Evaluation of Water and Sewer Rates in the Potomac River Basin
Part 1

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Contents

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I. Summary of Significant Findings

The principal findings of this study are set out below. Although they are not entirely surprising, their identification allows an organized and systematic approach to the problem of revenue inadequacy.

1. Financial difficulties which impinge on the level of service of small water and sewer utilities are ubiquitous.

2. Where problems of finance and infrastructure exist, they can be traced to a number of contributory factors, including:

   a. systems installed with financial aid from a grant or low cost loan, with no incentive for repair and replacement,

   b. scant attention paid to maintenance,

   c. no allowance in rate design for disaggregated cost of service of utility functions, or full life-cycle costs of plant and equipment, and

   d. co-mingling of utility revenue with general local authority funds, and a reluctance to adopt a self-sufficient financial policy.

3. Some federal, state and local funds are available to local utilities in the form of grants and loans for planned capital works; the availability of funding programs varies with time.

4. Some state programs of aid for maintenance and operations are available to local utilities.

5. Some programs are available to local utilities to assist in rate design and financial management.

6. Misunderstandings and lack of cooperation may exist between local utilities and the agencies who regulate their financial affairs.

7. Local utilities and regulatory agencies should become (and stay) aware of all available assistance programs and avenues for cooperation.

As a general result of the study, it can be concluded that aid in various forms is apparently available from a number of sources. However, the process of orchestrating access to these (many and changing) sources may in some cases be difficult. In addition to institutional sources of assistance, there is a growing body of literature which is specifically directed at the problem of utility rate design and revenue inadequacy. Two of

these, in particular, are developed as manuals of current practices and techniques for allocating costs of service and developing rates for water and wastewater systems (Refs 2,10).

II. Introduction

This report summarizes a study of water and sewer rates in the Potomac River Basin. Water and sewer utilities in Washington, D.C. and each of the basin states are represented. The motivation for this study came from an awareness of the problem of revenue inadequacy in the Eastern Panhandle Region of West Virginia; however, revenue inadequacy is widespread and widely reported (e.g. Refs 1,3). It has received attention by federal, state and local government agencies; and umbrella water and sewer associations. In many cases, this attention has no doubt resulted in solutions to the problem. By examining successful institutional arrangements elsewhere, and comparing other levels of charges in the Potomac River Basin, it is hoped that some assistance may be provided to utilities in the Eastern Panhandle Region.

This study is being conducted in two parts:

1. a survey of rates in the water and sewer utilities of the Potomac River Basin, and a summary of revenue inadequacy

problems and governmental assistance programs from a federal, state and local perspective;

2. within the context of part 1 above, a detailed study of the extent and cause of revenue inadequacy in the West Virginia Panhandle with direct involvement and specific recommendations, where appropriate, for addressing the problem.

The present report summarizes the findings of part 1 of the project.

III. The Problem: Revenue Inadequacy

The fundamental inadequacy of present revenues generated by small water and sewer utilities is the principal focus of this study. Two factors exacerbate the situation: aging and/or over-loaded systems, and the requirement for increasingly stringent levels of performance.

An indication of the need for funding of sewage treatment facilities is the number of plants which will require upgrading in order to meet the requirements of the National Municipal Policy. This policy requires that all publicly owned sewage

treatment plants meet their permit limits (at least secondary treatment) by 1988; they must all be under a compliance schedule to achieve this standard by September 30, 1985. This policy has major ramifications for both Pennsylvania and Virginia where a large number of plants are affected. It does not have a great impact in Maryland because most of the required upgradings are already in process with funds allocated. As Blue Plains STP is now meeting its permit limits, the District of Columbia is not affected.

While permit limits become more strict, funding of operation, maintenance and repair also begins to force difficult decisions on providing necessary local funding. How much negotiation and technical assistance should be allowed before pursuing fines and other punitive enforcement actions is an important issue for all jurisdictions. In the past, enforcement action against municipal dischargers had been delayed while funding was sought for sewage treatment plant improvements. Under the National Municipal Policy, compliance with all municipal permits is required by 1988 regardless of availability of funding. This condition will present significant enforcement challenges.

States and localities have become dependent on federal funds for necessary construction of municipal sewage treatment facilities, and now must determine how to obtain more state and local resources to do the job.

