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Water Quality Management Planning Is Not Comprehensive and May Not Be Effective for Many Years. CED-78-167; B-166506. December 11, 1978. 36 pp. +7 appendices (13 pp.).

Report to Rep. Ronald Bo Ginn, Chairman, House Committee on Public Works and Transportation: Investigations and Review Subcommittee; Rep. James C. Cleveland, Ranking Minority Member; by Elmer B. Staats, Comptroller General.

Issue Area: Environmental Protection Programs: Institutional Arrangements and Trade-offs (2210).
Contact: Community and Economic Development Div.
Budget Function: Natural Resources, Environment, and Energy: Pollution Control and Abatement (304).
Organization Concerned: Environmental Protection Agency.
Congressional Relevance: House Committee on Public Works and Transportation: Investigations and Review Subcommittee; House Committee on Public Works and Transportation; Senate Committee on Environment and Public Works. Rep. Ronald Bo Ginn; Rep. James C. Cleveland.
Authority: Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500; 33 U.S.C. 1251). Clean Water Act of 1977 (P.L. 95-217).

Section 208 of the Federal Water Pollution Control Act Amendments of 1972 authorized a planning program (referred to as "208 planning") to be undertaken in areas with substantial water quality control problems. The program has evolved from an optional one for urban regions to a mandatory one carried on by local, State, and interstate planning agencies. Statutory requirements for planning include identifying: needs and methods for financing treatment works; agencies necessary to construct, operate, and maintain facilities and carry out the plan; and nonpoint sources of pollution and control measures. Planning agencies had up to 2 years to address these requirements, complete initial plans, and submit them to the Environmental Protection Agency (EPA). Findings/Conclusions: The statutory 2-year period was inadequate for comprehensive planning and for developing information on pollution and water quality. Data on effects of pollutants on water quality were inadequate or unavailable. Waste-load allocations for polluters could be subject to legal action if adequate cause/effect data are not available. Other problems hindering 208 planning include: lack of committed local funds to continue planning and carry out recommendations when Federal funds are exhausted, disagreements among governmental units which may hamper implementing potential solutions to water quality problems, and the need for public participation programs more sensitive to local needs. Recommendations: The Administrator, EPA, should inform the Congress of problems being experienced in 208 planning and report on: how long it will take to acquire adequate

cause/effect data, technical capability, needed resources to accomplish 208 planning, and the strategy EPA plans for resolving data deficiency problems; and alternatives to the existing program, including setting priorities for planning requirements and an analysis of tradeoffs involved if alternatives had to be achieved in a shorter timeframe and at lower costs. He should also emphasize the importance of expanding public involvement efforts and modify public involvement regulations to emphasize the use of public opinion surveys. (HTW)

REPORT BY THE

Comptroller General

OF THE UNITED STATES

8602

Water Quality Management Planning Is Not Comprehensive And May Not Be Effective For Many Years

Water quality management planning probably will not be effective for many years until

--cause and effect water quality data is obtained,

planning efforts become more comprehensive, and

public participation strategies are broadened.

Unless good cause and effect data is obtained to clearly support implementation actions needed, implementation of plans developed by planning agencies risks legal action and rejection. The Environmental Protection Agency has proposed, and GAO agrees, that potential solutions to water quality problems should be tested in selected river basins before being applied on a nationwide basis.

This review was undertaken at the request of the Chairman and Ranking Minority Member, Subcommittee on Investigations and Review, House Committee on Public Works and Transportation.

CED-78-167
DECEMBER 11, 1978

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-166506

The Honorable Ronald Bo Ginn
Chairman
The Honorable James C. Cleveland
Ranking Minority Member
Subcommittee on Investigations
and Review
Committee on Public Works and
Transportation
House of Representatives

As you requested, we reviewed certain matters concerning the Environmental Protection Agency's administration of its water quality management planning program, more commonly referred to as 208 planning.

This report points out the problems that have hindered the effectiveness of the 208 program and problems being experienced by State and areawide agencies which do the planning. Although the program has had a number of accomplishments in a relatively short period of time, 208 planning has not been comprehensive and it may take many years before the program can be fully effective in clearing up the Nation's waters.

We did not obtain written agency comments; however, we did discuss the matters presented in the report with agency officials and included their comments where appropriate.

As arranged with your office, we are sending copies of this report to the Administrator, Environmental Protection Agency, and other interested parties. Copies will also be available to others upon request.

Elmer B. Staats

Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT TO THE SUBCOMMITTEE ON INVESTIGATIONS AND REVIEW, COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION HOUSE OF REPRESENTATIVES

WATER QUALITY MANAGEMENT PLANNING IS NOT COMPREHENSIVE AND MAY NOT BE EFFECTIVE FOR MANY YEARS

D I G E S T

The Federal Water Pollution Control Act Amendments of 1972 established a program of planning to be undertaken in geographic areas with substantial water quality control problems resulting from urban-industrial concentrations or other causes.

Over the years, the program has evolved from an optional one for urban regions to a mandatory one throughout the Nation carried on by local, State, and interstate planning agencies. (See pp. 5 and 6.)

Although the program has achieved some success, many problems have hindered its effectiveness. According to the States, it will cost about $100 billion to control water pollution from municipal point sources, or sources that can be readily identified. Additional billions will be needed to control nonpoint sources of water pollution throughout the Nation, that is, diffuse or unspecific sources of pollution. To set priorities, evaluate alternatives, and make sure that limited Federal water pollution control funds are used effectively, good planning is needed. (See pp. 2, 3, and 9.)

Section 208 of the Amendments authorized the planning program, now commonly referred to as "208 planning," the term used in this report. Through fiscal year 1978, about $232 million had been obligated for 208 planning efforts. An additional $150 million annually has been authorized for fiscal years 1979 and 1980. (See p. 39.)

Under section 208, planning agencies are to consider 11 statutory requirements, including a process identifying

--municipal and industrial treatment works needed over a 20-year period and methods of financing such construction;

--agencies necessary to construct, operate, and maintain all required facilities and carry out the plan; and

--nonpoint sources of pollution and control measures.

Because of inadequate time for planning and an Environmental Protection Agency instruction limiting the scope of planning efforts, many 208 planning agencies are not adequately considering the statutory requirements, resulting in a lack of comprehensiveness in completed plans. (See pp. 9 to 11.)

INADEQUATE STATUTORY TIME FRAME TO CARRY OUT 208 PLANNING

Planning agencies had up to 2 years under the act to address all statutory requirements, complete their initial plans, and submit them to the Agency no later than November 1, 1978. The areawide plans are to be updated annually and each must identify all sources of water pollution within the planning area, determine the seriousness of the pollution, and develop a means to control each type of pollution.

All State and areawide officials stated that the type of comprehensive water quality management planning envisioned by the Congress could not be done within the statutory 2-year period. According to them the 2-year period was completely inadequate for developing information on sources of pollution and the effects on water quality, particularly for nonpoint sources of pollution. The short statutory time also hindered 208 planning efforts to attract and hire qualified people. (See pp. 9 to 15.)

LACK OF ADEQUATE CAUSE/EFFECT DATA

Water quality data, describing how pollution occurs and to what degree water quality would

be improved after one or more causes of pollution are eliminated, particularly for nonpoint sources, is needed to support effective 208 planning and to pursue the most cost-effective control programs. All 208 planning officials stated that data often is inadequate or not available. For example, 12 of 16 208 planning agencies were unable to adequately address some priority problems approved by the Agency because of inadequate data. (See pp. 15 and 16.)

GAO found that plans prepared under basin water quality planning (a planning effort prior to 208 planning) were not adequate because they contained very little information concerning nonpoint sources of pollution. Many Government officials stated that basin plans do not contain all waste-load allocations or point or nonpoint source inventories. Therefore, State and area-wide planning agencies cannot rely on prior and related planning data and must expend time, effort, and dollars to obtain this necessary information. (See pp. 16 and 17.)

Potential legal problems may result from inadequate cause/effect data. Establishing waste-load allocations for certain polluters may be subject to legal actions if the data supporting the amounts polluters may not exceed is inadequate. (See pp. 17 to 19.)

OTHER PROBLEMS

Additional problems which have hindered or could continue to hinder 208 planning completion, comprehensiveness, and implementation include:

--Lack of committed local funds to continue 208 planning and to carry out the recommendations once Federal funds are exhausted. (See pp. 20 to 23.)

--Disagreements among local, special purpose governmental entities, and State governmental organizations, which may hamper

implementing potential solutions to water quality problems. (See pp. 23 to 25.)

--Public participation programs which need to be more sensitive to local needs and values. Public opinion surveys need to be used to augment current public participation approaches. (See pp. 25 to 29.)

RECOMMENDATIONS

The Administrator, Environmental Protection Agency, should inform the Congress of the problems being experienced in the 208 planning program and report to the Congress on:

--How long it will take to acquire adequate cause/effect data, technical capability, and needed resources to accomplish 208 planning as currently required by Public Law 92-500, as amended, and the strategy the Agency plans to follow to resolve the data deficiency problems.

--Alternatives to the existing 208 planning program required by Public Law 92-500 which would include

  (a) setting priorities for planning requirements considered essential to the program and

  (b) an analysis of the tradeoffs involved if the alternatives had to be achieved in a shorter time frame and at lower costs.

The Administrator, Environmental Protection Agency, should also

--emphasize to planning agencies the importance of expanding public involvement efforts to include opinions about water quality problems and control programs from the general public and

--modify the public involvement regulations to emphasize the use of public opinion surveys. (See p. 32.)

ENVIRONMENTAL PROTECTION AGENCY COMMENTS

The Agency generally agreed that 208 planning is not yet comprehensive but believes that many 208 planning agencies have successfully dealt with some complex issues and assisted citizens and local governments to implement regulatory programs to manage water quality. The Agency felt that the most effective way to use its limited resources was not to have 208 planning agencies consider all the requirements, but rather only the high-priority water problems. The agencies could then concentrate on developing and implementing fully some needed actions for water cleanup. The Agency also agreed that, in many instances, sufficient cause and effect water quality data is lacking when decisions are being made on how best to clean up water. The Agency believes, however, that a fortune could be spent on data gathering alone without any attempts being made to develop and implement needed solutions to water quality problems.

In GAO's view a sufficient amount of data needs to be obtained before attempting to implement solutions of an experimental nature on a nationwide basis. If data collection is too costly to obtain, GAO believes the experimental approaches should be applied on a limited basis in order to minimize costly attempts that may not improve water quality.

