REVENUE PROGRAMS FOR WASTEWATER AGENCIES

OHIO RIVER VALLEY
WATER
SANITATION COMMISSION

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This document explains inter-community wastewater collection and treatment system sharing costs for the layperson. It is not a technical guide which details the development of sewer service rates for individual community systems.

Prepared for the Engineering Committee,
Subcommittee for Drafting a Lay Document
on Wastewater Service Charges

Earl Richards, Chairman

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Ohio River Valley Water Sanitation Commission
for the States of Illinois, Indiana, Kentucky,
New York, Ohio, Pennsylvania, Virginia and
West Virginia

INTRODUCTION

This document has resulted from the recognition that it is particularly important for the public to understand the impact of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) on methods used to finance water pollution control facilities. It is not, however, authored or sponsored by the U. S. Environmental Protection Agency, and its statements should be distinguished from their official guidelines. It seeks to help elected and appointed local officials make sound judgments on the merit of a variety of new revenue systems presented to them for adoption, to clarify for industry the cost recovery provision in the Amendments to the Federal Act, and to answer some vital questions citizens will ask when the increased costs of water pollution control reach the residential sectors of their communities. Revenue Programs for Wastewater Agencies should also promote an understanding of the implications of the shift from the past, when the revenue decisions under discussion were made locally, to the present situation in which federal law has affected the nature of revenue programs.

Traditionally, communities have had wide latitude in choosing revenue programs within the framework of their own charters and state laws, but more recently, citizen interest in clean streams, lakes, and ocean waters has helped to generate federal laws imposing new treatment requirements upon many municipal and industrial wastewater facilities. Congress has chosen to assist communities by supplying the major share of capital costs for the new treatment plants. As a condition of this, however, federal law requires that the municipality employ a fair and equitable revenue program to pay for the proper operation and maintenance of the facilities and that any public agency using Federal grant funds in partial finance of their facilities adopt some form of user charge system to augment the program. The law also encourages the construction of treatment facilities which will process both the sewage from residences and industrially-produced wastewaters, but it stipulates that industry pay back the grant funds for constructing its share of the treatment plant. In this case, the U. S. Environmental Protection Agency has issued some specific regulations governing the revenue system for recovering these funds from industry - the abovementioned cost recovery provision. Many aspects of the change stipulated by federal law require broad clarification.

This document, therefore, generalizes rather than specifying exactly how a particular community should handle its shifts in revenue programs.

For this reason, all cost figures and charge computations contained within are examples and may diverge markedly from real figures for a given community. The federal statutes and U. S. EPA regulations referred to in this publication are those of early 1975, but although these may change, the principles discussed here will still apply to the problem of establishing equitable user charges.

SUMMARY

The sharing of community wastewater system costs among residential, commercial, and industrial users is complicated by the differences in those wastewaters and the uses to which the systems are put. Homeowners discharge their bathroom and kitchen wastes; commercial establishments such as bakeries, laundries, and restaurants, discharge wastes from their operations; and industries discharge wastes from their manufacturing processes. Additionally, melted snow and rainwater from streets, private residences and commercial property may drain into a single sewer system intended to carry away sewage as well as stormwater run-off, and even in communities where this is not the case, some ground and stormwater will inevitably leak into sewers specific to sanitary and industrial use. In all cases, however, conveyance costs are governed by peak and average flow rates, and treatment costs are governed by both peak flows and the strengths and characteristics of pollutional material in wastewaters.

Cost sharing becomes an intricate matter when it is recognized that strengths and characteristics of pollutants in industrial and commercial wastewaters may differ from those in residential sewage, that in discharges resulting from industrial processes, concentrations may vary considerably, and that stormwater rinsed from streets and roofs can contain even higher concentrations of pollutants than sanitary sewage. Stormwater maximum flows are determined by intensity and duration of precipitation and are likely to exceed sanitary or industrial process wastewater flows.

Because ground and stormwater flows in a system are not easily designated to specific users or property, sewers and treatment plants constructed to accommodate potential maximum stormwater flows and leakage must be considered a benefit to the community. This may be referred to as one "community use" related capability and expense. Another arises from the necessity and logic of designing and constructing a system for future use, because the addition of small increments of capacity at later dates would be unduly expensive.