Although the scope of the problem has not been well defined, all jurisdictions agree that funding for operation, maintenance, and repair and replacement at municipal and privately owned sewage treatment plants pose serious problems. User fees are generally insufficient to cover these problems. All jurisdictions should explore methods of assuring that sufficient funds are available for operation and maintenance. In addition, operator training programs (which are being carried out by all jurisdictions) should address financial management, as well as operations, repair, maintenance and pretreatment.

IV. Federal, State and District of Columbia Perspective

Two significant changes in the availability of federal funds have taken place since 1983:

1. Cost share formula. The federal government has since 1972 paid the majority of costs of constructing sewage treatment facilities. Until federal fiscal year 1985, the federal share has been 75% and the nonfederal share 25%. In 1984 this formula changed to a 55% federal 45% nonfederal sharing arrangement. The impact of this cost share formula change has not yet been felt because most of the construction going on at the present time was approved prior to the change becoming effective.

2. Allocation formula. The formula by which the total amount of federal funds appropriated to sewage treatment plant construction is distributed among the states may be changed as part of the reauthorization of the Clean Water Act which is expected to take place in 1985. All of the jurisdictions within the Potomac River Basin, excepting the District of Columbia, face the loss of about 21% of the funding that they would expect to receive if this change in formula does not take place. The District would get an increase of 82%. Legislation enacting the change in formula has passed the U.S. Senate. The House version of the bill, however, leaves the formula unchanged. The matter is expected to be resolved in conference committee early in the fall of 1985. The outcome has major consequences in terms of the states' ability to continue to improve sewage treatment facilities at the rate they had previously anticipated.

An aspect of federal funding which has not changed is the United States Environmental Protection Agency (EPA) policy on advanced waste treatment (AWT). Nutrient removal will be eligible for federal funding only where it is demonstrated, on a case by case basis, that AWT will correct an impairment of designated water uses and where all other sources are being controlled. An exception to this policy is made in the tidal Potomac, where

there are established federal/state policies on removing phosphorus. Elsewhere in the basin, it is unlikely at the present time that EPA will allow federal funds to be used for advanced waste treatment.

DISTRICT OF COLUMBIA

The EPA had taken enforcement action in the District of Columbia because of maintenance problems at the Blue Plains STP; the District is in the process of raising fees significantly. Increases in sewer rates (15% in 1984, 25% in 1985, and 35% in 1986) will provide the funds to improve operation and maintenance at Blue Plains. The plant is now meeting effluent discharge permit limitations.

MARYLAND

Maryland has agreed to provide additional funding to make up for federal reductions. Capital funding assistance for local sewage treatment facilities was greatly expanded by the utilization of $49 million in previously authorized bonds and the authorization of $5 million in new bonds in 1984. These provisions have the effect of holding the local share of sewage treatment construction at the same level despite the reduced federal

share. The capital assistance also specifically provides for chlorine removal, nitrogen removal and loans and loan guarantees for pretreatment. Another $14 million has been authorized in 1985.

Innovative and alternative sewage systems are being promoted by the state through funding and manpower devoted to assisting local governments with new technologies. Regulations have been drafted and published, and staff hired to administer the program. Currently, the Office of Environmental Programs is reviewing all existing innovative and alternative projects in the state. There are about 20; all are small and involve treating wastes prior to land treatment. There have been problems with high groundwater nitrate levels in some areas.

The state has two ways of forcing local governments to provide for maintenance replacement and repair in their financial management plans for sewage treatment plants: (1) deny construction permits or grants and (2) disapprove the County Water and Sewer Plan, which amounts to a moratorium. New regulations have been drafted requiring a financial management plan to be proposed and approved together with a construction permit or grant.

PENNSYLVANIA

Pennsylvania annually appropriates funds for operation and maintenance of municipal sewage treatment plants, and proposes to continue this grant program in the future. A pilot innovative and alternative sewage treatment approach has been initiated to develop a comprehensive rural sewage management program. Methods such as privatization and revolving loan funds are being explored by Pennsylvania.

