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The Clean Water Act: Financing Combined Sewer Overflow Projects

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The Clean Water Act

Financing Combined Sewer Overflow Projects

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In 1987 Congress expanded the scope of the Clean Water Act to include combined sewer overflows (CSOs) despite continuing to reduce federal assistance for water-pollution abatement and despite the fact that CSO abatement is far more costly than previous water-quality mandates. As a result, many low-income deindustrializing cities are now subject to an additional federal mandate that many of them cannot afford without extensive federal or state assistance. The authors conclude that, in lieu of increased federal funding for CSO abatement, U.S. Environmental Protection Agency regulatory guidelines and the Clean Water Act be amended to include an assessment of the fiscal and economic impact of CSO mandates. Such action would provide a basis for targeting the available resources where needs are greatest and the effect of CSO abatement is likely to result in tangible beneficial uses.

> It is the national policy that federal financial assistance be provided to construct publicly owned waste treatment works.
>
> — Clean Water Act of 1977

The Nature and Distribution of Combined Sewer Overflows

In most U.S. cities, sewer lines and stormwater collection systems were first constructed in the 1800s and early 1900s. Typically, sewer lines designed to carry raw sewage from urban residential areas and business districts were laid first. These were followed by stormwater drainage systems designed to collect rainwater during storms to reduce or eliminate urban flooding. In many cases, sewer lines and stormwater conduits were connected into a combined sewer, namely, a single collection system that conveys both sewage and stormwater.

The U.S. Environmental Protection Agency (EPA) estimates that there are more than 1,300 combined sewers in the United States serving approximately 1,100 communities with a total population of 43 million people.[1] Combined sewers are located primarily, although not exclusively, in the Northeast and Great Lakes areas. Eleven states in these two geographic areas account for 85 percent of the water-quality problems attributed to CSOs nationwide (see Figure 1).[2] Only eight states account for 70 percent of the

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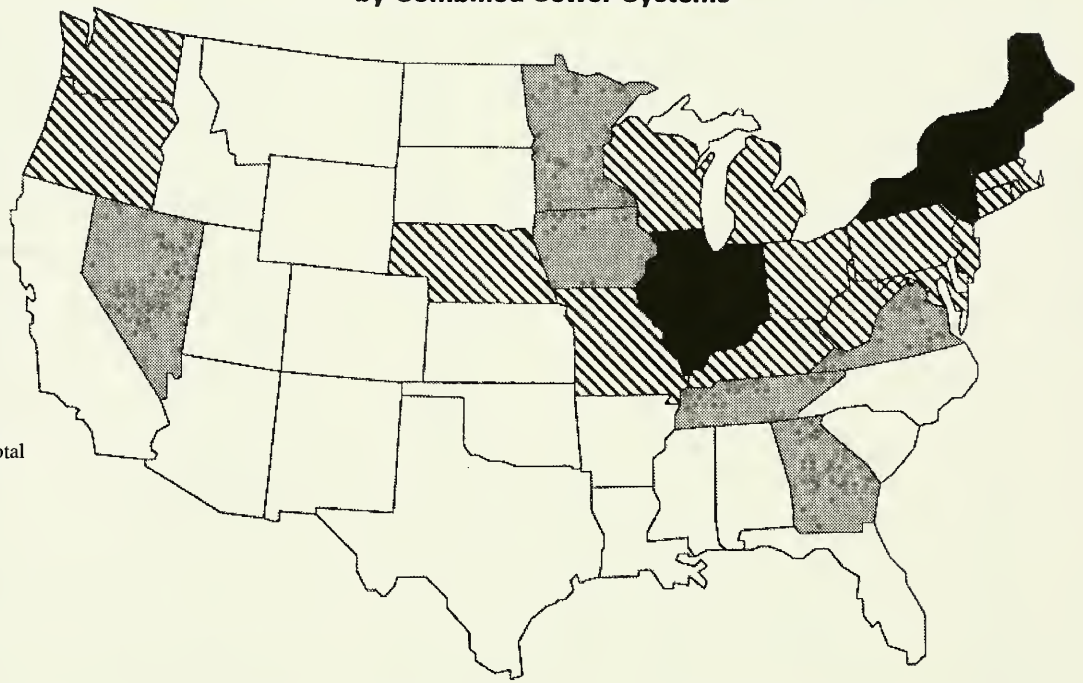
Figure 1

Geographic Distribution of Population Served by Combined Sewer Systems

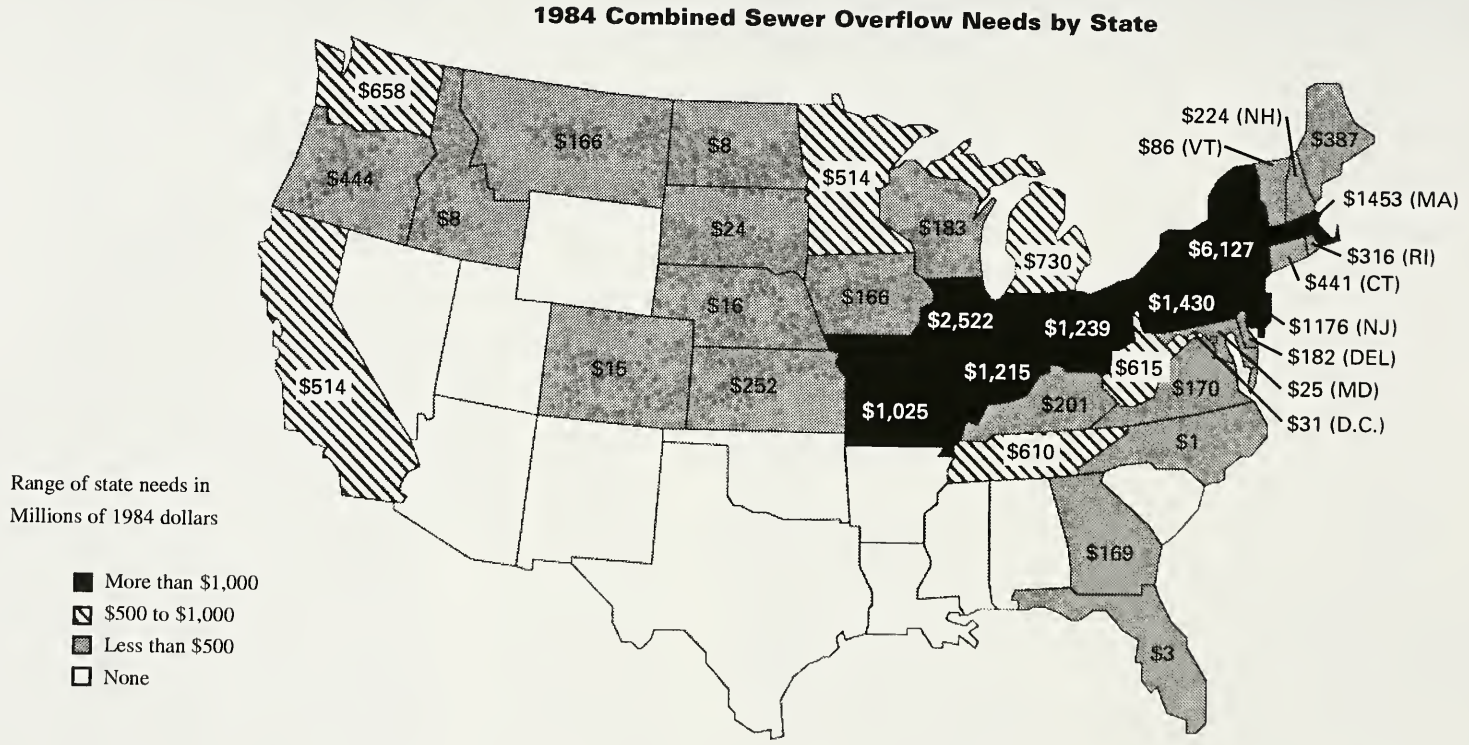


Ratio of projected population served by combined sewer to total sewered population, 1962

- 51% and over
- 26% to 50%
- 11% to 25%
- 0% to 10%

Source: U.S. Environmental Protection Agency, *Report to Congress on Control of Combined Sewer Overflows in the United States* (Washington, D.C.: Office of Water Program Operations, 1978), 1–2.