Contents

ABBREVIATIONS

BMP	best management practices
EPA	Environmental Protection Agency
GAO	General Accounting Office
NPS	nonpoint sources

GLOSSARY

Best management practices (BMP)	A practice, or combination of practices, determined by a State (or designated areawide planning agency) after problem assessment, examination of alternative practices, and appropriate public participation, to be the most effective and practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.
Cause and effect data	Cause data describes how pollution is occurring and the amount and type from each source. Effect data describes to what degree water quality would be improved after one or more of the causes of pollution were eliminated.
Nonpoint sources	Diffuse and nonspecific sources of pollution that are difficult to pinpoint and measure. Common examples include runoff from agriculture and forest lands, mining and construction, and storm runoff from urban areas.
Point sources	Discernible, confined and discrete conveyances of pollution such as from a pipe, ditch, vessel or rolling stock.
Waste-load allocation	The maximum allowable daily load of pollutants for each discharger of waste into a particular waterway. These discharge limits are required for each specific water quality criterion being violated or expected to be violated.

	Such loads shall be at a level at least as stringent as necessary to implement the applicable water quality standards.
Water quality criteria	Specific chemical, biological, and physical constituents that are indicators of pollution. If certain levels of these constituents are not exceeded, they are expected to allow a body of water to be suitable for its designated use.
Water quality standards	Water quality standards contain four elements: the designated use (such as recreation, drinking water, and fish and wildlife propagation) to be made for a body of water, criteria to protect those uses, implementation plans (for needed water quality improvement programs), and an enforcement plan.

CHAPTER 1

INTRODUCTION

The Chairman and the Ranking Minority Member, Subcommittee on Investigations and Review, House Committee on Public Works and Transportation, in a letter dated May 17, 1977, requested that we review the Environmental Protection Agency's (EPA's) implementation and management of the section 208 State and areawide water quality management planning program under the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) (33 U.S.C. 1251 et seq.).

They asked us to review and assess the following:

1. The implementation and management of the section 208 program by EPA.

2. The extent to which the statutory requirements under subsection 208(b)(2) are being addressed, and what other factors, if any, are being considered.

3. The interrelationship between the planning agencies, involved localities, State agencies, and other governmental units in (a) preparing the section 208 plans and (b) identifying and addressing the institutional problems associated with implementing the plans.

4. Whether the section 208 planning program is being coordinated with other planning programs.

5. Whether individualized plans are being developed for each area.

6. The allocation of section 208 and other funds for planning agency administration, consultant fees, data collection, public information and participation, and other program costs.

We reviewed the 208 planning program in the early stages of its implementation. As of September 1, 1978, only five of the plans had received partial EPA approval.

POLLUTION ABATEMENT IS COSTLY AND EFFECTIVE PLANNING IS IMPORTANT

Federal funds spent to abate pollution have been and will continue to be enormous. Therefore, effective

planning of pollution abatement and control programs is extremely important. From fiscal years 1972 through 1978, the Congress appropriated about $23 billion for grants for EPA to help municipalities build wastewater treatment facilities. (See app. I.) In addition, the Clean Water Act of 1977 authorized an additional $20 billion for the municipal construction grants program for fiscal years 1979 through 1982.

Despite massive Federal assistance provided to date, additional funds will have to be provided for wastewater pollution abatement activities. In a February 1977 report to the Congress, the States estimated that it would cost $100 billion to construct municipal wastewater treatment facilities, excluding separate storm sewers, to provide water quality adequate for fishing and swimming to meet 1990 populations. The estimated cost to control nonpoint sources of pollution nationwide would be additional billions of dollars. Unlike point sources, however, Public Law 92-500 did not specify a level of control for nonpoint sources or authorize funds to implement nonpoint source control projects. The Clean Water Act of 1977, however, authorized $600 million for implementing nonpoint source control projects.

Public Law 92-500 was enacted with an overall objective to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. It sets forth goals, requirements, and deadlines for achieving this objective and calls for eliminating discharge of all pollutants into navigable waters by 1985. An interim goal was established for attaining, wherever possible, water quality suitable for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the Nation's waters. This interim goal is to be achieved by July 1, 1983. The planning provisions of Public Law 92-500 include basin and 208 planning. Some confusion initially existed as to the relative importance of each, with EPA first placing emphasis on basin planning and later on 208 planning. Although section 208 planning has started slowly because EPA gave the program low priority, EPA now considers 208 planning to be extremely important for meeting water quality goals. In addition, the program has evolved over the years to where the States have now been given greater responsibility for 208 planning.

Because total funds for water pollution control are limited, good planning is needed to set priorities and evaluate alternatives for controlling water pollution. Planning serves as a basis of control over construction of

treatment facilities and other actions to abate water pollution. Critical parts of water quality management planning include a thorough analysis of the water and the problems with water quality, a careful consideration of alternatives for cleaning up the water, evaluation of public acceptance of various control efforts, and the establishment of specific timetables for required actions. Careful planning also is needed to ensure that construction grant funds are used most effectively to improve and protect the quality of the Nation's waters. Unless the full extent of water quality problems and their causes is determined by planning, a fortune may be spent on a cleanup program only to find that the water is still far below standard. EPA officials are quick to point out, however, that millions could also be spent on just monitoring to determine cause and effect relationships of water quality. According to them, data collection is very expensive and may never definitely establish cause and effect relationships for water quality. They contend that if EPA were to spend most of its resources on data collection, little or no attempt would be made to carry out control programs.

In enacting Public Law 92-500, the Con ess emphasized the importance of comprehensive water quality planning. The act requires two major levels of water quality management planning: (1) river basin 1/ water quality management plans to be developed by the States and (2) areawide waste treatment management plans to be developed by either regional agencies in specifically designated areas or States in all areas not covered by an areawide planning agency. (See diagram on p. 4.)

River basin plans are to identify water quality problems and set forth effective remedial programs to improve river basin water quality. EPA regulations require that basin planning include a monitoring program to (1) collect the data needed to determine the relationship between water quality and waste loads from individual polluters, (2) identify nonpoint sources of pollution, and (3) gather data necessary to set and review water quality standards and determine total allowable maximum daily amounts for point sources of pollution.

Whereas the river basin plan is concerned with evaluating the extent to which each river basin is polluted,

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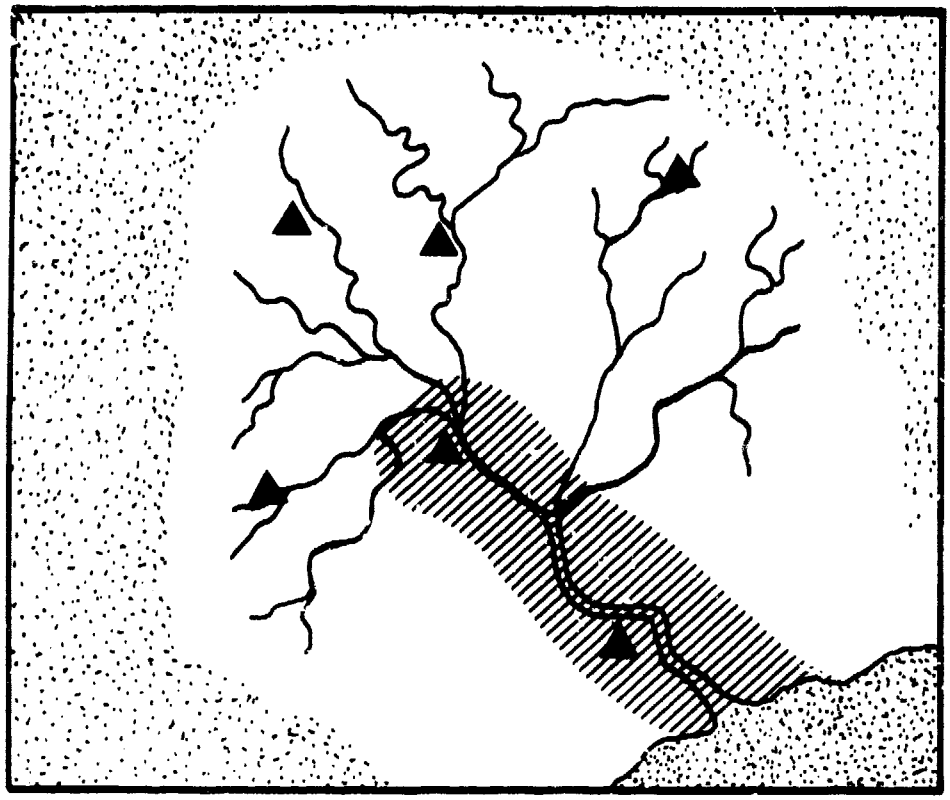
1/ The area drained by a river and its tributaries.

RELATIONSHIP BETWEEN AREAWIDE AND RIVER BASIN PLANNING



Areawide waste treatment management plan (section 208)

River basin plan (section 303[e])

Sewage treatment plant

the areawide (section 208) plan is concerned, in most cases, with only a particular part of a river basin identified as having substantial water quality control problems.

EVOLUTION OF 208 PLANNING 1/

In nearly 5 years, 208 planning has evolved from a program considered optional for urban regions to one which is mandatory in all areas of the Nation and performed by local, State, and interstate planning agencies. Nevertheless, EPA was slow in implementing the program and it has experienced a variety of problems which have inhibited its overall effectiveness.

When Public Law 92-500 was enacted, the Congress intended that EPA promulgate regulations for designating planning areas and for carrying out planning activities within 90 days of the date of enactment (January 16, 1973). It was also intended that State governors would designate planning area boundaries and a planning agency for each area by July 1973.

Unfortunately, EPA planning area designation guidelines were not published in final in the Federal Register until September 14, 1973, and most planning areas and agencies were not awarded funds until May and June 1975. Furthermore, grant regulations were not published and did not become effective until May 1974--almost a year and a half after the enactment of Public Law 92-500.

EPA officials gave several reasons for delaying the implementation of 208 planning, but primarily it was a matter of administrative priorities. EPA was assigned many new jobs by Public Law 92-500 but these jobs were done with not enough additional staffing and under short time frames. Thus, priorities were imperative and EPA assigned 208 planning a low priority.

Another indication of the low priority EPA gave the program is shown by the amount of funds it obligated in fiscal years 1973 and 1974. Although $150 million was actually

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1/Much of this information was derived largely from a National Commission on Water Quality report dated August 1975, entitled "Institutional Assessment of the Implementation of the Planning Requirements of the Water Pollution Control Act Amendments of 1972."

appropriated for 208 planning, only $13 million was obligated. As a result, the National Association of Regional Councils filed suit against EPA on October 16, 1975, to make the unobligated funds available. The National Association of Regional Councils contended that EPA failed to justify why it did not carry out the act's explicit funding obligations, while EPA contended that its authority to spend the funds had lapsed. The Court of Appeals ruled that in fact the funds had lapsed and EPA had no authority to obligate them. However, EPA was directed to request additional money to provide 100-percent funding to those agencies receiving a 75-percent grant after June 30, 1975. EPA made the request, but the Office of Management and Budget has not approved it.

In addition to implementation problems, the program also experienced problems with the State's role of planning for areas not included in designated planning areas. Under section 208, the Governors can designate local organizations to perform 208 planning for certain geographical parts of the State. Early in the program the State's responsibility was unclear concerning 208 planning for those parts of the State for which no designations were made.

