clean water

REPORT TO CONGRESS-1974

U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D. C. 20460

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June 1974

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

June 30, 1974

THE ADMINISTRATOR

Dear Mr. President:
Dear Mr. Speaker:

I am pleased to transmit to the Congress, as required by Section 516(a) of the Federal Water Pollution Control Act, the second of a series of annual reports covering measures taken to implement the objectives of the Act. The report covers calendar year 1973 except for grants, which are reported on a fiscal year basis.

Highlights of the report include:

- In fiscal year 1973, EPA made municipal construction grant awards of approximately $3 billion of which $1.6 billion was awarded from fiscal years 1973/74 funds.

- Under the National Pollutant Discharge Elimination System, 2,037 municipal and industrial permits were issued and 6,266 draft permits were forwarded to States for certification.

- 531 Federal enforcement actions were initiated or pursued in 1973; most concerned oil and hazardous substances liability.

- A study of the operation of municipal waste treatment works shows that: 71 percent need follow-up actions to correct operational, mechanical or manpower deficiencies; 21 percent are hydraulically overloaded; 21 percent do not have adequate laboratory facilities and/or adequate laboratory testing programs; and 30 percent do not meet BOD_5 design criteria, 50 percent do not meet suspended solids design criteria, and 21 percent do not meet settleable solids design criteria.

- Of the 3,155 waterway segments classified, 1,546 should be able to meet water quality standards using secondary treatment for municipal plants and best practicable treatment for industrial plants; 1,609 are expected to require more stringent controls.

- A study of the 22 largest and most populated waterways concludes that the poorest water quality and worsening trends are associated with nitrogen and phosphorus. Pollutants that have received the most widespread control, including oxygen-demanding loads and bacteria, show general improvement.

- Reports were published identifying methods, processes and procedures to control nonpoint source pollution from agriculture, silviculture, mining activities, construction activities, excavation disposal, salt water intrusion, and hydrographic modifications.

- Effluent limitation guidelines, performance standards and pretreatment standards were published for 23 industrial categories.

- Regulations were initiated or completed covering oil and hazardous substances. In the last 8 months of 1973, EPA received reports of 1,520 significant spills that involved 5.3 million gallons of oil and 746 tons of hazardous substances.

- Research studies of a broad variety were completed.

- Nine toxic pollutants were identified and standards have been proposed which will prohibit the discharge of toxic pollutants in toxic amounts.

A summary of manpower training activities, normally included in this series of reports, was transmitted to the Congress separately on January 17, 1974.

Sincerely,

Russell E. Train

Honorable Gerald R. Ford
President of the Senate
Washington, D. C. 20510

Honorable Carl B. Albert
Speaker of the House of Representatives
Washington, D. C. 20515

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I. Introduction

Evidence of water pollution can be found in virtually every large population center and, increasingly, in rural areas. The pollution comes from many sources and exists in many forms—from oil slicks and floating debris assailing the eyes to subtle changes in the aquatic environment that may affect the water's odor and taste.

Public concern about the condition of our Nation's waters has stimulated a broad and vigorous national effort to control and abate the pollution. Although Federal policies and programs provide direction to the effort, all levels of Government, industry, and the general public play major roles.

FEDERAL ROLE

Federal responsibilities are exercised primarily through the U.S. Environmental Protection Agency (EPA). They encompass—particularly since enactment of the Federal Water Pollution Control Act Amendments of 1972—a broad range of authorities. On one hand, they encourage compliance through grants and other types of assistance. On the other, they require compliance through regulatory programs.

Assistance Programs. EPA conducts several assistance programs. The programs include grants for waste water treatment works, grants for program development, technical assistance, and manpower development.

The construction grants program is by far the largest, involving $2 billion in Federal funds in fiscal year 1973, $3 billion in 1974, and $4 billion in 1975. The level of assistance has gradually increased since the first permanent Federal pollution control legislation was enacted in 1956. Today, the Federal share is 75 percent of a project's costs. A variety of projects are eligible for funding including treatment plants and interceptor sewers.

EPA also provides program grants to assist States and interstate agencies expand and improve a variety of activities essential to the control of water pollution. The activities include water quality planning and standards setting, surveillance, enforcement, issuance of permits, executive management, and administration of the construction grants program. The level of assistance varies from one activity to another, as well as from year to year. In fiscal year 1973, the States spent about $77 million on these activities, of which $20 million was in Federal assistance.

Technical assistance is another program receiving major EPA attention. Many pollution problems are too complex for States, communities, and industries to handle alone. EPA assists in such cases by providing services ranging from technical advice and consultation to extensive long-term field and laboratory studies. Within the limits of available resources, this assistance is provided on request, primarily to the States and municipalities.

As might be expected, the rapid expansion of pollution control activities has placed a strain upon the supply of trained manpower. In providing assistance, EPA pursues a number of approaches. These include providing short-term training by EPA staff to upgrade the skills of those already in the field, and employing a variety of ways to train sewage treatment plant operators. EPA will submit a report to Congress in January 1974 covering manpower development and training activities.

Regulatory Programs. Effective and equitable regulatory programs are essential elements of the Nation's pollution control effort. Such programs are necessary not only to assure compliance, but to provide equity to those who have voluntarily assumed the often costly burden of control.

From the start of the Federal control program in 1948, Congress recognized the basic role of the States in implementing and enforcing water

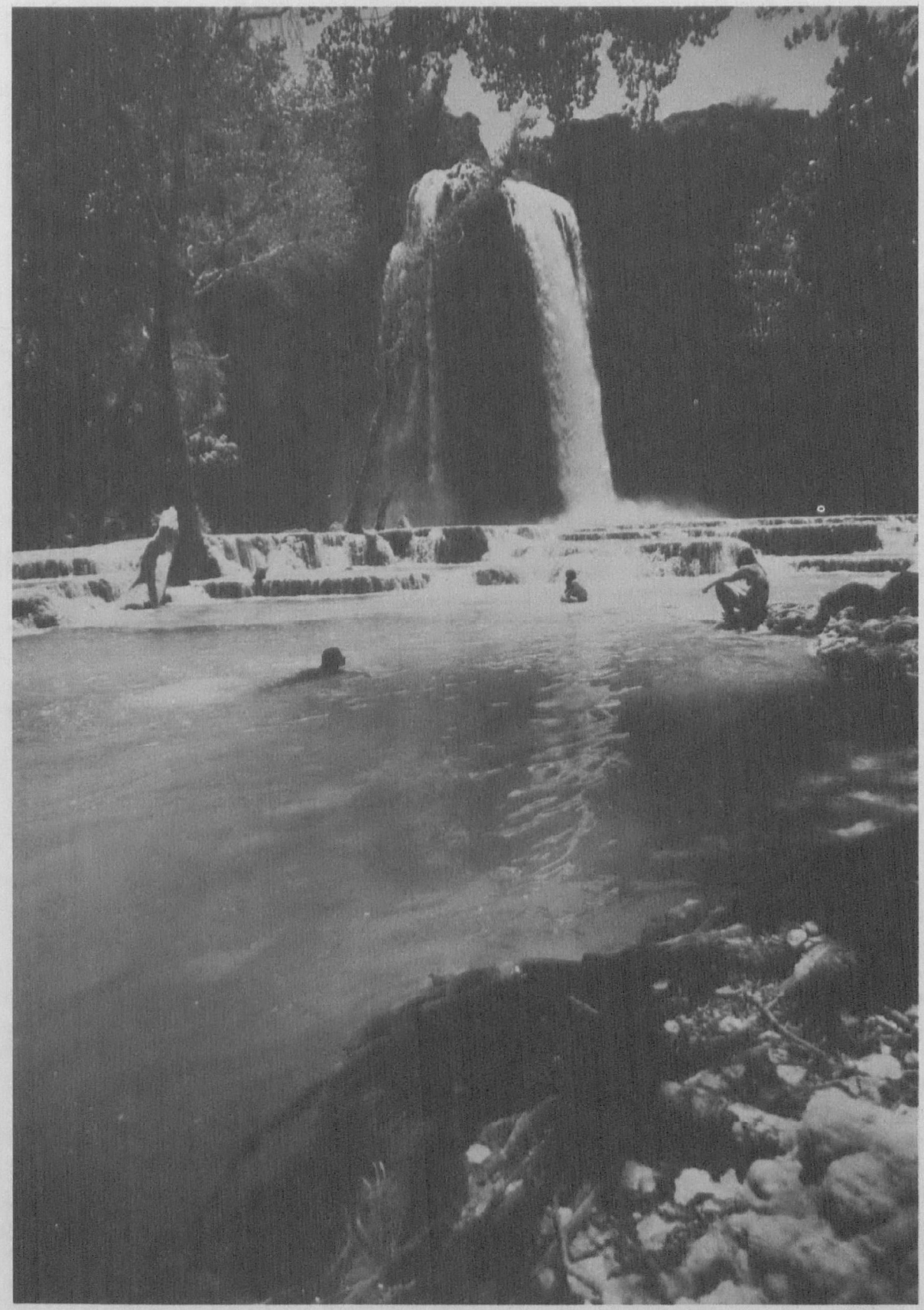
The responsibility to control and abate water pollution is shared by all levels of government, industry and the general public.

pollution control requirements. Federal legislation, however, asserts Federal regulatory authority to supplement and back up the States. Over the years, this regulatory role has been expanded and strengthened.

Until 1972, water quality standards authorized by the 1965 Act were the keystone of a combined Federal-State regulatory program. These standards consisted of two parts: (1) criteria designed to protect present and future uses of interstate waters through establishment of quality levels, and (2) a plan of implementation and enforcement outlining the pollution abatement measures required to meet those criteria. All States established standards for their interstate waters. In turn, these were accepted as Federal standards subject, if necessary, to Federal enforcement.

The 1972 Act strengthened the Federal and State regulatory functions by requiring point source discharges—primarily municipal and industrial dischargers—to achieve effluent limitations. Several types of effluent limitations are imposed:

- Existing industrial dischargers must use "best practicable" water pollution control technology by mid-1977 and "best available" by mid-1983.
- New industrial dischargers must use "best available demonstrated control technology."
- Industries that discharge into municipal systems pollutants not susceptible to treatment by the municipal plants must meet pretreatment effluent standards for these pollutants.
- Municipal treatment plants must provide a minimum of secondary treatment by mid-



The responsibility to preserve water quality is shared by all levels of government, industry and the general public. DOCUMERICA—Terry Eiler

1977 and "best practicable" treatment by mid-1983.

- Dischargers must meet toxic pollutant effluent standards.
- All dischargers must apply more stringent effluent controls if needed to meet water quality standards.

To facilitate enforcement of the many new pollution control requirements, the 1972 Act replaced former enforcement authorities with new authorities and provided a new regulatory scheme. The scheme is based largely on the imposition of specific requirements through a system of permits and is termed the National Pollutant Discharge Elimination System (NPDES). Permit conditions and other requirements of the Act are enforceable through EPA compliance orders and civil suits. Violators are subject to heavy penalties. A State may assume the responsibility if it meets certain requirements—including the capability and authority to modify, suspend, or revoke a permit—and has the powers and procedures necessary for criminal penalties, injunctive relief, and other enforcement mechanisms.

The Act also requires Federal agencies to comply with Federal, State, interstate, and local pollution control and abatement requirements to the same extent as any person must comply. EPA's role stems from the Act and is amplified in Executive Order 11752. The role includes review of Federal facilities compliance with applicable standards, providing guidance to the Federal agencies for implementing provisions of the order, providing coordination of Federal agencies' compliance actions with State and local agencies, and providing technical advice on waste treatment technology.

STATE ROLE

Although the Federal Government has taken an increasingly greater hand in dealing with water pollution, the States continue to bear the major share of the responsibility. States inherently have broad powers to deal with water pollution. These powers, together with delegated Federal authorities, place the States in a strong position to regulate all sources of pollution. State powers and responsibilities under the Act are exercised through a broad range of activities, including:

- States prepare an annual strategy and program report that describes the interim goals to be achieved during the year, the State resources to be assigned in meeting the goals, and the method of assigning resources.
- States prepare basin water quality management plans, as required by Section 303(e) of the 1972 Act. These plans are designed to be the central management tools of the States in administering their water quality programs.
- States are responsible for reviewing areawide waste treatment management plans called for by Section 208 and prepared by local agencies.
- States have major responsibilities in the administration of the construction grants program, including the responsibility for assigning priorities to projects eligible for Federal financial assistance. It is intended that certain Federal responsibilities such as review of plans and specifications be transferred to States as they are able to assume them. Some States provide funds to assist communities construct waste treatment works. Primary responsibility for monitoring municipal treatment plants to see that they operate correctly also rests with the States.
- States have the basic responsibility for planning and implementing programs for control of nonpoint sources of pollution.
- Some States have assumed and others are in the process of assuming responsibility for the NPDES permit program. States that have received the responsibility have concurrently assumed extensive enforcement responsibilities associated with permit compliance.
- States and the Federal Government share responsibility for enforcement.
- States establish and implement water quality standards. Under the 1972 Act, such standards are extended to intrastate, as well as interstate, waters.
- States perform monitoring and surveillance functions to identify and assess existing and potential water pollution problems and

also to measure the effectiveness of the permit and construction grants programs.

ROLE OF OTHER GOVERNMENT ENTITIES

Interstate, regional, and local agencies also participate to a major extent in the Nation's effort to achieve water quality. Their participation is illustrated by the following involvements:

- Municipalities and regional sanitary authorities reduce pollution by building waste water treatment works. Although the construction of such works is greatly assisted by Federal grants (and in many instances by State grants), the local entities are responsible for formulating and carrying out the construction plans. After the works have been completed, the municipalities are responsible for a continuing program of operation and maintenance. The importance of this role cannot be overemphasized, since reaching and maintaining water quality requirements depend significantly on the efficient operation of these municipally owned facilities.
- Regional planning agencies such as Councils of Government are responsible for establishing areawide waste treatment management plans. These areawide plans are of particular value where attacking water pollution problems on a wide basis is considered the most desirable alternative.
- Several interstate agencies and other jurisdictions such as Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Trust Territory of the Pacific Islands receive EPA State program grants. Through these grants the agencies conduct a variety of water pollution control activities.

ROLE OF INDUSTRY

With acceleration of the Nation's pollution abatement program, industries are faced with major pollution control expenditures. EPA estimates that about $12 billion will be required to meet the 1977 goal of "best practicable" control technology. There is only one specific Federal financial assistance program for industries, the small business loan program. In addition, several incentive programs encourage and support industries in meeting their treatment requirements. For example, industries receive indirect financial assistance through provisions of the Tax Reform Act of 1969. That Act permits accelerated amortization of water pollution control facilities for Federal income tax purposes.

Treatment of industrial wastes in municipal plants may offer substantial advantages to both parties, including: providing for more effective pollution control by encouraging regionalization; contributing to cost-effectiveness by locating responsibility for operation and maintenance within a single authority; and lowering treatment costs through economies of scale. Although joint municipal-industrial treatment of wastes is encouraged, EPA recognizes that there are problems and is moving to solve them. First, through pretreatment requirements, the discharge of water pollutants that would upset the operation of municipal systems, reduce their effectiveness, or pass through without adequate treatment will be controlled. Second, industries are required to reimburse the municipality for the costs added by treatment of their wastes.

ROLE OF THE PUBLIC

In the final analysis, the success or failure of the Nation's water pollution control programs will depend largely upon an informed public. The 1972 Act emphasizes public involvement by specifically requiring that both EPA and the States provide for public participation in the formulation of programs and policies. After soliciting comments and suggestions from a broad spectrum of public opinion—conservation groups, trade and other organizations, and State and Federal agencies—EPA adopted final regulations on Aug. 23, 1973.

The regulations state EPA's policy and establish minimum requirements for public participation. The requirements cover such areas as technical and informational assistance to citizens and public groups, notification of hearings, availability of informational materials, access to information, and participation in EPA rulemaking.

More detailed public participation requirements have been included, where applicable, in program regulations adopted to implement the 1972 Act. The more detailed requirements cover the discharge permit program, areawide waste

treatment management, and the construction grants program.

To further promote public understanding and participation in the water program, EPA is conducting a nationwide information and education program. Under an EPA grant, the Conservation Foundation is conducting a series of seminars and work shops during 1974. These 2-day seminars are to be held at all 10 EPA regional offices. Public interest groups, other organizations, and interested citizens are expected to participate. The seminars are designed to encourage the participants to initiate community work shops throughout the Nation. The work shops, in turn, will highlight local pollution problems and promote a "grass roots" understanding of the various water pollution control programs.

II. Water Quality, Monitoring and Planning

NATURE OF WATER POLLUTION

Any practical description of the nature of water quality can only be concerned with a very limited part of all conceivable physical, chemical, and biological aspects of actual waterbodies. Typical water quality measurements are, in fact, oriented toward a small group of commonly observed pollution problems:

- *Harmful substances.* A stream may be polluted by harmful substances in very low concentrations. A few of these are well known—heavy metals, pesticides, herbicides, and polychlorinated biphenyls (PCB's), for example.

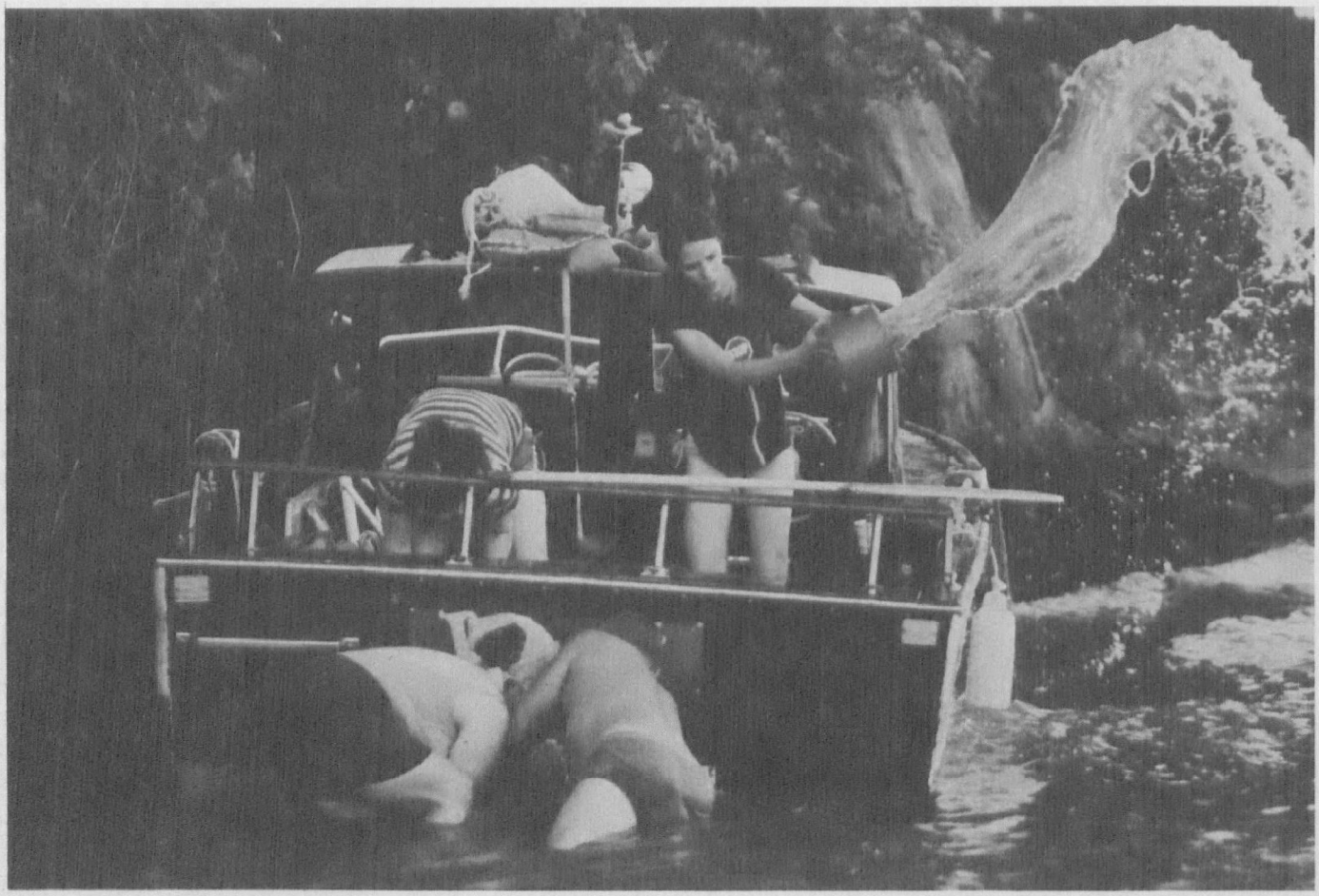
- *Physical Modification.* Aquatic habitats are sensitive to fluctuations of many physical characteristics of water, including temperature and transparency. Temperature fluctuations occurring naturally can be amplified by human activities through large discharges of industrial cooling water, such as from power plants or steel mills, from release of warm surface water held in reservoirs, or from destruction of shade trees along stream banks.

- *Eutrophication Potential.* Relatively stagnant waters (such as lakes and slow-moving estuaries) rich in nutrients can grow such heavy crops of algae and other aquatic plants that the water may be seriously depleted of oxygen. This prevents the survival of oxygen-sensitive food species and fish. In extreme cases, floating algal scum, thick bottom slimes, and odors result.

- *Salinity, Acidity, Alkalinity.* Major changes in the salt content of water can seriously disrupt aquatic communities and decrease the value of water for irrigation and water supply purposes. Acidity changes can be equally damaging by eliminating many desirable fish species. Changes in alkalinity create disruptions ranging from reduced agricultural production to the fouling of water pipes.

- *Oxygen Depletion.* The dissolved oxygen level is widely considered to be the single most important indicator of pollution; actually, there is no reason to consider it more or less important than indicators such as toxicity, salinity, and algal population. Oxygen-consuming or oxygen-demanding substances come from many sources—forested and agricultural areas, industrial and municipal discharges, storm sewers, sanitary sewer overflows, and bottom sediments.

- *Health Hazards and Aesthetic Degradation.* An assessment of health hazards from polluted water involves considerable uncertainty because there are unresolved questions about the die-off rates of pathogens in natural waters as well as their infectiousness for swimmers or other recreational water users. The evidence for waterborne toxicity via fish and shellfish is stronger, at least in the case of relatively high concentrations of mercury and cadmium. Waterbodies can be degraded aesthetically by increases in murkiness, color, algae, scums, floating solids and oils, and odors. Floating solids and oils generally originate in combined sewer overflows, storm sewer discharges, and unsewered runoff. Unpleasant odors can stem from many sources, including decaying organic matter and numerous industrial chemicals.



An assessment of health hazards from polluted water involves considerable uncertainty because there are unresolved questions about the die-off rates of pathogens in natural waters as well as their infectiousness for swimmers or other recreational water users. DOCUMERICA—Bill Strode

MONITORING AND EXTENT OF WATER POLLUTION

To determine the extent of the Nation's water pollution problems, the States and EPA cooperated in 1973 to produce an inventory and provisional classification of 3,313 waterway segments which are polluted or threatened with pollution:

- 1,546 segments that should be able to meet water quality standards using point source controls Congress requires to be available by 1977. These are the so-called *effluent-limited* segments.
- 1,609 segments where more stringent controls might be required to meet standards, or where new sources might threaten to degrade water quality. These are the *water-quality-limited* segments.
- 158 segments where classification was not made.

Based on State assessments, 1,343 of the 1,546 effluent-limited segments should be able to meet standards by 1977. Delays in installing controls may extend the date beyond 1977 for the other 203 effluent-limited segments. The date for clean-up of the 1,609 water-quality-limited segments will generally extend beyond 1977, and in some cases beyond 1983.

Twenty-Two Major Waterways. As a first step toward describing the specific quality of the Nation's navigable waters (required by Section 305(a) of the 1972 Act), EPA selected the 22 largest and most populated waterways for intensive study. These are:

- The 10 longest rivers in the country: the Missouri, Mississippi, Rio Grande, Yukon, Arkansas, Colorado, Columbia-Snake, Ohio, Red, and Brazos Rivers.

An EPA study of 22 major waterways shows that the poorest water quality and worsening trends are associated with nitrogen and phosphorus. DOCUMERICA—Bruce AcAllister

- The 10 rivers with the highest volume of stream flow: the Tennessee, Alabama-Coosa, Susquehanna, and Willamette Rivers—in addition to the Mississippi, Ohio, Columbia, Missouri, Red, and Arkansas listed above.

- The rivers or harbors on which the 10 largest urban areas are located: Hudson River-New York Harbor; Los Angeles Harbor; Lake Michigan shore and other waters of the Chicago area; Delaware River (Philadelphia); Detroit River (Detroit); Sacramento River and San Francisco Bay; Potomac River (Washington, D.C.); and Boston Harbor—in addition to the Ohio River (Pittsburgh) and Mississippi and Missouri Rivers (St. Louis) listed above.

The study utilized chemical and physical information from over 1.2 million data values stored in EPA's computerized data system, STORET. The data values were taken from samples collected during the 1963-72 period and involved 1,300 locations.

The study shows that the poorest water quality and worsening trends are associated with nitrogen and phosphorus, the nutrients most often blamed for eutrophication. On the other hand, the pollutants that have received the most widespread controls, including oxygen-demanding loads and bacteria, are improving:

- For nutrients, up to 54 percent of the reaches exceed EPA's guidelines for phosphorus set to protect against accelerated eutrophication in flowing streams. Furthermore, 84 percent of the reaches show increased phosphorus levels in 1968-72 over the previous 5 years. The nitrogen nutrients exceed reference levels in one-quarter of the reaches measured and increased in up to 74 percent of the reaches.

- Other pollutants present in high levels are phenols (industrial compounds that can affect fish flesh palatability and produce taste and odor in drinking water) and suspended solids (which interfere with some aquatic life processes). These results are not as disturbing as the nutrient data, because in up to 80 percent of the reaches with data, phenols and suspended solids improved in the past 5 years.

- The pollutants receiving the most widespread controls—coliform bacteria and oxygen-demanding organic materials—show general improvements in the past 5 years. Dissolved oxygen and oxygen-demand levels improved in up to 72 percent of the reaches, and coliform bacteria improved in up to 75 percent of the reaches.

A number of the 22 rivers were studied in greater detail than the others because they had the most data readily available. The results show that all have substantial problems in at least some major pollution areas (Table II-1).

WATER QUALITY PLANNING

The complexity of the Nation's water quality problem, as well as provisions of the 1972 Act, requires an overall strategy to ensure that EPA and State activities are consistent with major goals and with each other, that the activities are balanced, and that critical goals are met within financial and other constraints. Analysis of current water quality, future trends, and accomplishments to date reveals, however, that it is unlikely that all of the 1972 Act's goals will be reached within the mandated deadlines.

To minimize the effects of these delays, EPA gives the highest priority to two efforts—issuance of permits which have the greatest impact on water quality, and awarding of construction grants.

Overall, EPA's water quality program is proceeding in two phases. Phase I aims to achieve for the majority of the water, a level of water quality that will allow boating and fishing and support aquatic life by 1977; in this phase, the emphasis will be on issuing permits and grants to point sources. The goal of Phase II will be water clean enough for swimming by 1983. Research will play a large role preparing for this phase. New technologies will be developed for both municipal and industrial point sources, nonpoint sources, toxic pollutants, ocean dumping, ground water pollution, and eutrophication. Management techniques—including cost-benefit functions, effectiveness criteria, analyses of alternatives, and assessments of overall environmental impacts of proposed water quality management strategies—will be improved.

The level of pollution control will differ for the two phases of the program. In the first,

TABLE II-1

CONDITIONS OF EIGHT MAJOR RIVERS

River	Harmful substances	Physical modification	Eutrophication potential
Mississippi		High* turbidity and solids below Missouri River	High,* increasing nutrients but no algae
Missouri	Trace metals present in middle river	High* suspended solids, turbidity in middle, lower river	High,* increasing nutrients but no algae
Ohio	High,* increasing iron and manganese	High* suspended solids in lower river; some improvements	High* nutrients but no algae
Tennessee			Small increase in nutrients but no algae
Detroit area	Cyanides present but improving	Suspended solids improving; local temperature effects from discharges	High but decreasing nutrients discharged to Lake Erie
Columbia	Severe gas super saturation; some radioactivity, lower river	Occasional high* temperatures	High* nutrients but no algae, except for slime growths in lower river
Snake	Severe gas super saturation; significant pesticides	Turbidity from natural erosion, agricultural practices, reservoir flushing	Nuisance algae blooms each summer
Willamette	Significant sulfite waste liquor from pulp, paper wastes	High* turbidity at high flow; high temperature in summer	High* level of nutrients but no excessive algae
River	Salinity, acidity, and alkalinity	Oxygen depletion	Health hazards and aesthetic degradation
Mississippi	High* salinity, acidity below major tributaries	Oxygen-demanding loads from large cities evident	Commercial fishing eliminated in lower river by phenols, bacteria near cities
Missouri	High* dissolved salts in middle, lower river	High* organic loads from feedlots, etc.; improved near cities	High* bacteria and viruses in wet, dry periods
Ohio	Low* alkalinity, especially in upper river	Occasional low* dissolved oxygen near Cincinnati, Pittsburgh	High* bacteria especially in high population areas
Tennessee		Low* BOD_5 and decreasing COD in reservoirs	High* bacteria in small areas near cities; low radionuclides
Detroit area	Acids, chlorides low,* improving despite large discharges	Low* dissolved oxygen only at mouths of area tributaries	Phenols decreasing; bacteria unchanged-to-higher
Columbia	Approaches ideal for fresh waters	Dissolved oxygen close to saturation	Very low* bacteria
Snake	High* dissolved solids from irrigation in middle river	Dissolved oxygen close to saturation	High* bacteria below population centers
Willamette	Low* dissolved mineral salts; improved pH	Improved dissolved oxygen, no standards violations	High* bacteria, but improving

*High (or low) relative to other rivers, or relative to other sections of river, or to national reference levels. Does not necessarily imply standards violation or dangerous condition.

EPA's water quality programs are being administered to achieve for the majority of the Nation's waters a level of quality that will allow boating and fishing and support aquatic life by 1977. DOCUMERICA—Ted Rozumalski

effluent limitations will be based primarily on technology—best practicable treatment for industrial dischargers, secondary treatment for municipal dischargers. In segments where these effluent limitations cannot achieve the goals, more stringent limitations necessary to meet water quality standards or other requirements will be applied. To achieve the 1983 goals of Phase II, more demanding standards will be needed—best available technology for industrial dischargers and best practicable technology for municipal dischargers. During both phases, industries discharging into municipal plants will be required to pretreat their effluents to protect the operation of the municipal plant and to prevent delivery to the plant of any pollutant that it cannot treat adequately. Thermal effluent limitations can be adjusted if the discharger can prove that the limitations are more stringent than necessary to protect indigenous species.

