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BY THE COMPTROLLER GENERAL

# Report To The Congress

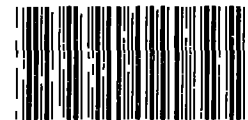
OF THE UNITED STATES

## User Charge Revenues For Wastewater Treatment Plants--Insufficient To Cover Operation And Maintenance

Half of the 36 municipal wastewater treatment plants GAO reviewed in 10 States were not raising sufficient funds from their user charge systems to cover operation and maintenance costs

Only 3 of 36 municipalities were setting aside funds to replace treatment plants when they reached the extent of their economical/technological life Many municipalities indicated that they would return to the Federal Government for replacement funding

GAO is recommending actions to improve administration of the user charge program GAO also believes the Congress should consider who will be responsible for funding future treatment plant replacement



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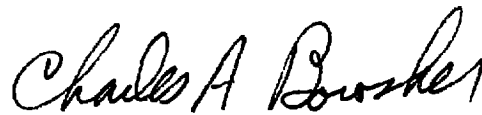
To the President of the Senate and the  
Speaker of the House of Representatives

Billions of dollars in Federal grants have been made to thousands of municipalities throughout the Nation to construct publicly owned wastewater treatment plants. Once constructed, municipalities are responsible for raising sufficient monies from system users to properly operate and maintain these plants.

We made our review to determine whether user charge revenues collected by municipalities are sufficient to properly operate and maintain the treatment plants; whether such costs are fairly and equitably distributed among system users; and whether sufficient revenues are being generated to pay for replacing major capital items in the plants such as large pieces of equipment.

This report also asks who--Federal, State, or local governments--will be financially responsible for replacing the treatment plants when they reach the extent of their economical/technological life.

We are sending copies of this report to the Director, Office of Management and Budget, the Administrator, Environmental Protection Agency, interested congressional committees; and other interested parties.



Comptroller General  
of the United States

D I G E S T

Many billions of Federal, State, and local dollars have been invested to build municipal wastewater treatment plants. Once these plants were built, the Congress intended that municipalities would raise sufficient funds, through fair and equitable user charge systems, to operate and maintain them. GAO found that half of the 36 municipal treatment plants, randomly selected in 10 States, were not charging users enough to cover operation and maintenance costs and were relying on other municipal revenue sources for funds. Also, 40 percent are not charging all users their fair and equitable share of costs. The impact? The future successful operation of costly treatment facilities may be in jeopardy, and the Nation's clean water goals may not be achieved. (See pp. 8 to 13.)

Replacing the thousands of Federally funded plants will require billions of dollars. Current Federal legislation is silent on the sources of funds for plant replacement. Only 3 of the 36 municipalities are now setting aside replacement funds. Twenty-three indicated that they would return to the Federal Government for replacement funding; the remaining 10 were undecided. (See pp. 27 to 30.)

GAO made this review to determine whether user charges being collected were equitable and satisfied the Congress' intention of self-sufficient treatment operations. Also, GAO wanted to see if user charges are sufficient to pay for replacing large equipment items and eventually the facility itself. GAO believes this review will help the Congress as it considers reauthorizing the Clean Water Act in 1982. (See p. 5.)

USER CHARGE SYSTEMS ARE INADEQUATE

Eighteen of 36 municipalities GAO reviewed were not collecting sufficient user charge revenues; 20 were not planning for major equipment replacement funds; and 14 were not distributing operation and maintenance costs equitably. Despite inadequate user charge fees, major operation and maintenance problems were not evident at the 36 plants visited. GAO attributes the lack of operating problems to the newness of the plants

and to the fact that municipalities were using other revenue sources to subsidize user charges. Although such practices allow operation and maintenance activities to continue, in GAO's opinion, the act's objective--maintaining self-sufficiency--is not being met. (See p. 8.)

With municipalities relying on other revenues to finance operation and maintenance costs, the need to eventually replace major equipment items can significantly strain local financial resources. For example, in 1975 Urbana, Ohio, agreed to place \$14,000 per year in a replacement fund. However, the first \$14,000 contribution was not budgeted until 1980 because of insufficient revenues from treatment plant operations. (See pp. 11-14.)

Inequitable user charge systems allow a few users to benefit while many users pay excessive charges. For example, Lyndon, Vermont, charges 12 commercial users a rate about 50 percent lower than the rate for its 1,000 residential users. GAO believes these subsidies violate a basic intent of the user charge concept--equity. (See p. 15.)

#### SYSTEMS ARE NOT SELF-SUFFICIENT

As a grant condition, municipalities agree to periodically review and update user rates and classes to meet increased costs or changing operating conditions. Fifteen of the 36 municipalities had not made these reviews, giving such reasons as (1) the municipality's annual budget review was considered adequate, (2) the municipality had remained virtually unchanged and therefore no review or update was required, or (3) raising user rates regardless of financial need was considered politically unacceptable. (See p. 21.)

None of these reasons, in GAO's opinion, justify not reviewing, updating, and revising user charges.

Neither the Environmental Protection Agency (EPA) nor those States that can approve user charge systems have followup programs to verify a municipality's compliance with user charge grant conditions. While EPA regulations provide that municipal systems may be reviewed by EPA, this option was not exercised at any of the 36 municipalities.

Even if the review option were exercised and shortcomings identified, no enforcement program exists under which penalties could be assessed for noncompliance. (See p. 23.)

GAO believes that both a followup program and an enforcement mechanism could be tied to the National Pollutant Discharge Elimination System Permit Program. Incorporating the requirements for user charge system reviews into permit compliance inspections would allow EPA and the States to evaluate user charge systems without much additional effort. (See p. 25.)

#### RECOMMENDATION TO THE CONGRESS

The Congress should consider whether the Federal Government will further participate in treatment plant replacement. If it should decide that State and/or local governments are to be held responsible, these governments must be made aware of this requirement so that they can begin planning for such future expenditures. (See p. 30.)

#### RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

To improve the user charge program, GAO recommends that the Administrator, EPA:

- Provide instructions to municipalities that clearly state (1) the purpose of the user charge program, (2) that except for ad valorem taxes, direct user charges are the only funding source authorized for financing treatment plant operations and maintenance, (3) the need to review and revise the user charge system in accordance with Federal regulations and grant agreements, and (4) the need to maintain the treatment plants' financial integrity and self-sufficiency.
- Incorporate, in existing operation and maintenance inspections and closeout financial audits of construction grants, a review of user charge system adequacy, including a review of the adequacy of reserve accounts for replacing major equipment considered essential for continued plant operations. (See p. 20.)
- Incorporate the user charge system requirements under the National Pollutant Discharge Elimination System Permit Program. (See p. 26.)

#### AGENCY COMMENTS

In its comments on GAO's draft report, EPA generally agreed with the report findings and said that a recent EPA management evaluation of nine utilities in the Northeast United States resulted in similar conclusions. EPA stated that

it will look to ways of developing financial management guidance for use by municipalities.

EPA, however, disagreed with GAO's recommendation to incorporate, as part of existing operation and maintenance inspections and closeout financial audits of construction grants, a review of user charge system adequacy, including a review of reserve accounts for replacing major equipment, and of incorporating the user charge system requirements under the National Pollutant Discharge Elimination System Permit Program. (See pp. 19 and 25 )

EPA stated that the primary determination to be made in an audit is whether the facility was constructed in conformance with approved plans and specifications and whether it meets applicable effluent discharge limitations. Also, EPA stated that the primary intent of the National Pollutant Discharge Elimination System Permit Program is to establish effluent quality limits, schedules, and reporting requirements. The program is not the appropriate place or means to address the adequacy of a municipal financial management program.

GAO disagrees with EPA on both issues. If, during its inspections and audits EPA determines that a municipality (1) is not providing for equipment replacement, (2) does not have adequate spare parts, (3) lacks qualified operators, and (4) does not have an adequate preventive maintenance program--all of which are dependent upon sufficient operating revenues--then GAO believes it is not a question of if but when the plant will fail. GAO believes that reports issued as a result of inspections and audits are an effective means of communicating to the municipalities deficiencies identified in their user charge programs. (See p. 20.)

The failure of municipalities to provide adequate revenues often results in the lack of spare parts inventories, qualified trained staff to operate the plants, and preventive maintenance programs. GAO believes these inadequacies will inevitably lead to plant failures and permit violations. Therefore, GAO believes user charge requirements should become part of the National Pollutant Discharge Elimination System Permit Program. (See p. 26.)

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ABBREVIATIONS

<b>EPA</b>	Environmental Protection Agency
<b>GAO</b>	General Accounting Office
<b>MGD</b>	million gallons per day
<b>NPDES</b>	National Pollutant Discharge Elimination System

## GLOSSARY

Ad valorem taxes	A tax based upon the value of real property.
Effluent	The wastewater discharged by an industry or municipality
Primary waste treatment	Treatment usually involving screening and sedimentation for removal of the larger solids in wastewater. This process removes about 30 percent of biological oxygen demand from domestic sewage.
Secondary waste treatment	Treatment using biological processes to accelerate the decomposition of sewage. The process removes about 80 to 90 percent of the biological oxygen demand from domestic sewage.
Useful life	The estimated period of time during which a treatment works or a component of a waste treatment management system will be operated.
User classes	A group of users having similar flow and wastewater characteristics. For example, EPA recognizes user classes for residential, commercial, and industrial users.