The following questions plagued EPA.

--What must the State do when a Governor had nondesignated parts of all of his State or had remained silent on some areas?

--Must the State act as the 208 planning agency, what powers must it have, and how shall local people participate?

Under EPA's current regulations, planning and management provisions of section 208 are mandatory in all parts of every State. If a substantial water quality problem exists, a local 208 planning agency must be designated. If no local designation is made, the State must act as the area's State planning agency and perform the full requirements set forth in section 208.

PROGRAM FUNDING

For fiscal years 1974 through 1976, 176 areawide grants and 49 State grants totaling over $216 million were awarded. (See app. II.) An additional 25 grants totaling $2 million were subsequently awarded by March 7, 1978, but

none of the funds were allocated to any new areawide or State 208 agencies. As of September 1, 1978, no plans have been completed according to all the requirements as set forth in the law. Twenty-one plans have received State certification, but all plans include conditions that must be satisfied before the State gives unconditional approval. Of the 21 plans receiving State conditional approval, only 5 have received EPA conditional approval. EPA's approvals are also conditional upon the planning agencies adequately completing various aspects of the plans. State certification and EPA approval actions are based, in part, on whether the plan meets the requirements of the regulations and the act. Certification and approval without conditions could be given only if control programs for each water quality problem were specifically identified and already being carried out. The conditions, in part, relate to further actions the planning agency must take to meet the requirements of the act and the regulations.

The Clean Water Act of 1977 (Public Law 95-217) authorized an additional $600 million--$150 million for fiscal years 1977 through 1980--to continue 208 planning. Although $600 million has been authorized for 208 planning for fiscal years 1977-80, only $116 million has been appropriated as of September 30, 1978. In addition to authorizing $600 million for 208 planning, Public Law 95-217 also authorized another $600 million for the 208 program whereby funding assistance can be provided to landowners installing the best management practices for long-term soil conservation to improve water quality by reducing run-off. See appendix III for a history of section 208 funding.

Throughout the years, the 208 program has experienced some problems. As pointed out in EPA's March 1, 1978, report entitled "Program Strategy for Water Quality Management FY 1979-83," the program initially was plagued by many problems:

> "Policy was often developed late, had changing objectives, and confused the ongoing planning efforts. There was a belated recognition that the program was a political process, and public participation was under-emphasized. Ill-defined and shifting relationships existed between States and areawides as to responsibilities. Most importantly, an overly ambitious attempt was made to cover all water quality and waste treatment problems in the initial two-year process."

During our review, we noted program weaknesses which are explained in chapters 2 and 3. Until such time that these weaknesses can be corrected, we believe the 208 program will be unable to reach its full potential for directing priorities and evaluating alternatives for controlling water pollution.

SCOPE OF REVIEW

We visited 6 EPA regional offices, 8 State water pollution control agencies, and 10 designated areawide planning agencies. At each location we interviewed officials concerning their statewide or areawide planning program. (See app. IV for a list of locations visited.) None of the agencies had completed water quality management plans during our visit. We examined the planning agencies' project control plans (work programs for the planning period) to determine the agencies intended actions during the planning period. (See app. V for scheduled use of grant funds by object class.) After completing our fieldwork, one of the areawide agencies we visited attempted to implement its 208 plan. (See p. 28.)

We also reviewed EPA contractor reports on 20 areawide planning agencies and interviewed consultants for 37 areawide planning agencies. We believe our combined information about efforts in 73 1/ State and areawide planning agencies generally is representative of 208 planning agencies.

We also contacted representatives of two marketing research firms to obtain information concerning strategies the planning agencies could use to involve the public in their water quality management planning efforts.

During the review, we were assisted by Dr. Donald T. Lauria, Professor of Water Resource Engineering at the University of North Carolina. Since 1965 he has been on the faculty of the Department of Environmental Sciences and Engineering at the University of North Carolina. His teaching and research interests include mathematical modeling, systems analysis, planning, and design, all in connection with water resources. Dr. Lauria is a registered professional engineer in North Carolina and New York and is a member of professional and honorary societies.

1/Our review also included two agencies EPA's contractor visited. Therefore, we reviewed 73 agencies, not 75.

CHAPTER 2

208 PLANNING EFFORTS ARE NOT COMPREHENSIVE AND MAY NOT BE LEGALLY ENFORCEABLE

Water quality management planning agencies are not adequately addressing many of the statutory requirements of section 208. This has occurred largely as a result of (1) an inadequate time frame for planning, (2) an EPA instruction limiting the scope of planning efforts, and (3) inadequate cause and effect water quality data needed to address the planning requirements. In addition, EPA has only received $469 million of the $900 million that has been authorized.

Many 208 planning agencies have devoted most of their time and resources to only a few of the statutory requirements and, as a result, water quality management planning efforts have not been very comprehensive. Also, the lack of adequate water quality data has hindered the effectiveness of many planning agencies and may result in serious legal roadblocks to implementing 208 plans.

Although both section 208 and EPA regulations set forth various requirements for 208 planning, State and areawide agency officials we visited stated they did not adequately address all the requirements. As a result, the initial plans, when completed, will not be comprehensive.

Tables 1 and 2, on pages 10 and 11, respectively, show the various statutory and regulatory requirements not being met by the 16 208 agencies we reviewed in detail. Most 208 planning agencies had taken some action on several requirements but, for many reasons, they did not complete them. Therefore, additional time and resources must be devoted to 208 planning before the program will become as comprehensive as the Congress envisioned.

INADEQUATE STATUTORY TIME FRAME TO CARRY OUT 208 PLANNING

State or areawide 208 planning agencies were required to complete their initial plans and submit them to EPA within 2 years, but no later than November 1, 1979. 1/ The 208

1/The Clean Water Act of 1977 allows some planning agencies to complete their initial planning process beyond November 1, 1978, but not to exceed the 2-year planning time frame allowed by law.

Table 1

Statutory Requirements Addressed During Planning by the 208 Planning Agencies We Reviewed

	Number of agency responses					
	(a)	(b)	(c)	(d)	(e)	(f)
Identifying municipal and industrial treatment works needed over a 20-year period and how to finance construction	4	5	7			
Establishing construction priorities and time schedules for municipal and industrial treatment works	7	6	3			
Establishing a regulatory program to oversee the requirements of section 208 of the act	7	4	5			
Identifying agencies necessary to construct, operate, and maintain all required facilities and carry out the plan	8	5	3			
Identifying financing, costs, and time necessary to carry out the plan	3	2	11			
Identify, if appropriate, agriculture and silviculture-related nonpoint sources of pollution and control measures	3		13			
Identifying, if appropriate, mine-related sources of pollution and control measures			10	6		
Identifying construction activity related sources of pollution and control measures	2		11			3
Identifying, if appropriate, salt water intrusion from reduction of fresh water and control measures	2	2	12			
Controlling the disposition of all residual waste which could affect water quality	4	2	9	1		
Controlling the disposal of pollutants on land or in subsurface excavations to protect water quality	4	2	8	1	1	

a/ Will be completely and adequately addressed during areawide planning.

b/ This requirement was not addressed under the 208 planning effort, but has been adequately addressed as part of the facilities planning (or some other planning) effort.

c/ Although considered during 208 planning, we were informed that a lack of time, data, or funds prohibited completion of work in this area. As a result, this area will probably receive conditional approval and work will have to be completed during a continued planning phase to obtain unconditional EPA approval.

d/ Officials indicated that this requirement was not a problem and, therefore, was not addressed during 208 planning.

e/ Not addressed at all.

f/ This requirement is considered to be a State responsibility and was not addressed by areawide planning agencies.

Table 2

EPA's Regulatory Requirements Addressed During Planning By The 208 Planning Agencies We Reviewed

	Number of agency responses					
	(a)	(b)	(c)	(d)	(e)	(f)
Planning boundaries	11	5				
Water quality assessment and segment classifications	8	3	2	1		2
Inventories and projections	9	4	3			
Nonpoint source assessment	1		15			
Water quality standards	5	8	1			2
Total maximum daily loads	3	2	3	2	3	3
Point source load allocations	2	2	4	2	3	3
Municipal waste treatment systems needs	7	3	5		1	
Industrial waste treatment systems needs	5	2	6	3		
Nonpoint source control needs	1		15			
Residual waste control needs; land disposal needs	4	1	11			
Urban and industrial stormwater systems needs	1		13		2	
Target abatement dates	1	1	14			
Regulatory programs	1		15			
Management agencies	1		15			
Environmental, social, and economic effect	1		13		2	

a/ Will be completely and adequately addressed during 208 planning.

b/ This requirement was not addressed under the 208 planning effort, but has been adequately addressed as part of the facilities planning (or some other planning) effort.

c/ Although considered during 208 planning, we were informed that a lack of time, data, or funds prohibited completion of work in this area.

d/ Officials indicated that this requirement was not a problem and, therefore, was not addressed during 208 planning.

e/ Not addressed at all.

f/ This requirement is considered to be a State responsibility and was not addressed by areawide planning agencies.

plans are to be updated annually to reflect new information and any changed condition through the State's continuing planning process. Each plan must identify all sources of water pollution within the planning area, determine the seriousness of the pollution from these sources, and develop a means to control each type of pollution.

As noted in chapter 1, many agencies were not able to promptly start their planning because of program implementation problems. In addition, according to State and areawide planning officials, the 2-year time frame was inadequate for the type of comprehensive water quality planning envisioned by the Congress.

According to EPA officials, the 2-year time frame is not enough time in which the plans can be completed and certified by the Governors and there is a general lack of agreement among EPA officials as to what would constitute an adequate time frame. In addition to the 2 years allowed for planning, the act allowed a 1-year startup period before the actual planning started.

EPA, State, and all areawide planning officials in Region X agreed that the 2-year time frame was completely inadequate for developing information on sources of pollution and the effect on water quality, particularly concerning nonpoint sources of pollution. As shown in tables 1 and 2 on pages 10 and 11, very few agencies are developing and implementing controls for nonpoint sources of pollution primarily because time in which to adequately address this problem is insufficient. Officials of all Oregon areawide agencies stated that they anticipate some unsuccessful nonpoint source projects because they were unable to obtain sufficient information about this area within the 2-year time frame.

EPA, State, and areawide agency officials in Region V agreed that the States are just beginning to understand the complexities of nonpoint source problems, but do not have specific water quality standards for some water quality parameters (phosphorous, nitrogen, and sediments) which are affected by nonpoint source pollution. Also, Wisconsin State officials are not convinced that such standards can be developed within the short period of time provided. For example, in Wisconsin many major effects of nonpoint source pollution are experienced in lakes and reservoirs, but the science of evaluating the cause and effect relationship between nonpoint source pollution and water quality problems in a lake or a reservoir is somewhat imprecise at this time.