Figure 2



Source: U.S. Environmental Protection Agency, *Assessment of Needed Publicly Owned Wastewater Treatment Facilities in the United States: 1984 Needs Survey Report to Congress* (Washington, D.C.: Office of Municipal Pollution Control, 1985), 14.

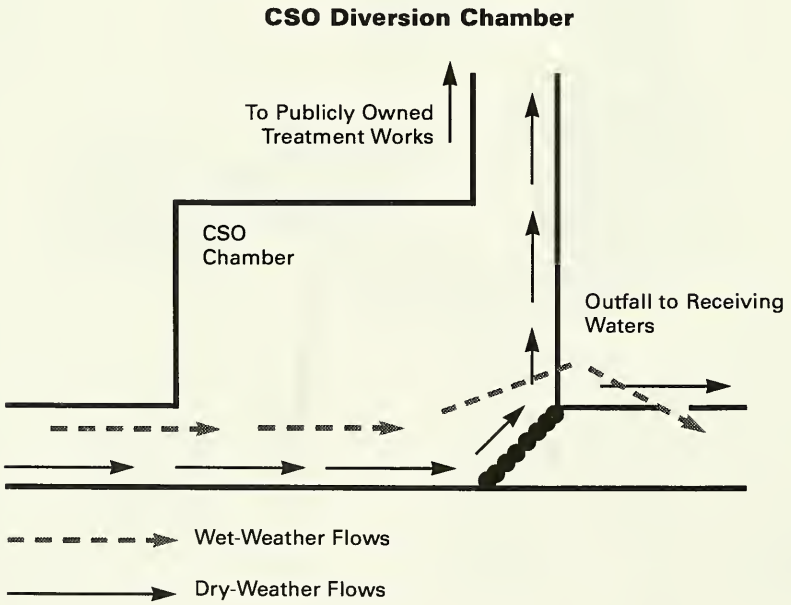
assessed construction needs for water-pollution abatement caused by combined sewer overflows (see Figure 2).[3]

In their earliest phase of development, sewer lines and stormwater collection systems were designed to discharge directly into receiving waters such as rivers, lakes, bays, and estuaries. These plans were developed long before the adverse health and environmental effects of such discharges were understood by scientists, government officials, and the general public. However, as part of an emerging public awareness and concern over such effects, the U.S. Congress passed the U.S. Public Health Act and the Federal Water Pollution Control Act of 1948. Cities and towns that had not already done so were required to build primary wastewater treatment facilities to strain and disinfect raw sewage before discharging it into receiving waters.

In addition to the construction of primary treatment facilities, municipalities with combined sewers encountered a derivative problem. Publicly owned treatment works (POTWs) are designed to process normal dry-weather sewage flows that come to the treatment facility from the collection system. During rainfalls, additional flows of stormwater enter a combined sewer through street inlets. The combined sewage flow and stormwater runoff often exceed the intake capacities of a POTW. Thus, if a combined sewer can discharge only through the POTW, the treatment facility is overloaded with stormwater and causes an extreme outfall of untreated combined sewage into the receiving waters; to prevent an overload of the POTW, excess flows may be contained in the collection system, where they back up and cause localized flooding of combined sewage in residential areas and business districts.

The standard solution to the problem of excess combined flows has been to construct diversionary chambers at key points throughout a collection system. As Figure 3 illustrates, the trunk lines of a combined sewer are generally routed into regulator chambers

Figure 3



that partially block outfalls to receiving waters with either a fixed or movable interceptor. Under normal dry-weather conditions, raw sewage flows are diverted into lines that carry them to the publicly owned treatment works where sewage is treated before being discharged into receiving waters.

During a storm, the water level rises in a combined sewer, and by design, the excess combined sewer flow (CSF) begins to overflow the interceptors and discharges directly into receiving waters without treatment. Combined sewer overflows contain not only untreated sewage, but stormwater runoffs entering the system gather dry-weather pollutants that have accumulated on the streets, in the gutters, and on the roofs of buildings. In addition, dry-weather sediments that have accumulated in the sewers are resuspended as the velocity of combined flow increases with the rising volume of storm water.[4] Therefore, the untreated effluents of a combined sewer overflow often contain unhealthy and environmentally dangerous levels of fecal matter, sediment, microorganisms, oil and grease, toxic metals, organic pollutants, and other storm debris.[5]

The Federal Water Pollution Control Act: An Evolving National Policy

The problem of water pollution caused by untreated or inadequately treated wastewater was revisited by the U.S. Congress in the Federal Water Pollution Control Act Amendments of 1972. This legislation established the fundamental principles and objectives of a national wastewater management policy. Section 101(a) of that legislation established an ambitious national mandate by declaring the following:

> The Objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this Act —
> (1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;
> (3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;
> (4) it is the national policy that federal financial assistance be provided to construct publicly owned waste treatment works.

To achieve these goals, the Federal Water Pollution Control Act Amendments of 1972 established a national program to regulate the discharge of pollutants into surface waters. The legislation created a National Pollutant Discharge Elimination System (NPDES), which requires point-source polluters to obtain a permit for discharges into U.S. waters. Generally, point sources consist of industrial process wastewater outfalls and sewage outfalls from municipal treatment plants.[6] The legislative guidelines for the NPDES require point-source dischargers to comply with specific technology-based requirements. For instance, the effluent limitations for all publicly owned treatment works are based on levels achieved by the implementation of secondary treatment.[7]

Under the 1972 legislation, individual states can assume authority for the administration of NPDES once their permitting processes are approved by the EPA. The law requires that state water-quality standards be consistent with federal policy but, if necessary to achieve the act's objectives, states are allowed to impose water-quality

standards more stringent than those required by federal regulations. Thirty-eight states operate EPA-approved NPDES permitting programs.

The 1972 legislation explicitly linked the achievement of national water-quality goals to federal financial assistance for municipalities affected by the new mandate (Section 101[a][4]). The Federal Water Pollution Control Act Amendments of 1972 implemented this linkage by creating a Construction Grants Program (CGP) that provided deep subsidies for the construction of publicly owned treatment works. The EPA was charged with administering the Construction Grants Program. Moreover, to provide guidance to Congress in funding the CGP, the EPA is required to develop biennial estimates "of the cost of construction of all needed publicly owned treatment works in each of the States" (Section 516 [b]).

The Clean Water Act of 1977

The national water-quality goals established by the Federal Water Pollution Control Act Amendments of 1972 were incorporated unchanged into the Clean Water Act of 1977, which otherwise extensively amended the earlier legislation. Significantly, for the first time, section 70 of the Clean Water Act specifically directed the EPA to "report on the status of combined sewer overflows in municipal treatment works operations" by the following year.[8] Combined sewer overflows from publicly owned treatment works were not covered explicitly by NPDES in either the 1972 or the 1977 legislation. NPDES regulates point sources of water pollution, while scientists, engineers, and EPA officials considered combined sewer overflows to be nonpoint sources of pollution. Consequently, it was generally assumed that stormwater discharges from combined sewer overflows were exempt from NPDES permits and, for this reason, CSOs were never specifically covered by the EPA's original NPDES regulations.[9]

Nevertheless, various legal challenges in the federal courts questioned the prevailing interpretation of the regulatory status of CSOs. The federal courts recognized stormwater and CSO discharges as point sources of water pollution. Therefore, communities that had met the NPDES technology-based requirement for secondary treatment at their POTWs were increasingly deemed subject to legal and regulatory action for combined sewer overflows that violated the water-quality standards established by the Clean Water Act of 1977.