## CHAPTER 1

### INTRODUCTION

For centuries, nature itself was able to keep our country's lakes and rivers clean. However, the daily discharge of billions of gallons of polluted wastewater from homes, businesses, and industries has placed more of a strain on many of our waterways than nature can accommodate. This pollution problem has made thousands of miles of rivers, estuaries, and lakes unfit for recreation fish, and other aquatic life and has the potential to contaminate and seriously damage the drinking water supplies for millions of people living in many parts of the country.

This serious situation has been the concern of Federal, State, and local governments, as well as citizen groups, for more than 30 years. To prevent the continued degradation of the Nation's waters and to restore already contaminated rivers, lakes, and streams, wastewater must be treated to remove damaging pollutants before being discharged into waterways. Critical to the success of this removal process are efficiently operated wastewater treatment plants. As of May 31, 1981, approximately 35,000 grants have been awarded to municipalities for wastewater treatment. These grants represent a Federal investment of about \$35 billion.

### WHAT FEDERAL PROGRAM ADDRESSES WATER POLLUTION?

The Federal program to prevent, reduce, and eliminate water pollution is carried out under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, et seq.). This legislation replaces an imprecise, highly judgmental approach toward water pollution with a program setting strict timetables and deadlines for dischargers and establishing more ambitious goals for cleaning up the Nation's waters.

The act's primary objective is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To reach this objective, the act proclaimed two goals for the Nation. One goal, commonly referred to as the "swimmable-fishable" goal, is to restore polluted waters, wherever attainable, to a quality that allows for the protection and propagation of fish, shellfish, and wildlife and for recreation use by July 1983. The other goal is to eliminate all pollutant discharges into the Nation's waters by 1985.

The act requires that, as a minimum, secondary treatment be used by all publicly owned wastewater treatment plants by July 1, 1977, and that by July 1, 1983, these treatment plants use the best practicable waste treatment technology available. The Administrator of the Environmental Protection Agency (EPA), who is responsible for implementing this act, is authorized to

extend the secondary treatment deadline requirements to July 1, 1983, when through no fault of a municipality, plant construction could not be completed in time or where Federal funds had not been made available to the municipality.

HOW IS THE CLEAN WATER  
OBJECTIVE TO BE ACHIEVED?

The goals of the Nation's clean water act are being achieved primarily by constructing or rehabilitating wastewater treatment plants through a Federal construction grants program. This program grew out of a recognition as early as the 1950's that inadequate municipal sewage treatment was a serious contributor to our water pollution and many municipalities were not financially prepared to address this problem. Historically, wastewater agencies were dependent on municipalities' general funds (raised largely from real estate taxes) to support their construction programs and provide money to operate their treatment plants. In the competition for limited money, other public facilities such as schools, libraries, and police and fire departments enjoyed a big advantage over wastewater treatment facilities. This situation led the Congress to establish a construction grants program to help local governments in building and/or upgrading badly needed wastewater collection and treatment facilities.

The Water Pollution Control Act Amendments of 1956 (Public Law 84-660) created the wastewater treatment construction grants program and authorized Federal financial assistance of up to 30 percent of the cost for constructing municipal wastewater treatment plants. Subsequent amendments increased the Federal share of construction costs to 55 percent. Between 1956 and 1972, Federal expenditures for the construction grants program totaled \$5.2 billion. The 1972 amendments to the act increased the Federal contribution to 75 percent and authorized a total of \$18 billion for the construction grants program. Finally, the 1977 amendments to the act authorized an additional \$25.5 billion through fiscal year 1982.

Often, wastewater treatment plants represent the single, largest physical asset owned by a municipality. The costs to construct a plant depend on both its size and the complexity of the treatment process. Plants generally range in size from a few hundred thousand gallons to several hundred million gallons of wastewater flow each day. Construction costs for a plant treating wastewater to the secondary level of treatment can range from several hundred thousand dollars to several hundred million dollars. The following table illustrates 1977 average construction costs for selected size plants using secondary treatment.

Average Construction Costs  
For Secondary Treatment Plants

<u>Flow</u> (million gallons per day (mgd))	<u>Construction costs</u> (millions)
1	\$ 2.6
5	10.5
25	45.0
50	84.0
100	155.0

Note: Figures are in 1977 dollars

Source: "Construction Costs for Municipal Wastewater Treatment Plants, 1973-1977," performed under contract for EPA by Dames and Moore.

With the rates of inflation that have existed during the past 3 years, these costs would be substantially higher if similar facilities were constructed in 1981. For example, based on EPA estimates of changes in the treatment plant construction cost index during the past 3 years, a 5 mgd plant now would cost about \$14 million and a 50 mgd plant now would cost about \$111 million.

HOW IS THE PROGRAM TO BE  
MONITORED AND ENFORCED

The National Pollutant Discharge Elimination System (NPDES) is the principal tool used in the water enforcement program. It is a national permit program to control the discharge of pollutants into waterways from all specific point sources, including industrial treatment plants; municipal treatment plants; certain agricultural, forestry, mining, and fishing operations; and other commercial activities. The system is administered by EPA or an EPA-approved State program.

The permit specifies which pollutants may be discharged and sets daily average and maximum limits on discharges to meet effluent limits and water quality standards. Under the act, discharging any pollutant into the Nation's waterways without a permit is illegal. Violators are subject to stiff penalties--fines, imprisonment, or both--enforceable in court.

HOW ARE TREATMENT PLANTS' OPERATION  
AND MAINTENANCE COSTS FUNDED?

Operation and maintenance costs--unlike construction costs, which are shared by the Federal Government--are borne solely by the municipality and are paid for over the life of the treatment plant. EPA estimates these costs at \$5 billion in 1980 and believes they may reach \$24 billion annually by 1990. The Congress intended that once a treatment plant was built, the municipality would keep it running properly.

Earlier pollution control legislation required grantees to provide for the proper operation and maintenance of treatment plants but did not specify any means of funding to meet this responsibility. The 1972 amendments to the act (Public Law 92-500) introduced the concept of a user charge system and required municipalities to adopt such a system as a condition for obtaining Federal construction grant funds.

The 1972 amendments (section 204(b)) stated the requirements that must be met before grants could be approved.

"\* \* \*the Administrator shall not approve any grant for any treatment works \* \* \* unless he shall first have determined that the applicant (A) has adopted or will adopt a system of charges to assure that each recipient of waste treatment services within the applicant's jurisdiction \* \* \* will pay its proportionate share \* \* \* of the costs of operation and maintenance (including replacement) of any waste treatment services provided by the applicant; \* \* \* and (C) has legal, institutional, managerial, and financial capability to insure adequate construction, operation, and maintenance of treatment works throughout the applicant's jurisdiction \* \* \*."

In its implementing regulations, EPA required municipalities to submit their proposed systems for review and approval during the construction phase of the project. Following EPA's approval of the system and as part of the overall grant conditions, municipalities must agree to (1) annually review the rate structure and revise the rate periodically to reflect actual treatment plant costs and (2) review, not less often than biennially, the wastewater contribution of users and user classes, the total cost of operation and maintenance of the facility, and the approved user charge system. Neither the legislation nor the regulations require any further followup by EPA to ensure that municipalities comply with the grant provision regarding user charge systems.

With the 1977 amendments to the act, EPA was authorized to delegate its user charge system review and approval authority to the States. The States are required to institute a review and approval process at least as stringent as the Federal

Government's. As of July 31, 1981, EPA had granted partial delegation authority to 41 States.

EPA's implementing regulations provide that basically two conditions must be satisfied for an adequate user charge system.

- Operation and maintenance costs for publicly owned treatment works must be equitably distributed to the pollutant sources.
- The user charge revenues generated must be sufficient to cover the operation and maintenance costs of the facility.

By legislation and EPA regulations, user charge revenues must also cover replacement costs. These are expenditures for obtaining and installing equipment, accessories, or appurtenances that are necessary to maintain the capacity and performance during the useful life of the treatment works (estimated by EPA to be between 20-40 years).

User charge requirements were the sole-approved method for financing operations and maintenance costs until a few large municipalities and other interested groups began to voice their opposition to the restrictiveness of the EPA regulations. These municipalities were primarily concerned with the administrative burden and costs associated with changing their existing revenue-collection systems, which were based on an ad valorem tax (see glossary). Therefore, in the 1977 amendments to the act, the Congress authorized the use of ad valorem taxes for residential and small nonresidential users. The use of ad valorem taxes represents the last major change to the user charge requirements.

