

EFAB

Richard Torkelson
Chair

Frieda K. Wallson
Vice Chair

Herbert Barrack
Executive Director

Members

Honorable Pete Domenici
Honorable Beryl Anthony, Jr.
Honorable Anne Northup
Honorable Rolland Lewis
J. James Barr
Philip Bescham
Joseph Blair
Jack Bond
William Chew
Roger Feldman
Dr. Richard Fenwick, Jr.
Dr. William Fox
Shookley Gardner, Jr.
David Gilbert
Harvey Goldman
John Gunyou
W. Jack Hargett
William James
Steven Lieberman
Robert Mabon, Jr.
Marlin Mosby, Jr.
John McCarthy
George Refelle
Heather Ruth
Roberta Savage
Warren Tyler
Douglas Wheeler
Elizabeth Yell

Environmental Financial Advisory Board

PRIVATE SECTOR PARTICIPATION IN THE PROVISION OF ENVIRONMENTAL SERVICES: BARRIERS AND INCENTIVES

The views and opinions expressed in this advisory do not represent those of the U.S. Environmental Protection Agency, nor are they intended to reflect consideration of other fiscal issues which may be overriding in terms of Administration domestic policy.

November 25, 1991

Printed on Recycled Paper

ACKNOWLEDGEMENT

The Board wishes to thank the many finance professionals and others who assisted in the preparation of this statement. To a great extent, this statement reflects the diverse input of experts in the field from academia, state and local government, the investment banking community, and professional organizations. The Board also appreciates the able assistance of EPA expert staff, particularly the Grants Administration Division.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
I. INTRODUCTION	1
II. DEVELOP FEDERAL POLICIES TO ENCOURAGE THE ESTABLISHMENT OF PUBLIC-PRIVATE PARTNERSHIPS	6
A. STATEMENT OF THE ISSUE	6
B. POTENTIAL APPROACHES	7
III. EVALUATE IMPLICATIONS OF INCREASING FLEXIBILITY IN APPLYING FEDERAL GRANT POLICIES AND REGULATIONS	8
A. STATEMENT OF THE ISSUE	8
B. POTENTIAL APPROACHES	9
C. CONCERNS	12
IV. ENCOURAGE STATES AND LOCALITIES TO MODIFY LAWS THAT ARE DISINCENTIVES TO PRIVATE INVESTMENT OR OPERATION OF FACILITIES	13
A. STATEMENT OF THE ISSUE	13
B. POTENTIAL APPROACHES	14
C. CONCERNS	15
V. PROMOTE FULL-COST PRICING	16
A. STATEMENT OF THE ISSUE	16
B. POTENTIAL APPROACHES	18
C. CONCERNS	18
VI. REDUCE RISKS ASSOCIATED WITH PRIVATE INVESTMENT OR OPERATION OF PUBLIC FACILITIES	20
A. STATEMENT OF THE ISSUE	20
B. POTENTIAL APPROACHES	21
C. CONCERNS	24
NOTES	25
APPENDIX	A-1
EFAB Members, Workgroup Support Staff, and Expert Consultant to the EFAB	
ACKNOWLEDGEMENT	

EXECUTIVE SUMMARY

The Environmental Financial Advisory Board (the Board) was established in August 1989 to advise the U.S. Environmental Protection Agency on ways to encourage and facilitate efficient provision of environmental services and to enhance investment in environmental facilities. Private participation in the provision of environmental services can serve these goals by increasing the funds available for facilities and, in many instances, by reducing construction and operating costs. Accordingly, the Private Sector Incentives Workgroup (the Workgroup) was formed within the Board to identify ways to reduce barriers and create incentives for increased private sector participation in the provision of environmental services.

The Board's suggestions are based on reports and research prepared by public and private entities, testimony to Congressional committees, discussions with experts in the field, and the professional experience of Board members. Some suggestions could be implemented immediately; others require longer-term cooperation with other federal, state, and local agencies. Together, they can significantly enhance the potential for private sector participation in environmental services.

CONSTRAINTS ON PRIVATE PARTICIPATION IN ENVIRONMENTAL PROTECTION

Traditionally, governmental units have provided environmental services such as the provision of drinking water and treatment of wastewater. The large scale of, monopolistic nature of markets for, and involvement of public interests in these services seemed to make their provision by government desirable. Recently, however, public-private partnerships have proved equally or more effective and efficient in delivering environmental services to the public.¹ Yet additional private involvement may be limited by a wide variety of impediments.

Federal laws and regulations developed to protect the public interest in the provision of environmental services can constrain private involvement by restricting public choices or undermining incentives for private investment. These laws may not be the only or the best means of protecting the public interest, however. For example, some of the conditions associated with the funding of wastewater treatment facilities through EPA's State Revolving Fund program can inhibit private sector participation.

Federal and state environmental regulations affect private sector operations and frequently constrain the nature of private sector investments in pollution control technologies. Using economic incentives -- rather than command-and-control regulations -- could stimulate the private sector to invest in cost-effective improvements in environmental quality. In addition, other changes to environmental regulations could improve the efficiency with which firms meet environmental quality goals.

At the state and local levels, other constraints on private investment are found. For example, laws subjecting contracts with private sector entities to annual reapproval and appropriation of funds are intended to ensure public accountability and competition. However,

they also can discourage private investment by exposing contractors to additional risks that their contracts will be terminated before their investments have been amortized.

User fees that are below the cost of service also can act as a disincentive to private investment, because they result in revenue streams for environmental facilities that are inadequate to cover costs, including the cost of capital. In addition, user fees set below costs encourage greater demands on environmental facilities than would full-cost pricing. Increased demands, in turn, increase the cost of providing environmental services and waste scarce natural resources.

In some cases, private lenders have been reluctant to invest in environmental facilities, as they judge potential returns too low for the risks involved. Sometimes, the private investor's evaluation of risk is shaped by misperceptions; in other cases, the real risks associated with some investments are indeed unmanageable from the perspective of a private investor.

STRATEGIES TO INCREASE PRIVATE INVOLVEMENT

The Board has developed the following strategies for the Administrator's consideration to increase private participation.

Stimulate the Creation of Public-Private Partnerships

In order to expand the range of financing options available to local governments seeking to meet environmental quality goals, the first strategy is for EPA to continue to expand its efforts to forge new links between the public sector and private partners. This effort can take the form of demonstration projects, creation of a privately supported development fund to finance the formation of public-private partnerships, technical assistance and expert advice to local governments who want to engage the private sector, recognition of successful partnerships, and encouragement of voluntary private sector projects to finance environmental facilities or projects.

Evaluate Implications of Increasing Flexibility of Federal Grant Policies

This strategy would increase private investment in wastewater treatment plants because it specifically addresses means of overcoming grant-related restrictions on private financing for these facilities. It specifies several actions that EPA should evaluate with regard to their public policy implications and the practicality of their implementation. The actions, listed below, would increase EPA's flexibility in applying federal grant regulations.

- Provide individual facilities, on a case-by-case basis, waivers that define public ownership as majority public ownership of assets or as public control over financial and operational decision-making;
- Through waivers, include reinvestment in EPA-approved facilities in the definition of compensation to the federal government for grant-funded assets;

- Provide explicit regulatory definition of the period of federal interest for grant-funded real property as a facility's design life; and
- Define and sanction acceptable encumbrance of grant-funded real property through case-by-case waivers.

The Board recognizes that there are many potential public policy concerns that need to be addressed in an evaluation of these actions. Three in particular should be examined: impacts on POTW compliance; project finance implications; and protection of the public interest.

Encourage Modification of State and Local Laws that Constrain Private Investment

The next strategy is to assist state and local government efforts to modify laws that unnecessarily restrict the involvement of the private sector. Some states have adopted privatization statutes designed to remove obstacles to private financing, ownership, or operation of facilities, or to private service delivery. The EPA can use the experiences of these states, along with other model statutes (such as the ABA Model Procurement Code) to develop the ability to provide technical assistance to states and localities that are seeking to increase the flexibility of their financing options.

Encourage Full Cost Pricing

The purpose of the strategy of encouraging full cost pricing is twofold: first, to encourage the most efficient use of resources possible, and second to provide the private sector with accurate indications of the potential revenues from an investment, and so encourage the highest level of private funding possible.

Reduce Risks Associated With Private Investment or Operation of Public Facilities

The final strategy addresses the need to reduce the risk associated with investments in environmental facilities in order to encourage higher levels of private funding. Information on the actual levels of risk associated with different types of environmental facilities would help investors avoid decisions made on the basis of misperceptions about environmental risks. More importantly, EPA should encourage different approaches to risk pooling and risk sharing to limit potential investors' exposure to liability from environmental investments.

THE IMPACT OF GREATER PRIVATE PARTICIPATION

Each strategy discussed by the Board is designed to stimulate private participation while protecting federal and local interests and ensuring that standards for compliance and financial accountability are maintained. The net effect should be more efficient delivery of high-quality environmental services.