Congress made a major policy departure by embracing the federal courts' opinion on this matter in the Water Quality Act of 1987.[10] Section 405 of the act amended the earlier legislation to require NPDES compliance for any stormwater discharge "that contributes to a violation of a water-quality standard or is a significant contributor of pollutants to waters of the United States." In this regard, the legislation directed the EPA to establish permit application requirements regulating municipal stormwater discharges. The EPA issued a national combined sewer overflow control strategy on September 8, 1989. The strategy emphasizes, quite explicitly, that CSOs are point sources of pollution subject to NPDES permits.[11]

The strategy, covering approximately 1,100 municipalities, establishes three major criteria for CSO control.[12]

- The policy allows no more than an average of four overflows per year for an urban area, and no more than five in rural areas.

- The policy calls for treatment of at least 85 percent of the volume of the combined sewage in the combined sewer system during rainfall events on a systemwide average basis.
- The policy establishes nine other minimum controls that prohibit CSO discharges in dry weather, regulate solid materials, require proper maintenance and monitoring of CSO facilities, and require public notification of CSO discharges.[13]

The new control strategy also directed the individual states to develop statewide CSO permitting strategies by January 1, 1990. More than thirty states had received EPA approval for their CSO control strategies as of April 6, 1992.[14]

Federal Funding of Water Pollution Abatement

The Federal Water Pollution Control Act of 1972 established an ambitious national mandate to improve water quality over a relatively short period of time. Subsequent amendments to the original legislation (1977, 1981) have reiterated the same national goals, then extending those goals in 1987 to include the problem of combined sewer overflows. A crucial component of the original national mandate was the establishment of a "national policy that federal financial assistance be provided to construct publicly owned waste treatment works" (Section 101[a][4]).

As noted above, the 1972 act, Section 201(a), established the Title II Construction Grants Program to support "the development and implementation of waste treatment management plans and practices which will achieve the goals of this Act." Initially, the program provided direct federal grants to municipalities and special districts for the construction of publicly owned treatment works, including CSO projects. The federal grants normally covered 75 percent of the cost of constructing the most cost-effective alternative for providing the necessary wastewater treatment.[15]

The 1972 and 1977 legislation allotted funds from the Construction Grants Program among the individual states "in the ratio that the estimated cost of constructing all needed publicly owned treatment works in each State bears to the estimated cost of construction of all needed publicly owned treatment works in all of the States" (Section 205[a]). Each state's allotment under this formula was allocated directly to municipalities and special districts for individual construction projects on the basis of state priority ratings developed by each state. The federal regulations governing the EPA's Construction Grants Program specified that states were to rate individual projects within their jurisdiction on the basis of four criteria: (1) severity of the pollution problem; (2) size of the population affected; (3) the need for preservation of high quality waters; (4) at the state's option, the category of need addressed.[16]

The categories of need consisted of secondary treatment, more stringent treatment, correction of infiltration and inflow problems, sewer system replacement or major rehabilitation, new collectors and appurtenances, new interceptors and appurtenances, and the correction of combined sewer overflow problems.[17] Each state was given sole authority to determine the relative weight of each of the four criteria, as well as sole authority to determine the priority of the various categories of need. Thus, whether a given combined sewer overflow project fell within a fundable part of a state's priority list depended on state policy.

Furthermore, the EPA stipulated that combined sewer overflow projects could qualify for federal grant assistance only if several additional criteria had been met:

- The proposed level of CSO control was necessary to protect a beneficial use of the receiving water even after technology-based standards had been achieved by industrial point sources and at least secondary treatment had been achieved for dry-weather municipal flows;
- Secondary treatment of dry-weather municipal flows had been achieved, or provision for funding of secondary treatment had already been made;
- The proposed CSO control technique would be more cost effective than other CSO control techniques or adding higher than secondary treatment for dry-weather municipal flows;
- The marginal costs were not substantial compared with marginal benefits.[18]

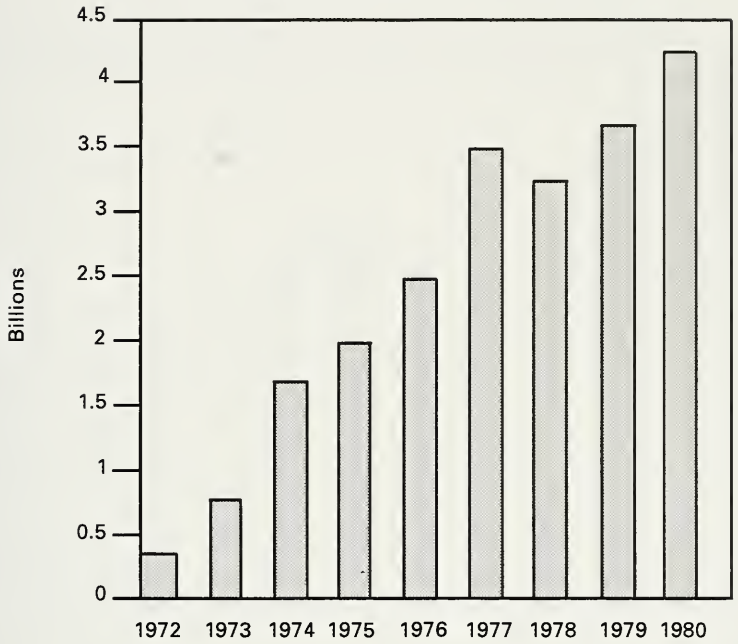
As noted above, the Clean Water Act of 1977 directed the EPA to "report on the status of combined sewer overflows in municipal treatment works operations" and to conduct a CSO needs assessment based on current applications for CSO project funding under the CGP. The act further stipulated that the report determine the number of years necessary, "assuming an annual authorization and appropriation for the construction grants program of $5,000,000,000, to correct combined sewer overflow problems" (33 U.S.C. 1375, Section 70[c]). Based on this fiscal assumption, the EPA estimated that it would take a minimum of ten years to complete CSO control under optimal conditions and perhaps as many as forty years to correct in some states.[19] However, in calculating these estimates the EPA emphasized to Congress and the president "the importance of maintaining constant buying power in the construction grants program if CSO correction is to be achieved in a reasonable period of time."[20] In fact, federal outlays for the Construction Grants Program increased during the 1970s, but actual outlays never reached the $5 billion promised by the 1977 legislation (see Figure 4). CGP outlays reached a peak of only $4.3 billion in fiscal year 1980 and have been declining since that time.

Indeed, the Municipal Wastewater Treatment Construction Grant Amendments of 1981 marked the beginning of a formal retreat in the federal government's financial commitment to national water-quality goals. First, the amendments imposed a requirement that, effective October 1, 1984, no less than 80 percent of each state's CGP allotment "shall be made only for projects for secondary treatment or more stringent treatment, or any cost effective alternative thereto, new interceptors and appurtenances, and infiltration-in-flow correction" (33 U.S.C. 1281, Section 201[g][1]). This change effectively mandated secondary treatment as the top priority for the Construction Grants Program, even as federal courts were bringing CSO problems under the jurisdiction of the Clean Water Act.

The effect of this change was partially offset by two other components of the legislation. Beginning in fiscal year 1983, a separate appropriation of $200 million per fiscal year was authorized specifically to address the water-quality problems of marine bays and estuaries affected by discharges from combined stormwater and sanitary sewer overflows. However, only 10 percent of U.S. combined sewer facilities affect marine bays and estuaries.[21] The EPA was authorized to use funds from a state's regular CGP allotment for CSO construction projects, but only where the correction of CSO problems was deemed a major priority in the state's ranking system and only if requested to do so by a state governor (33 U.S.C. 1285, Section 201[n]).