Wisconsin State officials believe that without standards and the ability to predict the amount of pollution and effect it will have on water quality, a nonpoint source program funded under section 208 can be little more than a sophisticated guess. According to Wisconsin officials, a rough estimate of the additional time needed to develop a sound nonpoint source program would be about 5 years provided the program received adequate funding.

One consulting engineering firm stated that it is asking too much of planning agencies to identify, address, and solve nonpoint source problems in a 2-year study. Agency officials explained that it is a tremendous task to identify nonpoint sources, quantify waste loads, and project nonpoint source water quality effects, and, in most cases, the 208 plans cannot adequately address this task, much less analyze the problem and recommend solutions. They stated that 208 efforts would be better spent initiating a comprehensive long-term sampling and monitoring program to verify nonpoint source waste-load characteristics and to test effectiveness of current control measures.

Prior to our review, a July 1975 report, prepared under contract for EPA entitled "National Profile of Section 208 Areawide Management Planning Agencies," also noted some problems resulting from the program's short time frame. The report stated that the 2-year statutory period is insufficient to accomplish all the analysis, planning, evaluation, and approval required for the 208 plan. It further noted that requirements for public participation, local review, and approval are very time consuming and significantly cut into the planning period.

Many problems cited by EPA's contractor relating to the inadequate time frame were mentioned by planning officials during our visits. Furthermore, the inadequate time frame not only significantly affected the ability of 208 agencies to address nonpoint source problems but also prevented some water quality problems, considered to be important by local officials, from being addressed.

EPA guidance limited planning efforts

A major reason 208 agencies did not address all planning elements was that an EPA instruction limited the scope of planning elements to be addressed by 208 planning agencies. In October 1975, EPA's Deputy Administrator issued the following instructions for the 208 planning program to all regional administrators:

"With the limited time and resources available, it is most important that each 208 agency zero in on those elements [planning requirements] for which it can likely obtain implementation in the near term. * * *"

As a result of this instruction which was primarily based on the limited time frame in which the statutory requirements could be addressed, many 208 agencies had to determine which of the planning elements would be addressed.

For example, 208 planning agency officials in Ventura, California, said that they initially identified four water quality problems in their area: seawater intrusion, groundwater mineralization, urban runoff, and irrigated agricultural erosion/sedimentation. Two problems had to be dropped from the study efforts because the time frame was inadequate and, as a result, two potentially important causes of pollution could not be addressed.

Salem, Oregon, areawide planning agency officials stated that, in accordance with EPA guidance, they downgraded the priority of their regional industrial wastewater problems because they could not be addressed adequately within the legislative time frame. However, through the 208 program, the planning agency was able to help the town develop a sewer use ordinance to regulate industrial discharges into the sewer system. The ordinance has been enforced since the summer of 1977.

Industrial chemicals discharging into the waterways can result in significant problems which may cause unnecessary spending of tens of millions of dollars. In our report entitled "Better Data Collection and Planning Is Needed To Justify Advanced Waste Treatment Construction" (CED-77-12, Dec. 21, 1976), we noted that controlling just one industrial firm's ammonia discharge would result in greater water quality improvement on the Willamette River rather than spending tens of millions of dollars for advanced waste treatment plants.

Many agency officials said that toxic chemicals were causing water quality problems in their area. Few agencies, however, actually addressed this issue during their 208 planning efforts. According to several agency officials, the work was too complex to be addressed adequately within the initial 208 planning period.

Inadequate time for attracting and hiring qualified people

Another related problem attributable to the short statutory time frame for 208 planning concerns the ability of 208 planning agencies to attract and hire qualified people. According to EPA officials in Region I, difficulties were experienced in recruiting qualified people because of lack of experience and expertise in this field. In addition, Maine's 208 program experienced complications because its wage level was low compared to private and Federal wage scales. The Pima Association of Government officials in Tucson, Arizona, said that an adequate 208 plan could be developed but that it would take 7 months longer because they experienced problems trying to obtain staffing. According to these officials, the required expertise was not available, and it took approximately 7 months to hire the staff, train them, and begin operations. Portland, Maine, officials stated that it took 6 months to develop a project control plan, hire the staff, and get the work started with no time left for problems and interruptions. They also stated that too many things can go wrong in the technical planning aspects. For example, it took the agency a year, rather than the planned 4 months, to develop a data management system.

LACK OF ADEQUATE CAUSE/EFFECT DATA

Water quality data, describing how pollution occurs and to what degree water quality would be improved after one or more causes of pollution are eliminated, particularly in the nonpoint source area, is needed to support effective area-wide planning and to pursue the most cost-effective control programs.

The lack of adequate data for planning purposes has been discussed in two previous reports. Our 1976 report, entitled "Better Data Collection and Planning Is Needed To Justify Advanced Waste Treatment Construction," showed that data collection was given low priority in certain areas by EPA and the States and that the water quality information used for planning purposes generally did not provide enough detail to identify the specific causes of water quality problems. The report concluded that unless the collection of reliable, necessary data is increasingly emphasized, plans would lack adequate data to solve water pollution problems.

Our report, entitled "National Water Quality Goals Cannot Be Attained Without More Attention to Pollution From Diffused or 'Nonpoint' Sources," disclosed that State and

local planning agencies lack data showing the effect on water quality of nonpoint sources of pollution and the various control techniques because of past emphasis on controlling point sources of pollution. In commenting on this report, EPA acknowledged the importance of proper data collection and analysis and also acknowledged that a data gap exists on (1) the cause and effect relationship between nonpoint sources and (2) the expected effects of various control techniques. EPA stated that it had not pressed for the collection of such data because the technical capability to make the assessments did not exist.

In our review of 208 planning we noted that adequate cause/effect data was lacking and that significant program problems will continue until steps are taken to correct this deficiency.

All 208 planning officials said that data is often inadequate or not available. Of the 16 208 planning agencies we visited, officials at 12 agencies stated they were unable to adequately address some priority problems EPA approved because of inadequate data. For example, an official at the Portland, Oregon, areawide planning agency stated that its combined sewer overflow problem was not addressed adequately because not enough data existed to prove the extent of the problems or to demonstrate that suggested control practices would improve water quality.

EPA Region VIII officials said that abatement of nonpoint sources of pollution presents a particular problem because cause and effect data is lacking. They added that local governments are unlikely to initiate control practices without proof that such controls will actually improve water quality.

Basin water quality plans, which are intended to provide basic information for areawide planners, are generally not adequate because they contain very little information concerning nonpoint sources of water pollution. According to officials at all government levels, basin plans are not complete and do not contain adequate water quality information. They added that basin plans do not furnish all waste-load allocations or point and nonpoint source inventories, and, therefore, 208 planning agencies cannot rely on them and must expend time, effort, and dollars to obtain this necessary information.

Basin water quality plans, which were to be approved before submitting 208 plans, should have analyzed problems in

a complete hydrological unit or river basin, thereby providing a logical framework within which areawide planning could build on.

All 208 planning agency representatives stated that basin water quality plans were inadequate as a source for identifying nonpoint source problems. For example, officials at the Portland, Maine, areawide planning agency stated that existing basin plans were not adequate for identifying the magnitude of nonpoint source problems. In addition, the project director at Portland, Oregon's, local areawide planning agency said that the State had not established waste-load allocations and this had adversely affected their efforts to prepare an adequate water quality management plan.

Officials in two other regions also were not satisfied with the information developed under the basin planning efforts. For example, Region VIII officials stated that, of 53 basin water quality plans, 27 were not complete because they did not contain waste-load allocations. A Tennessee State official also stated that, because waste-load allocations completed under basin planning efforts were largely based on guesswork, the Tennessee 208 planning program had to redetermine its waste-load allocations.

The lack of adequate water quality cause/effect data has plagued water quality planning for many years and apparently will continue to be a problem under 208 planning. Unless better data is obtained under the 208 program, significant problems may continue to be unresolved and the most cost-effective control program may not be undertaken.

POTENTIAL LEGAL PROBLEMS RESULTING FROM INADEQUATE DATA

The control of many nonpoint sources will require land management techniques or land use controls. Since such techniques and controls are controversial, they will be difficult to implement. Attempts to implement land use controls for nonpoint related problems without knowing the effect on water quality, or being able to establish the effect, may not only damage the credibility of areawide planning efforts but may also encounter legal barriers to implementing the plan.

The Salem, Oregon, 208 planning agency studied soil erosion/sediment control for agricultural land in one part of a county in the three-county planning area. On the basis of study results in the one county, the agency attempted to

implement an erosion/sediment control ordinance for the other counties as well. A consultant provided a legal analysis of the agency's approach and concluded that an ordinance, based on the limited work described above could not be enforced for the following reasons.

--Civil law requires a certain rational justification before implementing regulations. A pilot study in one area was not considered adequate to provide the necessary rational justification for implementing a three-county ordinance.

--The ordinance has to have a rational basis to be effective. The agency did not have adequate data to establish cause and effect relationships. Data or study results cannot be generalized, but must be site specific and precise, bearing reasonable semblance to the problem.

--More data on soil types, runoff coefficients, identification of sources of pollution, etc. (general cause and effect data that was not gathered) was needed not only for its study area but also for representative locations throughout the three-county area.

The need for cause and effect data cannot be considered necessary only for those instances where land management controls are being considered. Such data is also needed for other pollution abatement activities, such as requiring specific levels of wastewater treatment. For example, the Chief, Water Quality Planning Section, Tennessee Department of Public Health, stated the following legal action resulted from an inadequate data base:

> "The State, in cooperation with EPA Region IV and the Tennessee Valley Authority, developed waste load allocations requiring BOD [1/] and nitrogen removal ranging from 95 to 98 percent [2/] for point source dischargers on one State stream.

1/A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water and wastewater.

2/By comparison, secondary treatment removes roughly 85 percent of BOD.

> The allocations, based upon historical data, were included in discharge permits and in the basin water quality plan for this stream. One of the affected dischargers contended that actual water quality data did not substantiate the need for such stringent allocations and sued the State to prevent adoption of the basin plan and the allocations. An injunction was granted on the basis of the discharger's analysis which was sufficient to effectively dispute the State's rationale. The State's position primarily was based on assumptions and technical opinions."

The Chief also said that the 208 planning effort is operating without adequate data for sound planning. He believes the State will be open to legal actions because it lacks the necessary data to establish effective waste-load allocations.

Inasmuch as the implementation of land management techniques is controversial and will be difficult to enforce without some demonstration of cause and effect, we believe this area requires innovative planning approaches such as those Oregon used in addressing nonpoint source problems caused by agricultural and forestry practices. (See app. VI.)

As noted previously, we believe that 208 planning agencies typically do not have adequate cause and effect water quality data. The approach of developing water quality control programs without knowing the effect on water quality may result in an inadequate investigation of the water quality effect of nonpoint source control programs. In our opinion, this approach increases the likelihood of court actions.

