

Pipeline



Small Community Wastewater Issues Explained to the Public

Planning Is Essential for Successful Onsite System Management

Community officials have important jobs. Whether officials are elected, appointed, persuaded, or simply the only ones in town to volunteer, the community depends upon them to protect public health and local resources.

One of the best ways community leaders can help protect their friends, families, and neighbors is to make sure that local septic systems and other onsite wastewater systems are managed effectively. Like any other wastewater treatment system, onsite systems must be properly planned, sited, constructed, installed, operated, and maintained. If not, they can eventually malfunction or fail, jeopardizing the community's health and water resources.

This *Pipeline* outlines factors and issues that community leaders need to consider when planning for onsite system management. Much of the information presented in this issue is adapt-

ed or taken directly from a prepublication draft of a chapter about management in the newly revised U.S. Environmental Protection Agency publication *Design Manual: Onsite Wastewater Treatment Systems*, which is expected to be published in the fall of 2001. *Pipeline* and the *Small Flows Quarterly*, the National Small Flows Clearinghouse's (NSFC) other publication, will announce the availability of this manual when it is published.

Readers are encouraged to reprint this issue or any *Pipeline* articles in flyers, newspapers, newsletters, or educational presentations. Please include the NSFC's name and phone number on the reprinted information and send us a copy for our files.

If you have questions about reprinting articles or about any of the topics discussed in this newsletter, please contact the NSFC at (800) 624-8301 or (304) 293-4191. 💧

Elements of a Successful Management Program

The success of a community's onsite wastewater system management program (and, therefore, the success of its onsite systems) greatly depends upon

- public acceptance,
- local political support,
- adequate funding,
- a trained and capable staff, and
- clearly defined legal authority, regulations, and enforcement mechanisms (Citoli and Wiswall, 1982).

In other words, to be successful, management programs must be enforceable, measurable, publicly accepted, politically feasible, and affordable.

Existing management programs vary greatly in scope and character, depending upon the individual needs of communities. Over the years, it has become clear that successful programs tend to include many of the following elements:

- clear and specific program goals;
- guidelines for site evaluation, design, and construction;
- regular system monitoring and maintenance;
- licensing or certification of all service providers;
- incentives and effective mechanisms for enforcement;
- adequate records management; and
- public education and outreach. 💧

Citoli, P., and K. C. Wiswall. 1982. *Management of on-site and small community wastewater systems*. U.S. Environmental Protection Agency Municipal Research Laboratory. Cincinnati, Ohio. EPA 600/8-82-009. NSFC L001419.



Lessons Learned: Avoid These Pitfalls When Planning Your Community's Management Program

Although there are small communities across the country that manage their onsite wastewater systems successfully, many more do not. The mistakes communities make can be as instructive as their successes. What we learn from these shortcomings is that effective onsite system management must begin with good, comprehensive planning that extends throughout the life of the system.

Communities should plan to manage their onsite wastewater systems through initial site selection and evaluation, system design, installation, inspection, operation, monitoring, and maintenance—in other words, through their entire life cycle. The best way to accomplish this is through centralized management programs and onsite system regulations that are sound, practical, and useable.

According to the U.S. Environmental Protection Agency (1986), communities' efforts to plan for onsite system management tend to fall short

in the following areas:

- failure to adequately consider all site-specific environmental conditions;
- codes that make it difficult to adapt to local site conditions and that are unable to accommodate effective innovative and alternative technologies;
- ineffective or nonexistent public education and training programs;
- failure to include water conservation and reuse;
- ineffective controls on system operation and maintenance;
- lack of control over residuals management (e.g., septage treatment and disposal);
- failure to monitor what goes into systems;
- failure to consider the special characteristics and requirements of commercial, industrial, and large residential systems; and
- weak compliance and enforcement programs.

In addition, four primary problem areas have been identified in communities with onsite system difficulties:

1. insufficient funding;
2. inappropriate onsite management programs;
3. lack of inspection, monitoring, and program evaluation; and
4. lack of public involvement and education. 💧

U.S. Environmental Protection Agency. 1986. *Septic systems and ground-water protection. An executive's guide.* National Small Flows Clearinghouse Item #SMBLMG05. Morgantown, WV.