Figure 4

Construction Grants Program:
Federal Outlays, Fiscal Years 1972 to 1980



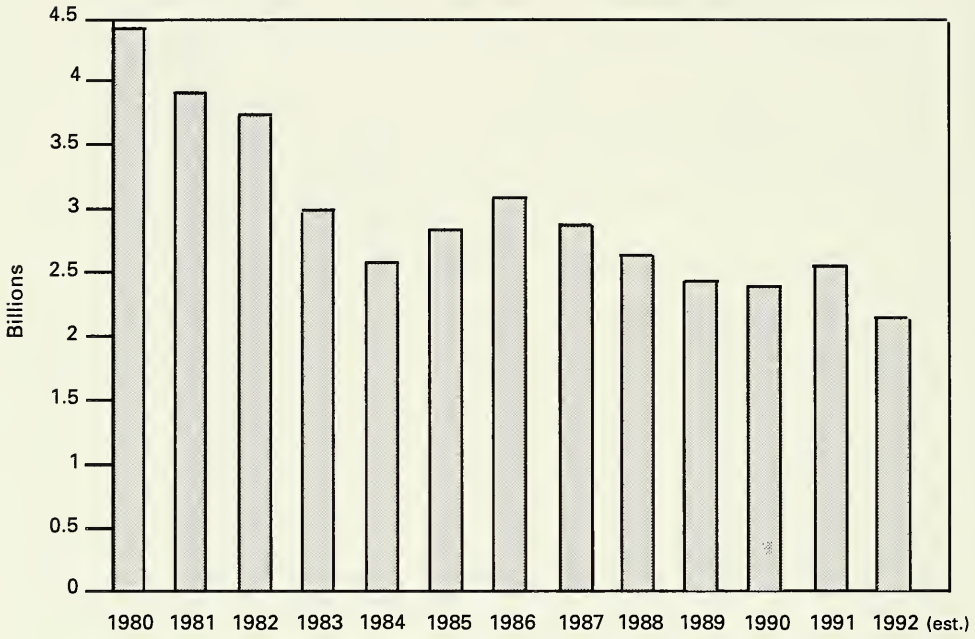
Source: Office of the President, *The Budget of the United States Government: Appendix* (Washington, D.C. : Government Printing Office, 1973-1981)

Third, and most important, the Construction Grant Amendments of 1981 reduced the federal contribution for the construction of publicly owned treatment works from 75 percent to 55 percent of construction costs.[22] In addition, the 1981 amendments lowered the annual authorizations for the Construction Grants Program and, accordingly, federal outlays for the construction of publicly owned treatment works began a steady decline that has continued unabated for sixteen years, even though the original water-quality goals and mandates remain the same as in the 1970s (see Figure 5).

Congress clearly understood that the sharp and protracted decline in federal assistance initiated by the 1981 amendments would create difficulties for municipalities currently or potentially subject to federal court orders. Section 26 of the 1981 amendments cited "the sense of the Congress that judicial notice should be taken of this Act and of the amendments to the Federal Water Pollution Control Act made by this Act, including reduced authorization levels under section 207 of such Act." While such decisions remain within the discretion of individual judges and courts, it was unquestionably the intent of Congress that the judiciary take special notice of the hardship created for municipalities by reduced federal funding. Consequently, Section 26 of the 1981 amendments directs that "parties to Federal consent decrees establishing a deadline, schedule, or timetable for the construction of publicly owned treatment works are encouraged to reexamine the provisions of such consent decrees and, where required by equity, to make appropriate adjustments in such provisions."[23]

Figure 5

Construction Grants Program:
Federal Outlays, Fiscal Years 1980 to 1992



Source: Office of the President, *The Budget of the United States Government: Appendix* (Washington, D.C. : Government Printing Office, 1981-1993)

Significantly, even when federal funding levels were at their peak for the Construction Grants Program, EPA needs assessments indicated that "the construction grant monies allocated to each region and state have never been sufficient to cover every proposed project [even though] few sewage facilities can be constructed without federal assistance."[24] Nevertheless, in its first year (FY 1981), the Construction Grant Amendments reduced the CGP spending authorization to $3.9 billion. In the time covered by the amendments, spending authorizations fell steadily to $2.9 billion in FY 1988.[25]

Overall, federal construction-related expenditures for sewage treatment facilities dropped by 48 percent in constant dollars from 1980 to 1988, despite EPA warnings that constant-dollar buying power would have to be sustained to achieve federal water-pollution mandates within the time frame established by the 1977 and 1987 legislation.[26] Moreover, EPA needs assessments indicate that by 1985 CSO projects had become the largest unmet need in the federal Construction Grants Program even though Congress mandated that secondary treatment be given top priority for funding. The EPA's most conservative estimate is that CSO control will require more than $23 billion in capital expenditures to reach the goals established by the Clean Water Act.[27]

Nevertheless, the erosion of federal support for the construction of publicly owned treatment works continued with the Water Quality Act of 1987. The federal spending authorization for construction of POTWs was reduced by another 75 percent, from $2.4 billion in FY 1988 to only $600 million in FY 1994. The act attempts to partially offset

the effect of these reductions on municipalities by mandating increased state contributions to the construction of treatment facilities.

The Water Quality Act enforced the state mandate by requiring the states to create state water pollution control revolving funds (SRFs) by September 30, 1989. The act authorizes annual federal appropriations to the SRFs, with each state's allotment defined as a fixed percentage of the total annual federal appropriation for all SRFs. However, in order to receive its federal allotment, each state must enter into a binding capitalization grant agreement with the EPA. These agreements require a state to match every four dollars in federal allotments with one state dollar. Thus, each state is expected annually to provide at least 20 percent of the total capitalization for its state revolving fund. The state must make its contribution to the SRF, in quarterly installments, on or before the date of the federal contribution. Moreover, in contrast to the earlier Construction Grants Program, the SRFs are authorized only to make loans to municipalities at below-market to zero interest rates. Loan recipients are required to establish a dedicated source of revenue, usually sewer fees, for repayment of the loan. Annual principal and interest payments must commence no later than one year after completion of the project and be fully amortized not later than twenty years after completion of the project.

However, as state governments plunged into fiscal crisis in the early 1990s, they increasingly slashed discretionary spending in order to balance budgets and to fund entitlements. In fiscal years 1992 and 1993, thirty-four states implemented spending reductions.[28] In this context, a recent National Conference of State Legislatures survey of state legislative budget officers suggests that funding environmental projects has been relegated to a fiscal nonissue as state governments seek to eliminate deficits, with funding going to costly entitlement programs such as Medicaid, Aid to Families with Dependent Children, K–12 education, and prisons.[29] One consequence of inadequately financed state revolving funds is that more and more municipalities are locked in confrontations with federal courts and the EPA over mandated CSO projects that many municipalities simply cannot afford to finance without extensive federal or state assistance.

Indeed, the problem of unfunded CSO mandates has become such a significant municipal issue that a special CSO Partnership was established by twenty-five municipalities during the 1988 annual congress of the National League of Cities. By 1989 one hundred twenty-five municipalities had joined the partnership in an effort to secure more flexible CSO regulations and more federal funding to aid local compliance with those regulations. The CSO Partnership contends that under existing guidelines, CSO control will exceed the financial capacities of many municipalities, particularly older cities with a limited tax base and a plethora of more pressing capital needs such as schools and fire and police protection.[30]

Case Study: CSO Abatement in Fall River, Massachusetts

The city of Fall River, Massachusetts, a member of the CSO Partnership, illustrates the dilemma faced by many old industrial and, increasingly, deindustrialized northeastern cities where the most serious combined sewer overflow problems are concentrated in the United States. Fall River, a coastal city with approximately 92,000 residents, is located in southeastern Massachusetts about twenty miles east of Providence, Rhode Island. The history of wastewater treatment in Fall River closely parallels the national pattern of wastewater facilities development. Fall River's original sewer system was designed and

constructed in the years 1820 to 1850. For the most part, its current combined sewer system was constructed between 1910 and 1930. Until 1952 the combined system discharged untreated sewage and stormwater runoff directly into adjacent Mount Hope Bay, the Quechechan River, and the Taunton River.