By helping to improve the conditions for private investment in environmental facilities, the EPA will provide state and local governments with another source of investment capital to meet environmental objectives. Private sector innovation and efficiencies also have the potential to reduce the cost of providing environmental services regardless of the source of capital. In addition, strategies that result in increased private investment may stimulate development and use of innovative technologies to help meet environmental objectives. Conservation and pollution prevention can be encouraged, and the potential hazards of environmental service provision may be reduced.

**Mr. William K. Reilly
Administrator
U.S. Environmental Protection Agency
Washington, DC 20460**

Dear Mr. Reilly:

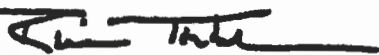
I am very pleased to transmit to you the Private Sector Incentives Advisory of the Environmental Financial Advisory Board (the Board). It describes problems that the private sector confronts when it wishes to join forces with public partners to invest in and/or provide environmental services. It also presents potential approaches that the U.S. Environmental Protection Agency may wish to consider to encourage greater private participation or investment in providing environmental services to the citizens of this nation. This is very much consistent with the work your staff has done under the Public-Private Partnership Initiative and other private sector initiatives.

The Board has concluded that greater private participation in the provision of environmental services would be in the public interest. In the Board's opinion, however, the development of public-private partnerships is inhibited by a number of factors that limit the operational flexibility of public environmental facilities or that reduce incentives for private partners.

EPA could help alleviate constraints and increase incentives for public-private partnerships by working within the Agency and with other federal, state, and local agencies and with Congress, the private sector, and others to implement the actions presented in this Advisory. By taking these steps, EPA can help promote efficient and effective environmental facilities. For example, the Board recommends an evaluation of increasing the flexibility of applying federal grant policies and regulations to encourage private sector involvement in needed environmental investment.

I would like to thank Warren Tyler, Chair of the Private Sector Incentives Workgroup for his leadership. The Board would like to express its appreciation to EPA for inviting us to assist the Agency in its work. We look forward to continuing our support and this dialogue in the future.

Respectfully submitted,



**Richard Torkelson
Chair, Environmental Financial
Advisory Board**

I. INTRODUCTION

Since the early 1970s, the U.S. Environmental Protection Agency (EPA) has been entrusted to oversee the restoration and protection of the nation's water, land, and air resources. This is a substantial undertaking, and EPA has come to rely on state and local governments as partners in administering environmental management programs and allocating resources to ensure compliance.

Tightened environmental controls due to statutes enacted in the 1980s and necessary expansions of programs challenge the ability of state and local governments to pay for future environmental quality services. Compared to roughly \$100 billion a year in 1990 the combined public and private cost of maintaining current environmental service standards is expected to be \$148 billion a year by the year 2000—an average annual increase of about \$5 billion.² New federal and state environmental mandates could further increase costs.

Private participation in the planning, financing, and delivery of these services is one way to help meet expanded needs by raising additional capital and lowering the costs of future compliance. This Advisory evaluates several policies to encourage private participation in public-private partnerships for funding the costs of environmental services and infrastructure.

A. THE ROLE OF THE PRIVATE SECTOR IN MEETING ENVIRONMENTAL OBJECTIVES

The private sector has several roles in providing environmental services and meeting environmental quality objectives. The total amount of private expenditures for facilities, equipment, and operations that improve environmental quality is significant. In fact, 63 percent of all environmental expenditures (both capital and operating costs) in 1987 were incurred by the private sector (See Figure 1). Specific private sector roles, which are not mutually exclusive, include:

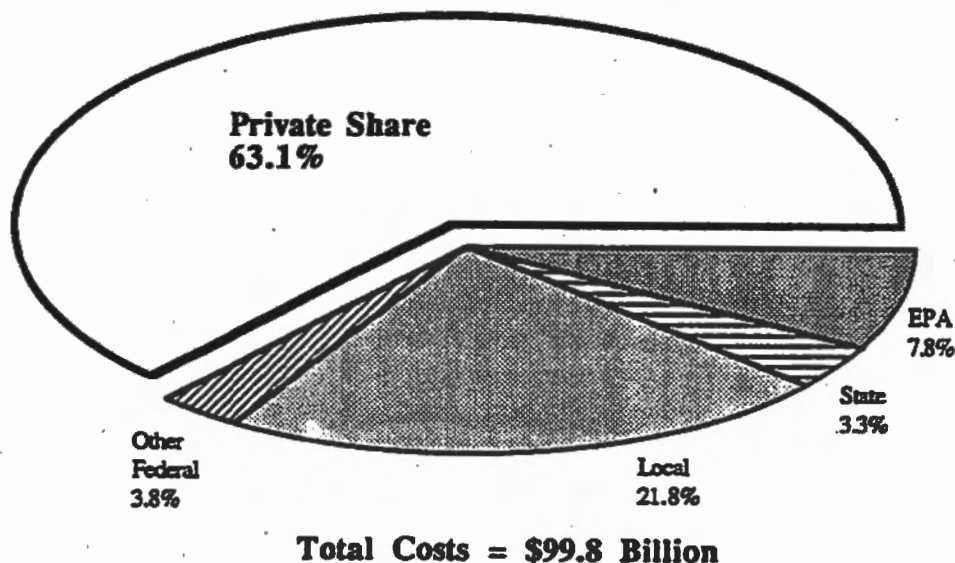
- **Service provider:** The private sector provides environmental services either under contract to public agencies or at a firm's own initiative. It can deliver these services as an owner-operator or as an operator under contract to a public agency or a private firm. The private sector assumes the service provider role principally in the supply of drinking water and the disposal of solid and hazardous waste. More than half of the community drinking-water systems, particularly those serving small communities, are privately owned and operated. Approximately 80 percent of the nation's solid waste is collected by private firms, with 15 percent of landfills privately owned and another 7 percent publicly owned but privately operated.³
- **Investor:** The private sector provides financial resources for environmental facilities owned by public or private entities. Both investment capital firms and private banks provide financing for several types of environmental facilities, particularly small public water supply systems as well as solid and hazardous

waste facilities. Financing can take the form of a direct equity share in the facility, or it can take the form of a loan, backed by some form of collateral, usually the revenue stream of the facility, or the facility itself.

- **Regulated industry:** Private industries that produce goods and services also invest in environmental facilities in order to comply with environmental regulations and continue their production activities. For example, most manufacturing facilities must invest in air pollution control equipment to receive a permit to operate. Most environmental expenditures incurred by regulated industries are for maintaining compliance, rather than for providing services to households or communities. For example, 41 percent of private environmental expenditures in 1990 were for complying with air pollution control standards.⁴
- **Third-party regulator:** The private sector also plays a role in enforcing the environmental compliance of individual firms when it finances or insures facilities that must meet environmental regulations. As a condition for the financing of environmental and other facilities, some lenders or insurers oversee the owner-operator's compliance with environmental regulations (including assurance of financial capability), and may withdraw funds if the noncompliance results in a risk to the lender's or insurer's investment.

FIGURE 1

Private And Public Shares Of The Cost Of Attaining Environmental Quality (1990)



The current pattern of private involvement in providing environmental services within different types of environmental media reflects the varying effects of market forces, regulatory requirements, and historical factors (such as the provision of federal grants) within each media. Private involvement, in the form of facility ownership and operation, is most common in the treatment, storage, and disposal of hazardous wastes,⁵ while private service provision is very common in other types of solid waste management.⁶ A large number of drinking water systems are privately owned and operated, but they only serve a small proportion of the U.S. population.⁷ There is little private ownership of wastewater treatment facilities,⁸ but there is an increasing amount of private operation of public wastewater treatment facilities.⁹

Actions taken by the Administrator and the EPA to encourage private involvement in the provision of environmental services will have different effects on how the private sector contributes to the attainment of objectives for different environmental media. These effects will depend on the forces that shape private involvement in providing services for each type of media, and the extent to which the private sector is affected by changes in federal policy.

There are several specific constraints on private sector investment in or provision of services that affect different types of environmental media. Few of these constraints uniformly affect private involvement in each type of service; where appropriate, media-specific effects are identified. Possible actions that the EPA could undertake to overcome these constraints are proposed and discussed below.

B. CONSTRAINTS AND DISINCENTIVES TO INCREASED PRIVATE PARTICIPATION IN PUBLIC ENVIRONMENTAL FACILITIES

The limited participation of the private sector in the investment in and provision of environmental services to date is largely a function of historical factors. However, it is also perpetuated by current public policies, legal constraints, and financial factors. The Board has identified four major groups of impediments to private investment that either directly constrain private involvement -- even when revenues appear sufficient to generate profits -- or that provide disincentives to private participation because they limit private profitability or impose unacceptable investment risks.

Federal policies and regulations

Several federal laws and regulations affect private investment in or the private operation of public environmental facilities. Federal tax laws have an impact on the cost of capital needed to construct facilities, while regulations associated with federal grant programs may restrict the profitability or availability of private financing for publicly owned facilities. This Advisory discusses the potential use of waivers to overcome restrictions imposed by grant regulations; federal tax policy is discussed in a separate Advisory.