CHAPTER 3

HINDRANCES TO AREAWIDE PLANNING NEED TO BE CORRECTED

In addition to a lack of comprehensive plans and potential legal problems, the 208 planning program faces several obstacles which could hinder the completion and implementation of plans. These obstacles include (1) the lack of commitment by local authorities to continue funding 208 areawide planning agencies and implementation activities when Federal funds are exhausted, (2) lack of institutional arrangements necessary to implement planning recommendations, and (3) inadequate public participation programs sensitive to local needs and values. Unless these obstacles are overcome, 208 plans may not be completed and millions of planning funds may be wasted.

LACK OF CONTINUED LOCAL FUNDING COMMITMENTS

The 208 process is intended to be an ongoing planning process, but no mechanism has been established to insure continued local funding of the planning aspects of the program. Furthermore, Federal funding to implement planning recommendations, particularly concerning nonpoint sources of water pollution, is extremely low compared to the estimated needs. To obtain planning funds, EPA required planning agencies to certify that the planning process would become financially self-sustaining after the development and approval of [illegible]tial 208 plans and that planning efforts would co[illegible]. As previously discussed, however, many planning agencies [illegible] not yet identified and developed control programs for all their water quality problems and do not plan to do so unless additional Federal funds are made available. Many Federal, State, and local officials stated that local governments, which are represented in designated areawide planning agencies, are unwilling to commit themselves to continued present funding levels of water quality planning. Following are examples of State and local officials commenting on the need for future Federal planning funds.

--Officials from the Mid-Willamette Valley Council of Governments stated that without additional Federal planning funds, local funds will not be made available. According to these officials, the agency is not prepared to carry out future 208 planning efforts using only local funds, and the lack of future funding will cause some current 208 plans never to be completed, updated, or implemented.

--EPA officials in Region IX stated that, without additional funding, planning will not be continued at the Pima Association of Governments, the plans will become shelf documents, and the dollars already spent will be wasted.

--California State officials said that the planning agencies are not seriously seeking self-sustaining funding sources. Instead they are hoping for continued Federal funds and have not planned to be completely self-sufficient. According to these officials, 208 planning will cease after initial plans are submitted unless Federal funding continues at about the 75-percent level.

--Region V EPA officials said that unless EPA continues to fund 208 planning by the State or areawide agencies, the degree of future planning efforts will not be maintained. Such efforts will, instead, be dictated by the level of funds an organization is able to generate for continuing planning purposes, which may or may not enable the organization to comply with all the mandated requirements set out in section 208.

An EPA contractor also found that continued local funding of 208 planning activities is not assured. In a July 1975 report, entitled "National Profile of Section 208 Areawide Management Planning Agencies," Centaur Management Consultants, Inc., asked areawide planning agencies if they expected problems in establishing a financially self-sustaining planning process. Of the 119 responses received, 92 (77 percent) stated they expected problems. The report further stated that, of the 136 agencies interviewed, 107 said they would not have participated in 208 planning if there had been only 75 percent funding for initial planning activities.

In a January 22, 1978, draft report, entitled "Managing the Water Quality Management Program--FY 1978-83," EPA also pointed to the problem of continued local funding. The report stated:

> "State and areawide agencies will not do the water quality management program at this point in time without Federal assistance. Timing of getting these funds has become critical as many agencies will soon have lost most of their staff as initial plans are completed. This impedes maintaining continuity in ongoing successful programs; and generated difficulties in re-starts; new staff have to be brought up on the learning curve.

Uncertain availability of additional funds does not allow planning to be effectively sequenced."

According to EPA officials in one region, it was extremely naive to think that areawide agencies would be financially self-sustaining. They stated that local governments supporting the 208 agencies are, in most cases, contributing as much as they are willing to, and it is unlikely they will increase their financial support. They also stated that, unless funds are provided to enable the 208 agencies to retain a core of staff, the 208 agencies will not be able to keep the plans updated and, therefore, they will become outdated in a few years.

With the recent passage of Proposition 13 in California, EPA officials are concerned that the State's water quality management planning program will be endangered. According to the Assistant Administrator, Office of Water and Management Waste, California has 13 active planning programs funded under section 208 which receive 75 percent of their operating funds from EPA. The local communities must raise, however, 25 percent of each 208 areawide agency operating budget. If other States pass similar legislation, water quality management planning may be one of the first areas to receive a reduction in support, or no support at all, depending upon the priority of the activity to other activities in the States' budgets.

PLANS MAY NOT BE IMPLEMENTED BECAUSE FUNDS ARE LACKING

Some 208 planning officials said that pollution abatement and control programs recommended by the 208 planning process will not be implemented unless additional 208 funds are provided. Little will be done in implementing best management practices without Federal funds. Farmers are one group that will need subsidies to implement best management practices as they relate to nonpoint sources in agriculture. In this regard, the Clean Water Act of 1977, which was enacted on December 27, 1977, now allows subsidies to farmers installing best management practices. A new program has been set up in the Department of Agriculture whereby grant assistance may be provided to rural landowners and operators installing best management practices for long-term soil conservation to improve water quality by reducing runoff. The act authorized $200 million and $400 million to be appropriated for this purpose for fiscal years 1979 and 1980, respectively.

The Federal costs may be enormous for providing grant assistance to rural landowners and operators installing best

management practices. For instance, a report issued in March 1978, to the Illinois Environmental Protection Agency by the State's Task Force on Agricultural Nonpoint Sources of Pollution, noted that changes in land use and soil conservation practices, such as contour plowing, conservation tillage, grading of land, and terracing might cost as much as $229 per acre. Approximately $1.3 billion would have to be spent for such control practices for the entire State. According to an Illinois EPA official, there are other problems in the State, such as pesticide runoff, fertilizer or nutrient runoff, and livestock waste runoff, that need to be addressed and may also cost billions of dollars to correct.

INSTITUTIONAL PROBLEMS MAY HINDER AREAWIDE PLAN IMPLEMENTATION

Many 208 planning agencies have not been able to develop adequate institutional arrangements to carry out 208 plans. Moreover, the ability to develop such institutional arrangements for all 208 planning agencies is very doubtful because of the fragmentation of necessary implementation authority among State, local, and special purpose governmental entities and the lack of sanctions to force planning implementation.

California State officials stated that, with the exception of the Tahoe Regional Planning Agency, none of the designated agencies in their State have the authority to implement plans. They further stated that the solution must have a majority acceptance within the governing body membership. According to the officials, there is little the State can do if a governing body's constituents decided they do not want to implement 208 recommendations.

An official from Elmhurst, Illinois, said that the Chicago Metropolitan area is in the final stages of developing a 208 water quality management plan which has cost approximately $7.3 million. According to this official, the draft plan which is now being reviewed does not provide for a cost-effective, implementable plan for controlling water pollution. Other public officials in the area have also expressed similar concerns about the 208 planning process and draft plan.

According to the Elmhurst official, the 208 planning process failed to provide for adequate input from local elected and appointed officials responsible for the plan's implementation. As a result, the draft plan

--does not provide for the most efficient expenditures of available moneys and does not analyze incremental costs as compared to benefits;

--requires the expenditures of billions of dollars for capital improvements as well as substantial increases in operating, maintenance, and replacement costs; and

--recommends a management structure that is unacceptable to many local implementing agencies.

Maine State officials said that under State law the State has the statutory authority to control erosion/sedimentation problems. They stated that although an erosion/sedimentation control program could be developed under existing State licensing (permit) authority, the State does not have the staff to do so. According to State officials, a sanction mechanism is needed to force governments to take the necessary action to implement 208 planning recommendations.

In those areas where the necessary authority is lacking, an agency's ability to obtain such authority is not always assured. For example, areawide planning agency officials in Portland, Maine, said that sanitary districts, which are responsible for sewer operations, maintenance, and construction, cannot be formally tied to municipal governments, which are responsible for land use controls. They added that local governments have the land use control authority and do not want to relinquish it to meet the requirements of 208 planning.

Oregon State officials stated that it is too early in the planning process to determine if the State will have the legal authority to effectively implement plans. Although Oregon's Department of Environmental Quality has the authority to control point sources of pollution, it is unclear which department will have the authority for implementing planning recommendations for nonpoint sources of pollution. According to these officials, management and implementation of best management practices could be undertaken by other State agencies such as the Department of Forestry for silvicultural activities and the Department of Geology and Mineral Industries for mineral extractions.

State agencies responsible for nondesignated areas may also face the same problems as areawide agencies in identifying potential implementing agencies. For example, the director of Tennessee's 208 planning effort said the State planning agency has no authority over agricultural and forestry nonpoint source pollution. He commented that implementation of the

plan would be up to other agencies and that such implementation is not assured.

NEED FOR EFFECTIVE PUBLIC PARTICIPATION STRATEGIES

The water quality management planning agencies are addressing pollution sources which may require management techniques such as land use controls, issuing permits and licenses, setting standards, and imposing fiscal policies such as metering or increasing taxes. These control methods, particularly land use control, can considerably affect the public and are highly controversial issues. Therefore, the success of water quality management plans may depend on how the public accepts various control measures.

Requirements for public participation

The 1972 amendments require that public participation in the development, revision, and enforcement of any plan or program established under the act be provided for, encouraged, and assisted by EPA and the States. EPA regulations state that public participation is intended to involve the public in formulating water quality management plans, including the determination of the planning goals, and to develop public support that will ultimately lead to acceptance and implementation of the plan.

To fulfill this requirement, EPA issued its June 1976 "Public Participation Handbook for Water Quality Management." According to the handbook, the purpose is to aid public education, create a plan sensitive to local needs and values, and build support for plan implementation. Further, the essence of the water quality management planning process is decentralized decisionmaking by citizens to influence planners and by elected officials responding to electorates.

EPA also stated in the handbook that regulatory controls undoubtedly will have to be used to achieve the 1983 water quality goals.

> "Without citizen support, such regulatory controls [measures and land use controls] may be viewed as politically unacceptable, and a potentially effective State program may not be approved."

An EPA Region X official stated that a public involvement strategy--which would be a step-by-step program on how plan implementation should take place through the public--is

just as important as the technical part of a water quality management study, if not more so. EPA Region X officials stated that the public involvement program should run parallel to technical aspects of the program. A cording to the official, without a strategy to implement a plan or convince the public that a problem in water quality exists, a technical plan can be wasted. Wisconsin officials also stated that public participation is critical and, if landowners do not understand and accept recommended practices, program success may not be possible.

Although EPA had developed public involvement guidance which the planning agencies were using, our review showed that most of the emphasis is being placed on involving special and key interest groups, rather than the general public, in the planning process. Although these groups' views are important, some water quality management plans may not be implemented because the views and opinions of the general public have not been obtained and, as a result, the final plans may be rejected.