#### OBJECTIVES, SCOPE, AND METHODOLOGY

We made our review to determine whether the user charges collected by municipalities raise enough money to properly operate and maintain their wastewater treatment plants and whether these charges are fairly and equitably distributed among users. We also wanted to find out whether the charges are sufficient to pay for replacing major capital items such as large pieces of equipment. Although not required, we also wanted to determine if the municipalities were giving any consideration to the eventual replacement of the facility itself. Our review was performed so we could advise the Congress whether municipalities were meeting the objectives of the user charge concept established in the act.

We visited four EPA regional offices, four delegated States' offices, and 36 municipalities in 10 States to obtain firsthand information on how well user charge systems are working. At the municipalities, we limited our work to reviewing the municipalities' financial statements and to identifying sources of revenue used to operate and maintain treatment plants.

We did not, however, perform any detailed reviews of subsidiary financial accounts or verify documents supporting such accounts.

The four EPA regions from which we drew our sample of municipalities were chosen to provide both a cross section of regional activity, as well as broad geographic distribution. At the regional offices, we selected the municipalities to be included in our review. The specific States involved were not selected on any statistical basis, except that we did attempt to select at least one State in each region classified as a delegated State. The regions and States included in our review were:

- Region I (Boston, Massachusetts) - Connecticut, Massachusetts, Rhode Island, and Vermont
- Region V (Chicago, Illinois) - Michigan and Ohio
- Region VI (Dallas, Texas) - Oklahoma and Texas
- Region IX (San Francisco, California) - Arizona and California

The 36 municipalities (nine in each of four EPA regions) were randomly selected from EPA's computerized grant information system. Our selection, although not statistically projectable, was made from the computerized listing of 896 construction projects completed before July 1, 1979, that had a requirement for a user charge system. Since a grantee can obtain more than one construction grant, we combined the grants for each grantee. After this process, we had a universe of 676 grantees (municipalities) from which to make our tentative selection. With random number tables, we then selected municipalities to visit that satisfied our other criteria, which were as follows:

- The grant covered the construction or modification/improvement to a treatment facility.
- The facility treated wastewater at the secondary or more advanced level.
- The facility had been in operation and a user charge system had been developed.

When a selected municipality did not meet these criteria, we randomly selected another municipality until we reached the number to be reviewed in each region. Because of discrepancies on the computerized listings (such as inaccurate treatment plant completion dates and purpose of the construction grant), we also had to review construction grant files and hold discussions with EPA/States officials to assure ourselves that selected municipalities generally met our criteria. The 36 municipalities finally selected for review ranged in population size from 1,000 to 3 million people and operated wastewater treatment plants that



ranged in size from 200 thousand gallons of wastewater flow per day to 387 million gallons of flow per day.

At the EPA regional offices, we reviewed (1) grant records to familiarize ourselves with the user charge systems proposed by the selected municipalities, (2) the evaluations performed on the proposed systems by regional staff, and (3) the actions taken that resulted in an approved system. In most instances, we interviewed EPA staff who were responsible for reviewing the systems to determine the procedures they followed, criteria they applied, and conclusions they reached. In addition to selected municipalities, we reviewed proposed user charge systems being processed by each regional office to assure that we had knowledge of current procedures

We also sought to obtain any studies that had been performed by or for EPA of user charge systems, reports of compliance inspections, or any other documentation of nonroutine regional activities relating to user charge systems. We also inquired into the extent of reviews performed of municipal systems after they had been implemented, and we discussed our findings with regional officials.

At delegated State agencies, we similarly determined the scope of review activity, criteria used, and actions taken with respect to user charges, paying specific attention to systems that had been selected for review.

Our work at the municipalities centered on reviewing user charge system documentation and budget and financial reports relating to revenue and expense associated with treatment plant operations and maintenance. We examined these records covering at least 2 operating years, where they were available, to determine the adequacy of user charge revenues and sources of other revenue to cover the treatment plant operation and maintenance costs. We interviewed financial and treatment plant operations staff to determine actions taken to comply with grant conditions relating to user charges and to determine sources of funds used for major equipment and plant replacement. We also discussed with municipal officials the reasons for noncompliance with their NPDES permits where such noncompliance was identified.

We also examined pertinent legislative history, regulations, instructions, reports, records, and other documents. These included prior studies on user charge systems performed by the EPA Inspector General and the accounting firm of Coopers & Lybrand. We also interviewed officials knowledgeable in wastewater treatment operations. These included EPA headquarters officials, design and consulting engineers, and certified public accountants.

## CHAPTER 2

### ARE USER CHARGE SYSTEMS ACHIEVING

#### SELF-SUFFICIENCY AND EQUITABILITY OBJECTIVES?

Are municipalities generating sufficient revenues from user charges to operate and maintain their wastewater treatment plants and protect the large capital investment in these facilities? The answer is "no" for many of the municipalities covered in our review. Half were not collecting sufficient revenues and 39 percent were not charging all users their equitable share of plant costs. Although 21 of 36 treatment plants reviewed exceeded their NPDES permit limits during the period of our review, we could not attribute these difficulties directly to shortages of funds, nor could we determine the effect of deferred maintenance on future operations. However, several of our prior reviews on wastewater treatment plant performance did show that a major cause of plant operating problems was insufficient operating funds. The impact? The successful operation of sophisticated facilities that cost billions of dollars to construct may be in jeopardy. Only time will tell whether the municipalities can keep the plants operating at peak efficiency and achieve the Nation's clean water goals.

#### USER CHARGES ARE NOT ALWAYS ADEQUATE TO OPERATE AND MAINTAIN TREATMENT PLANTS

From our sample of 36 municipalities, we identified 18, or 50 percent, where the revenues from user charges are not sufficient to finance operation and maintenance costs. <sup>1/</sup> In addition, 20 of the municipalities, or 55 percent, were not planning or providing for the financing needed for major equipment replacement during the service life of their plants. The additional funds needed to operate the plants and replace equipment generally came from other revenue sources including interest income, general funds, and connection, hook-up, and other fees.

#### Insufficient charges levied on users

The legislation initiating the user charge system required that it provide sufficient revenues for plant operation, maintenance, and replacement costs. The user charges were intended to assure that the financial burden be spread among all system users in relation to their waste discharge volume and not financed out of local taxes except for ad valorem taxes as permitted by the 1977 amendments.

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<sup>1/</sup>Seven of the remaining 18 municipalities in our sample had accounting records that precluded us--during the limited time of our review--from determining user charge adequacy because the records commingled wastewater collection and treatment revenues and expenses with those of other city services.

EPA's implementing regulations and guidelines specifically stated that user charge systems must generate sufficient revenue to offset the cost of all plant operation and maintenance and that such charges be reviewed annually and revised periodically as needed. The regulations also described several model systems for allocating costs between classes of users and prohibited the use of quantity discounts for high-volume dischargers. Neither the legislation nor the regulations provide for municipalities to reduce their user charge revenues by revenues collected from other municipal sources.

Despite the requirement that user charge revenues cover all operation and maintenance costs, 18 municipalities in our sample did not have enough fees to offset the operation and maintenance expenses incurred. Six of the municipalities had levied insufficient charges for at least 2 consecutive fiscal years.

The municipalities with insufficient user charge revenues were located in each section of the country and included treatment plants that encompassed each size of facility: small (less than 5 mgd), medium, (5 to 50 mgd), and large (more than 50 mgd), as shown in the following table.

<u>Facility size</u>	<u>Number in sample</u>	<u>Municipalities With Insufficient Revenues</u>					<u>Total</u>
		<u>Number with insufficient monies by EPA region</u>					
		<u>Boston</u>	<u>San Francisco</u>	<u>Dallas</u>	<u>Chicago</u>		
Small	23	5	1	2	4	12	
Medium	9	1	1	0	2	4	
Large	<u>4</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>	
Total	<u>36</u>	<u>7</u>	<u>3</u>	<u>2</u>	<u>6</u>	<u>18</u>	

The sizes of these facilities ranged from 0.2 to 387 mgd's and served populations that ranged in size from 1,000 to 3 million people.

As the table shows, insufficient user charge revenues are not unique to any geographic location or facility size. Municipalities were operating their treatment plants "in the red" because of budgetary limits on sanitation services, local political pressures to reduce user charge rates, resident discontent with increasing user charges rates, and the municipalities' failure to review and update their user charge systems.

When user charge revenues were short, municipalities resorted to other revenue sources. The schedule below identifies various other revenue sources municipalities used.

Other Revenue Sources Used to Offset  
Operation and Maintenance Expenses

<u>Other revenue sources</u>	<u>Municipalities using these sources (note a)</u>
General funds	2
Connection and hook-up fees	5
Other city fees (note b)	2
Interest income	2
Electric/water revenues	3
Short-term bank borrowing	2
Revenue-sharing funds	1
Other (note c)	10

a/Figures total more than 13 municipalities because some used more than one source of other revenue.

b/Examples of these fees include those for permits, licenses, and inspections.

c/Funds brought forward from prior periods--original sources for these funds are unknown.