A reasonable revenue program should thus obtain funds both from individual users and the community as a whole for these "community use" capabilities. Individual users and the total community should be charged according to the volume, discharge rate, and quantity of pollutional materials in their wastewaters. For practical purposes, homeowner charges are based in general historical information on domestic sewage strength as well as individual water use; user charges for large industries are based in analyses and accurate measurements of their respective wastewaters.

The "community use" share is logically obtained from property taxes, property-benefit charges, equal per-customer charges, or possibly sales and income taxes.

If a community is receiving federal construction grants, law requires that the operation and maintenance costs assigned to deliberate wastewater dischargers be equally distributed among all classes of users. In order that each user be charged equitably according to his wastes, these costs must be based in the total volume of wastes and quantity of pollutants (and/or the concentration of pollutants per unit volume).

The sharing of capital costs is calculated in a similar manner, except in the case of complications arising from the federal construction grant system. Although Congress has agreed that the federal government will supply the major portion of the capital costs involved in constructing legally acceptable community treatment plants (these are to process both residential sewage and industrial wastewaters), they have also stipulated that industry repay its share of the construction grant funds without interest and within a period of 30 years, thus making industrial user charges greater per 1,000 gallons and per pound of pollutant than residential and commercial user charges. The cost of larger sewers for bringing wastewaters to treatment plants may be distributed among governmental jurisdictions and private industries sharing the system, based in engineering considerations of cost responsibility.

THE PROBLEM OF FAIRNESS IN WASTEWATER SERVICE CHARGES

The development of a method for charging customers fairly for wastewater services is somewhat complex when compared to charging for other products generallly supplied by utilities. For example, the charge for water at a basic price of so much per 1000 gallons and electricity for so much per kilowatt is straightforward. However, wastewater is not a simple, uniform substance. A community system typically receives wastewaters of widely differing strengths and flow rates. The system receives wastewaters from residences, commercial establishments such as restaurants, bakeries, laundries and the like, and from manufacturing plants. Ground and stormwater also infiltrate into the system. Each source class has greatly different strengths and flow patterns. Stormwater is deliberately and legally directed into sewers designed for conveying both wastewaters and stormwater runoff, called combined sewer systems. Even where the sewer is intended for sanitary wastes only, some stormwater will inevitably get into the sewers through manhole covers, illegally connected roof or foundation drains, for example. The costs of transport and treatment are affected by:

1) The quantity of pollutional matter contained in the wastewater,

2) The form of the pollutional matter, that is, whether or not it is settleable particulate matter,

3) The discharge rate, and

4) The volume.

These cost-causing elements must be considered if contributions are to be proportional to the costs of treatment.

Differences in the content and form of pollutional matter can be gauged by comparing domestic sewage with other sources, because domestic sewage, that is, wastewaters from residences, is considered for charge purposes to be uniform in content of pollutional matter, with about 30 percent of the pollutional material in settleable form. Concentrations of pollutants in wastewaters from industrial processes and commercial establishments can range from ten or more times higher than domestic sewage to only 25 percent of that in domestic sewage. The content of settleable pollutional matter in industrial wastewaters can also range from near zero to practically 100 percent. Stormwater can contain as high a concentration of organic and suspended matter as residential wastes. Infiltration from groundwater normally contains very low concentrations of pollutional matter.

Volume is another factor in cost. Not only is the total volume over a period of time important but so is the maximum short-term volume, that is, the peak discharge rate.

Therefore, the first problem in establishing a fair charge system is the variation in characteristics among the types of sources, both in concentration and form of pollutional matter, and in the discharge volume pattern with time. The sources can be grouped into two categories, (1) those that permit measurement, sampling, and analysis of individual contributor's wastewaters and (2) those that enter the sewers in a diffuse manner and cannot be attributed to a particular user. The wastewaters of individual households as a practical matter are measured only by metering the water supplied. Actual measurement of individual household wastewaters is impractical both technically and economically. The only individual wastewater discharges for which continuous measurement and strength determinations are practical are those of large industrial contributors. Regarding infiltration and stormwater flow, it is generally feasible and worthwhile to obtain an estimate of the aggregate into a particular system or perhaps into branch sewers but unfeasible to attribute a measured quantity of infiltration and stormwater to individual users, because much of it flows directly into publicly owned sewers and property.