Coordinate Planning Efforts Within the Community

Planning how a community will manage its wastewater over a long period of time requires commitment and coordination from a number of parties. In small communities, citizens, planning agencies, environmental and natural resource protection agencies, and public health departments all should take an active role and interest in onsite wastewater management.

Planning agencies are organizations that have direct control over which areas of the state or local jurisdiction will be served by sewers and which require onsite systems. These agencies often are directly involved with zoning decisions and development requirements and how these are integrated into the community's overall plans.

Community leaders also should include local health department officials in the planning process. Health officials see first-hand the environmental and public health impacts of local zoning decisions, and they often are the ones that implement these decisions by actually siting and monitoring the onsite systems. Too often, the goals of local health agencies and natural resource protection programs are not adequately considered in onsite wastewater system planning.

Promote Unity

Although allowing all of these diverse voices access to the planning process can be difficult for communities to coordinate and control, this

approach will help ensure everyone's involvement and cooperation as well as the success of the program.

Coordination and cooperation among different agencies, organizations, and residents becomes especially important in communities with wastewater management programs that cross jurisdictional boundaries.

To avoid complications, community leaders should do their best to clearly define the balance of power among the people and agencies participating in the planning process and identify their responsibilities, particularly if these are not clearly dictated by state and local regulations. 💧

Management Program Planning—Where To Begin

Planning for onsite system management is no easy task. Residents and officials involved in the process will have many questions to answer and variables to consider, including the following:

- What are the specific goals of the management program?
- What geographic area will it include?
- What type or types of systems will be used?
- Where are current systems located, what is their status, and where will new systems be placed?
- What functions or activities will the management program perform? (See “Elements of a Successful Onsite System Management Program” on page 1.)
- Which organizations or institutions (management entities) can be used or created to carry out the management plan?
- How will the community pay for everything?

To begin with, planning should include developing specific program goals and making decisions regarding the geographic boundaries of the project and the scope of the program activities.

Developing Program Goals

Onsite system management programs generally focus on two goals: protecting public health and protecting the environment.

Public health and environmental protection goals both should focus on preventing or severely limiting the discharge of pathogens, nutrients, and toxic chemicals to groundwater and local surface water resources.

Identify and Protect Local Water Resources

Onsite system management programs should include the following water resource management goals:

- protect drinking water supplies,
- protect surface waters that support swimming, fishing, hunting, and

- other recreational activities;
- protect water resources and facilities that support or promote moderate and sustainable economic and population growth (if this is in line with the community’s overall planning and zoning goals); and
- protect existing environmentally sensitive areas and wildlife habitats.

Communities need to identify and evaluate the status of local water resources and other areas of concern in the watershed, including

- critical drinking water resources, such as reservoirs and aquifer recharge areas;
- freshwater lakes, ponds, rivers, and streams;
- coastal areas;
- wetland buffer areas;
- open spaces and critical wildlife habitats; and
- floodplains.

Evaluate the Impact Onsite Systems Have on Water Resources

Before a community can effectively protect its water resources, it should understand the impact that onsite wastewater systems can have. For example, a community should be aware of the amount and types of contaminants and nutrients that malfunctioning onsite systems potentially can or currently do add to local waters. Excess nutrients in surface waters contribute to algae growth, which robs fish and other aquatic life of oxygen. Informed communities can avoid development practices that will adversely affect water resources.

To accurately assess onsite systems’ impact under existing and future zoning conditions, communities may need to model various outcomes. Onsite system impact assessments should include the following:

- contaminant loadings of conventional onsite systems (septic systems) under existing and proposed growth scenarios, and

Comprehensive Planning and Zoning: The Best of All Possible Worlds

Community planning and zoning should include onsite system management planning. Comprehensive planning gives communities overall guidance toward setting onsite system management goals and policies. Zoning regulations provide communities with a detailed framework for implementing these planning goals.

Unless you are lucky enough to be planning a community or residential development from the bottom up, comprehensive planning and zoning may not be easy to achieve. Communities often must work through the politically charged process of amending existing zoning laws to address environmental protection and the impact of onsite systems. Ideally, communities’ zoning regulations should do the following:

- specify performance requirements for individual onsite systems or cluster systems installed within all nonsewered areas,
- place critical natural resource areas off-limits to development, and
- concentrate development within urban growth areas serviced by sewer systems when possible.