Program-specific environmental and other regulations at the federal and state level

Environmental regulations affect both production processes and costs for most industries. Regulations to control pollution of the major environmental media -- air, water, and land -- tend to be of the command-and-control variety -- that is, they specify the types of emissions control equipment or waste product handling procedures to be used. This type of regulation successfully controls a high percentage of pollutant emissions but limits the flexibility of industry to seek cost-effective means of complying with environmental quality standards.

Therefore, the command-and-control approach to environmental regulation will probably not provide the best strategy for achieving further reductions in pollutant emissions. Because environmental regulations affect the efficiency of private investments in both environmental facilities and nonenvironmental production facilities, economic incentives that help to harmonize compliance and profitability are likely to be more effective in the future.

Pricing policies

For some types of environmental services, user fees fully cover the costs of operation and maintenance activities, as well as the costs of capital. For other types of services, however, user fees have been held at levels that are lower than the actual costs of providing the service. From the private-sectors' perspective, these facilities are operating at a loss. Private investors are unlikely to consider investment in a facility that is operating at a loss unless user fees can be increased to a level that covers the costs of providing services, and/or they anticipate that they can reduce the costs of providing services sufficiently to generate a return on their investment. Even when subsidies from other local government revenues make up the difference between user fees and actual costs, private investors may be hesitant to make long-term commitments that depend on annual budget appropriations for price subsidies.

State and local procurement practices

Private firms that invest in public environmental facilities or provide environmental services under contract to state and local governments can face procurement practices that limit their flexibility in designing, financing, and operating facilities or in providing services. Such limitations can result in higher-cost environmental services and a lack of innovation in meeting the demand for environmental services.

Investment risk

For those environmental investments that pose real financial risks, such as potential Superfund clean-ups or post-closure requirements for solid waste landfills, private sector investment can be significantly deterred by the limited availability of adequate liability insurance. In addition, private investors may lack adequate information on the true level of risks associated with environmental facilities that have been traditionally owned and operated by the public sector. In the absence of adequate information, misperceptions of risk also can act as a disincentive to private investment.

C. POTENTIAL APPROACHES TO INCREASING PRIVATE PARTICIPATION IN PUBLIC ENVIRONMENTAL FACILITIES

State and local governments are finding that the need for private sector investment in environmental facilities and services has never been greater. This is because their financial resources for complying with federal environmental requirements are being reduced at the same time that their provision of lowest-cost environmental services is being inhibited. The Board has developed five strategies, designed to increase private sector involvement in environmental facilities and services, for the Administrator's consideration. These strategies, which are detailed in chapters II through IV, respectively, are as follows:

- Develop federal policies and programs to encourage the establishment of public-private partnerships for environmental services;
- Evaluate the public policy implications of increasing flexibility in applying federal grant policies and regulations to stimulate private investment;
- Encourage states and localities to modify laws that act as disincentives to private investment or operation of facilities;
- Promote strategies that encourage communities to develop user-fee systems that cover the full cost of providing environmental services; and
- Reduce risks associated with private investment or operation of public facilities.

Like constraints, these actions will have different effects on the private sector's involvement in facilities and services for each environmental media. Some media-specific effects of constraints are identified and discussed in the sections that follow, as are possible actions that EPA could undertake to overcome these constraints.

II. DEVELOP FEDERAL POLICIES TO ENCOURAGE THE ESTABLISHMENT OF PUBLIC-PRIVATE PARTNERSHIPS

This section addresses the general incentives for and merits of public-private partnerships for environmental purposes. In addition, it suggests actions that EPA could take to promote such partnerships.

A. STATEMENT OF THE ISSUE

The fiscal constraints of the 1980s have affected the ability of state and local governments to enact national environmental programs. These governments face the dilemma of having to provide greater services with fewer resources. While local environmental mandates increased substantially during the 1980s, available federal funding remains focused on surface water quality projects and is gradually being phased out.¹⁰ This has made it difficult for state governments to help EPA administer environmental programs and for local governments to expand resources to comply with these programs. Some of the traditional sources of local public financing will either become more expensive or will be unavailable in the 1990s. For example, state and local governments face annualized costs of \$33 billion in the year 2000 simply to maintain today's level of environmental quality.¹¹ This represents a doubling of environmental protection costs for 1981.¹²

Additional private investment could assist states and localities in financing their environmental programs in several ways. First, when private sector involvement reduces the costs of providing environmental services, it can also free public funds for use in other areas. In addition, when public financial resources are inadequate or nonexistent, or when municipal debt has already reached its limit under current law, private investment may effectively be the only source of funds for expanding the capacity of services.

Second, the private sector may be able to effect solutions not legally or politically possible for local government. For example, private commercial landfills outside municipal limits may be the only viable option for cities such as Chicago, where existing landfills are rapidly reaching capacity and where there has been a ban on the construction of new landfills and the expansion of existing ones since 1984.

Third, private firms can provide services at a significantly lower cost than can local governments--especially when the need for public monitoring of their performance, fees, and profits is minimized. For example, it has been estimated that, on the average, municipal refuse collection in the absence of competition is 28 to 42 percent more costly than refuse collection by a private contractor.¹³ The literature suggests that the cost differential can be attributed to innovations in technology and management and to savings in operating costs,¹⁴ and in design and construction costs.¹⁵ In contrast to the image of private sector contractors permitting serious cost overruns or providing inadequate services because the public sector will always provide additional funding, properly drafted service contracts that contain provisions for penalties or losses if specified conditions are not met -- for example, if operating costs are exceeded -- increase the accountability of the private sector and ensure that cost savings are realized.

B. POTENTIAL APPROACHES

Public-private partnerships can find creative ways to leverage available resources to achieve environmental quality goals. EPA can assist in the development of these partnerships through its own activities--such as rule-making, re-authorization of legislation, and establishment or revision of program policies. It can also assist communities in establishing public-private partnerships.

Demonstrations

EPA has established a demonstration program for public-private partnerships. This program should be expanded to include the development and implementation of public-private partnerships for financing environmental facilities or services. In addition, it should include a project evaluation component to assist the future development and implementation of independent public-private partnerships.

For those local governments that are successfully finding ways -- such as public-private partnerships -- to finance their environmental facilities, EPA could establish an awards program to publicly recognize their achievement. Similarly, voluntary actions on the part of businesses and corporations to help meet environmental objectives -- such as through pollution reduction efforts, developing corporate environmental policies and programs, or providing assistance to local government efforts -- should be recognized by EPA and rewarded. The information acquired from the awards program would serve as a valuable resource, and EPA should make it widely available to state and local environmental agencies.

Funding

Some local governments that wish to establish public-private partnerships find that one-time start-up costs limit their opportunities with the private sector. EPA should investigate the strengths and weaknesses of assisting in establishing an independent authority to make low-interest loans or grants to finance key stages in the formation of public-private partnerships. Sources of funding for the authority's development fund could include federal appropriations, corporate funds, and funds from other non-federal sources that have an ongoing commitment to improving the quality of state and local government. The Board generally believes that the concept may hold great potential in supporting the expanded use of public-private partnerships providing environmental services to local governments. In particular, the Board suggests that a development fund could prove advantageous in implementing the Agency's multi-media geographic initiatives.

Technical Assistance

Based on EPA expertise and the experience gained in demonstration projects, EPA should provide assistance to local governments that are interested in establishing public-private partnerships. This assistance could take many forms, including seminars, publications, and direct consultation on specific projects.

III. EVALUATE IMPLICATIONS OF INCREASING FLEXIBILITY IN APPLYING FEDERAL GRANT POLICIES AND REGULATIONS

This section addresses ways to accommodate and attract private investment in federally grant-funded environmental facilities.

A. STATEMENT OF THE ISSUE

Over the past twenty years, the federal government has invested about \$50 billion in the construction of facilities to help communities meet the requirements for treatment of wastewater. Many of these facilities must now be upgraded or expanded to satisfy increasing demands for wastewater treatment. The Board has analyzed the potential for private financing of these new construction costs and has found that it could be increased if waivers from current federal statutes and grant regulations were permitted. The Board, however, is not recommending that these be changed at this time. Rather, the Board is recommending that EPA analyze from both a governmental and an environmental perspective the policy implications of case-by-case waivers.

Public wastewater treatment facilities face pressures both to upgrade their facilities to meet regulatory standards and water quality objectives, and to expand their facilities in order to process increasing volumes of wastewater as communities grow. As for any major capital-intensive project, access to financing affects the ability of local jurisdictions to implement facility upgrades and expansion. Local jurisdictions, increasingly responsible for funding the full costs of wastewater treatment, have an incentive to seek the most cost-effective combination of project design, implementation and available financing options, in order to minimize the costs of attaining water quality objectives. In theory, these options could include private sources of capital, design methods, and/or facility operation. Current federal policies associated with grant-funded publicly-owned wastewater treatment facilities, however, constrain the private financing options available to those facilities that seek private sector involvement.

