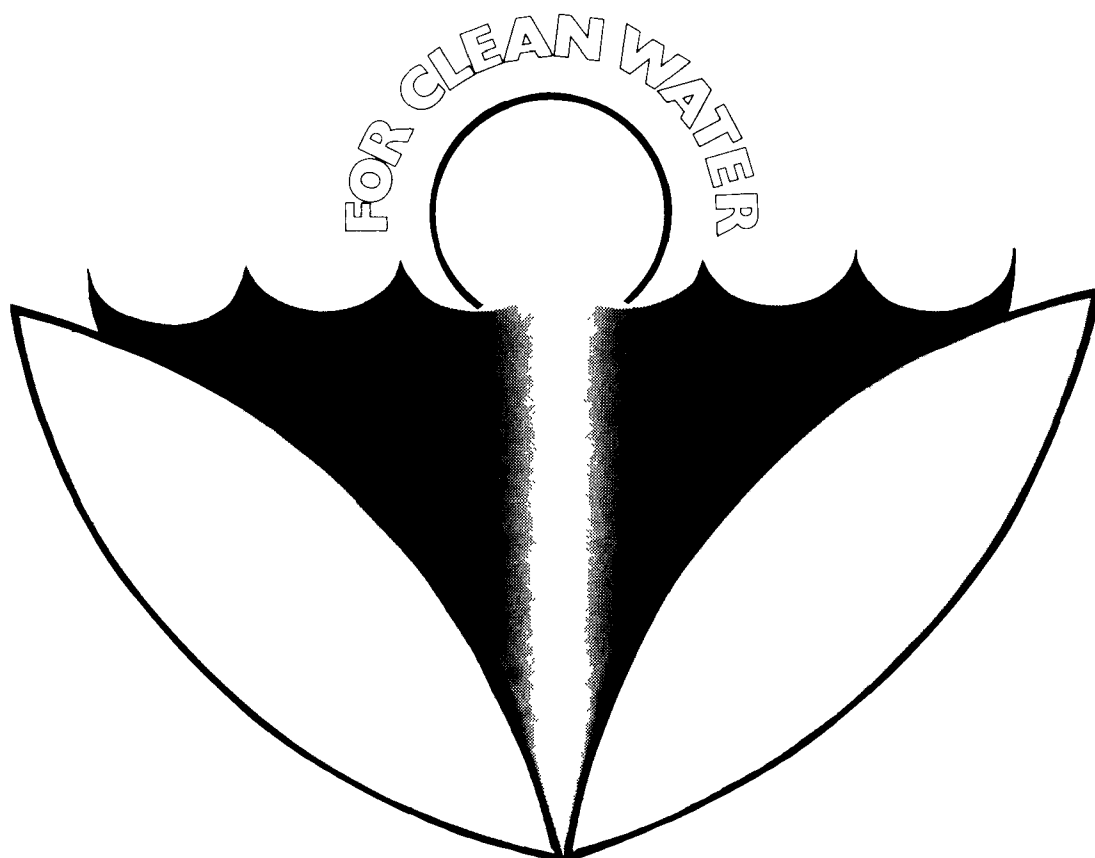




# **1990 PRELIMINARY DRAFT STRATEGY FOR MUNICIPAL WASTEWATER TREATMENT —COMPLIANCE**

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PRELIMINARY DRAFT 1990 STRATEGY FOR  
MUNICIPAL WASTEWATER TREATMENT

TASK IV - COMPLIANCE STRATEGY

OFFICE OF WATER AND WASTE MANAGEMENT  
U.S. ENVIRONMENTAL PROTECTION AGENCY

"This paper presents a preliminary draft strategy, proposed by EPA staff, for improving the national municipal wastewater treatment program. EPA is now considering the positions offered here. The document is intended for public review and discussion to assist EPA in developing its final 1990 Strategy."

January 16, 1981

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U.S. Environmental Protection Agency

## PREFACE

The proposals presented in the strategy are the result of both a major effort within the U.S. Environmental Protection Agency and extensive participation on the part of the interested public through meetings and the distribution of relevant issue and background papers prepared by EPA.

The 1990 Strategy was prepared under the guidance of Eckardt C. Beck, Assistant Administrator, Office of Water and Waste Management; James N. Smith, Associate Assistant Administrator, Office of Water and Waste Management; and Henry L. Longest II, Deputy Assistant Administrator, Office of Water Program Operations.

The Chairman of the 1990 Strategy effort within the Agency was Merna Hurd, Associate Assistant Administrator, Office of Water and Waste Management. The Deputy Chairman was Carl Reeverts, Office of Water Program Operations.

The Chairman of Task IV - Compliance Strategy was Robert Eagen, Office of Water Program Operations.

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## CHAPTER I

### INTRODUCTION

Since 1973 the federal government has awarded approximately \$30 billion in wastewater treatment facility construction grants. Most of these grant funds have not yet been converted to functioning sewage treatment plants, primarily because the average grant-assisted project requires from seven to nine years to complete. Moreover, approximately 85% of the completed facilities serve less than 10,000 people. Major grants, categorized generally as standard metropolitan statistical areas (SMSAs), have not, for the most part, completed planning, design and construction of facilities needed to satisfy the enforceable objectives of the Clean Water Act. Smaller communities, however, have been able to move through the program. Currently, more than 2300 communities have completed construction activity and now are confronted by the task of operating and maintaining totally new or upgraded treatment facilities.

As the expenditure of federal grant funds for the construction of community wastewater treatment plants increases, and as more of these facilities are placed in operation, public interest will shift from construction to the performance of the nation's publicly owned treatment works (POTWs). Numerous studies (1,2,3,4) of municipal wastewater treatment plants throughout the country have determined that a significant percentage of these facilities are not meeting the minimum effluent quality requirements of their National Pollutant Discharge Elimination System (NPDES) permits. Although the numbers differ somewhat from study to study, it is clear there are widespread performance problems. Depending on the criteria applied, between 30 and 50 percent of the nation's POTWs are significantly out of compliance with their NPDES effluent quality limits, thus failing to yield anticipated water quality benefits.

Obviously, these facilities represent a major public investment in pollution abatement which is not producing the anticipated results. This paper examines the POTW performance problem and discusses options which EPA and States can pursue to improve the compliance rate of municipal wastewater treatment facilities. More detailed discussions of these issues are available in the issue papers which were produced in the earlier stages of Task IV.

This strategy paper evaluates options available to EPA and the States to improve the performance of POTWs. Information presented is drawn from representatives of all levels of government and segments of the private sector involved in the planning, design, construction, management and operation of wastewater treatment plants. The proposed strategy should not be construed as EPA policy, but rather as an intermediate stage in the adoption of a compliance strategy to pursue in the next decade. It is intended to elicit comment from interested parties and reflects the influence of those who have reviewed earlier issue papers.

## CHAPTER II

### SUMMARY OF THE PROPOSED COMPLIANCE STRATEGY

The Clean Water Act of 1972, as amended in 1977 and 1980, incorporates the construction grants program as the primary means of reducing pollutants discharged from municipal sewerage systems. The publicly owned treatment works (POTWs) constructed with the assistance of the construction grants program can achieve the applicable goals of the Act only if they produce effluents that meet the quality requirements set in their National Pollutant Discharge Elimination System (NPDES) permits which govern their operation.

During the early years following the passage of the Clean Water Act, the primary objective of the construction grants program was to initiate action necessary to the construction of the required facilities. As the numbers of POTWs completed increases, it is evident that greater emphasis must be placed on the performance of these facilities once they are completed. The 1990 Construction Grants Strategy recognizes this need and includes a compliance strategy as one of the five major areas of concern in the overall strategy. This Compliance Strategy attempts to formulate a sound, practical program which, with the cooperation of State and local government agencies, will produce improved POTW compliance rates.

The major recommendations of the compliance strategy are summarized below:

#### STRATEGY TO IMPROVE THE QUALITY AND UTILITY OF COMPLIANCE INFORMATION

EPA presently lacks sufficient information on the performance of the POTWs constructed with the aid of the construction grants program. Improved compliance information will enable EPA and the States to better evaluate the program and to modify it to increase water quality benefits.

1. The Office of Water Program Operations and the Office of Enforcement will establish a national compliance data management system which summarizes self-monitoring data submitted by POTWs. This system must be coordinated with State pollution control agencies and cross-referenced with the Grants Information and Control System (GICS) to provide full utilization of the data.
2. EPA will establish requirements for quality control activities to be performed by the States to improve the quality of the POTW self-monitoring data.



## STRATEGY TO IMPROVE THE COMPLIANCE RATE OF NEW POTWs CONSTRUCTED WITH THE AID OF THE CONSTRUCTION GRANTS PROGRAM

It is imperative that greater consideration be given to the performance of POTWs during the planning, design and construction of these facilities. The following actions are intended to improve the quality of facilities constructed with the aid of the grants program and to better equip the POTWs to manage, operate and maintain these facilities:

1. Encourage the application of the systems approach to the construction grants process.
2. Strengthen implementation of pretreatment programs to prevent industrial wastes from degrading POTW effluent quality or jeopardizing sludge disposal options, particularly where effluent or sludge reuse alternatives are selected.
3. Modify the Inflow/Infiltration program to reflect the experience gained in earlier projects.
4. Investigate the feasibility of modifying NPDES effluent quality requirements for wet-weather conditions at POTWs experiencing severe I/I problems. This activity will be a part of the development of a strategy to deal with combined sewer overflows and stormwater.
5. Modify the definition of secondary treatment to allow the use of proven biological processes which do not satisfy existing secondary requirements but which offer benefits such as low energy requirements, process stability, and/or lower operator skill requirements. Use of these processes would be limited to applications which would not adversely affect water quality.
6. Provide an improved mechanism for the immediate correction of facility problems if a POTW fails to achieve compliance during startup, or if it is apparent that it will not be capable of achieving compliance at design loading.

## STRATEGY TO IMPROVE CONTINUING COMPLIANCE RATES

Once a POTW is constructed and successfully started up in compliance with NPDES permit requirements, it is essential that the operating agency take all measures necessary to assure that the facility continues to meet effluent standards. Unless the agency applies sound management practices to the operation and maintenance of the POTW, the public investment in clean water could be lost within a short time of startup. The following recommendations form the basis of a strategy to maintain POTWs in compliance after startup:

1. Provide grantees with financial management assistance.
2. Encourage the establishment of self-sufficient enterprise, or utility-type organizations.
3. Provide increased operator training assistance to the States.
4. Establish a POTW management assistance program for small communities.

#### STRATEGY TO IMPROVE THE COMPLIANCE RATE OF EXISTING POTWs

As more POTWs are constructed with the aid of the grants program, it is increasingly obvious that EPA must formulate a strategy to address those POTWs which have completed construction but are not achieving the effluent quality required by their NPDES permits. Although the quality of available data is not fully satisfactory, there can be no question that remedial action is required at many POTWs on final NPDES standards.

The following recommendations address this need:

1. Fund diagnostic evaluations of noncomplying POTWs and use the recommendations of these evaluations as the basis of enforcement action by the States or EPA.
2. Fund limited remedial construction necessary to correct deficiencies causing noncompliance at grant funded facilities.
3. Require and assist recipients of remedial construction grants to take legal action against negligent firms as a condition of grant acceptance.

Implementation of these recommendations by EPA and the States, in cooperation with local government agencies, will improve the quality and the performance of facilities produced with the assistance of the construction grants program, thus yielding increased benefits to the public and greater environmental protection.

## CHAPTER III

### CURRENT PROGRAM DESCRIPTION

#### BACKGROUND ON CURRENT PROGRAM - LEGISLATIVE AUTHORITY

The present construction grants program is authorized by the Federal Water Pollution Control Act (Clean Water Act) as amended in 1977. The 1977 Act, Public Law 95-217 made significant changes to its preceding act, the Clean Water Act of 1972 (PL-92-500). The 1972 Act provided the legislative basis for the present construction grants program.

The 1977 Act contains two national goals which were intended to provide a timetable for restoration and maintenance of the nation's waterways:

- By 1985 the discharge of pollutants to navigable waters be stopped.
- By July 1, 1983 (wherever attainable) an interim goal of water quality that provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water, be achieved.

In order to carry out the national goals a number of incentives and penalties were established. Specifically, the following sections shaped the present program:

#### Title II - Grants for Construction of Treatment Works

- Section 201 authorizes the granting of federal monies for construction of treatment works.
- "Section 204 - Limitations and Conditions" provides that no 201 grants be approved unless:
  - The applicant adopts a user charge system that assures each user will pay a proportionate share of the costs of operation, maintenance, and replacement of the system.
  - The applicant has the legal, institutional, managerial and, financial capability to ensure adequate construction, operation, and maintenance of the treatment works.
  - The applicant has made provision for the industrial users of the system to pay the applicant for the federal share of the cost of construction attributed to the treatment of such industrial wastes (Industrial Cost Recovery).

The last provision of ICR was repealed by Senate Bill #2725 as passed by the Congress on October 1, 1980, along with repeal of federal funds for the treatment of industrial flows in excess of 50,000 gallons per day. Congress did not prohibit industry from using municipal facilities. In fact, planning and designs to accommodate industrial flows are still grant eligible. Industries and local governments now, however, most jointly develop programs for raising funds to construct industrial capacity.