As shown above, a frequent source of other revenue was connection and hook-up fees. These are fees paid for the capital cost of both the lateral sewer extending in front of the user's property and the cost of connecting the user to this lateral line. However, we found that this fee was frequently used to offset treatment plant operation and maintenance costs. Currently, EPA has no restrictions or regulations on how these fees are used.

The following examples illustrate how other revenues are used to offset operation and maintenance costs:

--Northfield Township, Michigan, has an advanced treatment plant serving about 1,000 people with a design flow of 750,000 gallons. This upgraded plant, which began operating in 1978, received a \$2.1 million EPA grant and had 1979-80 operating expenses of \$375,000. The user charge rate, \$31.20/quarter, has been in effect for more than 3 years. An analysis of the financial statements and comments from both the director, County Department of Public Works, and the treasurer, Northfield Township, indicated that user charge rates were not adjusted because of a large surplus created by connection fees. These connection fees, when added to user charges, income from investments, and cash-on-hand created sewer fund surpluses of \$5,600 in 1978-79, \$197,000 in 1979-80, and another \$97,000 expected in 1980-81. Without the added revenue from these funds, the plant would not be self-sufficient.

--Hartford, Vermont, has a \$4.9 million, secondary treatment plant serving about 1,000 people with a design flow of 1 mgd. This facility received a \$3.4 million grant. The 1979 operating expenses were about \$210,000. Hartford's user charge rate was \$11 for the first 1,000 cubic feet of water, plus \$1.10 for every 100 cubic feet thereafter. Due to public clamor over these high rates, they were reduced to \$8 for the first 1,000 cubic feet and 80 cents for every 100 cubic feet thereafter. As a result of this reduction in revenues, the community had to use a \$139,000 connection and hook-up fee from a local Veterans Administration hospital to defray treatment plant operation and maintenance expenses. Without this fee, the plant would not have been self-sufficient.

--Tahlequah, Oklahoma, has a \$650,000 secondary treatment plant serving about 2,700 customers, with a design flow of 2 mgd. This facility, which began operations in 1978, received a \$508,000 grant. The sewer revenues are included with the water and electricity revenues under the Public Works Authority. Although we were unable to determine whether the facility was self-sufficient, the manager of the authority indicated that most of the authority's revenues come from selling electricity and this revenue subsidizes the sewer operations. He added that as long as he has money to adequately provide the utilities, he is not concerned about which department it actually comes from.

Municipalities fail to adequately consider major equipment repair and replacement

By legislation and EPA regulations, user charge revenues must also cover replacement costs. These are expenditures for obtaining and installing equipment, accessories, or appurtenances that are necessary to maintain the capacity and performance during the useful life of the treatment plant (estimated by EPA to be between 20-40 years).

In 20 of the 36 municipalities, user charge revenues were either not sufficient or were not set aside to replace major equipment or components that would become unserviceable during the life of the treatment plant. Replacement is not considered a particularly high priority item by municipalities with relatively new treatment plants. Therefore, municipalities are generally not setting aside funds for these purposes.

Where does the money come from if major equipment needs to be replaced? A representative of a national consulting firm in Boston stated that municipalities are not budgeting or making provision for major repairs to equipment or the equipment's replacement. His firm, which designs user charge systems for New

England municipalities, recommends establishing reserves for major equipment repairs and replacements, however, he stated that these municipalities generally make no provision for repairs or replacement that may be necessary beyond the current year. The expenses considered by the municipalities include routine items such as packing materials, seals, washers, and other items needed to maintain plant equipment. The consultant added, and we confirmed, that for the EPA regional office in Boston to approve a user charge system, the municipality needs to provide for only normal repair and replacement costs that could reasonably be expected to occur during a program year. He added that if major repairs to or replacement of equipment were needed to maintain the capacity of a municipality's treatment plant during its useful life, the municipality would probably use revenues from its real estate tax or from municipal bonds, which would have to be issued for that purpose.

In a recent presentation to northern Indiana mayors, the chief of the operations section, Water Division, EPA Region V, stressed the importance of charging current users for the cost of replacement:

"\* \* \* the law expresses an intent not to have extensive capital assets wasted by neglect or malfunction because of a lack of proper operation, maintenance, and replacement (OM&R) funds from local sources. No asset lasts forever and equipment is consumed as it is used. The rate of consumption is to some extent predicated upon levels of expenditures for maintenance. Accordingly, the cost of replacement must be placed upon those benefiting from the consumption, and not borrowed at the time of replacement, thus placing the burden upon future users \* \* \*."

At each of the 36 municipalities visited, we determined how major repair and replacement costs would be funded. Only 16 municipalities or 45 percent, have reserved user funds to finance major expenditures.

For major, possibly unanticipated, repairs or replacements, the following sources of funding were identified for the 36 municipalities.

Sources to Finance Major  
Repairs and Replacements

<u>Funding sources</u>	<u>Number of municipalities (note a)</u>
General funds	4
Bank loans	2
Municipal bonds	7
Reserves for replacement	16
Contingency funds	4
Capital funds	2
Special assessment	2
Funding source not established	4

a/ Figures total more than 36 because six municipalities used more than one source of funding.

It should be noted that with one exception--reserve for replacement--the other funding sources are either unrelated to user charge revenues or financed after equipment breakdowns.

The following examples illustrate some of the situations that can arise when major repairs and replacements are not adequately financed:

--Los Angeles, California, has three plants, with primary, secondary, and advanced treatment, to process the wastes from the city and its 14 contract agencies. The city has received EPA construction grants totaling more than \$50 million. The treatment plants' yearly operating budget is more than \$16 million. The combined design flow is 470 mgd and the plants serve more than 3 million residents.

Several officials, including the chief engineer of the sewage treatment division and the assistant director of the Bureau of Sanitation, told us that despite recent significant increases in the user charge, the sewage treatment division was not getting the funds needed to properly maintain the facility because user charge revenues were being used to finance the local capital share of planned projects. The division was unable to purchase needed equipment and hire needed personnel. As a result, many maintenance tasks were being deferred. The reported backlog of deferred maintenance was "several" years. The backlog in electrical repair work alone, according to one budget document, was nearly 10,000 staffhours.

The director, Bureau of Sanitation, in a 1980-81 budget statement, indicated that the limited funding and personnel shortages in past years have seriously affected the operational integrity of the division--excessive

numbers of sedimentation tanks out of service for repairs and continuous emergency-type repairs on process control instrumentation. Although a division engineer in the Bureau of Engineering disagreed with both our assessment and statements by Bureau of Sanitation officials, the Department of Public Works recently asked the city council to approve \$14.5 million for critical repairs from the general fund.

--Altus, Oklahoma, has a 3 mgd secondary treatment plant that cost about \$1.8 million and serves about 6,700 customers. This facility received a \$1.4 million grant. Although the sewer budget for 1980-81 included \$9,500 for equipment maintenance, the city administrator indicated that none of this amount is carried forward as a separate replacement fund. The city has a capital improvement fund, general fund contingency reserve, and insurance on plant equipment. In case of major expenditures, all three sources could be used. Recently, a speed reduction gearbox had to be replaced at a cost of \$10,000. The money for the purchase came from the city's contingency reserve. The city hopes to be reimbursed for about half of this amount from the insurance.

--Urbana, Ohio, has a 3 mgd secondary treatment plant serving more than 11,000 residents. The facility received a \$2.2 million grant and had operating expenses in 1979 of about \$415,000. EPA region V approved the city's user charge system in December 1975. As part of the approval, Urbana agreed to make minimum annual contributions to its replacement fund of at least \$14,000, until the fund reached a minimum balance of \$70,000. Although the plant has been operating since 1976, the \$14,000 replacement contribution was first budgeted in 1980. The reason? The director of finance said that insufficient revenues were obtained during the first 4 years of treatment plant operation and no funds were available for a replacement reserve.

#### Lack of serious effects on treatment plants from inadequate user charges

An indicator of the quality of operation and maintenance is the ability of the municipality to operate the treatment plant within the limits of its NPDES permit. In 21 of the 36 municipalities in our sample, permit violations have occurred during the period we reviewed. We could not attribute the violations to neglect of operations and maintenance due to the shortage of funds; however, in our previous reports 1/ of noncompliant wastewater

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1/ "Continuing Need for Improved Operations and Maintenance of Municipal Waste Treatment Plants," CED 77-46, Apr. 11, 1977, and "Costly Wastewater Treatment Plants Fail to Perform as Expected," CED 81-9, Nov. 14, 1980.



treatment plants, operation and maintenance deficiencies were identified as one of the major causes. Our 1977 report specifically related operation and maintenance problems to inadequate funds. An example of this is presented below.