Groundwater, as well as inland surface waters, are of concern to EPA. Such water will be exposed to increasing danger from the subsurface disposal of highly toxic substances. The 1972 Act gives EPA little authority to deal with pollution of ground water, even though the stringent treatment requirement for surface discharges will probably encourage subsurface disposal.

Oceans will be threatened by increased offshore drilling, transportation of petroleum products, and coastal refineries, as well as continued pollution from streams, atmospheric fallout, and dumping.

Statewide Planning. The Statewide planning required by Section 303(e) of the Act is the central management tool of the States in administering their water quality programs. By establishing priorities and schedules of action, the planning process helps direct resource expenditures, construction grant planning, and areawide planning. The planning requirements of several other sections of the Act will be achieved through the statewide planning process, including the preparation of water quality inventories, protection and restoration of lakes and water quality surveillance. Basin planning, which will be emphasized, will identify water quality problems and their relative severity.

During 1973, States took the first steps to implement the planning process:

- States classified all river segments as either water-quality-limited or effluent-limited.[1] States submitted the classification list as part of their initial plan.
- For water-quality-limited segments water quality analyses for load allocations were either begun, or resources were identified to perform the analyses.
- For effluent-limited segments, States began preparing management plans.

In 1974, the planning process will continue to develop basin plans on a time-phased schedule. The level of planning for a basin is being tailored to the complexity of the pollution problems in the basin, and to the amount of information necessary to make decisions for water quality. All basin plans include:

- A display of in-stream water quality data to indicate that segments are properly classified as effluent-limited or water-quality-limited.
- An assessment of needs for publicly owned treatment works.
- An inventory and ranking of significant municipal dischargers, and an inventory of significant industrial dischargers.
- Schedules or target dates for compliance, and effluent requirements.
- Recommendations for revisions of water quality standards.
- Identification of necessary controls over residual wastes.

In addition, plans for water-quality-limited segments include:

- An assessment of total maximum daily loads necessary to meet water quality standards.
- Established or targeted waste load allocations and effluent limitations.
- An assessment of nonpoint source pollution and needed control measures.

Areawide Planning. In 1974, areawide waste treatment management (AWTM) planning will

[1] See page 8.

begin in selected areas. This type of planning primarily involves metropolitan areas that have water quality problems requiring treatment levels beyond secondary for municipal wastes and best practicable control technology for industrial wastes. The planning is limited to areas where units of local government have agreed, or have indicated their intent, to operate a coordinated waste treatment management system. Generally, the State governor will designate the AWTM areas and the planning agencies that will conduct the work. The planning will include description of the regulatory programs required to ensure pretreatment of industrial and commercial wastes, to abate nonpoint source pollution, and to regulate the location, modification and construction of any facilities in the area that have an impact on water quality.

Establishment of areawide planning agencies will begin in 1974; by the end of fiscal year 1975, 125 agencies should be in existence. Most of these agencies will be established in urban-industrial areas, but they will also be established in areas facing acute growth demands over the next several decades or those with substantial groundwater pollution problems. The eventual plan adopted for the area should include an integrated program of point source controls (including controls of combined storm and sewer discharges), nonpoint source control, and control of land use and growth patterns. Furthermore, the plan must include a management system to insure plan implementation.

Facilities Planning. Facilities planning is the first step in the process of constructing publicly owned waste treatment works. Basically, facilities planning includes:

- A statement of the problems.
- An inventory of existing systems.
- A projection of future conditions.
- Setting of goals and objectives.
- An evaluation of alternatives to meet those goals and objectives—for example, land treatment or reuse of waste water and flow reduction measures (including correction of excessive infiltration/inflow), treatment of overflows, alternative system configurations, phased development of facilities, or improvements in operation and maintenance.
- An assessment of the environmental impacts of the alternatives.
- Selection of the best alternative waste treatment system.
- Design of selected treatment work.
- Provision for plan implementation.

Facilities planning provides for cost-effective and environmentally sound treatment works to meet applicable effluent limitations. Thus, facilities planning provides a firm foundation for the construction grant program in areas not designated for areawide waste treatment management plans, and serves as an integral part of more comprehensive planning. The facilities planning process will maximize the environmental effectiveness of the accelerated program for construction of treatment works and avoid unnecessary expenditure of public funds.

NONPOINT SOURCE CONTROL

State program assessments indicate that present requirements for point source controls (effluent limitations) will enable about one-third of the Nation's classified water segments to meet the 1977 goals. Part of the problems in the remaining segments are due to nonpoint source pollution. In 1971 EPA estimated that approximately one-third of the pollution in streams not meeting standards derived from nonpoint sources. The relative significance of nonpoint sources will increase as discharges from municipal and industrial point sources are brought under more effective control.

Nonpoint sources are not defined in the Act, although they are cited in several sections. Nonpoint sources are essentially those sources resulting in runoff, seepage, and percolation of pollutants to surface and groundwaters through diffuse and undefined routes. They are not now subject to NPDES permit requirements.

Nonpoint sources contribute a variety of pollutants. Sediments, nutrients, and pesticides are the predominant pollutants from non-irrigated farming, while build up of salts is the major problem from irrigated farming. Pollutants from mining vary with the type of mining types of pollutants depending on the particular kind of mining. Pollution problems

The significance of nonpoint sources of pollution such as from strip mining will increase as municipal and industrial point sources are brought under control. DOCUMERICA—Bill Gillette

from construction activities are almost entirely related to accelerated erosion and the resulting sediment runoff to surface waters.

The EPA strategy to control nonpoint sources calls for two major thrusts. The first is the technological/engineering effort to develop, demonstrate, and apply the best practical control technologies through Federal, State, and local mechanisms. The second thrust is a broad-based effort to assess and control the water quality impact of nonpoint sources. The effort will first identify, monitor, assess and predict the nature and extent of nonpoint pollution, particularly in segments where point source controls alone will be inadequate to meet water quality goals. Then it will develop new institutional arrangements where necessary to assure comprehensive nonpoint source management. These new arrangements include area-wide planning under sections 208 and 303(e) of the Act, as well as other implementing mechanisms.

Control Program Approach. EPA has identified 21 categories of nonpoint source contributions (Table II-2). Each category will require a different mix of assessment and implementing mechanisms, ranging from permitting under NPDES, to developing model laws and ordinances.

State assessments and reports will be prepared in early 1975 to provide an initial identification and evaluation of nonpoint sources.

Section 208 areawide planning and management program requires the inclusion of nonpoint source assessment and control strategies. Several plans are expected to be developed in 1975 to include the proper analysis of nonpoint source designations and specify the contributing areas under Section 303(e).

Concurrently, through the initiation of nonpoint source pilot programs EPA will develop, demonstrate, and apply feasible control technologies.

Program Accomplishments in 1973. Major accomplishments in 1973 include:

- Reports were issued to assist in the identification and evaluation of pollutants from nonpoint sources; and to identify methods, processes, and procedures to control pollution from agriculture, silviculture, mining activities, construction activities, excavation disposal, salt water intrusion, and hydrographic modifications.
- Guidelines for Statewide, areawide, and basin planning were developed to require consideration of nonpoint source contributions.
- Agency policies were issued for control of nutrient runoff from agricultural lands and for disposal of pollutants by deep well injection.
- Nonpoint source pilot control projects were established in four EPA Regions: Region III, mining activities; Region VIII, irrigation return flows; Region IX, groundwater pollution; and Region X, silvicultural activities.
- Contacts were made with other Federal agencies, particularly to develop and implement interagency agreements.
- In cooperation with the National Association of Conservation Districts, institutes were held in 30 States to develop appropriate State legislative programs to control runoff of sediment.

TABLE II-2

CATEGORIES OF NONPOINT SOURCE POLLUTION

Agriculture	Salinity
Dry land	Irrigation
Irrigation	Oil field brines
Animal wastes	Natural
Range lands	Deicing
Silviculture	Municipal and Industrial
Forestry management	Effluents
Harvesting	Urban Runoff
Mining	Storm sewers
Active	Surface runoff
Inactive	Rural sanitation
Tailings and overburden	Construction
Ground water	Land development
Hydrographic modification	Heavy construction

III. Grants to State and Local Governments

The 1972 Act clearly recognizes the primary responsibilities and rights of the States in controlling water pollution. In accordance with the Act, EPA's strategy to reduce water pollution places the basic responsibility on the States for direct action against the sources of pollution.

On the other hand, EPA is providing strategic guidance to develop a national, coordinated approach to water pollution abatement. EPA provides financial assistance to State and local entities for construction of municipal waste treatment plants and for the operation of the wide spectrum of activities conducted by individual State water pollution control agencies. EPA also conducts research and development activities, and issues and enforces permits in States not yet prepared to assume responsibility for these functions.

CONSTRUCTION GRANTS FOR MUNICIPAL WASTEWATER TREATMENT WORKS

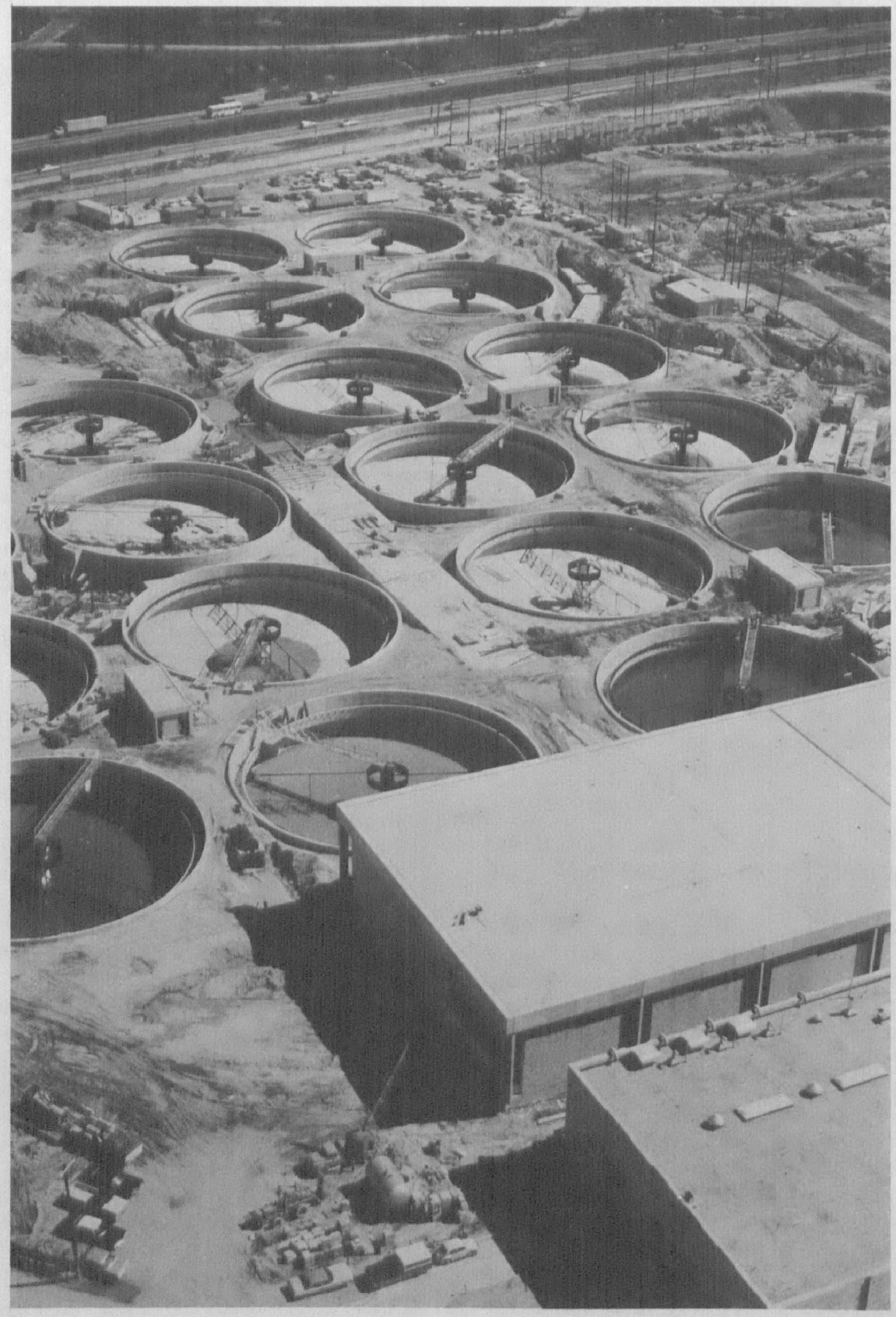
The program of Federal grants to aid communities in the construction of municipal waste treatment works was initiated with the Federal Water Pollution Control Act of 1956. Although Federal funding at that time was not significant, subsequent amendments to the Act have made more Federal funds available and led to accelerated plant construction.

Since 1957 the Federal government has provided $6.8 billion for the construction and expansion of more than 14,200 projects (Table III-1). The total cost of these projects was approximately $16.7 billion. Federal appropriations were less than $100 million per year through the early 1960's and then doubled in the latter half of that decade. Accelerated growth in the funding of this program began in 1970 with an appropriation of $800 million. Allocations made under the 1972 Act reached $2 billion in fiscal year 1973 and $3 billion in 1974 (Tables III-2 and III-3).

The Federal Water Pollution Control Act Amendments of 1972 substantially altered the methods of funding the construction grants program and the methods of providing assistance to individual projects. Rather than awarding a grant to an applicant for the Federal share of a project, EPA is now authorized to enter into an arrangement with the applicant wherein EPA creates a contractual obligation for payment of the eligible proportional costs of the separate elements of each project. Under this authority, EPA will incur contractual obligations for the Federal share of the costs of (1) preliminary plans and studies and other eligible preliminary work, (2) design plans and specifications, and (3) the construction of the waste treatment facilities. Payments against these contractual obligations are made to the applicant as all or parts of each of these elements are completed.

While the new legislation has made significant amounts of money available for the planning and construction of wastewater treatment works, the new requirements of the Act have necessitated a major restructuring of the construction grants program. EPA is revising the overall planning and grant award process and developing new regulations for managing the program. In fiscal year 1973 EPA made grant awards of approximately $3 billion of which $1.6 billion was awarded from fiscal years 1973/74 funds.

As required under Section 516 of the 1972 Act, EPA conducted a survey to determine the cost of construction of all needed publicly owned treatment works in each of the States and in the Nation as a whole. The survey results were forwarded to Congress in October 1973 and were used as the basis for allocating the fiscal year 1975 allotment of funds to the States. The total costs for all facilities reported



The Federal government has provided $6.8 billion for the construction and expansion of 14,000 municipal waste treatment works such as this plant serving the Washington, D.C. and neighboring areas. DOCUMERICA—John Nuebauer

TABLE III-1

CONSTRUCTION GRANTS FOR MUNICIPAL WASTE WATER TREATMENT WORKS (1957-74)

Fiscal year	Authorization	Appropriation	Fiscal year obligations	Expenditures*
		(thousands of dollars)		
1957	50,000	50,000	50,000	844
1958	50,000	45,657†	45,657	16,884
1959	50,000	46,816†	46,816	36,429
1960	50,000	46,101†	46,101	40,295
1961	50,000	45,645†	45,645	44,085
1962	80,000	80,000	80,000	42,103
1963	90,000	90,000	90,000	51,738
1964	100,000	90,000	89,642	66,432
1965	100,000	90,000	88,225	69,755
1966	150,000	121,000	120,946	81,479
1967	150,000	150,000	150,000	84,476
1968	450,000	203,000	203,000	122,109
1969	700,000	214,000	214,000	134,530
1970	1,000,000	800,000	800,000	176,377
1971	1,250,000	1,000,000	990,000‡	478,366
1972	2,000,000	2,000,000	2,000,000‡	413,408
1973	2,000,000	1,900,000	0	
1973	5,000,000**	2,000,000††	1,368,801	684,400
1974	6,000,000**	3,000,000††	222,464***	
Total	19,320,000	11,972,220	6,651,297	2,593,710

*Payments during fiscal year.
†Includes supplemental appropriations of $657,000 in 1958, $1,816,000 in 1959, $1,101,000 in 1960, and $645,260 in 1961.
‡Estimated to nearest million dollars.
**Contract authority (method of funding changed from authorized appropriation to contract authority by 1972 Act).
††Amount of contract authority released by Presidential action.
***Obligated as of 6/30/73.

in the survey was $60.1 billion; treatment plants and interceptor sewers alone amounted to $35.9 billion. In setting the formula for fiscal year 1975, Congress provided that allotments would be based 50% on total needs and 50% on needs for treatment plants and interceptor sewers with the provision that no state's allotment would be less than that received in 1972.

Surveys conducted in 1969, 1970, and 1971 showed needs of $10.0 billion, $12.6 billion, and $18.1 billion, respectively for treatment plants and interceptor sewers. The $35.9 billion reported in the 1973 survey was double that reported two years previously. The reasons for this large increase include a more comprehensive survey of facilities, minimum treatment requirements at the secondary level, more stringent water quality requirements, better estimating procedures, and inflation.

STATE PROGRAM GRANTS

EPA grants assist the States to carry out a variety of activities essential to comprehensive State efforts to control water pollution. These

TABLE III-2

CONSTRUCTION GRANTS IN FISCAL YEAR 1973 FOR MUNICIPAL WASTE WATER TREATMENT WORKS, BY STATES*

State	Allocations	Obligations	Percent obligated
Alabama	$ 7,224,000	$ 212,450	3
Alaska	4,504,000	4,159,847	92
Arizona	2,692,000	1,467,775	55
Arkansas	7,072,000	7,072,000	100
California	196,352,000	62,666,211	32
Colorado	6,332,000	—	—
Connecticut	33,620,000	32,776,250	97
Delaware	13,130,000	—	—
District of Columbia	14,228,000	14,228,000	100
Florida	72,528,000	18,792,728	26
Georgia	19,460,000	18,439,360	95
Hawaii	6,606,000	—	—
Idaho	4,354,000	3,126,765	72
Illinois	124,978,000	78,596,290	63
Indiana	67,324,000	26,191,860	39
Iowa	23,114,000	23,114,000	100
Kansas	7,484,000	5,340,210	71
Kentucky	13,198,000	10,274,100	78
Louisiana	18,856,000	13,289,140	70
Maine	19,350,000	19,350,000	100
Maryland	85,164,000	71,124,430	84
Massachusetts	75,152,000	74,426,750	99
Michigan	159,628,000	159,337,150	99
Minnesota	40,638,000	40,405,275	99
Mississippi	7,870,000	534,141	7
Missouri	33,112,000	20,851,150	63
Montana	3,324,000	2,979,450	90
Nebraska	7,416,000	5,295,780	71
Nevada	5,754,000	4,819,350	84
New Hampshire	16,618,000	16,618,000	100
New Jersey	154,080,000	154,080,000	100
New Mexico	4,216,000	764,620	18
New York	221,156,000	211,454,750	96
North Carolina	18,458,000	6,531,896	35
North Dakota	934,000	701,175	75
Ohio	115,474,000	115,474,000	100
Oklahoma	9,216,000	6,254,760	68
Oregon	16,988,000	16,721,092	98
Pennsylvania	108,428,000	69,092,280	64
Rhode Island	9,778,000	8,367,000	86
South Carolina	12,910,000	6,731,061	52
South Dakota	1,896,000	992,250	52
Tennessee	23,210,000	12,210,468	53
Texas	55,388,000	52,291,210	94
Utah	2,816,000	—	—

TABLE III-2 (Continued)

State	Allocations	Obligations	Percent obligated
Vermont	4,436,000	2,059,586	46
Virginia	58,286,000	57,977,750	99
Washington	17,812,000	17,500,524	98
West Virginia	9,998,000	3,217,050	32
Wisconsin	34,830,000	2,419,050	7
Wyoming	536,000	425,925	79
Guam	1,744,000	—	—
Puerto Rico	17,690,000	—	—
Virgin Islands	1,786,000	—	—
American Samoa	96,000	—	—
Trust Territory of the Pacific Islands	756,000	297,675	39
Total	$2,000,000,000	$1,481,052,574	74

*As of December 31, 1973.

TABLE III-3

CONSTRUCTION GRANTS IN FISCAL YEAR 1974 FOR MUNICIPAL WASTE WATER TREATMENT WORKS, BY STATES*

State	Allocations	Obligations	Percent obligated
Alabama	$ 10,836,000	$ —	—
Alaska	6,756,000	6,184,292	92
Arizona	4,038,000	—	—
Arkansas	10,608,000	8,053,890	76
California	294,528,000	—	—
Colorado	9,498,000	—	—
Connecticut	50,430,000	7,970,870	16
Delaware	19,695,000	—	—
District of Columbia	21,342,000	21,135,400	99
Florida	108,792,000	—	—
Georgia	29,190,000	—	—
Hawaii	9,909,000	—	—
Idaho	6,531,000	361,206	6
Illinois	187,467,000	—	—
Indiana	100,986,000	—	—
Iowa	34,671,000	1,322,460	4
Kansas	11,226,000	—	—
Kentucky	19,797,000	—	—
Louisiana	28,284,000	237,480	1
Maine	29,025,000	14,580,815	50
Maryland	127,746,000	20,444,700	16
Massachusetts	112,728,000	62,437,851	55
Michigan	239,442,000	9,456,125	4

TABLE III-3 (Continued)

State	Allocations	Obligations	Percent obligated
Minnesota	60,957,000	6,230,000	10
Mississippi	11,805,000	—	—
Missouri	49,668,000	—	—
Montana	4,986,000	165,000	3
Nebraska	11,124,000	—	—
Nevada	8,631,000	—	—
New Hampshire	24,927,000	8,552,660	34
New Jersey	231,120,000	60,233,760	26
New Mexico	6,324,000	912,000	14
New York	331,734,000	129,230	—
North Carolina	27,687,000	—	—
North Dakota	1,401,000	1,310	—
Ohio	173,211,000	3,091,085	2
Oklahoma	13,824,000	237,890	2
Oregon	25,482,000	20,048,732	79
Pennsylvania	162,642,000	—	—
Rhode Island	14,667,000	—	—
South Carolina	19,365,000	—	—
South Dakota	2,844,000	—	—
Tennessee	34,815,000	—	—
Texas	83,082,000	301,350	—
Utah	4,224,000	—	—
Vermont	6,654,000	465,480	7
Virginia	87,429,000	26,021,040	30
Washington	26,718,000	4,474,375	17
West Virginia	14,997,000	—	—
Wisconsin	52,245,000	—	—
Wyoming	804,000	—	—
Guam	2,616,000	—	—
Puerto Rico	26,535,000	—	—
Virgin Islands	2,679,000	—	—
American Samoa	144,000	—	—
Trust Territory of the Pacific Islands	1,134,000	—	—
Total	$3,000,000,000	$283,049,001	9

*As of December 1, 1973.

EPA grants supplement State funding and strengthen the capacity of State agencies to achieve the goals established by the Act.

Federal expenditures for State water pollution control program grants have grown from $3 million in fiscal year 1957 to $40 million in fiscal year 1974. Expenditures doubled between fiscal years 1973 and 1974. At the same time, State appropriations have also grown rapidly. Total Federal and State spending has increased from about $40 million in fiscal year 1971 to an estimated $115 million in 1974 (Table III-4). In fiscal year 1973, the latest period with reliable data on State programs, the largest expenditure (about a quarter of the total) was for surveillance activities (Table III-5). On the average, the states spent $4 for every $1 they received from Federal funds (Table III-6).

TABLE III-4

FEDERAL WATER POLLUTION CONTROL PROGRAM GRANTS
Fiscal Years 1949-1974

Fiscal year	Federal allotment	Federal expenditure	State expenditure	Total	Federal participation as percent of total
	(thousands of dollars)				
1949	783	783*	Unknown	Unknown	Unknown
1950	845	845*	2,287	3,132	27
1951	815	815*	2,993	3,808	21
1952	769	769*	4,017	4,786	16
1953	—	—	3,912	3,912	0
1954	—	—	3,989	3,989	0
1955	—	—	Unknown	Unknown	Unknown
1956	—	—	4,216	4,216	0
1957	1,800	1,683	4,005	5,688	30
1958	2,700	2,539	6,009	8,548	30
1959	2,700	2,621	6,515	9,136	29
1960	2,700	2,582	6,756	9,338	28
1961	2,700	2,642	7,606	10,248	26
1962	4,500	4,262	8,163	12,425	34
1963	4,700	4,471	9,277	13,748	33
1964	4,700	4,525	9,531	14,056	32
1965	4,700	4,596	11,205	15,801	29
1966	4,700	4,535	12,271	16,806	27
1967	4,700	4,584	17,643	22,227	21
1968	9,000	8,704	19,035	27,739	31
1969	9,000	8,860	22,284	31,144	28
1970	9,400	9,335	24,956	34,291	27
1971	9,465	9,454	29,992	39,446	24
1972	14,100	14,060	37,939	51,999	27
1973	18,900	18,900	58,240	77,140	25
1974	38,900	38,900	76,800	115,700	34

*Figure shown is Federal allotment; actual expenditure not known.

Program Changes in 1974. The 1972 Act provided an impetus for change in Federal/State relations. The program cycle of fiscal year 1974, the first full cycle after passage of the Act, illustrates the changing partnership between the States and EPA in implementing the Act.

The new program cycle starts in January when EPA issues a national water strategy paper setting emphasis and objectives for the next fiscal year. Each State then prepares a preliminary strategy, which outlines the State's major problem areas and the means of abating pollution in these areas. The State submits its strategy, with preliminary output and resource data, to the EPA Regional Office by April 15. Outputs include, for example, the number of permits to be issued in the following fiscal year. Resources are the dollars and man-years required to reach the output in each program element.

After public meetings on this preliminary document and negotiations with the EPA Regional Office concerning outputs and resources, the State submits its final program by June 15. The EPA Regional Office then has until July 15 to approve or disapprove the State program.

TABLE III-5

EXPENDITURES FOR STATE PROGRAMS BY PROGRAM ELEMENTS (FY 1973)

Program element	Millions of dollars	Percentage
Planning and standards	13.8	20.8
Pollution control facilities	12.2	18.3
Other programs	8.1	12.5
Surveillance	17.4	26.2
Enforcement	5.5	8.3
Executive and auxiliary	9.2	13.9
Total*	66.2	100.0

*Excluding four States that did not provide a breakout by program element.

Part of the negotiations between the State and the Regional Office centers on the distribution of resources between elements of the program. The Regional Office sets aside additional funds for those program elements stressed in the national strategy. For example, in fiscal year 1974 approximately 50 percent of Federal grant funds were earmarked for permitting, planning and monitoring, and review of construction project plans and specifications. The precise division of Federal grants varies from State to State depending on individual needs, but the use of the incentive grant mechanism allows EPA to influence water pollution abatement activities throughout the country in conformance with the national strategy.

The final major phase of the program cycle is in December and January when the State and the Regional Office meet to conduct a midyear evaluation of the State program. Actual outputs are compared with target outputs, major problems are identified, and mutually acceptable solutions are worked out.

Thus far, it appears that the program changes introduced in response to the 1972 Act have resulted in more harmonious State/Federal relationships and a concentration of State and Federal resources to attack priority water pollu-

TABLE III-6

EXPENDITURES FOR STATE PROGRAMS BY STATE (FY 1973)

State	Federal	State	Total
	(thousands of dollars)		
Alabama	267	233	500
Alaska	26	125	151
Arizona	181	146	327
Arkansas	162	405	567
California	1,045	9,075	10,120
Colorado	138	316	454
Connecticut	251	463	714
Delaware	126	241	367
District of Columbia	165	480	645
Florida	438	1,363	1,801
Georgia	315	935	1,250
Hawaii	71	331	402
Idaho	61	229	290
Illinois	661	4,459	5,120
Indiana	360	651	1,011
Iowa	185	173	358
Kansas	140	556	696
Kentucky	246	789	1,035
Louisiana	267	454	721
Maine	95	550	645
Maryland	280	5,034	5,314
Massachusetts	529	973	1,502
Michigan	556	1,919	2,475
Minnesota	241	1,293	1,534
Mississippi	191	225	416
Missouri	302	278	580
Montana	56	196	252
Nebraska	99	155	254
Nevada	52	74	126
New Hampshire	151	714	865
New Jersey	475	952	1,427
New Mexico	74	207	281
New York	726	3,567	4,293
North Carolina	378	698	1,076
North Dakota	52	87	139
Ohio	680	1,335	2,015
Oklahoma	177	278	455
Oregon	151	876	1,027
Pennsylvania	740	2,915	3,655
Rhode Island	232	257	489
South Carolina	216	582	798
South Dakota	53	54	107
Tennessee	328	758	1,086

TABLE III-6 (Continued)

State	Federal	State	Total
	(thousands of dollars)		
Texas	637	5,382	6,019
Utah	83	209	292
Vermont	111	489	600
Virginia	310	1,589	1,899
Washington	275	1,295	1,570
West Virginia	151	459	610
Wisconsin	309	2,263	2,571
Wyoming	32	46	78
Guam	114	57	171
Puerto Rico	274	145	419
Virgin Islands	105	53	158
Total	14,340	57,388	71,728

tion problems. In fiscal year 1975, EPA will make minor modifications to clearly define Federal and State roles in the joint effort to clean up the Nation's waters.

IV. Regulation

The 1972 Act greatly strengthened the regulatory authority of EPA and the States in water quality control. Through the permit system, known as the National Pollutant Discharge Elimination System (NPDES), stringent requirements are applied to individual dischargers. Streamlined enforcement measures replace former enforcement mechanisms, with heavy penalties applicable in cases of violation. Other regulatory programs under the Act govern pollution by oil and hazardous substances and sewage from vessels.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

Section 402 of the Act requires that any discharge into the Nation's navigable waters from any point source may be made only in accordance with the conditions of a discharge permit issued by EPA or by a State with an approved permit program. The permit must be written so as to ensure that the discharge will meet all applicable requirements of the Act regarding effluent limitations, prohibited discharges, new source performance standards, toxic and pretreatment effluent standards, ocean discharge criteria, and the inspection, monitoring, record-keeping, reporting, and entry requirements.

NPDES supplants the Refuse Act permit program, established December 1970 but effectively halted in December 1971 by a Federal court decision. Unlike the old program, which could not be applied to control municipal sewage discharges, NPDES applies to municipalities, industries, Federal facilities and certain agricultural and other dischargers. Violations of permit requirements and permit conditions subject dischargers to the Act's enforcement procedures.

Permit applications under the Refuse Act are considered permits under NPDES (and vice versa). The new program, particularly with respect to industrial permits, had a workable basis in the old program. Good relations with State agency personnel, the results of industrial waste effluent studies, and staff experience gained under the earlier program—all are largely applicable to NPDES.

The 1972 Act provides for public participation in various aspects of the water program. Public participation in NPDES is more particularly provided for in the regulations governing permit issuances by EPA (40 CFR 125) and by States with approved programs (40 CFR 124).

State Participation. The Act directs that any State requesting authority to administer the NPDES permit program for dischargers within the State should receive that authority from EPA if it meets certain requirements. These include capability and authority to modify, suspend, or revoke a permit, and the powers and procedures necessary for recourse to civil relief, criminal penalties, injunctive relief, and other enforcement mechanisms. EPA may review State permit programs and under certain circumstances object to the issuance of a permit. During 1973, five States received approval to administer the NPDES permit program—California, Oregon, Connecticut, Michigan, and Washington—and another 11 States had made application for the authority. The five States with permit authority issued 401 permits in 1973.