### Title III - Effluent Limitations

- "Section 301, Standards and Enforcement," makes possible extensions of permit compliance deadlines under paragraph (i)(1) if construction is necessary at a POTW but the funds or time are not available for the construction to be completed. Under this provision, interim effluent limits can be set but the construction must be completed by July 1, 1983. This provision was the basis of the Municipal Management System undertaken by the Office of Water Enforcement.
- "Section 307, Pretreatment" of industrial wastes sent to municipal facilities, provides that municipalities shall require industrial users to remove toxic elements from discharges to POTW to the extent required by local sludge disposal programs and the POTW's capability to treat and prevent toxics from entering the nation's waters.
- "Section 309, Federal Enforcement" contains specific penalties to be used in the case of violations. Included are provisions for:
  - Administrative orders which seek correction of a specific problem with a deadline generally less than 30 days.
  - The State in which a municipality is located shall be joined as a party to any civil action brought against the municipality by the U.S. Should the municipality be prevented from raising revenue (by State law), the State shall be liable for payment of any judgement against the municipality.

### Title IV - Permits and Licenses

- Section 402 establishes a National Pollutant Discharge Elimination System (NPDES) to issue permits for discharge to navigable waters. Under the system the State submits a permit program to the Administrator for approval. After approval the State may administer the program and issue the permits.

- Section 402(h) provides for restriction or prohibition of new connections to a treatment works that violates its NPDES permit. This adds the moratorium as an enforcement tool against noncompliant municipalities.
- Section 405 encourages reuse of sludge and the development of pretreatment programs compatible with sludge reuse programs.

## CURRENT ENFORCEMENT POLICIES

The current enforcement policies of EPA can be found in the National Municipal Policy and Strategy (NMPS) published by the Office of Water Enforcement in October 1979. This document was followed by the Municipal Management System published in March 1980 which provided guidance in implementing the NMPS.

### Municipal Enforcement Strategy

- The current definition of non-compliance is failure (generally a consistent failure) to achieve NPDES permit quality limitations imposed on the plants effluent. The definition does not lend itself to a classification or grading system of violation but the terms "serious" or "minor" are used to quantify noncompliance.
- The National Municipal Policy and Strategy is an effort to obtain national POTW compliance with the minimum secondary standard deadline of July 1, 1977. Since 60% of the nations POTWs did not meet the deadline, a program of correction is necessary. In addition, a large percentage of treatment plants cannot meet their NPDES permit limits. By correcting the "non-compliance" with the secondary deadline the NMPS hopes to improve the NPDES compliance also. The NMPS established six categories of POTW compliance:
  - CATEGORY I POTWs that need construction comply; did not significantly contribute to the delay in construction; construction grant funding is or will be available to assist in complying; and can complete construction by the 1983 deadline.
  - CATEGORY II POTWs that need construction to comply; did not significantly contribute to the delay in construction; construction grant funding through Step 3 is available to assist in complying; but cannot complete construction by the 1983 deadline.

- CATEGORY III POTWs that need construction to comply; did not significantly contribute to the delay in construction; for which construction grant funding through Step 3 does not appear to be available by July 1, 1983, and consequently, may not complete construction by the 1983 deadline.
  - CATEGORY IV POTWs that need construction to comply and are causing significant public health or pollution problems, but due to lack of position on project priority lists, may require judicial action to assure prompt achievement of NPDES permit requirements.
  - CATEGORY V POTWs that have completed construction and are not meeting effluent limitations or other NPDES requirements.
  - CATEGORY VI POTWs that need construction to comply and did not significantly contribute to the delay in construction.
- Through construction grants, permit modification (Section 301(h), authorizes five-year secondary treatment waivers for "no harm" discharges to marine waters), permit extension (301(i)) and enforcement action the NMPS forces all POTWs into a compliance schedule.

#### Current Penalties and Priorities

As seen from the categories of POTWs contained in the NMPS, plants with and without construction grants are treated differently. Also treated differently are plants which have completed construction and do not comply - they are targeted for enforcement action.

The NMPS and the Municipal Management System (MMS) have singled out major facilities for enforcement priority. Since these facilities are normally associated with significant pollution problems, they are to be corrected as soon as possible.

The MMS contains a penalty or enforcement response guide for major permittees which contains sanctions for reporting, compliance schedule and effluent violations. The severity of the actions taken are usually tied to the number of times the violations has taken place and the effect of the violation. The majority of the enforcement actions recommended involve notices of noncompliance, grant related actions and administrative orders. The effectiveness of these methods is limited.

## Pretreatment Policies/Penalties

The national municipal pretreatment program is concentrating on the problem of industrial wastes in POTWs on three fronts:

- Section 301(b)(2)(A)(ii) of the Clean Water Act requires that all industrial users of POTWs be in compliance with national pretreatment standards no later than 3 years after such standards have been established.
- Pretreatment requirements are to be tied to a POTWs NPDES permit setting a date by which a program must be developed.
- The construction grants program contains regulations which prohibit grant awards (Step 2-Design after June 30, 1980; Step 3-after December 31, 1980) and payments (no more than 90% of a Step 3 or 2+3 grant after October 1, 1978) if a pretreatment program is not being developed.

With this segmented procedure and the delay in providing national categorical standards for many industries, there has been confusion and reluctance to act on the part of municipalities, industries and State officials. The publishing of a Pretreatment Program Guidance Package on September 23, 1980, by the Municipal Construction Division should help correct the situation.

Categorical standards represent an attempt by EPA to limit pollutants from specific industries which have historically caused water quality problems. These include industries such as metal plating, tanneries, petrochemical production, etc., that discharge substances that are harmful to the biological systems of POTWs (oils, fats, toxic metals, etc.) Since these industries regularly produce biologically toxic substances they have been singled-out for action as a protective precaution.

The setting of these standards has been a time consuming job for the agency. The industries affected have not always been involved to the greatest extent possible and, therefore, many industries have challenged the standards. The challenges and subsequent discussion have caused further delay.

Since the pretreatment program is tied into construction grant regulations and NPDES permit requirements, some of the same enforcement tools used in the NMPS can be applied to pretreatment noncompliance. An important difference is the added sanctions given in the case where Step 2 or Step 3 funding has not been obtained. No new grants may be made after December 31, 1980, without the grantee starting a pretreatment program. With most new POTW construction being funded by construction grants, this represents a powerful penalty.

## CURRENT SITUATION: DATA/GRANTS/NONCOMPLIANCE

### Data Information Systems - ADP

At present several EPA systems exist independently which contain POTW information:

- PCS - Permit Compliance System - contains facility inspection reports, compliance schedule events and discharge monitoring report (DMR) data.
- GICS - Grants Information and Control System - contains grant tracking: grant dollars, project description, target dates for the municipal construction grants program.
- NEEDS - Contains Construction Grants Needs Survey data with costs and categories of needs.
- Also available is a limited amount of EPA Form 7500-5 Operation and Maintenance Inspection data.

The fragmented state of the ADP systems at EPA makes information retrieval difficult at best. Ironically, one reason ADP is used is to facilitate access to a large quantity of data.

One of the tasks presented in the municipal management strategy is integration of the EPA data bases containing municipal treatment works information. Specifically the PCS and GICS are to be combined or cross referenced so that grant schedules and permit compliance schedules can be coordinated. Progress on this subject has been very slow.

In short, EPA's present compliance data management system cannot produce the type of management information necessary to adequately characterize POTW performance. Furthermore, since compliance data cannot be readily cross-linked with grants data, the grants program lacks the capability to adequately assess performance of POTWs constructed with the aid of the grants program.

### Status of Grant Project Completion vs. Needs

As of October 1980, the following construction grant project information is available:

- Active Step 3 construction grants - 6,268 representing 24.925 billion dollars.
- Active Step 4 grants (design and construction) - 783 representing 850.8 million dollars.
- 8,846 PL-92-500 projects have been completed representing 4.106 billion dollars (2,183 Step 3 projects - \$3.065 billion; 156 Step 4 - \$233.1 million).
- 31.58 billion dollars has been appropriated for the program (PL-92-500 and subsequent).



The following is a summary of the 1978 Needs Survey:

<u>Needs Category</u>		<u>1978 Survey</u> (in Billions)
I	(Secondary Treatment)	15.09
II	(More Stringent Treatment)	
	A. Secondary levels	(11.0)
	B. Advanced Secondary	(6.8)
	C. Advanced Treatment	(2.7)
	Total Category II	20.51
III-A	(Infiltration/Inflow)	2.44
III-B	(Replacement and/or Rehabilitation)	4.88
IV-A	(New Collector Sewers)	19.02
IV-B	(New Interceptor Sewers)	18.47
V	(Combined Sewer Overflow)	25.74
Total I - V		106.15
VI	(Control of Stormwater	61.67
Total I - VI		167.82

Since congressional allocations for the program are running between 3 and 4 billion dollars a year, the program cannot expect to satisfy even the 1978 Needs. Because of population and urbanization increase the Needs projection is used primarily to assess the backlog of program funding deficiency.

#### Status of POTW Noncompliance

Currently EPA's construction grant and enforcement data management systems are not capable of displaying compliance profiles for all existing major and minor publicly owned treatment plants.

Since 1972, the Agency has used its data management resources to track grant activity and new construction. The existing data system does not adequately determine and assess continuing compliance. The current emphasis for data management reflects the Agency's past enforcement and municipal management strategy.

Many of the 33 States administering the NPDES program periodically compile statistics on POTW compliance.

The methods used and objectives associated with gathering continuous compliance information differ among the States, and EPA Regional interest in reviewing compliance information varies. In the future regular, uniform compliance information should be generated by the States for use by Congress, EPA, and State agencies. Such information would be useful for determining funding and enforcement priorities. Before an integrated data management system can be developed, however, agreement must be reached on several issues, including:

- An acceptable classification system for major and minor discharges;
- Methods for distinguishing between significant and insignificant permit violations;
- A universal classification system and manifest system for industrial users;
- A system for ranking discharge permit noncompliance that is keyed to displaying water quality impacts;
- The need for reporting financial and management information related to POTW budgets, staffing, maintenance and rehabilitation.

Nationally, failure to achieve continuous compliance appears to be a significant problem for POTWs. Recent studies indicate permit noncompliance will continue to be a problem. Generally, continuous noncompliance is not attributable to a single cause, but is the result of several factors, all of which must be coordinated to secure successful POTW operations. A recent study of 180 major POTWs conducted by Energy and Environmental Analysis, Inc., found, for example:

- 64 percent of the noncompliance cases involved influent problems (infiltration, inflow, and industrial waste flows were the prevalent cause);
- 49 percent of the cases involved design, construction and equipment flows;
- 20 percent of the cases involved poor insufficient operations, maintenance, management procedures or staff.

Although the percentages vary, the above findings are supported by similar studies conducted by EPA, as well as independent program reviews conducted by the General Accounting Office. Moreover, all reviews of noncompliance have reached the same conclusion: in more cases than not,

noncompliance is the result of several factors, but the probability of noncompliance can be reduced if operations costs, staffing, operator training, influent characteristics and POTW budgets are adequately considered as treatment systems are designed, equipment is selected, and construction proceeds.

Many of the noncompliance reviews completed indicate influent characteristics, as well as a grantee's ability to operate and manage a new sewage treatment plant, are not adequately considered during the facilities planning process. For example, GAO found in a recent review of small community treatment systems that installed technologies were often too complex, requiring skills and revenues that could not be provided by the operating agencies. In many of the small community cases examined, GAO found grantee capability was inadequately considered during facility design, and uniformed grantees failed to question the need for costly or inadequately sized treatment units advocated by their design engineers.

Another study, also completed by GAO, found in many instances inadequate controls on industrial influent caused significant noncompliance. GAO found numerous cases where industrial users either failed to adequately characterize wastes and flows prior to system design, or radically changed production processes once the POTW was placed in operation, thus altering influent profiles originally used to develop the treatment processes.

GAO and others also found failure to adequately consider operating costs and a grantee's capability to raise needed revenues often contributes to noncompliance.

In some cases user charge cost estimates developed early in the facility planning process were far below actual operations costs. In other cases anticipated growth needed to defray fixed costs associated with reserve capacity did not occur, thus maintaining higher than projected costs for existing users and restricting POTW management's ability to secure approval of rate increases as needed. Industrial plant closures, relocations, or changes in product and need for treatment services also have been identified as causes for noncompliance, particularly in communities with significant individual users and a stable population. Fixed cost associated with the new "reserve" capacity must be distributed among remaining users, thus elevating per capita costs to levels which often are not acceptable.

### Financial Management

The area of fiscal management of a POTW and how it impacts noncompliance is just now receiving attention. In recent articles (July 1980, May 1979) the Journal of the Water Pollution Control Federation has pointed out fiscal self sufficiency as an area of concern for municipalities in the 1980's. With decreasing federal involvement,

inflation, eroding State financial resources, and taxpayer revolt, the local governments are faced with tighter financial restrictions which they must balance with good O&M and adequate wastewater treatment budgeting.

The federal involvement in fiscal management at the local level has been deliberately minimized. The only specific requirements in the Clean Water Act involve:

- A construction grants applicant must have sufficient legal and financial capability to insure adequate construction, operation and maintenance of the treatment works.
- An applicant must adopt a user charge system that assures that each user will pay a proportionate share of the costs of operation, maintenance and replacement of the system.

