration of operations improvements, management changes and employee development. Limited option development was also noted as a common deficiency in New York.

Failure to Set Numerical Goals. Some plans simply neglected to identify numerical goals or temporal schedules for goal attainment. California plans were not required to set goals or schedules. Over a third of the Oregon plans had reviewed failed to set numerical goals. Concern was also raised in Minnesota where half of the plans reviewed either neglected to set a goal or simply wrote "0".

Limited Cost Accounting Analysis. Plans that are strong on technical feasibility, but weak on financial analysis, provide little guidance to investment targeting and tend to be less convincing documents when presented to upper management. Most state interviewees noted poor or non-existent financial analyses. This was the most glaring deficiency reported in Washington.

Clumsiness in Establishing Performance Indices. Implementation performance is evaluated in most states through annual reporting of indices. If the indices are poorly constructed, or base lines inconsistent or errors made in computations, the indices will not report accurately. Many of the plans reviewed in New York had

poorly constructed indices. The California indices were often inconsistent and erroneously inclusive of waste treatment as well as source reduction performance.

Failure to Clarify Implementation Programs. Plans that present no discussion of implementation procedures may indicate lack of consideration of follow-up. This lack of follow-up may lead to limited program implementation and a focus on plan-making rather than a on-going planning process. One third of the Oregon plans offered no indication of who was responsible for implementation.

6. Indicators of Successful Plans

In reflecting upon the plans, the state staff identified several conditions that tended to be indicators of good planning. These included:

Evidence of Upper Management Commitment. All state interviewees noted the importance of "upper management commitment." In both New York and Oregon it was noted that management commitment was dramatically revealed during site visits. Often where plans were well executed it was upper level managers who met with state inspectors (sometimes, in Board Rooms).

Role of the Planning Team. The convening of a planning team and the breadth of experience represented on the planning team appeared to be an important indicator of plan quality. Minnesota plans seemed to be better where the preparers came from different divisions within the firm. Washington plans tended to be better where those preparing the plan had good working relations with a wide range of others in the plant, particularly those responsible for production.

Past Performance in Environmental Protection. A good indicator of high quality performance in planning is the past environmental performance of the firm. Firms with good materials tracking systems in place tended to be better prepared for planning in Washington. Firms with good environmental compliance records in Oregon tended also to be firms that presented comprehensive, well developed plans. Oregon firms involved in Total Quality Management programs appeared to present better plans. On the other hand, plans prepared by outspoken proponents of source reduction were occasionally surprisingly weak in California.

Work Culture Attentive to Environmental Issues. Some firms demonstrate a fairly articulated commitment to environmental protection made manifest in corporate public relations statements, high level environmental management responsibilities, employee education and support efforts, and bonus and award programs. One California firm had gone so far as to provide special uniforms to its waste reduction planning team members. Another firm redistributed its accrued savings to employees

as wage bonuses. Such firms appear better prepared to execute good plans.

7. Lessons Learned

When asked about lessons that could be drawn from the first round of pollution prevention plans, state staff noted the following items:

Value of Early Commencement. Several of the state staff noted the importance of starting the planning process early. Data presentation was greatly enhanced where firms had started early on data collection. Awareness of a broad range of options appeared to have been expanded where the planning process was not rushed. Washington encouraged firms to prepare draft plans for state review in anticipation of the submittal of final plans.

Value of Access to Information and Technical Assistance. With all of the case studies, manuals and electronic data bases available today, many firms still appear to have limited information about new technologies, materials or practices. Technical assistance, workshops and manuals all appear to assist those attempting to plan. State staff in Washington seemed to have done the most to promote good planning. Besides workshops and manuals, the state prepared a frequently distributed newsletter, held agency "open houses", conducted site visits, reviewed draft plans, and maintained phone contact with all of those preparing plans during the planning process.

Value of Wide Participation. Planning teams made up of personnel from different functional areas in the firm were often noted as beneficial. Wide participation, particularly from "shop floor level" employees was reported valuable in option development phases of planning. One Washington firm sought suggestions from its employees and ended up compiling 20 pages of option ideas.

Value of Consulting Services. While consultants can provide a valuable role in assisting with elements of plan-making, several interviewees noted the problems that arise where consultants are responsible for the whole plan-making exercise. Minnesota plans were improved where consultants had assisted, but were unlikely to be implemented if the planning had simply been "farmed out". Where consultants prepared entire plans in New York, the plans were better presented and followed the guidelines more consistently, but there appeared to be a lower level of implementation commitment on the part of the firm.

8. Conclusions

Even this quick review of pollution prevention and waste reduction planning suggests that while there is rapid progress there remains much to improve. The plans prepared thus far are seldom comprehensive (some states have yet to require multi-media planning) and there is frequently a low level of attention to implementation or evaluation. Too often the focus has been more on plan preparation than on the establishment of an integrated and continuous planning process. While many states require plan updating, the schedules are such that second rounds have not yet been accomplished.

These problems should not be surprising or discouraging. Two years ago no firms were engaged in state-promoted pollution prevention or waste reduction planning; today, hundreds of firms are. The level of compliance during this first round appears high. The state requirements leave a wide margin of flexibility to the firms. This flexibility leads to some confusion and lack of completeness. Yet, flexibility is valuable because it is intended to promote adaptation, experimentation and learning, which, in the long run, should be the hall marks of effective pollution prevention programs.

State staff who have reviewed plans are generally enthusiastic and optimistic. While their overall assessment is positive, the deficiencies, inaccuracies and confusion reported suggest that many firms will adopt facility planning only after some fairly rough starts. Experience with planning may yield significant benefits for business and the environment, but this brief survey argues for now for patience and further good work.