Under interim authority provided in the Act, 17 States and American Samoa were authorized to issue NPDES permits until March 19, 1973. A total of 183 were issued by 16 jurisdictions before the interim authority ended.

Regulations. A major program effort in 1973 was the preparation, publication, and promulgation of regulations governing NPDES. Much groundwork had been done while the 1972 law was going through the legislative process. Guidelines for State participation in NPDES were published in proposed form on Nov. 11, 1972,

Discharges into the Nation's navigable waters form any point source may be made only in accordance with the conditions of a discharge permit. (Discharge from a pulp mill.) DOCUMERICA—Doug Wilson

and in final form with some revisions on Dec. 22, 1972. This early effort responded to Congressional emphasis on State participation. Regulations prescribing policy and procedures to be followed in connection with EPA issuance of permits were published for comment on Jan. 11, 1973. They became effective on their publication in final form on May 22, 1973, enabling EPA to begin to issue permits for applications that had been received and processed. The regulations also govern EPA permits for the disposal of sewage sludge under Section 405 of the Act.

EPA review and issuance of permits is centered in the 10 Regional Offices. By the end of 1973, a total of 2,999 permits had been issued, (Tables IV-1 and IV-2). Many more permits were being processed at year's end. A total of 6,266 drafts were forwarded to the States to give them the opportunity to certify that the discharge covered by an EPA-issued permit (a Federal

TABLE IV-1

INDUSTRIAL PERMIT ACTIVITY IN 1973 UNDER NPDES

Region	Permit to States	Permits to public notice	Permits issued
I	1,008	617	158
II	490	242	24
III	626	300	149
IV	1,421	1,226	849
V	1,578	661	217
VI	384	263	78
VII	468	468	272
VIII	415	407	252
IX	120	382	289
X	225	225	184
Total	6,266	4,539	2,472

TABLE IV-2

MUNICIPAL PERMITS DRAFTED AND ISSUED IN 1973

Region	Applications received	Permits drafted			Permits issued		
		Major	Minor	Total	Major	Minor	Total
I	736	15	161	176	0	3	3
II	1,064	30	265	295	0	0	0
III	1,278	2	362	364	0	3	3
IV	1,937	1	349	350	0	78	78
V	3,468	6	1,166	1,172	0	170	170
VI	1,673	9	1,002	1,011	0	0	0
VII	1,422	1	224	225	1	7	8
VIII	1,403	14	246	260	1	115	116
IX	510	5	66	71	2	27	29
X	524	0	142	142	0	120	120
Total	14,015	83	3,983	4,066	4	523	527

permit) will meet applicable effluent limitations, standards, prohibitions, and other appropriate requirements. EPA Regional Offices issued public notices on 4,539 permit applications.

Public notices are issued on all permit applications. If sufficient interest is shown, public hearings are held. More formal adjudicatory hearings also may be requested. In some cases permit applicants have requested adjudicatory hearings and later withdrawn the request. If the request concerns matters that will be considered initially at a public hearing and resolved there, the request for an adjudicatory hearing may be denied as untimely. Such a hearing may again be requested after the public hearing if any matters remain unresolved. During 1973 118 adjudicatory hearings were requested, and one was held.

In spite of this apparent indication of interest, public participation in the permit program has not been high. Applicants request hearings, and several citizen organizations are very active, but general citizen involvement in the permit issuance process has not materialized.

Objectives in 1974. A number of major objectives have been set for 1974. One is to develop a computer monitoring program involving EPA, other Federal agencies, and the States. Increased State participation, both the formal assignment of authority to issue NPDES permits and informal cooperation, is another major objective. EPA will seek to harmonize national and State priorities for permit issuance and also continue the policy of involving the State to the maximum extent up to the point a permit is issued. If the State lacks only legal authority, the permit may be completely processed by the State, although it must be issued by EPA. The EPA goal is the issuance of all major NPDES permits by Dec. 31, 1974, drafting all minor permits by that date, and the completion of all permits by June 30, 1975.

Permits are being processed at an increasingly rapid rate, and more attention is being given to major facilities. Much of the language in permits has been standardized to facilitate rapid drafting. The permit program will require a sustained effort after the first round of permits are issued to ensure compliance with permit conditions. Permittees are required to submit different types of reports, which must be processed, reviewed, and in some cases response made. Performance must be monitored. Noncomplying dischargers will be subject to enforcement action.

Municipal Permits. Under the NPDES permit program, discharge of waste water from municipal facilities will be legal after 1974 only if in accordance with a permit. Permit conditions are primarily designed to limit the quantity and concentration of pollutants in the discharge. The Act requires that these pollutants be reduced by mid-1977 to the level provided by secondary treatment or to the level necessary to protect

established water quality standards, whichever is more stringent. By mid-1983, pollutant discharges are to be reduced to the level possible from "best practicable waste treatment technology," or to the level necessary to meet water quality standards.

Every municipal facility discharging waste water must apply for a permit. Each permit issued establishes effluent limitations in terms of chemical, physical, and biological characteristics of pollutants. An industry piping its waste into a municipal sewage plant is not required to obtain a permit. The municipal permit, however, will specify effluent limitations for both the industrial and municipal components of the discharge from the municipal plant. The municipality will be responsible for imposing local pretreatment requirements on industrial effluent if necessary.

Compliance with permit conditions will be monitored closely. Municipalities are required to report regularly on the nature and amounts of their pollutant discharges, and these reports will be spot checked with field visits by Federal and State officials. Operation and maintenance of plants will also be inspected regularly. Municipalities having difficulty meeting permit conditions will receive technical assistance to the extent Federal and State resources allow.

Special conditions may be included in permits where treatment plants are approaching overload or are already overloaded. If deemed appropriate, the State or EPA Regional Office drafting a permit may require the permittee to accommodate any increase in waste water flows by such means as improving the operational performance of the treatment plant, reallocating flows and pollutant loads among industrial and domestic sources, and using interim facilities. Permittees may also be required to undertake certain planning and managerial actions to forestall future overloads and violations of permits.

Permit applications had been received from 14,015 municipalities by the end of 1973 (Table IV-2). "Minor" facilities (serving a population of less than 10,000 without significant industrial waste water flows piped to the plant) are required to complete a short application form. All other facilities, called "major," are required to submit much more detailed information. Of the 527 permits issued in 1973, only four were major permits; however 4,066 permits were drafted, of which 83 were for major facilities.

Aquaculture. Section 318 of the Act provides for the issuance of special (non-NPDES) permits for discharges associated with approved acquaculture projects. An EPA regulation has been drafted covering aquaculture facilities designed to use pollutants for the maintenance, growth, and propagation of fresh water, marine, or estuarine organisms, as well as for development of new aquaculture crops. Not covered by the regulation are facilities such as fish hatcheries, fish farms, and similar projects that do not use waste from a separate industrial or municipal point source.

Applications to operate aquaculture projects are to be filed with EPA Regional offices. Permits will be reviewed by EPA with assistance from the Corps of Engineers, the Department of Commerce, the Department of the Interior, and the appropriate State agencies. A formal period of public comments is provided before a decision is made on the proposed project.

OIL AND HAZARDOUS SUBSTANCES

The primary objective of EPA's oil and hazardous substance program is to protect water quality by preventing spills and minimizing the impact of spills on the environment. Section 311 of the Act specifies a threefold approach to the control of spills: response, prevention, and enforcement. Implementation of Section 311 requires promulgation of key regulations, development of the National Contingency Plan, establishment of spill response programs, and development of an aggressive spill prevention program.

Regulations. Six regulations were completed in 1973 to implement the spill control program (Table IV-3). Additional regulations are being developed including several that will permit the hazardous substances program to become operational.

The National, EPA Regional, and Coast Guard District Contingency Plans provide the mechanism for coordinated actions of Federal and State agencies to ensure effective response activities to minimize damages resulting from spills. The National Plan will be revised to reflect new response procedures resulting from the promulgation of the key hazardous substances regulations.

TABLE IV-3

REGULATIONS GOVERNING OIL AND HAZARDOUS SUBSTANCES

Title	Status
Harmful Discharges of Oil—311(b)(4)	40 CFR 110 issued 9/11/70
Discharge of Oil for Research, Development, and Demonstration Purposes—311(b)(4)	Guidelines issued 4/17/71
Criteria for State, Local, and Regional Oil Removal Contingency Plans—311(j)(1)(A)	40 CFR 109 issued 6/28/71
National Oil and Hazardous Substances Pollution Contingency Plan—311(c)(2)	40 CFR 1510 issued 8/13/73
Liability Limits for Small Onshore Oil Storage Facilities—311(f)(2)	40 CFR 113 issued 9/13/73
Oil Pollution, Nontransportation Related—311(j)(1)(C)	40 CFR 112 issued 12/11/73
Oil Removal Methods—311(j)(1)(A)	Target date—fall 1974
Hazardous Substances Prevention, Nontransportation Related—311(j)(1)(C)	Target date—spring 1975
Designation of Hazardous Substances—311(b)(2)	Target date—summer 1974
Hazardous Substances, Harmful Quantities and Rate of Penalty—311(b)(4), 311(b)(2)	Target date—fall 1974

Response to Spills. Spills are defined as noncontinuous discharges or dumping that occur as a result of accidents, malfunctions of equipment, human error, deliberate discharges of bilge or ballast water, and convenience dumping of hazardous substances and oil into sewers, streams, estuaries, coastal waters, and upon land areas. EPA responds to spills in inland waters, while the U.S. Coast Guard responds to those in coastal (including the Great Lakes) waters.

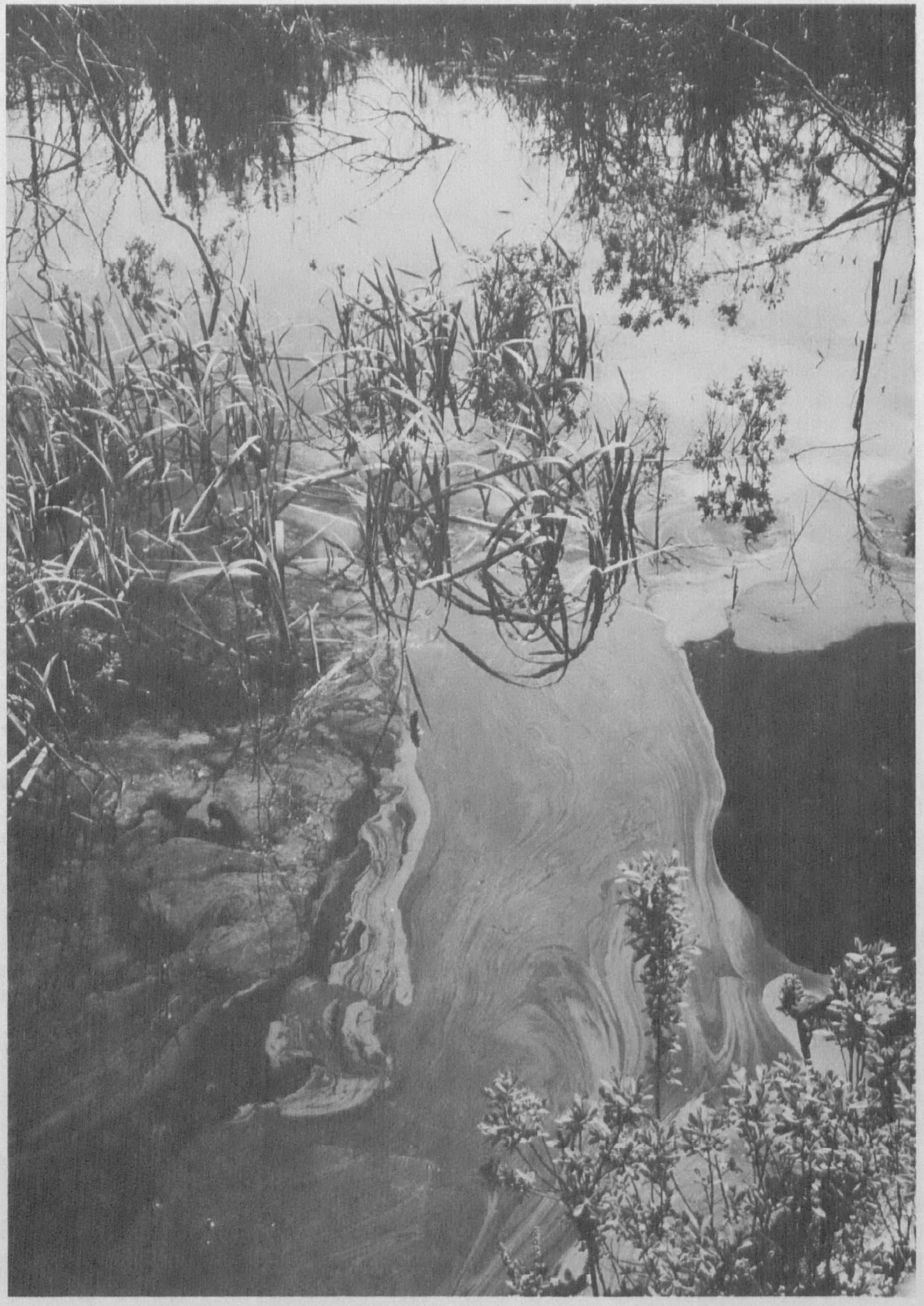
Over 10,000 spills occur annually in the United States; approximately 80 percent involve oil, including crude and petroleum products ranging from grease to gasoline and waste lubricating oil. From May 1 to Dec. 31, 1973, EPA received reports of 1,520 significant spills involving 5.3 million gallons of oil and 746 tons of hazardous substances including cyanide, acrylonitrite, valeraldehyde and other materials that cause severe stress on the aquatic environment. In accordance with the law, it is EPA's position that the discharger should take actions to remove the spilled material; if he fails to do so, EPA will undertake the cleanup, and the discharger will pay the removal costs.

Spill Prevention. The major emphasis of the oil spill program is on implementing pollution prevention regulations. The Coast Guard is responsible for prevention in transportation facilities (such as vessels, tank trucks, railroads, and pipelines), while EPA has the responsibility for nontransportation-related operations (such as oil wells, refineries, and tank farms). Those affected by EPA regulation have 1 year from the effective date to prepare and implement spill prevention control and countermeasure plans, unless EPA grants an extension. Initially, EPA is directing its efforts at repeat violators and major dischargers; a 50 percent reduction of spills is anticipated within 2 years.

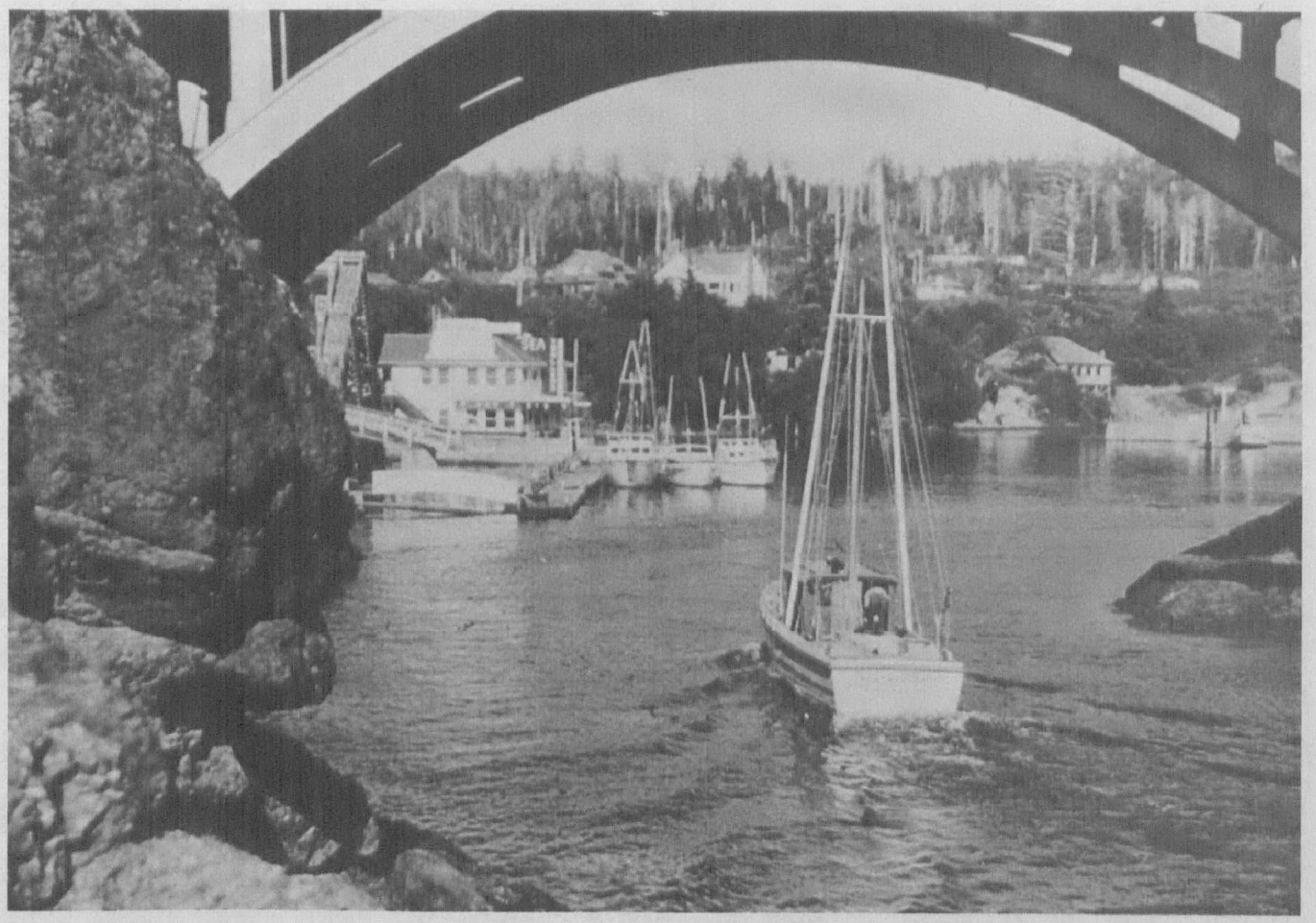
MARINE POLLUTION

EPA has played a key role in developing strong technical studies to support and strengthen the United States' position at the 1973 International Marine Pollution Conference held in late 1973. Agreement was reached in principle to control ship-generated discharges of oil, noxious liquid substances, packaged dangerous goods, sewage, and garbage into the oceans.

Vessel Wastes. In 1972, EPA promulgated standards of performance for marine sanitation



More than 10,000 spills occur annually in the United States of which about 80 percent involve oil.
DOCUMERICA—Hope Alexander



The Coast Guard with EPA assistance is preparing regulations governing design, construction, installation, and operation of marine sanitation devices.

devices, and the Coast Guard, with EPA's assistance, is now preparing regulations governing design, construction, installation, and operation of the devices.

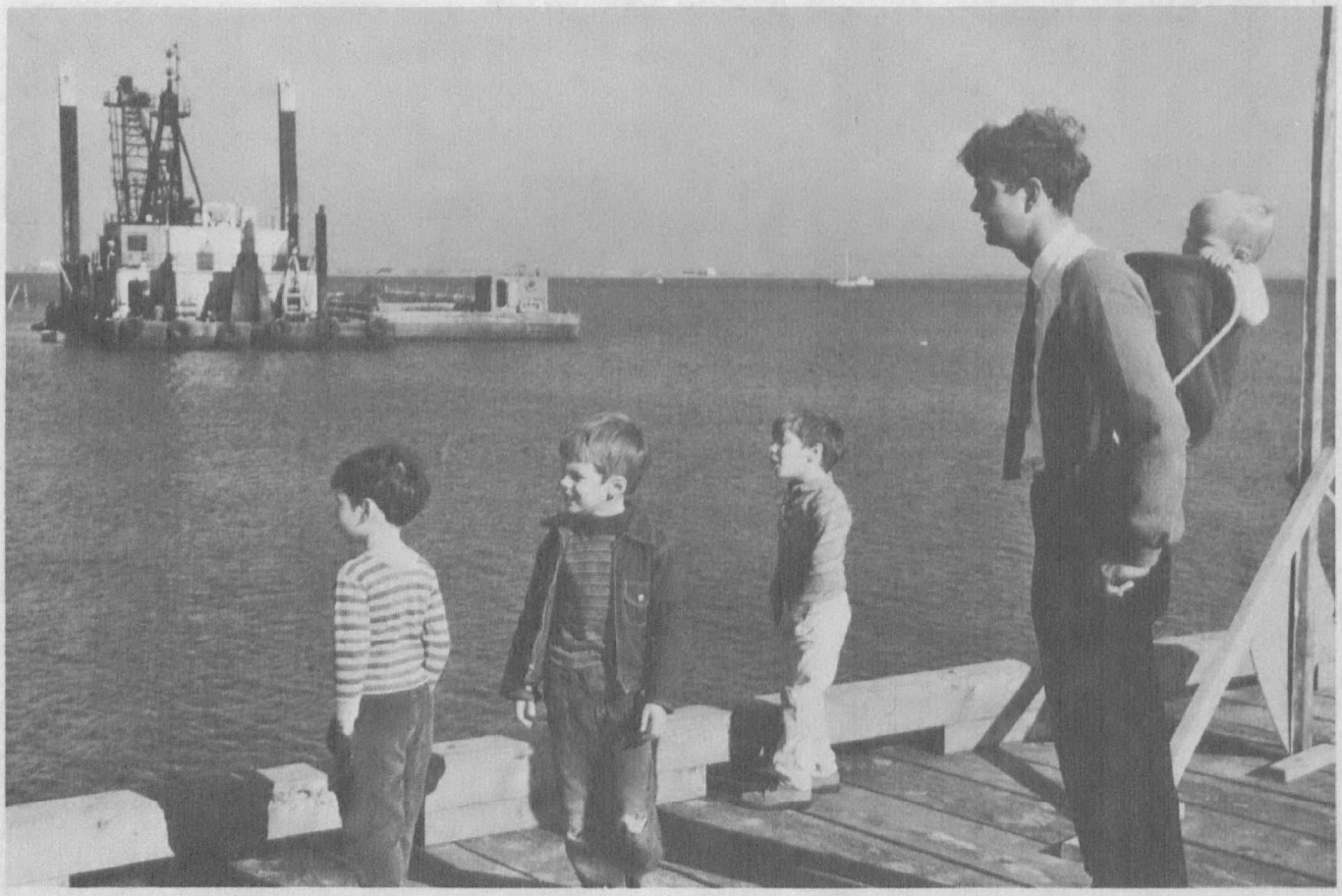
The 1972 Act contains a new provision permitting States to maintain no-discharge zones, if EPA determines that adequate treatment facilities are available in that area.

As the marine sanitation devices become widely used, another problem will arise: How to dispose of the wastes onshore. In port areas, the city sewage treatment plants are not capable of treating discharges from large commercial vessels; in rural areas, sewage treatment facilities simply do not exist, and the disinfectants used are quite often too toxic to be injected into the ground. The problem may require development of a packaged sewage treatment system capable of receiving and treating the wastes. At present, only limited technology is available in this area.

DISPOSAL OF DREDGE OR FILL MATERIALS

The Army Corps of Engineers is authorized under Section 404 of the 1972 Act to issue permits for the disposal of dredged or fill materials in navigable waters and to specify disposal sites.

EPA is developing guidelines in conjunction with the Army Corps of Engineers defining procedures for site specification and use. The guidelines are being prepared to minimize or prevent the harmful effects of disposal of dredged or fill material in inland navigable waters. The most stringent safeguards will be employed to prevent irreversible damage to those waters. An important consideration in preparation of the guidelines, however, is the need to avoid undue restrictions on waters that must be dredged and filled to maintain naviga-



Guidelines are being prepared to minimize or prevent the deleterious impacts of dredged or fill materials.

bility. Before the guidelines are issued in final form, comments will be considered from other Federal agencies, such as the National Oceanic and Atmospheric Administration and the Department of Interior, private industries, and environmental organizations.

ENFORCEMENT

EPA Actions Under 1972 Act. EPA regulatory activity in the water quality area was primarily directed during calendar year 1973 to the implementation of the stringent requirements of the Act. Hence large numbers of enforcement actions were not expected to be brought during 1973; only 531 were initiated or pursued by EPA during the year including 133 cases under the Refuse Act and two cases under Public Law 92-532, the ocean dumping law, which complements the Federal Water Pollution Control Act in the control of ocean waters pollution (Table IV-4).

The 1972 Act replaced former enforcement authorities with a new regulatory scheme, based largely on NPDES permits.

Under Section 309, EPA can issue a compliance order or bring a civil action for a violation of any provision of the Act respecting effluent limitations, water quality related effluent limitations new source performance standards, toxic or pretreatment effluent standards, or inspection, monitoring, record-keeping, reporting, and entry requirements, or any condition or limitation of a permit implementing those provisions, including the phased schedule of compliance.

Any point-source discharge made without a permit, or any discharge whatever of a radiological, chemical or biological warfare agent or high-level radioactive waste, is prohibited and likewise subject to enforcement action.

Violators are subject to civil penalties not to exceed $10,000 a day. Willful or negligent violations subject violators to fines of up to $25,000 a day, 1 year's imprisonment, or both;

TABLE IV-4

ENFORCEMENT ACTIONS IN 1973*

Federal enforcement (Section 309)	
Administrative orders	19
Civil actions	2
Criminal actions	7
State enforcement NPDES permits	3
Oil and hazardous substance liability (Section 311)	338
Cases initiated under the Act as formerly in effect and saved under PL 92-500	27
Enforcement under Refuse Act	
Civil actions initiated by EPA	48
Criminal actions initiated by EPA	76
Civil actions initiated by Justice Department with EPA assistance	7
Criminal actions initiated by Justice Department with EPA assistance	2
Enforcement under Marine Protection, Research, and Sanctuaries Act	2
Total	531

*For details, see Appendices A through E.

second convictions are punishable by fines of up to $50,000 a day, imprisonment for not more than 2 years, or both. Intentional false statements, or tampering with a monitoring device, subjects the violator to a fine of not more than $10,000, 6 months imprisonment or both.

If a State has authority to administer the NPDES within that State, EPA may first notify the State of a permit violation; in such a case, EPA may issue an order or bring a civil action only if the State fails to act after 30 days. The law explicitly preserves the right of the States to adopt and to enforce requirements at least as stringent as those in effect under the Act. The States are encouraged to establish and to carry out strong enforcement programs.

Section 402(k), the so-called immunity provision states that a discharge covered by a proper permit application, on which final administrative action has not been taken, will not be a violation of basic effluent limitations, new source performance standards, NPDES provisions, or the Refuse Act, until December 31, 1974.

The Refuse Act of 1899, which prohibits the discharge of refuse (except liquid sewage) into navigable waters without a permit or in violation of permit conditions, was extensively used in water quality enforcement to fill gaps in the law in the period prior to the enactment of the 1972 Act. The Refuse Act remains a useful instrument in some cases, such as discharges from nonpoint sources, discharges that impede navigation, and spills.

More than 60 percent of the total number of water enforcement actions taken in 1973 involved Section 311, Oil and Hazardous Substance Liability. The oil pollution control authorities had been carried over largely unchanged from the previous legislation. Parallel authorities governing hazardous substances other than oil were added by the 1972 Act.

- Two enforcement provisions of the Act showed no activity during 1973: Section 402(h), court action to restrict or prohibit the introduction of pollutants to publicly owned treatment works.
- Section 504, Emergency Powers, which authorizes EPA to seek court action in a case of imminent and substantial endangerment to the health of persons, or to their welfare in certain cases endangering their livelihood.

Section 505 confers on any citizen or group of citizens whose interest may be adversely affected the right to bring a civil action. EPA regulations prescribing procedures for giving prior notice of citizen suits appeared in the *Federal Register* in final form on June 7, 1973 (40 CFR 135). Of interest are suits pending at year's end brought under the citizen suit authority by the Natural Resources Defense Council, concerning effluent guidelines, permit exemptions and the toxic pollutant list.

Reserve Mining Case. Among the 27 actions continued under the Act as formerly in effect is the Reserve Mining Co. case. It had its origin in the Lake Superior Enforcement Conference, first convened in May 1969 under former Section 10 of the Act. The Federal-State conference, which met again in 1969, as well as in 1970 and 1971, considered but did not resolve the problem of Reserve's daily discharge of 67,000 tons of taconite tailings into Lake Superior. In April 1971, EPA, acting under another provision of former Section 10, issued to Reserve a 180-day notice of violation of Federally approved water quality standards for

Lake Superior. When voluntary compliance did not follow, EPA, on Jan. 19, 1972, requested the Attorney General to institute immediate legal action to abate the pollution.

Suit was filed Feb. 18, 1972, under the Federal Water Pollution Control Act and the Refuse Act. The complaint was amended to include a count under the Federal common law of nuisance. The court permitted the States of Wisconsin and Michigan and four environmental groups to intervene as plaintiffs, and 11 localities and business groups as defendants.

In June 1973, EPA research indicated the presence of asbestiform fibers in the drinking water of Duluth, Minn., and other communities on the western arm of Lake Superior and in the air of Silver Bay, Minn. The trial began August 1, 1973. The plaintiffs presented testimony showing Reserve as the source of the asbestiform fibers, and their presence in air and water as a health hazard. At year's end the United States was still considering joining the motion for a preliminary injunction requested by the plaintiff States of Minnesota, Wisconsin, and Michigan, and environmental groups. Primarily for purposes of accountability as to the economic issues, the United States, Minnesota, and Wisconsin moved to join Armco and Republic, which own Reserve. The District Court granted the motion, but the Court of Appeals reversed on appeal. Reserve presented evidence on the asbestos issue, arguing that the fibers found in the water supply are not asbestiform and do not come from Reserve's plant. The court indicated that the economic issues would be heard next. The trial is expected to continue for some time into 1974.

Washington Suburban Sanitary Commission Case. EPA and its predecessor agencies have been concerned with the pollution problems of the Potomac River Basin in the Washington, D.C., metropolitan area since a Federal-State enforcement conference first convened in 1957. Significant actions with respect to the area's difficult municipal pollution problems were taken during 1973. In October, the Department of Justice, at EPA's request, filed suit against the Washington Suburban Sanitary Commission (WSSC), the water supply and sewerage agency serving most of Montgomery and Prince Georges County, Maryland. The suit was based on WSSC's excessive flows to the Blue Plains, and its discharge of raw sewage to the Potomac and Anacostia Rivers. The suit asked the court to order WSSC to cease raw sewage discharges to the Potomac and Anacostia Rivers, to restrict WSSC's issuance of additional sewer hook-ups, and to defer the use of outstanding sewer hook-up permits, except those for public service facilities and for prevention of health hazards. The case is not expected to go to trial for some time.