Integrating onsite system management into community planning and zoning allows officials to better manage local growth. It also allows them to consider factors, such as onsite system density, system proximity to water bodies, local soil conditions, and the type of development/subdivision that should be permitted in each watershed. Officials also can plan for the orderly expansion of community sewer systems, when appropriate. 💧

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EPA Offers Guidelines for Managing Onsite Systems

When onsite and decentralized wastewater systems are properly managed, they can be the most practical, environmentally sound, and least expensive way to treat household wastewater in small communities. But when the need for proper management is ignored, communities often put local water quality and public health at risk.

For this reason, the U.S. Environmental Protection Agency (EPA) has developed a draft of proposed *Guidelines for Management of Onsite/Decentralized Wastewater Systems*. The purpose of these voluntary guidelines is to improve the performance of onsite and decentralized wastewater systems by improving local management programs.

The guidelines present five incremental levels of "model" management programs, from basic information collection and maintenance awareness, to the most comprehensive programs in which utilities own and manage systems. Each model program includes a set of management objectives and elements and activities aimed at accomplishing the objectives. Program elements included planning, siting, designing, constructing, operating, maintaining, managing residuals, certifying and licensing, educating and training, inspection monitoring, and record keeping.

The model programs are meant to help states, communities, or tribal governments to identify their management objectives, evaluate whether or not their current programs are adequate, and choose an appropriate management program that will help them achieve their objectives and protect public health and the environment.

For more information about the EPA's proposed management guidelines and other EPA initiatives relating to onsite/decentralized wastewater systems, visit EPA's Web site at www.epa.gov/owm/decent/index.htm. From there, go to the "Management" page for the full text of the draft guidelines and updates on their status. If you have further questions, contact EPA contractor Lisa Knerr at (703) 385-6000. 💧

Management Program Planning—Where To Begin

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- the applicability of conventional and/or alternative onsite system technologies in the watershed, and which technologies or combination of technologies best protect public and environmental health.

Program Boundaries

Management programs should be established within certain geographical boundaries based upon existing jurisdictional or administrative boundaries, problem areas, and/or protection areas or resources. Watershed or environmental protection area boundaries rarely coincide with political boundaries. When management areas cross

jurisdictional lines, communities must cooperate and share resources, possibly through interjurisdictional agreements.

The simplest option is usually to establish a management program using existing town or county jurisdictions. This type of boundary makes it relatively easy for communities to pinpoint which geographical areas the program covers, which onsite systems fall within this area, and which are excluded. Sometimes, communities also can make use of existing government fiscal, legal, and personnel resources, such as local health department staff. 💧

Moore Leaves *Pipeline*, Moves to NDWC

Michelle Moore, who served as *Pipeline's* editor from November, 1999, to has left the National Small Flows Clearinghouse (NSFC) to work as promotions editor for the National Drinking Water Clearinghouse (NDWC).

At the NDWC, Moore is in charge of publicizing all products and activities relating to small community drinking water systems. She also serves as promotions editor for the NDWC's new magazine *On Tap* and will contribute feature articles.

"I would like to thank *Pipeline's* readers and especially the many small community and wastewater treatment experts who helped review and improve each issue," says Moore.



Michelle Moore
Photo by Kevin Kundert

Cathleen Falvey is *Pipeline's* current editor. She previously edited the newsletter from 1995 to 1999. 💧

Announcing the National Environmental Services Center

Regular *Pipeline* readers will notice a small addition to the front page of every issue. From now on *Pipeline* will display the logo for the National Environmental Services Center (NESC), (pronounced "nessie").

NESC is a service organization that specializes in providing technical assistance and information about drinking water, wastewater, solid waste management, and environmental training to communities serving fewer than 10,000 people. Formerly the Environmental Services and Training Division, NESC comprises the following partner

organizations: the National Small Flows Clearinghouse, the National Drinking Water Clearinghouse, the Environmental Training Center for Small Communities, and the National Onsite Demonstration Program.

NESC offices are located at the National Research Center for Coal and Energy at West Virginia University in Morgantown. For more information, call (800) 624-8301 or (304) 293-4191. Or visit NESC's Web site at www.nesc.wvu.edu. 💧



Tailor the Program To Fit Your Community

What options do communities really have for managing their onsite systems? Is it essential to oversee every stage in the life cycle of every system in a community? Or can a program with a more limited scope provide effective management?