EPA and State reviews of financial capability determine primarily whether a grantee has legal authority to charge users and raise construction funds through bond issues or other mechanisms. The user charge system is created and approved during design or construction of the facility and represents a "best guess" of the costs of O&M and replacement. State and federal reviews do not determine the adequacy of POTW operating budgets. Instead, the user charge review determines only if each class of user (industrial, residential or commercial) is assigned a rate coefficient proportional to demand for treatment services. Replacement as defined by EPA regulations is an expenditure "for obtaining and installing equipment, accessories, or appurtenances which are necessary to maintain the capacity and performance during the service life of the treatment works for which such works were designed and constructed." This definition excludes costs associated with replacing the plant after its design life is over, expanding the system, or upgrading treatment capabilities. With this type system the municipality is destined to remain dependent on the federal government for new construction and major upgrading.

Given the large federal liability for satisfying unmet treatment needs (approximately \$80 billion), it appears unlikely that municipalities will receive federal grants for system expansions, future rehabilitation, and process improvements. The Water Act does provide that grantees should raise sufficient revenues to operate and maintain their POTWs in compliance with discharge permits. Currently national user charge revenues are estimated to be \$46 billion annually. POTW operating revenues, based on increasing the current federal investment from \$30 billion to \$70 billion by 1990, must increase to approximately \$30 billion to assure adequate operation, maintenance and expansion of municipal treatment capability. It appears, however, that without significant changes at the local level, revenues needed to maintain newly constructed facilities will not be available. The record for existing POTWs indicates that current operations, maintenance and replacement revenues fall short of needs. Unless this trend is reversed,

maintenance of treatment facilities now put in place is likely to be deferred, necessitating massive future investments if water quality is to be maintained. It appears a joint federal-State effort to assist municipalities in developing user charge and treatment system financial management programs, and periodically review POTW operating budgets is warranted. The effort for new facilities should involve identification, during the preliminary planning, of domestic and industrial revenue sources, actual and anticipated. This information would assist the grantee in selecting treatment alternatives, assessing operating capability, designating services areas, and developing financial profiles necessary for securing local construction funds.

The effort for upgraded, one-line facilities should involve preventive maintenance scheduling, review of service agreements, assessment of existing charges and schedules for rate increases, and the development of revenue sources for capacity expansions or significant future upgrades.

Under current program conditions, municipalities are "conditioned" to expect POTW replacement funds from federal programs. Consequently, unless some fundamental financial management changes are made, the long term outlook for continual compliance, with decreasing federal participation, is bleak.

## STATUS OF ENFORCEMENT ACTIVITIES

### Implementation of the Municipal Strategy

The Municipal Management System (MMS) is the implementation process for the national municipal policy and strategy. The operation of the MMS is currently being phased in. Headquarters evaluation of the MMS operation is scheduled for January 1981.

### Federal Court Orders

Under the current policies of enforcement, municipal strategy has been focused on plants to be constructed. The anticipated large increase in court cases has as yet failed to materialize:

- 1978 - Six federal court orders
- 1980 - 28 federal court orders against plants under construction

### Other EPA Enforcement Actions under the Water Pollution Control Act

Type of Action	1977		1978	
	Non-municipal	Municipal	Non-municipal	Municipal
Administrative Order	354	265	436	556
Referral to the Department of Justice	88	20	107	26

Source: Information supplied by U.S. Environmental Protection Agency, Office of Water Enforcement.

Although EPA's enforcement resources are shifting toward POTWs which are not meeting effluent quality requirements, the agency's enforcement capabilities are of necessity limited to the most serious violators among the nation's more than 18,000 POTWs. Clearly, other measures are necessary to supplement existing federal enforcement programs if POTW compliance rates are to improve.

### DELEGATION TO THE STATES

In accordance with the 1977 amendments to the Clean Water Act, EPA is actively engaged in the transfer of the operation of the construction grants program to the States. Delegation of the NPDES permit program has been in progress since 1972, when the Act was first passed. The following table shows the status of NPDES and 205(g) construction grant delegation.

At present, 33 States have been delegated permitting authority, 37 states have assumed a significant portion of the administration of the construction grants program (see Figure III.1). While slightly more States have obtained 205(g) delegation than NPDES delegation, the differences become significant when it is realized that the NPDES delegation was presented in the 1972 Act but the 205(g) delegation did not come into existence until the 1977 Amendments.

The obvious explanation for the difference is the incentives provided for 205(g) delegation. After October 1, 1977 a State may receive up to 2% of its construction grants allocation (or \$400,000, whichever is greater) each year to administer the construction grants program in the State. This monetary incentive, together with the States opportunity to "run its own show", make the construction grants delegation attractive to State governments.

Figure III.1

## NPDES AND CONSTRUCTION GRANTS PROGRAM DELEGATION

REGION	STATE	NPDES Delegation	205(g) Delegation
I	Maine		X
	New Hampshire		X
	Vermont	X	X
	Massachusetts		X
	Connecticut	X	X
	Rhode Island		X
II	New York	X	X
	New Jersey		X
	Virgin Islands	X	
	Puerto Rico		X
III	Pennsylvania	X	X
	West Virginia		X
	Virginia	X	
	Maryland	X	X
	Delaware	X	X
IV	North Carolina	X	X
	South Carolina	X	X
	Kentucky		X
	Tennessee	X	
	Georgia	X	X
	Alabama	X	
	Mississippi	X	X
	Florida		
V	Wisconsin	X	X
	Minnesota	X	X
	Illinois	X	X
	Indiana	X	
	Ohio	X	
	Michigan	X	X
VI	New Mexico		
	Texas		X
	Oklahoma		X
	Arkansas		
	Louisiana		
VII	Nebraska	X	X
	Iowa	X	X
	Kansas	X	
	Missouri	X	X

FIGURE III.1 CONTINUED

REGION	STATE	NPDES Delegation	205(g) Delegation
VIII	Montana	X	X
	North Dakota	X	X
	South Dakota		X
	Wyoming	X	X
	Utah		X
	Colorado	X	X
IX	California	X	X
	Nevada	X	
	Arizona		X
	Guam		
	Hawaii	X	
X	Oregon	X	
	Idaho		X
	Washington	X	X
	Alaska		X



One of the provisions of Senate bill #2725, passed by the Congress on October 1, 1980, allows the State management assistance grant (for 205(g) delegation) to be based on the authorized construction grant fund amount rather than the allocated amount. This was changed because the Congress has been reducing the allocation for the program year after year. If this situation was to continue, the States would be faced with dwindling program budgets to support their delegation staffs. More stable state programs should result from the change.

The delegation program, however, also has run into problems. Those States assuming responsibility for managing construction activity have experienced budget constraints, hiring freezes, and high rates of staff turnover. Moreover, the volume of grant activity has forced delegated States as well as EPA to focus on new construction as opposed to assuring continuous compliance at recently constructed facilities.

Recently, Congress approved changes to the Water Act which permit the agency to base 205(g) awards on program authorizations as opposed to appropriations. This change will enable the agency to substantially increase State management grants, but it in no way removes internal State restrictions on personnel. Without adequate, qualified staffs the States will be unable to address continuous compliance and will be pressed to adequately oversee construction, design and planning activity for the approximately 11,487 grant projects now in the system. The potential for management problems at the State level could increase in the near future as major grantees move through facilities planning into design and construction. In the near future State staffs will be pressed to manage their workload. Over the long run, if States increase staff capability, State revenue sources will have to be secured because the federal 205(g) management grants could become inadequate.

## CHAPTER IV

### AVAILABLE OPTIONS AND RECOMMENDATIONS

Chapter III, in describing the existing compliance situation and the EPA programs which affect POTW compliance rates, raises several issues:

- The quality of EPA's compliance data management system
- The compliance rate of new POTWs constructed with the aid of the grant program
- The compliance rate of POTWs which have gone through the grants process and are now on line
- POTW financial management capabilities
- POTW staffing needs.

This section of the strategy paper discusses options EPA might employ to improve POTW compliance rates.

The issue papers which have been written as a part of Task IV have discussed a great many options which EPA might employ to improve POTW compliance. In addition, other options have come to light in comments responding to the issue papers or from other sources. These options represent a wide variety of actions, and some are in conflict with others. Some would require legislative action to implement, while others require only administrative action. Many of these options are discussed below. For greater detail, the reader should refer to the Task IV issue papers.

#### OPTIONS TO IMPROVE THE QUALITY AND UTILITY OF COMPLIANCE INFORMATION

One of the difficulties encountered in an attempt to formulate an EPA strategy to improve POTW compliance rates is the scarcity of high quality compliance data. Although essentially every POTW in the country is required to submit standardized quarterly self-monitoring reports on plant performance, there is no coordinated national data management system to enable the Agency to effectively utilize the information contained in these Discharge Monitoring Reports (DMRs). Furthermore, although the DMRs report self-monitoring data, there is no systematic means of insuring that the information in these reports is accurate. In fact, the limited efforts which have been made by EPA to evaluate the quality control capabilities of POTWs indicate that there is a strong probability that DMR data accuracy is not good.

Presently, only the DMR data submitted by major (flows greater than 1 mgd) POTWs is included in a national data processing system. Because of the lack of standardized procedures at various State and EPA Regional offices, this information is of limited value in assessing POTW performance. EPA's office of Enforcement is presently implementing a new system called Permit Compliance System II (PCS II), which should improve the present situation somewhat. However, there is little activity now underway to improve the quality of DMR data. The options listed below are designed to improve EPA's ability to evaluate the performance of the nation's POTWs.

#### Option 1

Establish a national POTW performance information system which would summarize self-monitoring effluent data submitted in the quarterly Discharge Monitoring Reports (DMR's) and utilize existing cross-links between enforcement and grants information files to examine the relationship between performance and location, type of treatment, capacity, flow, etc.

The system would feature a POTW performance index assigning a numerical index to each facility based on the frequency and magnitude of permit violations. Composite indices would be calculated for various groups of plants (e.g., types of treatment, location, capacity, etc.). Concise reports would be issued quarterly, allowing readers to quickly evaluate the performance of the nation's POTW's.

Although setting the criteria for these degrees of noncompliance involves the exercise of professional judgement, once the criteria are accepted, classification of a given POTW's compliance status can easily be accomplished by a computer program which surveys data from DMR's/ A five-point performance index is suggested:

<u>Effluent quality</u>	<u>Performance index</u>
compliance with NPDES effluent limits	5
insignificant noncompliance	4
minor noncompliance	3
significant noncompliance	2
serious noncompliance	1

Such a system would provide a more meaningful gauge of the performance of POTW's than is now available. In addition to providing a yardstick to evaluate the effectiveness of the construction grants program, the system would serve as a means of setting priorities for enforcement actions taken by EPA and the States. It would also identify problem areas, thereby serving as an aid to the formulation of corrective programs and policies.

Although the system would overlap with systems now in service in some States, it would provide most States and EPA with valuable information not presently available.

#### Option 2

Increase surveillance and analysis efforts by EPA and the States to improve the reliability of DMR data.

Although this is a resource intensive activity, it is essential if the DMRs are to have any utility as indicators of POTW compliance. EPA has developed a procedure called the Performance Audit Inspection (PAI), which is designed to evaluate the quality control capability of POTWs. PAIs must be conducted on a continuing basis to achieve an acceptable level of self-monitoring data quality. The delegated States would perform the vast majority of PAIs. EPA's role would be that of setting minimum requirements for PAI procedures, minimum numbers of inspections to be performed, and program quality assurance. The inspections would also benefit the POTWs by supplying a written evaluation of plant quality control activities and some on-site training by experienced, skilled inspection personnel.

#### Option 3

EPA, through the delegated States, establishes a POTW effluent sampling program independent of the self-monitoring program.

This effort would eliminate the dependence on self-monitoring data to evaluate POTW performance. However, it would necessitate a great increase in cost to provide meaningful information. Furthermore, since a significant portion of the self-monitoring data is also used for in-plant process control, this option would not eliminate the need for self-monitoring activities. It is unlikely that such a massive monitoring program would produce benefits worthy of the large resource requirement.

#### RECOMMENDATIONS TO IMPROVE THE QUALITY AND UTILITY OF COMPLIANCE INFORMATION

Because the self-monitoring system is well established, it should remain as the foundation of the POTW compliance information gathering effort of EPA and the States. However, both EPA and the States must increase efforts to improve the quality of the self-monitoring data if this system is to be of

any significant value in measuring POTW performance. Secondly, the various agencies which receive the discharge monitoring reports (DMRs) from the POTWs must standardize their data management system outputs if EPA is to effectively use the information to manage the national program. EPA must expand its compliance data management system to include data on all POTWs, not just majors, as is now the case. If the grants program is to fund the construction of minor POTWs, it must have the ability to track their performance; otherwise, it cannot effectively manage the program. Finally, EPA's Office of Water Program Operations and Office of Enforcement must improve coordination of their programs by accelerating implementation of the National Municipal Policy and Strategy and work closer together to improve the management of POTW compliance data which is vital to both programs.

These improvements, which are incorporated in Options 1 and 2, can be achieved with a modest increase in State and federal resources. Without these improvements, EPA will have a limited ability to evaluate the impact of various enforcement and grants policies, procedures and programs, and therefore will be handicapped in its ability to manage the grants program. The implementation of Option 3, on the other hand, would require excessive resources at the State level, and would not be cost effective.

These recommendations would best be implemented through the formation of a task force of representatives from EPA's Office of Enforcement, Office of Water Program Operations (both Headquarters and Regional personnel) and several State program officials.