Some POTWs may find that a facility upgrade "package," which includes private sources of finance coupled with private sector design innovations or construction savings, provides the lowest-cost means of complying with permit requirements and meeting water quality objectives. The financing -- whether debt or equity -- would be repaid through the guaranteed revenue stream generated by user fees, and could, in some circumstances, involve encumbering the facility as collateral. Because individual jurisdictions' access to financing varies considerably with local economic conditions and competing demands for limited SRF or bond funds, some wastewater treatment upgrades or expansion may experience significant delays -- or even little possibility -- in obtaining financing. For those facilities that have difficulty obtaining financing, permit violations, degradation of water quality, and possible bans on increased growth may result. Some of the facilities that are unlikely or unable to obtain financing through common public finance channels may wish to obtain financing in the private capital market.

According to federal grant policy, established in Circular A-102 of the Office of Management and Budget (OMB) and implemented through the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments (Uniform

Regulation), the recipient of any federal grant to fund a capital facility must hold the title to grant-funded property. The grant application agreement prohibits both the sale of grant-funded property during the period in which the federal government retains an interest in it, and the use of such property as collateral.

If a grant-funded facility is sold, federal grant policy requires that the federal government be reimbursed for its share of the funding for the property. That share is calculated by applying the current market value of the property to the proportion of original funding provided as a federal grant. Thus, a private firm that invests in a grant-funded facility for treating wastewater would have to pay the federal government for a portion of the facility's current market value as well as for any upgrading or expansion of the facility. (If a private firm buys the facility, these payments would be added to the purchase price.) Unless costs could be cut enough without affecting the quality of the service, the private investor would have to increase the facility's revenues to cover these payments. This would be accomplished by raising annual sewage fees, unless a municipality chose to reallocate existing taxes or other revenues to augment the facility's fee revenues.

The potential magnitude of increases in sewage fees due to grant repayment and facility upgrading or expansion could be great. Unpublished estimates of the costs of upgrading an actual wastewater treatment plant in Connecticut demonstrate that upgrading with private funds would raise user fees by 140 percent (55 percent to cover the cost of repaying the federal share in the facility and 85 percent to cover the cost of upgrading).¹⁶

EPA adopted the Uniform Regulation (with modifications) to implement the requirements of Circular A-102 for wastewater treatment facilities. As the granting agency, EPA is also required to review and approve requests to dispose of grant-funded wastewater treatment facilities and to administer repayment requirements. EPA implements A-102 through its Administrative grant regulations at 40 CFR Parts 30, 31 and 33.

B. POTENTIAL APPROACHES

If consistent with federal policy and sound public policy, EPA could improve conditions for private investment in wastewater treatment facilities. For example, on a case-by-case basis, EPA could increase the flexibility of grant regulations and the application of those regulations to local governments. Greater flexibility could potentially be accomplished by permitting waivers from existing definitions of terms -- such as public ownership -- in EPA grant regulations, or from specific requirements -- such as what can be considered fulfillment of grant repayment -- in those regulations.

The anticipated benefit of considering waivers under EPA and other regulations concerning private investment in publicly owned wastewater treatment plants is to reduce the potential cost burden on consumers by permitting an influx of private capital needed to upgrade and expand wastewater treatment facilities. If the public owner is required to repay the federal grant in order to involve a private partner in the facility, the rate increases associated with repayment may obviate any cost savings associated with access to private sources of capital and private sector expertise.

Define Public Ownership

The Clean Water Act confines the allocation of federal program funds (Title II grants and Title VI loans) to publicly owned wastewater treatment works. While public ownership is not explicitly defined in the Clean Water Act or in EPA regulations that implement the Act, EPA currently interprets public ownership to mean 100 percent ownership by a state or a municipal government or public authority.

This definition of public ownership limits the ability of local governments to obtain private financing for expansion or upgrading of facilities and construction of new facilities. It has a direct impact on those joint public-private proposals to upgrade, expand, or replace facilities with State Revolving Fund (SRF) loans under Title VI of the Clean Water Act. According to EPA guidance on SRFs, if a portion of a federally funded wastewater treatment plant is to be privately owned, SRF loans can be used to support only the publicly owned portion.¹⁷ This policy restricts the currently available options for addressing the financial and management needs of facilities by limiting private finance to those situations in which the privately funded components of a facility form an independent and physically separable unit, leaving the original grant-funded facility in its original condition.

While the public ownership requirement of the Clean Water Act most directly affects facilities seeking SRF loans, those grant-funded (Title II) facilities seeking equity (ownership) investment might also be precluded from commingling existing publicly owned portions of a facility with privately owned ones. This is the case because the current interpretation of the Uniform Regulation apparently requires 100 percent public ownership of grant-funded facilities.

To permit greater levels of private participation in facility financing, EPA could permit waivers from grant regulations that provide the option to redefine public ownership in either one of the following ways:

- Public control of assets -- that is, more than 50 percent of assets owned by a public entity; or
- Public control over financial and operational decision-making.

Defining public ownership as public control of assets would allow public-private partnerships to participate in federally funded SRF programs restricted by statute to POTWs. This could potentially double the amount of financing available for much needed new facilities without triggering repayment requirements and thus increasing user fees. A grant-funded facility that is currently 100 percent owned by public authorities, might also be able to invite private investment of equity as long as the investment does not exceed 49.9 percent of the facility's value. Either definition should result in the ability to obtain SRF loans; however, the implication of either definition from an environmental public policy perspective would need to be carefully assessed. Defining public ownership as public control over financial and operational decision-making would allow even greater financing flexibility. Such a definition may be more attractive to the private sector than majority ownership of assets.

Accept Reinvestment as Compensation

Compensation requirements are triggered if a grantee seeks to sell a facility or equity financing for a newer facility. This limits the effectiveness of a facility owner's efforts to leverage the value of the facility -- usually in terms of its revenue stream -- because a portion of the capital that is raised must be used for a purpose that does not increase the value of the facility or its capacity to provide service. As a result, repayment requirements can result in an increase in user fees that is not offset by an increase in the rate base (the number of people served) or in services provided, including improved water quality.

To minimize the impact of facility upgrades on user fees and to encourage private investments in grant-funded facilities, EPA could consider allowing the federal repayment requirement for individual facilities to be fulfilled by reinvestment in EPA-approved wastewater treatment projects. Such reinvestment would ensure that money intended for public use would not be used for private gain.

Define Period of Federal Interest

EPA could evaluate the governmental and environmental implications of modifying its grant regulations to explicitly define both, the period of federal interest in wastewater treatment plants, and the period for which plants are needed, as equivalent to the design life of the facility. After this period, grant agreement assurances would be considered fulfilled, and repayment would not be required. A precedent for this approach exists. The duration of federal interest in grant-funded airports is 20 years, after which federal grant requirements no longer are in effect. Either definition should promote public-private partnerships.

Local governments frequently face the need to augment the capability of facilities or renovate facilities by the time their design life ends. Limiting the duration of federal interest and defining public ownership as a majority share would allow private sector financing to meet these needs. However, this approach would not permit *newer* facilities to seek equity or debt financing without triggering repayment requirements.

Permit Acceptable Encumbrance

The financing options of facilities supported by Title II construction grants may, in some cases, be limited by restrictions on what can and cannot be encumbered -- used as collateral -- to secure refinancing. In cases where a public facility is required to identify property as collateral for obtaining credit, these requirements would preclude access to debt financing. In a clear departure both from past practice and current federal policy, if a facility were limited by these requirements, EPA could define the concept of acceptable encumbrance for that facility. Through such facility-specific reviews, EPA would retain oversight to ensure that such encumbrance was in the public interest.

C. CONCERNS

The Board recommends that EPA evaluate the public policy implications of waiving certain grant requirements on a case-by-case basis. The Board recognizes that there are many potential public policy concerns that need to be addressed with respect to waivers for this purpose. Three in particular should be examined in such an evaluation:

- **Compliance Impacts of Waivers**

In order to obtain a waiver from grant regulation restrictions on private sector involvement, a publicly-owned wastewater treatment facility should be able to demonstrate the compliance impacts of the waiver -- in other words that there is a demonstrated need for capital investment for compliance purposes.

- **Project Finance Implications**

Waivers are only appropriate if project finances are improved under a private sector involvement option. A POTW should be able to demonstrate that project finances, including long-term impacts on user fees, are optimized under a private sector involvement option that requires waivers from federal grant regulations.

- **Protection of the Public Interest**

If waivers are considered, protection of the public interest would have to be ensured in the waiver process, potentially in terms of whether adequate protections can be provided through contract arrangements, permit requirements, or other means. The public interest is not protected if facilities are not operated in compliance with environmental regulations and requirements, if they do not continue to provide services as long as they are needed, or if they are not operated in a fiscally sound manner.

IV. ENCOURAGE STATES AND LOCALITIES TO MODIFY LAWS THAT ARE DISINCENTIVES TO PRIVATE INVESTMENT OR OPERATION OF FACILITIES

This section addresses actions that state and local governments can take to promote private interest in financing environmental facilities. EPA's role in these activities is limited, therefore, to the provision of information and assistance.

A. STATEMENT OF THE ISSUE

Some government practices, such as those aimed at assuring accountability and public control over decisionmaking, indirectly discourage private involvement. Consistent with a move toward federalism, EPA may wish to encourage states to modify these practices if there are viable alternatives for maintaining their purposes, and the benefits of these practices are outweighed by their negative effect on private participation.