A second problem in distributing cost among particular users relates to that capacity of the system constructed for future community growth but not currently in use. The provision for increased future use is sound and economically justified because periodic, small additions of capacity would be so expensive and troublesome. However, since the user is not likely to make subsequent use of the system in proportion to his present use and since most new wastewaters are likely to come from the future development of residential and commercial property, it is probably unfair to ask that the current user pay for the growth capacity of the system in accordance with present flow and strength.

A logical way to handle the matter of obtaining the revenue for the infiltration, inflow, and future capacity is to consider these obligations of the total community and to develop a practical revenue system which distributes charges equitably throughout the community. Property taxes offer one way of obtaining such revenue, since they are a traditional means to obtaining revenues for services diffused over an entire governmental district - police protection, law enforcement, fire protection, recreational projects, street maintenance, for example.

Property benefit charges offer a second means of such community-wide distribution. These are simply a billing to each owner for certain services or benefits. They differ from a property tax in that they are not voter approved tax levies. They may be limited to the property affected and can be based on other property characteristics in addition to value. One other characteristic for proportioning costs could be land area; another, the length

of property fronting a street. Assigning property benefit charges is not authorized by statute in some states. Summary statements of some state restrictions on use of taxes are presented in Appendix A.

A real advantage to using property taxes or benefit charges is that they allow revenue to be obtained from undeveloped property. This is particularly appropriate with respect to capacity for future use, but it may also apply to infiltration and stormwater use. A revenue program which restricts its sources to present individual industrial, commercial, and residential users, on the other hand, will not obtain revenue from undeveloped property.

HISTORICAL PRACTICES IN OBTAINING REVENUE SOURCES FOR WASTEWATER SERVICES

Historically, the provision for sewers and public water supplies has largely been the responsibility of community government. Sewers and treatment plants in early communities were generally supported by property taxes, as were all local government efforts such as street paving, police protection, and recreational facilities. Later, some communities chose to raise all or part of the revenues needed to support the system by charging users based on some estimate of volume of wastewaters discharged. The charges were later refined to include not only volume but also quantity of pollutional matter contained in the wastewater. Over the years, a number of communities developed revenue systems which obtain part of the necessary income for wastewater facilities from property taxes and part from users. In addition, a few governmental districts not authorized to employ taxes as a revenue source for their services were established. These had to rely solely on user charges to residential, commercial and industrial customers. Other local agencies were authorized to obtain revenues only from property taxes and were therefore unable to employ the proportional-to-use charges.

In 1951 a Joint Committee of the American Society of Civil Engineers and the American Bar Association studied the matter of fair revenue systems thoroughly and issued a precedent-setting report in which they recommended that revenue be obtained from each user and beneficiary in proportion to costs of providing the particular use and benefits. One important portion of this recommendation is the recognition of "beneficiary" as well as user. The two terms distinguished benefits by use, that is, deliberate discharges of sewage or industrial wastes (user) from "benefits in other ways" (beneficiary). "Benefits in other ways" are the community uses described in the preceding section; one is the carrying away and treatment of stormwater; another, the capacity provided for future community growth, and a third, the necessary allowance for groundwater or stormwater leakage into the sewers. These all benefit the community, and thus the associated costs can be measured or estimated in total, that is, grouped together, rather than determined as originating with individual customers.

IMPACT OF THE 1972 AMENDMENTS TO THE FEDERAL WATER POLLUTION CONTROL ACT ON CHARGES FOR WASTEWATER SERVICES

The 1972 Amendments to the Water Pollution Control Act are having a major impact on wastewater service charges. The have imposed new treatment requirements on many local wastewater agencies and will cause the sharp increase in costs of wastewater services from these agencies. Congress has provided grants from Federal funds to pay the major share of capital costs of community wastewater treatment plants, specifying that communities must employ revenue programs within certain guidelines to qualify for these. The law espressly requires the local agency to adopt a revenue system which assures that each recipient of services pay a proportionate share of the costs of operation and maintenance of wastewater treatment facilities. Furthermore, it stipulates that industries using the facilities pay back that portion of the grant used to construct the plant with capacity for industrial waste treatment.