#### OPTIONS TO IMPROVE THE COMPLIANCE RATE OF NEW PLANTS CONSTRUCTED WITH THE AID OF THE GRANTS PROGRAM

A number of factors influence the performance of a wastewater treatment plant, and the interrelationship of those factors is complex. For example, the choice of process in the facility plan has a profound influence on the skills and revenues required to operate a POTW. Conversely, a skilled operator can often compensate for poor design or faulty equipment by modifying operational practices. Obviously, improving the quality of facilities through improved facility plans, improved design and improved equipment will enhance the probability that the facility will comply with its NPDES permit conditions. However, without adequate funding and sound management even the finest POTW will eventually fail. EPA must take measures to assure that compliance is factored into every step of the construction grants program, from facility plan through startup.

The impact of the facility plan on compliance is often underestimated. Many major decisions which affect plant performance, including the selection of process and the estimation of project capital and O&M costs, are made in the

facility plan. If unnecessarily complex technology requiring highly skilled operators is selected for a small rural community POTW, the probability of compliance is reduced. Failure to accurately characterize the wastewater to be treated has resulted in the construction of facilities unable to achieve effluent quality compliance at startup. Specific options to improve the quality of facility plans are discussed in detail in Task III, Operations. This selection of the Compliance Strategy will discuss some options which affect facility plan quality in a more general manner.

Obviously, the design of a POTW has a profound impact on the operability and maintainability of the facility and, consequently, on the probability of compliance of the completed plant. Ideally, every POTW design would be developed in close coordination with individuals skilled in the operation and maintenance of wastewater treatment facilities, communicating with design professionals as equals. Unfortunately, this is too seldom the case. A specific design-related problem which has received a great deal of attention is the selection of equipment for use in POTWs. The Federal Government, like most States and many local governmental units, encourages open competition in procurement and prohibits the use of proprietary or "lock out" specifications. Many designers contend that this policy has on occasion resulted in the installation of inferior equipment in grant-funded POTWs, subsequently causing poor effluent quality due to mechanical breakdown or failure to attain adequate performance levels. EPA is continuing to work with appropriate representatives of the private sector to develop methods and policies to assure that appropriate equipment is installed in POTWs.

As wastewater treatment facilities become more complex to meet higher effluent quality requirements, the efficient management becomes a greater challenge to operating agencies. Operators needed to staff sophisticated treatment systems may be unavailable or unaffordable, particularly outside of major metropolitan areas. Many grantees, especially in small towns or those located in rural areas, are unable to operate and maintain complex treatment systems. Sometimes, the grantee's capabilities are not adequately considered as system designers develop treatment alternatives and operation, maintenance and replacement programs. In the past, the primary emphasis of all participants in the construction grants program has been on the construction of facilities. Relatively little attention has been devoted to the subsequent operation of the plants once construction has been completed. It has generally been assumed that grantees possessed or could quickly develop the capabilities to successfully manage the POTWs produced with the assistance of the grants program. In many cases this assumption has proven to be incorrect. This is not surprising, since the POTW often represents the largest, most complex capital and operations project ever undertaken by the grantee. EPA must adopt policies which will better prepare POTWs to manage their projects from facility plan through startup and beyond.

A major cause of noncompliance in many POTWs is the existence of influent conditions which exceed the ability of the plant to treat and discharge within effluent quality limites. There are two primary types of influent problems:

- Industrial wastes, and
- Inflow/Infiltration (I/I).

Industrial wastes cause noncompliance by imposing excessive organic or hydraulic loads on the treatment units or, less frequently, contributing toxic substances which inhibit biological treatment processes and severely limit sludge utilization and disposal options available to the POTW. EPA must implement measures which will address these serious influent problem areas as a part of the construction grants strategy.

In those cases where toxic loadings from industry contaminate sludge and preclude reuse, local disposal costs are fixed at high levels, thus raising overall treatment costs for all users. Often increased costs for sludge disposal will stimulate efforts to reduce costs in other areas such as preventive maintenance or operator staffing and salaries. Noncompliance will result from such cost-cutting measures.

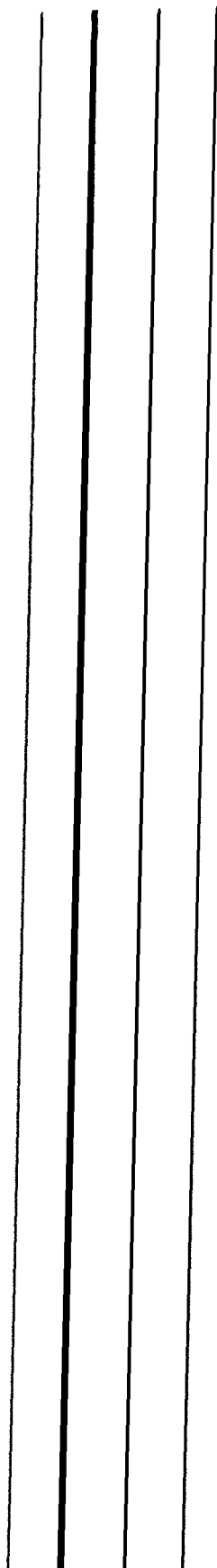
Frequently, those preparing facility plans fail to adequately characterize the wastes to be treated by a proposed POTW, especially where significant industrial discharges are involved. Also, municipalities, fearful of jeopardizing the economy of the community, are often reluctant to impose effective controls on industrial dischargers. Changes in industrial processes sometimes lead to the discharge of wastes which the POTW is not equipped to treat, causing NPDES permit violations. Currently, there are no requirements for binding use agreements between industrial users and POTW managers. The absence of such agreements leaves many POTWs unprepared to treat or pay for system modifications needed to treat process waste which changes significantly during the life of a POTW. Moreover, the absence of user agreements between a POTW and industrial users impairs the POTW management's ability to develop preventive maintenance schedules, forecast future treatment needs, and project long-term revenues. At any time an industrial user may withdraw from this system and face little or no financial or legal penalty. This new "excess capacity" can cause noncompliance in an otherwise sound treatment system.

The following options to improve the compliance rate of new POTWs have been discussed in greater detail in earlier issue papers prepared as background for the 1990 Strategy:

#### Option 1

Implement the pretreatment program in accordance with the Clean Water Act, Section 307(b) and (c) and other sections as applicable.

Federal requirements for industrial pretreatment programs are being developed at this time. These requirements involve three major components: categorical standards, general pretreatment regulations and construction grants regulations. Three of the 34 categorical pretreatment standards have been issued. The remainder are under development. General pretreatment regulations are expected to be issued in final form before the end of 1980. Construction grants regulations pertinent to pretreatment were issued in 1978. A class deviation was issued this June extending the dates for submission of pretreatment programs.





Option 3

Requirement of a binding agreement between POTWs and major industrial waste dischargers.

The discharge of industrial wastewater in  
[REDACTED]

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A Municipal Pretreatment Program Guidance Document has been developed and will be issued shortly. Currently, municipalities are utilizing 201 grant funds to undertake the first phase of the pretreatment program which includes industrial surveys.

In addition to the activities already underway, this option includes a vigorous public awareness and implementation assistance effort, including the distribution of material to explain the importance of pretreatment programs, emphasizing the benefits to POTW operation. Also, a minimum of one pretreatment seminar would be held in each Region to acquaint POTW administrative and technical personnel with the pretreatment program. Each Region would sponsor seminars for State personnel to fully acquaint them with the pretreatment program.

## Option 2

Improve the quality of facility plans by increasing the emphasis on characterizing industrial wastewaters (quality and quantity) to be discharged to POTWs.

This can be accomplished by the following actions:

- Encourage the active involvement of significant industrial dischargers in the preparation of the facility plan.
- Issue guidance to A/E firms, grantees, and reviewers regarding the importance of industrial wastes to POTW performance.
- Liberalize funding of industrial waste surveys and other facility planning activities necessary to determine the impact of industrial wastewaters on the POTW.
- Require those preparing facility plans to cross-reference all industries in the study area with the industrial waste survey information on file with EPA and the States.

### Option 3

Requirement of a binding agreement between POTWs and major industrial waste dischargers.

The discharge of industrial wastes into a municipal system can have major impacts on operations if the flow or waste characteristics change dramatically from original design conditions. This is particularly true if the industrial loads are a large percentage of the total waste loads. Dramatic changes may occur due to a plant shutdown, a major plant expansion or a major change in an industrial process.

Currently, as a condition of participating in the grants program, a grantee is required to obtain from an industry a letter of intent as to projected waste loading. However, the letter of intent is not binding. Considering the financial commitment on the part of the grantee, this option requires an agreement between the grantee and industrial user as to existing and future waste loadings. Modifications to the agreement would involve a penalty clause, probably including financial considerations. The concept should be applied only to the large industrial users, e.g., those contributing loading greater than ten percent of system capacity, or where an industry discharges a lesser quantity of a waste which might present significant problems to the treatment process or sludge disposal.

### Option 4

Modify the Inflow/Infiltration (I/I) program to reflect findings of recent studies.

Recent investigation has revealed that grant-assisted projects to reduce I/I problems in collection systems have, to a great extent, failed to provide predicted results. Since excessive I/I is a well-documented serious problem at POTWs--often a leading cause of noncompliance in large areas of the country--significant changes must be made in the present I/I program. In a recent issue paper on Infiltration/Inflow, the following three-phased implementation plan was formulated to modify the I/I program:

Phase I - Interim Guidelines for I/I (Ongoing):

Issue PRM providing interim I/I guidelines which emphasize the following:

- Addressing I/I problems in service lines separately in terms of quantity and proposed rehabilitation.
- Using concurrent pressure testing and sealing techniques in place of TV whenever applicable. This would be especially emphasized where TV was previously used for quantifying infiltration sources.
- Determining excessive I/I on the basis of a 30% to 50% maximum removal efficiency. This will ensure that other factors such as groundwater migration and I/I from service lines will be taken into consideration in the cost-effectiveness analysis.
- Proposing an acceptable sewer maintenance program as part of Step 1 work.
- Limiting all field work to I/I problem areas only. Problem areas must be identified by flow monitoring or other means first in order to minimize unnecessary field work and thereby improve the overall effectiveness of the program.

#### Phase II - Input for Final Guidelines for I/I:

1. Conduct four I/I program review meetings to be held in four different strategic locations. The meetings will serve two major functions:
  - Inform the public (including States, municipalities and private sector participants) of the results and findings of the recent study on the effectiveness of the I/I program.
  - Request the public to participate in the development and formulation of solutions to the problems identified in the I/I program.
2. Initiate joint effort of OWPO and ORD to develop new approaches and technical procedures for I/I.

Research efforts will be initiated to develop more effective technical procedures. Briefly, the new I/I procedures will emphasize the following issues:

- Increase the efficiency of the I/I program and the treatment plant by more effectively rehabilitating sewers to remove excessive I/I.

- Improve the reliability of the I/I program by accurately determining the I/I conditions in the sewer system.
  - Expedite the Step 1 grant process by simplifying and streamlining the I/I procedure.
  - Maintain the useful life of the treatment plant by minimizing the effect of I/I migration.
  - Ensure an effective O&M program for the rehabilitated sewer system.
3. Initiate a program to further evaluate the effectiveness of both the technical and administrative aspects of the I/I program, and to recommend additional modifications as appropriate.

#### Phase III - Final Guidance for I/I:

1. Formulate and propose final I/I guidelines to supplement or supersede the PRM issued in phase I.
2. Circulate for comment and implement through statutory changes, regulatory changes, or policy development, previously identified initiatives found to be beneficial and productive. These initiatives may include, but are not limited to the following:
  - increased enforcement of sewer use ordinances
  - increased enforcement of required O&M programs
  - expanded grant funding for service line rehabilitation
  - construction grants sanctions for accountability (i.e., assist municipalities recover funds where jobs are not satisfactorily completed)
  - technical changes to guidance and/or methodology
  - continue R&D effort
  - continue short-term and long-term program evaluations.

## Option 5

Modify NPDES permit effluent standards on a case-by-case basis for POTWs experiencing excessive inflow and/or infiltration.

As explained above, recent studies have shown that the efforts to correct I/I have often fallen far short of expectations, indicating that it is not as feasible to reduce I/I as was originally assumed when the sewer system rehabilitation program was initiated. On the other hand, it is often equally difficult to effectively treat large hydraulic surges associated with I/I and maintain effluent quality. Biological treatment processes do not generally respond well to rapid changes in hydraulic loading rates. Flow equalization, while useful in some situations, is often ruled out by cost or space considerations. This option would allow, on a case-by-case basis, the relaxing of federal secondary requirements, as is now permitted for POTWs which treat combined sewer flows during periods when flow exceeds the capacity of the secondary treatment units. In effect, POTWs in this category would be assigned a dual effluent standard with the NPDES permit stipulating the conditions which would permit the discharge of wastewater receiving less than secondary treatment. During periods of high peak flow (i.e., wet weather flows from collection systems with excessive I/I) all flows in excess of design flow should be diverted for physical treatment (e.g., swirl device clarifier), disinfection and discharged to receiving waters. During this period of peak flow the normal (design) flow would be treated as usual, so that relatively stable conditions of the unit processes can be maintained. The legal definition of "significant" influent problems should be based on a cost-effectiveness analysis showing that dual discharge levels would result in a significant life-cycle cost savings and improve POTW compliance with minimum impact on water quality.

The imposition of dual effluent standards will increase secondary unit process reliability by minimizing hydraulic surges. In most cases, there will be negligible impact of the poorer effluent quality on receiving water quality because of the receiving waters' high flow. During periods of receiving water high flow, surface runoff (nonpoint) pollution can contribute more pollutants than POTW effluent. The decision to allow a POTW to operate under dual effluent standards would be based on assessments of the environmental and health effects of reduced treatment levels. The pollutant load on receiving waters may be increased slightly under this option.