In some cases, state or local statutes simply prohibit public entities from entering into certain kinds of relationships with the private sector. In other cases, statutes limit private activities to such a degree that public-private partnerships are discouraged. For example, about a half dozen states impose some form of restriction on interstate shipments of solid waste,¹⁸ effectively prohibiting the development of efficient regional waste management facilities. Such constraints preclude private investment in potentially profitable public-private partnerships.

Many state and local procurement laws also require selection of the lowest-cost bidder¹⁹ -- thereby eliminating competition on the basis of best service provision or most innovative technology -- and prohibit alteration of project design or financing once project specifications have been established. Such laws limit the range of technology and innovative approaches that are available to the public sector, by restricting bidders to specifications expressed in requests for bids on a project, rather than making arrangements to incorporate changes in design, technology, and financing as a project progresses. Some states do allow negotiation of service contracts for privatization projects, making those projects exempt from minimum bidding requirements. The state procurement law in Maryland, for example, allows negotiated turnkey contracts on a case-by-case basis. Kentucky's privatization law allows sole-source procurement under a carefully structured process.

State and local regulations that require periodic contract negotiations between private investors and local authorities may also discourage investors. These regulations introduce a large degree of uncertainty into long-term planning, threatening the ability of private investors to amortize capital costs over a sufficient period of assured operation.

Long-term contracts are attractive for private investment since they allow private firms to lower the fees they charge by spreading amortization costs over a longer period and by reducing the premium on risk included in user fees. Conversely, private participation is discouraged and/or user costs are potentially higher due to the risks associated with short-term contracts subject to periodic renegotiation without any assurances of renewal. However, some

states and localities place constitutional or statutory restrictions on the ability of local governments to enter into long-term contracts. These restrictions reflect a concern that localities may lose control of essential public services unless the terms of agreement can be renegotiated frequently.²⁰ Local governments may find it harder to attract private sector interest when they are unable or unwilling to enter into long-term service contracts with private firms. This is due to the increase in risk to the private sector and the increase in user fees to compensate for increased risk.²¹

B. POTENTIAL APPROACHES

Encourage Use of Competitive Negotiation in Procurement

To reduce barriers to competitive negotiation, where appropriate, EPA could provide guidance to states that are considering revision of their procurement laws to enable local governments to adopt the American Bar Association (ABA) Model Procurement Code and Ordinance. The Agency could also provide guidance to local governments on facilitating private sector participation through use of the ABA Code. The ABA Model Procurement Code and Ordinance provides voluntary standards that states and local governments can use to revise their procurement statutes to provide greater sophistication and flexibility. Under a procurement system based on this model, local governments would have the legal authority to use a competitive negotiation process, and contracts could be given to the offeror submitting the best overall proposal, as measured by the evaluation criteria stated in a request for proposal (RFP). Contract awards would not have to be made to the lowest bidder. This approach is more like that taken in federal procurement processes under the Federal Acquisitions Regulation (FAR), which specifies that contracting entities are required only to accept the minimum reasonable bid if a bidding process other than single sealed bids is employed. Moreover, competitive negotiation practices, implemented according to requirements similar to those in the ABA Model Procurement Code, assure that the objective of minimum bid requirements—ensuring that public funds are allocated on the basis of competition and that public expenditures are efficient—are met, without creating a disincentive to private participation.

Establish Guidance on Effective Privatization Legislation

Given the importance of long-term contractual arrangements in attracting private participation, EPA could provide guidance to states and localities on legislation that would authorize long-term contracts between local governments and the private sector when feasible, practical, and desirable. This would require EPA establishing a sound empirical basis for recommending arrangements that work. Some states have already enacted such legislation. For example, in Kentucky, privatization law authorizes local governments to negotiate long-term service agreements for wastewater and drinking water projects. In New Jersey, the state public contracting law was recently amended to allow local governments to consider long-term contracts.

Gathering and rigorously evaluating evidence from a variety of state and local experiences, EPA could help develop policies that minimize disincentives to private investors and operators while ensuring that public funds are allocated on the basis of competition, that public

expenditures are efficient, and that the public sector maintains control over the provision of environmental services.

EPA could also develop "best practice" guidance on long-term service agreements. These materials could cover methods of allocating risk between the public and private partners in ways that assign private partners reasonable business risks while preserving public control over the delivery of environmental services. For example, EPA could help authorities properly structure service agreements that minimize design, construction, and operation risks for local governments through the inclusion of private performance and compliance guarantees as well as private reporting requirements suited to the nature of the project in question.

C. CONCERNS

One potential aspect of long-term contracting is its effect on tax-exempt financing. If a service agreement extends beyond five years, it falls under the Treasury Department's definition of a private activity and must be financed with higher-cost private activity bonds. Tax exemption is available for some private activity bonds, but the volume of such debt is restricted by annual volume caps for each state. Therefore, EPA should incorporate IRS guidance on whether short-term contracts that are automatically renewed could be used by some local agencies to avoid the loss of tax-exempt bond status when long-term contracts are employed.

V. PROMOTE FULL-COST PRICING

This section addresses the merits of full-cost pricing as the foundation for all types of financing. In particular, full-cost pricing would eliminate one of the fundamental disincentives inhibiting private investment in public environmental facilities.

A. STATEMENT OF THE ISSUE

The Board believes that the way communities charge and pay for environmental facilities needs to change, both to meet tougher conditions for project finance and to better balance demands with available resources. These changes in user fees -- based on the full cost of providing services -- would ensure that consumers' demand for services is proportionate to the cost of providing them. It could also present an opportunity to encourage private investment as an alternative to public financing of local environmental facilities.

Local governments finance their environmental facilities and services with general revenues, dedicated taxes, federal and state grants and loans, and user fees for the services provided. Historically, many communities have not relied on user fees to cover the full costs of providing services. Rather, they have subsidized service provision from one or more of the other possible sources of revenue.

The extent of subsidization varies for each kind of environmental facility and is affected by the original form of financing obtained for facilities and equipment. For example, a significant portion of the capital costs for wastewater treatment facilities, which are almost entirely publicly owned and operated, have historically been covered by federal grants. This has lowered the expenditures required for debt service, and thus has kept user fees and state or local subsidies lower than if full capital costs had to be recovered with fees. For example, a 1987 survey of major sewerage agencies indicated that user fees cover only about 60 percent of combined O&M and debt service costs in 1986.²² Fees were more likely to cover O&M costs (78 percent) than debt service for capital costs (38 percent). Between 1982 and 1986, the average proportion of O&M and debt service costs covered by user fees remained unchanged.²³ Large jurisdictions -- those serving populations over 250,000 -- are more likely to be able to cover their costs through user fees than small jurisdictions because they are able to spread them over a much larger rate base.

In the case of drinking water, a 1984 survey of community water systems²⁴ found that revenues for 334 publicly owned systems fell short of operating expenses plus debt service by \$0.76 per 1000 gallons. On the other hand, private water suppliers averaged a profit of \$0.72 per 1000 gallons. Both types of providers averaged deficits if they served smaller communities, but the deficits of private suppliers were much lower than those of public suppliers.

In addition to subsidies, communities have been able to keep user fees low for several reasons. As mentioned above, construction grants subsidized the capital cost of many wastewater treatment plants, thus lowering the costs that need to be covered by fees or other sources. Second, some communities have not provided adequate revenues to cover operation and

maintenance costs. They have allowed their environmental facilities to deteriorate and are, in effect, "mining" their infrastructure. Third, some communities have not provided the necessary services required to safeguard the environment. For example, in some communities, universal garbage collection is not available and home owners are permitted to dispose of their own waste on their property.

Two factors are likely to increase the costs of environmental services for local governments: the decreasing availability of grant funding and other subsidized federal and state funding; and the increasing cost of service provision due to regulatory requirements and, in some cases, limited waste management capacity. Local governments will have to choose whether to fund these cost increases through increased allocations of general revenue to environmental services, or through increased user fees, or both.

One of the effects of subsidized user fees is that consumers' demand for services does not reflect the actual cost of providing services, and so can result in wasteful use of services and the resources used to provide them. For example, if water is priced below full cost, users will tend to consume more water than they would at higher, full-cost recovery prices. Also, under subsidized prices, users have fewer incentives to put water supplies to their highest valued uses. Under subsidized prices, for example, homeowners may choose to water their lawns excessively. This, in turn, results in increased demand for new water supplies, drives costs up, and can promote costly supply augmentation investments.

In addition to inefficient uses of resources, conventional ways of charging and paying for public environmental services have discouraged private investors by sending price signals that do not correctly reflect the value of the investment. Private investors look to the level of user fees as the indicator of long-term income in estimating rates of return from investments in environmental facilities. They will be attracted to public works investments only if the user fees being charged cover the public agency's costs of providing services *and* private investors anticipate that they will be able to lower the costs of providing services, thus generating a return on their investment.²⁵ When private investors observe that a facility is providing services at a price that is lower than the public agency's costs and is, therefore, operating at a loss, it is only reasonable for them to invest in the facility if they believe they can either (1) raise fees to a level sufficient to cover the cost of providing services, *or* (2) reduce costs so far below those of the public agency that they can maintain user fees at the same level and still make sufficient returns.