The Environmental Protection Agency, the agency administering this law, has subsequently adopted regulations which provide that the share of the grant to be paid by industry be distributed among industrial users proportionately to all variables influencing the cost of treatment - volume and strength of wastewaters, for example. Congress realized that certain uses of a wastewater system could not be broken down into volume or strength characteristics for purposes of charging individual users and consequently provided the alternative that classes of users be established and the charges be distributed fairly among the classes. Within any one class, where the volume, strength, and discharge rate of individual contributors can be determined, the law implies that charges to each user be proportionate to the extent of use. Among residential, commercial and industrial user classes, costs can be adequately distributed in this way, and such a distribution is what the law intended to accomplish where possible. Communities and sanitary districts are unrestricted in their methods for raising revenue to meet the local share of capital costs.

As discussed previously, however, costs within the "community use" class cannot logically be assigned to each user according to individual responsibility. The use of property taxes or property benefit charges appears to be an appropriate means of distributing these costs in a revenue system. Another means of dealing with these costs involves charging the same amount per customer. The latter is particularly appropriate to governmental service districts which do not have taxing authority or ability to make property benefit charges.

The new law requires regional planning of wastewater services before awarding grants. The subjects of regional planning, capacity for future growth and revenue programs intermesh. The ideal concept is that regional wastewater collection and treatment facilities properly include all relevancies - land use plans, preservation of resources contributing to the quality of life of the community, its environmental quality, its transportation plans,

the cost effectiveness in meeting the existing wastewater service needs to the region and future needs for new or more intense development. The situations to be avoided are those that typically plague areas today. One such problem occurs in fringe areas where use of inappropriate or too densely placed household soil disposal systems results in health and esthetic problems as in-yard seepage develops. Similarly, individual household treatment systems discharging into local drainage channels cause back-yard gullies running with inadequately treated sewage. Finally, the trend toward construction of many small systems serving localized developments, each with its own treatment plant and effluent, can result in poorly operated plants, as experts are not affordable at a low cost because of loss of advantage of scale. This compounds the work of the control agencies.

The concept of regional planning embodied in the law should promote systems with the capacity of properly managing, conveying and treating the wastewaters of the region. Regional systems should solve the problems previously mentioned including provision of future capacity tailored to the regional plan. The advantages of economies of scale and better treatment through better operation and maintenance will counter the tendency of developed communities to divorce themselves from the wastewater problems of new neighbors. The attitude of converted, mutually advantageous action throughout the region should prevail and, like other utilities, the system should reach out judiciously to serve all reasonable demands of growth. The future capacity should be available on a first come-first serve basis and when exhausted, the addition of needed capacity should be undertaken as a regionally supported endeavor. The concept of an older governmental entity establishing ownership in a regional facility and not sharing in capacity needs is unrealistic and makes for overburdening complexities. The deliberate failure to provide for wastewater treatment needs as a means of controlling growth in the region is poor practice. Land use planning and zoning should come first and wastewater services made to correspond with them.

USER CHARGE DISTRIBUTION AMONG CLASSES OF USERS

The principle to be followed in deciding the charges to each user is that each shall pay according to the costs of providing the services to him. The costs of treating wastewaters are governed by volume and quantity of materials present in the sewage; in other words, its strength. Two measurements are commonly used for the strength of sewage; one is suspended matter, which is matter in solid form; the other is a measurement of organic matter called Biological Oxygen Demand (BOD). The costs of the treatment facilities can be related fairly well to one or the other or a combination of these three; volume, BOD and suspended matter. In some local situations, other constituents in the wastewaters may be involved in the treatment plant and these would be included as in the case of phosphates and their removal.

In many financing programs, the costs are best considered in two categories: Construction or capital costs, and repairs, operation and maintenance costs, which are those of labor, management, and power to run the plant. Construction costs are usually financed by selling bonds (borrowing); the annual costs are the interest charges plus money to pay back the bond holders, much like home mortgage payments.

Treatment facilities themselves are made up of the following major parts:

Pipes and sometimes pumps to transport the wastewaters;
Tanks to allow matter to settle from the wastewater;
Tanks to remove the non-settleable material by a process called biological treatment;
Equipment to make the removed material disposable.