## Option 6

Modify the definition of secondary treatment to allow the use of biological processes which do not meet the existing criteria but which have other significant advantages.

The present definition of secondary treatment found in Federal Regulations (40 CFR 133.100) requires the concentration of effluent BOD and total suspended solids (TSS) concentrations to be no greater than 30 milligrams per liter (mg/l) and a reduction in BOD and TSS of at least 85%. These limits have shifted the economics of wastewater treatment toward the more sophisticated unit processes, such as activated sludge, and away from fixed-film processes such as trickling filters and other biological processes which are less demanding of operator skill and less energy intensive. In general, activated sludge becomes more cost-effective as plant size increases and is more suitable for large facilities. Modifying the secondary requirements would permit the use of simpler processes in the small POTWs, which are generally less able to afford highly trained personnel. Because these simpler processes usually cost less to operate--especially in small facilities--it is likely that the change in secondary treatment requirements will enhance compliance rates and reduce O&M costs in smaller systems. It is possible that this modification should be restricted to POTWs below a certain capacity, as is the present exception applicable to waste stabilization ponds. The reduced requirements would be limited to those applications where it could be demonstrated that receiving water beneficial uses would not be jeopardized by the modification.

The existing requirement that secondary treatment remove 85% of BOD and TSS is another requirement which often causes compliance problems at POTWs which treat unusually "weak" sewage. Since NPDES permits set limits on the total weight of these pollutants to be discharged from a POTW, as well as the maximum concentration of those pollutants, dropping the 85% removal requirement would increase compliance rates and avoid expenditures for unnecessary advanced waste treatment units without jeopardizing water quality. The quality and quantity of effluent discharged, not percentage removal, determine the impact of a discharge on receiving water quality. Therefore, this option also proposes the elimination of the 85% removal requirement from the definition of secondary treatment.

The precise effluent quality limits to be applied in the modified definition and the restrictions on its application will require extensive technical evaluation and consultation with State water quality management agencies and other interest groups.

#### Option 7

Increase federal POTW operator training assistance in areas of special need.

In general, the federal government has determined that operator training is a State function. Accordingly, EPA has discontinued its direct POTW operator training program. However, recent studies (2,3) which evaluated the performance of 103 POTWs concluded that improper operator application of concepts and testing to process control was the most frequently occurring factor limiting the performance of the selected facilities. This finding indicates a need to improve the effectiveness of existing operator training efforts, especially in the area of process control. Although the States provide direct training of operators, there

are some training-related functions which are more appropriately accomplished at a national level. These include the preparation of operator training materials and assistance in developing an effective training delivery system. This latter function would logically include workshops for trainers and other similar activities designed to improve the effectiveness of trainers of POTW operators.

Although EPA's National Training and Operational Technology Center (NTOTC) in Cincinnati, is now performing this function, these activities must be accelerated if the process control training is to meet existing and future needs. Competent operators are an indispensable element in any program to improve POTW compliance rates.

### Option 8

Promote operability in the design and review of plans and specifications for new POTWs.

The focus of facility planning and design and their review is not usually directed towards those things which most affect the ability of a POTW to attain compliance with permit conditions. In addition, there may be an issue that treatment plants should be designed more conservatively based on the variable characteristics of sewage. There are indications that treatment plants in England operate very consistently at high levels of removal. The English plants seem to be immune to many of the problems found in this country. Although English and American treatment systems are very similar in most respects, the English plants are designed more conservatively. A study of English plants is presently in progress through a cooperative project by AMSA, EPA and the British Water Research Center.

A recently completed EPA-sponsored study (4) of 50 POTWs in nine Western States found that many of the design faults contributing to noncompliance were failures to design treatment units and sludge handling facilities conservatively enough. EPA is cooperating with the Water Pollution Control Federation (WPCF) and the American Society of Civil Engineers (ASCE) in the production of a series of design guidance manuals which should assist designers to improve the quality and operability of new POTWs.

Promoting operability in design and review could be established by:

- Reviewing existing requirements for planning and design and their resultant impacts on operations
- Complete study on English plants
- Establish design parameters and/or modify requirements



- Observe program in Illinois which is currently being revamped to focus on operations
- Train State reviewers to focus on operations during review of facility plans and design plans.

Such a program may be difficult to establish in a short time period. Also, too rigid application of design parameters could reduce designer initiative and flexibility. More conservative designs may increase costs of treatment. Effective training programs to enhance reviewers' abilities to evaluate operability will be difficult to develop.

### Option 9

Promote the automation of wastewater treatment process control through research, development, demonstration, and technology transfer.

Two recent EPA-sponsored studies (2,3) investigating operation and maintenance of POTWs found that the failure of operators to apply wastewater treatment concepts and process control testing to the control of the wastewater treatment process was the most prevalent operational deficiency at the facilities studied. Operators skilled in process control are in extremely short supply. The development of reliable automated control of wastewater treatment processes will allow more efficient utilization of the scarce talents available. In July 1980, EPA's Municipal Environmental Research Laboratory released a report entitled "Assessment and Strategy for Automated Process Control in Wastewater Treatment," (5) which reports on the existing status of the development of automated process control and recommends a strategy to accelerate improvements in plant performance using automated process control. A summary of the strategy follows:

#### Short Range Objectives:

1. Transfer state-of-the-art, demonstrate and document integrated microprocessor control of small plants and document design approaches on available automation for energy conservation.
  - a. Transfer present SOA technology to the field so that the cost effective instrumentation and automation presently proven feasible is appreciated, understood and properly applied.
  - b. Demonstrate and document integrated micro-processor control of small treatment plants.
  - c. Document design approaches for use of automation and instrumentation for energy conservation.

2. Develop centralized management of multiple small plants using digital technology.

3. Document benefits of overall plant automation.

#### Long Range Objectives:

1. Develop improved automated approaches to achieve energy conservation.

2. Develop automated process control for new technology and improve approaches on existing technology.

3. Develop automated areawide management for plants and collection systems.

4. Support as needed, the continuing development of instrument specifications by the National Bureau of Standards (NBS) and the establishment of a non-federal instrument certification laboratory.

#### Option 10

Apply the systems approach to the construction grants process.

The planning, design, construction and subsequent operation of a wastewater treatment facility is often the largest, most complex project ever undertaken by a municipality or other local government unit. Successful implementation requires a wide variety of specialized skills seldom found in a single firm. Presently, the consulting engineer is usually called upon by the POTW owner to coordinate the entire project. Under this option, a project manager with specific skills and training would act as the POTW owner's agent to direct and coordinate the activities of all the participants throughout the project, from facility plan through startup. This would facilitate the involvement of specialists in fields such as financial management, user charge systems, pretreatment and operations and maintenance in addition to the more conventional areas of planning, design and construction.

An example of this process is the separation of those tasks associated with operations and maintenance of the POTW from the design contract. A team of specialists skilled in the management, operation and maintenance of POTWs, with capabilities to train O&M personnel, would institute a comprehensive startup program including staffing, training, and initiating operations of the POTW in order to provide the grantee with a stable, competent operating organization. This process expands and modifies the present grant-eligible startup activities now associated with the operation and maintenance of the POTW. Specifically, the activities would include the following:

- Preparation of a series of plant-specific training manuals for each functional unit of the POTW.

- Preparation of a comprehensive plant operations manual focusing on process control.
- Initiation of a Preventive Maintenance Management System prepared specifically for the POTW.
- Preparation of a Plan of Operation.
- Periodic consultation with the designer regarding process control features, plant layout and equipment selection.
- Plant-specific training of operating and maintenance personnel.
- Coordinating and supplementing training supplied by equipment manufacturers.
- Supervision of startup of the POTW.

The design engineer would supervise equipment testing and determine if the installed equipment meets the requirements of the plans and specifications.

The startup service could be provided by firms to be prequalified by the States to perform this work. Where it possesses the capability, the design firm could provide the startup service. Otherwise, any firm meeting the requirements of the certifying State would provide this service. In any case, the contract would be separate from the design contract, and all activities would be coordinated by the project manager.

Although the use of the systems approach may add to the capital cost of the POTW, it will improve the quality of the resulting facility and, just as importantly, it will establish the POTW as a fully operational unit, with a trained staff and a functional management capability at the outset of operations.

Where conflicts between the designer and the O&M team arose, they would be resolved by the project manager, who would have authority over the entire project. If this option is to have a significant beneficial impact on the compliance rate of POTWs, there must be some system implemented to assure that qualified firms are selected for the various tasks. A significant advantage to this system lies in the fact that it does not assume that the many diverse capabilities required to plan, design, construct and startup a POTW must be obtained from a single firm. Rather, it allows the project manager to tap the strengths of several firms.

## Option 11

### Mandatory starting services.

Under present EPA policies, the provision of startup services is optional. This option would require that all grant assisted projects include startup services unless specifically exempted by a Regional Administrator or appropriate State official. Even the smallest, simplest POTWs have operating and maintenance needs. It is important that POTW operational personnel be adequately trained and that the facilities be placed in full operation while the designer, contractor, and others under contract with the grantee are still actively engaged in the project. This requirement will facilitate the transition from construction project to functional POTW. Startup services would be provided by the same O&M team described in the previous option.

### RECOMMENDATION TO IMPROVE THE COMPLIANCE RATE OF NEW POTWs

None of the options listed above can insure that all new POTWs constructed with the aid of the grants program will meet effluent quality requirements when placed in service. Compliance at startup depends upon the skill, cooperation and dedication of all of the participants in the complex process which produces a successfully operating facility. Regulations and requirements cannot compensate for a lack of these necessary qualities. However, the ten options listed above do address many of the major causes of noncompliance of new POTWs. They attempt to propose reasonable, workable approaches to the correction of these problems. Many of the concepts incorporated in these options have been successfully demonstrated projects and programs throughout the country.

### OPTIONS TO IMPROVE CONTINUING COMPLIANCE RATES

Once a POTW is constructed and successfully started up in compliance with NPDES permit requirements, it is essential that the operating agency take all measures necessary to assure that the facility continues to meet effluent standards. Unless the agency applies sound management practices to the operation and maintenance of the POTW, the public investment in clean water could be lost within a short time of startup. The performance of many facilities constructed with the assistance of the grants program has deteriorated because the operating agencies have failed to provide such basic requirements as preventive maintenance programs, personnel training and advancement programs and adequate financial support.

Obviously, many of the practices and policies required to assure continuing compliance must be established before the POTW is constructed. User charge systems and plans for equipment replacement or other contingency funds must be developed before a facility starts up, if financial emergencies are to be avoided. Effective

maintenance management systems must be in place from the first day of operation if mechanical reliability and long equipment service life are to be realized. Sewer maintenance programs, industrial waste monitoring and control, and effective hookup policies and tracking are required to assure that treatment capacity is not exceeded. Many of the measures required to assure initial compliance, discussed in the previous section, are also necessary to maintain compliance throughout the life of the facility.

The options listed below address the issue of continuing POTW compliance. They discuss various measures EPA and the delegated States might employ to favorably influence the compliance rates of grant-funded POTWs beyond startup.

#### Option 1

Increase availability and quality of process control training for POTW operating personnel.

Although basic training for entry level wastewater treatment plant operators is widely available, high quality training in the control of biological processes is difficult to obtain. Yet lack of process control skill is the most prevalent operational problem encountered at non-complying POTW's. EPA has assumed the role of catalyst in operator training, relying on others to provide direct training to operating personnel. EPA's National Training and Operational Technology Center (NTOTC) in Cincinnati is now developing process control training packages for basic introductory level courses. Under this option, this activity would be accelerated and senior level course packages would also be developed immediately. NTOTC would increase the availability of process control training opportunities to experienced operators through the following activities:

- Development of process control training materials.
- Development of curriculum for process control instructors.
- Training of process control instructors.
- Assisting States in delivery of process control training.

It is an undeniable fact that the successful performance of all POTWs ultimately depends on the availability of competent, dedicated operators. The Federal Government has taken the position that operator training is the responsibility of the States. However, there are certain training-oriented activities, such as the development of training packages and reference materials, information exchange and the development of improved training delivery systems, which are most efficiently carried on at the national level. Under this option, EPA would increase its activities in this area to assist the States in their efforts to equip senior POTW operators (and those who advise these operators) with the training necessary to operate modern wastewater treatment facilities.

## Option 2

Establish an assistance program for small communities, emphasizing sound innovative and economical management schemes.

Approximately 85% of the nation's POTW's serve communities with populations of less than 10,000. Because of the high unit costs of operating small wastewater treatment facilities and a general lack of resources, many small communities have difficulty maintaining POTW effluent quality at a satisfactory level. Modern wastewater treatment plants often require skilled personnel and expensive equipment which are beyond the financial means of small communities.

The development of cooperative, multiple-system management arrangements, in which several POTW's could join together to share administrative and technical resources, would allow each participant to enjoy an economy of scale otherwise available only to larger organizations. Arrangements could vary widely, drawing on private sector resources where they would offer the most economical solution to a specific problem.

EPA would implement this initiative primarily through the delegated States, offering a variety of services.

- Demonstration grants for innovative management alternative for small POTW's, emphasizing cooperative efforts and private sector services.
- Preparation and distribution of guidance material for small communities, emphasizing efficient and effective management options.
- Establishment of a small multi-disciplined resource team in each EPA region to work with the States to assist small communities in the formation of effective management programs. The team would include experts on the financial, administrative, legal, and technical aspects of operating small POTW's.
- Distribution of case histories of successful small POTW management arrangements to States and small communities.