VIRGINIA

The Virginia Resources Authority was created to assist local governments in obtaining financing for water and sewer facilities. Startup funding was provided from state general funds. The Authority received additional operating funds and had its activities expanded in 1985. Its total bonding authority is $300 million. Its first bond issue of about $22 million has been issued. The first recipients will be localities with good credit ratings. After the Authority has established a good rating, communities which have poorer or nonexistent credit histories will be included. The Authority, however, cannot address all the construction funding needs of localities, so alternative funding methods are being explored.

A total of $3.3 million will be made available during FY 1986 to the Sate Water Control Board for the implementation and enhancement of three statewide programs. The National Municipal Policy Hardship Assistance Program is a local grant program for localities which encounter hardships in meeting the effluent standards established by the Clean Water Act. Eligibility is dependent upon a local government's ability to pay. The Design Fees Financial Assistance Program will provide a percentage of the design costs for the planning and construction of major sewage treatment plants to those localities which do not currently have large wastewater treatment facilities in place and for which even the allocation of planning money might present a significant obstacle. The Infiltration and Inflow Program will provide supplemental financial assistance to those localities with older wastewater treatment systems which have cracked or deteriorated sewer lines and other physical plant difficulties.

Operation, maintenance and repair of sewage treatment plants presents enforcement problems. In many cases, user charges are too low to adequately cover maintenance and repair requirements. A number of options are available for enforcing permit standards against municipalities. The first step is usually a onsite inspection and technical assistance. Next, the staff will work with an owner to allow a reasonable time for corrective action. If these steps are not successful, various enforcement actions

can be taken, such as consent orders, special orders, or court action. In addition, the Virginia State Water Control Board can impose a moratorium on new hookups to poorly operating plants. This measure is used sparingly. More frequent is the use of a limit on new hookups which is significantly lower than demand but not a complete moratorium.

NATIONAL MUNICIPAL POLICY IN VIRGINIA
(Publicly Owned Treatment Works)

	All Potomac	Major Potomac
Number of POTWs:	54	15
Number Under NMP1:	21	3
MCP2:	(16)	(2)
CCP3:	(5)	(1)

[1]NMP - National Municipal Policy

[2]MCP - Municipal Compliance Plan (requires upgrading of facilities)

[3]CCP - Compliance Correction Plan (requires improvements in operation)

Compliance with the National Municipal Policy will require a significant effort over the next several years. The State Water Control Board has been developing compliance schedules with the affected communities.

WEST VIRGINIA

In this report, attention to water and sewer rates in the State of West Virginia is focused on that portion of the state in the Potomac River Basin which is in the Eastern Panhandle Region. In this area, perhaps more than any other, Municipal and Public Service District utilities have found it difficult to provide the desired level of service with revenues derived from the existing rates.

It is in the nature of small water and sewer systems to have few major components; therefore, when one breaks down and/or unexpectedly needs to be replaced, a relatively large expense is incurred. There appears to be a need for improved communication in West Virginia between the Public Service Commission (PSC) which does have a policy of helping small utilities with financial problems, and those utilities which have the impression that the PSC is imposing harsh limits on financial practices.

The problem in this area centers on the inability of the utilities to gain approval from the PSC to generate and maintain sufficient funds in reserve to cover large unexpected repair and replacement expenses. As a result, a financial crisis develops and compounds an interruption in service when a significant breakdown occurs. On the other hand, the PSC has a policy of

making itself available to smaller Public Service Districts and Municipalities for technical assistance with the design of rate structures. The costs of programmed extensions, renewals and replacements are allowable items in rate designs. However, long term financing is required for large expense items.

V. Rate Structures

Rate structures range from simple flat periodic rates to sophisticated attempts to derive revenue in proportion to disaggregated costs of service. Billing component variables include:

a. connection charge; proportional to meter size and class of user,

b. front foot charge; proportional to property frontage on public right-of-way,

c. account charge; a flat rate to cover bookkeeping costs associated with setting-up or transferring an account and making a special meter reading,

d. advance quarterly use charge; proportional to meter size and to cover the provision of service between relatively long billing intervals, and losses from non-payment of bills,

e. service charge; proportional to meter size and to cover the cost of meter reading, repair and replacements, billing, postage, accounting and other services,

f. commodity charge; a flat periodic rate, or a unit charge per quantity of water delivered (and sewage discharged) between meter readings,

g. rate steps; variably proportional to meter size and/or quantity delivered (and discharged), in increasing or decreasing blocks or rates,

h. minimum charges/quantities; periodic billing charges which in some cases cover those costs associated with account charges, advance periodic use charges, and service charges, etc.

