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STATEMENT OF
ELMER B. STAATS
COMPTROLLER GENERAL OF THE UNITED STATES

BEFORE THE
SUBCOMMITTEE ON OVERSIGHT AND REVIEW
HOUSE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

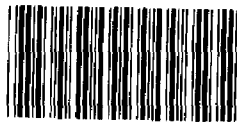
ON

THE [IMPACT OF NONPOINT SOURCE POLLUTION ON
MEETING NATIONAL WATER QUALITY GOALS]

Mr. Chairman and Members of the Subcommittee:

We are here at your invitation to present our views on the impact of "nonpoint" source pollution on our ability to meet national water quality goals. Our comments are based on concerns presented in a number of our issued reports (attachment 1) which address a wide range of activities directly related to the nonpoint pollution problem and which contain recommendations aimed at dealing with the problem.

Last July we testified before this subcommittee on EPA's construction grants program. We commented that the hearings were most timely because of the growing concern in the country and the Congress over inflation. Inflation is still a major problem and it is increasingly important that we continually evaluate costly Government programs, such as the water pollution control program, to ensure that they are efficiently and effectively operated and do not contribute unnecessarily to inflation.



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Testimony
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Nonpoint pollution can have a major negative impact on the billions of dollars that are being spent to abate point sources of pollution. We are concerned about nonpoint pollution because the extent of the problem is unknown, data on its effect is inadequate, solutions are not readily available, and funding has been sadly lacking. For these reasons, we believe the subcommittee is appropriately addressing a major nationwide problem that will ultimately affect our ability to meet the 1983 fishable/swimmable water quality goal.

What is nonpoint pollution?

Stormwater runoff brings all kinds of contaminants into streams, rivers, lakes, and sewers. These pollutants come from farmlands, forests, urban streets, construction sites, and mines. Nonpoint pollution refers to situations where pollutants enter the water in a diffused and diluted form rather than from a specific discharge point. In contrast, factories or municipal wastewater facilities discharge from a particular point and this water pollution is called point source pollution.

Agricultural activities and urban stormwater runoff are the major sources of nonpoint pollution. In volume, the major nonpoint pollutant is sediment from soil erosion of agricultural lands. As erosion depletes topsoil from the land, the resulting sediment transports other pollutants, such as pesticides and excess nutrients, into the waterways. Runoff from lands used to support livestock also contributes large quantities of nitrogen and phosphorus. Urban runoff contains almost all types of pollutants, such as suspended sediment, toxic materials, oil and grease, and animal litterings.

Other sources of nonpoint pollution are acid mine drainage, forestry activities, and construction sites.

How severe is the problem?

We do not know how severe the nonpoint problem is. Although estimates vary widely, the general consensus is that nonpoint pollution is often a significant problem and, unless it is solved, many rivers and lakes will not be able to meet our Nation's water quality goals. The Environmental Protection Agency (EPA) estimates that nonpoint sources of water pollution account for more than half of the pollutants entering national waters. The Council on Environmental Quality estimates that pollution from nonpoint sources, such as feedlots, landfills and agriculture, are 5 to 6 times the pollution load from municipal and industrial point sources. The Council believes that even if municipalities and industries would meet minimum treatment levels for point sources, the 1983 water quality goals would not be met because of nonpoint pollution. To describe the magnitude and impact of the problem on a national basis is very difficult, however, because States vary in climate, soil, and rainfall—all of which affect the amount of pollutants entering the waterways.

In 1977, we did a study to assess the impact of nonpoint sources in achieving water quality goals. In that study, none of the States we visited had comprehensive data on the impact and extent of nonpoint sources. EPA said that nationally such data is nonexistent. EPA is obtaining more data on the impact and extent of nonpoint source of pollution under its 208 planning program, but the data is still not comprehensive.

A 1977 EPA report to the Congress indicated that of 246 river basins in the United States, 68 percent had nonpoint pollution from agriculture, 52 percent from urban runoff, 30 percent from mining, and 15 percent from forest activities. We also know that about 4 billion tons of sediment per year, of which three-fourths comes from agricultural lands, ultimately end up in the waterways. About 1 billion tons ends up in the ocean; the remainder settles in reservoirs, rivers, and lakes, shortening their useful life.

