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EXECUTIVE SUMMARY

Adequately managed decentralized wastewater systems are a cost-effective and long-term option for meeting public health and water quality goals, particularly in less densely populated areas. Small communities' wastewater needs are currently 10 percent of total wastewater demands. Decentralized systems serve approximately 25 percent of the U.S. population, and approximately 37 percent of new development. This document addresses the Congressional House Appropriations Committee's request that EPA report on:

(1) the Agency's analysis of the benefits of decentralized wastewater system alternatives compared to current (i.e., centralized) systems;
(2) the potential savings and/or costs associated with the use of these alternatives;
(3) the ability of the Agency to implement these alternatives within the current statutory and regulatory structure; and
(4) the plans of the Agency, if any, to implement any such alternative measures using funds appropriated in fiscal year 1997.

Also addressed in this response is the Committee's inquiry on the role of Rural Electric Cooperatives in upgrading rural drinking water and wastewater facilities.

BACKGROUND

Well through the first half of this century, wastewater management entailed either centralized collection sewers with some type of treatment facility for the highly populated areas, or conventional onsite systems (or sometimes cesspools) for small towns, suburban and rural areas. With the passage of the Clean Water Act (CWA), P.L. 92-500 in October 1972, which contained a national policy to provide funding for publicly owned treatment works and a goal to restore our lakes and streams, most communities selected centralized systems which were eligible for funding by the federal government. The 1977 amendments to the CWA required communities to examine or consider alternatives to conventional systems, and provided a financial set-aside for such treatment systems to be built. Approximately 2,700 facilities utilizing innovative and/or alternative technologies were constructed through this grant program which ended in 1990. Incentive set-aside funding was not continued under the Clean Water State Revolving Fund (SRF) program. Given the billions of dollars in remaining needs for upgraded and new wastewater facilities (EPA, 1993), communities must look even closer at alternative technologies for meeting their needs.

One area of concern is failing or obsolete wastewater systems in less densely populated areas. When these systems were first built, common practice was to install the least costly solution, which was not necessarily the most appropriate solution for the conditions. For a

variety of reasons, these systems are failing. Both centralized and decentralized system alternatives need to be considered in upgrading failing systems to provide the most appropriate and cost-effective solution to wastewater treatment problems. This document addresses the issues raised when considering decentralized treatment options.

BENEFITS OF DECENTRALIZED SYSTEMS

Decentralized systems are appropriate for many types of communities and conditions. Cost-effectiveness is a primary consideration for selecting these systems and is summarized below. A list of some of the benefits of using decentralized systems follows:

- Protects Public Health and the Environment. Properly managed decentralized wastewater systems can provide the treatment necessary to protect public health and meet water quality standards, just as well as centralized systems. Decentralized systems can be sited, designed, installed and operated to meet all federal and state required effluent standards. Effective advanced treatment units are available for additional nutrient removal and disinfection requirements. Also, these systems can help to promote better watershed management by avoiding the potentially large transfers of water from one watershed to another that can occur with centralized treatment.

- Appropriate for Low Density Communities. In small communities with low population densities, the most cost-effective option is often a decentralized system.

- Appropriate for Varying Site Conditions. Decentralized systems are suitable for a variety of site conditions, including shallow water tables or bedrock, low-permeability soils, and small lot sizes.

- Additional Benefits. Decentralized systems are suitable for ecologically sensitive areas (where advanced treatment, such as nutrient removal or disinfection is necessary). Since centralized systems require collection of wastewater for an entire community at substantial cost, decentralized systems, when properly installed, operated and maintained, can achieve significant cost savings while recharging local aquifers and providing other water reuse opportunities close to points of wastewater generation.

POTENTIAL COSTS AND SAVINGS

Decentralized onsite and cluster wastewater systems can be the most cost-effective option in areas where developing or extending centralized treatment is too expensive (e.g., rural areas, hilly terrain). Cost estimates on a national basis for all decentralized systems are difficult to develop due to the varying conditions of each community. The comparisons presented in this document suggest that decentralized systems are typically cost-effective in rural areas. For small communities and areas on the fringes of urban areas, both decentralized and centralized systems

(or combinations) can be cost-effective, depending on the site conditions and distance to existing sewers.

OVERCOMING BARRIERS TO IMPLEMENTING DECENTRALIZED SYSTEMS

Several barriers, listed below, inhibit the expanded use of decentralized wastewater systems. Suggested ways to overcome the barriers are also provided. The barriers and suggestions address a wide range of issues and apply to the various organizations associated with implementing decentralized systems.