Rate structures which attempt to identify and derive revenue in proportion to cost of service are more likely to be found among larger utilities.

A survey of rates charged by some of the water and sewer utilities in the Potomac River Basin indicates large variation in the level of commodity charges. This is undoubtedly due in part to the individuality of rate designs; some utilities issue rates expressed entirely as commodity charges, while others vary in complexity and relationship to cost of service. Other causes of variation in rates include: differences in the age and expense of infrastructure, operating and labor costs, and size of rate base (population served) over which to spread overhead costs. The following table presents a sample of rates in the basin. These are expressed as being generally consistent with the concept of commodity charge, but are not all representative of charges in the same time period.

	Rate $/1000 gal		Population	Average	Effective
	Water	Sewer	Served	(mgd)	Date
DISTRICT OF COLUMBIA					
D.C. Government	1.17		756,500	200.	10/01/85
MARYLAND					
Brunswick	0.68		5,000	0.5	7/31/81
Cumberland	0.69		40,000	10.	7/31/81
Frederick	1.08		30,000	4.2	7/31/81
Frostburg	1.00		10,600	0.9	7/31/81

	Rate $/1000 gal Water	Sewer	Population Served	Average (mgd)	Effective Date
Hagerstown	0.80		75,000	9.6	7/31/81
La Plata	1.24		2,500	0.3	7/31/81
Lexington Park	0.59		8,600	0.7	7/31/81
Rockville	0.86		40,000	5.0	7/31/81
Waldorf	1.00		17,100	2.2	7/31/81
Westminster	1.68		18,000	1.4	7/31/81
Washington Suburban Sanitary Commission	0.92		1,300,000	143.	7/31/85
PENNSYLVANIA					
Borough of Chambersburg			17,900	2.8	06/79
Gettysburg Municipal Authority			7,800	0.96	06/79
VIRGINIA					
Alexandria	0.79	0.84	115,000	13.4	FY 1982
Arlington County	1.10	1.21	180,000	24.4	FY 1982
Berryville	2.47	1.85	3,000	0.22	FY 1982
Broadway	2.23	10.00*	900	0.15	FY 1982
Colonial Beach	1.83		4,000	0.14	FY 1982
Elkton	1.00	1.30	1,500	0.45	FY 1982
Fairfax County Water Authority	0.70			78.	1984
Grottoes	1.33		1,200	0.09	FY 1982

	Rate $/1000 gal Water	Sewer	Population Served	Average (mgd)	Effective Date
Harrisonburg	1.06	1.50	14,600	3.8	FY 1982
Louden Co. San. Auth.	2.23	2.30	21,000	1.0	FY 1982
Luray	1.29	1.60	5,900	0.63	FY 1982
New Market	2.20	1.76	1,500	0.60	FY 1982
Round Hill	2.00	2.55	1,100	0.06	FY 1982
Shenandoah	3.50	3.50	1,800	0.17	FY 1982
Timberville	1.80	12.00*	1,000	0.05	FY 1982
Warrenton	1.55	1.55	4,500	0.57	FY 1982
Waynesboro	1.00		15,000	3.0	FY 1982
Winchester	0.88	0.88	26,200	4.9	FY 1982
Woodstock	3.45	1.15	2,400	0.34	FY 1982
WEST VIRGINIA					
Berkeley Springs	3.20	3.50	4,000		09/82
Charles Town	1.80	1.74	7,500		09/82
Harpers Fy/Bolivar	2.50	3.06	1,500		09/82
Hedgesville PSD	3.33				09/82
Martinsburg	1.42	0.92	19,000		09/82
North Berkeley PSD	2.30				09/82
Opequon PSD	2.26		6,000		09/82
Paw Paw	4.13	0.73	800		09/82
Ransom	1.80	2.02			09/82
Shepherdstown	2.59	3.54	2,500		09/82
South Berkeley PSD	2.00				09/82

* Flat rate quarterly charge.

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