EPA's handbook also contains a sample of what the agency considers a balanced Policy Advisory Committee. Of the 28 committee members, no less than 18 represent State or local government agencies or bodies; 5 represent business, development, or farming interests; 2 represent environmental groups; 2 represent other citizen groups; and 1 represents the Federal Bureau of Land Management. In our opinion, such a committee cannot adequately provide for meaningful public involvement in the decisionmaking process because most members represent special interest groups or government agencies rather than the general public.

Several organizations have characterized EPA's public participation program as one in which the general public, for the most part, has been largely ignored. In June 1977, the Institute for Public Interest Representation, Georgetown University Law Center, issued a memorandum pointing out serious and pervasive deficiencies in EPA's public participation regulations. According to the Institute, because EPA's regulations do not specifically require that private citizens be part of the planning process, the views of important segments of the public may not be heard by the planning agencies. In addition, the Institute pointed out that because of the requirement that local government officials make up a majority of the advisory committees' membership, the committees may well be at variance with views of the general public.

An EPA 1976 consultant report of 20 local planning agencies concluded that:

> "* * * the general public does not feel sufficiently informed about the intent, progress, or potential implications of the water quality management program, without which, it will be difficult to implement water quality management plan elements which affect private property." (Underscoring supplied.)

In addition, officials from two national marketing and opinion research agencies stated that although the major methods EPA recommended to achieve public participation--public meetings or hearings and formation of policy advisory committees--can provide worthwhile public inputs, they can also result in considerable bias because they do not provide for surveying general public opinion. They explained that an effective public participation program requires the use of opinion research early in the program and that such research is extremely important because it identifies the affected citizen's reaction to the question of whether problems exist or not. They said it will identify what the public perceives to be important--what level of clean water (or air) they will accept, pay for, etc. They said once these parameters are known, then a process can be developed to explain the benefits and costs necessary to support the program, and this information can greatly assist overall acceptance by affected citizens.

Public opinion surveys could guide planning efforts and assist in obtaining public acceptance

Officials from all of the 208 planning agencies said that they encountered difficulties in obtaining public involvement and convincing the public that its water quality problems are important and warrant implementation of pollution control programs. Although all agencies were experiencing problems with public participation programs, only one agency had performed a public opinion survey. According to EPA officials, EPA's current and proposed regulations concerning public participation are silent with respect to the use of public opinion surveys.

Portland, Maine, areawide planning agency officials stated they were unable to obtain broad-based public involvement. They said the real problem was getting people interested because they see large waste treatment facilities operating and believe all water quality problems will be solved.

Maine officials stated that even if affected citizens believe a water quality problem exists, that does not mean they believe it is significant enough to require regulatory controls. They added that controls will have to be addressed in terms of economic costs and benefits rather than water quality considerations.

At the time of our review, of the 16 planning agencies reviewed, only 1 had completed and tried to implement its plan. Three other agencies, however, had implemented portions of their plans even though their entire plan had not been completed. Officials at the Tahoe Regional Planning Agency (TRPA) in EPA Region IX believed they had a viable water quality management plan which would be used to implement land management controls through land use ordinances. Affected State and local government officials, however, rejected the plan, citing the high implementation costs. The estimate to implement all the control measures was $140.9 million. As a result, TRPA now plans to establish a demonstration project on the lake which would develop cause and effect relationships and cost-benefit comparisons.

A TRPA official stated that they had not used public opinion surveys and the public involvement techniques used--public hearings and newspaper advertisements--apparently resulted in a biased sample of public opinion which was not representative of the general public. He added that public opinion surveys probably would have been helpful in identifying what the general public believed was important and could have been used to modify their plan to achieve better public acceptance.

The director of a national marketing and opinion research firm also stated that in the water quality area, because of its complexity, the initial phase of opinion research is absolutely vital. He believed that agencies experienced difficulties with "lack of public interest" due, in part, to the poor public participation methodologies used.

The key objective in a public opinion survey approach is to get the opinions of a general cross section of the population about a project or planned water quality control action. This survey could be done through randomly selecting a few individuals in the area that will be affected. Personal interviews, questionnaires, or small group discussions could be used by either opinion research groups or public officials. These methods have been successfully used for years by private firms for testing consumer attitudes and are used nationally for testing public opinion. They

can be used to augment public meetings and the opinions of public and special interest groups.

According to opinion research officials, the cost of private firms' opinion research is relatively inexpensive. For example, they said obtaining 400 interviews, which provides 95 percent reliability that the results are representative of a larger general population, would cost approximately $8,000 if a telephone survey were conducted and $30,000 to $40,000 if a house-to-house canvass were conducted. Variations to this approach could either increase or decrease this cost.

The national marketing and opinion research officials commented that EPA's suggested methods for public participation--newsletters, briefings, media coverage, and questionnaires--only guarantee that those special interest groups or a few citizens who are interested would participate during formulation of the plan.

CHAPTER 4

CONCLUSIONS, RECOMMENDATIONS, AGENCY COMMENTS, AND OUR EVALUATION

CONCLUSIONS

Planning is not being done comprehensively under section 208 of Public Law 92-500 as envisioned by the Congress. Water quality management planning needs to be comprehensive if the Nation's water quality problems are to be solved in the most cost-effective manner.

Although 208 planning is supposed to direct the other planning, construction, and discharge provisions of Public Law 92-500, the program has been beset by many problems, such as inadequate water quality data and unreasonable time constraints, which may prevent the program from being able to fully affect solutions to water quality problems. As a result, it may take many years beyond November 1, 1978, before 208 planning will be able to direct the reduction of all sources of pollution comprehensively. Other factors such as the lack of commitment by areawide agencies to continue 208 planning without Federal funds, institutional problems preventing 208 plans from being implemented, and need for improved public participation strategies will ultimately contribute to how effective 208 planning can become.

The problems being addressed by 208 planning agencies are long-term because water quality information needed for correcting these types of problems is not yet available. EPA stated that the technical capability to identify the cause and effect relationship among nonpoint source problems and the expected water quality effects of various control techniques does not now exist. Because of an inadequate water quality data base, agencies are forced to rely on a combination of judgment and existing limited water quality data for preparation of plans.

We believe, however, a technical capability is necessary before controls of nonpoint sources of pollution can be implemented. Any attempts to implement controls for nonpoint related problems, without being able to demonstrate to the public the effect on water quality, may encounter legal barriers preventing implementation of the plan.

The initial 2-year period for submitting 208 plans may not result in plans being comprehensive or solutions to

problems being addressed adequately. For some agencies, additional time may be needed to prepare plans, especially if the agency needs water quality data and the data gathered during this period is not representative because of climatic or other conditions. An adequate time frame is especially critical where issues involving nonpoint sources of pollution are concerned. Because nonpoint sources of pollution significantly affect water planning, it is questionable whether 208 planning can ever be effective unless this area is addressed adequately.

Once the Federal Government stops providing funds for the program, 208 planning may cease, or become ineffective. During our visits with Federal, State, and local officials, many planning agency officials stated that they cannot continue to carry out future 208 planning efforts and, as a result, some 208 plans may never be completed, updated, or implemented once Federal funds are stopped.

It is unrealistic to think that 208 planning will ever become financially self-sustaining with the majority of 208 planning agencies. The extent of future 208 planning will depend on the level of funds that can be generated and allocated for this purpose by local and State governments. We conclude that, unless the Federal Government funds best management practices for reducing pollution from various nonpoint sources, farmers and other landowners will not pay for the control measures because the added costs will put them at a competitive disadvantage.

To accomplish the legislative goals of clean water requires the development of sound water quality management plans. The plans should consider the general public's

--perception of significant water quality problems and what it is willing to pay with its limited resources to correct the problems and

--understanding of what the water quality management effort is trying to accomplish.

The plan should include information obtained through public participation and public opinion surveys in addition to information provided by special interest groups. The guidance furnished by EPA to local planning agencies, however, has resulted in techniques being used which have resulted in program inputs which generally have not reflected the interest of the general public, and one plan has been rejected.

For these reasons, the outlook for implementation of 208 planning solutions to water quality problems does not appear promising at this time.

While we found three agencies that did implement portions of their plans, the situation at the Tahoe Regional Planning Agency might indicate future problems when attempts are made to implement entire 208 plans. Although the Tahoe Regional Planning Agency officials thought they had a viable water quality management plan which could be used to implement land management controls through land use ordinances, State and local government officials rejected the plan citing the high implementation costs.

RECOMMENDATIONS

The Administrator of EPA should reassess the 208 planning program and report to the Congress on:

--How long it will take to acquire adequate cause/effect data, technical capability, and needed resources to accomplish 208 planning as currently required by Public Law 92-500, as amended, and the strategy the Agency plans to follow to resolve the data deficiency problems.

--Alternatives that might be tried in lieu of 208 planning as required by Public Law 92-500 which would include

(a) setting priorities for planning requirements considered essential to the program and

(b) an analysis of the tradeoffs that would be involved if the alternatives had to be achieved in a shorter time frame and at lower costs.

The Administrator of EPA should also

--emphasize to planning agencies the importance of not only obtaining opinions of special interest groups but also opinions about water quality problems and control programs from the general public and

--modify public involvement regulations to emphasize greater use of public opinion surveys.

AGENCY COMMENTS AND OUR EVALUATION

To expedite issuance of the report, we did not obtain formal, written agency comments; however, the report was discussed with cognizant EPA officials and their comments are included where appropriate.

EPA generally agreed that 208 planning is not yet comprehensive but pointed out that many 208 planning agencies have successfully dealt with some complex issues and assisted citizens and State and local governments to implement regulatory programs to manage water quality. EPA felt that the most effective way to use its limited resources was not to have the 208 planning agencies address all the requirements but rather to address only the high-priority water problems.

According to EPA officials, the 208 program has had several accomplishments that include adopting and enforcing sewer use and pretreatment ordinances; combining treatment facilities in the regions, resulting in greater cost effectiveness and significant cost savings; implementating land application systems; and implementing septic tank management programs and siting regulations. Some agencies have also been able to implement nonpoint source control programs for runoff from agriculture, silvicultural, and construction activities. EPA officials believe that many of the controls which have been implemented with 208 planning assistance will protect against future water quality problems and costly corrective measures.

We cannot, however, say that any of the 208 plans we looked at were successful because they had not been completed and implemented. Although some interim outputs have been achieved--land use regulations or ordinances--the technical information is not available to determine the water quality effects of these actions. EPA has acknowledged that a data gap exists on the cause and effect relationship concerning nonpoint sources of pollution because it does not have the technical ability to analyze the data. In effect, the 208 program is being used on a nationwide basis to experiment with a variety of implementation actions which may or may not result in improvements of water quality.

EPA stated that the report does not reflect EPA policies for the 208 program--especially with regard to cause and effect data. Although it agreed that cause and effect data is not complete, EPA said it encourages implementation of best management practices and water quality monitoring to determine their effectiveness. When

best management practices do not result in sufficient improvement in water quality, the planning agency will refine the recommended management practices and continue to monitor their effectiveness. Developing and refining best management practices to meet water quality goals is an iterative process according to EPA.