--During 1969 a 350,000 gallon per day secondary treatment plant in Earlington, Kentucky, was in poor operating condition and the city apparently was not aware of what would be required to properly operate and maintain the plant. A State official believed the major problem was inadequate staffing. In a 1975 visit, the plant was found to be badly neglected, with many items of equipment broken down and inoperable. State officials indicated that because of an inadequate operating budget, the plant could not afford to purchase the needed equipment. A joint EPA/State inspection in April 1975 showed no improvement in operation and maintenance. The inspection team commented in its report that (1) the plant was improperly operated and maintained because of understaffing and (2) the city should allocate sufficient funds to enable proper plant operation and maintenance.

The newness of the treatment plants was a primary reason we identified few significant operation and maintenance problems at the 36 municipalities we visited. For example, the consulting engineer for Holliday, Texas, indicated that the treatment plant had only passed its warranty period in early 1981. Because of this factor, we were unable to directly relate operation and maintenance problems or permit violations to an inadequate user charge system.

#### DISTRIBUTION OF OPERATION AND MAINTENANCE COSTS BETWEEN USERS IS NOT ALWAYS EQUITABLE

Of the 36 municipal user charge systems in our sample, 14, or 39 percent, contained apparent inequities both between or within user classes. These inequities included senior citizen discounts, special commercial/industrial rates, subsidized city buildings, and volume discounts.

The 1972 amendments to the Water Pollution Control Act established the premise that recipients of plant services pay their proportionate share of operation and maintenance costs. EPA regulations provide only general guidance for establishing and assuring proportionality. These regulations state that costs must be distributed to each user in proportion to such user's contribution to the total wastewater loading of the treatment plant. Factors such as strength, volume, and delivery flow rate characteristics shall be considered and included as the basis for the user's contribution to ensure a proportional distribution. The user charges can be computed for classes of users and levied on water deliveries.

Examples of the 14 systems that we believe contained elements that did not assure equitable distribution of costs are presented below.

--Lyndon, Vermont, has a \$3.5 million, 750,000 gallon per day, secondary treatment plant serving about 1,000 customers. This facility received a \$2.6 million grant. The operating expenses for 1979 were about \$165,000. The initial costs to users in 1977 was a minimum charge of \$25/quarter, up to 10,000 gallons of water consumed (\$2.50 per 1,000 gallons), plus \$1.25 for every additional 1,000 gallons. Since users were charged only half the original rate for consumed water in excess of 10,000 gallons, large-volume users were receiving a subsidy.

In 1973 a commercial customer rate was adopted for those using more than 200,000 gallons/quarter. Twelve of the 1,000 customers fell in this range and were charged a rate of \$1.40 per 1,000 gallons, with no minimum charge levied. Subsequent rate changes increased the residential fee to a minimum of \$33/quarter per 10,000 gallons, plus \$1.70 for each additional 1,000 gallons, while commercial rates were set at \$1.55 for each 1,000 gallons consumed--with no minimal charge levied. These rates are inequitable because 62 percent of the users were paying the minimum fee--consuming less than 10,000 gallons per quarter.

Our analysis of 10 users in each of four water meter books showed 45 percent of these 40 users actually consuming less than 5,000 gallons per quarter. Accordingly, not only were large residential and commercial users receiving quantity discounts, the floor upon which the minimum fee was based appears too high.

--Yukon, Oklahoma, has a \$2.4 million, 3 mgd secondary treatment plant serving about 4,600 customers. This facility received a \$1.8 million grant. The estimated 1979 annual operating budget was about \$120,000. The user charge rate for both residential and business users is \$1.50 for the first 4,000 gallons of water consumption plus 20.4 cents per each additional 1,000 gallons. Apartment owners pay this same rate on total water used. We believe this can create inequities for single-family residences. For example, the city utility office manager stated that each apartment unit in one Yukon complex with 74 units uses the minimum of 4,000 gallons. However, the complex only pays the \$1.50/4,000 gallons once and all additional usage is charged at the 20.4 cent per additional 1,000 gallon rate. In contrast, each residential user would pay the \$1.50 minimum charge. For a 1-month period, the apartment complex paid \$65.48 on 317,625 gallons of water. If 74 residential users paid only the \$1.50 minimum rate, the total charge would be \$111.00, or \$45.52 more than the apartment complex.

Therefore, we believe apartment owners are receiving the benefit of a quantity discount. If an equitable cost distribution system were used, each apartment unit would be required to pay the same rate as single-family residences.

Although the amounts in this particular example may not be significant, it does illustrate the existence of inequities which may involve large amounts of money in municipalities outside our sample.

## CONCLUSIONS

The user charge system established by half of the 36 municipalities in our sample provided insufficient revenue to meet operation and maintenance costs. To offset these deficits, municipalities obtained additional funds from other revenue sources, such as connection fees, short-term bank loans, or general tax receipts.

EPA has no restrictions or regulations on municipalities using other sources of funds to subsidize treatment plant operations and maintenance costs. We can see where some of the sources of funds are related to treatment plant operations--interest earned on sewer fund balances--and could be offset against operation and maintenance expenses. However, continuing to rely on the other sources of funds--general funds and short-term bank borrowing--does not, in our opinion, conform with the intent of the legislation. In addition, we question the use of connection and hook-up fees as a source of treatment plant operating revenues. Although a municipality collects these fees from system users to offset the capital costs of both extending a sewer line in front of a user's property and connecting the user to that line, we found that this "return-of-costs" was used to offset treatment plant operation and maintenance expenses. We believe EPA should identify which other sources of funding--if any--a municipality can use to offset operation and maintenance costs and reemphasize to regional administrators, delegated State agencies, and municipalities the purpose of user charge systems.

In addition to user charges not providing adequate operation and maintenance funding, we found that 20 of the 36 municipalities, or 55 percent, were neither collecting nor setting aside the financial resources needed to replace major pieces of equipment during the service life of the treatment plant.

We believe these major expenditures could cause both a severe financial strain on the municipalities and affect the continued successful operations of their treatment plants. Also, we believe the failure of municipalities to collect or set aside funds for the eventual replacement of major equipment is inconsistent with the legislative requirement that the implemented user charge

systems provide for adequate revenues to properly operate and maintain treatment plants during their useful lives. We believe EPA needs to again stress to both delegated state agencies and municipalities the requirement and necessity of planning for the eventual replacement of major equipment to assure that the treatment plants continue to do their part in meeting the Nation's water quality objectives.

In addition, we believe EPA should incorporate, as part of existing operation and maintenance inspections and closeout financial audits of construction grants, a review of user charge system adequacy, including a review of the provisions for replacing major pieces of essential equipment.

#### AGENCY COMMENTS AND OUR EVALUATION

In a letter dated October 30, 1981 (see app I), commenting on our draft report, EPA stated that it generally agrees with our findings and that a recent EPA management evaluation of nine utilities located in the Northeast United States resulted in similar conclusions. One of the principal conclusions in our report and the EPA evaluation was that local wastewater authorities seldom provide for sufficient equipment replacement funds.

The letter also stated that EPA recognizes that a replacement set-aside fund is an essential element of municipal self-sufficiency and local governments must be made aware of this responsibility so they can program sufficiently for funding to cover future municipal wastewater expenditures.

However, in commenting on our proposal that it identify other sources of funding--if any--a municipality can use to offset operation and maintenance costs and re-emphasize to EPA regional administrators, State agencies, and municipalities the purpose of user charge systems, EPA stated that except for ad valorem taxes, the act provides for no source of operating and maintenance funding other than direct user charges. According to EPA, municipalities can finance debt service through various means, including bonds, special assessments, and connection charges.

EPA stated that municipal wastewater treatment expenditures may be divided in two general categories. The first category is for capital costs, debt repayment, reconstruction, and expansion. The second category is for operation and maintenance expenses, for which the establishment of user charges is fixed by law. EPA stated however, that in many cases, because of inattention or inflexibility, user charge systems become obsolete.

We believe this latter point has been validated not only by the findings contained in this report but by the agency itself in several of its studies. However, the major issue still remains--municipalities are not complying with either (1) the intent of

the Congress when it established the user charge requirements that treatment plants be self-sufficient or (2) that except for ad valorem taxes, direct user charges be the only source of revenue to offset treatment plant operation and maintenance expenses. EPA's response is silent on how EPA intends to deal with these issues.

EPA stated that it will look to ways of developing financial management guidance for use by the municipalities and that this guidance would assist communities in determining whether general economic or fiscal conditions merit review and revision of their existing user charge systems as well as how this might best be accomplished. In a November 5, 1981, meeting with EPA officials, the director, office of program operations, advised us that EPA hoped to have the new financial management guidance package available for distribution to municipalities in 6-9 months.

Although the agency's financial management guidance package is a step in the right direction, we believe that the information in the package should clearly reiterate to the municipalities (1) the purpose of the user charge program, (2) that except for ad valorem taxes, direct user charges are the only source of funding approved for financing treatment plant operation and maintenance expenses, (3) the need to review and revise, when necessary, user charge systems in accordance with grant agreements, and (4) the need to maintain the treatment plants' financial integrity and self-sufficiency as envisioned by the Congress when it enacted the user charge system requirements in the Federal Water Pollution Control Act amendments of 1972.