- Lack of Knowledge and Public Misperception. The perception of some homeowners, realtors, and developers that centralized systems are better for property values and are more acceptable than decentralized systems, even if they are far more costly, makes it difficult to demonstrate that properly designed and managed decentralized systems can provide equal or more cost-effective service. Also, many regulators and wastewater engineers are not comfortable with decentralized systems due to a lack of knowledge. Decentralized systems, particularly the non-conventional types, are not included in most college and technical instructional programs.

  Overcoming the Barrier. Professional training and certification programs should include decentralized treatment systems. Educational materials for homeowners should explain proper operation and maintenance practices and the consequences of failures.

- Legislative and Regulatory Constraints. State enabling legislation that provides the necessary legal powers for carrying out important management functions may be absent, vague, or not clearly applicable to decentralized systems. Most importantly, in almost all states, legislative authority for centralized and decentralized wastewater systems is split between at least two state agencies. It is also common for legislative authority for decentralized systems to be split between state and local governments, resulting in further confusion regarding accountability and program coordination. Under these conditions, decentralized wastewater systems have not gained equal stature with centralized facilities for public health and environmental protection.

  Many states and localities also rely on inflexible and prescriptive regulatory codes for decentralized systems, and often allow only the use of conventional septic systems. Where alternative systems are approved, approval often involves a lengthy process. As a result, an onsite system that may be inadequate (because the system could not operate under the special site conditions) or a needlessly expensive centralized system or expansion may be selected.

  Overcoming the Barrier. States should be encouraged to develop or improve enabling legislation that allows the creation of management agencies and empowers new or

existing organizations to carry out management functions for decentralized wastewater systems. Also, states should consider consolidating legal authority for centralized and decentralized wastewater systems under a single state agency so that all wastewater management options are reviewed more equitably.

State and local regulatory codes should be revised to allow the selection of decentralized systems based on their ability to meet public health and environmental protection performance standards, just as centralized systems are now. The development and use of model codes can facilitate this process.

- Lack of Management Programs. Few communities have developed the necessary organizational structures to effectively manage decentralized wastewater systems, although such management programs are considered commonplace for centralized wastewater facilities and for other services (e.g., electric, telephone, water). Without such management, decentralized systems may not provide adequate treatment of wastewater.

  Overcoming the Barrier: Management programs should be developed on state, regional, or local levels, as appropriate, to ensure that decentralized wastewater systems are sited, designed, installed, operated, and maintained properly and that they continue to meet public health and water quality performance standards. Examples of possible management structures (see Appendix C) should be provided to municipalities (e.g., public ownership/private maintenance). Examples of successful attempts of implementing management programs should be highlighted (see Appendix E for case studies).

- Liability and Engineering Fees. Homeowners and developers are often unwilling to accept the responsibility and potential liability associated with unfamiliar systems such as those providing decentralized treatment. Also, engineers' fees are often based on a percentage of project cost and have little incentive for designing low cost systems.

  Overcoming the Barrier. Liability can be addressed within the context of a management plan which will prevent failures and develop mechanisms to cover failures. Engineering fees should not be based on project cost for decentralized systems.

- Financial Barriers. EPA's Construction Grants program, and now the Clean Water SRF program, have been the major source of wastewater treatment facility funding. These programs are generally available only to public entities. Difficulties exist for privately-owned systems in obtaining public funds under current federal and state grant and loan programs.

Overcoming the Barrier. There are a number of other federal sources of funding for private entities. The U.S. Department of Agriculture's Rural Utility Service provides funding through its Water and Waste Disposal loan and grant program to public entities, Indian tribes, and organizations operated on a not-for-profit basis, such as an association, cooperative, or private corporations. Two EPA programs, the Clean Water SRF program for nonpoint source control and the CWA section 319 program, are also available to private entities. Public grant and loan funds for wastewater management should be utilized to a greater extent to manage decentralized wastewater systems where eligible. Education for community officials should be provided on the these eligibilities.