Capital Costs

Separate distribution of capital from operation and maintenance costs is necessary for a rational approach. It is also advisable to separate the costs of each element or part of the plant. First, considering the capital costs of each element, tanks for separating the suspended matter by settling are sized according to flow rate, that is, volume of sewage. The tanks for taking out organic matter in solution or materials not removed by settling are sized largely according to BOD strength. The facilities for processing the material removed in treatment, called sludge, originate from both the suspended matter and BOD in the ratio of about two volumes from suspended matter and three from BOD removal. Thus, the capital cost is logically divided among the three measurements in accordance with the contribution by each user. Typically, such distribution for the total treatment plant, following the procedure explained above will result in about the following percentage distribution of capital costs.

Volume - 25-40%
Suspended matter - 20 to 30%
BOD - 30 to 50%

The charges per 1,000 gallons of volume, the charges per pound of suspended matter and the charges per pound of BOD are computed from a cost distribution similar to that described above. These are usually referred to as unit costs.

At first consideration it might appear that once the costs of handling each volume of sewage and each quantity of BOD or suspended matter is established it would be a simple matter to assess each user his charges. However, the situation is seldom so simple, and different user classes have to be taken into account, because the information required for assessing costs to each class of users is different. Typical classes are residential, major industrial, and small commercial/industrial users.

For the residential user the only practical estimate of sewage volume is the water supply. This is an imperfect measurement, however, because much of the water used does not find its way into the sanitary sewer. In fact, one study has shown that only half the water used reached the sewer during the lawn watering season. Also, it is not feasible to measure the strength of each householder's sewage. Values available in textbooks and published reports offer an estimate of domestic sewage strength. A more accurate estimate can be obtained from data available on the quantity of BOD and suspended matter received at the treatment plant involved. The total received at plant, less the load from industrial users, commercial users, and stormwater equals the quantity of BOD and suspended matter from residential sources. All this information is sometimes difficult to obtain. The sum of residential water use may then be employed to compute the average strength. The total charge for both volume and strength for household wastes per 1,000 gallons is then the sum of the volume charge plus a charge per unit of suspended matter at average strength, as computed above, plus a charge per unit of BOD at such average strength. This may be clarified by example. For instance, assume that the capital costs of the system are distributed among volume, BOD and suspended matter and the following numbers reached:

5 cents per 1,000 gallons
1 cent per pound of suspended matter
2 cents per pound of BOD

If at the computed average domestic sewage strength, each 1,000 gallons of domestic sewage contained 2.0 pounds of suspended matter and 1.7 pounds of BOD, the total comprehensive charge of 1,000 gallons would be:

Volume		5¢
Suspended Matter	2 x 1¢ =	2¢
BOD	1.7 x 2¢ =	3.4¢
Inclusive Charge		10.4¢ per 1,000 gallons

Thus, the inclusive charge to homeowners for capital costs would be 10.4 cents/1,000 gallons of water used. The above is an illustrative value and reflects only capital costs.

Use of the municipal sewers by a large wet-process industry can be and usually is measured fairly accurately and continuously. Samples are typically collected and analyzed one to seven days a month. Computation of charges is, therefore, a simple matter of applying the unit charges for volume, suspended matter, and BOD, and summing them.

The cost and effort to measure the volume and strength of wastes from smaller industries and commercial establishments continuously or frequently is too great to be warranted. Nevertheless, the strength of wastes from establishments such as restaurants, bakeries, and ice cream stores is different from that of residences, and this difference must be reflected in the charge system. A practical way of doing this is to adopt an average waste strength for each type of business and to compute the comprehensive volume charges

as has been described. The volume is then taken as equal to water use, and the charge computed. If data on strength is not available in published reports, a sampling program can be carried out. As an alternative to a standard of waste strength for each type of establishment, a number of classes of industrial wastes may be set up by strength and each type of establishment then assigned to a class as indicated by known information or a sampling program. Each class could have its corresponding charge in accordance with its strength range.

The previous paragraphs discussing how equitable distribution of construction costs among classes of users may be derived is hopefully relatively straightforward and easily understood. One complication deliberately omitted from the preceding discussion is the Congressional requirement that the grant funds for constructing industry's share of the treatment plant must be paid back by industrial users over a 30-year period without interest. One method of handling this is to distribute the local construction costs among the classes of uses as described so as to arrive at local annual capital costs per 1,000 gallons and per pound of pollutional material. All users would pay these. A second computation is then made for the annual charges for the industrial share of the grant pay back in order to arrive at additional charges per 1,000 gallons and per pound of BOD and suspended matter for the industrial user's grant pay back. The two charges, the local share of construction costs and federal grant industrial pay backs, would be added to establish total capital user charges for industry.