EPA disagreed with our proposal that it incorporate, as part of existing operation and maintenance inspections and closeout financial audits of construction grants, a review of user charge system adequacy, including a review of the provisions for replacing major pieces of essential equipment. EPA stated that, while the Clean Water Act requires user charge systems to be reviewed and approved before construction grants are awarded, it makes municipalities responsible for maintaining adequate user charge systems. EPA believes in a results-oriented system, whereby the primary determinations made in an audit are whether the facility was constructed in conformance with approved plans and specifications and whether the facility can and will meet applicable NPDES effluent limits. If the latter result is not achieved, then it is incumbent upon the delegated State to take whatever actions are necessary to induce the municipality to achieve compliance.

We agree that the primary determinations made in an audit are whether the facility was constructed in conformance with approved plans and specifications and whether the facility can and will meet applicable NPDES effluent limits. In fact, that is the basis of our proposal. If, in the course of its inspections and audits, either EPA and/or a delegated State determines that a municipality is not providing for replacement of major pieces of essential equipment, then it surely follows that it is not a matter

of if a plant will violate its IPDES permit but rather when the permit will be violated. The only disagreements that appear to be left between us and EPA is (1) when the municipality should be notified of its shortcomings, (2) who should make the notification, and (3) what actions can be taken to remedy noncompliance. We believe that the reports issued as a result of inspections and audits are an effective means of communicating to the municipalities any deficiencies identified in their user charge programs.

#### RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

To improve administration of the user charge program and to ensure continued compliance with the user charge concept envisioned by the Congress, we recommend that the Administrator, EPA:

- Incorporate, as part of the financial management guidance package, instructions to the municipalities that clearly state (1) the purpose of the user charge program, (2) that except for ad valorem taxes, direct user charges are the only source of funding authorized for financing treatment plant operation and maintenance expenses, (3) the need to review and revise the user charge system in accordance with Federal regulations and the grant agreement, and, (4) the need to maintain the treatment plants' financial integrity and self-sufficiency as envisioned by the Congress.
- Incorporate, as part of existing operation and maintenance inspections and closeout financial audits of construction grants, a review of user charge system adequacy, including a review of the adequacy of reserve accounts for replacing major pieces of equipment considered essential for continued plant operations.

### CHAPTER 3

#### FOLLOWUP NEEDED TO ASSURE

#### CONTINUED USER CHARGE SYSTEM

#### COMPLIANCE

As with many other aspects of the construction grants program, prime responsibility for maintaining an appropriate user charge system rests with the municipality. However, municipalities have wavered from this responsibility by failing to review and update rates and user classes as needed to meet increased costs or changed conditions. In addition, neither EPA nor the delegated States we visited have any mechanism for verifying municipalities' continued compliance with user charge grant conditions. This failure by EPA, State, and municipal officials to assure continued user charge compliance may eventually result in plant performance problems that could defeat the purpose of the construction grants program--to clean up the Nation's waterways.

#### MUNICIPALITIES NEED TO REVIEW AND UPDATE USER CHARGE SYSTEMS AS REQUIRED

The user charge problems we identified are often related to the failure of municipalities to periodically review and update their user charge systems. From our visits to 36 municipalities, we identified 15 where the required biennial review of the systems was not performed. Nine of the 15 systems had not been reviewed in 5 or 6 years and 3 had not been revised although changes had occurred within the municipality. Occasionally, reviews and updates of the user charge system can be adversely affected by politics, at which time the self-sufficiency of the system becomes of secondary importance.

EPA user charge regulations and guidelines have two requirements concerning a municipality's responsibilities to review and revise its user charge system. The first requires the municipality to review the user charge rate annually and revise this rate periodically to reflect actual treatment plant costs. The other requires the municipality to review, not less often than biennially, the wastewater contribution of users and user classes, the total costs of operation and maintenance of the facility, and the approved user charge system. During this review, the municipality is required to revise the charges to maintain the proportionate distribution of costs, ensure that sufficient revenue is being generated, and apply any excess revenues to the future charges of the class generating the surplus.

Reasons given by the municipalities for not performing the biennial reviews included:

- The annual budget review of costs and rates was adequate
- The requirement for a biennial review was forgotten.
- The community had remained unchanged and no adjustments were necessary.
- The costs involved to perform this type of detailed review were too much.
- The availability of other funding sources minimized the need to adjust user charge rate structures.

The following examples illustrate reasons given by municipal officials for not performing biennial reviews.

- Albion, Michigan, has a 4 mgd secondary treatment facility serving 3,200 customers. The plant was built at a cost of \$4.9 million with a Federal grant of \$3.7 million. The director, Department of Public Works, stated that although the rates were changed there was no need to review the user charge system because nothing significant had changed in the community. However, we were subsequently informed that several changes have occurred, including the closing of two industries and a reduction in the city's population. Currently the plant is treating an average wasteload of 2.1 mgd.
- Orange, Massachusetts, has a \$2.7 million, 1.1 mgd secondary treatment plant serving 3,500 people. This facility received a \$1.9 million grant. The user charge system in Orange has not been reviewed since fiscal year 1977. The superintendent of the treatment plant stated that he was unaware of the requirement for a biennial review.

The political climate of a municipality can also affect the performance of the review or the enactment of rate increases. The costs of local government (including wastewater treatment costs) are a major concern to local politicians and citizens, and we found examples both in our sample municipalities and through discussions with EPA regional officials where these concerns affected the process of reviewing and adjusting user charge rates to keep systems self-sufficient. In these cases, rates and rate increases were made based on what would be acceptable to residents rather than on what was necessary for good plant operation and maintenance. For example:

- Hartford, Vermont, has a \$4.9 million, secondary treatment plant serving 1,000 people with a design flow of 1 mgd. This facility received a \$3.4 million grant. The user charge rate recommended by the city's consultant and later adopted by the city--\$11 for the first 1,000 cubic feet of water plus \$1.10 for every 100 cubic feet thereafter--was reduced significantly, as a result of



public clamor, to \$8 for the first 1,000 cubic feet and \$0.80 for every 100 cubic feet thereafter. To defray operation and maintenance costs, the city had to use a \$139,000 connection fee paid by a local Veterans Administration hospital.

--In New Haven, Connecticut, a \$50 million, 40 mgd primary and secondary treatment system with 24,000 hook-ups had to borrow \$400,000 from the city's general fund to help finance its operating budget of \$4.75 million in fiscal year 1980. The chief civil engineer told us that this borrowing was necessary because the governing Board of Aldermen was reluctant to increase rates without more substantial justification than was provided. He believed that recently enacted property tax increases contributed to the Board's reluctance.

In several cases, we learned that increases in user fees can cost elected officials their positions. In March 1977 hearings before the Subcommittee on Water Resources, House Committee on Public Works and Transportation, a witness testified that a Tucson, Arizona, city councilman was the subject of a petition for recall because he attempted to comply with the requirements for a user fee system. In Simi Valley, California, city officials were recalled when the sewer charge was increased from \$5/month to \$8/month. Following the recall election, the rates were reduced back to \$5/month.

#### REGULATIONS DO NOT REQUIRE EPA OR STATE FOLLOWUP OF USER CHARGE SYSTEMS

Construction grant conditions require that municipalities annually review their user charge rates and biennially review the wastewater contribution of users and user classes. EPA regulations do not require either EPA or the States to monitor the municipalities' compliance with these grant conditions.

Although the regulations provide that user charge systems may be reviewed by EPA not more often than annually, this option was not exercised at any of the 36 municipalities in our sample. EPA officials told us that once systems are approved no further review is made of their adequacy, except when a complaint is received and they consider it worthy of an investigation. These officials also stated that even if such reviews were made and deficiencies in the municipality's user charge system were identified, no penalties exist under current regulations short of court action based on breach of grant conditions. Finally, EPA officials stated that no followup reviews are made to determine the status of the municipal user charge system because not enough personnel are available to make the reviews and the regional offices are not assigned the specific responsibility for performing the reviews.

The EPA regional offices we visited had from one to eight staff members responsible for reviewing and approving user charge systems. In each of the regional offices, the section chief verified that followup on implemented user charge systems would not be possible with existing staff levels.

PRIOR STUDIES OF USER CHARGE SYSTEMS  
IDENTIFIED SIMILAR SHORTCOMINGS

Two studies have been made of the use of user charges by municipalities. The first, performed by Coopers & Lybrand, an accounting firm, resulted in a report entitled "Management Evaluation of User Charge/Industrial Cost Recovery Systems," dated October 19, 1978. The consultant recommended that EPA:

- Establish and appropriately staff a headquarters unit responsible for overall coordination of user charge system reviews and postimplementation reviews.
- Establish centralized review groups in each regional office to be responsible for user charge system reviews, approvals, and postimplementation reviews.
- Perform a staffing analysis to determine the estimated user charge system workload in each region and the mix of skills and personnel necessary to meet the estimated workload in each region.
- Develop formal procedures and systems for monitoring user charge system development and postimplementation reviews, to include separate user charge system files.
- Develop standardized formats and procedures for user charge systems and eliminate piecemeal reviews.
- Implement postimplementation reviews of user charge systems.