Related to this suit are citizen actions brought by the Montgomery Environmental Coalition et al. and by Smoke Rise, Inc., et al., against EPA, WSSC, and others. The first action seeks, among other things, to compel EPA to bring an enforcement action against WSSC; the second action, brought by builders in Maryland, seeks to get sewer service for their construction activities. On Dec. 19, 1973, the court agreed with the government motion to dismiss the Coalition's case as to the United States on the ground that enforcement action is discretionary and not mandatory. At year's end, the Government was seeking a stay of the Smoke Rise case pending determination of related litigation.

As NPDES permits are issued and the Act's requirements are implemented, there will be increasing emphasis on compliance monitoring and on enforcement actions in the case of violations.

V. Water Quality Standards and Effluent Limitations

Federal authorities to handle water pollution problems have been strengthened over the years since enactment of the first permanent legislation in 1956. A major increase in authority stemmed from the Water Quality Act of 1965, which authorized the establishment and enforcement of water quality standards for interstate waters. Although water quality standards were expanded to cover intrastate waters by the 1972 Act, primary emphasis was placed upon a new approach. The new approach is based on controlling pollution at its source through effluent discharge limitations. Together, the approaches provide a complementary and broad legislative base for pollution control programs.

WATER QUALITY STANDARDS

The 1965 Act required States to adopt and enforce water quality standards for interstate waters. Each of these standards consisted of criteria, representing the acceptable limits of pollutants in receiving waters to protect the designated use or uses of the water, and a plan of implementation and enforcement. Based on the latest scientific knowledge of the effects of pollutants on human health, biological communities, recreation, and aesthetics, EPA developed water quality criteria which it recommended for inclusion in the State water quality standards.

Section 303 of the 1972 Act calls for an expansion of the Federal/State standards system to all navigable waters, including intrastate waters. Accordingly, in 1973 the major effort of the water quality standards program was to set Federal/State intrastate standards and to bring up to date many of the established interstate standards. The process will be essentially complete in mid-1974, and will establish a water quality target for 1977.

Later, standards will be revised again to designate uses and supporting criteria consistent with the Act's 1983 goal for water quality. These revised uses and criteria, to go into effect no later than 1978, should provide the basis for imposing the point and nonpoint source controls needed to achieve the 1983 goal. Lower uses should not be designated initially unless the natural quality of water is lower than the recommended minimum criteria. The socioeconomic and environmental costs and benefits may be balanced further in hearings regarding exceptions to water quality related effluent limitations.

Water Quality Criteria and Information. The 1972 Act required EPA to publish revised recommendations for water quality criteria and information on the more stringent water quality objectives of the Act. This requirement was met in October 1973 with publication of a two-volume document, *Proposed Water Quality Criteria and Water Quality Information.* Volume I contains the criteria for water quality for protection of human health and for the protection and propagation of desirable species of aquatic biota. Volume II contains information on the maintenance, restoration, measurement, and classification of waters. Also, pollutants suitable for maximum daily load calculations are identified. Following a public comment period, the criteria will be re-evaluated and revised, if necessary.

EFFLUENT LIMITATIONS

Effluent limitations are developed separately for municipal and industrial dischargers. The discharge of heat and toxic pollutants is afforded special consideration.

Municipal Effluent Limitations. Municipalities and regional sanitary authorities are required to provide secondary treatment by mid-1977. In certain basins a higher level of treatment may be required to meet water quality standards. The

Municipalities are required to provide a minimum of secondary treatment by mid-1977. (Cleaned wastewater at a Philadelphia plant pours over spillways, en route to the Schuylkill River.)

minimum level of effluent quality to be achieved is expressed in terms of biochemical oxygen demand, suspended solids, fecal coliform, bacteria, and pH.

Protection of dissolved oxygen levels will most frequently have the highest priority once secondary treatment levels have been attained. Less frequently, nutrient removal will be emphasized.

All projects funded after mid-1974 must provide for the application of "best practicable waste treatment technology" (BPWTT). By mid-1983 all publicly-owned treatment works must be in compliance with the requirements for BPWTT. Treatment beyond BPWTT must be provided where necessary to meet water quality standards.

BPWTT is determined by consideration of alternative waste management techniques including reuse and land application, as well as treatment processes. The selection of an alternative is left to each municipality or regional sanitary authority. However, if the municipality is to receive Federal funds it must be guided by EPA's cost-effectiveness regulations.

Any alternative selected must comply with certain additional requirements. In case of land application or land utilization techniques, the municipality must, to qualify for Federal funding, comply with criteria designed to ensure that the Nation's ground water resources remain suitable for drinking water purposes.

The criteria for reuse may vary greatly depending on the intended use of the effluent.

Restrictions have been kept to a minimum to encourage reuse of wastewaters. At the same time, reuse should not be allowed to result in greater pollution of either ground or surface waters than other major alternatives. Accordingly, to qualify for Federal grants, any reuse system must conform to the criteria for ground water and the requirements applicable to direct discharge of pollutants by publicly owned treatment works.

Other waste management techniques involving treatment and discharge include flow reduction and control of storm and combined sewers. The selection should be governed by cost-effectiveness as well as by general environmental considerations.

Industrial Effluent Limitations. Industries discharge a broad range of pollutants into the Nation's waters. In the aggregate, industry discharges about three times the amount of waste as do all the sewered private residences in the United States, and the volume is increasing several times as fast.

The 1972 Act provides for a vigorous attack on industrial water pollution, setting deadlines for a number of specific control actions. Guiding the control program will be two salient requirements: Existing industries discharging pollutants into the Nation's waters must use the "best practicable" water pollution control technology currently available by July 1, 1977; and they must use the "best available" technology economically achievable by July 1, 1983.

EPA is publishing guidelines on effluent limitations to define the "best practicable" and "best available" technology for various industries. The guidelines consider several factors, including the cost of pollution control, the size and age of the industrial facility, the process used, the energy requirements, and the non-water-quality environmental impact of the controls. EPA may require that, where practicable, there may be no discharge of pollutants from industrial facilities.

In addition, new sources of industrial pollution must use the "best available demonstrated control technology," which EPA is defining in the form of standards of performance for various industries.

EPA is also publishing pretreatment standards for new industrial sources and proposing regulations stating the application of effluent limitations to users of publicly owned treatment works.

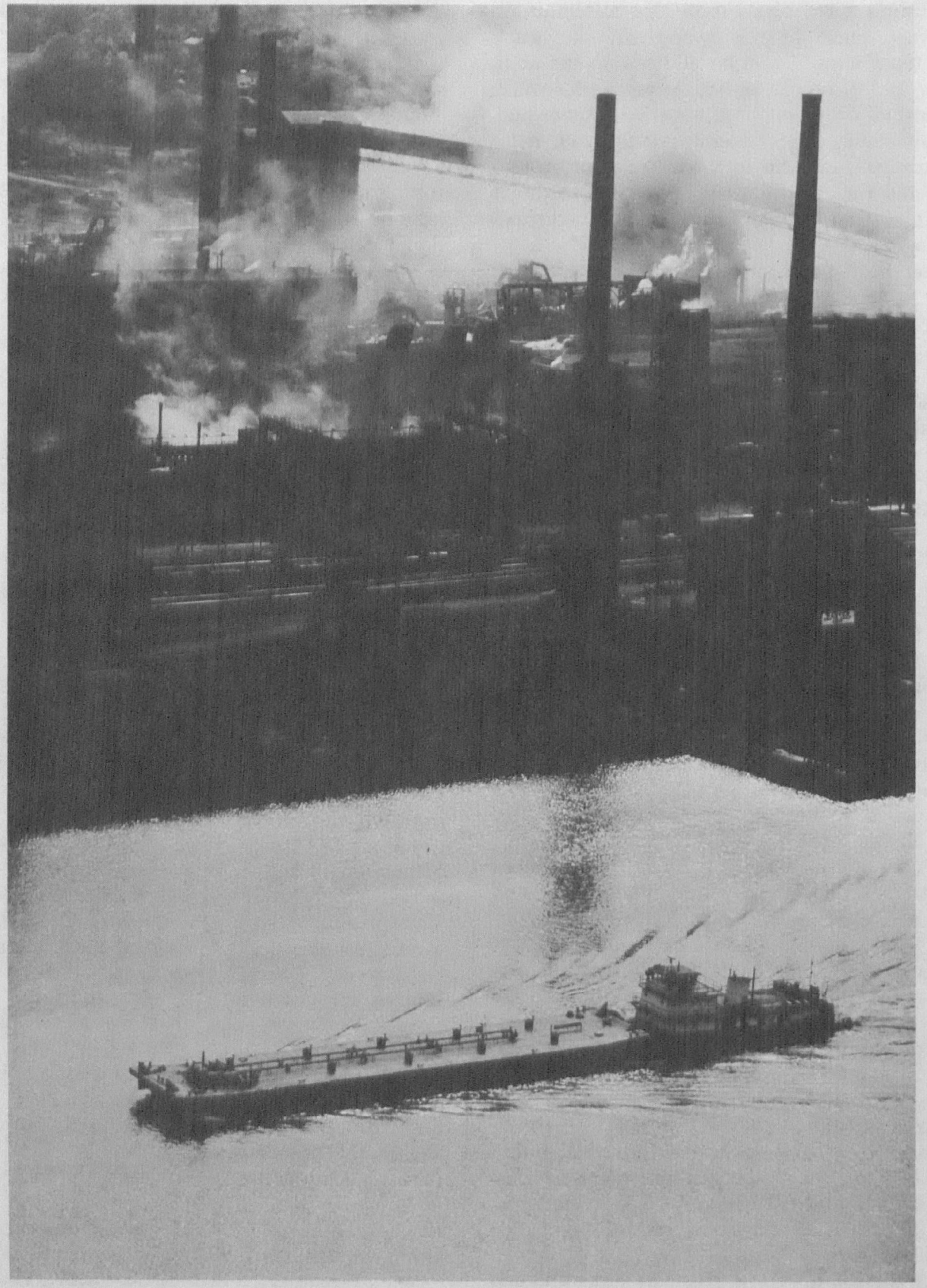
Contracts were negotiated to perform the necessary initial studies and analyses of the industrial categories listed in Section 306 of the Act, designated Group I (Table V-1). Of these EPA is studying 19 industries with the most complex problems in 2 phases (Table V-2). In response to the Act, which directed that additional categories be identified, EPA assigned 16 more categories to Group II for intensive study (Table V-3), and more may be added later.

Development of guidelines. During 1973, effluent limitation guidelines for existing sources, performance standards for new sources, and pretreatment standards for new sources were published in the *Federal Register* as proposed regulations for 23 of the 30 Group I, Phase I, categories. EPA first used technical contractors to assist EPA in its study of each industry. Input and review comments were received from other Federal agencies, the States,

TABLE V-1

MAJOR INDUSTRIAL CATEGORIES LISTED IN THE 1972 ACT (GROUP I, PHASE I)

Pulp and paper mills	Plastic and synthetic materials manufacturing
Paperboard, builders paper, and board mills	Soap and detergent manufacturing
Meat product and rendering processing	Fertilizer and phosphate manufacturing
Dairy product processing	Petroleum refining
Grain mills	Iron and steel manufacturing
Canned and preserved fruits and vegetables processing	Nonferrous metals manufacturing
Canned and preserved seafood processing	Steam electric power plants
Sugar processing	Ferroalloy manufacturing
Textile mills	Leather tanning and finishing
Cement manufacturing	Glass manufacturing
Feedlots	Asbestos manufacturing
Electroplating	Rubber processing
Organic chemicals manufacturing	Timber products processing
Inorganic chemicals manufacturing	



Existing industrial dischargers must use "best practicable" water pollution control technology by mid-1977 and the "best available" by mid-1983. DOCUMERICA—John Alexandrowicz

TABLE V-2

MAJOR INDUSTRIAL CATEGORIES REQUIRING ADDITIONAL STUDY (GROUP I, PHASE II)

Pulp and paper mills	Fertilizer manufacturing
Meat product and rendering processing	Iron and steel manufacturing
Grain mills	Nonferrous metals manufacturing
Canned and preserved fruits and vegetables processing	Phosphate manufacturing
Canned and preserved seafood processing	Ferroalloy manufacturing
Sugar processing	Glass manufacturing
Electroplating	Asbestos manufacturing
Organic chemicals manufacturing	Rubber manufacturing
Inorganic chemicals manufacturing	Timber products processing
Plastic and synthetic materials manufacturing	

TABLE V-3

ADDITIONAL INDUSTRIAL CATEGORIES REQUIRING STUDY (GROUP II)

Paint and ink formulation and printing	Machinery and mechanical products manufacturing
Converted paper products	Coal mining
Fish hatcheries and fish farming	Petroleum and gas extraction
Transportation	Mineral mining and processing
Paving and roofing materials (tars and asphalts)	Water supply
Wooden furniture manufacturing	Miscellaneous food and beverage processing
Auto and other laundries	Miscellaneous chemicals manufacturing
	Ore mining and dressing
	Steam supply

industry, citizen groups, and the Effluent Standards and Water Quality Information Advisory Committee. These steps followed to develop guidelines and performance standards:

- *Industrial categorization.* Industries were subcategorized based on raw materials, products, manufacturing processes, and other factors such as age or size of plant.
- *Waste characterization.* Raw waste characteristics were identified for each category or subcategory. The heat content and the chemical, physical, and biological characteristics of all waste waters (including toxic and other constituents) were identified.
- *Identification, documentation, and verification of control and treatment technology.* This step included consideration of:
  - All existing and potential treatment and control technologies (including in-plant and end-of-process technologies).
  - Limitations and reliability of each treatment technology and required implementation time.
  - Effects of application of each treatment technology on non-water-quality pollution problems.
- *Development of cost information.* For each treatment technology, cost information was developed for investment costs and annual costs (including capital, depreciation, operating and maintenance, and energy costs). An economic impact analysis indicated industry segments which should have difficulty meeting pollution control requirements.
- *Evaluation of data.* Data were evaluated to determine the best practicable control technology currently available, the best available technology economically achievable, and the best available demonstrated control technology.
- *Determination of effluent limitation.* The performance of exemplary plants in each industry subcategory (except in case of technology transfer) was analyzed to determine achievable effluent limitation for all industries in the subcategory.

Future developments. Final regulations covering most of the Group I, Phase I categories will be published in the *Federal Register* during the spring of 1974.

Effluent limitations guidelines and performance standards for industrial categories within Group I, Phase II, and Group II are currently

being developed and will be published during 1974.

Toxic Effluents. Most substances are toxic to aquatic life and to other organisms when present in sufficient concentrations for sufficient periods of time. EPA is using Section 307(a) of the 1972 Act to control those substances that are toxic to important effected organisms. To address the complex problem of toxic pollutants EPA used the following selection criteria to develop the initial list of pollutants:

- Data from laboratory or field studies indicate that a pollutant could constitute a serious environmental threat if discharged into water. The data covered bioaccumulation, teratogenicity, mutagenicity, carcinogenicity, and high acute and chronic toxicity.
- The pollutant is discharged, or has the potential of being discharged, from point sources.
- Data are available to establish effluent standards meeting the requirements of the Act.
- Setting standards under Section 307(a) is appropriate because of the overall environmental effectiveness of the control measures available to EPA and the environmental benefits to be derived.

Using these criteria, EPA promulgated the following initial list of toxic pollutants on September 7 following 4 public hearings held in various parts of the country by the Effluent Standards and Water Quality Information Advisory Committee:

Aldrin-Dieldrin (pesticides)
Benzidine (chemical used in dyes)
Cadmium
Cyanide
DDT (DDD, DDE)
Endrin (pesticide)
Mercury
Polychlorinated biphenyls (organic compounds used in heat exchangers and other uses)
Toxaphene (pesticide)

Proposed effluent standards were published December 27. These are expected to become final in 1974 after appropriate public hearings.

Most toxic pollutants are intended to be controlled primarily through effluent guidelines and water quality standards. Both are implemented through effluent limitations (or prohibitions) in NPDES permits, which are issued for periods not to exceed five years. Water quality standards normally are revised once every 3 years.

Appearance of a substance on the toxic pollutant list may be viewed as a signal that water quality criteria for the pollutant should be incorporated in the next revision of all water quality standards. At the same time, guidelines for industries identified as major dischargers of the pollutant will be reviewed, and revised if necessary.

Thermal Discharges. Temperature is one of the most important characteristics of water. Aquatic plant and animal life can be drastically affected by abnormal increases in water temperature. Artificial temperature changes, even at levels that may be far below those that are acutely lethal, can favor predators, parasites, or diseases that can destroy indigenous populations. Further, increases in water temperatures can cause aquatic plants to proliferate and accelerate euthrophication, with severe implications, both biologically and aesthetically.

A discharge of heat is a pollutant under the Act and so is subject to effluent guidelines and water quality standards. However, Section 316 of the Act contains provisions, unique to thermal discharges, which

- Allow thermal control requirements to be modified if the applicant can demonstrate that they are excessively stringent for aquatic life protection.
- Require that effluent limitations minimize the potential damage of cooling water intake structures.
- Provide assurances that a source will not be required to make multiple modifications regarding its heat discharges within a short period of time.

Receiving water standards. The interim water quality criteria published by EPA under Section 304(a) will, when final, supercede EPA's former water temperature recommendations. By specifying seasonal average and maximum temperatures for individual fish species, the new criteria

The discharge of heat is subject to effluent guidelines and water quality standards. (Cooling tower at Trojan Nuclear Power Plant near St. Helens, Oregon on the Columbia River.) DOCUMERICA—Gene Daniels

can provide better protection for aquatic life than is achieved by most of the existing State water quality standards. State standards will be revised as necessary to integrate the new recommendations. For each waterway, the State will determine one or more species that should be protected. The selected species should be indicative of the overall local biologic situation, so that the resulting criteria adequately protect the balanced, indigenous aquatic population. The temperature requirements will then apply in all areas of the specific water body outside of defined, limited mixing zones.

As an important initial step in its thermal pollution control program, EPA is developing thermal water quality criteria for both fresh and marine waters. These criteria, to be published in the *Federal Register*, will define the temperature requirements for meeting the 1983 goal, will be available as guidelines for the States to use in reviewing their water quality standards, and will define water quality needs for individual dischargers seeking to prove that proposed effluent limitations may be more stringent than necessary to protect the indigenous aquatic populations.

Effluent Limitations. Thermal effluent limitations are imposed through NPDES on individual point sources to meet the 1977 and 1983 goals. The best available technology required by 1983 may consist of offstream cooling, which allows little if any discharge of heated water. For certain industries, the limitations will be determined initially by reference to effluent guidelines developed for existing sources and new sources. Guidelines for the steam electric power industry proposed in March call for the phased achievement of offstream cooling during 1977-1983. These guidelines will be published during the summer of 1974, following review of public comments and possible revision.

The 1972 Act also provides that if the thermal effluent limitations are more stringent than necessary to protect indigenous aquatic populations, any source may ask the permitting agency for an exemption. An existing source can demonstrate its need for exemption by showing that its prior operation and discharge has caused no appreciable harm. Or it may attempt to show that the proposed limitations are more stringent than necessary to protect various important species selected by the permitting agency. If the source can't demonstrate either of these conditions, it must produce comprehensive biological, chemical, physical and engineering information regarding the water body and the discharge. After a public hearing, the permitting agency can impose alternative limitations.

Proposed regulations specifying procedures for such exemptions will be published in early 1974 in conjunction with the effluent guidelines for the steam electric power industry.

VI. Research and Development

A strong scientific and technical base is crucial to EPA's success in formulating policy, setting standards, program implementation, and enforcement. The Agency is conducting a research, development, and demonstration program focussed on developing new or improved pollution control technology, improving monitoring instrumentation and methods, increasing understanding of pollution processes and their effects on health and the ecology, and developing more effective methods to utilize scientific, technical, and socio-economic data for environmental decision-making. Together, these interrelated programs provide technical support to EPA and other agencies responsible for cleaning up the Nation's waters.

HEALTH EFFECTS PROGRAM

The health effects program concentrates on two major activities—assessing the effects of water pollutants on health and developing criteria and standards for ensuring safe supplies of drinking water.

Health Effects. The objectives of the water quality health effects program are: To develop criteria for safe treatment and disposal of effluents and sludges from wastewater treatment facilities; and to develop health-related criteria for fresh and marine recreational waters. Research is being directed towards assessing potential health hazards associated with the use of land for wastewater and sludge treatment and disposal. Airborne emissions from wastewater treatment facilities are being investigated to determine if they could result in carryover of pathogenic microorganisms to the surrounding population. Studies are underway in recreational waters to relate incidence of diseases among swimmers to various indices of pollution. These will result in development of health-related criteria for recreational waters.

Water Supply. The water supply research and development program is developing criteria for promulgating water quality standards for municipal drinking water. This research effort includes studies of the biological effects of infectious agents and toxic contaminants in drinking water. New or improved technology is being developed for the effective and economical control of drinking water contaminants during storage, treatment, and distribution. Specifically, efforts are being directed to demonstrate technologies for inactivation of infectious agents and removal of toxic contaminants so that municipalities can achieve compliance with present and future drinking water standards. The more significant research efforts and achievements are:

- Reverse osmosis has been used to isolate trace organics from tap water. The nature and toxicity of these organics are being determined.
- A cooperative study has been initiated with the National Institute of Heart and Lung Disease to correlate drinking water quality and chronic diseases.
- A ten-year review of waterborne disease outbreaks has been completed.
- Toxicological and epidemiologic studies are being conducted for lead, cadmium, nitrate, barium, silicate, and asbestos in drinking water.
- Trace metals and organic compounds are being determined in highly treated wastewater effluent to identify best reuse of such effluents (agricultural, industrial, municipal or recreational).
- A miniaturized sample and an improved carbon extraction procedure have been developed for determination of the general organic content of drinking water.
- Treatment processes are being improved for the removal of mercury, barium, selenium, arsenic, and nitrates.

EPA's health effects program concentrates on two major activities—assessing the effects of water pollutants on health and developing criteria and standards for ensuring safe supplies of drinking water. DOCUMERICA—Erik Calonius

ECOLOGICAL PROCESSES AND EFFECTS PROGRAMS

Ecological studies are directed primarily toward development of criteria to be used in setting water quality standards. Two major studies underway cover estuaries and the Great Lakes.

Estuarine and Coastal Zone Research. The objectives of the estuarine and coastal zone research program include developing (1) scientifically and legally defensible water quality criteria; (2) information for assessment of damage to marine ecosystems from acute and chronic exposures to pollutants; (3) criteria for ocean disposal via outfalls and dumping; and (4) predictive models for the long-term effects of pollutants on marine ecosystems.

The following studies were initiated in 1973 in response to Section 104(n):

- Description of pollution stress in arctic and sub-arctic estuarine ecosystems.
- Ecological impact of petroleum substances, heavy metals and synthetic organic compounds on estuary ecosystems.
- Characterization of the Nation's estuaries according to energy flow via the food chain and pollutant stress.
- Ecological requirements essential for the protection of estuarine ecosystems.

Great Lakes. EPA's research program on the Great Lakes provides a scientific basis for assessing the source, fate, effects, and importance of pollutants in large lakes in general, with particular emphasis on the Great Lakes. As an integral part of this program, predictive mathematical models for lake water quality management are being developed and improved.

Among the specific pollution problems being addressed are:

EPA develops procedures for assessing damage to marine habitats from pollutants.

- Eutrophication
- Thermal pollution and related power production problems
- Hazardous materials, including industrial wastes
- Disposal of dredging spoils.

During 1973 the International Field Year for the Great Lakes (IFYGL) program in Lake Ontario comprised the major fraction of EPA's research effort. (EPA is the U.S. lead agency for the IFYGL chemistry-biology program.) Reports from EPA and agency-supported scientists on various aspects of the chemistry and biology of Lake Ontario were issued. Development of a predictive mathematical model based on the IFYGL data is proceeding on schedule and will be continued through 1975.

The agency continued to support studies on Lakes Erie and Huron, which are being coordinated by the U.S.-Canadian International Joint Commission (IJC). A report on the status of Lake Erie was issued. In anticipation of the conclusion of IFYGL field research in 1974, EPA's field research emphasis began to shift to Saginaw Bay-Lake Huron as part of the IJC-Upper Great Lakes reference study.

MUNICIPAL POLLUTION CONTROL

The quality of water in many river basins is presently below prescribed standards because of pollutants discharged from urban sources. Conventional wastewater treatment technology, originally developed to remove suspended solids and biodegradable materials, generally lacks the effectiveness necessary to meet today's requirements. The characteristics of municipal wastewaters have been changing because of the increasing amounts of industrial wastes accepted by sewerage systems. Continued urban growth is overloading existing systems and will require development of more efficient technology.

A major portion of the municipal pollution control research, development, and demonstration effort has therefore been applied to developing new technology to upgrade the performance of existing treatment processes. Upgrading municipal plants can take many forms, depending on the particular system. In all cases, the key element in upgrading systems is ensuring that existing facilities are used to their maximum capability. Present efforts are concentrating on two broad areas:

- Development of methods to ensure the plant will operate at its design efficiency over a wider range of loadings.
- Development of methods and unit processes that may be added to existing systems to increase treatment efficiencies.

Examples of plant upgrading activities include:

- Conversion of secondary treatment air activated sludge process to permit use of pure oxygen.
- Conversion of existing primary treatment systems to an oxygen activated sludge process.
- Conversion of rock media trickling filter systems to plastic media trickling filter systems.
- Addition of chemicals to primary treatment systems together with operation of activated sludge for nitrification.
- Addition of alum to secondary clarifier systems to remove more phosphorus in a trickling filter system.
- Addition of chemicals to stabilization pond effluents to facilitate removal of algae.

Many cities are now applying new or improved technology to upgrade municipal treatment works (Tables VI-1 through 3). For the most part, the technologies have been brought to the field application stage through the EPA research, development, and demonstration program.

Completely new processes are also being developed. One of the more recent concepts to be incorporated in the municipal research, development, and demonstration program is the physical-chemical treatment system. This technique differs from conventional technology in that the system no longer depends on biological degradation of the waste materials. Instead, advanced waste treatment techniques utilizing processes more familiar to chemical engineering disciplines are being actively pursued. While physical-chemical systems may cost more to operate, they also have the potential for increased throughput, reduced land acquisition costs, and more stable performance. Table VI-4

TABLE VI-1

MUNICIPAL WASTE WATER TREATMENT WORKS USING OXYGEN

Location	Type of system	Flow (million gallons per day)	Status (October 1973)
Detroit, Mich.	Submerged turbine	300	Startup
Philadelphia, Pa.	Surface aerator	210	Design
Philadelphia, Pa.	Surface aerator	150	Design
New Orleans, La.	Surface aerator	122	Construction
Tampa, Fla.	Surface aerator	60	Construction
Danville, Va.	Surface aerator	24	Construction
New York, N.Y. (Newton Creek)	Submerged turbine	20	Operational
Fairfax County, Va.	Surface aerator	12	Operational
Speedway, Ind.	Surface aerator	7.5	Operational
Calabas, Ga.	Converted air diffusers	1.8	Operational

TABLE VI-2

MUNICIPAL WASTE WATER TREATMENT WORKS REMOVING NITROGEN

Location	Type of process	Flow (million gallons per day)	Status (December 1973)
Washington, D.C.	N-DN,* suspended growth	300	Construction
Tampa, Fla.	N-DN,* suspended growth fixed film	60	Construction
Alexandria, Va.	Ion exchange	54	Design
Arlington, Va.	Breakpoint chlorination	30	Design
Madison, Wis.	Nitrification, suspended growth	30	Design
Fairfax County, Va.	Ion exchange	22.5	Design
Owosso, Mich.	Breakpoint chlorination	6.0	Design
Orange County, Calif.	Ammonia stripping	15	Operational
Central Contra Costa, Calif.	Suspended growth system	1.0	Operational
Rosemount, Minn.	Ion exchange	0.6	Operational
El Lago, Tex.	N-DN,* suspended growth fixed film	0.5	Operational

*Nitrification-denitrification.

lists some of the plants where carbon absorption technology is planned or under construction.

A small municipal facility (500,000 gpd) at El Lago, Texas, was converted to an advanced wastewater treatment plant with no disruption of services. Existing capital equipment was retained and utilized as useful components of the advanced waste treatment facility. High quality effluent is being produced by the proper combination of chemical-physical and biological processes to meet effluent requirements for biological oxygen demand, suspended solids, phosphorus, and nitrogenous pollutants.

A major problem that received additional attention in 1973 is the development and demonstration of programs to utilize or dispose

TABLE VI-3

MUNICIPAL WASTE WATER TREATMENT WORKS REMOVING PHOSPHORUS

State	Number of plants		
	Operational	Under construction	Planned
Michigan	33	10	30
Ohio	11	14	17
Wisconsin	10	3	7
Indiana	4	3	4
Illinois	3	3	3
Minnesota	1	1	1
Pennsylvania	1	—	2
New York	—	—	8

TABLE VI-4

MUNICIPAL WASTE WATER TREATMENT WORKS USING GRANULAR ACTIVATED CARBON

Location	Flow (million gallons per day)	Status (December 1973)
Niagara Falls, N.Y.	60	Design
Cleveland, Ohio	50	Design
Garland, Tex.	30	Construction
Fitchburg, Mass.	15	Construction
Rocky River, Ohio	10	Construction
Cortland, N.Y.	10	Construction
Lake Tahoe, Nev.	7.5	Operational
Owosso, Mich.	6	Construction
Rosemount, Minn.	0.5	Operational
Colorado Springs, Colo.	4	Operational

of sludges generated by wastewater treatment systems. Techniques for determining criteria for land disposal of sludges are being developed. In addition, techniques to promote better sludge digestion and concurrent generation of methane as a new energy source are under active review.

INDUSTRIAL POLLUTION CONTROL

EPA's industrial research and development is directed toward innovative, efficient, and economical methods to control the pollution from industrial sources. This program provides:

- Demonstrated technologies to upgrade present industrial wastewater treatment practices.
- An expanding data base for establishment of technically and economically feasible effluent guidelines.
- Definition of pretreatment parameters for discharge of industrial wastes to sewer systems.
- Alternative methods for control or reuse of waste heat.