EPA'S ABILITY AND PLANS TO IMPLEMENT

Over the past 20 years, EPA has put considerable resources into helping small communities meet their wastewater needs. This has been accomplished in many ways -- financing, public education, technical assistance, technology transfer, research, demonstrations, and assistance with program development. Most of the outreach, which includes technical assistance and education has been grouped under the umbrella of EPA's Small Community Outreach and Education Program (SCORE). Assistance has also been provided indirectly through federal funding of the many associations that have come together to support small community needs. Many of these efforts continue today and will continue into the future. Described below are ongoing and planned activities and programs conducted by EPA or with EPA assistance, which provide a framework for implementing alternatives such as decentralized treatment systems.

Funding

- Technologies funded under the Innovative and Alternative Technology provisions of the Construction Grants program are being assessed under a technology assessment program which will produce technical documents and fact sheets on various technologies.

- The Clean Water State Revolving Fund program has funded decentralized systems in several states since the expiration of the Construction Grants Program. Loans are also available for nonpoint source activities, including planning, design and construction activities associated with correcting onsite system problems.

- EPA is working with USDA's Rural Utility Service and HUD to provide funding to communities in a more efficient and less burdensome manner. Improved coordination and cooperation between the Agencies is outlined in a memorandum that is in the process of being signed by the three Agencies. Follow-up actions to implement improvements will be undertaken in fiscal years 1997 and 1998.

- EPA has recently announced a Hardship Grants Program for Rural Communities which will fund wastewater treatment in communities not served by centralized wastewater collection or treatments systems. Decentralized systems may be the option of choice for these rural, dispersed communities. The program can also fund training programs that, among other things, can assist in the development of management districts.

Outreach and Education

- EPA provides yearly funding for the National Small Flows Clearinghouse to provide a wide range of technical assistance.

- The Small Towns Environmental Program (STEP) encourages the use of small alternative systems through a grass-roots, self-help program.

- The National Environmental Training Center for Small Communities (NETCSC) supports environmental trainers through development and delivery of training curricula and training of trainers.

- The Rural Community Assistance Program provides technical assistance to rural communities.

Technology and Demonstrations

EPA's technology and demonstration programs, in collaboration with other stakeholders, provide technical guidance through the following projects:

- National Onsite Demonstration Project
- Updates of EPA design manuals on Onsite Systems, Small Community Technologies and Constructed Wetlands; and a guidance document for Large Capacity Septic Systems
- Grants under the Environmental Technology Initiative to demonstrate onsite technologies
- A grant to develop a research agenda for onsite treatment
- A small community wastewater testing and verification center under EPA's Environmental Technology Verification (ETV) program (discussions are underway)

Program Development

- EPA plans to collaborate with other federal agencies to develop guidance to assist communities in implementing management systems based on performance goals.

- EPA is also encouraging planning and implementation on a watershed basis to meet water quality goals. Improved decentralized treatment is an important component of many of these plans.

THE ROLE OF RURAL ELECTRIC COOPERATIVES IN UPGRADING FACILITIES

Rural electric cooperatives are private entities that build and manage extensive rural utility systems. These cooperatives have the capability to address a full range of technical, financial, administrative, and regulatory issues related to the supply and management of electric power. In the Fiscal Year 1997 House Appropriations Committee report, the Committee acknowledged the significant interest of the cooperatives "to expand their current role of delivering electricity to the delivery to rural communities of clean water and safe drinking water improvement technologies as well." The Committee "is uncertain whether expansion into this new field is an appropriate means of upgrading rural drinking and wastewater facilities to meet federal requirements." EPA was asked to review this matter and report on its findings prior to the Committee's fiscal year 1998 budget hearings for EPA. The review is presented as an appendix to this response (Appendix F).

In summary, drinking water and wastewater treatment facilities can be upgraded and managed by rural electric cooperatives, although 13 states would require enabling legislation for them to own and/or operate drinking water and wastewater facilities. Cooperatives could be a good solution in rural areas because cooperatives are non-political, known entities to the homeowners, that bring experienced management and staff to solve the O&M challenge, as well as options for obtaining capital. The ability to provide management services, including O&M, can be the cooperatives' most valuable asset.

From the drinking water perspective, cooperatives offer great promise as management entities for small water systems which lack institutional strength. However, for many reasons, it is unlikely that more cooperatives will make significant movements into the drinking water and wastewater business quickly. These reasons involve the interest on the part of individual owners to pay for onsite system management, the technical ability of the cooperative to manage drinking water and wastewater facilities, limited experience with low energy onsite technologies, and the ability to obtain capital. Once these issues are resolved, the community and cooperative may be able to work together to efficiently provide the needed wastewater services.