Operation and Maintenance Costs

Thus far, this discussion has been concerned with the revenue for construction or investment costs rather than costs for operation and maintenance. These include personnel salaries and wages, power, repair and replacement of the equipment in order to keep the system functioning properly. Such costs are logically distributed between user and property benefit charges in a manner similar to that discussed for capital costs. The share assigned to property benefit will be considerably lower. For example, the operation and maintenance costs for unused capacity (future capacity) would correspond only to keeping the unused capacity in good shape and would not include any electric power expense. Costs associated with infiltration and stormwater can be quite significant, particularly if these include a peak load consideration.

Principle operation and maintenance costs are for labor and electric power. Power is typically used for two main purposes: 1) pumping of sewage and 2) compression of air for the treatment process. The quantity of compressed air used is proportional to the BOD; thus, power costs would be logically divided proportionately to volume and BOD. A small share of personnel costs would be assigned to volume, because the larger the size of units, the greater the amount of labor to maintain them. The removal of BOD requires a great deal of labor for operating the air compressors, the sludge recirculation pumps, and the excess sludge processing equipment. The lesser share would be distributed to suspended matter where the labor involves largely the skimming, the sludge processing and disposal.

Customer Costs

In the operation of a wastewater system a small but significant part of the services are independent of the amount of use a customer makes of the system. Such parts of the services are for reading meters, billing customers, and accounting. The time and materials involved in these operations are the same regardless of the size of the bill. A common term for such equally shared costs is "customer" costs. Other costs logically shared about equally per customer are uncollectable accounts, costs of collecting delinquent accounts and certain administrative expenses. Still others are associated with providing wastewater services without specific charge to governmental users. For example, in some instances the local agency may choose not to bill the city hall, court building, schools, fire stations, police stations or city hospitals directly although U. S. EPA regulations may require direct charges for such services. If "free" service is granted governmental users, the costs should be distributed equally among all users rather than in proportion to use.

If imposition of property taxes or property benefit charges is not possible because legislative authority is lacking for the beneficiary charges previously discussed, then these too can, instead, become customer costs.

Collection and Transport Costs

The previous discussions of user charges have dealt exclusively with treatment costs, that is, costs of constructing and operating the treatment plant. Two additional costs involve the collection system, the network of small sewers leading to each house and industry, and the large sewers, called interceptors,which, like super highways, connect with major branch sewers and lead to the treatment plant. When interceptors must be built to consolidate scattered small treatment plants, to pick up outfall discharges not receiving treatment, or to bring suburban areas into a central location, significant costs can be involved. Part of these should be paid by property taxes and part by user charges. Profound disagreements can develop as to how an outlying suburb and an inner city industry ought to share the interceptor sewer costs.

The Federal regulations leave this matter of sharing the costs of collection and interceptor sewers to the local community because of the complexities of individual situations. Careful consideration of the facts and circumstances at each location governed by sound engineering judgments should permit a distribution acceptable to all. The transport cost may logically be greater for one local government subdivision in the system than for another. Engineering considerations that usually enter into these decisions include such factors as no penalization for arbitrary location of the treatment plant and some distribution of transport costs among all users

because the transport system makes possible lower treatment costs for all. The Federal regulations require the operation and maintenance charges for each 1,000 gallons or each unit of BOD and suspended matter to be the same for all users, but the transport charges may differ. Again, careful consideration of the facts and circumstances at each location and the use of sound judgment should lead to a cost distribution acceptable to all.

The small collection lateral sewer costs are typically a local matter handled by assessed property taxes or as part of the purchase price of a home.

Total Costs

Thus, the total user charges for treatment and transport to each homeowner will be the sum of the user charge components, that is, of capital costs (interest and bond payments) assigned to user charges, the operation and maintenance costs (the latter including the equally shared customer costs), and transport costs assigned to user charges. These will ordinarily total in the range of $30 to $80 per family per year for wastewater treatment in compliance with the 1972 Amendments to the Water Quality Act. (For some cities already practicing good treatment, the new requirements may not result in much additional charge above that currently paid. For other cities, these costs may be entirely new.) The community use or beneficiary costs for a homeowner is estimated ordinarily to be about $10 to $25 per average household per year; thus the total is $40 to $105 per household per year exclusive of costs of the collection system. The total impact of the 1972 Amendments to the Federal Water Pollution Control Act, given the goals set for 1983, are generally going to result in substantial increases.