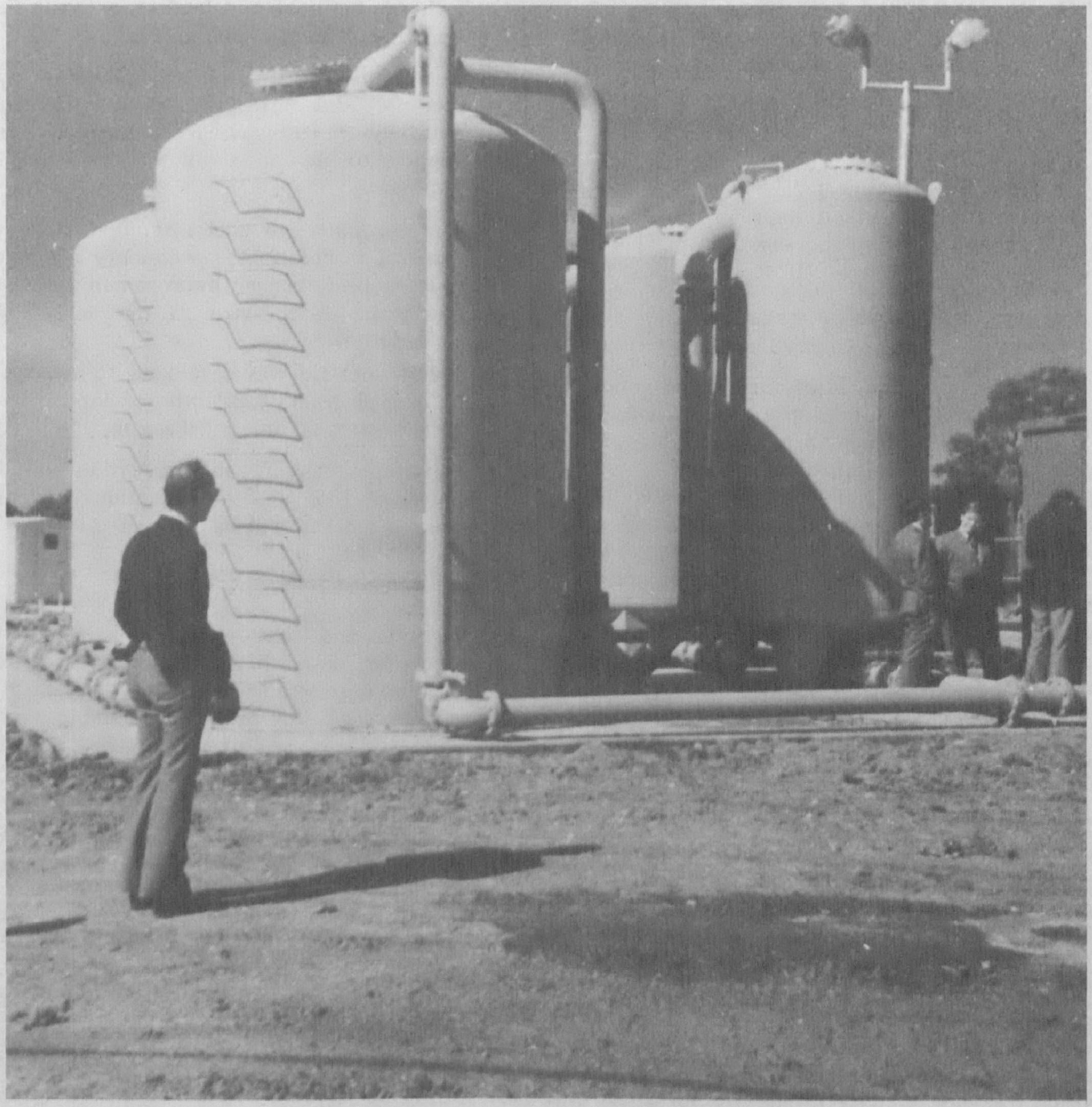
Wherever possible, the programs focus on development of technology that will allow industry to recover all or part of the costs of control through reuse or sale of the control by-products.

During 1973, the industrial program was reoriented to ensure that the research efforts would conform to the 1972 Act. One of the Act's requirements calls for private industry to install "best practicable technology" by 1977. After mid-1974, programs to develop industrial wastewater control technology will be focused on satisfying the 1983 requirements for "best available technology" and the 1985 goal of "no discharge."

A significant effort was initiated in 1973 to review and assist in preparation of the effluent limitation guidelines. This effort, which will continue in 1974, is directed towards definition of pollution from industrial wastes and best available treatment systems, giving due regard to costs. Emphasis will be on developing systems for industries deemed likely to:

- Have the greatest difficulty in meeting waste quality requirements.
- Contribute the most significant pollution loads.
- Discharge toxic or potentially toxic materials.

On a selective basis, EPA will continue to support technology development programs for small, fragmented industries either unable or



Advanced wastewater treatment facility at El Lago, Texas.

unlikely to develop effective technology without outside support.

NONPOINT SOURCE POLLUTION CONTROL

The EPA nonpoint source research and development program develops the knowledge and techniques to abate and control water pollution from such sources as agriculture, mining, construction, and spills.

During the past year the program was reoriented to provide the technical basis for decisions to implement the 1972 Act. The major emphasis is now on:

- Assessing the comparative pollutant discharge from nonpoint sources on a regional and national basis.

- Developing and verifying procedures for estimating pollutant discharges from specific nonpoint sources and land use complexes, and for predicting reductions in pollutant discharges resulting from implementation of specific controls.
- Evaluating the performance of nonpoint source controls and their applicability to representative regional conditions.
- Developing and demonstrating new or improved controls for sources where available controls are clearly inadequate.

Wherever possible, efforts are being concentrated on control and prevention of discharges at the source rather than on collection and treatment of pollutants after their discharge.

During 1973 a manual was published outlining available environmental control practices for beef feedlot operations, and an evaluation technique was developed for determining the potential pollution impact of strip mining on a given area. This technique is expected to be of considerable value as strip mining activities are accelerated in response to the national energy problem.

To predict the runoff from agriculture lands, EPA is developing a mathematical model that describes pesticide runoff quantitatively as a function of different combinations of conditions, such as pesticide type and formulation, soil properties, climatic conditions, watershed characteristics, and agricultural practices. The model accounts for the fate of pesticides on and in the soil during rainfall and between rainfall events. It will permit the evaluation of corrective management or engineering practices. It will also provide a basis for making recommendations for pesticide usage. And finally, the model will guide pesticide manufacturers in tailoring pesticide formulations to meet regional requirements for pollution prevention. The model is now being extended to include plant nutrient runoff.

EQUIPMENT AND TECHNIQUES PROGRAM

Research efforts have been concentrated on developing test procedures required under various sections of the Act. New and improved analytical methods for determining chemical and biological pollutants have been developed for use both in the field and laboratory. Specific developments of the past year include:

- A technique that will simultaneously identify and measure 72 of the 92 naturally-occurring chemical elements was adapted to the analysis of wastewaters and sediments.
- The problem of determining coliform bacteria in chlorinated secondary effluent was resolved through improvements in the membrane filter used in the analytical procedure.
- A new method was developed to measure NTA, a proposed substitute for phosphates in detergents, in municipal sewage.
- Development of an EPA-wide computerized biological data handling system was started and will be completed in 1974.

QUALITY ASSURANCE PROGRAM

To maintain and improve the reliability of environmental data, EPA has intensified its comprehensive program for quality assurance. Key elements of the program are laboratory quality control and method standardization. The significant achievements of the year include:

- A compendium of analytical methods employed by major laboratories within EPA was published and distributed to encourage selection of uniform methods.
- Approximately 4,000 sets of reference standards were distributed to Federal, State, local, and private water-monitoring laboratories for verifying their analyses.
- Guidelines for effluent test procedures were promulgated on October 16, 1973, as required by Section 304(g) of the Act.
- Three manuals were published detailing tentative procedures for monitoring aquatic micro-biological, biological, and marine environmental parameters.

DATA AND INFORMATION RESEARCH PROGRAM

Remote Sensing. Development is well underway of an aerial monitoring procedure for detecting and classifying wastewater outfalls. In

each of EPA's 10 Regions, three major outfalls have been surveyed, and "signatures" amenable to aerial detection are being established for each type of source.

Technical assistance is being provided to Regional Offices in the identification through photo analysis of nonpoint pollution sources. A study of a 2,200 square-mile area of the Calcasieu River Basin in Louisiana has been completed. Studies are underway of a 3,500 square mile area of the Monongahela River Basin in Pennsylvania and West Virginia, a 8,000 square mile area of the Elkhorn River Basin in Nebraska, and a 6,000 square mile area in Iowa.

Technical assistance is being provided to Regional Offices in the aerial detection of oil and hazardous material spills and discharges in support of enforcement activities in California, Idaho, Nevada, Mississippi, Pennsylvania, and New York.

Lake Eutrophication. The eutrophication threat to selected fresh water lakes and reservoirs in 27 Eastern States is being assessed in conjunction with State water pollution control agencies and the National Guard. Aimed at developing lake water quality criteria and information concerning point and nonpoint sources of lake degradation, the program is slated for expansion into the western part of the United States during 1974. The survey will provide significant assistance to State water pollution control planning and to the EPA nonpoint source and water quality criteria research and development programs.

ENVIRONMENTAL MANAGEMENT RESEARCH PROGRAM

Engineering, economics, and physical, biological, and social sciences, in conjunction with systems analysis techniques, are brought together in a interdisciplinary effort to develop improved environmental quality management methods. The Program's goal is to provide decision-makers with data and techniques to minimize the social cost of pollution and its control. Research areas include environmental quality forecasting and analysis, comprehensive planning, procedures to set and implement standards, cost and benefit analysis, and environmental impact analysis procedures. While the program focuses on managing the environment considered as a whole, it also provides management assistance directly applicable to water problems. Recent accomplishments include:

- A report to Congress on the cost-benefit analysis research program.
- An investigation of the economic impact of water quality on property values.
- A handbook containing improved methods for more accurately estimating the cost of water quality control technology.
- A survey of the impacts of wastewater treatment processes on air pollution and solid wastes.
- Development of procedures for cost-effective design of ambient water quality monitoring programs.
- An investigation of methods for implementing land use controls to protect water quality.
- An analysis of various types of regulations for controlling the discharge of industrial wastes into municipal sewerage systems.
- Development of procedures for efficient control of phosphate pollution on an area-wide basis.

A comprehensive environmental assessment system became operational; the system provides national, State, and regional forecasts of pollutants generated by the Nation's production activities, and the amount entering waterways. In addition, for any given actual or projected level of environmental control, the system will provide estimates of control costs.

Other water quality management projects initiated or continued include:

- A series of projects investigating alternative concepts for financing the various provisions of the Act.
- Development of procedures for designing a cost-effective program for States to use in monitoring their permit programs.
- Analysis of the economic and environmental impact on coastal areas of banning ocean disposal of municipal wastewater sludges, and specification of practical alternatives.
- Demonstration of comprehensive metropolitan water quality planning.

An assessment of the eutrophication threat to selected freshwater lakes and reservoirs is being conducted in conjunction with State water pollution agencies and the National Guard.

- An investigation of the potential impact of air quality standards on water quality.
- Development and demonstration of a regional system for determining the most economic degree of wastewater reuse.
- Analysis of a wide range of standards concepts for control of ground water quality.

TECHNOLOGY TRANSFER

Technology transfer bridges the gap between research and full-scale operational use by evaluating newly developed successful technologies and transferring this knowledge to consulting engineering firms; municipal, industrial, and State design engineers; city managers; directors of public works; industrial managers; conservation groups and others concerned with the design and construction of pollution control facilities.

The program has issued a series of comprehensive process design manuals. The manuals, which cover phosphorus removal, carbon adsorption, upgrading existing wastewater treatment plants, and suspended solids removal, are being revised to include the latest data available. New design manuals have been started for sludge handling and disposal, sulfide control, and small treatment plants for municipalities and for the pulp and paper and power industry. A handbook has been completed for monitoring industrial wastewater, covering such topics as sampling, flow measurement, analytical techniques, and automatic monitoring methods. The manuals and handbook have been widely distributed.

Approximately 6,000 municipal, State, industrial, and private consulting engineers attended technology transfer seminars held during 1973. The seminars included coverage of environmental pollution control techniques for selected industries, new technology for municipal plants, and infiltration/inflow of sewers.

A new technical capsule report series was introduced, summarizing critical design, operational, and economic information for a number of successful industrial projects.

VII. Efficiency of Treatment Works

EPA conducts periodic operation and maintenance (O&M) inspections and evaluations of existing wastewater treatment facilities. These inspections are conducted primarily to assure compliance with grant conditions on facilities constructed with Federal grants. The actual performance of treatment works compared to their design efficiencies, as well as other related data, were used to prepare this portion of the report as required by Section 210 of the Act.

DATA COLLECTION AND METHODOLOGY

The results of 1,090 inspections conducted during the calendar year 1972 and continuing through October 1973 are stored in a computer file entitled The Sewage Treatment Plant Operation and Maintenance Data Base (STPOM). This file is the main source used in developing operational or performance information. The STPOM file contains operational data only, so that other sources were required to supply the design data. Since it was not feasible to search State files on each project for the original design criteria, the search was restricted to data currently available within the EPA Regional Offices. However, since specific removal levels often were not given for older plants, State requirements for removal efficiencies in effect at the time of Federal grant awards were substituted where possible. This approach made it possible to obtain design information on all but a few plants.

Inspection records with adequate operating data were selected for inclusion in primary survey group A. BOD_5 removal was the main criterion for selection. Of the records reviewed approximately half contained insufficient data to compare operating and design efficiency. These records were placed in Group B for analysis of physical and mechanical operational performance.

The remaining projects were referred to the EPA Regional Offices to complete the plant design data. As a result, 89 records or 8 percent of the total sample were disqualified due to lack of design data.

The final survey samples:

Group A - Records with enough design and operational data to allow comparisons	461
Group B - Records without operational performance data	540
Records without design data	89
Total	1,090

The plants in Group A represent all sizes and types of waste treatment processes (Table VII-1). The sample contains records from 38 States, with the number ranging from as few as one from one State to as high as 64 from another; the median is 14 records per state.

PERFORMANCE OF GROUP A PLANTS

Performance data, taken from operating records of the plants at the time of the EPA/State inspections, were used to calculate basic efficiency of Group A plants. On the average the plants were removing 82 percent of BOD_5, 79 percent of suspended solids, and 98 percent of settleable solids (Table VII-2). The distribution of plants meeting or not meeting the original design criteria for BOD_5 removals was determined by size of plant and type of treatment process (Table VII-3), as were the average removal efficiencies for each group by type of process and size (Table VII-4).

Since effluent standards of a maximum of 30 mg/l for both BOD_5 and suspended solids have been established, the records from secondary treatment plants in Group A were reviewed for performance on these measures. Of these plants, 280 had both BOD_5 and suspended solids data, 46 percent met the standards, 23 percent were

TABLE VII-1

NUMBER OF MUNICIPAL TREATMENT PLANTS IN PRIMARY SURVEY GROUP

Type of process	Group 1 (15+ mgd*)	Group 2 (5-15 mgd)	Group 3 (1-5 mgd)	Group 4 (0-1 mgd)	Total	%
Primary	3	7	24	26	60	13.0
Lagoons	—	—	1	8	9	2.0
Trickling filters	5	24	81	69	179	38.8
Activated sludge	10	23	50	130	213	46.2
Total	18	54	156	233	461	100.0
%	4.0	11.7	33.8	80.5	100.0	100.0

*Million gallons per day.

TABLE VII-2

EFFICIENCIES OF MUNICIPAL TREATMENT PLANTS

	% meeting design criteria	Average removal efficiencies		
		Primary	Secondary	All
		%		
BOD_5	70	46	87	82
Suspended solids	50	54	82	79
Settleable solids	79	96	98	98

maintaining effluents containing not more than 40 mg/l for either measure, and the remaining 31 percent were producing effluents with more than 40 mg/l of one or both measures.

Problems and Deficiencies. In Group A plants that did not meet one or more of the design criteria, five significant problems were identified:

- 71 percent need follow-up actions to correct operational, mechanical, or manpower deficiencies.
- 51 percent do not have an O&M manual designed for their specific plant.
- 26 percent are hydraulically overloaded.
- 21 percent do not have adequate laboratory facilities and/or adequate laboratory testing programs.
- 9 percent are affected by infiltration/inflow during wet weather.

For Group A plants, operating in conformity with their design standards, a review of the same problem areas showed the following:

- 56 percent need follow-up actions to correct operational, mechanical or manpower deficiencies.
- 42 percent do not have an O&M manual designed for their specific plant.
- 20 percent are hydraulically overloaded.
- 21 percent do not have adequate laboratory facilities, and/or adequate laboratory testing programs.
- 15 percent are affected by infiltration/inflow during wet weather.

PERFORMANCE OF GROUP B PLANTS

Physical and mechanical performance data were examined for the 540 plants included in Group

TABLE VII-3
MUNICIPAL TREATMENT PLANTS MEETING DESIGN CRITERIA FOR BOD_5 REMOVAL
(Based on BOD_5 Removals)

Type of process	All groups				Group 1 (15+ mgd*)				Group 2 (5-15 mgd)				Group 3 (1-5 mgd)				Group 4 (0-1 mgd)			
	Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting	
	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†
Primary	37	62	23	19	1	33	2	18	5	71	2	25	13	54	11	16	18	69	8	22
Lagoons	6	67	3	6	—	—	—	—	—	—	—	—	—	—	1	7	6	75	2	5
Trickling filters	108	60	71	13	5	100	—	—	8	33	16	11	56	69	25	14	39	57	30	12
Activated sludge	169	79	44	8	4	40	6	6	18	78	5	5	42	84	8	6	105	81	25	9
Total/Average	320	70	141	12	10	56	8	9	31	57	23	11	111	71	45	13	168	72	65	12

*Million gallons per day.
†Average deviation below design in percentage points of BOD_5 removal.

TABLE VII-4

AVERAGE PERCENT REMOVAL OF MUNICIPAL TREATMENT PLANTS

Type of process	Group 1 (15+ mgd*)	Group 2 (5-15 mgd)	Group 3 (1-5 mgd)	Group 4 (0-1 mgd)	Average removal in percent	Average design removal in percent
Lagoons						
BOD_5	—	—	73	89	87	86
Suspended solids	—	—	51	92	83	89
Settleable solids	—	—	—	100	100	97
Trickling filters						
BOD_5	90	78	84	83	83	85
Suspended solids	85	74	83	83	82	85
Settleable solids	99	98	98	98	98	98
Activated sludge						
BOD_5	85	87	90	93	91	87
Suspended solids	82	81	83	83	82	87
Settleable solids	98	98	98	99	98	98
Primary						
BOD_5	28	56	40	50	46	44
Suspended solids	66	72	49	53	54	57
Settleable solids	99	98	97	95	96	95
All plants						
BOD_5	77	79	79	85	82	81
Suspended solids	81	77	78	81	79	93
Settleable solids	98	95	98	98	98	98

*Million gallons per day.

B. These plants were grouped by size and by types of treatment process (Table VII-5). The majority of these plants are small, less than 1 mgd.

The most significant findings for these plants are:

Laboratory related:

- 75 percent have inadequate laboratory testing for process control, the majority of them primary treatment plants and lagoons, smaller than 5 mgd.

Maintenance related:

- 60 percent do not have an O&M manual for the plant.
- 41 percent list spare parts inventories as inadequate.
- 36 percent indicate that records of maintenance repairs and replacement are inadequate.
- 25 percent indicate that routine maintenance schedules are inadequate.

Operations related:

- 71 percent require follow-up actions to correct deficiencies in the plant, its operations, or its staff and training needs.
- 31 percent indicate that operations and other plant personnel do not routinely attend short courses, school, or other training.

Structural/design related:

- 56 percent have varying degrees of infiltration problems.
- 18 percent of plants having both design and average daily flow rates are overloaded.

ANALYSIS

Except for the limitations in availability of laboratory based performance measures, the results of this survey are generally encouraging. In the sample where operational performance and design criteria could be compared, the national averages show that 30 percent of the plants sampled were not meeting their design efficiency in terms of BOD_5 removal. However the average percentage of BOD_5 removal for all plants slightly exceeds the average design values. For settleable solids, the average operational efficiency also meets the design requirements. Only in the case of suspended solids do the operational figures fall below (and only slightly) what the plants were designed to do.

Almost one third of the plants surveyed were operating below design efficiency; however, the survey sample cannot be assumed to fully represent the nation. Still, if the survey results did apply nationally, approximately 6,000 plants would be contributing unnecessarily high pollution loads to their receiving waters.

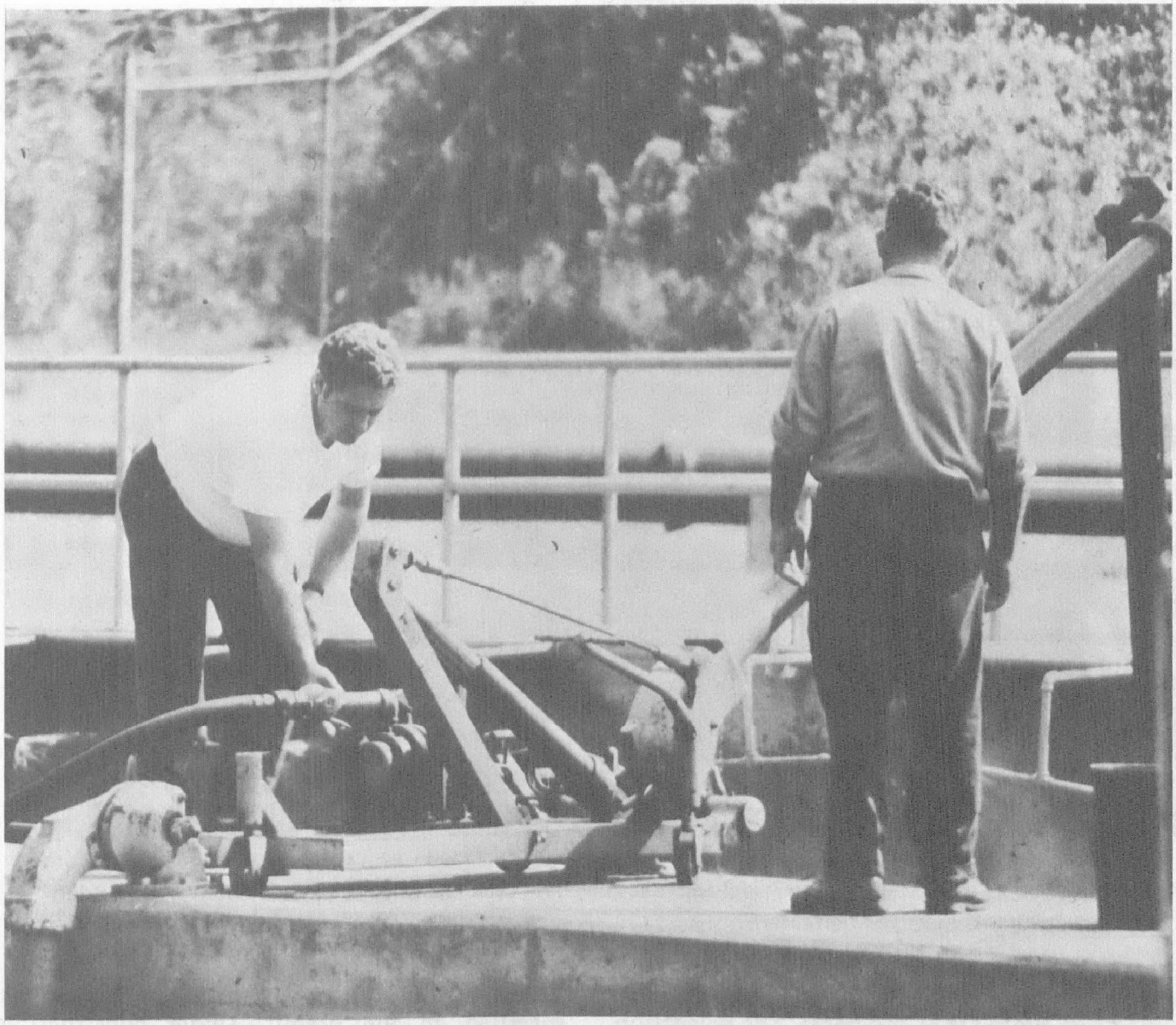
The most significant problem encountered was the lack of operational data. The plants

TABLE VII-5

NUMBER OF MUNICIPAL TREATMENT PLANTS WITH INSUFFICIENT OPERATIONAL DATA

Type of process	Group 1 (15+ mgd*)	Group 2 (5-15 mgd)	Group 3 (1-5 mgd)	Group 4 (0-1 mgd)	Group 5 (no mgd data)	Total
Primary	1	5	43	55	4	108
Lagoons	—	6	16	126	25	173
Trickling filters	—	5	41	51	1	98
Activated sludge	—	5	30	118	9	162
Total	1	21	130	350	39	540

*Million gallons per day.



Plant maintenance must be performed on a routine, planned basis by qualified personnel.

making up Group B were generally smaller than those making up Group A, with Group B having a much higher percentage of plants under 1 mgd.

Thus, it appears that the reporting failure occurs predominantly in the very small plants, particularly in the primary treatment and lagoon categories. Many of these plants do not have the equipment or trained personnel to conduct laboratory analyses, or have never been required to report test results, as indicated by the fact that 75 percent have inadequate laboratory testing for process control.

The second largest problem area related to O&M deficiencies. Of plants not meeting design efficiencies and of those in Group B, 71 percent required corrective actions, which is 15 percent higher than the plants that were meeting their design goals. In addition, the plant inspectors assessments of the physical and mechanical performance of Group B plants showed that more than 30 percent were deficient in one or more of the following areas: spare parts inventories, maintenance record keeping, and staff training.

To meet the requirements of the NPDES program, many plants will have to improve their capability for testing and laboratory analyses and to increase the effectiveness of their O&M

Improvements in laboratory control and recordkeeping have been identified as the most widespread need in maintaining treatment plant efficiency.

programs. The NPDES program will also strengthen State O&M programs. The delegation of the NPDES permit authority to a number of States has involved them to a much greater extent in the definition and enforcement of detailed treatment plant performance criteria. These States must assume a stronger position in improving plant O&M.

The eligibility requirements for the construction grants have been strengthened to emphasize O&M at various project stages. At the planning stage, the grantee must consider possible increases in treatment efficiency due to improved O&M at existing facilities as an alternative to new facilities. In his final project plan the grantee must also assure that the grant-assisted facility will be operated and maintained properly. In addition, grant regulations now require clearer identification of intended design efficiencies in project submissions as well as reviews based on meeting effluent limitations specified in the permit. Under construction grant regulations, the State also must have an effective O&M monitoring program to assure compliance with various provisions of the Act and the regulations.

EPA took additional steps during 1973 to encourage better coverage of O&M by its State program grants. These grants will impact the States' O&M capability by providing for compliance monitoring and for direct review of each State's O&M program. The existence of major plant O&M deficiencies has been known for some time and was the basis for organizing the Federal O&M programs and staffs. Many of the activities initiated since are now having an impact through the publication of source documents, guidelines, and manuals.

Another major activity emphasized during 1973 is the development of a technical assist-

ance program. As municipalities begin to encounter difficulties in complying with the effluent limitations specified in NPDES permits and as the economic and performance benefits of improved O&M are demonstrated, demand for such technical assistance services will grow. This increased demand should provide an incentive for the private sector to develop and market operation and maintenance services.

While experience with technical assistance is still limited, the experiences of four activated sludge plants in Colorado demonstrate what can be achieved:

- A 7 mgd plant was removing only 73 percent of the applied BOD_5 resulting in a discharge of over 6,500 pounds per day of BOD_5 to the receiving stream. At the conclusion of the technical assistance effort, the plant was removing 86 percent with a discharge of less than 3,500 pounds per day of BOD_5—a 46 percent decrease in the amount of pollutant passing through the plant.

- Technical assistance at a 5 mgd plant increased the BOD_5 removal efficiency from 82 to 91 percent. The average effluent BOD_5 decreased from approximately 30 mg/l to approximately 15, and the average total suspended solids in the effluent decreased from approximately 40 mg/l to less than 20.

- The BOD_5 removal efficiency of a 0.5-mgd plant was increased from 45 to 75 percent, and the effluent BOD_5 was decreased from over 100 mg/l to approximately 40.

- The BOD_5 removal efficiency of a 5.5 mgd plant was increased from 81 to 94 percent. The effluent BOD_5 concentrations decreased from 35 mg/l to 15 and the effluent concentration of total suspended solids decreased from 35 mg/l to 18.

OPERATION AND MAINTENANCE

A comprehensive municipal operations strategy is being implemented. The strategy links issuance of municipal permits with efforts to improve the operational efficiency of plants. To maximize the impact of the strategy, EPA is emphasizing the following:

- Improving the consideration of proper O&M at all stages of new construction grant projects.
- Insuring that O&M considerations and interim performance criteria are adequately integrated into municipal permits.
- Realigning EPA inspection priorities to concentrate on intensive initial and follow-up inspections on critical plants in priority areas.
- Establishing a technical assistance capability for improving existing plant operations.
- Providing guidance to state agencies on improving their municipal operations programs. The States must be established in the lead role in improving treatment plant operations.

In addition, these activities are considered essential to the success of an aggressive nationwide effort to improve operations:

- A public information program to promote better O&M of municipal treatment facilities.
- Training efforts fully integrated with and responsive to operational requirements.
- Improved data handling and assessment capabilities to provide an improved data base for program support and direction.
- Continued development of technical publications and other information sources on O&M aspects of plant design and operations.

The O&M inspections provide the basic data to evaluate an existing facility's performance and to identify operational problems that could be corrected to produce higher operating efficiencies. Based on the O&M inspection results, the municipal permit conditions can be written to incorporate more stringent conditions achievable by improved operation of a facility. Technical assistance will be offered to municipalities to help them improve plant operations to meet the more stringent permit conditions and reduce the pollution load on receiving waters.