It also agreed that, in many instances, sufficient cause and effect water quality data is lacking when decisions are being made on how best to clean up water.

EPA believes, however, that a fortune could be spent on data gathering alone without any attempts being made to develop and implement needed solutions to water quality problems. It maintains that data collection is costly and may never provide conclusive evidence of the causes and effects of nonpoint pollution. Therefore, EPA policy is to require development and implementation of control practices based on the best available data. Based on continuing water quality monitoring, control practices are to be evaluated and modified to ensure their effectiveness.

We believe all 208 funds should not be spent on water quality data collection. We are concerned, however, that many of the potential control solutions, such as best management practices, may not be the most effective way to clean up water quality problems. Obviously, decisions have to be made in the absence of full and complete information. Because of the vast sums of money that are associated with control measures to improve water quality, we would like to see a sufficient amount of data gathered before such decisions are made. In this way, some expensive control measures may be avoided in instances where the data shows that improvements to water quality are marginal or that other alternatives may be more effective.

Without adequate data control actions developed under this program will be experimental. Interim program achievements, such as land use regulations and ordinances, can only be cited at this point as surrogates for real water quality improvements. We believe that until adequate water quality data is collected, widespread implementation of control actions could be costly and may not improve water quality.

Regarding the absence of this data, EPA has proposed to experiment with potentially expensive control actions. It has identified three problem areas--determination of need for advanced waste treatment facilities, urban stormwater runoff, and agricultural runoff--which require

intensive data collection efforts. For each problem area, a limited number of model projects are, or will be, developed across the country which will take 2 to 5 years to complete. They are being conducted with controlled methodologies so that what is learned may be applied throughout the nation at lower cost and in a shorter time frame.

We agree with EPA's approach and believe that costly potential solutions to water quality problems should be tested before being applied on a widespread basis.

According to EPA, implementation of water quality management recommended point and nonpoint source controls hinges on positive action by State and local governments to adopt and enforce specific control programs. Actions range from adoption of new enabling legislation and ordinances for sewer use, urban runoff control, or septic system management to modification or expansion of existing programs, such as adding requirements for constructing best management practices or modifying drainage or agriculture practices to protect water quality.

EPA believes the 208 planning program is significantly expanding water quality improvement and protection beyond the traditional engineering orientation of building plants and pipes. Consideration of long-term protection and improvement programs raises difficult social, economic, and political issues, such as growth management, degree of regulatory control, economic impacts and local and State and local governments' financial capability to undertake such programs, that must be resolved before programs can be adopted and carried out. According to EPA, the 208 program has moved water pollution control out of an insulated technical arena into the complex political arena where such issues should properly be resolved. We agree with EPA that implementation of potential solutions to water quality will be a difficult and arduous task. Many needed control programs may never be implemented because of the inability of State and local governments to aggressively take action to adopt and enforce such programs.

EPA agreed with us that public participation strategies are necessary, but took exception to the emphasis we placed on public opinion polls. According to EPA, public opinion polls are captured moments in time and should assess general public attitudes and preferences as they change after education and information. In addition, EPA believes public participation has to be more active than simply responding to a poll. We agree with EPA on public opinion polls. In

general, however, we are referring to a more active public survey process than now being used. We believe that opinion surveys should be used at various times during project development and that they should augment rather than replace current public participation approaches.

EPA is proposing new public participation regulations which, if adopted, should improve its public participation program. We recommend that public opinion survey methodologies be included in the final regulations.

ENVIRONMENTAL PROTECTION AGENCY

CONSTRUCTION GRANTS FOR WASTEWATER TREATMENT WORKS

Fiscal year	Authorized	President's budget	Appropriated	Obligations	Outlays
	(000 omitted)				
1970	$1,000,000	$ 214,000	$ 800,000	$ 424,999	$ 176,376
1971	1,250,000	1,000,000	1,000,000	1,228,364	478,366
1972	2,000,000	2,000,000	2,000,000	787,635	413,408
1973	a/ 7,750,000	b/ 2,000,000	c/1,900,000	2,926,271	684,400
1974	d/ 6,600,000	b/ 3,000,000	e/ 600,000	2,790,681	1,553,421
1975	b/ 7,000,000	b/ 4,000,000	e/1,400,000	4,226,936	1,937,575
1976	-	b/ 9,000,000	e/800,000	4,329,228	2,428,569
Transition qtr.	-	-	e/800,000	687,634	919,463
1977	1,700,000	-	e/3,800,000	-	-
	-	4,500,000	f/ 1,980,000	7,501,146	3,529,577
1978	g/4,500,000	4,500,000	4,500,000	4,000,000*	4,135,000*
	-	-	e/ 5,000,000	-	-
1979	-	-	4,200,000	-	-
	g/5,000,000	4,500,000	e/ 1,400,000	5,000,000*	4,660,000*
	$36,800,000	$34,714,000	$30,180,000	$33,902,894	$20,916,155

*(Estimated)

a/Contract authority in Public Law 92-500, $5 billion, reimbursement to States, $2,750 million.
b/Contract authority--total $18 billion.
c/Appropriated for reimbursement to States.
d/Contract authority, $6 billion; reimbursement to States, $600 million.
e/Appropriated for payments against contract authority obligations.
f/$1 billion of $4.5 billion supplemental request; $480 million, Public Works Appropriation Act, Public Law 94-447; $300 million reimbursement to States, Economic Stimulus Appropriation Act, Public Law 95-29; $200 million reimbursement to States, HUD-Independent Agencies Appropriation Act, Public Law 94-378.
g/ Authorized by the Clean Water Act of 1977.

APPENDIX I

APPENDIX II

TOTAL GRANTS AWARDED NATIONALLLY

UNDER SECTION 208 AS OF MARCH 7, 1978

	Grant amounts (millions)	Awards
Areawide:		
1974	$ 13.0	11
1975	150.0	138
1976	12.0	27
1977	1.3	a/20
State:		
1976	41.0	49
1977	.7	a/ 5
	$218.0	250

a/Awarded to existing agencies.

	Fiscal year					
Region	1974/75	1976	1977	1976	1977	Total
	(areawide)			(State)		
I	$ 12,170,970	$ -	$ -	$ 2,473,700	$ -	$14,644,670
II	23,860,539	384,750	-	4,243,450	-	28,488,739
III	18,062,070	2,493,433	223,900	1,489,836	-	22,269,239
IV	24,858,670	1,571,250	155,500	7,225,750	-	33,811,170
V	38,474,467	1,374,707	287,527	5,408,595	-	45,545,296
VI	10,600,212	711,170	-	6,806,330	174,500	18,292,212
VII	5,782,500	-	-	4,092,800	-	9,875,300
VIII	12,545,000	-	370,854	2,580,999	20,000	15,516,853
IX	10,637,000	4,786,687	112,000	2,716,113	290,000	18,541,800
X	6,190,000	180,000	136,100	4,452,900	209,179	11,168,179
Total	$163,181,428	$11,501,997	$1,285,881	$41,490,473	$693,679	$218,153,458

HISTORY OF SECTION 208 FUNDING

(As of September 30, 1978)

Fiscal year	Authorized	Appropriated	Obligated	Number of agencies Areawide	Number of agencies State
	(millions)				
1973	$ 50.0	$a/50	$ 0	0	0
1974	100.0	b/100	13	11	0
1975	150.0	150	150	138	0
1976	-	53	53	27	49
1977	150.0	15	c/14	0	0
1978	150.0	c/69	2	0	0
1979	150.0	32	-	-	-
1980	150.0	-	-	-	-
Total	$900.0	$469	$232	176	49

a/Authority for obligating the $50 million lapsed.

b/Authority for obligating the remaining $87 million lapsed.

c/Additional grants to existing agencies.

LOCATIONS VISITIED DURING REVIEW OF

EPA's WATER QUALITY MANAGEMENT PLANNING

Region I:
- Maine--Department of Environmental Protection
  - Greater Portland Council of Governments

Region IV:
- Tennessee--Department of Health
  - Mississippi-Arkansas-Tennessee Council of Governments

Region V:
- Wisconsin--Department of Natural Resources
  - Dane County Regional Planning Commission

Region VIII:
- Montana--Department of Health and Environmental Sciences
  - Blue Ribbons of the Big Sky Areawide Planning Organization
  - Flathead Drainage 208 Project

Region IX:
- Arizona--Office of Economic Planning and Development 1/
  - Pima Association of Governments
- California--Water Resources Control Board
  - Tahoe Regional Planning Agency
  - *Ventura Regional County Sanitation District
- Nevada--Environmental Protection Service 2/

Region X:
- Oregon--Department of Environmental Quality
  - Columbia Regional Association of Governments
  - *Mid-Willamette Valley Council of Governments

1/Discussions with State officials were limited to obtaining an overview of the Pima Association of Governments areawide planning project because the State did not receive a 208 planning grant.

2/In Nevada we discussed the areawide planning project at Lake Tahoe and also recorded some general comments on 208 planning. We did not review Nevada's 208 planning effort.

*Agencies included in study by EPA consultant.

PERCENT OF TOTAL GRANT BUDGETED BY OBJECT CLASSIFICATION--

208 PLANNING AGENCIES WE VISITED (note a)

	Object class category									
Agency	Personnel	Fringe benefits	Travel	Equipment	Supplies	Contract	Construction	Other	Total direct	Indirect
A	16.90	3.14	-	-	-	72.93	-	-	92.98	7.02
B	42.92	6.20	.48	-	8.25	35.85	-	-	93.70	6.30
C	13.06	2.69	2.50	.31	2.56	75.44	-	-	96.56	3.44
D	11.65	3.08	.42	.21	1.05	83.17	.42	-	**100.00**	-
E	29.51	-	-	.59	-	45.24	-	7.98	83.31	16.69
F	20.73	3.11	4.85	.61	.91	58.08	-	11.72	b/**100.01**	-
G	57.20	11.44	2.05	1.18	-	9.06	-	7.00	87.92	12.08
H	45.33	8.29	.62	1.56	1.59	18.46	-	4.81	80.66	19.34
I	21.05	2.14	.46	.04	.46	62.79	-	9.08	96.02	3.98
J	24.01	3.85	1.25	.94	7.90	62.07	-	-	b/100.02	-
K	22.98	2.41	.56	1.30	.19	67.80	-	.19	95.43	4.59
L	58.17	7.56	6.44	1.15	.77	25.91	-	-	100.00	-
M (note c)	11.79	1.68	1.50	1.50	1.45	76.66	-	1.83	96.41	3.59
N	5.13	2.42	.22	.11	-	87.84	-	2.16	97.87	2.13
O	18.57	4.09	2.35	1.53	-	63.21	-	-	89.75	10.25

a/Other studies we reviewed did not show any breakdown of how funds were budgeted.

b/Exceeds 100 percent due to rounding.

c/According to EPA regional and 208 planning agency officials, this represents roughly 88 percent of the total grant and is the best available information concerning how grant funds were budgeted.