## Option 3

Encourage the establishment of self-sufficient enterprise, or utility-type organizations to provide wastewater collection and treatment services.

Most POTWs are operated as an integral part of local government, often as a section of the department of public works. It is often difficult to separate the actual POTW costs and revenues in this situation. EPA construction grants regulations require that a user charge system be established to provide adequate funding for the operation, maintenance and repair of the POTW. Unfortunately, EPA and the States do not have sufficient resources to assure that realistic user charge systems are implemented and updated, and, if they are, that the user charges are dedicated to the support of the management of the POTW. Local governments also have difficulty establishing sinking funds for the replacement or repair of major equipment because of competing demands for funds. The establishment of independent, financially self-sufficient utility-type organizations would alleviate many of these financial management problems. EPA has encouraged financial self-sufficiency, but has not yet developed an effective program which will have any appreciable impact on this issue. Because of the profound influence of wastewater service on development patterns, and the economic significance of wastewater utility policy on local government, many jurisdictions are reluctant to surrender control of the wastewater service function. EPA must develop a program which provides incentives to local government to convert to financially self-sufficient organizations or to accomplish the same ends by assuring financial integrity and independence of POTWs with the local government. EPA must provide POTWs with realistic, practical financial management assistance and must enforce existing regulations governing the self-sufficiency of POTWs.

#### Option 4

Encourage POTWs to conduct comprehensive periodic performance audits.

As with any enterprise, it is usually quite beneficial to conduct periodic, comprehensive audits of POTW performance. These audits would be performed by a multidisciplinary team which would address, at a minimum, the following areas:

- Financial management
  - User charges
  - Replacement funding
- Staffing
  - Qualifications
  - Salaries
  - Training
- Process control
- Laboratory
- Preventive maintenance management

- Solids handling and disposal
- Administration
- Energy conservation.

The results of the audit would provide the POTW with guidance to modify its management program before deficiencies lead to compliance problems. The report would also be available to regulatory agencies and the public, thus providing additional incentive to implement measure necessary to maintain the facility in compliance with NPDES effluent quality requirements.

Although the audit would add to the O&M budget, it would, at least in some cases, improve operating efficiency, thereby saving operating expenses.

### Option 5

Provide grantees financial management assistance through the delegated States.

Without adequate financial support, a POTW, no matter how well planned, designed, and constructed, cannot long continue to comply with effluent quality requirements. For this reason, financial management must be considered the foundation of continuing POTW compliance. Yet lack of sound financial management is a common problem in both major and minor wastewater treatment facilities. Because of the complexity of the financial management issue, this option is broken down into several sub-options which are discussed below.

This section first presents the various types of assistance options EPA might wish to implement, briefly sets forth some considerations relating to the delivery of technical assistance, and discusses EPA and State roles in managing the assistance programs.

Assistance options fall into two major areas- financial planning and financial oversight--which are outlined on the following page (Figure IV.1) and presented in the matrix shown as Figure IV.2. Planning assistance is designed to address financial management obstacles before they become serious impediments to a project. Oversight assistance involves corrective action to ensure that difficulties beyond the scope of financial planning are overcome.

The type of assistance offered will depend on grantee needs (or areas of concern) the project phase, and grantee capabilities. The purpose of providing financial management assistance is to address the following areas of concern-- to remove the financial management barriers to achieving and maintaining compliance, to reduce the economic burden on the users, and to achieve POTW economic self-sufficiency. Although many of the assistance options address all areas of concern, they may do so to different degrees of effectiveness. Others focus on one or two areas, even though all areas are somewhat related.



Figure IV.1

TYPES OF FINANCIAL MANAGEMENT ASSISTANCE OPTIONS

Types of Assistance	Planning	<ul style="list-style-type: none"> <li>• Make all financial planning costs grant eligible</li> <li>• Fund consolidated service area feasibility studies</li> <li>• Fund early fiscal assessment</li> <li>• Fund technical assistance programs</li> </ul>
	Oversight	<ul style="list-style-type: none"> <li>• Fund compliance diagnostic</li> <li>• User charge review before and after implementation</li> </ul>

Some of the assistance options, such as studies dealing with the feasibility of consolidating service areas, are suited to a POTW's entire life cycle, both the pre-operational and operational phases. Others, such as the early fiscal assessment and the compliance diagnostic, are designed to respond to needs arising in a particular phase.

Grantee capabilities will also guide the selection of assistance options. Planning and oversight assistance may well be sufficient for larger grantees having an adequate in-house financial management staff. Smaller grantees with limited expertise may be unable to take full advantage of the planning options, however, and may require specialized delivery mechanisms discussed under the technical assistance option.

Other considerations include:

- The Promotion of Long-Term Federal Cost Reductions--Some options, especially those related to planning assistance, have a high potential to reduce federal costs over the long run. The concept is that by spending a relatively small amount of money for prevention the need for more costly remedial programs can be reduced.
- Relative Federal Cost--The types of assistance contemplated cost very little when compared to the magnitude of the construction grants program. Yet it is still possible to distinguish relative costs among the various options. Some costs, however, may vary widely depending on the number of grantees wishing to participate.
- Increased Administrative Workload--This includes only those options which are likely to consume a fairly substantial amount of manhours in administration. This increased workload will result whether the option is administered by the Federal Government or is assigned to local, regional or State authority.
- Grantee Participation--Because it is in the interest of the grantees to respond to the identified areas of concern, most forms of assistance proposed are described as optional. Compliance and self-sufficiency, however, are two areas of critical concern to the national program. Attaining both of these is the result of a number of complex factors, many of which cannot be fully addressed through financial planning assistance options alone. Oversight options are therefore required to help ensure that financial planning efforts meet with eventual success. If selected as a strategy element, early fiscal assessment would also be required. Because it is aimed at the third area of concern--reduced economic burden on users--it is well within the capability of even small communities, and will cause no increase in project completion times.

A discussion of the various assistance options follows:

A. Require Early Fiscal Assessment:

Concept

An assessment of an applicant's financial condition is done by local officials prior to the selection of a treatment system. It may take the form of an inventory, using such indicators as the ratio of debt to potential revenues and operating surplus to total expenditures. Each ratio indicates the relative strength or weakness of a particular aspect of the local economy. The aggregate of individual figures suggests an overall picture of the municipality's financial condition and may provide an early indication of future problems.

Comment

- Serves as an early warning of existing or potential problems.
- Likely reduces the number of treatment system alternatives to be considered in Step 1.
- Assessment is compatible with small community management expertise.
- May indicate that further studies are needed to determine if there is economic justification for reclassifying water quality standards.
- Could be used in conjunction with the generic facility plan screening process.
- Provides adequate lead time to seek additional aid and to coordinate this aid with EPA construction grants.
- Entails minimal expense which would be grant eligible.
- Likely reduces the number of treatment system alternatives to be considered in Step 1.
- Saves time spent in considering systems a community cannot afford.
- Provides useful data for bond marketing.

## B. Fund Consolidated Service Area Feasibility Studies:~

### Concept

This option studies the feasibility of consolidating under a single authority the management functions which would otherwise be provided by separate jurisdictions. The studies, conducted as part of facility planning, would include the political feasibility of consolidation as well as any economic and environmental benefits anticipated. One variation of this option would fund studies related to consolidated procurement of construction material and consultant services.

### Comment

- Uses combined resources of an entire area.
- Promotes achievement of economies of scale.
- Facilitates areawide financial planning.
- Often resisted because of conflicting jurisdictional priorities.

## C. Require User Charge Review Before and After Implementation:

### Concept

This alternative standardizes pre-implementation review procedures at the national level. It establishes a centralized review process in each Regional or State Office; conducts post-implementation reviews of a representative example of grantees. User charge reviews as currently practiced place substantial emphasis on the proportional distribution of expenses among the various classes of users. Under this option, proposed and actual charges would also be reviewed to determine if sufficient funds were being collected to operate and maintain the system without further outside aid.

### Comment

- Assists in the achievement of POTW financial self-sufficiency by identifying funds needed for current and long-term operation.
- Stresses consistency and thoroughness in review methodology.
- Improves accuracy and reliability of entire review process.

- Helps ensure compliance by encouraging good management and maintenance practices.
- Requires a fairly high level of federal involvement.

#### D. Make Available and Fund Compliance Diagnostics:

##### Concept

This alternative would provide grantees whose POTW's are not meeting prescribed effluent levels with the option of engaging private sector firms to evaluate the causes of permit violations. Whether or not the causes are found to originate from financial management difficulties, POTW owners would be required under enforcement actions to take steps to remedy the identified problem areas. The diagnostics would be eligible for federal funding thus offering grantees an alternative to paying for their own studies.

##### Comment

- "Hands on" approach designed to solve grantee-specific problems.
- Relatively cost-effective: diagnosis costs incurred by the Federal Government and correction costs incurred by grantees are small in comparison to original planning, design and construction costs, yet will lead to permit compliance.
- Requires substantial increase in federal administrative work load.
- Raises equity issue of second-round grants.

#### E. Make all Financial Planning Costs Grant Eligible:

##### Concept

The alternative funds all aspects of financial planning related to the construction and operation, maintenance, and replacement (O,M&R) of treatment systems. Many financial planning costs are already eligible under current regulations and encouragement of such planning may result in wider use. Funding additional costs, such as those incurred in marketing bonds, would help ensure that grantees secure adequate construction financing at the appropriate time and would help to reduce the total local share of the project. Advocating the use of currently eligible financial planning studies will result in identification of a project's full cost and the establishment of a user charge system sufficient to cover O, M & R costs. The timing and magnitude of the required expenditures could then be integrated with the capital improvements program, thereby contributing to the town's overall fiscal soundness.

### Comment

- Promotes unified, realistic municipal planning.
- Identifies where adjustments or trade-offs in the capital improvements program might have to be made.
- Improves programming for future capital budgeting.
- Requires, in many instances, the use of outside consultants; small communities may lack the expertise to fully evaluate and use such input.

## F. Provide States and Grantees with Technical Assistance:

### Concept

This option enables local governments to develop such major elements of comprehensive financial management as grant management and user charge systems. This can be accomplished either through delivery mechanisms which provide assistance directly to the grantees, or through a two-tiered approach in which Headquarters establishes national and regional programs to aid the States. (See Task II -- The 1990 Management Strategy.) Aside from financial management assistance, the delivery options listed below can be adopted to offer such technical assistance as that related to pretreatment, sludge management and I/A technologies. The following methods of providing technical assistance thus achieve a dual flexibility in that they can be targeted either at States or municipalities, while responding to a wide variety of needs. The sole exception is the circuit rider program which, although managed at the State level, is designed primarily to serve small grantees directly. The comments on the various delivery mechanisms are mainly in reference to the impacts of the proposals on grantees, rather than States, because grantees are the ultimate beneficiary of any particular approach.

### 1. Provide Financial Systems Guidance Document

#### Concept

This alternative focuses on the accounting, financial management and management information system needs of grantees. It explains and illustrates EPA compliance requirements and addresses the grantee's internal needs related to treatment facility management.

### Comment

- Lowest federal cost of all delivery options.
- Well suited to rapid distribution of information.
- Of less use to small communities with existing in-house management deficiencies.

## 2. Fund a National Resource Center

### Concept

The center serves as a national clearinghouse for financial management and resource information. It issues information digests in newsletters, offers generic financial management assistance and, where a specific problem arises, directs the grantee to the appropriate source of assistance. It could also be staffed with professional engineers and planners, as well as financial managers, enabling them to address the full range of grantee concerns, and to disseminate information regarding innovative management techniques. Resource center staff would also be responsible for training Regional experts, preparing training packages, and advising and assisting on projects as requested by the Regions. Regional personnel would, in turn, provide similar assistance to the States, offering information on program development, staff training, and evaluation of delegation performance. (See Task II -- 1990 Management Strategy.)

This Center is somewhat similar to the Financial Management Resource Center sponsored by the Department of Housing and Urban Development and operated by the Municipal Finance Officers Association. The proposed resource center, however, differs from the HUD model in that it would not sponsor workshops or conferences. It is distinguished from the service center (below) because it would cost less than the service center to staff and operate, and would be national in scope.

### Comment

- Requires low levels of federal administrative involvement and financial commitment.
- Well suited to communities which confront problems in obtaining basic information.
- Does not have "hands on" assistance capabilities; would probably be less effective than service center for communities with severe management deficiencies.

### 3. Fund Regional Information Centers

#### Concept

The Centers serve as regional contact points for financial management and planning issues related to POTW's. They sponsor workshops to improve State and local capabilities. As States continue to assume greater responsibilities for program management, they will have a corresponding need to develop higher levels of expertise in these areas. The Regions will serve as the second tier in the financial management and technical assistance strategy, helping to ensure that delegation is not hampered by such constraints.

#### Comment

- Serves as an unbiased reference point against which consultants' recommendations can be evaluated.
- Decreases reliance on the private sector which is especially prevalent in small communities and is sometimes responsible for expensive, inappropriate systems.
- Lowers local financial management costs by supplying these services only as needed.
- Possibly the most costly delivery option in the long-term.

### 4. Fund a Circuit Rider Program

#### Concept

A number of grantees located in a reasonably serviceable geographic area may apply for federal funds to establish a circuit rider program. The circuit rider is expected to visit each town at least monthly and to work with grantees to ensure that financial management considerations do not result in project delays, excessive user charges, continued dependence on outside funding sources, or, ultimately, in permit violations.