In response to the federal mandates contained in the U.S. Public Health Act and the Federal Water Pollution Control Act of 1948, Fall River constructed a publicly owned primary wastewater treatment plant (1948–1952). The facility provided primary treatment for normal dry-weather sewer flows and discharged the treated effluents into Mount Hope Bay. Fall River's primary treatment facility was upgraded in 1961 and 1971. Finally, in compliance with the Federal Water Pollution Control Act Amendments of 1972, the city initiated the design and planning of a secondary wastewater treatment facility. It was constructed from 1979 to 1981, with 75 percent of the project's $36 million cost defrayed by the EPA's Construction Grants Program. Because an additional 15 percent of the construction cost was defrayed by the state, Fall River was required to provide only 10 percent of the capital necessary to comply with the federal mandate. Finally, during the last decade, the city voluntarily implemented an industrial pretreatment program.[31] This series of improvements to Fall River's wastewater treatment process produced a system that complied with the water-quality standards established under the water control amendments of 1972 and with the provisions of the Clean Water Act of 1977. The city's most recent environmental study indicates that under dry-weather conditions, discharges from the city's sewer system no longer disturb water quality sufficiently to affect the normal life of receiving waters.

However, because the Water Quality Act of 1987 defined combined sewer overflows as a point source of pollution, Fall River responded to changing federal policy by commissioning a Phase I CSO facilities plan, which was completed by the Maguire Group, Inc., in November 1987. As a result of findings reported in the plan, Fall River implemented a further $12 million rehabilitation of its combined sewer to reduce infiltration inflows to the system. The city also instituted new collection system controls that include the routine cleaning of sewer lines to reduce back pressure and the addition of weirs to the CSO structures to prevent outflows during low-flow periods. These improvements have virtually eliminated dry-weather CSOs and limited CSO discharges during periods of light rainfall.[32]

Yet during moderate to heavy rainfalls, excess flows continue to build up in the combined sewer and discharge, untreated, into receiving waters. Currently the city's combined sewer has nineteen outfall points that discharge into Mount Hope Bay (13), the Quechechan River (4), and the Taunton River (2). These outfalls are estimated to contribute about 941 million gallons per year of untreated wastewater to the receiving waters.[33] Fecal coliform is the main pollutant discharged during Fall River's combined sewer overflows, although the most recent study of their environmental impact indicates that after a combined sewer overflow, fecal coliform levels in Mount Hope Bay return to prestorm levels within twenty-four to forty-eight hours.[34]

Nevertheless, after the Environmental Protection Agency released its combined sewer overflow control strategy in August 1989, the anticipated change in administrative policy placed Fall River in technical violation of its National Pollutant Discharge Elimination System permit, mainly because of the combined sewer overflows that occur during moderate to heavy rainfall. On September 29, 1989, the EPA issued an administrative order to the city of Fall River, citing the discharge of untreated storm and sanitary wastewater from the nineteen combined sewer outfalls as a violation of its NPDES

permit (MA0100382). The administrative order required the city to submit a Phase II draft CSO facilities plan to the EPA and to the Massachusetts Department of Environmental Protection (MDEP) by November 1, 1990. The Phase II plan was required to assess alternative solutions to the Fall River CSO problem and to recommend a solution in conformity with EPA and MDEP planning guidelines.[35]

Phase II planning resulted in a recommendation that Fall River construct an off-line deep-tunnel storage facility. The consultant's recommendation is to bore a 4.6 mile, 18-foot-diameter tunnel 150 feet below ground, giving the tunnel a storage capacity of 48.3 million gallons. During periods of rainfall, excess combined sewer flows would be routed into the deep tunnel and stored so that combined flows neither overload the treatment facility nor discharge into receiving waters. Once rainfalls end and flow levels to the treatment facility return to normal, excess wastewater stored in the deep tunnel would be pumped to the publicly owned treatment works, where it can receive primary and secondary treatment. The proposed deep-tunnel storage alternative will not entirely eliminate combined sewer overflows, but it will reduce the number of CSOs to four per year, a level of CSO abatement sufficient to comply with the EPA's CSO control policy and the MDEP's combined sewer overflow strategy.[36]

In the meantime, the city of Fall River was also sued by the New England Conservation Law Foundation, Inc., under provisions of the Clean Water Act. The U.S. District Court, District of Massachusetts, issued an enforcement order on March 11, 1992, which dictated a strict planning and construction timetable for the proposed CSO facility in Fall River.[37] The federal court's timetable is consistent with the schedule for statewide CSO control established by the Massachusetts Department of Environmental Protection, which estimates that CSO abatement in the state will take at least fifteen to twenty years. However, the document establishing the statewide CSO control strategy also acknowledges that "the limitation in funds will be the major obstacle to achieving water-quality standards in [the state's] CSO impacted areas."[38]

Funding CSO Abatement

The total capital cost of the proposed deep-tunnel storage facility in Fall River is estimated to be $115 million. This mandated cost is imposed despite the fact that Fall River remains in a chronic condition of economic and fiscal distress.[39] For instance, its economy depends heavily on a declining manufacturing base that still accounts directly for more than one-third of all the city's employment and wages. Since 1986, Fall River's total employment base has declined by more than 7 percent, for a net loss of 2,659 jobs. This figure is roughly 50 percent higher than that for statewide job losses during the same period; similarly, unemployment over the entire course of the last business cycle was approximately 50 percent higher than the statewide average. As of March 1996, the city's unemployment rate was more than 14 percent and exceeded 19 percent during the trough of the 1990–1991 recession.

Not surprisingly, standard measurements of Fall River's fiscal capacity indicate that the city's ability to raise revenue locally is far below average. First, Fall River residents are among the poorest in the state of Massachusetts. Fall River's per capita income of $10,966 (1989) is only 62 percent of the statewide average and ranks 348th of 351 Massachusetts municipalities. Similarly, Fall River's median household income of $22,452 (1990) is only 54 percent of the statewide average and ranks 347th of the 351 municipalities. Second, while the main own-source revenue for Massachusetts munici-

palities is the property tax, Fall River's residential, commercial, and industrial property values are in a chronically depressed condition. In 1992, total assessed property values per capita in Fall River were $30,752, or only 49 percent of the statewide average, that is, 347th. Consequently, the city has been heavily dependent on state local aid; yet, because of the state's own fiscal crisis, this source of revenue declined by more than 20 percent after fiscal year 1989.

Despite the city's distressed economic condition and abnormally low fiscal capacity, the expectations for federal and state assistance continue to diminish each year. As already documented, federal assistance for wastewater construction projects has been declining for more than a decade, and current authorizations for spending under the Water Quality Act indicate that this trend will continue for the foreseeable future. At the same time, state finances in Massachusetts, as elsewhere, are only beginning to emerge from the severe fiscal crisis that began in 1989.[40] Indeed, recent analyses by state legislative budget officers and others project that state finances will remain precarious in most states for the near future.[41] Finally, as a result of declining federal and state assistance for water pollution abatement, the financial capacities of the Massachusetts state revolving fund appear inadequate to support the numerous abatement projects eligible for funding.

As previously noted, passage of the Water Quality Act of 1987 dramatically altered the Construction Grants Program by shifting the main responsibility for administering wastewater treatment grants from the Environmental Protection Agency to the state revolving funds. In 1989, the commonwealth of Massachusetts complied with the requirements of the Water Quality Act by creating a state revolving fund under Chapter 275 of the Massachusetts General Laws. The fund is managed as the Massachusetts Water Pollution Abatement Trust (MWPAT) under the Massachusetts Department of Environmental Protection.

Nationwide, CSO abatement has been costing from $1,300 to $2,500 per capita for households served by a combined sewer system.[42] Thus, estimates based on these averages predict that CSO abatement in Massachusetts will require from $2.5 billion to $4.9 billion in capital outlays over the next fifteen years and, in fact, the EPA's total documented needs for CSO abatement in Massachusetts already exceed $2.7 billion.[43] Three CSO projects alone, serving eleven of its twenty-six affected communities, have a known cost of more than $2 billion — Boston/Massachusetts Water Resource Authority at $1.6 billion, Lower Connecticut River Valley at $350 million, and Fall River at $115 million.

Hence, to meet the timetable established by the state's CSO control strategy, the MWPAT would need to advance approximately $300 million annually in capital outlays simply to address the state's CSO problem. However, in its first four years the MWPAT received state and federal capitalization funds sufficient to issue only $120 million in loans. The MWPAT's financial plan predicted that $661 million in new projects would be funded through 1995, but nearly three-quarters (74%) of that sum was allocated to the Massachusetts Water Resources Authority for the Boston Harbor cleanup and to the city of New Bedford for the construction of a secondary treatment facility.[44] It is evident that the current and anticipated resources of the MWPAT are inadequate to meet CSO water-quality mandates within a fifteen-year time frame, particularly since secondary treatment remains a higher-level priority in the competition for limited funds.