Not all soil that erodes ends up in our streams. A Department of Agriculture study done at the request of New York State showed that of 45 million tons of soil being eroded each year, only 4.2 million tons ended up as sediment in State waters. The study concluded that most soil moved on land from one point to another. Erosion, then, is highly site specific and varies depending on the slope of land, type of soil, and amount of rain.

Nonpoint pollution is difficult to identify and measure because so many variables affect it. For example:

- The amount and intensity of rain affects the degree of pollutants washed into waterways. Hard rain tends to wash more pollutants into waterways than soft rain.
- Runoff from clayish soils is higher than runoff from sandy soils which are more able to absorb water and pollutants. The mix of soil types changes over time as raw land is converted to farmland which in turn may be converted to urban development.

—Soil eroding from creek and river banks varies according to volume and rate of flow of the river, type of soil on river banks, and whether the river is straight or curved.

The following is an example of how difficult it is to address the nonpoint problem. We know that phosphorus and nitrogen from animal wastes and fertilizers get into waterways and cause algal problems which affect the oxygen level of the water. Although we know that phosphorus, nitrogen, light, temperature, and suspended solids affect the growth of algae to some degree, we cannot determine with certainty what the effect on preventing or reducing algae will be if one or more of these elements is increased or decreased. For instance, algae can sometimes be increased by a decrease in suspended solids. By reducing the solids, more light penetrates the water and, in turn, causes algal growths.

Another nonpoint problem that is difficult to address is urban runoff. Urban runoff contributes huge amounts of nonpoint pollution and the control of combined sewer overflows can be enormously expensive. Our recent report on Chicago's Tunnel and Reservoir Plan (TARP) illustrates how expensive it can be for a city to clean up its urban runoff problem. Not only would the completed TARP project include 131 miles of tunnels and four reservoirs, but other projects would have to be undertaken to realize TARP's full benefits. The cost of TARP and the associated projects could exceed \$11 billion by 1983, which is greater than the cost of the Alaska pipeline.

Trying to determine the severity of nonpoint pollution is difficult because nonpoint pollution is not only induced by man but can occur naturally. However, sediment coming from natural and pristine lands cannot be distinguished from sediment coming from agricultural lands. Unless some type of a tracer is present, the source of the pollutant cannot be determined. Generally, a method to accurately measure contamination from natural sources does not exist.

There are indications, however, that some waters have always had a nonpoint problem. A University of Massachusetts study showed that if all the waters in New England could be classed A, B, or C (Class A being the best), only 14 percent of New England's waters would have been classed as "A" prior to the Pilgrims' landing. The Missouri River has always had high sediment concentrations, and Green Bay, Wisconsin, may have received its name because of its algal blooms.

Why don't we know more?

Responsibility has been delegated to State and areawide planning agencies to develop and carry out nonpoint source control programs. Little has been accomplished, however, because major emphasis has been on point sources and the States and local agencies lack the time, funds, and Federal technical assistance necessary to develop adequate nonpoint source data.) For example, as of September 30, 1978, the primary Federal program covering nonpoint pollution had obligations of \$232 million while programs covering municipal point sources had \$28 billion.

Authority to establish a nonpoint source program stems from section 208 of the Clean Water Act, which requires State and local agencies to prepare an areawide waste treatment management plan. Setting planning policies and priorities and determining how section 208 funds are to be used is EPA's responsibility. The plans must identify areas needing municipal and industrial waste treatment facilities; establish priorities for constructing such facilities; and identify the nature, scope, and extent of nonpoint sources of water pollution as well as ways to control them. The act does not provide funds for implementing nonpoint controls or set forth comprehensive requirements regarding their use.

We recently completed an extensive evaluation of the 208 program, at the request of this subcommittee, in which we concluded that the program fell far short of its objectives and would not be effective for many years. Some of the problems hindering the effectiveness of the program were that:

- Planning agencies did not adequately address many of the statutory requirements for water quality planning. As a result, nonpoint pollution and control measures were not identified.
- Water quality data, showing 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, was not being obtained.
- Local authorities lack commitment to continue funding water quality planning after Federal funding is exhausted.