Appendix A

ENFORCEMENT ACTIONS PENDING OR COMPLETED DURING CALENDAR YEAR 1973 UNDER PL 92-500, SECTION 309 (FEDERAL ENFORCEMENT)

TABLE A-1

ADMINISTRATIVE ORDERS UNDER SECTION 309

Name of discharger	Location	EPA region	Receiving waters	Alleged violation	Date of order	Results or status 12/31/73
Basic Materials Co.	Missouri	VII	Mississippi River	Compliance schedule	12/19/73	Company requested additional time to comply
Browning Ferris Industries of Kentucky, Inc.	Boone County, Walton, Kentucky	IV	Mud Lick Creek; Big Bone Creek, a tributary of Ohio River	Continuing leaching of liquid wastes from company's solid waste disposal site	12/17/73	Company complying with schedule set out in order
BSAF Wyandotte Corp.	Wisconsin	V	Wisconsin River	Violation of effluent limits	12/18/73	Awaiting compliance
Comstock Foods, Inc.	Rushville, Ontario County, New York	II	West River	Failure to supply monitory data as mandated by condition of NPDES permit	12/11/73	Periodic monitoring data now being received; company letter indicates that comprehensive monitoring report will be submitted when controlled release program gets under way again in spring 1974
East Point Seafood Co.	Alaska	X	St. Paul Harbor	Interim permit date missed	12/19/73	Work in progress
Great Western Sugar Co., Eaton Mill	Colorado	VIII	Cache la Poudre River	By-pass prohibition in permit	11/12/73	Compliance 11/29/73
Great Western Sugar Co., Longmont Mill	Colorado	VIII	South Platte River	By-pass prohibition in permit	10/23/73	Compliance 11/2/73
Great Western Sugar Co., Loveland Mill	Colorado	VIII	South Platte River	By-pass prohibition in permit	11/12/73	Compliance 1/24/74
Holly Sugar Corp.	Montana	VIII	Yellowstone River	Effluent limitations in permit	12/14/73	Compliance 1/11/74
Husky Oil Co.	Wyoming	VIII	Crow Creek	Effluent limitations in permit	12/5/73	Company unable to achieve compliance; 309(b) action being prepared
Idaho Springs, City of	Colorado	VIII	Clear Creek	By-pass prohibition in permit	11/26/73	Compliance 12/7/73
Kennecott Copper Corp.	Arizona	IX	Gila River	309(a)(3)-permit condition	11/6/73	Discharge to cease by 1/15/74
North Pacific Processors	Alaska	X	St. Paul Harbor	Interim permit date missed	12/19/73	Work in progress
Pan Alaska Fisheries, Inc.	Alaska	X	St. Paul Harbor	Interim permit date missed	12/19/73	Work in progress
Peavey Paper Mills, Inc.	Wisconsin	V	Flambeau River	Violation of effluent limits	12/24/73	Awaiting compliance
Plastene Supply Co.	Missouri	VII	Portage Bay	Compliance schedule	11/21/73	Order complied with
Pueblo Board of Water Works	Colorado	VIII	Arkansas River	Effluent limitations in permit	11/21/73	Compliance not yet achieved; negotiations continuing
Ursin Seafoods, Inc.	Alaska	X	St. Paul Harbor	Interim permit date missed	12/19/73	Work in progress
Whitney-Fidalgo Seafoods, Inc.	Alaska	X	St. Paul Harbor	Interim permit date missed	12/19/73	Work in progress

TABLE A-2

CIVIL ACTIONS UNDER SECTION 309

Name of discharger	Location	EPA region	Receiving waters	Alleged violation	Date of referral to U.S. Attorney	Results or status 12/31/73
Great Western Sugar Co., Eaton Hill	Colorado	VIII	Cache la Poudre River	By-pass prohibition in permit	11/28/73	Complaint filed 12/21/73; court order (1/9/74) extended time to answer to 2/6/74
U.S. v. W. Langston Holland; Robert D. Wray; Kirk T. Pierce; Lewis H. Kent; Robert D. Wray Construction Co.; George F. Young, Inc.; C. E. Pierce Construction Co.	St. Petersburg, Florida	IV	Papy's Bayou	33 U.S.C. Section 1311(a), 33 U.S.C. Sections 403, 407	12/13/73	Temporary restraining order, 12/21/73; preliminary injunction, 1/11/74; initial settlement offer, 1/24/74; second settlement offer, 1/30/74

TABLE A-3

CRIMINAL ACTIONS UNDER SECTION 309

Name of discharger	Location	EPA region	Receiving waters	Alleged violation	Date of referral to U.S. Attorney	Results or status 12/31/73
Central Nebraska Packing Co.	Nebraska	VII	North Platte River	Non-filer	10/12/73	Pending
Continental Cheese, Inc.	Nebraska	VII	Crooked Creek	Non-filer	10/9/73	Pending
Elmer Duerfeldt Co.	Nebraska	VII	Half Breed Creek	Non-filer	6/30/73	Pending
Libbey-Owens Ford	Ohio	V	Otter Creek	Discharging without a permit	9/12/73	Under review
Mapes Industries	Nebraska	VII	Salt Creek	Non-filer	4/26/73	Company now discharging into city sanitary sewer; U.S. Attorney declined to prosecute 7/3/73
Runny Meade Estates, Inc.	Missouri	VII	Belleau Creek	Discharge of pollutants	11/23/73	Pending
Tri County Logging Co.	Michigan	V	Bear Creek	Discharging without a permit	12/07/73	Under review

TABLE A-4

STATE ENFORCEMENT NPDES PERMITS UNDER SECTION 309

Name of discharger	Location	EPA region	Receiving waters	Alleged violation	Date of EPA notice	Results or status 12/31/73
Eagle-Picher Industries, Inc.	Missouri	VII	Lone Elm Creek	Effluent limitations compliance schedule	10/26/73	Company requested permit modification
Moss-American, Inc.	Missouri	VII	Drainage ditch to Dry Creek	Effluent limitations compliance schedule	10/26/73	Appropriate enforcement action taken by State
Stock Yards Service & Supply Co.	Iowa	VII	Missouri River	Compliance schedule	12/11/73	Appropriate enforcement action taken by State

Appendix B

ENFORCEMENT ACTIONS PENDING OR COMPLETED DURING CALENDAR YEAR 1973 UNDER PL 92-500, SECTION 311 (OIL AND HAZARDOUS SUBSTANCE LIABILITY)

TABLE B

ENFORCEMENT ACTIONS UNDER SECTION 311

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action - referral to and date	Results or status 12/31/73
A. B. Chance Co.	Missouri	VII	Bush Creek	Tank control valve	311(b)(6) 311(b)(5)	U.S. Coast Guard (USCG) and U.S. Attorney, 7/2/73	USCG collected $300, 10/10/73
A. & O.C. Trailer Court	Missouri	VII	Fabius River	Opened tank valve	311(b)(6)	USCG, 8/31/73	USCG assessed preliminary penalty of $5,000, 12/17/73
Albert Gibson	California	IX	Fresno Slough	Spill	311(b)(6)	USCG, 9/11/73	Pending
Alger & Smith Transportation Co.	Massachusetts	I	?	Overfilled tank	?	10/2/73	Pending
Allied Chemical Co.	Baton Rouge, Louisiana	VI	Bayou Branch, Mississippi River	Spill	?	USCG, 3/27/72	Pending
American Oil Co.	Georgia	IV	Tributary to Sope Creek	Spill	311(b)(6) 311(b)(5)	9/28/73 9/28/73	USCG has not reported (civil action) Under consideration (criminal action)
American Smelting & Refining Co.	Tennessee	IV	Cedar Creek	Spill	311(b)(6) 311(b)(5)	USCG, 12/14/73 12/14/73	USCG has not reported (civil action) Under consideration (criminal action)
Amoco	Wyoming	VIII	Little Teapot Creek	Spill	311(b)(6)	USCG, 5/31/73	Penalty of $200 paid 8/30/73
Amoco	"	VIII	Silver Tip Creek	Spill	311(b)(6)	USCG, 8/17/73	Pending
Amoco & Clark Trucking	Utah	VIII	Farmington Bay	Spill	311(b)(6)	USCG, 5/24/73	Case dismissed, 10/26/73
Amoco Pipeline Co.	Cleburne, Texas	VI	Lake Cleburne	Spill	311(b)(6)	USCG, 9/10/73	Pending
Amoco Refineries	Missouri	VII	Sugar Creek	Open valve	311(b)(6)	USCG, 10/19/73	Pending
Arapahoe Pipeline Co.	Colorado	VIII	Plum Brush Creek	Spill	311(b)(6)	USCG, 4/5/73	Pending
Archer-Daniels Midland Co.	South Carolina	IV	Todd Branch, Little Lynch River	Spill	311(b)(6)	USCG, 1/23/73	USCG has not reported
Arco	Washington	X	Scribner Creek	Spill	311(b)(6)	USCG, 5/21/73	Penalty of $1,500 paid
Arco Oil Co.	Illinois	V	Spoon River	Spill	311(b)(6)	USCG, 4/19/73	Penalty of $250 paid 7/17/73
Arco Oil Co.	California	IX	Mud Creek	Spill	311(b)(6)	USCG, 9/26/73	Penalty of $1,000 paid 1/15/74
Argo Petroleum	California	IX	Bear, Maple, Tar Creeks	Spill	311(b)(6)	USCG, 11/7/73	Pending
Arizona Fuel Corp.	Utah	VIII	Big Sand Wash	Spill	311(b)(6)	USCG, 12/10/73	Pending
Arizona-Pacific Truck Lines	Utah	VIII	Beaver Creek	Spill	311(b)(6)	USCG, 9/12/73	Pending
Ashland Oil & Transportation Co.	Kentucky	IV	Big Pitman Creek	Spill	311(b)(6) 311(b)(5)	1/23/73 1/23/73	Penalty of $1,000 assessed 3/21/73 (civil action) Case dismissed without prejudice; will not be tried until appeal procedure in Ashland's Little Cypress Creek case is completed (criminal action).
Ashland Oil & Transportation Co.	"	IV	Nat Creek, tributary to Levisa Fork of Big Sandy River	Spill	311(b)(6)	3/22/73	Penalty of $500 assessed 5/7/73
Ashland Oil & Transportation Co.	"	IV	Burning Fork Creek	Spill	311(b)(6)	6/8/73	USCG has not reported
Ashland Oil Co.	Wyoming	VIII	Cottonwood Creek	Spill	311(b)(6)	USCG, 9/28/73	Penalty of $5,000 assessed 12/17/73
Ashland Oil Co.	Kentucky	IV	South Branch Panther Creek	Spill	311(b)(6)	10/10/73	Penalty of $200 1/23/74
Ashland Oil Co.	"	IV	Little Cypress Creek	Spill	311(b)(6) 311(b)(5)	4/24/73 4/24/73	Penalty of $300 assessed 5/15/73 (civil action) Motion to dismiss overruled; Guilty plea; $500 fine pending appeal (criminal action)
Ashland Oil Co.	"	IV	Swift Creek, tributary to Red River	Spill	311(b)(6)	4/18/73	USCG has not reported
Ashland Oil Co.	Indiana	V	Ohio River	Spill	311(b)(6)	USCG, 9/18/73	Penalty assessed

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action referral to and date	Results or status 12/31/73
Ashland Oil Co.	Indiana	V	Patoka River	Spill	311(b)(6)	USCG, 10/30/73	Under consideration
Ashland Oil Co.	"	V	Barr Creek	Spill	311(b)(6)	USCG, 12/3/73	Under consideration
Ashland Oil Co.	"	V	Big Creek	Spill	311(b)(6)	USCG, 12/3/73	Under consideration
Ashland Pipeline Co.	Kentucky	IV	Unnamed tributary to Salt River	Spill	311(b)(6)	4/18/73	USCG has not reported
Ashland Pipeline Co.	Illinois	V	Black River	Spill	311(b)(6)	USCG, 7/5/73	Penalty of $300 paid 12/12/73
Ashland Pipeline Co.	Indiana	V	Sand Creek	Spill	311(b)(6)	USCG, 5/18/73	Penalty of $500 assessed 8/73
Ashland Pipeline Co.	"	V	Yellow Creek	Spill	311(b)(6)	USCG, 8/13/73	Penalty of $100 paid 12/6/73
Ashland Pipeline Co.	"	V	Tributary to Bayou Creek	Spill	311(b)(6)	USCG, 10/30/73	Under consideration
Ashland Pipeline Co.	Ohio	V	Black River	Spill	311(b)(6)	USCG, 9/18/73	Penalty assessed
B & R Oil Co.	Maine	I	?	Gas spill	?	USCG, 8/1/73	Penalty of $500 assessed 9/28/73; case closed
B & R Transport Co.	North Carolina	IV	Broad River	Spill	311(b)(6) 311(b)(5)	9/29/72 9/29/72	Penalty of $3,500 6/20/73 (civil action) Declined to prosecute (criminal action)
Baker Gasoline Co.	Iowa	VII	Corydon Reservoir	Storage tank overflow	311(b)(6) 311(b)(5)	USCG and U.S. Attorney 7/24/73	USCG collected $200 11/13/73 (civil action) Declined to prosecute (criminal action)
Bangor Hydro Electric Co.	Maine	I	Penobscot River	Oil leak	311(b)(6) 311(b)(6) 311(b)(5)	USCG, 8/73 U.S. Attorney 8/73	Pending (civil action) Fine of $5,000; case closed 12/73 (criminal action)
Barringer Oil Co.	North Carolina	IV	Celia Creek	Spill/bridge collapsed	311(b)(6)	1/31/73	Penalty of $500 assessed 4/4/73
Berks Associates	Pennsylvania	III	Schuylkill River	Crank case oil (3-5 bbl.)	311(b)(6)	USCG, 2/6/73	Of original assessment of $1,000, $350 paid
Beverly Hills Oil Co.	California	IX	Ballona Creek	Spill	311(b)(6) 311(b)(5)	USCG, 11/28/73 to U.S. Attorney 1/31/74	Pending
Blalock Hauling Co.	Georgia	IV	Blue John Creek	Spill	311(b)(6)	3/13/73	Penalty of $2,500 assessed 5/24/73
Blalock Hauling Co.	Georgia	IV	Unnamed creek to Price Pond	Spill	311(b)(6) 311(b)(5)	4/13/73 4/13/73	Penalty of $2,500 assessed 5/23/73 (civil action) Under consideration (criminal action)
Boeing	Washington	X	White River	Spill	311(b)(6)	USCG, 1/30/73	Penalty of $3,000 paid
Bowers Supply Co.	West Virginia	III	Harmon Creek	Kerosene (6800 gal.)	311(b)(6)	USCG, 8/8/73	Of original assessment of $1,000, $500 paid 12/3/73
Broyhill Industries, Inc.	North Carolina	IV	Lower Creek	Spill	311(b)(6)	3/7/73	Penalty of $900 paid as assessed 6/26/73
Buckeye Pipeline Co.	Indiana	V	Billy Creek	Spill	311(b)(6)	USCG, 7/5/73	Penalty of $300 paid 12/12/73
Burley Mayberry	Kentucky	IV	Smith Branch to Powder Mill Creek	Spill	311(b)(6) 311(b)(5)	10/4/73 10/4/73	Penalty of $100 assessed 12/3/73 (civil action) Under consideration (criminal action)
Burlington Northern RR	Washington	X	Columbia River	Spill	311(b)(6)	USCG, 9/27/73	Penalty of $100 assessed
Burlington Northern RR	Nebraska	VII	Salt Creek	Outfall discharge	311(b)(6) 311(b)(5)	USCG, 3/9/73 U.S. Attorney 3/9/73	USCG final assessment of $250 paid 5/29/73
Camden Iron & Steel	South Carolina	IV	Catawba River	Spill	311(b)(6)	8/21/73	USCG has not reported
Carolina Aluminum Co.	North Carolina	IV	Unnamed Creek	Spill	311(b)(6)	1/3/73	Declined (lack of evidence that oil reached water)
Carolina Aluminum Co.	"	IV	Tributary to Chowan River	Spill	311(b)(6)	1/3/73	Penalty of $750 3/1/73
Casino Pier, Inc.	Missouri	VII	Lake of Ozarks	Automatic shutoff failed	311(b)(6) 311(b)(5)	USCG U.S. Attorney 8/19/73	USCG final assessment of $150 12/28/73 (civil action) Declined to prosecute 10/3/73 (criminal action)
Castle Tool	Pennsylvania	III	Darby Creek	Fuel oil (20 gal.)	311(b)(6)	USCG, 5/3	Penalty of $250 paid 9/17/73

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action—referral to and date	Results or status 12/31/73
Cavalier Towing, Inc. d/b/a "Pamela D"	Tennessee	IV	Ohio River	Overfilled tank	311(b)(6)	11/29/72	Penalty of $1,500 2/13/73
Celanese Corp.	North Carolina	IV	Tributary to Sugar Creek	Spill	311(b)(6)	1/19/73	?
Central Vermont RR	Vermont	I	Lake Champlain	Spill	?	3/14/73	Penalty of $3,000 paid; case closed
Chamberlain Mfg.	Massachusetts	I	Nashroad Pond	Oil escape, continuous	?	USCG, 11/14/73	Pending
Charter International Oil	Texas	VI	Houston Ship Channel	Spill	311(b)(6)	USCG, 4/6/73	Declined
Chemquid Disposals, Inc.	Emerson, New Jersey	II	Cedar Creek	Spill, from leak in a tanker truck, of *toluol, acetone,* xylene	311(b)(6)	USCG, 2/1/73	Penalty of $3,500 asked, $3,500 fine
Chevron	Montana	VIII	Flat Lake	Spill	311(b)(6)	USCG, 6/11/73	Case dismissed 7/20/73
Cities Service	Mississippi	IV	Kittering Creek	Spill	311(b)(6)	8/23/73	USCG has not reported
Clark Chemical Corp.	Massachusetts	I	?	Spill	?	USCG, 8/16/73	Penalty of $100 assessed 9/13/73; case closed
Coastal States Gas Prod. Co.	Houston, Texas	VI	Colorado River	Spill	311(b)(6)	USCG, 3/30/73	Pending (also see table E-2)
Conoco Pipeline Co.	Kansas	VII	Unnamed tributary	Pipeline leak	311(b)(6)	USCG, 7/2/73	12/11/73 Final assessment $100
Conservation Chemical Co.	Missouri	VII	Missouri River	Storage lagoon overflow	311(b)(6)	USCG, 10/31/73	Pending
Continental Pipeline Co.	Kansas	VII	Arkansas River	Pipeline leak	311(b)(6)	USCG, 12/10/73	Pending
Cowan Oil Co.	Tennessee	IV	Millers Creek	Spill	311(b)(6)	USCG 4/9/73	Penalty of $2,500 assessed 10/3/73 (civil action)
					311(b)(5)	U.S. Attorney, 4/9/73	Acquitted 7/31/73 (criminal action)
CRA, Inc.	Kansas	VII	Caney River	Corrosion leak	311(b)(6)	USCG, 11/23/73	Pending
CRA, Inc.	Nebraska	VII	North Platte River	Trap overflow	311(b)(6)	USCG, 7/12/73	Coast Guard collected $200 12/3/73 (civil action)
					311(b)(5)	U.S. Attorney	Declined to prosecute 7/19/73 (criminal action)
Cracker State Oil Co.	Georgia	IV	Private lake	Spill	311(b)(6)	11/2/73	USCG has not reported (civil action)
					311(b)(5)	11/2/73	Under consideration (criminal action)
Craig & Johnson	Massachusetts	I	?	Oil discharge	?	USCG, 1/19/73	Penalty of $1,000 paid; case closed
Crown Central	Houston, Texas	VI	Houston Ship Channel	Spill	?	USCG, 2/29/72	Pending
Crucible Steel	Pennsylvania	III	Ohio River	Tar (minor quantity)	311(b)(6)	USCG, 8/31/73	Penalty of $300 paid 12/3/73
Crystal Refining Co.	Michigan	V	Fise Creek	Spill	311(b)(6)	USCG, 12/21/73	Pending
Davis Transportation Co.	North Carolina	IV	Moccasin Creek	Overturned truck	311(b)(6)	1/19/73	Penalty of $250 4/20/73
Diamond Shamrock Co.	Wyoming	VIII	Lightening Creek	Spill	311(b)(6)	USCG, 10/25/73	Penalty of $300 paid 12/21/73
Dick's Truck Line	Wyoming	VIII	Flat Creek	Spill	311(b)(6)	USCG, 11/2/73	Penalty of $200 paid 1/21/74
Dixie Drilling Co.	Tennessee	IV	Bear Branch, Ivy Branch, Oak Creek, Clear Fork River	Spill	311(b)(6)	USCG, 9/11/73	USCG has not reported (civil action)
					311(b)(5)	U.S. Attorney	Guilty, 12/17/73; $3,000 fine (criminal action)
Duke Power	North Carolina	IV	Lake Norman	Spill	311(b)(6)	1/19/73	No penalty
Edmos Corporation	North Carolina	IV	Walker Branch, Clark Creek, South Fork River	Spill	311(b)(6)	8/30/73	USCG has not reported
Electric Wiring, Inc. or Elmore Construction Co.	North Carolina	IV	Unnamed	Spill	311(b)(6)	1/3/73	Penalty of $1,000 3/5/73
Ellisville, City of	Missouri	VII	Oak Hill Branch of Keifer Creek	Lift station	311(b)(6)	USCG, 8/15/73	Penalty of $200 paid 10/30/73
Elm City Oil Co.	New Hampshire	I	Warner's Pond	Spill	?	USCG, 1/29/73	Penalty of $2,000 assessed 11/15/73

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action referral to and date	Results or status 12/31/73
Eureka Pipe Line	Parkersburg, West Virginia	III	North Fork Hughes River	Crude oil (130 bbl.)	311(b)(6)	USCG, 2/6/73	Original penalty $500; revised penalty $200; case being appealed
Eureka Pipe Line	"	III	Johnson Creek	Crude oil (35 bbl.)	311(b)(6)	USCG, 2/6/73	Original penalty $500; revised penalty $100; case being appealed
Eureka Pipe Line	"	III	Sugar Creek	Crude oil (35 bbl.)	311(b)(6)	USCG, 2/7/73	Original penalty $500; revised penalty $250; case being appealed
Eureka Pipe Line	"	III	Green Creek	Crude oil (30 bbl.)	311(b)(6)	USCG, 2/7/73	Original penalty $300; revised penalty $100; case being appealed
Eureka Pipe Line	"	III	Tanner Creek	Crude oil (300 bbl.)	311(b)(6)	USCG, 2/1/73	Original penalty $1,000; revised penalty $750; case being appealed
Eureka Pipe Line	"	III	Stillwell Creek	Crude oil (30 bbl.)	311(b)(6)	USCG, 2/7/73	Original penalty $5,000; revised penalty $2,500; case being appealed
Eureka Pipe Line	"	III	Little Creek	Crude oil (325 bbl.)	311(b)(6)	USCG, 2/23/73	Original penalty $1,000; revised penalty $500; case being appealed
Eureka Pipe Line	"	III	Cappo Run	Crude oil (50 bbl.)	311(b)(6)	USCG, 2/23/73	Original penalty $3,500; revised penalty $2,000; case being appealed
Eureka Pipe Line	"	III	Indian Run	Crude oil (25 bbl.)	311(b)(6)	USCG, 2/23/73	Original penalty $500; case being appealed
Eureka Pipe Line	"	III	Indian Creek	Crude oil (20 bbl.)	311(b)(6)	USCG, 2/23/73	Original penalty $300; case being appealed
Eureka Pipe Line	"	III	Arnold Creek	Crude oil (20 bbl.)	311(b)(6)	USCG, 2/21/73	Original penalty $500; revised penalty $300; case being appealed
Eureka Pipe Line	"	III	Lake Floyd	Crude oil (100 bbl.)	311(b)(6)	USCG, 2/23/73	Original penalty $300; case being appealed
Eureka Pipe Line	"	III	Pickenpaw Run	Crude oil (110 bbl.)	311(b)(6)	USCG, 5/3/73	Original penalty $500; case being appealed
Eureka Pipe Line	"	III	Piney Fork	Crude oil (25 bbl.)	311(b)(6)	USCG, 5/29/73	Original penalty $500; case being appealed
Eureka Pipe Line	"	III	Big Indian Run	Crude oil (75 bbl.)	311(b)(6)	USCG, 5/3/73	Original penalty $500; revised penalty $250; case being appealed
Eureka Pipe Line	"	III	Cappo Run	Crude oil (50 bbl.)	311(b)(5)	U.S. Attorney, 4/24	U.S. Attorney declined to prosecute
Eureka Pipe Line	"	III	South Fork Hughes River	Crude oil (25-45 bbl.)	311(b)(6)	USCG, 2/2/73	Original penalty $500; case being appealed
Eureka Pipe Line	"	III	Little Rowles Run	Crude oil (25 bbl.)	311(b)(6)	USCG, 2/6/73	Original penalty $500; revised penalty $300; case being appealed
Eureka Pipe Line	"	III	McElroy Run	Crude oil (115 bbl.)	311(b)(6)	USCG, 5/3/73	Original penalty $300; case being appealed
Eureka Pipe Line	"	III	Meathouse Fork	Crude oil (40 bbl.)	311(b)(6)	USCG, 5/29/73	Original penalty $500; revised penalty $300; case being appealed
Eureka Pipe Line	"	III	Bunnell Run	Crude oil (50 bbl.)	311(b)(6)	USCG, 5/3/73	Original penalty $500; revised penalty $250; case being appealed
Eureka Pipe Line	"	III	Coxcamp Fork	Crude oil (50 bbl.)	311(b)(6)	USCG, 5/29/73	Original penalty $300; revised penalty $100; case being appealed
Eureka Pipe Line	"	III	Simmons Run	Crude oil (75 bbl.)	311(b)(6)	USCG, 5/29/73	Original penalty $300; case being appealed
Eureka Pipe Line	"	III	Addis Run	Crude oil (30 bbl.)	311(b)(6)	USCG, 5/29/73	Original penalty $300; case being appealed
Eureka Pipe Line	"	III	Fink Creek	Crude oil (60 bbl.)	311(b)(6)	USCG, 11/15/73	Informal hearing scheduled
Eureka Pipe Line	"	III	Spicewood Run	Crude oil (100 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
Eureka Pipe Line	"	III	Indian Creek	Crude oil (25 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
Eureka Pipe Line	"	III	Grass Run	Crude oil (50 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
Eureka Pipe Line	"	III	Little Spring Run	Crude oil (40 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
Eureka Pipe Line	"	III	Yellow Creek	Crude oil (30 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
Eureka Pipe Line	"	III	Buck Run	Crude oil (100 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
Eureka Pipe Line	"	III	Long Run	Crude oil (60 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
Eureka Pipe Line	"	III	Fink Creek	Crude oil (40 bbl.)	311(b)(6)	USCG, 11/15/73	" " "
F. S. Services	Illinois	V	Little Sandy Creek	Spill	311(b)(6)	USCG, 8/1/73	Fined 8/25/73

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action—referral to and date	Results or status 12/31/73
Fannin Co.	Georgia	IV	Unnamed tributary to Toccoa River	Spill	311(b)(6) 311(b)(5)	USCG 1/11/73 U.S. Attorney	USCG has not reported (civil action) Penalty of $500 5/1/73 (criminal action)
Farenthold (Crispin Co.)	Houston, Texas	VI	Mississippi River	Spill	311(b)(5) (old)11(b)4)	U.S. Attorney 1/31/72	U.S. Attorney declined to prosecute 8/29/73
Fear and Duncan	Illinois	V	Tributary of North Fork of Kaskaskia River	Spill	311(b)(6)	USCG, 9/18/73	Fined 11/12/73
Ferguson's Garage	Missouri	VII	Goodwater Creek	Intermittent discharge	311(b)(6) 311(b)(5)	USCG 9/14/73 U.S. Attorney	USCG dismissed case 12/7/73
Firestone Tire & Rubber Co.	Iowa	VII	Wafley Creek	#2 Outfall	311(b)(5)	USCG	U.S. Attorney declined to prosecute 10/24/73; USCG collected $500 11/30/73
Fitch Oil Co.	New Hampshire	I	?	Spill	?	8/13/73	Penalty of $250 paid 9/14/73; case closed
Fleet Transport Co.	North Carolina	IV	Unnamed tributary to Watauga Creek	Spill	311(b)(6)	8/30/73	Penalty of $250 paid 1/14/74
Fleet Transport Co.	Tennessee	IV	Highway #27 North of Wartburg, Tennessee	Spill	311(b)(6)	1/23/73	USCG hearing, 6/4/73, found no conclusive evidence that oil reached river; no penalty
Fleet Transport Co.	North Carolina	IV	Tributary to Lower Little River	Spill	311(b)(6)	6/8/73	Penalty of $1,000 assessed 9/24/73; $750 compromise accepted 10/15/73
Fleet Transport Co.	Georgia	IV	Gaitor Creek	Spill	311(b)(6)	5/10/73	USCG has not reported
Flying Diamond Transport Corp.	Utah	VIII	Jordan River	Spill	311(b)(6)	USCG, 8/8/73	Pending
Ford Motor Co.	Missouri	VII	Mill Creek	Ruptured underground line	311(b)(6) 311(b)(5)	USCG, 3/23/73 U.S. Attorney	Final penalty by USCG $300 6/14/73; (civil action) Declined to prosecute 8/9/73 (criminal action)
Forest City Enterprises	Illinois	V	Cahoon Creek	Sludge	311(b)(5)	U.S. Attorney 9/24/73	Complaint filed 11/27/73
Foster Lumber Co.	Colorado	VIII	Eagle River	Spill	311(b)(6)	USCG, 12/20/73	Pending
Four Corners	Utah	VIII	McCracken Creek	Spill	311(b)(6)	USCG, 7/29/73	Pending
Fredrickson Motor Corp.	North Carolina	IV	Gasher Creek, Swannanoa River	Spill	311(b)(6)	8/23/73	Penalty of $100 11/16/73
G & G Oil Co.	Virginia	III	Backwater River	#2 Fuel oil (3,885 gal.)	311(b)(6)	USCG, 7/14/73	Of original assessment of $3,500, $250 paid 7/24/73
General Foods Corp.	New York	II	Genesee River	Spill	311(b)(6)	9/7/73	Referred to USCG; $2,000 penalty assessed
George A. Rheman Co., Inc.	South Carolina	IV	West Fork French Broad	Spill	311(b)(6)	USCG, 3/15/73	4/27/73 USCG hearing accepts $1,000 compromise offer, 5/23/73 $1,000 paid
Getty Pipe Co.	New Jersey	II	Woodbridge Creek	Spill	311(b)(6)	USCG, 11/27/73	Penalty of $1,200 asked
Gildo Adkins	Indiana	V	Hunley Creek	Spill	311(b)(6)	USCG, 4/12/73	Case closed—insufficient evidence
Great Lakes Container Corp.	Kansas	VII	Kansas River	Sewer discharge	311(b)(6) 311(b)(5)	USCG, 7/17/73 U.S. Attorney	Coast Guard collected $300 9/28/73 (civil action); Declined to prosecute 11/8/73 (criminal action)
Gulf Oil Co.	Kansas	VII	Sand Creek	Collapsed plastic collection line	311(b)(6)	USCG, 9/27/73	Pending
Gulf Oil Co.	Missouri	VII	Coldwater Creek	Storage tank leak	311(b)(6)	USCG, 9/6/73	USCG collected $300 penalty 12/31/73
Gulf Oil Co.	California	IX	Coyote Creek	Spill	311(b)(6)	USCG, 5/73	Penalty of $500 9/20/73
Gulf Pipeline Co.	Texas	VI	Trinity River	Spill	311(b)(5) (old 11(b)4)	U.S. Attorney, 5/9/72	Fined $500 3/5/73
H. F. Johnson	Idaho	X	North Fork of Snake River	Spill	311(b)(6)	USCG, 5/7/73	Penalty of $500 paid
H. F. Johnson	"	X	Cascade Creek	Spill	311(b)(6)	USCG, 10/5/73	Penalty of $250 assessed
H. K. Marshall Oil Co.	North Carolina	IV	Crabtree Creek	Spill	311(b)(6) 311(b)(5)	USCG, 11/5/73 U.S. Attorney	U.S. Coast Guard has not responded (civil action). Under consideration (criminal action)