As a result, Massachusetts, like many states, has gradually been shifting the costs of federal water pollution mandates onto municipalities. The state's original SRF guide-

lines established so-called 45 percent grant equivalency awards for municipal water pollution abatement projects deemed federally eligible and, therefore, entered on the MDEP's state priority list. A 45 percent grant equivalency is achieved by advancing the full capital cost of a project as a loan to the municipality. Interest payments on the loan are heavily subsidized from reserve and equity funds controlled by the MWPAT and are further defrayed by annual payments made to the MWPAT by the state on behalf of municipalities with outstanding loans. The effect of these subsidies is that a 45 percent award appears to the recipient to be a loan amortized at approximately 3 percent simple interest over twenty years.

Significantly, the Massachusetts DEP's original policy intent was to also provide 75 percent grant equivalency awards for priority-listed projects in so-called hardship communities. A 75 percent grant equivalency is achieved by first advancing the full capital cost of a project to the eligible municipality. The MWPAT raises the grant from 45 percent to 75 percent by forgiving 25 percent of the loan, effectively writing off this portion of the principal. The remaining principal is repaid at near zero percent subsidized simple interest.

When Phase I planning of the Fall River CSO project was approved for construction grants funding in 1983, it received, as a hardship community, an outright 90 percent grant rather than a loan. Thus, as the project developed over the following decade, it was widely expected by city officials, business leaders, and citizens that the remainder of the project — Phase II design and Phase III construction — would continue to qualify for at least a 75 percent grant equivalency award under the MDEP's hardship provisions.

However, the original design and program guidelines for the state revolving fund were premised on fiscal conditions that ceased to exist soon after the program's start-up in 1989. As the state's fiscal condition failed to improve significantly, MWPAT guidelines were amended in 1992 to reduce the grant equivalency awards available to the state's municipalities for water pollution abatement (Chapter 205, M.G.L.). The category for hardship communities was abolished.[45] Furthermore, projects remained eligible for 45 percent grant equivalency awards only if they were placed on the state's priority list before 1992. Thus, the Phase II design costs for Fall River's CSO project may qualify for 45 percent grant equivalency assistance, but given other changes to the MWPAT guidelines, it is quite definite that Fall River will not receive a similar equivalency for the more costly Phase III construction.

The 1992 Chapter 205 amendments reduced MWPAT loans from 45 percent to 25 percent grant equivalency for projects placed on the state's priority list in 1992 or afterward. A 25 percent grant equivalency is achieved by decreasing the interest rate subsidies provided on MWPAT loans. Since the actual construction phase of Fall River's CSO project has been postponed by a court decision, it will qualify at best for a 25 percent award. Under this scenario, Fall River would have to triple its municipal sewer fees or raise property taxes by 24 percent simply to finance the CSO project. However, there is no guarantee that the project will be funded either in part or in its entirety, since the MWPAT's own fiscal capacities are under stress. If Fall River is required to finance its project entirely through its own resources, the city would be required to quintuple municipal sewer fees or raise property taxes by 43 percent.

Consequently, as Fall River's CSO project has developed through its various phases, federal and state financial assistance have steadily withered away. A CSO project becomes more costly in each succeeding stage as it moves from Phase I planning to

Phase II design to Phase III construction. Yet, in moving through each of these phases, Fall River has encountered a steady decline in assistance, from a 90 percent grant for the least expensive phase of the project, to a likely 45 percent grant for the slightly more expensive Phase II design, to a possible 25 percent grant for construction of the CSO facility. Moreover, given the MWPAT's fiscal constraints, there is a strong likelihood that the city will have to finance all or part of the project through a municipal bond issue paid for with dedicated increases in municipal sewer fees or property taxes.

However, under either scenario, calculations of projected debt ratio indicate that Fall River may be required to exceed even the emergency debt ceiling established by state law, which limits cities to a debt ratio of 5 percent of equalized assessed property values.[46] Thus, in order to comply with the federal CSO mandate, the city would have to violate state laws concerning municipal finance or obtain a special waiver from the state's Emergency Finance Board. Significantly, Fall River's Moody bond rating of only Baa1 is already among the lowest in the state despite the city's merely average per capita debt load.

Hence, in complying with the federal CSO mandate, it is quite possible that the city's bond rating will fall to junk bond status, namely Ba1 or lower, and in using up the city's available credit, the CSO project will crowd out approximately $100 million in ready-to-go capital spending required to rebuild the city's ailing human and physical infrastructure.[47] In effect, compliance with the federal court order could force Fall River to sacrifice schools, fire and police protection, and drinking water improvements to combined sewer overflow abatement. Nevertheless, Fall River has been forced to move forward on the CSO project according to a strict timetable established by the U.S. District Court without regard to fiscal realities. As a result, the city is wedged between the mandate of a national policy and the constraints of local economic and fiscal conditions.

The Prospects for Fiscal Relief

Any realistic appraisal of federal and state fiscal policies suggests that municipal officials cannot expect any significant relief from unfunded water-quality mandates in the foreseeable future. While a variety of legislation is pending at both the federal and the state levels, this legislation, even if passed in toto, will still offer limited relief to municipalities and ratepayers. Indeed, the structural gap between the costs of federal water-quality mandates and the fiscal resources available to meet those mandates, which continues to grow wider, is not likely to be closed during the remainder of the decade.

Pending legislative initiatives that claim to offer relief consist of two types: (1) direct financial assistance to municipalities for water-quality improvements and (2) indirect assistance to sewer ratepayers through individual tax subsidies. The most significant direct-relief initiative pending at the federal level is a reauthorization of the Water Quality Act, which had been expected to pass Congress by the end of 1994. It is widely expected that the reauthorization, if it ever moves forward, will contain at least three significant changes involving the financing of water-quality mandates.[48] First, the new act was expected to provide an initial federal authorization to the state revolving funds of $2.5 billion with the authorization increasing to $5.5 billion by FY 2000. Thus, if Congress actually appropriates the full amount authorized by the Water Quality Act of 1994, and if individual states fully match the federal appropriation, the SRFs would receive an additional $35 billion in capitalization by the end of the decade. Second, the

new act will also create a special class of "hardship communities" defined as municipalities in which sewer rates exceed a fixed percentage (most likely 1.25%) of median household income. Under the proposed language, state revolving funds will be allowed to make negative-interest-rate loans, in effect a partial grant, to hardship communities, if a state legislature passes separate legislation authorizing its SRF to grant negative-interest-rate loans. Finally, the new act will probably authorize SRFs to extend the loan repayment period from twenty to thirty or forty years for hardship communities, effectively reducing the annual outlays of the affected municipalities by 25 percent or more, although the total debt load will not be affected by this provision.

While such changes are an important step in the right direction, several caveats are in order. Congress has indicated its intent to withdraw from any further financing of water-quality improvements once the reauthorized Water Quality Act expires in FY 2000. By that time, Congress insists that the SRFs are to be fully self-financing revolving funds capable of meeting water-quality mandates without additional federal assistance. However, the simple fact is that capitalization of the SRFs will not be sufficient to meet the cost of existing water-quality mandates based on EPA estimates. The EPA's most recent needs survey concludes that the known cost of meeting existing mandates under the Clean Water Act will be $137.1 billion over the next twenty years. Combined sewer overflow projects alone will require $41.2 billion during the same period.[49] So even if Congress and the states appropriate the full $35 billion expected under the new Water Quality Act, it will still leave an unfunded water-quality mandate of more than $102 billion (of which CSOs are the single largest component).