The Congress has made some effort to provide direct funds for nonpoint control projects in agricultural areas. The Clean Water Act of 1977 authorized \$200 million for fiscal year 1979 and \$400 million for fiscal year 1980 for the Rural Clean Water Program, to assist owners and operators of rural land in using best management practices to control nonpoint pollution. However, none of the funds has been appropriated. For fiscal year 1980, the Department of Agriculture has requested the Congress to appropriate \$75 million to initiate the program.

The Department of Agriculture's Soil Conservation Service and Agricultural Stabilization and Conservation Service carry out programs to alleviate or control soil erosion by encouraging and helping farmers to develop soil and water conservation practices. While these programs are aimed at conserving land for production, they also help prevent or lessen agriculture-related pollution. Our reports have concluded that these programs have not been as effective as they could be in encouraging soil conservation practices and reducing erosion to tolerable levels. In the Agricultural Conservation Program, for example, funded at \$190 million for fiscal year 1977, most of the funds were spent to enhance food production rather than to control erosion. In line with our recommendation, appropriations legislation for the 1979 program does not allow spending for practices that are primarily production oriented or

that have little or no conservation or pollution abatement benefits. The Department requested \$65 million less for the 1980 program than was funded in 1979 as a result of this shift in program emphasis.

What is the impact if little is done about nonpoint sources?

If we continue to give inadequate attention to nonpoint pollution serious consequences may occur. Our 1977 report on nonpoint pollution concluded that water quality goals will not be achieved in many rivers and lakes and, in fact, nonpoint pollution will in some cases actually mitigate the effectiveness of very expensive point source control facilities. Our May 1978 report on secondary treatment in the St. Louis area noted that construction of expensive secondary treatment plants would have a negligible effect on oxygen and suspended solids because of nonpoint pollution resulting primarily from agricultural and natural runoffs.

As you may recall, in our testimony before this subcommittee last year, we voiced concern over EPA's push to construct advanced waste treatment facilities without assurance that these facilities are the most effective or efficient means for achieving water quality goals. We cited two instances in our 1976 advanced waste treatment (AWT) report where AWT facilities were being built to remove phosphorus without considering what should have been the proper mix of point versus nonpoint controls to achieve water quality standards. For one of the facilities, the State had not determined the most effective or efficient actions needed in the

river basin to achieve water quality standards. More attention to the cause and impact of the phosphorus problem in these cases may have changed EPA's decisions to construct the facilities.

What is EPA doing to improve its data base?

In our water quality planning report, we recommended that EPA reassess its planning program and report to the Congress on how long it would take to acquire adequate cause/effect data, technical capability, and needed resources to accomplish water quality planning, and the strategy EPA planned to follow in attempting to resolve its data deficiency problems.

EPA said it has designed a long-range strategy to look at priority nonpoint source problems at selected locations throughout the country. The Agency plans to then apply the information gained from these prototypes to other locations. EPA will collect and analyze data to determine (1) the magnitude and extent of pollution caused by nonpoint sources, (2) whether the nonpoint source problem is of national significance, (3) how much a control program will cost, (4) what controls are appropriate and effective, and (5) the possibilities of achieving technology transfer. EPA will conduct the studies of urban runoff and agriculture problems and AWT projects in various parts of the country under differing climatic, topographic, hydrologic, and land use conditions:

- To address urban runoff problems, EPA plans to conduct 30 studies through 1981 at a cost of \$30 million.

- For agriculture problems, 28 projects costing about \$35 million have been funded to determine on a site specific basis the best management practices for various agricultural nonpoint source pollutants under differing conditions in order to evaluate their cost-effectiveness in meeting water quality goals. These projects are being carried out under a cooperative agreement with Agriculture and EPA funds.
- For AWT projects, EPA plans in 1980 to select 20 proposed projects as pilot cases. Grantees will be responsible for identifying water quality standards for affected segments; determining which pollutants to analyze; and estimating for those pollutants the natural background, nonpoint source, combined sewer and point source pollution.

What should be done?

The approach taken to reach the goal of fishable and swimmable waters should be that which is most cost effective. In past testimony we have pointed out the need to have good and reliable information for making decisions involving large expenditures of Federal funds.