The second study, performed by the western region, Office of Inspector General, EPA, covered an audit of 19 grantees in three western EPA regional offices. This report, issued January 13, 1981, identified several noncompliant user charge systems and cited deficiencies similar to those discussed previously in this report. The Inspector General report also confirmed the continued existence of the deficiencies identified by Coopers & Lybrand 2 years earlier and reiterated its recommendations.

In discussions with the deputy director of the EPA Municipal Construction Division, we were advised that the recommendations made in both studies have not been acted on and that no action is currently being contemplated. He further advised us, however, that the agency has been directed by the new Administrator to

review and revise all existing program regulations. During the course of this review process, the recommendations contained in the studies will be considered. EPA does not know when the regulation review and revision process will be completed.

### CONCLUSIONS

EPA's grant conditions and the regulations require, respectively, that municipalities annually review their rate structure and biennially review the user class structure to assure that both self-sufficiency and equitability are maintained. Such reviews are not always made. Although all 36 municipalities performed some type of annual review of their rate structures, only 15 of the 36 municipalities performed the required biennial review.

Neither EPA nor the delegated State agencies we visited have any provision for verifying that municipalities have performed either the annual or biennial reviews. Even if such followup reviews were made by EPA or the delegated States and deficiencies in municipalities' user charge systems were identified, no penalties exist under current EPA regulations short of court action based on breach of grant conditions.

Without an enforcement mechanism to compel municipalities to comply if shortcomings are identified, such reviews of the user charge systems will not provide the needed results. We believe EPA could periodically review user charge systems as part of the compliance inspections performed under the NPDES permit program. Also, either by administrative action or by appropriate amendment to the act, if necessary, EPA should make the user charge requirement a permit condition and enforceable in the same manner as other permit conditions. By making these user charge requirements a permit condition, EPA and/or the delegated States would obtain an enforcement mechanism to ensure that municipalities maintain a self-sufficient plant and additional assurance that the Nation's water quality objectives will be met.

### AGENCY COMMENTS AND OUR EVALUATION

In commenting on our draft report, EPA disagreed with our proposal of incorporating the user charge requirements under the NPDES permit program. According to EPA, NPDES compliance inspections are primarily concerned with permit effluent limitations, treatment plant performance, laboratory facilities, and sampling techniques.

EPA stated that one of its compliance improvement initiatives for municipal wastewater treatment plants involves diagnostic inspections of noncomplying plants. According to EPA, these inspections, which will be conducted primarily by delegated State agencies, will focus on evaluations of operation and maintenance procedures and may include reviews of financial management programs. Such reviews could evaluate user charge systems.

EPA also disagreed with us that compliance with the user charge system should be an enforceable part of a municipality's NPDES permit. According to EPA, the primary intent of the NPDES program is to establish effluent quality limits, schedules, and reporting requirements. It is not the appropriate place or means to address the adequacy of municipal financial management programs.

Identifying user charge shortcomings does not appear to be the basis for the disagreement between us and EPA on this proposal. The disagreement, in our opinion, lies in how best to correct the problem once it is identified. We believe the NPDES permit enforcement program affords the best opportunity for both EPA and the delegated States to take corrective action. Under the enforcement program, a series of steps can be taken to induce a municipality to comply with the permit requirements before execution of the final action--formal submission to the courts for judgment.

EPA, on the other hand, is opposed to using the NPDES enforcement program as a means of addressing the adequacy of municipal financial management programs and has stated that the primary intent of the NPDES program is to establish effluent quality limits, schedules, and reporting requirements. We are not in total disagreement with EPA that this should be the program's primary intent. However, as previously stated, we do believe that the lack of sufficient operating and expense revenues will have a significant adverse impact on the ability of a treatment plant to operate within NPDES permit limits. The failure of municipalities to provide adequate revenues often results in the lack of spare parts inventories, qualified trained staff to operate the plants, preventive maintenance programs, etc. Inadequacies of this type will, in our opinion, inevitably lead to plant failures and permit violations.

For these reasons, we believe the user charge system requirements should become part of the NPDES permit program.

#### RECOMMENDATION TO THE ADMINISTRATOR, EPA

We recommend that the Administrator, EPA, incorporate the user charge system requirements under the NPDES permit program.

## CHAPTER 4

### SOURCES OF FINANCING PLANT

#### REPLACEMENT ARE UNCERTAIN

The question remains: Who will finance the billions of dollars needed to replace the thousands of plants now in operation? Wastewater treatment plants built during the earlier years of the construction grants program are nearing the end of their economic/technological lives and must eventually be replaced. Although the needed replacement costs will be in the billions of dollars, current Federal legislation is silent on the sources of these funds and little has been done to answer this question by Federal, State, or municipal governments. In our sample of 36 municipalities, only three were presently setting aside funds for plant replacement.

#### FUTURE TREATMENT PLANT REPLACEMENT WILL BE COSTLY

Although no precise estimate exists, replacing the thousands of treatment facilities that have obtained funding under the Federal Water Pollution Control Act, as amended, will be in the billions of dollars. For example, EPA estimates a 10 mgd activated sludge treatment plant constructed in 1960 for \$2.5 million would cost at least \$13 million if it were replaced in 1980. Over a 20-year period, this represents about a sixfold increase in construction costs. As shown in chapter 1, the 1977 average construction costs for secondary treatment plants range from \$2.6 million to \$155 million.

The estimated reconstruction costs, when added to the present unmet needs to meet the Nation's water quality goals (estimated by EPA to be \$119 billion), are staggering and will probably continue to grow.

#### SOURCES OF LOCAL FINANCING FOR TREATMENT PLANTS ARE LIMITED

Municipalities have traditionally financed the local share of waste treatment project costs through municipal bonds or special assessments. Municipal bonds, either general obligation or revenue bonds, are the most common method. Most officials in the 36 selected municipalities said that they would continue to use these methods to finance the local share of project costs and, if necessary, the total costs of future projects, assuming Federal funding were not available. Realistically, however, these methods of financing are limited by legal, economic, political, and other factors. For example, those communities that have used municipal bonds for all capital projects and have reached their "debt ceiling" are legally unable to sell bonds above this limit. Other communities may find their bonds difficult to sell because of

higher interest rates for other securities (e.g., Treasury bills), which have made the lower yielding, tax-free municipal bonds less attractive to investors.

In California and Massachusetts, citizens' dissatisfaction with the cost and size of government has resulted in statewide initiatives such as "Proposition 13" (California) and "Proposition 2-1/2" (Massachusetts) that limited the availability of funds to municipalities, including funds for new capital projects.

This type of limitation has had a significant impact, for example, on the city of Los Angeles. In March 1980 the Mayor of Los Angeles executed a consent decree resolving litigation with EPA. The total capital costs associated with implementing the consent decree, at the time of our review, was approximately \$711 million. At that time, it was anticipated that \$375 million would be financed by grants from the Federal and State governments while the remaining \$336 million would be borne by the city.

According to the city administrative officer, Los Angeles traditionally financed its sewer projects with general obligation bonds. However, since the passage of Proposition 13 (which requires two-thirds voter approval for State or local tax increases), this financing is no longer feasible. Although under State law it is still theoretically possible to issue revenue bonds for sewer purposes, such action does not appear practical due to statutory interest rate limitations and market conditions. Consequently, the city initiated a fourfold increase in its sewer service charge and now uses 65 percent of its user charge revenues to finance the local capital share of planned projects.

Another factor cited by officials of the municipalities was citizen resistance to special assessments or increased user charges that were designed to raise funds for future projects (e.g., replacement of sewage treatment plants) that would not directly benefit them.

LITTLE IS BEING DONE BY FEDERAL,  
STATE, AND LOCAL GOVERNMENTS TO  
PROVIDE FOR LONG-TERM FINANCING

Neither EPA nor the delegated States we visited require that municipalities set aside funds for financing plant replacement, and little is being done voluntarily. Only three municipalities in our sample of 36 were making provision, by earmarking funds, to meet a portion of the long-term capital needs. Officials in 23 of 36 municipalities told us that they would return to the Federal Government for replacement funding; officials from the remaining 10 municipalities were undecided.

EPA has made several references to the question of plant replacement in congressional testimony and, most recently, in the "1990 Preliminary Draft Strategy for Municipal Wastewater Treatment", dated January 1981. This study was undertaken by

EPA's office of water and waste management to review and reassess the municipal construction grants program goals. The purpose of this strategy study was to examine what is to be accomplished by the year 1990 and what steps (administrative, legislative, etc.) are necessary to accomplish those goals. The study was divided into 5 parts--funding, management, operations, compliance, and planning. The compliance part of the draft strategy states that municipalities, under the current program, are "conditioned to expect" treatment plant replacement funds from the Federal Government. This strategy proposes changes to the construction grants program to reduce the continued reliance by municipalities on the Federal Government for future financial assistance regarding treatment plant replacement. However, the deputy director of the Municipal Construction Division told us that no action has been taken to finalize and implement those changes related to treatment plant replacement. The finalizing of the 1990 draft strategy is being held in abeyance pending review by the new EPA Administrator.