When a public agency seeking privatization plans to make up the difference between user charges and the cost of service provision through subsidies and intergovernmental transfers, revenues adequate to cover costs will be generated. Financially, the revenue stream of the facility may be equivalent to a full-cost pricing approach. For most types of investments, however, the private sector will prefer full-cost pricing. If a public-private partnership includes a proposed general revenue contribution to make the revenue stream equal to full-cost pricing, the private sector may be hesitant about the risks of annual appropriation processes and the security of long-term revenue streams. Dependence on subsidies to generate a target rate of return increases the uncertainty or risk associated with a project and, therefore, discourages private participation.²⁶

Full-cost, unsubsidized fee structures are usually greatly preferred, if not required, for private participation in environmental investments. Accordingly, increasing fees to fully cover current costs should elicit greater private investor participation. By contrast, subsidization and underpricing provide a disincentive to private investment because they send incorrect signals to the consumer regarding the true value of the service. When fees are increased, not only will private investors be able to make rational investment decisions, but households will often choose to consume services at a level that reflects their true cost and value.

B. POTENTIAL APPROACHES

User fees that reflect the cost of providing services will reduce wasteful use of services and will give the private sector an incentive to invest in environmental facilities and services, freeing up local government resources for other uses. Thus, by promoting a greater public awareness of the cost of environmental services, full-cost pricing encourages conservation, recycling and, in conjunction with reduced demand, pollution prevention.

Endorse Full-cost Pricing

EPA could encourage full-cost pricing of environmental services in three ways. First, it could endorse the practice in EPA publications and operational guidance as a matter of public policy and as a necessity for financial and operational efficiency. Second, it could help localities implement full-cost pricing by providing technical assistance to set up effective cost-accounting procedures, to estimate capital and operating costs per unit of service delivered, and to establish appropriate volume discounts or rebates for commercial on-site treatment. Third, it could help localities ease the transition from subsidized to full-cost pricing, as well as mitigate public opposition to the transition, by providing technical support for public outreach and information programs that explain the benefits of full-cost pricing.

Encourage States to Incorporate Adequacy of Fees in Permit Review Process

Processes for reviewing state permits for environmental facilities provide a logical opportunity for encouraging full-cost fees for environmental services. States could either require full-cost pricing as a condition for granting or renewing permits, or they could simply include a review of the adequacy of fees in the permit process. While EPA could consider requiring states to implement these or similar requirements, the Board considers it more appropriately left to the discretion of the states. However, EPA could provide guidance to states to assist them in incorporating a review of fee adequacy in their permitting process.

C. CONCERNS

Although full-cost pricing is conducive to efficient resource allocation and increased private participation in environmental infrastructure, it may nonetheless impose hardships on small, low-income communities and on low-income users within individual communities. Elimination of local government subsidies -- financed out of general revenues from taxes -- in favor of increased user fees could unduly burden low-income users. There may be some

communities that have a user base too poor to support higher user fees. These communities may not be able to adopt full-cost pricing.

Determining actual "full cost pricing" user fees can be difficult for a public agency charged with overseeing rates set by private service providers. The objective in regulatory rate setting is to establish rates that reflect actual costs plus a reasonable return on investment. Unless the regulatory agency has direct knowledge of costs -- most likely with reference to a public agency's costs of providing services -- numerous regulatory issues arise. It can be very costly to establish a regulatory mechanism that reflects sufficient independent knowledge of industry costs in order to ensure that the private provider is not setting rates at a level that permits excessive profits.

To the extent that voters in local elections express their objections to higher prices there may also be a political constraint to the implementation of full-cost pricing on a local level.

If EPA encourages the inclusion of full-cost pricing in state permit review processes, some states could perceive that their management prerogative is being undermined.

VI. REDUCE RISKS ASSOCIATED WITH PRIVATE INVESTMENT OR OPERATION OF PUBLIC FACILITIES

This section addresses steps EPA could take to reduce either the real or perceived risks associated with private investment in public environmental facilities. Reducing the perception of risk is relatively straightforward. Reducing real risks will require more concerted EPA action.

A. STATEMENT OF THE ISSUE

The private sector frequently perceives investment in environmental facilities to be financially risky. Unfortunately, tools for reducing investment risks are limited. In particular, insufficient information on environmental risks and inadequate environmental liability insurance may act as a disincentive to private investment. The limited role of private investors in regulating the risk-related activities of facilities may also be discouraging.

The private sector evaluates rates of return in light of the risks associated with a project. Since investors require that returns be commensurate with risks, investment in high-risk projects is attractive only if high rates of return are anticipated. Conversely, projects offering moderate rates of return will attract investors only if the associated risks are perceived as moderate or low.

Investment risk is also reflected in the premium paid to investors. Lenders will exact a higher than normal risk premium in the interest rates they charge to lend money if they perceive risks to be higher than normal. In turn, this either increases the costs of services to communities or, if risk premiums are insufficient, discourages private investment.

One key factor in investor response to risk, however, is the *perception* of risk. This perception may or may not reflect an understanding of *real* risk. When perceived risk is greater than real risk, communities pay too much to finance their environmental projects. Thus investors need adequate information on actual risks posed by environmental facilities and their operation in order to evaluate the returns they require to account for risks.

The private sector is very experienced in evaluating the risks of activities that have traditionally involved private participants. Yet it may lack specific information relative to degrees of risk associated with those types of environmental facilities that traditionally have been publicly owned. In addition, investors may erroneously extrapolate the risks and costs associated with hazardous environmental activities -- such as waste spills or site contamination -- to other less risky environmental undertakings such as the provision of community water supply or wastewater treatment.

Perhaps more important than misperceptions of risk due to inadequate information is the lack of widely available environmental insurance at reasonable rates. This can prove a significant disincentive to private investment. For instance, under the "joint and several liability" provision in Superfund, any participant in the generation, transportation, or management of hazardous waste could be forced to pay the entire cost of cleaning up a contaminated site, even though other firms contributed to the problem. Because banks are forced to view the liabilities associated with

Superfund cleanups as dollar-for-dollar debits against corporate assets, they are leery of inheriting a Superfund liability in the event of a bankruptcy. A growing number of banks are scrutinizing all industrial loans for potential Superfund liabilities.²⁷

Environmental liability is also a concern in solid waste management and, to a lesser extent, in drinking water and wastewater treatment. For example, leaching of toxics from landfills can contaminate local wells. Instituting mitigation measures will greatly reduce risks, but not eliminate them. EPA's proposed post-closure requirements are perhaps the greatest liability facing private investors in solid waste landfills. Owners of municipal solid waste landfills will be required to provide some type of financial assurance that will protect against future contamination. Liability insurance covering unforeseen contamination is offered by only two underwriters and is expensive. Because liability insurance has not been required in the past and the post-closure rule is relatively new, most landfill owners currently do not carry post-closure liability insurance.²⁸

B. POTENTIAL APPROACHES

Information on Sources and Degrees of Risk

EPA could help potential lenders and investors evaluate the real risks of investment in environmental projects by providing detailed information about the different types of risks and the activities from which they derive. The two types of risk associated with environmental facilities are catastrophes or single events (such as spills) and day-to-day events (such as noncompliance with permits). The likelihood of occurrence and costs are very different for each.

Risks differ for each kind of environmental facility. Thus for each facility, the following information should be provided:

- Historical probability of each type of catastrophic and day-to-day event;
- Measures in place to minimize the risks of these events and how each measure reduces the probability of each risk;
- Costs of mitigating the effects of events; and
- Objective factors associated with catastrophic and day-to-day events -- for example, certain environmental conditions, or modes of operation.

To the degree possible, such information should segregate truly random events that could occur at any well-regulated facility from events that can be traced to particular design or operating parameters, such as groundwater contamination resulting from an unlined, unmonitored solid waste landfill. One simple example of a way to organize this information is presented in the following table, for different types of minimization measures.

**Table 1. Analysis of Risk by Environmental Service
and Risk Minimization Measures**

<u>Facility</u>	<u>Main Risks</u>	<u>Mitigation of Risks</u>
Drinking Water	Source contamination	Wellhead protection program; watershed management
	Viral/bacterial contamination	Filtration, disinfection -- ensure compliance with EPA regs.
Wastewater Treatment	Violation of discharge permit	Better O&M, adequate facility size
	Toxics from industry	Industrial pretreatment program
Solid Waste:		
Overall	Environmental contamination from mishandling	Source reduction, materials recovery, energy recovery
Landfills	Leaching of toxics	Structural controls (liners, leachate collection, monitoring wells), screening of materials for acceptance
Incinerators	Air pollution (dioxins)	Stack emission controls

Privately Provided Risk-Ratings

EPA could provide technical assistance to develop "risk ratings" for facilities from an independent organization, not unlike financial ratings obtained from Moody's or Standard and Poors. For example, an independent organization might develop ratings such as a triple "A" rating for facilities that have instituted stringent controls against environmental contamination, and a "B" rating for facilities that have implemented basic control measures. Along with detailed information on risks related to environmental activities, risk ratings for environmental facilities would allow private investors to make investment decision about those facilities on the same basis as they make other investment decisions. As a result, investors would be more likely to consider involvement in low-risk environmental projects, and the user fees that they would consider necessary to cover costs and risks will more accurately reflect the actual risks posed by a given project.