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action–referral to and date	Results or status 12/31/73
H. K. Porter, Inc.	Lynchburg, Virginia	III	Fishing Creek	22,000 gallons	311(b)(6)	USCG, 2/28/73	Of original $5,000 penalty, $1,000 paid 5/16/73
H. S. Bunting	Pennsylvania	III	Susquehanna River	#6 Fuel oil (6,000 gal.)	311(b)(6)	USCG, 2/6/73	Of original assessment of $4,000, $250 paid
Hanson Buick	Georgia	IV	South Fork, Peachtree Creek	Spill	311(b)(6)	USCG, 10/30/73	U.S. Coast Guard has not responded (civil action)
					311(b)(5)	U.S. Attorney 10/30/73	Under consideration (criminal action)
Harbour Bros. Construction	Kansas	VII	Wolf Creek	Road spray washed off by rain	311(b)(6)	USCG, 9/24/73	Preliminary assessment $3,000 11/13/73
Harold Epps d/b/a/ Hero-Hilco Enterprises	Missouri	VII	Lake Taneycomo	Road oil washed off by rain	311(b)(5)	U.S. Attorney	Declined to prosecute 1/18/73 (criminal action)
					311(b)(6)	USCG, 4/12/73	Coast Guard referred case back to U.S. Attorney 12/3/73 for collection of penalty (civil action)
Hathaway & Patterson Co.	Massachusetts	I	?	Intermittent oil leaks	311(b)	1/29/73	Fined $1,000–company appealed & fine was reduced to $500. Case closed
Hazel Marie Johns	Kansas	VII	Chisholm Creek	Broken oil sludge dike	311(b)(6) 311(b)(5)	USCG, 6/15/73 U.S. Attorney	U.S. Attorney declined to prosecute 10/26/73 (criminal action)
Home Oil & Gas Co.	North Carolina	IV	Old Town Creek	Spill	311(b)(6)	1/3/73	Penalty of $1,500 3/28/73
Hotchkiss Oil Co.	Fredericksburg, Virginia	III	Quantico Creek	#2 Fuel oil (500 gal.)	311(b)(6)	USCG, 6/20/73	Of original penalty of $2,500, $250 paid 10/17/73
Hougland Barge Lines	Paducah, Kentucky	IV	Ohio River	#2 Fuel oil (10,000 gal.)	311(b)(6)	USCG, 8/1/73	$4,000 paid 9/7 Of original assessment of $4,000. USCG referred to U.S. Attorney for action pursuant to 311(b)(5)
ICI America	Massachusetts	I	Muddy Cove	Oil leak	311(b)(6)	USCG, 11/6/73	Pending
Indiana Farm Bureau	Illinois	V	Coffee Creek	Spill	311(b)(6)	USCG, 10/31/73	Pending
Indiana Farm Bureau	"	V	Coffee Creek	Spill	311(b)(6)	USCG, 10/30/73	Pending
International Paper Co.	Massachusetts	I	Androscoggin	Spill	?	USCG, 10/5/73	Pending
Iren S. Light, Inc.	Lebanon, Pennsylvania	III	Schuylkill River	#2 Fuel oil (3,000 gal.)	311(b)(6)	USCG, 3/1/73	Penalty waived 5/25/73. Original assessment $2,500
Isenhour Brick	North Carolina	IV	Tributary to Town Creek	Spill	311(b)(6) 311(b)(5)	USCG, 1/7/74 U.S. Attorney	USCG has not reported (civil action) Under consideration (criminal action)
Jones & Laughlin Steel	Ohio	V	Cuyahoga River	Spill	311(b)(6)	USCG, 7/10/73	Penalty of $1,000 paid 8/31/73
Jones Texaco	Georgia	IV	Unnamed tributary	Spill	311(b)(6)	5/10/73	$100 penalty 6/24/73
Kaiser Aluminum & Chemical Corp.	West Virginia	III	Ohio River	Light rolling oil (500 gal.)	311(b)(6)	USCG, 4/9/73	$200 paid 5/10/73
Kaw Pipeline Co.	Kansas	VII	Big Creek	Cracked gathering line	311(b)(6)	USCG, 11/15/73	Pending
Kaw Pipeline Co.	Kansas	VII	Lost Creek	Pipeline leak	311(b)(6)	USCG, 8/8/73	Preliminary assessment $300 11/12/73
Koch Oil Co.	Duncan, Oklahoma	VI	Little Beaver Creek	Spill	311(b)(6)	USCG, 12/18/73	Pending
Koch Oil Co.	"	VI	Heybern Reservoir	Spill	311(b)(6)	USCG, 12/18/73	Pending
Kunkel Fuel Oil	Pennsylvania	III	Darby Creek	#2 Fuel oil (2,200 gal.)	311(b)(6)	USCG, 11/15/73	Pending
Lakehead Pipeline Co.	Minnesota	V	Tamarac River	Spill	311(b)(6)	USCG, 12/3/73	Declined
Leach Bros., Inc.	Dallas, Texas	VI	Garcitas Creek	Spill	311(b)(5)	U.S. Attorney, 5/2/73	Fined $1,000 1/1/74
Leach Bros., Inc.	"	VI	"	Spill	311(b)(6)	USCG, 5/3/73	Civil penalty $1,500 10/12/73
Lebeouf Bros. Towing, Inc. & Mary R. Towing Co., Inc.	Kentucky	IV	Ohio River	Spill	311(b)(6)	11/29/73	No fine 1/8/74
Ledbetter Construction Co.	Georgia	IV	South Fork Creek	Spill	311(b)(6)	5/15/73	$1,200 penalty 8/20/73
Liberty Materials Co.	Liberty, Texas	VI	Trinity River	Spill	311(b)(5) (old 11(b)(4))	U.S. Attorney, 5/9/72	Pending
Lion Oil Co.	El Dorado, Arkansas	VI	Smackover Creek	Spill	311(b)(6)	USCG, 7/12/73	Civil penalty $1,000 8/21/73

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action–referral to and date	Results or status 12/31/73
Lion Oil Co.	Eldorado, Arkansas	VI	Smackover Creek	Spill	311(b)(6)	USCG, 7/12/73	Civil penalty $500 8/21/73
Lipton Tea Co.	Missouri	VII	Rock Creek	Fuel line leak	311(b)(6)	USCG, 11/30/73	Pending
M. D. Zirkle Logging Co.	California	IX	Paynes Creek Slough	Spill	311(b)(6)	USCG, 11/16/73	Pending
MFA Oil Co.	Missouri	VII	Dry Fork Creek	Storage tank leak	311(b)(6)	USCG, 8/8/73	Declined 10/9/73
MFA Oil Co.	"	VII	Tributary to Lost Creek	Tank rupture	311(b)(6)	USCG, 6/6/73	Declined 10/9/73
M & M Tank Lines, Inc.	North Carolina	IV	Lankston Branch	Spill	311(b)(6) 311(b)(5)	USCG, 3/19/73 U.S. Attorney	USCG has not reported (civil action) Under consideration (criminal action)
M & M Tank Lines, Inc.	"	IV	Tuu's Creek	Spill	311(b)(6)	1/3/73	Penalty of $375 7/18/73
McCulloch Oil Corp.	Utah	VIII	Duchesne River	Spill	311(b)(6)	USCG, 6/9/73	Notice of investigation 10/16/73
McDowell Asphalt Co.	Missouri	VII	McCord Creek	Parking lot runoff	311(b)(5) 311(b)(6)	U.S. Attorney 8/20/73; USCG, 8/21/73	Pending
McMurrey Pipeline	Tyler, Texas	VI	Kickapoo Creek	Spill	311(b)(5)	U.S. Attorney, 12/27/73	Pending
Mackin Construction Co.	Massachusetts	I	Mill River	Overfilled gas tank	?	U.S. Attorney, 3/2/73	No action
Malitonsky Cooperage	Pennsylvania	III	Allegheny River	Spill	311(b)(6)	USCG, 1/23/73	Original assessment $5,000
Manchester View Motel	Vermont	I	Tributary Batten Kill River	Oil sludge leak	?	USCG, 11/14/73	Pending
Marane Oil Heat Co.	Massachusetts	I	Lake Quinsigamon	Oil leak	?	USCG, 11/21/73	Pending
Marathon Oil Co.	Wyoming	VIII	Grass Creek	Spill	311(b)(6)	USCG, 3/22/73	Pending
Marathon Oil Co.	"	VIII	"	Spill	311(b)(6)	USCG, 9/26/73	Pending
Marathon Oil Co.	"	VIII	"	Spill	311(b)(6)	USCG, 10/29/73	Pending
Marathon Oil Co.	"	VIII	Dry Creek	Spill	311(b)(6)	USCG, 11/29/73	Penalty of $300 assessed 1/21/74
Marathon Oil Co.	Illinois	V	Bonpas Creek	Spill	311(b)(6)	USCG, 9/18/73	Penalty of $300 paid 12/18/73
Mar-Tee Landfill	Cape May, New Jersey	II	Delaware Bay	Petroleum solvents and coal tar distillates discharged	311(b)(6)	8/20/73	Referred to USCG, asked for a $2,500 fine
Mar-Tee Contractors, Inc., Thomas Brodesser Jr. & Co.	Cape May, New Jersey	II	Pennsylvania Ponds	Chemical and oil leachate spill from landfill site; non-notification	311(b)(5)	11/30/73	Sent to U.S. Attorney for criminal action under §311(b)(5)
Maverick Oil Co.	Michigan	V	Flint River	Spill	311(b)(6)	USCG, 12/21/73	Pending
Merrill Transport Co.	Vermont	I	Tributary to Deerfield River	Spill	?	USCG, 8/17/73	USCG refused to assess a fine on grounds that waters were not navigable. Case closed.
Messer Oil Co.	Pennsylvania	III	Knapps Creek	Crude oil (50 bbl.)	311(b)(5)	U.S. Attorney, 9/26/73	Filed information with Court
Miami Oil Co.	Montana	VIII	Two Medicine Creek	Spill	311(b)(6)	USCG, 6/7/73	Pending
Mid-State Oil Co.	North Carolina	IV	Unnamed tributary to Lake Norman	Spill	311(b)(6)	6/1/73	Penalty of $500 9/27/73
Mid-State Oil Co.	Indiana	V	Vaughn Watershed	Spill	311(b)(6)	USCG, 9/18/73	Fined 11/12/73
Milwaukee Railroad	Wisconsin	V	Menominee River	Spill	311(b)(6) 311(b)(5)	USCG 8/13/73; U.S. Attorney, 8/14/73	Pending Pending
Mobil Oil	Wyoming	VIII	Pine Grove Creek	Spill	311(b)(6)	USCG, 9/10/73	Penalty of $200 paid 1/2/74
Mobil Pipeline Co.	Kansas	VII	Whitewater River	Corrosion leak	311(b)(6)	USCG, 6/6/73	Preliminary assessment $300 9/25/73
Mobil Pipeline Co.	"	VII	Walnut River	Corrosion leak	311(b)(6)	USCG, 7/16/73	Declined 7/20/73
Mobil Pipeline Co.	"	VII	Spring Creek	Collection line leak	311(b)(6)	USCG, 11/6/73	Pending
Mobil Pipeline Co.	"	VII	Walnut River	Portable pump discharge	311(b)(6)	USCG, 9/6/73	Pending
Mo-Ky	Missouri	VII	Bitterroot Creek	Intermittent discharge	311(b)(6) 311(b)(5)	USCG, 7/20/73 U.S. Attorney	Preliminary assessment $1,000 9/26/73
Multihome Corp.	Pennsylvania	III	Stoney Creek	#2 Fuel oil	311(b)(6)	USCG, 6/12/73	Original penalty $3,500 revised to $1,000; pending

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action--referral to and date	Results or status 12/31/73
Multi-Wood Products Co.	Missouri	VII	McCord Creek	Retention lagoon overflow	311(b)(6)	USCG, 6/6/73	Final assessment $500 11/20/73
National Transit Co.	Oil City, Pennsylvania	III	Charley Run	Crude oil (40 bbl.)	311(b)(6)	USCG, 8/31/73	Penalty of $500 paid 10/29/73
National Transit Co.	"	III	Bone Creek	Crude oil (50 bbl.)	311(b)(6)	USCG, 8/31/73	Penalty of $300 paid 10/29/73
National Transit Co.	"	III	Gardner's Run	Crude oil (30 bbl.)	311(b)(6)	USCG, 5/23/73	Penalty of $300 paid 8/1/73
National Transit Co.	"	III	"	Crude oil (120 bbl.)	311(b)(6)	USCG, 5/23/73	Penalty of $300 paid 8/1/73
National Transit Co.	"	III	Lewis Run	Crude oil (130 bbl.)	311(b)(6)	USCG, 11/29/73	Assessment of $300 pending
National Transit Co.	"	III	Fish Creek	Crude oil (44 bbl.)	311(b)(6)	USCG	Original penalty of $300
National Transit Co.	"	III	Dolphin Run	Crude oil (30 bbl.)	311(b)(6)	USCG	Original penalty of $300
National Transit Co.	"	III	Turkey Run	Crude oil (200 bbl.)	311(b)(6)	USCG	Original penalty of $500
National Transit Co.	"	III	Chartiers Creek	Crude oil (35 bbl.)	311(b)(6)	USCG	Original penalty of $300
National Transit Co.	"	III	Robinson Run	Crude oil (226 bbl.)	311(b)(6)	USCG	Original penalty of $400
National Transit Co.	"	III	Horne Run	Crude oil (100 bbl.)	311(b)(6)	USCG, 3/21/73	Of original penalty of $500, $100 paid 7/6/73
National Transit Co.	"	III	Buffalo Creek	Crude oil (20 bbl.)	311(b)(6)	USCG, 3/21/73	Of original penalty of $500, $250 paid 7/6/73
National Transit Co.	"	III	South Creek	Crude oil (30 bbl.)	311(b)(6)	USCG, 3/21/73	Of original penalty, of $500, $200 paid 7/6/73
Necessary & Necessary	Bristol, Virginia	III	Peak Creek	Used lubricating oil (2,000 gal.)	311(b)(6)	USCG, 10/4/73	Original penalty of $2,500 pending
New Departures Hyatt Div.	Bristol, Connecticut	I	North Creek	Spill	?	USCG, 9/11/73	Pending
New System Laundry, Inc.	Massachusetts	I	A culvert	Spill	?	USCG, 11/23/73	Pending
New York Bituminous	West Nyack, New York	II	Hackensack River	Kerosene-asphalt mixture spill	311(b)(6)	USCG, 8/10/73	$4,000 fine asked; matter being appealed
New York Bituminous Products, Inc.	Blooming Grove, New York	II	Tributary to Moodna Creek	Asphalt mixtures spill	311(b)(6)	USCG, 12/10/73	Maximum penalty requested
Northeose Oil Services	Syracuse, New York	II	New York Barge Canal	Spill	311(b)(6)	USCG, 8/20/73	Fine of $500 paid
Notre Dame Hospital	New Hampshire	I	Piscataguag River	Oil leak	?	USCG, 12/18/73	Pending
Nyamza, Inc.	Ashland, Massachusetts	I	?	Spill	?	6/11/73	Pending
O'Boyle Tank Lines	South Hill, Virginia	III	Flat Creek	Gasoline and #2 fuel oil (1,707 gal.)	311(b)(6)	USCG, 6/10/73	Original penalty $2,500 revised to $1,000; penalty waived
Otis Ainsworth	Mississippi	IV	Walesheba Creek	Ruptured line	311(b)(5)	3/15/72	Penalty of $3,000 6/21/73
Owensboro-Ashland Co.	Kentucky	IV	Tributary to Panther Creek	Pipeline leak	311(b)(6) 311(b)(5)	USCG, 1/23/73 U.S. Attorney	Penalty of $1,000 3/8/73 (civil action) Under consideration (criminal action)
P.I.E. Trucking Co.	Kansas	VII	Lake Gardner	Storage tank leak	311(b)(6) 311(b)(5)	USCG, 12/18/73 U.S. Attorney	U.S. Attorney declined to prosecute 11/28/73 (criminal action)
Patrick Petroleum Co., et al	Alabama	IV	Alabama River	Spill	311(b)(6) 311(b)(5)	USCG, 9/29/72 U.S. Attorney, 11/21/72	Declined (civil action) 2 guilty pleas, 1 Nolo Plea $2,500 total fines (criminal action)
Perry Demolition Co.	Utah	VIII	Mill Creek	Spill	311(b)(6)	USCG, 9/25/73	Pending
Petco Oil Co.	Colorado	VIII	Burlington Ditch, South Platte River	Spill	311(b)(6)	USCG, 9/17/73	Penalty of $2,000 assessed 12/20/73
Petco Oil Co.	"	VIII	South Platte River	Spill	311(b)(6)	USCG, 3/26/73	Under investigation
Petco Oil Co.	Wyoming	VIII	Muddy Creek, Little Snake River	Spill	311(b)(6)	USCG, 8/14/73	Penalty of $500 assessed 1/21/74
Phillips Oil Co.	Utah	VIII	Jordan River	Spill	311(b)(6)	USCG, 12/14/73	Pending
Phillips Petroleum Co.	Kansas	VII	Swing Creek	Gathering line	311(b)(6)	USCG, 6/6/73	Penalty of $500 paid 10/17/73
Pie Truck Lines	Utah	VIII	Duchesne River	Spill	311(b)(6)	USCG, 11/5/73	Pending
Pilot Oil Co.	Wyoming	VIII	Sweetwater Run	Spill	311(b)(6)	USCG, 8/14/73	Penalty of $300 10/9/73
Pittsburgh & Lake Erie RR	Pittsburgh, Pennsylvania	III	Ohio River	Diesel (10,000 gal.)	311(b)(6)	USCG on scene	Penalty of $200 paid 10/19/73

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action—referral to and date	Results or status 12/31/73
Platte Pipeline Co.	Wyoming	VIII	North Platte River	Spill	311(b)(6)	USCG, 7/12/73	Penalty of $100 paid 12/27/73
Platte Pipeline Co.	Missouri	VII	Cedar Creek	Broken line	311(b)(6)	USCG, 8/31/73	13/20/73 preliminary assessment $300
Proctor-Silex, Inc.	North Carolina	IV	Lovill's Creek	Spill	311(b)(6)	6/15/74	USCG has not reported
Producers Gathering Co.	Bolivar, New York	II	Hallsport	Spill	311(b)(6)	USCG, 9/6/73	After appeal, $400 fine asked by USCG
Putnam Bros. Co.	Presque Isle, Maine	I	?	Spill	?	USCG, 6/73	Penalty of $2,000 assessed on 8/20/73. Case closed.
Quarles Robertson Oil Co.	Arlington, Virginia	III	Four Mile Run	Gasoline (150 gal.)	311(b)(6)	USCG, 5/3/73	Original penalty of $2,500 appealed
R & R Conoco	Missouri	VII	Big Blue River	Underground fuel line leak	311(b)(6) 311(b)(5)	USCG, 9/29/73 U.S. Attorney	Preliminary penalty $200 12/20/73 (civil action)
Ramsey Corp.	Missouri	VII	Wenzel Creek	Storage tank runoff	311(b)(6)	USCG, 7/12/73	Coast Guard collected $200 11/30/73 (civil action)
					311(b)(5)	U.S. Attorney	Declined to prosecute 7/16/73 (criminal action)
Raymond Winkler	Uncasville, Connecticut	I	Fort Shantok Brook	Spill	?	USCG, 11/1/73	Pending
Rein, Schultz & Dahl	Wisconsin	V	Mississippi River	Spill	311(b)(6)	USCG, 8/13/73	Penalty of $200 paid 11/8/73
Rink & Range, Inc.	Westport, Connecticut	I	?	Oil leak	?	USCG, 9/11/73	Pending
Robert D. Thorpe	Missouri	VII	Tarkio Creek	Broken pipe cap	311(b)(5) 311(b)(6)	USCG, 3/1/73; U.S. Attorney 3/8/73	USCG collected $1,000
Robinson Freight Line	Tennessee	IV	Ocoee River	Spill	311(b)(5)	2/12/73	Pending
Royster Transport Co.	North Carolina	IV	Dollar Branch	Spill	311(b)(6)	3/20/73	8/8/73 $600 fine.
SICO Co.	Lancaster, Pennsylvania	III	Tyler Run	#2 Fuel oil (6,000 gal.)	311(b)(6)	USCG, 4/9/73	Penalty of $3,000 Original referred to U.S. Attorney for collection
S&S Dust Control	Iowa	VII	Winnebago River	Frozen tank valve	311(b)(6)	USCG, 3/16/73	USCG collected $100 9/11/73 (civil action)
					311(b)(5)	U.S. Attorney	Information filed 4/18/73; fined $500 5/30/73; (criminal action)
Santa Fe RR	California	IX	Los Angeles River	Spill	311(b)(6)	USCG, 11/7/73	Pending
Santos Fuel, Inc.	Bridgeport, Connecticut	I	Wepawaug River	Oil discharge	311(b)(6)	USCG, 6/27/73	Pending
Scarlock Oil Co.	Tennessee	IV	Big Black River	Spill	311(b)(6)	3/13/73	6/28/73 $2,000 fine
Sheldon Oil Co.	California	IX	Shasta Lake	Spill	311(b)(6)	USCG, 9/26/73	Declined
Shell Oil Co.	Montana	VIII	Yellowstone River	Spill	311(b)(6)	USCG, 11/9/73	Pending
Shell Oil Co. (2)	"	VIII	Beaver and Pennell Creeks	Spill	311(b)(6)	USCG, 7/27/73	Penalty paid of $1,000 for both
Shell Oil Co.	North Dakota	VIII	Gumbo Creek	Spill	311(b)(6)	USCG, 12/12/73	Notice of investigation 1/8/74
Shell Pipeline	Kilgore, Texas	VI	Moody Creek	Spill	311(b)(6)	USCG, 7/17/73	Penalty of $2,500 11/19/73
Silco Oil	Colorado	VIII	Black Squirrel	Spill	311(b)(6)	USCG, 5/16/73	Penalty paid of $300 8/27/73
Skelly Oil Co.	Kansas	VII	Unnamed stream tributary of Chikaskia River	Pipeline leak	311(b)(6)	USCG, 10/31/73	Pending
Skelly Oil Co.	Missouri	VII	Timberline Lake	Filler cap not secured	311(b)(5) 311(b)(6)	USCG, 7/17/73 U.S. Attorney	Preliminary penalty of $5,000 9/24/73 (civil action)
Skelly Oil Co.	Kansas	VII	Peace Creek	Corrosion leak	311(b)(6)	USCG, 8/10/73	Penalty of $300 paid 12/12/73
Skelly Oil Co.	"	VII	Tributary to Chikaskia River	Corrosion leak	311(b)(6)	USCG, 10/31/73	Pending
Skelly Oil Co.	"	VII	"	Corrosion leak	311(b)(6)	USCG, 10/31/73	Pending
Skelly Oil Co.	"	VII	Chikaskia River	Corrosion leak	311(b)(6)	USCG, 6/5/73	Penalty of $100 paid 11/8/73
Sohio Petroleum Co.	Kansas	VII	Saline River	Broken flow line	311(b)(6)	USCG, 11/29/73	Pending
Sohio Petroleum Co.	"	VII	Lost Creek	Broken hose	311(b)(6)	USCG, 6/5/73	Penalty of $200 paid 10/9/73
Southern Pacific RR	California	IX	Sacramento River	Spill	311(b)(6)	USCG, 9/26/73	Pending
Sperry-Vickers, Inc.	Missouri	VII	Short Creek	Oil emulsion leak	311(b)(6)	USCG, 6/6/73	Declined 7/19/73

TABLE B (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action–referral to and date	Results or status 12/31/73
Springfield School	Springfield, Vermont	I	Black River	Fuel oil leak	?	USCG, 10/16/73	Pending
Standard Oil Bulk Station	Missouri	VII	Railroad Lake	Bulk tank overflow	311(b)(6) 311(b)(5)	USCG, 7/20/73 U.S. Attorney	Penalty of $300 paid 10/12/73 (civil action)
Standard Oil Co.	Georgia	IV	Lake Allatoona	Truck accident	311(b)(6)	11/29/73	No penalty 2/9/73
Standard Oil Co.	"	IV	Woodell Creek	Overturned truck	311(b)(6)	11/29/73	No penalty 2/9/73
Standard Oil Co.	California	IX	Byron-Bethany Canal	Spill	311(b)(6)	USCG, 6/25/73	Penalty of $1,000
Standard Oil Co.	"	IX	Ballona Creek	Spill	311(b)(5)	U.S. Attorney, 9/19/73	Pending
Stanley J. Oakdale	California	IX	Dog Creek	Spill	311(b)(6)	USCG, 9/13/73	Declined
Stroube Development Co.	Corsicana, Texas	VI	Rush Creek	Spill	311(c)	U.S. Attorney, 10/14/73	Pending
Sun Oil Co.	Waterford, Connecticut	I	Fenger Brook	Gas spill	?	USCG, 9/12/73	Pending
Taft Broadcasting	Missouri	VII	Indian Creek	Fuel tank leak	311(b)(6) 311(b)(5)	USCG, 9/29/73 U.S. Attorney	Coast Guard collected $300 12/5/73 (civil action) Declined to prosecute (criminal action)
Tarheel Grading Co.	North Carolina	IV	Unnamed creek to Long Creek	Spill	311(b)(6) 311(b)(5)	USCG, 4/13/73 U.S. Attorney	6/23/73 $250 fine (civil action) $500 fine less amount paid USCG = $250 (criminal action)
Templon Spinning Mills, Inc.	North Carolina	IV	Unnamed tributary to Reed's Creek	Spill	311(b)(6)	5/31/73	Penalty of $100 9/10/73
Tenneco	Wyoming	VIII	Belle Fourche River	Spill	311(b)(6)	USCG, 2/3/73	Case dismissed 11/20/73
Tenneco Oil Co.	Florida	IV	Unnamed creek 5 miles from Dunnellon, Florida	Spill	311(b)(6) 311(b)(5)	USCG, 8/3/73 U.S. Attorney	USCG has not reported (civil action) Nolo–1/10/74 $1,000 fine (criminal action)
Terra Resources	Wyoming	VIII	Castle Creek	Spill	311(b)(6)	USCG, 4/10/73	Case dismissed 5/2/73
Texaco/Cities Service Pipeline Co.	Tulsa, Oklahoma	VI	Verdigris River	Spill	311(b)(6) (old 11(b)(5))	USCG 11/21/72	Declined 1/4/73
Texaco, Inc.	North Dakota	VIII	Garrison Reservoir	Spill	311(b)(6)	USCG, 10/19/73	Pending
Texaco, Inc.	"	VIII	Lake Sakakewa	Spill	311(b)(6)	USCG, 10/26/73	Pending
Texaco, Inc.	Pennsauken, New Jersey	III	Schuylkill, New Jersey	#6 Fuel oil (100 gal.)	311(b)(6)	USCG, 4/17/73	Of original penalty of $1,000, $300 paid 6/29/73
Texaco, Inc.	Rhode Island	I	Three Mile River	Gas spill	?	12/18/73	Pending
Texaco, Inc.	West Cote Blanche Bay, Louisiana	VI	Estuary Bay	Spill	311(b)(6) (old 11(b)(4))	U.S. Attorney, 12/29/72	Pending
Texas-New Mexico Pipeline Co.	Aneth, Utah	VIII	San Juan River	Spill	311(b)(6) (old 11(b)(5))	USCG, 4/2/73	Declined
Thomas Oil Co. Kern County	California	IX	Poso Creek	Spill	311(b)(6)	USCG, 11/14/73	Pending
Thompson Oil Co.	Waynesboro, Pennsylvania	III	Antietam Creek	#2 Fuel oil (2,100 gal.)	311(b)(6)	USCG, 5/3/73	Penalty of $500 paid 9/11/73
Transmountain Pipeline Co.	Washington	X	Silver Creek	Spill	311(b)(6)	USCG, 4/27/73	Penalty of $200
Union Pacific RR	Washington	X	Spokane River	Spill	311(b)(6)	USCG, 5/10/73	Penalty of $2,500 paid
Union Pacific RR	Wyoming	VIII	Big Laramie River	Spill	311(b)(6)	USCG, 6/20/73	Penalty of $5,000 assessed 11/7/73
Union Pacific RR	"	VIII	"	Spill	311(b)(5)	U.S. Attorney, 7/20/73	Pending
Uniroyal	Chicopee, Massachusetts	I	Chicopee River	Paraflex spill		10/24/72	Company fined $3,000 on 4/25/73. (Also case under Refuse Act); case closed
U.S. Steel Corp.	Duquesne, Pennsylvania	III	Thomson Run	Exchange oil (50 gal.)	311(b)(6)	USCG, 12/3/73	Original penalty of $300 in litigation
U.S. Steel Corp.	"	III	Monongahela River	#6 Fuel oil (40,000 gal.)	311(b)(6)	USCG, 6/1/73	Penalty of $750 paid 11/13/73

TABLE B (Concluded)

Name of discharger	Location	EPA region	Receiving waters	Problem/incident	Applicable provision*	EPA action—referral to and date	Results or status 12/31/73
V. Smith Lumber Co.	Missouri	VII	Beeler's Creek	Field runoff	311(b)(6)	USCG, 8/20/73	Coast Guard collected $400 11/15/73 (civil action)
					311(b)(5)	U.S. Attorney	Declined to prosecute (criminal action)
Valvoline Oil Co.	Freedom, Pennsylvania	III	Ohio River	Oil	311(b)(5)	USCG, 5/18/73	Referred to U.S. Attorney, $4,000 paid 2/4/73. Expert witness supplied by EPA
Vest Towing Co.	Mississippi	IV	Mississippi River	Spill	311(b)(6)	2/23/73	Pending
Volunteer Asphalt Co.	Tennessee	IV	Tennessee River	Spill	311(b)(6)	9/22/72	Penalty of $1,000 paid 1/29/73
Volunteer Oil Co.	Tennessee	IV	Tributary to Chucky Creek	Spill	311(b)(6)	5/2/73	Fine of $500 paid 6/8/73 (civil action)
					311(b)(5)	5/2/73	Declined to prosecute 5/31/73 (criminal action)
Waumbec Mills	Manchester, New Hampshire	I	Merrimack River	Spill	?	?	Company pleaded guilty and fined $600—1/15/73; Case closed
Waxler Towing Co.	Mississippi	IV	Mississippi River	Spill	311(b)(6)	3/22/73	USCG has not reported
West Point Pepperal, Inc.	Alabama	IV	Langdale Lake	Spill	311(b)(6)	8/30/73	USCG has not reported
Western Airlines	California	IX	Los Angeles storm drain	Spill	311(b)(6)	USCG, 9/27/73	Pending
Williams Bros. Pipeline Co.	Nebraska	VII	Weeping Water Creek	Open valve	311(b)(6)	USCG, 5/30/73	Penalty of $1,000 paid 11/12/73
Williams Bros. Pipeline Co.	Iowa	VII	Otter Creek	Corrosion leak	311(b)(6)	USCG, 7/30/73	USCG closed case 11/21/73
Williams Bros. Pipeline Co.	"	VII	Squaw Creek	Pipeline break	311(b)(6)	USCG, 9/24/73	Pending
Williams Bros. Pipeline Co.	"	VII	Otter Creek	Corrosion leak	311(b)(6)	USCG, 8/31/73	Penalty of $100 paid 12/17/73
Williams Bros. Pipeline Co.	"	VII	Unnamed creek	Pipeline break	311(b)(6)	USCG, 4/26/73	Final assessment $500 6/5/73
Williams Bros. Pipeline Co.	"	VII	Thunder Creek	Pipeline break	311(b)(6)	USCG, 7/17/73	Penalty of $250 paid 11/12/73
Williams Bros. Pipeline Co.	Kansas	VII	Neosho River	Corrosion leak	311(b)(6)	USCG, 8/31/73	Preliminary assessment $300 12/17/73
Wolf's Head Oil Refining Co.	Oil City, Pennsylvania	III	Allegheny River	Naphtha (125 bbl.)	311(b)(3)	USCG, 5/21/73	Of original penalty of $5,000, $2,000 paid
Wyandotte Industries	Waterville, Maine	I	Kennebec River	Spill	?	?	Company fined $2,250 on 1/17/73; case closed.
Yellowstone Pipeline	Idaho	X	Prichard Creek	Spill	311(b)(6)	USCG, 8/6/73	Penalty of $1,000 paid