Industries may be expected to pay user charges totalling about $100 to $400 per million gallons for wastes of strength similar to that of sewage. Greater charges would occur for higher strength wastes. The charges for industry per 1,000 gallons and per pound of pollutional material would be greater, of course, because of the industrial grant pay-back requirements. A large wetprocess industry may pay as much as $200,000 a year or more for wastewater services.

The lower costs in these ranges would occur with large systems. This is typical of manufacturing operations where costs generally are lower the larger the plant and the greater the production. Costs would be expected to be lower when all the population and industries join in one system. For this reason, Congress, in the 1972 law, supported and encouraged systems which collect sewage from large areas and from industry as well as residences. The lower unit costs thus benefitted both homeowners and industry.

The Federal requirement of industrial pay back of grant funds results in another advantage to homeowners sharing the system. Up to half of the Federal funds industry repays go to the local wastewater agency and may be

used by the agency for plant expansion, replacement and other costs. The homeowners will thus be relieved of paying any part of the costs met through use of repaid grant money.

APPENDIX A

STATE LEGISLATIVE RESTRICTIONS

A SUMMARY OF STATE RESPONSES REGARDING RESTRICTIONS ON SEWAGE FACILITY FUNDING, NOVEMBER, 1974

1. Restrictions On Use of Taxes

Question: Does your state have any legislative or regulatory restrictions on use ad valorem, other general taxes or other types of service charges to pay for capital or operating and maintenance costs for sewage collection and treatment systems? Examples: property taxes for construction or O & M; uniform service charge rates for all classes of users; inclusion or exclusion of sewer system bonds in statutory bonding limits.

Responses:

Illinois: No restrictions on municipal systems although legislation for some sanitary districts does not provide for user charges. Generally sewer system bonds are included in statutory bonding limits.

Indiana: No restrictions.

Kentucky: Provisions vary with each type of public service agency. In 1974 legislature adopted bill conferring authority for all entities to comply with cost recovery requirements of PL 92-500.

New York: No restrictions; state law requires that user charges be equitable. Bonds for construction of sewer and treatment facilities are excluded from constitutional debt limits.

Ohio: No legislative or regulatory restrictions. Revenue bonds excluded from statutory limits.

Pennsylvania: Requires legal research but it is believed that there are no restrictions for municipal systems but there may be restrictions for sanitary districts. Revenue bonds are not subject to municipal bonding limits.

West Virginia: No restrictions.

2. State Control Commission Regulation

Question: Are municipal, county or sanitary district rates, accounting procedures, etc. subject to approval by state utility commission?

Responses:

Illinois: No

Indiana: No

Kentucky: Variable depending on specific authorizing legislation for sanitary districts.

New York: No. Approval is by the Comptroller, Department of Audit and Control.

Ohio: No

Pennsylvania: No except outside authorized service area.

West Virginia: Yes, all municipal, county, public service or authorities operating a sewage system must have rates approved by West Virginia Public Service Commission.

3. Reserve Fund Restrictions

Question: Are there any legal restrictions on the ability of municipal, county or sanitary districts to establish a reserve fund for future treatment expansion or replacement as required by the industry cost recovery regulations established by U. S. EPA?

Responses:

Illinois: No express statutory provisions which prohibit or allow establishment of reserve funds; specific legislation may be required for non-home rule counties, municipalities or sanitary districts.

Indiana: No

Kentucky: Blanket 1974 legislative authority authorizes all waste treatment agencies to establish reserve funds as required by PL 92-500.

New York: Restrictions on establishment of reserve funds, however, the local government could be presumed to be acting as an agent of the Federal Government in collection of the proportionate share of capital cost attributable to the federal grant.

Ohio: No

Pennsylvania: Regulated by bond indentures and by language in Municipal Authority Act.

West Virginia: No legal restrictions except approval of rates and reserve fund by the Public Service Commission.