Circuit riders will be retained by the grantees and will be directly responsible to local officials. The sole grant eligible function of circuit riders is to provide assistance which relates exclusively to POTW projects. Grants under this program will be for a very substantial amount of the eligible costs for the first year and will be gradually reduced over a three-year period. If all or some of the participating communities wish to continue the program after the third year, they will be responsible for funding it and may then use the program to respond to non-POTW concerns.



Circuit rider programs could also be staffed with professional engineers as community needs dictate. The service of both financial managers and engineers would be grant eligible for towns involved in all construction grants steps, as well as for those with operating plants who are either not in compliance, or who wish to improve their current financial management or operating techniques.

#### Comment

- Provides continuous access to expertise usually available only in larger cities.
- Enhances local control of the program by reducing reliance on independent consultants and contractors.
- Promotes short-term federal involvement.
- Programs similar to this have been used in other States; an engineer will soon be hired as a circuit rider in Region VII to help with the technical and financial problems of POTW's in a group of small communities.
- Program has great potential to generate important spin-off benefit: the permanent establishment of circuit rider services to fill a wide variety of other local financial management needs after POTW needs have been met.

The financial management assistance options are summarized in the matrix (Figure IV.2) on the following page.

#### PROGRAM MANAGEMENT ROLES

While assistance programs can operate through a number of different institutions such as 208 agencies and Regional or interstate authorities, program management functions are the responsibility of either EPA or the delegated States. Each management approach has its advantages as noted below.

#### Programs Managed by States

EPA policy of delegating certain program management functions to the States would be furthered by providing financial management assistance through new or existing State programs, such as those used in Maryland and New Hampshire. New State programs which address one or more of the national areas of concern could also be made eligible for funding. The benefits of this approach are as follows:

Figure IV.2

## FINANCIAL MANAGEMENT ASSISTANCE AND DELIVERY OPTIONS

DESCRIPTION	OPTIONS	AREAS OF CONCERN			SUITABILITY		PROVIDES OUTSIDE ASSISTANCE TO GRANTEE-SPECIFIC PROBLEMS	PROMOTES LONG-TERM FEDERAL COST REDUCTION	RELATIVE FEDERAL COST	REQUIRES INCREASE IN ADMINISTRATIVE WORKLOAD	GRANTEE PARTICIPATION REQUIRED
		IMPACT ON NONCOMPLIANCE	REDUCE ECONOMIC BURDEN ON USER	PROMOTES POTW SELF-SUFFICIENCY	PARTICULAR PHASE	BOTH PHASES					
TECHNICAL ASSISTANCE DELIVERY OPTIONS	ASSISTANCE OPTIONS	EARLY FISCAL ASSESSMENTS	X		Step 1			X	Low		X
		CONSOLIDATED SERVICE AREA FEASIBILITY STUDIES	X	X		X		X	Low		
		FINANCIAL PLANNING COSTS GRANT ELIGIBLE (All)	X	X		X			Low		
		USER CHARGE REVIEW	X	X		X			Medium	X	X
		COMPLIANCE DIAGNOSTIC	X		Operational Phase		X		Medium	X	
		TECHNICAL ASSISTANCE	X	X		X	Varies	X	Varies	Varies	
		ASSISTANCE DOCUMENT	X	X		X		X	Low		
TECHNICAL ASSISTANCE DELIVERY OPTIONS	ASSISTANCE OPTIONS	NATIONAL RESOURCE CENTER	X	X		X		X	Low		
		REGIONAL SERVICE CENTER	X	X		X	X	X	Medium	X	
		CIRCUIT RIDER	X	X		X	X	X	Medium		

- States have a number of different financial reporting, debt ceiling and other requirements which should be recognized early in the process and can serve as the framework around which assistance programs are built.
- Because States are closer to the grantees and are more aware of their individual needs, they could be in a better position to devise alternative types of assistance.
- Delivering assistance through federal support of State programs could also be made contingent on State matching funds. Although it would be desirable for funds to be matched on a one-to-one basis, program flexibility and State participation could be improved by allowing States to contribute as much as they desired, or to designate for matching funds only those options which they would especially like to implement. Whichever form the State contribution assumes, it will increase the impact of every federal dollar spent and enable more grantees to receive assistance.

#### Programs Managed by EPA

Even though EPA continues to delegate more responsibility to the States, it is, in the end, responsible for the success of the program. Questions therefore arise as to which functions the States are better able to fulfill and whether the assistance options contemplated are the proper objects of delegation. The advantage of an EPA-managed program are summarized below:

- EPA already has the knowledge and experience required to address complex problems and implement new initiatives. This capability has generally not been developed on the State level because of limited resources or because States are slow to react to demands for this type of assistance.
- EPA is in a better position to inform grantees of new and existing federal policies, concerns, and requirements, as well as to disseminate new technical information.
- Federal support of State programs will result in duplication of resources in each State. Due to the high levels of expertise required to provide technical assistance, this duplication will be very expensive.

#### RECOMMENDATIONS TO IMPROVE CONTINUING COMPLIANCE RATES

Unquestionably, the responsibility for maintaining POTWs in compliance with NPDES permit requirements lies with local government. The roles of

The strategy should be sensitive to the federal costs involved. In spite of the fact that no strategy element is very expensive when compared with other Program costs, the costs of the entire strategy should be proportionate to the benefits derived.

Finally, in order to reinforce and refine the strategy over the next few years, more data needs to be gathered regarding grantee financial capabilities and financial management needs. The type of information of interest to the construction grants program is outlined on page 26.

The recommendations presented below are listed according to their order of importance in meeting these criteria.

#### NEAR-TERM RECOMMENDATIONS

##### Recommendation:

Fund the compliance diagnostic, thereby encouraging grantees to use it.

This recommendation directly responds to the most important area of concern: achieving and maintaining compliance. Besides serving as a final phase checkpoint for altering or refining the financial management and planning activities that preceded it, the diagnostic is also the most comprehensive of the strategy elements. Not only do financial management problems fall within its scope, but all others related to planning, design, construction and operation of the plant. The diagnostic also offers guidance which is tailored to individual local needs and POTW-specific problems.

##### Recommendation:

Require that pre- and post-implementation user charge reviews give particular attention to the adequacy of the charges in terms of sustaining the plants' operating and maintenance expenses.

The restructuring of emphasis in user charge reviews and the addition of post-implementation reviews is designed to contribute not only to the goal of compliance, but also to the secondary objective of POTW self-sufficiency. These reviews will ensure that grantees are aware of the full cost of their projects so that adequate revenues can be generated to meet these expenses.

##### Recommendation:

Fund regional service center and circuit rider programs on a pilot program basis.

Federal and State Government are confined to regulatory activity and assistance. The options presented in the previous section all deal with some form of assistance -- either through active assistance programs or information transfer.

Of the first four options, only Option 1 -- the provision of operator training assistance to the States -- represents any significant commitment of EPA resources. In light of the continuing demand for senior operators, it is recommended that this option to upgrade federal operator training assistance be implemented as soon as possible. Effective State operator training programs depend on the development of high quality instructional material and skilled trainers. These resources can be most efficiently developed at the national level.

Option 2, which establishes a program to assist small POTWs through the delegated States and through information transfer programs, requires only modest resources which should yield significant benefits in improved compliance rates at minor POTWs.

Options 3 and 4 are also recommended. They require that EPA, in its guidance documents and other appropriate means, encourages the application of sound management practices at POTWs.

Option 5 discusses methods of providing financial management assistance. The rationale for the financial management assistance strategy is based on each strategic element's ability to respond to criteria developed throughout this paper. These criteria can be ranked according to their potential for creating conditions which lead to compliance. The options, or strategy elements, can then be ranked according to this potential for satisfying the criteria.

First of all, it is essential that any strategy element address at least one of the three areas of concern. Achieving and maintaining compliance is clearly the most important because it, alone of the three, represents a major effort toward improved national water quality. Even though promoting POTW self-sufficiency and reducing the economic burden on users are important objectives, these other areas of concern are subordinate to the goal of constructing and operating treatment plants which meet permit discharge requirements.

Yet the strategy as a whole should address these other areas, because the potential for achieving the primary goal of compliance is enhanced by ensuring that user charges are sufficient by themselves to cover O&M expenses, and are developed as efficiently as possible in order to reduce costs.

Next, the strategy should contain at least one element which treats grantee-specific problems. The wide range of grantee financial management capabilities makes this essential.

The strategy should also be suited to both phases of a POTW's life cycle. Again, this is necessary in order to assure compliance. The least costly efforts toward this end can be made in the planning, design and construction phase, while remedial efforts may be needed for some plants now in operation.

Both programs address all three areas of concern, provide a much needed individual level of assistance, and are suitable for both POTW phases. By funding both programs on a pilot basis, the effectiveness and expense of each program can be evaluated before a relatively substantial, nationwide commitment is made.

Recommendation:

Fund a national resource center.

While providing less intensive levels of assistance than the service center or circuit rider programs, the resource center meets all three areas of concern and does so at substantially less cost. It also is suited to all POTW phases and serves to complement the other strategy elements by supplying information about them.

Recommendation:

Prepare and distribute a financial systems guidance document.

Addressing all areas of concern and suited to both POTW phases, the guidance document will supply financial systems information which is adaptable to a wide variety of communities. The cost and time involved in producing and distributing this assistance are relatively small, yet many grantees may derive considerable benefit from this guidance.

Recommendation:

Require that an early fiscal assessment be conducted by grantees during facility planning.

Aimed primarily at reducing the economic burden on users by examining fiscal capability early in facility planning, the costs and time required to conduct this assessment are minimal. And, by requiring local officials themselves to evaluate their municipality's financial condition, this strategy element drives home the importance of financial considerations in POTW projects.

## LONG-TERM RECOMMENDATIONS

Each strategy element should be periodically evaluated to insure that any necessary adjustments and refinements are made and that program objectives continue to be met.

The service center and circuit rider programs should be expanded, if justified by the demand for such services, the success of the program in meeting grantee needs, and the reasonableness of the projected costs.

The recommended plan excludes two options discussed earlier; consolidated service area feasibility studies and grant eligibility for all financial planning costs. The latter is not included because very few costs are not now eligible under the Step 1 grants process and the emphasis placed on making full use of existing eligibilities will soon be provided by the issuance of a new Program Operations Memorandum (POM). Consolidated service area feasibility studies were excluded because the costs involved are so minimal as not to discourage local jurisdictions from initiating these studies on their own.

## PROGRAM MANAGEMENT RECOMMENDATIONS

As noted primarily, State and federal approaches to program management each have their own benefits. Because any given strategy element might be more suitably managed by one level of authority rather than another, it is necessary to evaluate each element individually to determine the best manager of that particular program.

### Programs Managed By States

The list below outlined those programs that will produce the greatest benefits if delegated to the States.

1. Early Fiscal Assessment. Because some States already have the authority to approve facility plans and because this assessment would be part of the facility planning process, it is logical that the States assume this function along with approval of other Step 1 processes. State management of this process would also help produce realistic assessments which take into account State financial reporting, debt ceiling and other requirements.

2. User Charge Reviews. Many States have already been delegated this function. They are familiar with the existing review procedures and consequently would have little difficulty in applying the new reviews which stress the adequacy of the proposed and actual charges.

3. Compliance Diagnostic. Those States that have been delegated NPDES permit enforcement would also manage the diagnostic. These federally funded evaluations provide an additional incentive which complements the deterrent of State enforcement actions.

4. Circuit Rider Programs. While the program described in this paper envisions a contract between grantees and the circuit rider, States could assume a greater degree of control by hiring the circuit rider themselves and making his services available to groups of grantees.

## Programs Managed By EPA

The benefits of federally managed programs, described in the last section, center on EPA's knowledge and experience derived from program management over the past eight years and from a national and regional management infrastructure. The following programs can be implemented to best advantage if they are managed at the federal level.

1. Financial Systems Guidance Document. This publication is issued and compiled by EPA Headquarters and will contain the most reliable financial management information available nationally. Such a document is beyond the scope of most State agencies.

2. National Resource Center. Because of its national coverage, the resource center will provide even the most geographically isolated grantees throughout the country with a first line of direct, reliable financial management information.

3. Regional Service Center. The regional approach to providing financial management assistance combines the best features of the federal management role (expertise and regional infrastructure) with individual attention to grantee-specific problems. The regional approach also eliminates the need to duplicate such programs in every State, thereby reducing costs.

An action plan to implement this strategy will be presented in the final draft of this paper.

## SUMMARY OF THE RECOMMENDATIONS TO PROVIDE FINANCIAL GUIDANCE

### A. Near-Term Recommendations

1. Fund Compliance Diagnostic Studies
2. Fund and Require Pre- and Post-Implementation User Charge Reviews
3. Fund Pilot Programs for Regional Service Centers and Circuit Riders
4. Fund a National Resource Center
5. Prepare and Distribute Financial Systems Guidance Document
6. Fund and Require Early Fiscal Assessments

### B. Long-Term Recommendations

1. Periodically Evaluate Near-Term Recommendations



2. Expand Pilot Programs for Regional Service Centers and Circuit Riders, if justified

#### C. Program Management Roles

1. Programs Managed by States
  - o Early Fiscal Assessments
  - o User Charge Reviews
  - o Compliance Diagnostics
  - o Circuit Rider Programs
2. Programs Managed by EPA
  - o Financial Systems Guidance Documents
  - o National Resource Center
  - o Regional Service Center

#### OPTIONS TO IMPROVE COMPLIANCE RATES AT EXISTING POTWs

As more POTWs are constructed with the aid of the grants program, it is increasingly obvious that EPA must formulate a strategy to address those POTWs which have completed construction but are not achieving the effluent quality required by their NPDES permits. Although the quality of available data is not fully satisfactory, there can be no question that remedial action is required at many POTWs on final NPDES standards.