Mitigation of Risks

EPA could mitigate the real risks associated with environmental investment by reducing the magnitude of liabilities that could be incurred by individual facilities. It could accomplish this by promoting risk-pooling through insurance programs in which environmental facilities, private insurers, and/or governments as a group cover the liability associated with specific environmental projects. With more readily available environmental liability insurance for lenders,

for example, banks and other lenders will be more willing to finance firms involved in Superfund cleanups or other activities associated with environmental risks.

EPA could also reduce risks by endorsing and facilitating new programs to offer environmental liability insurance to capital lenders and providers of environmental services. One example of such a program that could serve as a model is one sponsored by the Environmental Standards Group (ESG). This program provides coverage analogous to title insurance for real estate transactions and is designed to protect lenders against the financial loss that might be incurred in the event of mortgage foreclosures on waste-contaminated real estate. Insurance would cover up to \$30 million of liability on each mortgaged property that had been found clear of contaminants following investigation of historical land use for that specific site (using a specially created database) and an onsite inspection. Any site considered contaminated could be insured after the environmental hazard was corrected.

One example of an insurance mechanism that could help mitigate risks is a recent proposal made by the American International Group (AIG), the largest issuer of environmental impairment insurance. The proposal constitutes a privately funded alternative to government involvement in liability insurance. It suggested that a small percentage of all premiums for general business liability insurance be dedicated to a fund for clean-up of waste sites. The purpose of this plan is to raise cash needed to clean up Superfund sites and to direct resources to cleanup measures rather than to litigation.

Private investment of equity could be encouraged by a similar program designed to insure the facility itself. Bearing in mind the environmental community's concern that breaking the linkage between those responsible for site contamination and those asked to finance site cleanups may undermine the foundation of the Superfund program, the concept of a privately operated fund appears attractive. It could reduce federal expenditure on litigation and collection; it would reassure potential private investors now concerned about future liability for unforeseen contamination; and, through savings realized by companies now subject to Superfund litigation, it could increase the funds potentially available for further environmental investments. However, the Board feels that additional analysis of this type of approach would be required to determine the public policy impact of such a program.

With increased private provision of environmental liability insurance, the private sector could likely become much more involved in the monitoring and control of environmentally related facility actions. Because insurers would clearly be interested in maintaining a contaminant-free site, they would police subsequent use of sites they insure to ensure proper materials handling. In a sense they would be acting as a third-party regulator to protect their financial interests. Thus, in addition to aiding early detection of contamination and spurring private clean-up efforts (a prelude to mortgage approval), private insurers could provide a measure of comfort to commercial lenders and thus encourage private loans for environmental infrastructure.

C. CONCERNS

Because the operations and site conditions of environmental facilities are unique, general information (beyond that the private sector could easily develop on its own) about the risks of such facilities may have a limited application to specific investment decisions. In addition, lack of specific risk information may limit the technical ability of an independent risk-rating agency to develop adequately a comparative system for ranking environmental projects in terms of risk. Some risks may prove to be uninsurable due to their potential magnitude, degree of uncertainty, or long-lived and latent nature.

NOTES

1. US Environmental Protection Agency, *Public -Private Partnership Case Studies: Profiles of Success in Providing Environmental Services*, September 1989; page 6.
2. US Environmental Protection Agency, *Environmental Investments: the Cost of a Clean Environment Report to Congress*, November 1990; Table 8-12A.
3. National Solid Wastes Management Association, "Privatizing Municipal Waste Services: Saving Dollars and Making Sense" (1989), pages 1, 4.
4. See Note 2.
5. National Governors' Association, *Siting New Treatment and Disposal Facilities*, Center for Policy Research (1989), pp. 2-3. Also personal communication with Norm Weiss, Arizona Department of Environmental Health Services (December 11, 1990); Raoul Clark, Florida Department of Environmental Regulation (December 31, 1990); Brett Smith, Minnesota Waste Management Board (December 19, 1990); Marge Howell, North Carolina Hazardous Waste Management Commission (December 28, 1990); and "1990 State-by-State Outlook for Commercial TSD Facilities," *The Hazardous Waste Consultant* (March/April 1990).
6. National Solid Wastes Management Association, "Privatizing Municipal Waste Services: Saving Dollars and Making Sense" (1989), pages 1, 4, 6. See also Eugene J. Wingerter, "Where the Waste Industry is Going," *Waste Age* (April 1990), p. 282; Richard J. Sweetnam, Jr., "Trends in Waste-to-Energy," *Waste Age* (November 1989), p. 41; and Eileen Berenyi and Robert Gould, *Resource Recovery Yearbook*, New York: Government Advisory Associates, Inc. (1986), pp. 13-16, 72; cited in National Solid Wastes Management Association, "Privatizing Municipal Waste Services: Saving Dollars and Making Sense" (1989), pp. 4-5; David A. Dorau and Keith R. Connor, "Meeting the MRF Challenge in the 1990s," *Public Works* (September 1990), p. 107; Dexter Ewel and Frank C. Shaw, "Risk Allocation in a Changing MRF Industry," *BioCycle* (April 1990), pp. 64-65; and Abbie C. Page, "Financing a Material Recovery Facility," *BioCycle* (August 1989), pp. 54-56.
7. Research Triangle Institute, *Final Descriptive Summary: 1986 Survey of Community Water Systems*, prepared for the U.S. Environmental Protection Agency (October 1987), p. 9.
8. The privatized municipal wastewater treatment facilities are in Auburn, Alabama; Pelham, Alabama; Chandler, Arizona; Gilbert, Arizona; East Aurora, New York; and Downingtown, Pennsylvania. Another facility in Greenville, South Carolina, was developed under a privatization agreement but later sold back to the public partner. (This list was developed primarily through phone contacts with knowledgeable individuals. An initial list was obtained from: John G. Heilman and Gerald W. Johnson, "A Feasibility Study of the

Privatization of Public Wastewater Treatment Works," prepared for the U.S. Geological Survey, Department of Interior (January 1989).)

9. William T. Lorenz & Co., *1989 Update - Water Pollution Control Industry Outlook* (March 1989), pp. 533-549; and Apogee Research, Inc., *The Nation's Public Works: Report on Wastewater Management*, prepared for the National Council on Public Works Improvement (May 1987), p. 89, 95-96; "A Bull Market for Sludge Disposal," *Public Works Financing* (June 1989), p. 7; personal communication with William Reinhardt, editor of *Public Works Financing* (December 18, 1990).
10. See Note 2.
11. U.S. Environmental Protection Agency, *Environmental Investments: The Cost of a Clean Environment*. Tables 3-3 to 7-3 (1990).
12. The costs double over the period 1981 to 2000 in real terms, reported in 1986 dollars. See US Environmental Protection Agency, *Environmental Investments: the Cost of a Clean Environment*, Report to Congress, November 1990; Page 1-11.
13. National Council on Public Works Improvement, *Fragile Foundations: A Report on America's Public Works* (February, 1988), p. 197.
14. See E.S. Savas *Privatization: The Key to Better Government*, New Jersey: Chatham House (1987). Chapter 6: "Applications in Physical and Commercial Services" in for a summary of the results of studies conducted through 1986; see also page 125. See also James D. McDavid & Gregory K. Schick, "Privatization Versus Union-Management Cooperation: the Effects of Competition on Service Efficiency in Municipalities", *Canadian Public Administration* Volume 30 No. 3 (Fall 1987):472-488.
15. John G. Heilman and Gerald W. Johnson "System and Process in Capital-Intensive Privatization: A Comparative Case Study of Municipal Wastewater Treatment Works", *Policy Studies Review* Volume 8 No.3 (Spring 1989): 549-572. Heilman and Johnson's cost savings findings are highly sensitive to potential changes to local governments' internal review processes, and thus are not inherent to private construction.
16. Unpublished estimates by Apogee Research, Inc., based on data from Connecticut Department of Environmental Protection and construction cost data from Metcalf & Eddy.
17. Federally-funded SRFs, however, can fund facilities in the nonpoint source and estuarine areas that have private participation.
18. The Supreme Court has ruled that it is unconstitutional to bar transport of solid waste into a state solely on the grounds that it originates out of state, unless the facility is publicly owned (*City of Philadelphia v. New Jersey*). Several states and localities have promulgated laws or regulations which limit the intrastate transport of solid waste in such a way as to comply with this ruling, however (*Waste Age*, October 1987 pages 53-56). In addition, Congress has attempted to pass federal legislation to allow states to ban shipments of solid waste from other states under certain conditions, such the proposal by

Senators Daniel R. Coats (R-Ind.) and Mitch McConnell R-Ky.) to amend the District of Columbia appropriations bill (HR 5311) in 1990.