Thus, the act will not fundamentally resolve the problem of unfunded water-quality mandates. Consequently, unless key state governments plug the $102 billion structural gap, many municipalities may receive no SRF assistance, or insubstantial amounts, for otherwise SRF-eligible projects simply because of inadequate federal funding. Massachusetts has made some effort to increase direct assistance during the last two fiscal years. In FY 1994, the state appropriated an additional $30 million in direct grants to the Massachusetts Water Resource Authority (MWRA) for rate relief in the forty-three communities it serves. For FY 1995, the state approved an additional $50 million, including $10 million for non-MWRA ratepayers. These special appropriations have helped to slow the pace of rate increases in MWRA communities, but total state assistance is still minuscule compared with the $7.7 billion in total documented needs — $2.7 billion for CSOs — identified for Massachusetts by the EPA.[50]

Not surprisingly, as this structural gap continues to unwind, elected officials are being pressured toward additional responses by a burgeoning ratepayers' revolt. Various proposals for indirect tax relief have been proposed that aim to subsidize individual ratepayers in municipalities burdened by water-quality mandates. For example, in 1993 Massachusetts amended its SRF statute to allow municipalities with enterprise funds — a minority of the state's towns and cities — to repay the capital costs of SRF loans with property tax revenue rather than sewer fees.[51] This change covertly effects a federal subsidy through state legislation by making individual ratepayers eligible to use the property tax deduction on federal personal income taxes as a way of defraying the costs of sewer construction.

Significantly, however, such a change offers no relief to the vast majority of ratepayers, even in eligible communities, because most taxpayers do not itemize deductions on the federal income tax form. Similarly, Massachusetts senators Edward Kennedy and John Kerry have proposed federal tax legislation that allows individuals to deduct from

personal income taxes those portions of sewer and water bills which exceed one percent of adjusted gross income.[52] This proposal suffers from the same problem as the state plan, unless it is somehow structured differently from the existing property tax deduction to allow the deduction without itemization. Hence, nothing on the existing legislative agenda offers much promise of substantial relief for municipalities or ratepayers. Indeed, at this point, it is not even clear whether Congress will reauthorize the Water Quality Act.

Assessing the Cost of Compliance

A national policy that ignores local economic and fiscal capacities may be reasonable when that policy includes a substantial effort to federally fund the mandate. In the past, the local economic and fiscal impact of federal water-quality mandates was mitigated by deep federal subsidies, particularly capital grants, that alter the cost-benefit equation from a local standpoint. Furthermore, previous mandates for primary or secondary treatment were far less costly than the available options for controlling combined sewer overflows. For most municipalities, CSO abatement costs many times more than the construction of secondary treatment facilities.[53] In this respect, the Water Quality Act of 1987 and the EPA CSO control strategy have imposed far more costly mandates than in the past during a period of declining federal assistance.

In this context, declining federal subsidies, uncertain state finances, a weak local tax base, and a weak local economy can drastically shift the cost-benefit equation for the construction of CSO facilities, particularly for declining and deindustrializing cities. However, until recently there has been little concern for the economic and financial calculations of municipalities to the extent that EPA regulations and court decisions have consistently enforced a water-quality standards approach to the CSO problem in the United States.

According to the EPA's own CSO benefit analysis guidelines, the water-quality standards approach "assumes that certain water-quality standards are associated with the protection of water uses . . . although the connection may not always be scientifically defensible."[54] Instead, biochemical water-quality standards establish regulatory guidelines as a surrogate measure of benefits, irrespective of whether any real marginal cost benefits are realized by a local community subject to those standards. Interestingly, EPA guidelines require communities to assess the comparative cost-benefit ratio of different CSO abatement options after the federal mandate has been imposed, but the statutory guidelines do not require an analysis of whether the mandate itself is economically and fiscally feasible for a particular municipality.

However, because it is unlikely that significantly increased federal funding will be forthcoming any time soon, it is necessary to establish criteria for allocating and targeting the limited resources available to those municipalities whose maximum water-quality improvement may occur with a minimum of economic and fiscal cost to municipalities. Such criteria would allow for flexible enforcement of the CSO control strategy along a continuum that would permit the postponement, delay, or extension of high-cost CSO projects that are unlikely to produce any significant beneficial use from the anticipated water-quality improvements. Such decisions would be greatly enhanced if federal-level environmental impact statements and state-level environmental impact reports were considered by regulators and judges in conjunction with an economic and fiscal impact statement.

The U.S. Environmental Protection Agency took a significant step in this direction in April 1994 in the final draft of its new combined sewer overflow control policy. It was released to clarify the enforcement standards and implementation of EPA's 1989 strategy. Although the new policy still requires municipalities to comply with technology-based and water-quality-based CSO standards "as soon as practicable," for the first time enforcement schedules are to be developed that consider financial feasibility for municipalities in addition to the long-standing criterion of physical feasibility, that is, technology-based standards. Thus, on publication of the new CSO control policy, EPA administrator Carol M. Browner noted that it "recognizes the site-specific nature of CSOs and their impacts and provides the necessary flexibility to tailor controls to local situations."[55]

Nevertheless, the EPA's new regulatory guidelines apply only to the issuance of NPDES permits and to EPA administrative orders.[56] Federal courts, as in Fall River, are still not required to consider financial feasibility, and the federal court had until recently been unwilling to consider any criterion other than physical feasibility in the development of an implementation schedule. Hence, at this point the EPA's increasingly flexible enforcement of CSO mandates and the federal court's literal enforcement of the CSO mandate are creating two separate standards: a strict standard for municipalities where private environmental groups have filed suit in federal court and a flexible standard for all other municipalities. The next logical step toward resolving these conflicting standards would be to incorporate the EPA's new CSO control policy, particularly its references to financial feasibility, into the Water Quality Act. Furthermore, the requirement that an economic and fiscal impact statement be weighed in the development of any court-ordered enforcement schedule would at least introduce additional considerations into judicial proceedings that would both encourage and allow greater flexibility in deciding the speed and the extent to which the CSO mandate should be implemented in particular municipalities. ❧

Notes

1. U.S. Environmental Protection Agency (henceforth, EPA), *1992 Needs Survey: Report to Congress* (Washington, D.C.: Office of Water, 1993), 2.
2. Larry Morandi, *Wastewater Permitting and Finance: New Issues in Water Quality Protection* 17, no. 8 (Denver: National Conference of State Legislatures, 1992).
3. EPA, *Assessment of Needed Publicly Owned Wastewater Treatment Facilities in the United States: 1984 Needs Survey Report to Congress* (Washington, D.C.: Office of Municipal Pollution Control, 1985).
4. The resuspension of dry-weather sediments is an inherent characteristic of combined sewers because they are sized for a wide range of flow rates and are therefore not designed to maintain a self-cleansing velocity during low-flow dry-weather periods.
5. A leading national study detected forty-six priority toxic pollutants in CSO discharges throughout the United States. Zinc, nickel, lead, copper, and chromium were the toxic elements present in the highest average concentrations; trichloroethene, methylene-chloride, tetrachloroethene, 1,1,1-trichlorethane, and toluene were the organic pollutants detected in the highest average concentration. E-coli bacteria are routinely encountered in CSO discharges; see Michael A. Crawford and Charles Goodwin, *Combined Sewer Overflow Toxic Pollutant Study* (Washington, D.C.: EPA, Effluent Guidelines Division, 1984). Also see V. P. Olivieri, C. W. Kruse, and K. Kawata, *Microorganisms in Urban Stormwater* (Cincinnati: EPA, Environmental Research Information Center, 1977); EPA, *Urban Stormwater and Combined Sewer Overflow*

Impact on Receiving Waters (Cincinnati: Municipal Environmental Research Laboratory, 1979); EPA, *Fate and Effects of Particulates Discharged by Combined Sewers and Storm Drains* (Cincinnati: Environmental Research Information Center, 1980).