According to Graham Knowles, coordinator of the National Onsite Demonstration Program (NODP) Phase IV, which focuses on onsite system management, while it is ideal for communities to oversee every stage of the planning, construction, installation, and maintenance of every onsite system, a limited management program is certainly better than no management at all.

“In the real world, onsite system management takes many forms,” says Knowles. “Communities tailor their management programs to fit their individual needs and resources. Programs vary in the level of responsibility they assume and require of system owners, and communities can take heart in the fact that they have many options for improving local onsite system performance and longevity.”

Although onsite management programs vary widely in focus and scope, they tend to share some common elements. (See the article “Elements of a Successful Management Program” on page 1 for details.)

Select the Right Management Entity

Communities have several options for administering onsite system management. Programs can be run by the town, county, or state, or by a public agency, such as the local health department. Or they can be administered by existing organizations, such as homeowners’ association, or a special organization or entity formed expressly for this purpose. In some states, enabling legislation is needed to allow special entities to manage onsite systems.

Examples of special management entities include sanitary, water, and sewer districts; public utility districts;

and multiple purpose special districts. Rural utility cooperatives and corporations may manage onsite systems through public/private partnerships.

To select the right organization to manage local systems, community leaders should define the specific functions the management program will perform. Next, they should identify which local institutions or agencies have the statutory authority and resources to carry out these functions.

The scope of a management entity’s authority can vary greatly. Usually, individual onsite systems are privately owned and management entities oversee their inspection, maintenance, and repair. But in some communities, the management entity owns all the systems in its jurisdiction and assumes complete responsibility for their operation and maintenance.

Ideally, the management entities should have adequate and appropriate

- legal authority,
- financial resources,
- personnel resources (expertise/experience), and
- flexibility to coordinate and change.

Legal Authority

Depending upon the needs of the community and the scope of the program, management entities may need the legal authority to perform, oversee, and/or regulate the following:

- site evaluations,
- system design,
- installation,
- operation and maintenance,
- rehabilitation,
- monitoring,
- planning,
- financing,
- public education,
- property acquisition,
- contract service suppliers,
- regulations and standards enforcement, and
- permit issue and approval.

Financial Resources

Effective onsite wastewater management often comes at increased costs for communities. A variety of financing options exist, but not all types of management entities have the legal authority to implement each option.


The type of management organization or agency may dictate the type of financing available. For example, an organization may or may not be eligible to receive taxes, user fees, or federal or state grants.

Expertise and Flexibility Wanted

Having enough well-trained and experienced personnel to successfully carry out the program is important. The scope of the management program will dictate the staff required. For example, management agency personnel may perform system inspections, or the community may choose to contract this job out to a private firm.

The program staff must include people with adequate experience and expertise to coordinate the different technical and institutional issues involved in managing onsite systems. People who have knowledge of engineering and environmental, legislative, socioeconomic, and administrative considerations also are required.

In short, a management entity needs the expertise, experience, ability, and flexibility to

- provide policy and management continuity,
- charge fees for services,
- maintain adequate financial responsibility,
- compel users to comply with the requirements of the management program,
- shift liability, and
- hire and retain adequately qualified employees (NCAES, 1990). 

North Carolina Agricultural Extension Service (NCAES). 1990. *Soil facts: Management of single family wastewater treatment and disposal systems*. North Carolina State University, Raleigh.

Types of Management Entities

County and Local Agencies

The size, purpose, and authority of local and county agencies varies from state to state. Some states delegate all or part of the responsibility for managing onsite systems to local governments. In other states with “home rule” powers, local governments have the authority to manage onsite systems on their own or through multiple agency or jurisdictional agreements, without special authority from the state.

County and local agencies, such as health departments, can regulate onsite systems and perform other functions within their jurisdictions, or they can supplement and support existing community wastewater management programs with technical, financial, or administrative help.

Special Districts

Local governments sometimes create special districts, such as wastewater management districts, to provide services they do not (or cannot) offer. A special district may consist of single or multiple communities or portions of communities. State enabling legislation outlines the major governmental characteristics of the district, such as the area to be serviced and the district’s function, organizational structure, financial authority, and performance.

These districts are independent units of government created to provide one or more services (such as onsite wastewater system management) to all within their boundaries. They usually have the authority to impose service charges, collect fees, make special assessments upon properties, and issue revenue or special assessment bonds. Some special districts enjoy the same financing powers as municipalities, including the ability to levee taxes. They are separate legal entities from the community, which can enter into contracts, sue, or be sued independently.