19. The Federal Acquisition Regulation (FAR) requires competitive, sealed bids in many, but not all, federal procurements (sect. 6.4), but does allow for acceptance of the lowest *reasonable* bid (sect. 14.5, 15). Not all states have used the FAR as a model, however.
20. Another form of risk mitigation often restricted by state and local rules is put-or-pay contracts that provide facilities with assured input flows or compensatory payments.
21. It must be noted that the advantages of long-term contracts in attracting private participation are mitigated in part by federal regulations governing tax-exempt bond financing. If a service agreement extends beyond five years, it falls under the IRS definition of a private activity and must be financed with generally higher cost private activity bonds. Tax exemption is available for some private activity bonds, but the volume of such debt is restricted by annual volume caps for each state.
22. Association of Metropolitan Sewerage Agencies, *Municipal Wastewater Treatment Facility Financial Survey* (1987). Percentage of costs covered by user fees calculated from data reported for Section C 3, 4, and 5.
23. Association of Metropolitan Sewerage Agencies, *Municipal Wastewater Treatment Facility Financial Survey* for (1983), Section IV data; (1987), Section B-1 data.
24. Frederick W. Immerman, *Final Descriptive Summary 1986 Survey of Community Water Systems*, for EPA Office of Drinking Water (Washington, DC, October 23, 1987), p. 48.
25. In more economic terms, if user fees are set at a level that covers the average total cost of the public agency, including the cost of capital, the optimal level of service will be provided (assuming the facility is operating as a natural monopoly). If a private investor is considering investing in the plant and recovering costs from the revenues of the facility, they would not be able to earn "normal" profits (a market return on the use of capital and other resources) unless they can reduce average total costs to a level below those of the public sector. Alternatively, if a public agency is trying to attract a private investor and has already reduced costs as much as is possible, it can set user fees -- based on the calculation of average total costs -- at a level that reflects a normal return to the private sector. In this case user fees would be raised above a level required by the public sector to provide services and cover their costs, but would not provide the private sector with "monopoly" profits. The latter approach is one of the standard methods of setting rates for regulated private monopolies, such as power utilities.
26. Personal communication with Harvey Goldman, Executive Vice President, Air and Water Technologies Corporation.
27. A recent GAO study concluded that in response to the restricted availability and high cost of commercial insurance, more and more hazardous waste treatment, storage, or disposal facilities are relying on their own assets to pay for environmental liabilities associated with their operations. The same study found that the number of firms offering insurance,

the number of policies written, and total liability coverage has decreased dramatically since 1984. In addition the average cost of liability insurance has increased by more than a factor of 10 since 1982. See Government Accounting Office, *Hazardous Waste: The Cost and Availability of Pollution Insurance*, October 1988.

28. Personal communication with Bob Peters, National Solid Waste Management Association.

APPENDIX

Environmental Financial Advisory Board (EFAB)

EFAB Chair

Richard Torkelson
Deputy Commissioner for Administration
New York State Department of
Environmental Conservation
Albany, NY

EFAB Vice Chair

Frieda K. Wallison
Partner
Jones, Day, Reavis & Pogue
Washington, DC

Private Sector Incentives Workgroup

Warren W. Tyler (Workgroup Leader)
Vice President
State Savings Bank
Columbus, OH

J. James Barr
Vice President and Treasurer
American Water Works Company, Inc.
Voorhees, NJ

Philip Beachem
Executive Vice President
New Jersey Alliance for Action, Inc.
Edison, NJ

Joseph D. Blair
Executive Director
Massachusetts Industrial Finance Agency
Boston, MA

Honorable Pete V. Domenici
U.S. Senator
State of New Mexico

EFAB Executive Director

Herbert Barrack
Assistant Regional Administrator
Region II, U.S. Environmental Protection
Agency
New York, NY

Harvey Goldman
Executive Vice President and Chief
Financial Officer
Air and Water Technologies Corporation
Somerville, NJ

W. Jack Hargett
Vice President Government Relations
The Parsons Corporation
Washington, DC

Honorable Rolland W. Lewis
Mayor of Mount Vernon
Mount Vernon, IL

Steven Lieberman
Assistant Director for General Management
Office of Management and Budget
Washington, DC

David W. Gilbert
Vice President
Envirotech Operating Services
Birmingham, AL

**Public Sector Financing Options
Workgroup**

George A. Raftelis (Workgroup Leader)
Partner
Ernst & Young
Charlotte, NC

William H. Chew
Senior Vice President
Municipal Finance Department
Standard & Poor's Corporation
New York, NY

Roger D. Feldman, P.C.
Partner
McDermott, Will & Emery
Washington, DC

Shockley D. Gardner, Jr.
Executive Director
Virginia Resources Authority
Richmond, VA

Robert F. Mabon, Jr.
Morgan Stanley and Company, Inc.
New York, NY

Marlin L. Mosby, Jr.
Managing Director
Public Financial Management, Inc.
Memphis, TN

Roberta H. Savage
Executive Director
Association of State & Interstate Water
Pollution Control Administrators
Washington, DC

Douglas P. Wheeler
Secretary for Resources
Sacramento, CA

Economic Incentives Workgroup

Frieda K. Wallison (Workgroup Leader)
Partner
Jones, Day, Reavis & Pogue
Washington, DC

Honorable Beryl F. Anthony, Jr.
U.S. Representative
State of Arkansas

Dr. William Fox
Associate Director
Center for Business & Economic Research
University of Tennessee
Knoxville, TN

John Gunyou
Commissioner
Minnesota Department of Finance
St. Paul, MN

Heather L. Ruth
President
Public Securities Association
New York, NY

Richard Torkelson
Deputy Commissioner for Administration
New York State Department of
Environmental Conservation
Albany, NY

Small Community Financing Strategies Workgroup

Elizabeth Ytell (Workgroup Leader)
Director, Water-Wastewater Division
Rural Community Assistance Corporation
Sacramento, CA

Jack Bond
City Administrator/Deputy Mayor
for Operations
Washington, DC

Thomas Christensen
(Retired Supervisor)
Charter Township of Ironwood
Ironwood, MI

Dr. Richard Fenwick, Jr.
Vice President, Corporate Economist
CoBank National Bank for Cooperatives
National Credit Services Division
Denver, CO

William B. James
Associate Director
Prudential-Bache Capital Funding
Public Finance Department
New York, NY

John C. "Mac" McCarthy
State Director
U.S. Department of Agriculture
Farmers Home Administration
Alexandria, LA

Honorable Anne Meagher Northup
Kentucky State Legislator
Louisville, KY

Workgroup Support Staff

Environmental Protection Agency

David P. Ryan
Comptroller

John J. Sandy
Director, Resource Management Division

David Osterman
Chief, Resource Planning and
Analysis Branch

Helen Beggun
Chief, Grants Administration Branch
Region II

Alice Jenik
Chief, Policy and Program
Integration Branch
Region II

Margaret Binney
Analyst

Ellen Fahey
Analyst

Vera Hannigan
Senior Analyst

Joanne Lynch
Analyst

Timothy McProuty
Senior Analyst

Eugene Pontillo
Senior Analyst

**Environmental Protection Agency
(Cont.)**

**Ben Abruzzo
Analyst**

**George Ames
Senior Analyst**

**Leonard Bechtel
Analyst**

**Kim Thomas
Secretary**

**Ann M. Watt
Analyst**

Apogee Research, Inc.

**Dr. Kenneth Rubin
President**

**Ann Carey
Vice President**

**Dr. Susan Jakubiak
Senior Economist**

**Matthew Hardison
Vice President**

**Barbara Richard
Senior Financial Analyst**

**Lisa Akeson
Senior Economist**

**Amy Doll
Policy Analyst**

**Chris Knopes
Policy Analyst**

Expert Consultants to the EFAB (from EPA)

**Stephen Allbee
Chief, Municipal Assistance Branch
Office of Wastewater Enforcement
and Compliance**

**Marian Cody
Analyst
Grants Administration Branch
Office of Administration and
Resources Management**

**Ann Cole
Small Community Coordinator
Office of Regional Operations and
State/Local Relations**

**A. W. Marks
Senior Advisor
Enforcement and Program Implementation
Division
Office of Ground Water and
Drinking Water**

**Kitty Miller
Environmental Protection Specialist
Office of Water**

**Donald Rugh
Analyst
Office of Wastewater Enforcement
and Compliance**

**Expert Consultants to the EFAB (from
EPA) (Cont.)**

**Michael Deane
Environmental Protection Specialist
Office of Wastewater Enforcement
and Compliance**

**Ellen Haffa
Analyst
Grants Administration Branch
Office of Administration and
Resources Management**

**James Horne
Special Assistant
Office of Wastewater Enforcement
and Compliance**

**Peter Shanaghan
Mobilization Manager
Office of Ground Water and
Drinking Water**

**Ronald Slotkin
Analyst
Office of Research and Development**

**Brett Snyder
Economist
Economic Analysis and Research Branch
Office of Policy, Planning, and Evaluation**