APPENDIX V

THE EXPERIMENTAL NATURE OF STATEWIDE 208 ASSESSMENTS

The 1983 interim water quality goal of fishable and swimmable waters cannot be achieved in many regions because of nonpoint pollution. Because of the past emphasis on solutions to point source problems, relatively little is known about nonpoint source (NPS) problems. Oregon's approach to nonpoint source problems caused by forestry, grazing, and agricultural practices was an example of the experimental nature of 208 planning approaches. Although such an approach is difficult to apply in locations faced with complex pollution problems--urban centers at the bottom of a river basin drainage--it may be effective in rural basins and in less complex areas at the upper end of urbanized basins.

INTRODUCTION

As part of Oregon's areawide planning for nondesignated areas, a statewide process is being designed to identify and curb the problems that result from NPS pollution. The program involves developing a water quality management plan that meets the NPS objectives in section 208 of Public Law 92-500. These objectives are to

(1) identify and evaluate the nature and extent of present or potential NPS problems and

(2) develop and initiate processes, procedures, and methods to control, to the extent feasible, identified NPS problems.

As the major thrust in achieving these objectives, Oregon has developed a statewide 208 Assessment Program for studying the stream quality effects that result from forestry, grazing, and agricultural practices. The resultant program has two major phases. Phase I is a way of using State water resource experts to quickly identify the location, type, and severity of NPS pollution. The collected information will provide a means for setting priorities for future efforts aimed at understanding and controlling NPS problems. Phase II encompasses the development and application of logical procedures for determining the relative erosion potential and the most suitable land management practices for different types of terrain. The procedures and information developed are to provide a guide for controlling erosion-related NPS problems and a baseline for continually evaluating the effectiveness of applied land management practices.

APPENDIX VI

PHASE I: A QUICK STATEWIDE IDENTIFICATION OF NPS POLLUTION

The Phase I assessment is being conducted through a questionnaire asking respondents to indicate current water quality levels and specific water quality problems on a package of statewide tables and maps. The package was sent to field biologists and soil scientists directly concerned with local water resource management for several State agencies. Questionnaires were sent to 36 U.S. Soil Conservation Service districts in the State, 10 U.S. Bureau of Land Management districts, 101 U.S. Forest Service districts, 23 State Department of Fish and Wildlife districts, the State Department of Forestry, 5 Department of Environmental Quality districts, and 4 designated areawide Councils of Governments. These are the major water quality and land use related groups in the State. A side benefit of this process has been the cooperation and coordination of these groups which may significantly facilitate best management practices (BMP) implementation.

Each respondent has rated the local major streams as having good, moderate, or poor quality with regard to NPS-related problems. The respondents identified major types of problems, including excessive stream bank erosion, siltation or sedimentation, excessive debris accumulation, excessive water withdrawal, low flows, elevated water temperatures, low dissolved oxygen, excessive algal or slime growths, nutrients, pesticides or herbicides, and aesthetic or recreational problems.

The questionnaire information is being collated into a series of statewide multicolored maps. Stream segment maps will be used to show the location of specific types of NPS problems. In addition, maps designating individual river basins will be developed to aid the development of management priorities. By combining demographic information, the priorities will show the basins most urgently in need of (1) BMP application, (2) field studies to define problems and determine BMPs, and (3) careful planning to prevent potential NPS problems.

Following initial compilation, the statewide maps and priorities will be reviewed by several statewide public interest groups, political advisory committees, and members

of the general public at several "town hall" type meetings in each of the 36 counties in Oregon. The intent is to develop a consensus on priorities and develop confidence in the results so that agencies and the public will accept the information as a basis of developing a continual planning process for the controlling NPS problems.

PHASE II: SELECTION AND TESTING OF LAND MANAGEMENT PRACTICES

Phase II of the Oregon 208 assessment encompasses the development and application of a relatively simple procedure for relating stream quality to natural terrain characteristics and to land management practices. The work involves the development of a logical framework for determining the key linkages between the causes of erosion (terrain-land management interactions) and the resultant stream quality effects. Soil erosion and sediment-related effects on water quality are being emphasized in this study because this is the most widespread and pervasive NPS problem in Oregon.

Past NPS survey efforts have examined individual stream components without relating them comprehensively to the surrounding terrain. Because of this approach, it has been difficult to define the cause and effect relationships of NPS pollution. The common conclusion is that determination of proper land conservation practices will require many monitoring sites in each watershed to correlate pollution loads to specific sources and to instream effects. Such a monitoring program of all nonpoint sources in each examined river basin would be both cost prohibitive and logistically impossible.

An additional data problem occurs because the structure of a statewide 208 assessment program requires obtaining meaningful information in a short time. An approach based on standard analysis of water samples would not work because the quality of flowing water represents a condition that exists for only one instant in time. For example, the water quality of a stream varies greatly with flow and temperature changes and varies drastically during storm events. Because of this transient nature, studies based on water quality analysis require at least several years of repetitive sampling to define the effects of NPS pollution.

To avoid this lengthy process, the Oregon 208 assessment is determining the quality of streams through quick reconnaissance field surveys of physical and fishery habitat conditions.

In contrast to water quality, these characteristics of a stream are far more permanent. If land management practices remain unchanged, the physical and fishery habitat conditions of a stream are unlikely to change markedly over time. This relative permanency makes these two visually observable characteristics ideal indices for short-term studies in which only one or two visits are possible to each stream segment.

An innovative feature of this study is the use of aerial photography rather than just relying on stream studies. This basic procedure was initially developed by the U.S. Geological Survey and, as modified for the 208 assessment, is based on an analysis of existing earth science data, an interpretation of high altitude aerial photography, and a collation of results from the reconnaissance stream surveys. The Phase II work can best be described as consisting of four steps (see p. 48).

Step 1 is collating information on climate, slope, geology, and soils to develop overlay maps showing the relative erosion potential of different lands within each basin. For example, because of a steep slope and a highly erodible bedrock, a certain land area in a basin may have a far greater potential to erode than any other area.

Step 2 is using aerial photography to determine and map the current land management practices (i.e., dairy grazing or lumber operations) and land features caused by the erosion and deposition of sediment. The erosional and depositional features are located by symbols representing the type of feature directly on the erosion potential maps from step 1. The purpose of mapping these features is to try to relate the type, size, and number of adverse land effects resulting from erosion to (1) the natural potential of land to erode (i.e., degree of slope and soil type) and (2) the type of current land management practices.

Step 3 in Phase II is conducting reconnaissance surveys of physical and fishery habitat conditions to determine the stream effects resulting from the various combinations of land erosion types and land management practices. The surveys are conducted on designated segments of small tributary streams; an attempt is made to select each segment to define an area having one land erosion type and one land management practice. Through this selection process, the combined information can later be used to rank the various erosion potential/land management combination as to their stream quality effects.

APPENDIX VI

The field team of biologists and geologists has prepared a set of field forms for quickly characterizing the physical and fishery habitat conditions of streams. The team spends about 1 hour studying each stream segment, and it supplements information on the standard forms with notes and numerous photographs. At the conclusion of the field work, the collected information is used to determine stream quality ratings for each investigated segment. These ratings are later segregated into categories of good, moderately degraded, or severely degraded quality with regard to man-caused NPS problems. Finally, the three categories are color coded and delineated directly on the erosion potential map from step 1.

Step 4, the final step in Phase II, is developing a management tool for portraying the land and stream quality effects that result from the various combinations of land erosion potentials and land management practices for individual river basins. The tool will represent a matrix table (see p. 48) which lists, across the horizontal axis, the previously delineated land types in their increasing potential to erode, and, down the vertical axis, the identified land management practices according to their increasing potential for disrupting the land surface.

Once the matrix is completed, the results can be used for both resource planning and management. For planning purposes the matrix shows the severity of land and stream effects that can be expected from applying a given land management practice to land having an identified erosion potential. If the effects are slight, the practice may be compatible and may be tried. If the effects are moderate, the practice may be used provided BMPs are applied. If the anticipated effects are severe, perhaps the given practice should not be applied on the specific land area.

For management purposes the matrix might be used to immediately determine areas where conservation measures need upgrading. In addition, the matrix, together with the map, provide a possible basis for prioritizing site specific investigations of land management practices. For example, an Oregon State Forest Practices Officer generally is able to visit only about 20 percent of the forestry operations occurring in each district. By using the map and matrix, an officer might be able to evaluate which proposed operations seriously need site specific investigations and detailed management plans. Each evaluation would merely involve using the map to determine the erosion potential of the land units and using the matrix to determine the probable stream quality effects.

The map and matrix also may provide a baseline for future monitoring of the relative area-to-area success of land management planning. For example, by using the matrix and map to define a baseline stream condition, an analyst might later evaluate whether land management planning favorably affected the physical and fishery habitat water quality. This potential for effective monitoring is critically needed before land management planning should be accepted as an effective means for controlling NPS pollution in tributary streams. This approach illustrates the experimental nature of the 208 planning program.

We believe that this is an innovative way for gathering needed data on nonpoint sources and selecting appropriate land use controls. Apparently the process could provide a sound data base which, over time, can be used to develop legally supportable pollution control actions. The study team leader stated that they are studying five sections of the State which cover an estimated 5 percent of the State's land area. By reviewing statewide soils, geology, and land slope maps, he estimated that the information developed on the initial areas covered might be extendable to 20 percent of the land area of the State. He also estimated that an additional six to seven more areas could be covered in an additional 2 years. He stated this indicates that although this NPS approach can save time in identifying and setting priorities for problems, only the top priority problems can be analyzed in a 2-year period. He believed several additional years probably will be needed to completely analyze all the planning areas in each State.

Even this approach is not the full answer because it primarily relates to technical, rather than the political side of the problem. More will need to be done to determine acceptable implementation stategies that will be acceptable to the public.

APPENDIX VI

Oregon's process for guiding the choice and monitoring of rural land BMPs. The process assesses the relative erosional and sediment impacts on streams that result from application of various land management practices on different types of terrain.

PRIORITY PROBLEM AREAS ADDRESSED BY THE 208 PLANNING AGENCIES WE VISITED

Problem areas	Number of agencies addressing each problem
Agricultural (nonirrigated) nonpoint source	3
Agricultural (irrigated) nonpoint source	1
Combined sewer overflow	1
Groundwater	1
Municipal point sources	6
On-lot disposal	3
Preservation of environmentally sensitive areas	2
Rural runoff and/or erosion	3
Silviculture nonpoint source	2
Urban storm runoff	5
Waste sludge disposal or reuse	3
Application of imported water	1
Salt water intrusion	1

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