*311(b)(5)—failure to notify of discharge—criminal penalty
(b)(6)—discharge of oil or hazardous substances in harmful quantities—civil penalty
(d) —marine disaster; U.S. costs recoverable
(e) —imminent and substantial threat, onshore or offshore facility—court relief
(f) —vessel, onshore and offshore removal costs liability U.S. costs recoverable
(g) —third party removal costs liability U.S. costs recoverable
(j)(2)—EPA regulations violation—civil penalty
(j)(2)—DOT (Coast Guard) regulations violation—civil penalty

Appendix C

ENFORCEMENT ACTIONS PENDING OR COMPLETED DURING CALENDAR YEAR 1973 INITIATED UNDER PREVIOUS LEGISLATION AND SAVED UNDER PL 92-500

TABLE C

ENFORCEMENT ACTIONS INITIATED UNDER ACT AS FORMERLY IN EFFECT

Name of discharger	Location	EPA region	Receiving waters	Problem	EPA action under old sec. 10/date	EPA action in 1973/date	Results or status 12/31/73
Basic Management Inc.	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Permit applied for 11/24/71; no permit required	Permits issued to facilities discharging to company ponds
Cities Service Corp.	Copperhill, Tennessee	IV	Ocoee River	Acid mine drainage and silt	180-day notice 9/29/72	Draft permit in progress; proposed issuance date 6/74	
Clark County Sanitation District No. 1	Las Vegas, Nevada	IX	Las Vegas Wash	Municipal wastes	180-day notice 12/23/71; informal hearing 1/25/72	Public notice of proposed permit	Permit application being processed
Flintkote Co., U.S. Lime Division	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Permit denied 7/20/73	Final compliance achieved 5/1/73
Henderson, City of	Henderson, Nevada	IX	Las Vegas Wash	Municipal wastes	180-day notice 12/23/71; informal hearing 1/25/72	No permit application	Second notice to apply recently sent
Jones Chemical, Inc.	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Discharge ceased; no permit	No action required
Kerr-McGee Chemical Co.	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Permit issued 8/26/73	Final compliance to be achieved 12/31/74
Kingsbury General Improvement District	Washoe County, Nevada	IX	Lake Tahoe	Municipal wastes	180-day notice 11/9/71; informal hearing 1/6/72; suit filed 9/12/72	Injunction granted 5/16/73 prohibiting issuance of building permits pending completion of sewers	Injunction amended 11/9/73; sewers under construction
Knoxville, City of	Tennessee	IV	Tennessee River	Municipal wastes	180-day notice 9/7/72	Permit issuance scheduled for 5/74	
Las Vegas, City of	Las Vegas, Nevada	IX	Las Vegas Wash	Municipal wastes	180-day notice 12/23/71	Permit applied for 9/5/73	Permit being processed
Las Vegas Valley Water District	Las Vegas, Nevada	IX	Las Vegas Wash	Cooling tower	180-day notice 12/23/71; informal hearing 1/25/72	No permit required—a water management agency	Authority transferred for developing regional wastewater management plan
Montpelier, City of	Idaho	X	Bear River	Primary treatment only	180-day notice 5/17/72		Secondary treatment construction in progress
Montrose Chemical Co.	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Discharges covered by Stauffer Chemical permit of 8/26/73	Final compliance to achieved 12/31/75
Nevada Power Co., Clark Generating Station and Sunrise Generating Station	Las Vegas, Nevada	IX	Las Vegas Wash	Cooling tower blowdown	180-day notice 12/23/71; informal hearing 1/25/72	Two permits issued 8/30/73	Final compliance to be achieved 12/31/73
Nevada Sand and Gravel Co. (Stewart Brothers)	Las Vegas, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Permit denied	Ceased discharge early 1973
New Orleans, City of	New Orleans, Louisiana	VI	Mississippi River	Municipal wastes	180-day notice 5/19/72	–	Construction underway
Paul, City of	Idaho	X	Snake River	Primary treatment only	180-day notice 5/17/72		Secondary treatment construction underway
Priest River	Idaho	X	Pend Oreille River	Primary treatment only	180-day notice 5/17/72		Secondary treatment construction underway
Sandpoint	Idaho	X		Primary treatment only	180-day notice 5/17/72		Secondary treatment construction underway
Reserve Mining Co.	Minnesota	V	Lake Superior	Taconite tailings	Court action requested 1/20/72; case filed 2/17/72	Trial begun	Trial continued

TABLE C (Concluded)

Name of discharger	Location	EPA region	Receiving waters	Problem	EPA action under old sec. 10/date	EPA action in 1973/date	Results or status 12/31/73
State Stove & Manufacturing Co.	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Permit issued 8/26/73	Final compliance to be achieved 6/1/74
Stauffer Chemical Co.	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/23/71; informal hearing 1/25/72	Permit issued 8/26/73	Final compliance to be achieved 12/31/74
Tahoe-Douglas District	Washoe County, Nevada	IX	Lake Tahoe	Municipal wastes	180-day notice 11/9/71; informal hearing 1/6/72; suit filed 9/12/72	Injunction granted 5/16/73 prohibiting issuance of building permits, pending completion of sewers	Injunction amended 11/9/73; sewers under construction
Titanium Metal Corp. of America	Henderson, Nevada	IX	Las Vegas Wash	Nutrients and total dissolved solids	180-day notice 12/31/71; informal hearing 1/25/72	Permit issued 8/1/73	Final compliance to be achieved 1/1/77
W. R. Grace Co.	Owensboro, Kentucky	IV	Ohio River	Paper and chemical wastes	180-day notice 8/1/72	Permit issued consistent with 180-day notice schedule	
Whiting, City of	Indiana	V	Lake Michigan	Municipal wastes	Court action requested 9/1/72; case filed 9/11/72	Consent decree signed 9/6/73 calls for City to cease discharge to Lake Michigan by 5/1/75	
Yazoo City	Mississippi	VI	Yazoo River	Municipal wastes	180-day notice 7/27/72	Permit issuance schedule for 5/74	

Appendix D

ENFORCEMENT ACTIONS PENDING OR COMPLETED DURING CALENDAR YEAR 1973 UNDER REFUSE ACT

TABLE D-1

CIVIL ACTIONS INITIATED BY EPA UNDER REFUSE ACT

Name of discharger	Location	EPA region	Receiving waters	Problem	Date of referral to U.S. Attorney	Action in 1973 (if previously referred)	Results or status 12/31/73
Alabama By-Products	Tarrant, Alabama	IV	Five-Mile Creek	Coke waste	4/71	Extensive work on a Consent Decree during 1st quarter	Consent Decree never signed; EPA processing a permit along lines of proposed Consent Decree
Beacham, Sam	Kitty Hawk, North Carolina	IV	Currituck Sound	Dredge and fill	8/7/72	Drafted covenants running with the land to protect a 100-foot buffer around the development	Pending. Possibility of settlement without filing
Central Railroad of New Jersey	Califon, New Jersey	II	South Branch of Raritan River	Coconut oil spill	9/14/73		Referred to U.S. Attorney for civil injunction to repair conditions. Matter to be joined in a court order in a suit currently under way against railroad
Cook Paint & Varnish Co.	Missouri	VII	Missouri River	Phenols, oil, and grease; paint wastes	12/17/71	Consent Decree entered 8/73	
Cowan & Shain, C. F. Jameson & Gore, Inc.	Haverhill, Massachusetts	I	Merrimack River	Tanning wastes	12/3/71	Case dismissed because companies filed NPDES permit applications	Case closed
Fulford, Owen	Harkers Island, North Carolina	IV	Core Sound	Dredge and fill	8/7/72	Preliminary injunction issued 9/5/72	Justice Department attempting to settle with defendant
Hamakua Sugar Mill Co. (owned by Theo. H. Davis & Co.)	Island of Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Stipulation of dismissal prepared; company indicates it will sign	Mill closed 7/72
Hamel Tanning Co.	Haverhill, Massachusetts	I	Merrimack River	Tanning wastes	?	Complaint filed 12/3/71; a stipulation of dismissal with affidavit of Louis Hamel was filed and dismissed on 11/5/73	Case closed
Haverlock, Nick	Wyoming	VIII	North Platte River	Solid waste	3/29/73	Consent Decree	Case closed
Hinkel, Alvin	North Dakota	VIII	Missouri River	Illegal landfill	10/18/73	Referred to U.S. Attorney	Defendant applied for sec. 10 permit from Corps of Engineers; prosecution in abeyance
Holland, W. Langston, et al	Tampa, Florida	IV	Papys Bayou	Dredge and fill	12/5/73	Temporary Restraining Order 12/21/73	Awaiting hearing on preliminary injunction
Honokaa Sugar Co. (owned by Theo H. Davis & Co.)	Island of Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Permit issued 9/21/73; stipulation of dismissal prepared; company indicates it will sign	Compliance within effluent limits to be achieved by 7/1/76
Houston Lt. & Pwr. Co.	Houston, Texas	VI	Trinity Bay	Thermal pollution	'72	–	On-going monitoring
Hoyt & Worthen Tanning Co.	Haverhill, Massachusetts	I	Merrimack River	Tanning wastes	?	Complaint filed 12/3/71. 12/3/71. Consent Decree signed 10/5/73	Case closed
Jefferson County Landfill	Missouri	VII	Meremac River	Leachate from landfill	5/73	U.S. Attorney declined to prosecute 7/73	
K & W Oil	Wyoming	VIII	North Platte River	Oil	7/6/72	Consent Decree	Case closed
Kaiser Aluminum and Chemical	Baton Rouge & Gramercy, Louisiana	VI	Mississippi River	"Red mud"	'72	–	Pending; compliance in progress
Kennebec Log Driving Co.	Winslow, Maine	I	Kennebec River	Log driving	3/19/71	Government's Motion for Summary Judgment was argued 1/5/73; Court denied the motion	Under review to determine if EPA should recommend appeal
Key West, City of	Key West, Florida	IV	Gulf of Mexico	Solid waste	7/3/73	U.S. Attorney filed Motion for Summary Judgment	Awaiting decision on motion

TABLE D-1 (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem	Date of referral to U.S. Attorney	Action in 1973 (if previously referred)	Results or status 12/31/73
Koppers Co., Inc.	Birmingham, Alabama	IV	Tributary of Opossum Creek	Coke waste	4/71	Unsuccessful negotiation on proposed stipulation for dismissal	Permit being prepared
Laupahoehoe Sugar Co. (owned by Theo. H. Davis & Co.)	Island of Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Permit issued 9/21/73; stipulation of dismissal prepared; company indicates it will sign	Compliance within effluent limits to be achieved by 7/1/76
McWane Cast Iron Pipe Co.	Birmingham, Alabama	IV	Tributary to Village Creek	Iron waste	4/71	Extensive negotiation on Consent Decree	Consent Decree unsigned; permit being processed
Maiden Lumber Co.	Wyoming	VIII	Big Horn River	Solid waste	3/19/73	Consent Decree	Closed
Marias Valley	Montana	VIII	Marias River	Dumping solid waste	1/12/74	Complaint filed	Pending
Mauna Kea Sugar Co., North Plant (owned by Hilo Coast Processing Co.)	Papaikou, Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Permit issued 9/21/73; stipulation of dismissal signed 10/9/73	Compliance within effluent limits to be achieved by 7/1/76
Mauna Kea Sugar Co., South Plant (owned by Hilo Coast Processing Co.)	Wainaku, Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Permit issued 9/21/73; stipulation of dismissal signed 10/9/73	Compliance within effluent limits to be achieved by 7/1/74
Microfab Inc.	Amesbury, Massachusetts	I	Merrimack River	Waste water	?	Consent Decree signed 7/25/72	Case closed
Mid-City Industrial Park	Kansas	VII	Kansas River	Chromium	4/14/72	Consent Decree entered 3/73	
Nashville Bridge Co.	Bessemer, Alabama	IV	Tributary to Village Creek	Iron waste	4/71	Unsuccessful attempt to have company sign stipulation for dismissal	Company has a closed system and does not require a permit; case essentially moot
Northern Oil Co.	Burlington, Vermont	I	Lake Champlain	Oil discharge	?	–	Case settled by Consent Decree
Ozark-Mahoning	Colorado	VIII	North Platte River	Discharge of wastes	10/10/72	Consent Decree	Case closed
Paauhau Sugar Co. (owned by C. Brewer and Co.)	Island of Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Stipulation of dismissal signed 1/3/74	Mill closed 11/72
Peabody Coal Co.	Indiana	V	North Coal Creek to Wabash River	Discharge of coal fines and yellow boy	10/12/72	Preparation for trial	Tentative settlement; draft agreement being prepared for publication by Justice Department
Pembroke, City of Eastport, City of	Maine	I	?	Improper maintenance of municipal dump	8/29/73	–	U.S. Attorney declined to prosecute on 8/30/73 since steps have been taken to institute a central dump; case closed
Pepeekeo Sugar Co. North Plant (owned by Hilo Coast Processing Co.)	Hakalau, Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Permit issued 9/21/73; stipulation of dismissal signed 10/9/73	Compliance to be achieved by 6/30/74
Pepeekeo Sugar Co. South Plant (owned by Hilo Coast Processing Co.)	Pepeekeo, Hawaii	IX	Pacific Ocean	Cane trash, bagasse, sediment	9/3/71	Permit issued 9/21/73; stipulation of dismissal signed 10/9/73	Compliance to be achieved by 7/1/76
Phillips Boatyard & Lawrence Owens	Wanchess, North Carolina	IV	Croatan Sound	Dredge and fill, refuse	8/7/72	Consent Order of Dismissal providing for $200 compensatory damage and permanent injunction filed 12/29/72	Case closed
Pikes Dump	Lynn, Massachusetts	I	Saugus River	Deposit of refuse in river	3/7/73	–	Case in discovery stage
Unknown dischargers of polychlorinated biphenyls	Los Angeles, California	IX	Los Angeles County sanitary sewer system, tributary Santa Monica Bay	Polychlorinated biphenyls	3/6/72	Grand Jury disbanded; insufficient evidence to produce indictment	Case closed
Rohm & Haas	Deer Park, Texas	VI	Houston Ship Channel	Ammonia, oxygen-demanding materials	1972	Appeal to 5th Circuit Court	Pending

TABLE D-1 (Concluded)

Name of discharger	Location	EPA region	Receiving waters	Problem	Date of referral to U.S. Attorney	Action in 1973 (if previously referred)	Results or status 12/31/73
Smith, George	Wyoming	VIII	Big Horn River	Solid waste	3/19/72	Consent Decree	Case closed
Standard Veneer & Timber Co.	California	IX	Smith River	Spill	1/8/73	U.S. Attorney forwarded case to California Attorney General's office 2/23/73, who filed complaint 5/15/73	Unknown
Star Valley Cheese	Wyoming	VIII	Salt Creek	Discharge of plant wastes	10/10/72	Referred to U.S. Attorney	Consent Decree
Sullivan's Island	South Carolina	IV	Intracoastal waterway	Trash, solid waste	6/14/72	Case discussed with U.S. Attorney attempting to get Justice Department authorization to file	Justice Department considering authorizing filing of complaint
U.S. Pipe & Foundry	Birmingham, Alabama	IV	Five-Mile Creek	Steel waste	4/71	Consent Decree signed 1/5/73	Permit consistent with Consent Decree being prepared
U.S. Steel Corp., Waukegan Works	Illinois	V	Lake Michigan	Heavy metals, iron, suspended solids, phenol	10/3/72	Filed 10/6/72; negotiations continuing	Negotiations continuing
Whittaker Corp., City of Memphis	Memphis, Tennessee	IV	Mississippi River	Textile waste	6/19/72	Consent Decree signed 3/9/73; approved 3/14/73	Permit consistent with Consent Decree being prepared
Wire Rope Corp. of America	Missouri	VII	Missouri River	Heavy metals, acidity	2/2/72	Consent Decree entered 8/73	

TABLE D-2

CRIMINAL ACTIONS INITIATED BY EPA UNDER REFUSE ACT

Name of discharger	Location	EPA region	Receiving waters	Problem	Date of referral to U.S. Attorney	Action in 1973 (if previously referred)	Results or status 12/31/73
A. Laugeni & Sons, Inc.	West Haven, Connecticut	I	Thames River	Paint spill	1/31/73		Complaint filed 3/29/73; company fined $500 4/16/73; case closed
American Oil Co.	Illinois	V	Mississippi River	Oil spill	1/24/73		Fined $1,000 7/2/73
American Petrofina Co.	Natchez, Mississippi	IV	Mississippi River	Oil and salt spill	6/2/72		U.S. Attorney will file case if EPA finds evidence of another discharge
Amoco Chemical Co.	Illinois	V	Illinois River	Methaxylene spill	12/6/73		Pending
Ann Arbor Railroad Co.	Michigan	V	Betsie Bay	Sodium carbonate	8/7/73		Pending
Ashland Oil Co.	Indiana	V	Honey Creek to Ohio River	Oil spill	2/27/73		Fined $500 6/22/73
"	"	V	Rush Creek to Wabash River	Oil spill	2/27/73		Fined $500 6/2/73
Ashland Petroleum Co.	Tonawanda, New York	II	Niagara River	Sulfuric acid spill	7/30/73		Referred to U.S. Attorney
Atlantic Wire Co.	Branford, Connecticut	I	Branford River	Acid leak	?		Fined $500; case closed
Bethlehem Steel Corp.	Lackawanna, New York	II	Lackawanna Canal and Smokes Creek	Refuse Act violation; discharge of benzol and a ferrous chloride waste spill	7/30/73		Referred to U.S. Attorney
Byerlyte Department of Koppers Corp.	Ohio	V	Ohio River	Xylene spill	5/22/73		U.S. Attorney declined to prosecute 7/30/73
Central Nebraska Packing Co.	Nebraska	VII	North Platte River	Non-filer	6/12/73		Pending
Chemical Applications, Inc.; North Shore Petro Co.	Beverly and Salem, Massachusetts	I	Salem Harbor	Oil spill	12/72	Defendants arraigned 1/17/73; no contest plea 11/28/73	Fine suspended because of amount of money defendants spent on cleanup; case closed
Chemical Leaman Tank Lines, Inc.	Tonawanda, New York	II	Sawyer Creek	Acetonitrile spill	7/30/73		Referred to U.S. Attorney, who declined to prosecute
Chrysler Corp.	Missouri	VII		Paint waste		U.S. Attorney declined to prosecute	
Cities Service	Ft. Meade, Florida	IV	Peace River	Phosphate wastes	12/31/71		Defendant pleaded guilty; case closed
Coastal States Gas Prod. Co.	Houston, Texas	VI	Colorado River	Oil spill	3/30/73		Fined $500 6/18/73
Colgate-Palmolive	Kansas	VII	Kansas River	Various types solids	7/3/73	Information filed 10/25/73	Pending trial
Collier Development Corp.	Naples, Florida	IV	Tributary to Cocohatchee River	Garbage	7/26/72	U.S. Attorney declined to prosecute	Case closed
Continental Cheese, Inc.	Nebraska	VII	Crooked Creek	Non-filer	10/9/73		Pending
Coquina Investors, Inc.; Jones & Braido Construction Co.; McCormack & Scofield Marine	Naples, Florida	IV	Doctors Bay	Dredge and fill	8/27/73		Under consideration by U.S. Attorney
Crystal Refining Co.	Michigan	V	Fish Creek	Oil spill	4/3/73		Case retracted from U.S. Attorney and sent to USCG 1/21/74
Del Oil & Gas Corp.	Natchez, Mississippi	IV	Mississippi River	Salt water	6/6/72		U.S. Attorney will file case if EPA finds evidence of another discharge
Duval Sulphur	Galveston, Texas	VI	Galveston Harbor	Oil spill	2/2/72		Fined $500 2/2/73
F.S. Services, Inc.	Illinois	V	Little Sandy Creek	Gasoline spill	5/14/73		Pending
Forest City Enterprises	Ohio	V	Cahoon Creek	Sludge	9/24/73		Complaint filed 11/27/73
Frisco Railroad	Missouri	VII	Meramec River	Hopper car overturned	6/11/73		U.S. Attorney declined to prosecute 6/19/73
Getzfried, Francis	Wyoming	VIII	Greybull River	Solid waste	12/27/73		Negotiations pending

TABLE D-2 (Continued)

Name of discharger	Location	EPA region	Receiving waters	Problem	Date of referral to U.S. Attorney	Action in 1973 (if previously referred)	Results or status 12/31/73
Great Lakes Steel Co.	Michigan	V	Detroit River	Oil spill	5/11/73		Indicted 11/21/73
Gulf Oil Co.	Texas	VI	Houston Ship Channel	Oil spill	12/28/71		Filed against Warren Petroleum; fined $500 2/14/73
Hampden Color and Chemical Co.	Springfield, Massachusetts	I	Farmington River	Sodium hydroxide spill	12/14/73		Pending
Hinkel, Alvin	North Dakota	VIII	Missouri River	Illegal landfill	10/18/73		Defendant applied for a sec. 10 permit from Corps of Engineers; prosecution in abeyance
Ingram Barge Co.	Illinois	V	Chicago Sanitary & Ship Canal	Gasoline spill	3/22/73		Pending
Inland Steel Co.	Indiana	V	Lake Michigan	Suspended solids	12/4/73		Pending
Interlake Inc.	Ohio	V	Maumee River	Lamp black spill; suspended solids	8/7/73		Complaint filed 8/24/73
Interlake Steel Co.	Ohio	V	Maumee River	Coal tar spill	5/24/73		U.S. Atty. declined to prosecute 7/24/73
J.C. Keeter Realty Co.	Atlantic Beach, North Carolina	IV	Bogue Sound	Dredge and fill	8/72	U.S. Attorney determined that defendant had obtained Corps of Engineers' permit and decided not to proceed	Case closed
Kerr-Magee	Cushing, Oklahoma	VI	Cimarron River	Oil spill	2/3/72	U.S. Attorney declined to prosecute 10/11/73	
Kings Point West, Inc.	Sun City Center, Florida	IV	Little Manatee River–Cypress Creek	Silt	7/3/73	U.S. Attorney declined to prosecute based on action by local authorities	Case closed
Lakehead Pipeline Co.	Wisconsin	V	Fouche Creek	Crude oil	5/4/73		Pending
Lefler Concrete Block Co.	Charlotte, North Carolina	IV	Stewart Creek to Catawba River	Arsenic	5/24/72		Not guilty verdict; case closed
Lester Hill	Indiana	V	White River	Junk dumping	8/7/73		U.S. Attorney declined to prosecute 8/10/73
Lihue Plantation Co., Ltd.; Hawaii Board of Harbor Commissioners	Island of Kauai	IX	Nawiliwili Harbor	Molasses spill	11/15/71	Case filed 11/26/71; $500 fine imposed against company	Case closed
MKT Railroad	Cushing, Oklahoma	VI	Cimarron River	Oil spill	2/18/72	U.S. Attorney declined to prosecute 10-11-73	
M/T Bow Gran	Michigan	V	Saginaw River	Vinyl toluene	8/7/73		Pending
Merrill Transport Co.; Scott Paper Co.	Westbrook, Maine	I	Presumpscot River	?	?	U.S. Attorney filed one count against each defendant 3/15/73	Both cases closed: Scott, nolo contendre, fine of $500; Merrill Transport case dismissed
Mid Continent Pipeline Co.	Cushing, Oklahoma	VI	Cimarron River	Oil spill	2/18/72	U.S. Attorney declined to prosecute 10/11/73	
Midland Coop Refinery	Cushing, Oklahoma	VI	Cimarron River	Oil spill	2/18/72	U.S. Attorney declined to prosecute 10/11/73	
Midland Enterprises	Illinois	V	Chicago Sanitary and Ship Canal	Toluene	10/15/73		Pending
National By-Products, Inc.	Nebraska	VII	Mississippi River	Process waste	2/13/73		Fined $2,100 4/16/73
Patrick Petroleum Company et al.	Choctaw Bluff, Alabama	IV	Alabama River	Crude oil; use of chemical dispersant	11/21/71	Fined $1,500 on plea of nolo contendre	Case closed
Permian Corp.	Houston, Texas	VI	Bayou Dim	Oil spill	4/13/73		Pending
Petco Oil Co.	S. Royalton, Vermont	I	White River	Oil discharge	?		Pending
Proctor & Gamble	Ohio	V	Mill Creek	Wastewater spills (3)	8/7/73		U.S. Attorney declined to prosecute 11/2/73
Richard W. Elsie	Indiana	V	Black River	Oil and brine spill	7/16/73		Penalty of $500 paid 10/22/73

TABLE D-2 (Concluded)

Name of discharger	Location	EPA region	Receiving waters	Problem	Date of referral to U.S. Attorney	Action in 1973 (if previously referred)	Results or status 12/31/73
Roberts Commercial Galvanizing Co.	Fultondale, Alabama	IV	Tributary of Five-Mile Creek and tributary of Locust Fork of Black Warrior River	High concentrations of pollutants	12/29/72		Company closed down; case closed
Robinson Freight Line, Inc.	Knoxville, Tennessee	IV	Ocoee River	Sulfuric acid	2/12/73		U.S. Attorney declined to prosecute
S.S. Gleneagles	Ohio	V	Cuyahoga River	Coal dumping	5/11/73		U.S. Attorney declined to prosecute 9/5/73
Seaway Industrial Park Development Co., Inc.	Tonawanda, New York	II	Niagara River	Discharge of a green chemical substance	8/30/73		Referred to U.S. Attorney
Standard Oil Co. of Ohio	Ohio	V	Otter Creek	Oil spill	3/22/73		U.S. Attorney declined to prosecute 5/25/73
"	"	V	"	Oil spill	3/22/73		"
"	"	V	"	Oil spill	3/22/73		"
"	"	V	"	Oil spill	4/30/73		"
"	"	V	"	Oil spill	5/3/73		"
"	"	V	"	Oil spill	5/3/73		"
Sun Oil Co.	Michigan	V	Rouge River	Oil spill	3/9/73		Indicted 11/21/73
Terpstra Fuels, Inc.	Wisconsin	V	Duschee Creek	Oil spill	5/4/73		U.S. Attorney declined to prosecute 1/8/74
Texaco Oil Co.	Wisconsin	V	Lake Michigan	Oil spill	5/24/73		U.S. Attorney declined to prosecute 6/13/73
Texas-New Mexico Pipeline Co.	Aneth, Utah	VIII	San Juan River	Oil spill	4/11/73		Pending
Titanium Metals Corp.	Ohio	V	Ohio River	Lube oil	1/24/73		U.S. Attorney declined to prosecute 4/13/73
U.S. Steel Corp.	Indiana	V	Grand Calumet River	Oil spill	1/26/73		Pending
Union Oil Co.	Illinois	V	Chicago Sanitary & Ship Canal	Oil spill	2/27/73		U.S. Attorney declined to prosecute 3/6/73
Uniroyal	Chicopee, Massachusetts	I	Chicopee River	Paraflex spill	10/24/72	Company pleaded guilty 4/25/73	Company fined $2,000 under Refuse Act and $3,000 under section 311 of FWPCAct; case closed
Werlin Corp.	Ohio	V	Ohio River	Molasses spill	5/18/73		U.S. Attorney declined to prosecute 8/16/73
White Fuel Co.	Boston, Massachusetts	I	Boston Harbor	Oil discharges	?		Company pleaded guilty to criminal charges; fined $1,000; case closed

TABLE D-3

CIVIL ACTIONS INITIATED BY JUSTICE DEPARTMENT UNDER REFUSE ACT WITH EPA ASSISTANCE

Name of discharger	Location	EPA region	Receiving waters	Problem	Date of referral to U.S. Attorney	Action in 1973 (if previously referred)	Results or status 12/31/73
Harshaw Chemical Co.	Ohio	V	Black River via city of Elyria sewers	Mercury, other heavy metals	2/72	Agreement negotiated	Negotiated agreement published in *Federal Register* 1/17/74
Republic Steel Corp.	Ohio	V	Cuyahoga River	Cyanide, sulfates	4/27/71	Negotiations continuing	Negotations continuing
U.S. Steel Corp., Gary Works	Indiana	V	Grand Calumet River	Phenols, cyanide	2/19/71	Negotiations continuing	Negotiations continuing
U.S. Steel Corp., Cleveland Works	Ohio	V	Cuyahoga River	Phenols, suspended solids	4/28/71	Agreement negotiated; consent decree entered in court 12/18/73	Monitoring compliance with consent decree
U.S. Steel Corp., Lorain Works	Ohio	V	Black River	Phenols, suspended solids	4/28/71	Negotiations continuing	Negotiations continuing
Ward Paper Co.	Wisconsin	V	Wisconsin River	Pulp, paper mill wastes	4/14/71	NPDES permit to public notice 12/10/73	Public hearing held 1/16/74; U.S. Attorney will ask for dismissal of case after permit is issued
Wausau Paper Mills	Wisconsin	V	Wisconsin River	Pulp, paper mill wastes	4/14/71	NPDES permit to public notice 12/10/73	Public hearing held 1/16/74; U.S. Attorney will ask for dismissal of case after permit is issued

Name of discharger	Location	EPA region	Receiving waters	Problem	Date suit filed	Action in 1973 (if previously filed)	Results or status 12/31/73
Bethlehem Steel Corp.	Bethlehem, Pennsylvania	III	Lehigh River	Heavy heating oil	1/22/73		U.S. Attorney declined to prosecute
Malitovsky Cooperage	Pittsburgh, Pennsylvania	III	Allegheny River	Oil	12/72	EPA assisted Justice Department	To be dismissed because of corrective measures taken by defendant

Appendix E

ENFORCEMENT ACTIONS PENDING OR COMPLETED DURING CALENDAR YEAR 1973 UNDER MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT OF 1972 (OCEAN DUMPING)

TABLE E

ENFORCEMENT ACTIONS UNDER MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT

Name of discharger	Location	EPA region	Receiving waters (water body and general water area)	Alleged violation	Enforcement action date	Results or status 12/31/73
General Marine Transport Corp.	Bayonne, New Jersey	II	Atlantic Ocean (sludge dump grounds 73 40'W 40 20'N)	Failure to comply with interim special permit condition Transportation for dumping after expiration of interim special permit	11/21/73	Request for hearing 12/20/73
Sun Oil Company	Marcus Hook, Pennsylvania	III	Atlantic Ocean	101(a)	60-day notice, 12/11/73	Hearing scheduled 2/13/74