Improvement Districts

As an alternative to special districts, communities may create improvement districts that benefit only those residents living within a defined service area. Unlike special districts, improvement districts are not independent authorities. Instead the same local government office that creates them governs them.

Public Authorities

Public authorities—such as commissions, public benefit corporations, municipal authorities, and sewerage authorities—are corporate bodies chartered by a state legislature. These authorities have the power to own, finance, construct, and operate public facilities, including those that produce revenue.

Private Nonprofit Districts

Instead of creating public authorities or special districts, some small communities and groups of residents opt to form private nonprofit corporations, such as rural cooperatives and property owners associations. These associations can be created to own, operate, and maintain onsite systems, depending on the needs and preferences of residents.

Public/Private Partnerships

Communities also can manage local onsite systems through various types of public/private partnerships. For example, local governments and health agencies may allow private contractors to perform site evaluations. Residents often privately own and manage onsite systems, but local governments or health agencies regulate the systems through permits.

In other cases, residents retain ownership of onsite systems, but a public entity, such as a wastewater management district, monitors and maintains the systems. A public

authority or special district also may entirely own, operate, and maintain onsite systems.


Federal and State Agencies

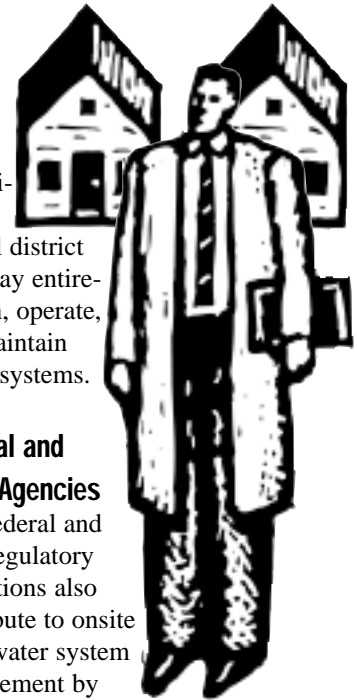
Federal and state regulatory institutions also contribute to onsite wastewater system management by promulgating rules, regulations and legislation, and code enforcement. Several federally funded agencies offer financial and technical assistance to state and local onsite system management efforts. (Refer to the list of contacts on page 7.)

However, state and local governments usually have direct responsibility for regulating and managing onsite wastewater systems.

Some states offer technical assistance in evaluating sites and designing community wastewater systems. Some administer financing programs for building new systems and replacing failing systems, and they often set and enforce standards for system design, installation, and maintenance. States also may conduct research on system performance.

To provide incentives for local management efforts, states may

- establish minimal technological and managerial standards,
- establish standards to protect resources,
- provide consulting expertise,
- provide testing laboratories, and
- provide periodic program review. 



Association Unites Onsite System Management Practitioners

In the spring of 2000, a group concerned with advancing onsite system management in the U.S. met to form the American Onsite Management Association (AOMA). According to Paul Chase, M.A., L.E.H.P., the organization's new executive director, the AOMA's mission is to help communities manage onsite systems.

"The AOMA seeks to promote the concepts and practices of onsite wastewater management through education, research, and discussion," says Chase. "Over the next few months, we will be

developing our strategy to accomplish these goals."

The AOMA is run by and for people involved in the day-to-day work of organizing, operating, and administering onsite system management programs. It provides these practitioners with technical support and expertise and creates opportunities for them to exchange ideas regarding the art and science of managing onsite systems in small communities.

For more information about the organization, call Chase at (815) 562-9693, or send e-mail to AOMA2001@aol.com. (See the list at right for complete contact information.)



Left: AOMA board members (from left to right) Karen McBride, James C. Smith, Bob Vincent, and Dennis Hill. Right: AOMA Executive Director Paul Chase.



CONTACTS

National Small Flows Clearinghouse (NSFC)

The NSFC offers a variety of technical assistance and free and low-cost information about wastewater technologies for small communities. Only a few of our many resources and services are mentioned in this newsletter. Call the NSFC at (800) 624-8301 or (304) 293-4191 or visit our Web site at www.nsfv.wvu.edu for more information.