In our review of the 36 municipalities, we found that, with the exception of California, none of the remaining nine States had imposed any requirement for municipalities to accumulate funds for replacing treatment plants.

In 1974 California instituted a requirement that municipalities collect and deposit funds for plant replacement in a wastewater capital reserve fund. The annual contribution to the fund was to be determined by taking the construction cost of the existing wastewater treatment system and dividing that cost by 30 years. The requirement was difficult to enforce and apparently proved burdensome to the municipalities. Therefore, in 1978 the State made using the wastewater reserve fund optional. Currently the State is studying a revised requirement that would be less burdensome to municipalities. No time frames have been established for completing the study.

## CONCLUSIONS

Inadequate funds for major replacements during the service life of a treatment plant can create monetary problems for a municipality. However, a similar situation, on a much larger scale, will occur later as the plant nears the end of its useful life. Since the 36 municipalities we visited had recently completed treatment plant construction under the Federal grants program, it was not surprising that many plan on returning to the Federal construction grants program when replacement or reconstruction becomes necessary.

However, the question remains Who will be responsible for financing the billions of dollars needed to eventually replace the thousands of plants now under construction or in operation? Neither Federal, State, nor local governments are currently addressing this issue.

## RECOMMENDATION TO THE CONGRESS

In view of the huge future dollar requirement for this program, the Congress should consider whether there will be further Federal participation in treatment plant replacement or whether plant replacement will become the responsibility of State and/or local governments. If the Congress should decide that State and/or local governments are to be held responsible, these governments must be made aware of this requirement so that they can begin planning for such future expenditures.

## AGENCY COMMENTS

In commenting on our draft report, EPA stated that with regard to replacing entire facilities constructed with Federal funds when they reached the extent of their economical/technological lives, or upgrading of treatment facilities unrelated to increased Federal requirements, it believes all municipalities should be made aware of the fact that the wastewater construction grants program will not continue indefinitely and communities should plan to replace these facilities.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON D C 20460

OCT 30 1981

OFFICE OF  
POLICY AND RESOURCE MANAGEMENT

Mr Henry Eschwege  
Director  
Community and Economic Development Division  
U S General Accounting Office  
Washington, D C 20548

Dear Mr Eschwege

The Environmental Protection Agency (EPA) has reviewed the General Accounting Office (GAO) draft report, "Municipal Funding of Wastewater Treatment Plant Operation and Maintenance Costs Is Inadequate." Public Law 96-223 requires the Agency to submit comments on the draft report which are presented below. Our comments are divided into two sections. The first section covers general findings and the second section contains our comments on the report's recommendations. In addition to these comments, we provide editorial comments in an enclosure.

General Findings

The Agency generally agrees with the report's findings. A recent EPA management evaluation of nine utilities in Region I resulted in similar conclusions. One of the principal conclusions of the GAO report and our evaluation was that local wastewater authorities seldom provide for sufficient equipment replacement funds.

We recognize that replacement set-aside is an essential element of municipal self-sufficiency and local governments must be aware of this responsibility so they can provide sufficient funding for future municipal wastewater expenditures. Reflecting this concern, EPA recently sponsored a series of five seminars to introduce a draft version of the Wastewater Utility Management Manual which features measures to achieve municipal self-sufficiency.

With regard to replacement of entire facilities constructed with Federal funds, or upgrading of treatment facilities unrelated to increased Federal requirements, we believe that all municipalities should be made aware of the fact that the wastewater construction grant program will not continue indefinitely. Communities should plan to replace these facilities themselves.

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The Agency's Office of Research and Development (ORD) undertook a comprehensive national study of publicly owned municipal treatment works in 1975. The main objective of the study was to identify and quantify the specific causes of inadequate performance and to formulate recommendations for improvement. As a result of this comprehensive national study, completed in 1978, a new approach called Composite Correction Program (CCP) was developed by ORD. This approach has been found to be very effective in improving existing treatment works performance and reliability without major plant modifications. The general approach of CCP is to eliminate all performance limiting factors at a facility through the implementation of the correction recommendations that are made as a part of the comprehensive evaluation. CCP has been successfully demonstrated at several facilities. Because major plant modifications and capital expenditures are not required in this approach, user charges are kept as low as possible.

EPA has adopted this procedure for widespread use as a part of its national enforcement strategy for publicly owned treatment facilities because we believe it will be an effective means of improving the compliance of municipal treatment works with National Pollutant Discharge Elimination System (NPDES) requirements.

#### Report's Recommendations

As a basis for our response to the recommendations in the draft report, the framework of requirements for local financing of municipal treatment works should be clearly understood. A summary of relevant sections of the Clean Water Act (the Act) and EPA's implementing regulations regarding user charges follows. The Act requires

- o the grant applicant to adopt a system of charges to recover the cost of operation and maintenance (O&M), including replacement costs, and
- o each recipient of waste treatment services to pay its proportionate share of the cost of O&M, including replacement.

Section 212(3) of the Act defines "replacement" as " those expenditures for obtaining and installing equipment, accessories or appurtenances during the useful life of the treatment works necessary to maintain the capacity and performance for which such works are designed and constructed ". Replacement of the facility itself at the end of its useful life, as discussed on page 5 of the draft report, is outside the scope of the Act.

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Construction grant regulations require that user charge systems, whether based on actual use or ad valorem taxes, generate sufficient revenue for the proper operation and maintenance of the treatment works, including replacement, and distribute these charges proportionately to each user or user class

#### GAO Recommendation

Identify other sources of funding--if any--a municipality can use to offset operation and maintenance costs and re-emphasize to EPA Regional Administrators, State agencies, and municipalities the purpose of user charge systems

#### EPA Response

Except for ad valorem taxes, the Act provides for no source of operating and maintenance funding other than direct user charges. The municipality can finance debt service through various means, including bonds, special assessments and connection charges.

Municipal wastewater treatment expenditures may be divided in two general categories. The first category is for capital costs, debt repayment, reconstruction and expansion. The second category is for operation and maintenance expenses, for which the establishment of user charges is fixed by law. However, in many cases, because of inattention or inflexibility, user charge systems become obsolete.

EPA will look to ways of developing financial management guidance for use by municipalities. This guidance would assist communities in determining whether general economic or fiscal conditions merit review and revision of their existing user charge and debt repayment systems and, if so, how this might best be accomplished.

#### GAO Recommendation

Incorporate, as part of existing operation and maintenance inspections and closeout financial audits of construction grants, a review of user charge system adequacy, including a review of the provisions for replacing major pieces of essential equipment.

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EPA Response

EPA disagrees with GAO's premise that EPA should be responsible for monitoring the adequacy of municipal user charge systems. While the Clean Water Act requires user charge systems to be reviewed and approved prior to the award of step 3 grant assistance, it makes municipalities responsible for maintaining adequate user charge systems. We believe in a results-oriented system, whereby the primary determinations made in an audit are whether the facility was constructed in conformance with approved plans and specifications and whether the facility can and will meet applicable NPDES effluent limits. If the latter result is not achieved, then it is incumbent upon the delegated State to take whatever actions are necessary to induce the municipality to remedy the non-compliance.

GAO Recommendation

Incorporate the user charge requirement for periodic reviews and updates as part of compliance inspections performed under the NPDES permit program.

EPA Response

We disagree with this recommendation. NPDES compliance inspections are primarily concerned with permit effluent limitations, treatment plant performance, laboratory facilities and sampling techniques.

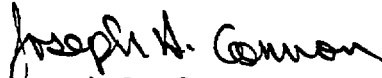
One of EPA's compliance improvement initiatives for municipal wastewater treatment plants involves diagnostic inspections of noncomplying plants. These inspections, which will be conducted primarily by delegated State agencies, will focus on evaluations of operation and maintenance procedures and may include reviews of financial management programs. Such reviews could evaluate user charge systems.

We also disagree with the comment following the last recommendation which indicates that compliance with the user charge system should be an enforceable part of the municipality's NPDES permit. The primary intent of the NPDES program is to establish effluent quality limits, schedules and reporting requirements. It is not the appropriate place or means to address the adequacy of municipal financial management programs. We believe the compliance improvement initiative discussed above will achieve GAO's objective more efficiently.

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We very much appreciate the opportunity to respond to this draft report prior to its publication.

Sincerely yours,



Joseph A. Cannon  
Acting Associate Administrator  
for Policy and Resource Management

Enclosure (See GAO note below.)

GAO Note In the enclosure, EPA provided technical comments which were considered. These comments resulted in no revision to the conclusions and recommendations in our report.

(089146)

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