A recent EPA-funded study (1) of POTW performance found that 53% of the 1,167 major municipal treatment plants (those with actual average flows greater than 1 MGD) on secondary or more stringent treatment limits, were in significant or serious violation of their NPDES permit conditions during the spring quarter of 1977. When all effluent quality violations were included, the noncompliance rate rose to 77%. This latter figure is somewhat misleading, since it includes minor transient violations which have little water quality significance.

Noncompliance at existing POTWs is discussed in greater detail in an issue paper produced earlier. This paper will limit discussion of the subject to a brief summary of the problem, followed by a listing of options to improve the compliance rate of existing POTWs under consideration by EPA. Causes of non-compliance can be placed in three general categories:

- Influent--These include industrial wastes, I/I, and failure to limit system hookup to plant capacity.

- Facility--These include design and equipment deficiencies, obsolescence and construction related problems.
- O&M--These include all problems related to the management, financing, operation, and maintenance of POTWs.

These categories are not independent of each other. Often, adjustments in O&M procedures can counteract the negative effectiveness of design or influent problems. A study (2) sponsored by EPA's Office of Research and Development (ORD) found that 70% of the noncompliers analyzed could be brought into compliance with operations-oriented corrections.

Many plants exhibit multiple problems which prevent compliance. EPA's Municipal Environmental Research Laboratory has funded two studies (2,3) which together comprise the National Operational Maintenance Cause and Effect Survey. One of the MERL-funded studies developed a systematic approach to the correction of problems causing POTW's to violate effluent standards. This procedure, called the Composite Correction Program (CCP) consists of a detailed diagnostic evaluation of a POTW, in which all factors contributing to violation of NPDES permit conditions are identified. Next, a plan of action--the CCP--addressing each of these problems is formulated. Finally, the CCP is implemented to bring the plant into compliance. The CCP addresses administrative as well as technical problems, and requires the continuing involvement of a team of experts over a significant period of time to insure that the improvements called for in the CCP are fully implemented and achieve the intended results. This process generally requires a minimum of several months and longer, if extensive physical modification are required. The CCP has been successfully demonstrated at several POTWs. MERL has issued a contract for the development of a detailed protocol for the CCP. This work will be completed in 1981.

Based on experience gained through several EPA funded studies, along with information and comments offered by EPA's regional offices and several State environmental protection agencies, the following options have been developed to address effluent quality noncompliance in existing POTWs.

#### Option 1

Utilize diagnostic evaluations of noncomplying POTWs to prepare Composite Correction Programs (CCPs), which are used as the basis of enforcement action by the States or EPA.

A growing number of firms are developing the capability to perform diagnostic evaluations of POTWs. These firms have the ability to prepare composite correction programs which address all of the factors contributing to effluent quality non-compliance, including administrative, financial and managerial problems as well as the technical O&M problems which are often the result of more basic problems in the financing or management of a POTW.

Because of the limited resources available for enforcement against POTWs which have completed construction but fail to meet NPDES permit requirements, this option provides for the payment, through a Step 1 grant, of 75% of the cost of a diagnostic evaluation by a firm qualified in the operation and management of POTWs. This would substitute a corrective action for the present punitive enforcement measures, which are both expensive and time consuming to implement. Funds for these "enforcement diagnostics" would be provided from 201 monies in accordance with a priority system based on severity of violation. As with any activity, the utility of the enforcement diagnostic, which would provide a plan for achieving compliance, would be directly dependent on the qualifications of those performing the work. Firms providing this service would be required to demonstrate competence in the management of POTWs, including process control, preventive maintenance management, personnel management, budget analysis and other aspects of POTW management.

An alternative procedure would have the State or EPA issue an administrative order requiring a POTW, in violation of NPDES permit effluent quality requirements, to engage a qualified firm to perform an enforcement diagnostic without grant assistance. As in the original option, the CCP would be utilized as the basis of a remedial program. A compliance schedule for implementation of the CCP would be set, and the POTW would be required to adhere to that schedule.

Another variation of option 1 would have those States which choose to do so develop the capability to conduct their own enforcement diagnostics or contract directly with firms which would perform the diagnostics evaluation.

Selecting the best method of funding diagnostic evaluations is particularly difficult. Those opposed to partial federal funding of diagnostics contend that local government is responsible for compliance and must pay for all corrective action required to achieve compliance. Those favoring grant eligibility state that the cost of a diagnostic evaluation as compared to the federal investment in the POTW is a very small price to pay for a CCP which can be used as a plan for remedial action to achieve compliance. Furthermore, federal funding of the diagnostic should minimize the time required to obtain the CCP, since enforcement actions are frequently subject to delays.

## Option 2

Establish a "fast track" grant procedure to fund limited remedial capital construction (including eligible collection system improvements) necessary to correct influent and facility problems preventing POTW compliance.

Remedial grants would be available only to POTWs that are unable to achieve compliance after constructing new facilities or upgrading existing facilities. Remedial grants would be used solely for correcting mistakes and oversights. Second grants would not be available for correcting noncompliance caused by deficient operations, new industrial flows, or capacity expansions.

These grants would not change the scope of the original POTW construction grant, but would be limited to those measures necessary to achieve compliance with NPDES permit requirements. The grant would encompass both design and construction costs, and would be exempted from many of the usual restrictions and requirements of the existing construction grants program, since it is intended only to meet the objectives of the originally approved project. Priorities would be determined by severity of violation and water quality impact. Grant eligibility would be determined by the same criteria now employed by the construction grants program.

These grants would provide a rapid means of attacking facility and influent problems identified in the "enforcement diagnostic" discussed in option 1 of this section. The use of the fast track grant, to correct facility deficiencies at a POTW which was constructed with grant funds, may be regarded as a "bail out" of incompetent designers, suppliers of substandard equipment and local government agencies which have not initiated timely corrective action. However, under present federal and State laws and regulations governing the complex process of planning, designing, constructing and operating a POTW with the assistance of the construction grants program, it is virtually impossible to identify a party who is accountable to the extent of financial responsibility for corrective action. In any event, the fast track grant to correct POTW deficiencies in no way prevents legal action against a negligent designer, contractor or vendor. Where EPA or the State feels that negligence on the part of a consultant or contractor is the cause of noncompliance, the grant can be made on the condition that the grantee files suit against the negligent party, returning damages recovered to the grants fund.

### Option 3

Develop and implement more effective enforcement mechanisms to improve compliance at POTWs.

Present EPA enforcement activities are primarily directed at the construction of new grant-assisted POTWs. However, without a meaningful enforcement program focusing on the performance of existing facilities, many POTWs will not devote the resources necessary to assure compliance. Some of the options discussed above are, in effect, enforcement activities. Under the provisions of the 1977 amendments to the Clean Water Act, EPA is currently in the process of delegating much of the responsibility for the construction grants program and the NPDES permit program to the States. During this period of transition, it is important that close coordination be maintained between the grants program and the enforcement program at the State and federal levels.

At present, many POTWs in serious violation of NPDES effluent quality requirements are not under any meaningful enforcement action which is likely to result in some effective stimulus to achieve compliance. In most cases, it is more costly to operate a POTW in compliance than to violate effluent standards. Since resources at the local level are generally scarce, expenditures necessary to properly operate and maintain a treatment system are often deferred, or funds are diverted to other uses. EPA must increase its efforts to implement more effective enforcement methods in cooperation with the States. Once POTWs are convinced they are better off if they maintain effluent quality in compliance with NPDES requirements, they will redirect resources to this purpose.

#### Sanctions:

EPA and States administering the NPDES program are responsible for enforcing national pollution control requirements. Currently, the Clean Water Act mandates all municipalities discharging into the nation's waterways must, at a minimum, meet secondary treatment discharge limitations as defined by EPA by 1983. The Clean Water Act authorizes waivers from secondary treatment requirements only for approved marine discharges. All other municipalities must construct necessary treatment facilities, regardless of whether federal funds are available or not.

The Clean Water Act's secondary treatment requirement is mandatory. Enforcement discretion is not authorized, nor are waivers available to municipalities that are unable to secure funds through the construction grants program. The only funding-based waiver in the legislation applies to industries committed to using POTWs which have not yet received funding. Industries, however, are not entitled to federal construction grant funds.

EPA's current enforcement program for municipal dischargers is construction oriented. Most agency resources are devoted to negotiations with municipalities. Construction scheduling, grant commitments, and eventual satisfaction of secondary treatment requirements are stressed. These activities produce enforceable schedules which may not be realistic but will technically satisfy the Clean Water Act's 1983 completion deadline.

Among those municipalities which are not entitled to federal construction grant funds, few have decided to locally finance necessary treatment system improvements. Municipalities have not felt threatened by agency enforcement proceedings or compelled to meet the statutory deadline. Where enforcement has been initiated, the courts have been reluctant to impose rigid penalties, especially in cases where the treatment system was in need of major capital improvements which were considered eligible for federal grant funding.

Municipalities that have already completed construction, or need no construction to satisfy enforceable requirements of the Clean Water Act, also feel little risk for violating NPDES effluent quality standards. These municipalities can save substantial operating costs (energy, chemicals, and operations salaries) by minimizing POTW performance. If an enforcement action is initiated, most municipalities can continue to operate their POTW in a noncompliance mode until a court approved settlement is reached. In most cases, fines that are imposed are small compared to the savings in operational costs.

Although EPA and State pollution control agencies are beginning to direct some enforcement activity toward continuous compliance, program managers are faced with the task of developing remedies which are acceptable to the courts while also acting as a deterrent to non-target POTWs.

The courts are reluctant to impose significant fines on municipalities, and significant, punitive penalties have been awarded only in the most egregious cases where intent to violate the law could be clearly established. Moreover, even before fines for egregious violations can be secured, significant violations must be detected through the self-reporting compliance tracking system, causal factors established, and responsibility assigned.

The major element missing from the national continuous compliance program is risk. Given the existing focus of enforcement -- construction and initial compliance -- municipalities recognize continuous compliance is often ignored by federal and State officials. Continuous compliance monitoring is often a low priority within the States. Priority for continuous monitoring could be established at the national level, and State specific objectives negotiated through State management assistance grants awarded to delegated States. Such an objective oriented approach could be tied to grant awards under Section 205(g) and would be compatible with the environmental manager mode under review in the 1990 management task.

Compliance monitoring and quality assurance also could be developed at the State or jurisdictional level through Section 208 of the Clean Water Act. Although generally regarded as a planning provision, Section 208 could be modified to provide funding to State or areawide "utility commissions." These commissions, particularly if established with Statewide authority, could monitor compliance, administer operator certification and continuing training programs, review and approve user charge rate increases, oversee expansion and preventive maintenance scheduling and review and approve sewer use ordinances, industrial use agreements and sludge disposal programs. The utility commission could regulate POTW operations along the same lines as electric utilities, which are also providing basic public services.

Regardless of whether "utility commissions" to regulate POTWs are established or not, use of existing enforcement tools could be improved to encourage compliance in specific instances while serving as a deterrent nationally.

An initial step in deterring noncompliance would be to remove uncertainty concerning enforcement risk. Currently, enforcement under the Water Act is not clearly mandatory. Mandatory enforcement responses for noncompliance would encourage POTW compliance. This same "mandatory" approach could be applied to monetary or other penalties, such as connection bases or appointment of special POTW managers that are responsible only to the courts but paid by local agencies.

Continuous compliance tools, such as connections bans or fines, are punitive. They are fair, however, if universally applied. They would not be effective in all cases. For example, a connection ban would not encourage compliance at a POTW serving a no-growth area. It would be effective where residential or industrial growth is expected and sewage treatment alone is the limiting influence.

Other tools also are available for assuring continuous and initial compliance, but their usefulness is limited to new, EPA funded grantees. For example, in new construction EPA could avoid increasing grants to municipalities that have delayed construction, fallen off schedule, and incurred substantial inflationary costs. This policy would encourage grantees to tightly manage construction activity, but it would be difficult in some instances to assign responsibility for delay. It would be unfair to punish a grantee for delays caused by State or federal reviewers.

Once federally funded systems are constructed, EPA could reward compliance by subsidizing local debt payments. Such a program would initially reward sound operators, but over time would become a small compliance incentive as real operations costs rise but debt payments, due to inflated tax receipts, become less of a burden locally.

#### RECOMMENDATIONS TO IMPROVE COMPLIANCE AT EXISTING POTWs

Aggressive enforcement programs at the State and federal level are the key to the reduction of the high incidence of effluent quality noncompliance in POTWs. Greater emphasis on the performance of facilities which have completed construction and are not meeting NPDES permit limits is a central feature of the compliance strategy. However, to be effective, the strategy must incorporate reasonable programs which demonstrate a cooperative approach on the part of regulatory agencies.

The following measures are recommended to reduce effluent quality violations at POTWs which have completed construction:

- Utilize diagnostic evaluations as a basis of enforcement action. Diagnostics should be grant eligible.
- Require violating POTWs to implement the recommendations of the diagnostic on a firm schedule.
- Establish a fast track procedure to fund remedial capital construction which is strictly limited to the correction of deficiencies in the original project and which do not represent changes in the basic scope of the original project.
- Require and assist recipients of these remedial construction grants to take appropriate legal action to recover funds where EPA or the States identify negligence on the part of construction contractors, engineers or equipment suppliers.

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