American Onsite Management Association (AOMA)

The AOMA was formed to assist and provide information to local officials and others involved in running onsite system management programs. The AOMA is located at 3900 S. Mulford Road, Rochelle, Illinois 61068-9626. Or call (815) 562-9693. E-mail: AOMA2001@aol.com.

National Onsite Demonstration Program (NODP) Phase IV

Phase IV of the NODP is committed to assisting America's small communities determine how to effectively manage all aspects of their onsite wastewater activities. Call Graham Knowles, program coordinator, at (800) 624-8301 or (304) 293-4191, or visit the NODP IV Web site at www.nesc.wvu.edu/nodp4/ for more information.

Rural Community Assistance Program (RCAP)

RCAP is a network of nonprofit organizations that provide assistance to rural and low-income communities concerning almost every aspect of planning effective wastewater treatment. Call RCAP's national office at (202) 408-1273 for the number of your regional RCAP office, or visit www.rcap.org.

NODP Phase IV Focuses on Management

Help is on the way for small communities. The emphasis of Phase IV of the National Onsite Demonstration Program (NODP) is to promote and develop effective onsite wastewater management strategies for small communities.

Funded by the U.S. Environmental Protection Agency (EPA), NODP Phase IV assists communities by identifying successful onsite system management models across the country. The project provides local officials with information about these models and with tools and strategies to help them implement their own successful onsite system management programs.

"Our goal is to strategically disseminate information on many different management models that suit various

situations," explains John Mori, director of the National Environmental Services Center (NESC), NODP's parent organization.

As NODP Phase IV Coordinator Graham Knowles explains it, the program's goal is to "catch people doing the right things, so we can identify, collect, and celebrate good onsite management practices."

Community leaders can visit the NODP Phase IV's Web page at www.nesc.wvu.edu/nodp4/ for a detailed description of its activities and services, or they can contact Knowles at (800) 624-8301 or (304) 293-4191.

RESOURCES AVAILABLE FROM NSFC

To order any of the following products, call the National Small Flows Clearinghouse (NSFC) at (800) 624-8301 or (304) 293-4191, fax (304) 293-3161, e-mail nsfc_orders@mail.nesc.wvu.edu, or write NSFC, WVU, P.O. Box 6064, Morgantown, WV 26506-6064. Be sure to request each product by item number and title. A shipping charge will apply.

CD-ROM Offers the NSFC's Best

The National Small Flows Clearinghouse (NSFC) is pleased to announce its first-ever CD-ROM. Titled *Wastewater Resources for Small Communities*, the CD-ROM includes the best NSFC products distributed over the past 10 years, including articles



from *Pipeline*, *Small Flows*, *Small Flows Quarterly* magazine, and *The Small Flows Journal*. The CD also includes the NSFC's 2000-2001 *Wastewater Products Catalog*; *Septic Stats*, developed through Phase IV of the National Onsite Demonstration Program; popular NSFC documents, fact sheets, brochures, and posters; and popular EPA resources, such as the *Response To Congress On Decentralized Wastewater Treatment Systems*. The CD is PC compatible and requires a 486 or Pentium® processor and Windows® 95 or a more recent version. The price of the CD-ROM is \$14.95. Request Item #WWCDGN162.

Small Flows Quarterly magazines

The first two issues of the *Small Flows Quarterly*, published in 2000, include several articles relating to onsite system management, including "Wastewater



Management Surfaces as an Important Issue in the New Millennium" and "Onsite System Management Can Take Many Forms." These back issues are \$1 each. Request Items #SFQUNL01 and #SFQUNL02.

Environmental Planning for Small Communities: A Guide for Local Decision Makers

This EPA book presents approaches for developing a community plan to protect public health and the environment. It provides suggestions for building a planning team, defining problems and needs, reviewing regulations, developing strategies, and implementing an environmental plan. The 159-page book is \$16.50. Request Item #WWBKM07.

Management Case Studies Available

A 105-page document titled *Guidance Handbook for On-Site Sewage System Monitoring Programs in Washington State* includes valuable onsite system management case studies and information. The price is \$19.75. Request Item #WWBKM06.

Management Programs Can Help Small Communities

This 1996 *Pipeline* issue provides an overview of onsite system management programs and explains how they can benefit small communities. The issue is \$0.25. Item #SFPLNL05.

PIPELINE



National Environmental Services Center



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