6. EPA, "Effluent Guidelines and Standards," 40 *Code of Federal Regulations,* Parts 401–460, for individual point-source-category permitting regulations.
7. Ibid., Part 133.
8. EPA, *Report to Congress on Control of Combined Sewer Overflows in the United States* (Washington, D.C.: Office of Water Program Operations, 1978).
9. Morandi, *Wastewater Permitting,* 1.
10. Water Quality Act of 1987, 33 U.S.C. 1251 et seq., P.L. 100-4, *United States Statutes at Large,* vol. 101.
11. The policy states, "CSO point sources currently discharging without a permit are unlawful and must be permitted or eliminated"; see 54 *Federal Register,* 37370.
12. John C. Hall, Christopher L. Rissetto, and Joseph M. Santarella, Jr., "Control Strategies for Combined Sewer Overflow," *Journal of the Water Pollution Control Federation* 61 (August 1989): 1409–1413; Catherine A. Simpson, "EPA Issues CSO Control Plan," *Pollution Engineering,* February 1, 1993, 24.
13. Municipalities that violate NPDES permits are potentially liable for civil penalties of up to $25,000 per day for each violation. The EPA is also authorized to impose administrative penalties of up to $125,000.
14. Morandi, *Wastewater Permitting,* 3.
15. Thomas E. Walton and Virginia R. Hathaway, *Benefit Analysis for Combined Sewer Overflow Control* (Cincinnati: EPA, Environmental Research Information Center, 1979), 6–7.
16. R. Wycoff, J. Scholl, and S. Kissoon, *1978 Needs Survey: Cost Methodology for Control of Combined Sewer Overflow and Stormwater Discharge* (Washington, D.C.: EPA, 1979).
17. Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251, et seq., P.L. 92-500, *United States Statutes at Large,* vol. 86; Clean Water Act of 1977, 33 U.S.C. 1251 et seq., P.L. 95-217, *United States Statutes at Large,* vol. 91.
18. EPA, "Program Requirements Memorandum," No. PRM 75-34 (1976); EPA, "Program Requirements Memorandum," No. PRM 77-4 (1976).
19. EPA, *Report to Congress on Control of Combined Sewer Overflows,* ES-3.
20. Ibid., ES-1.
21. It should be noted that CSO facilities affecting marine bays and estuaries account for about 40 percent of the total assessed dollar needs attached to CSO correction and about 38 percent of the total population served by combined sewers; EPA, *1984 Needs Survey Report to Congress,* 15.
22. The 1981 amendments do allow up to 10 percent of each state's regular CGP allotment to be advanced to potential grant applicants to cover the costs of facility planning or the preparation of plans, specifications, and estimates.
23. Municipal Wastewater Treatment Construction Grant Amendments of 1981, 33 U.S.C. 1251 et seq., P.L. 97-117, *United States Statutes at Large,* vol. 95.
24. Walton and Hathaway, *Benefit Analysis for Combined Sewer Overflow Control,* 31.
25. Patrick MacAuley and Renée Mathieu, "Federal Construction-Related Expenditures, 1980 to 1988," *Construction Review,* March/April 1987, 2–18.
26. Ibid., 3, 13.
27. EPA, *Cost Estimates for Control of Combined Sewer Discharge to Marine Bays and Estuaries: Addendum to 1982 Needs Survey* (Washington, D.C.: Office of Water Programs Operations, 1983).
28. National Governors Association, *Fiscal Survey of the States,* Washington, D.C., April 1992, vii–viii.
29. Corina L. Eckl, Anthony M. Hutchinson, and Ronald K. Snell, *State Budget and Tax Actions, 1992: Preliminary Report* (Denver: National Conference of State Legislatures, 1992).
30. "CSO Problems Prompt Cities to Organize," *Public Works,* March 1990, 107–109.
31. Maguire Group, Inc., *City of Fall River CSO Phase II Facilities Plan: Final CSO Facilities Plan,* 3 vols. (Boston, 1992), vol. 3, I-2-3.

32. Ibid., II-16.
33. Ibid., I-1.
34. Ibid., II-16-20.
35. Ibid., ii.
36. Commonwealth of Massachusetts, *Combined Sewer Overflow Strategy* (Boston: Department of Environmental Protection, Bureau of Resource Protection, 1990), identifies twenty-six communities and sewer districts, including Fall River, with combined sewer overflow problems. These communities and districts serve a population of almost 2 million residents or roughly one-third of the state's total population.
37. United States District Court, District of Massachusetts, "Order." *Conservation Law Foundation of New England, Inc. vs. City of Fall River,* Civil Action No. 87-3067-Z (March 11, 1992).
38. Ibid., 1.
39. All data in this section are from the Massachusetts Department of Employment and Training, ES-202 Files, and the Massachusetts Department of Revenue Municipal Data Bank.
40. Massachusetts Taxpayers Foundation, *State Budget Trends: An Analysis of the Governor's Fiscal 1992 Budget* (Boston, 1991); Joseph S. Slavet, Raymond G. Torto, Edmund Beard, and Louis C. DiNatale, *After the Miracle: A History and Analysis of the Massachusetts Fiscal Crisis* (Boston: John W. McCormack Institute of Public Affairs, 1990); Joseph S. Slavet and Raymond G. Torto, *After the Honeymoon: Conjugal Bliss or Fiscal Chaos?* (Boston: John W. McCormack Institute of Public Affairs, 1991).
41. Commonwealth of Massachusetts, *Quality and Commitment: Senate Committee on Ways and Means FY 1993 Budget; Volume One: Analysis and Narratives* (Boston, 1993); Joseph S. Slavet and Joseph R. Barresi, *Fiscal Smell Tests: A Mid-Term Reality Check of Massachusetts Finances* (Boston: John W. McCormack Institute of Public Affairs, 1993).
42. Steve Wordelman, "CSO Regulations' Impact on Municipalities," *Public Works,* October 1991, 53–54; "CSO Problems Prompt Cities to Organize."
43. EPA, *1992 Needs Survey,* A-2.
44. Commonwealth of Massachusetts, *Finance Plan* (Boston: Massachusetts Water Pollution Abatement Trust, 1993).
45. Projects placed on the state's priority list before 1989 are still eligible for 75 percent grant equivalency awards under the Massachusetts Water Pollution Abatement Trust Commonwealth Fund.
46. Commonwealth of Massachusetts, *Laws Relating to Municipal Finance and Taxation,* Department of Revenue, Division of Local Services, Municipal Bulletin No. 30 (St. Paul: West Publishing, 1993).
47. Fall River Regional Task Force, *A Fall River Public Schools Building Needs Update: "The Ganbatte Report"* (Fall River, Mass., 1991); City of Fall River, "1993 Ready-to-Go Community Development Block Grant Projects," submitted to the U.S. Conference of Mayors, 1993.
48. "Water Quality Act," H.R. 3948. The Water Quality Act of 1994 was still pending as this article was being written. Thus, the analysis is based on advanced drafts of the bill, available since March of 1994, and on conversations with congressional staff.
49. EPA, 1992 *Needs Survey,* 2.
50. Peter J. Howe, "$15.3b Budget Gets Initial Senate OK with Sewer Rate Aid," *Boston Globe,* June 22, 1993, 18; EPA, *1992 Needs Survey,* A-2.
51. Peter J. Howe, "Water-Rate Relief Plans Flow on Beacon Hill: Senate Budget to Offer Tax Deduction Idea," *Boston Globe,* June 16, 1993, 30.
52. Scott Allen, "Kennedy, Kerry Say Boston May Get $100m for Harbor Cleanup," *Boston Globe,* June 22, 1993, 10; Elizabeth Neuffer, "Clean-Water Mandate Confounds U.S. Customers," *Boston Globe,* June 22, 1993, 1, 10.
53. Clyde Wilber, "CSOs: Water-Quality-based Controls," *Water Environment & Technology,* July 1991, 80.
54. Walton and Hathaway, *Benefit Analysis for Combined Sewer Overflow Control,* 39–40.
55. EPA, "Combined Sewer Overflow (CSO) Control Policy," 40 *Code of Federal Regulations,* part 122, April 1994.

56. The flexibility established by the EPA's new CSO Control Policy will be incorporated into the Water Quality Act of 1994 by extending the attainment of water quality standards to "not later than December 31, 2009." However, the expected language does not apply this extension to any municipality where a federal court order or consent decree has established an earlier compliance deadline.