Better data on nonpoint sources of pollution is essential to establish priorities for selecting those projects providing the greatest benefit to controlling water pollution. With the limited funds available, some

choices must be made between constructing municipal wastewater treatment facilities and implementing practices to control both point and nonpoint sources of pollution.) The Southeastern Wisconsin Regional Planning Commission estimated that by the year 2000 only 240 miles of streams and 18 lakes in its area could meet the fishable/swimmable water quality goal using conventional point source facilities. Nonpoint source controls, on the other hand, would enable 720 miles and 90 lakes to meet the goal. With both point and nonpoint controls in place, 1,054 miles and 94 lakes would be able to meet the goal. Situations like this point out the need for comprehensive information to decide which mix of solutions is most cost effective.

Without sufficient front-end planning to develop more and better data on the sources, extent, and impact of nonpoint pollution, sound, cost-effective, and beneficial solutions may not be adopted. Such data is now fairly limited. In our nonpoint source report, we pointed out that it was impossible to make reliable cost-benefit analyses and cost-effective tradeoffs among various pollution control alternatives because the effectiveness and cost of any given control practice will vary depending on such factors as rainfall intensity, topography, soil, and regional cost differences. EPA agreed that a data gap on the cause and effect relationship between nonpoint sources and the expected impact of various control techniques exists. EPA said that it had not pressed for the collection of such data because the technical capability to make the assessment did not currently exist and was being developed through its research effort.

EPA's 208 planning program is a vehicle that can be used to bridge the information gap. However, the 208 program expires at the end of fiscal year 1980, less than 15 months away. We endorse the program's continued funding. EPA has documented examples where its 208 planning efforts have resulted in large savings. According to EPA, \$2 to \$ 3 million was saved when a reevaluation of plans showed that AWT would produce negligible improvement in water quality due to nonpoint sources and low dissolved oxygen problems caused by upstream dams. It seems reasonable to us that the millions spent under the 208 program could go a long way towards assuring that the billions being spent under EPA's construction grant program are being spent wisely and prudently.

Likewise, we believe the Rural Clean Water Program should be implemented. Best management practices are the first line of action to control nonpoint pollution and possibly reduce costly capital intensive projects. This program also has significant potential to provide the kind of data we have been advocating. Funds have been authorized but none have been appropriated.

In summary, it is quite obvious that our national needs far exceed the Federal funds which are appropriated each year for waste treatment facilities. The time has come for EPA and the States to look more critically at the mix of treatment alternatives to address both the point and nonpoint problems. We would expect that many pollution problems, once identified, could be alleviated most cost effectively by a suitable combination of several alternatives. We believe that EPA should now begin to devise

strategies to give greater consideration to how nonpoint source controls can achieve water quality goals in a more cost effective manner.

This completes my prepared statement. We will be glad to respond to any questions you might have.

LIST OF GAO REPORTS ON THE NONPOINTSOURCE POLLUTION PROBLEM

"Greater Conservation Benefits Could Be Attained Under the Rural Environmental Assistance Program", B-114833, February 16, 1972,

"Additional Actions Needed to MINimize Adverse Environmental Impacts of Timber Harvesting and Road Construction on Forest Land", B-125053, March 20, 1973

"Progress in Meeting Important Objectives of the Great Plains Conservation Program Could Be Improved", B-114833, June 28, 1973

"Action Needed to Discourage Removal of Trees That Shelter Cropland in the Great Plains", RED-75-375, June 20, 1975

"Better Data Collection and Planning Is Needed to Justify Advanced Waste Treatment Construction", CED-77-12, December 21, 1976

"To Protect Tomorrow's Food Supply, Soil Conservation Needs Priority Attention", CED-77-30, February 14, 1977

"National Water Quality Goals Cannot Be Attained Without More Attention to Pollution from Diffused or "Nonpoint" Sources", CED-78-6, December 20, 1977

"Secondary Treatment of Municipal Wastewater in the St. Louis Area--Minimal Impact Expected", CED-78-76, May 12, 1978

"Water Quality Management Planning Is Not Comprehensive and May Not Be Effective For Many Years", CED-78-167, December 11, 1978

"Combined Sewer Flooding and Pollution--A National Problem. The Search For Solutions In Chicago, Six Volumes", CED-79-77, May 15, 1979