

CHAPTER 10
MANAGEMENT OF ONSITE SYSTEMS

10.1 Introduction

Onsite systems offer a viable means for controlling public health hazards, environmental degradation, and nuisances that might otherwise arise from wastewater generated in unsewered areas. If onsite systems are to perform successfully over a reasonable lifetime, a sound management program with sufficient technical assistance and enforcement capabilities is needed.

Management programs may take many forms. A good program, at a minimum, performs the following functions:

1. Site evaluation validation
2. System design review
3. Construction supervision
4. Operation and maintenance certification
5. Rehabilitation assistance
6. Monitoring and enforcement
7. Public education activities

Most states perform some or all of these functions with much of the responsibility often delegated to local units of government. These programs are very diverse (1). At one end of the spectrum, the state may limit its responsibility to the promulgation of minimum standards to be adopted by local jurisdictions, which may have the right to establish stricter standards. At the other end, the state may retain all management functions over onsite systems.

Thus, the management programs used in various jurisdictions differ greatly as do their effectiveness. Therefore, the following examination of approaches and techniques that may be used to manage onsite systems is intended to:

1. Provide a means of evaluating the existing management program.
2. Suggest techniques used to improve an existing management program or to establish a new one.

Some of the techniques discussed may not be readily incorporated into existing management programs due to different state constitutional and statutory provisions and legal interpretations. Some techniques may require the enactment of enabling legislation granting the management entity necessary authority to manage onsite systems.

10.2 Theory of Management

An effective management program provides technical assistance together with strong regulation enforcement. Both aspects are directed at major control points.

10.2.1 Principal Control Points

There are several distinct phases in the life of an onsite system that require control. These are:

1. Installation
2. Operation
3. Maintenance

During the "installation" phase, the management program must limit installation to suitable sites, and assure the proper design and construction of all onsite systems. It is during this phase that management programs can be most effective in minimizing the potential threat to public health and water quality.

During the "operation" phase, the management program must assure proper operation of an onsite system through periodic monitoring. While there are very few operational requirements for a septic tank-soil absorption system, some of the onsite systems have more extensive requirements. A good management program imposes controls during this phase whether the system's operation is straightforward or elaborate.

Finally, in the "maintenance" phase, the management program must provide for adequate maintenance of an onsite system, e.g., periodic pumping of septic tanks. It also must detect any onsite system that fails to function properly. This may be done through systematic or random inspections. A good program takes the necessary action to assure that repair, replacement, or abandonment of failed systems is completed.

10.2.2 Authority Needed by Management Entities

If adequate management is to be provided at the principal control points, management entities should have the authority to perform the functions listed below. The optional functions become imperative if the management entities own the onsite systems.

Suggested Functions

1. Site evaluation
2. System design
3. Installation
4. Operation and Maintenance
5. Rehabilitation
6. Monitoring

Optional Functions

1. Planning
2. Legal functions
3. Financing
4. Public education

The authority to perform these functions does not need to be granted to a single management entity. In fact, it is unlikely that one entity will have all the program responsibility. However, the total management program should have the combined authority to perform the necessary functions.

In each jurisdiction, the authority of each management entity should be examined. Statutory authority, judicial decisions, and the state constitution must be carefully reviewed. Often existing programs may be adapted and/or utilized to aid in management. For example, the management entities may require that certain onsite systems be designed by registered professional engineers even though the entities themselves do not register engineers. In the event that additional authority is needed, enabling statutory language will be required.

10.3 Types of Management Entities

There are several types of entities that have the authority to perform the management functions previously described. These include:

1. State agencies
2. Local governmental/quasi-governmental units
3. Special purpose districts
4. Private institutions (profit, nonprofit)

10.3.1 State Agencies

Except for the limitations contained in its own constitution, each state retains complete authority to protect the general welfare of its citizens, including the management of onsite systems. The state health agency and/or agency responsible for water quality are the agencies most likely to exercise the state's authority.

The degree of control exerted by state agencies over onsite systems varies from state to state. Many states set design standards for onsite systems. Those that do not set standards delegate authority to local governments to do so. Several states retain the responsibility for administrative/technical portions of the onsite management program.

A state management program is often considered more effective, because local pressures to weaken onsite regulation are not thought to be as effective at the state level. In addition, since states typically have more resources to hire or retain experienced individuals than most local units of government, state agencies are in a better position to take responsibility for many of the regulatory and administrative requirements.

10.3.2 Local Governmental/Quasi-Governmental Units

In some states, a portion or most of the responsibility of onsite system management is delegated by the legislature to units of local government. In other states with strong "home rule" powers, the local unit of government has the authority to manage onsite systems even without being so delegated by the state legislature. The various types of local governmental units are:

1. Municipalities - Incorporated units of government have full responsibility for the general welfare of its citizens; have broad financing authority, including the authority to levy property taxes, to incur general obligation debts, to use revenue bonding and to impose special assessments upon benefited property; and are legal entities authorized to contract, commence law suits, and own property.
2. Unincorporated Government (e.g., County) - Unincorporated governmental units often have authority equal to municipalities; however, these units may not have the authority for some onsite program management responsibilities, i.e., ownership of onsite systems which do not serve county institutions. Typically,

these units have financial authority and legal entity status similar to municipalities.

3. Quasi-Governmental Units - These units include regional (multi-county) water quality boards, regional planning commissions, local or regional health departments/boards, councils of government, and other agencies with the exception of special purpose entities. Their authority varies with the intended purpose of each unit; however, the financial authority is typically less than that of municipalities and unincorporated governmental units.

10.3.3 Special Purpose Districts

Special purpose districts depend entirely on enabling legislation for their authority and extent of services. These districts are independent units of government, created to provide one or more services, such as water and wastewater services to those within their boundaries. If permitted by the enabling legislation, services may also be provided to others outside their boundaries. The boundaries are often permitted to cross local governmental boundaries so that services can be provided to all those in need, despite the fact that residents of the district reside on either side of local governmental boundaries (counties, towns, villages, etc.).

Nearly all special purpose districts have sufficient financial authority to impose service charges, collect fees, impose special assessments upon property benefitted, and issue revenue and/or special assessment bonds. In addition, some special purpose districts receive the same financing authority enjoyed by municipalities, including the authority to levy taxes and incur general obligation debt (i.e., general obligation bonds backed by taxing authority). These districts are usually legal entities that may enter into contracts, sue, and be sued.

10.3.4 Private Institutions

Private institutions do not rely on enabling legislation, but are founded upon the right of individuals or corporations to enter into contracts. However, they are often subject to review or regulation by state public service or utility commissions.

10.3.4.1 Private Nonprofit Institutions (Associations and Corporations)

These entities include homeowners' associations, private cooperatives, and nonprofit corporations that provide services for onsite systems. The range of services may vary from merely providing maintenance to complete ownership of the system. The freedom of the contract permits this complete range of services; however, the association or corporation may be regulated by the state public service or public utility laws.

10.3.4.2 Private-for-Profit Institutions

This type of entity may be a sole proprietorship, partnership, or corporation that provides services for onsite systems. The homeowner or a group of owners (homeowners' associations) typically enters into a contract with this private entity for the provision of services. These services could include maintenance and operation of the owner's onsite system, or the private entity could own the systems and charge the homeowner for the use of the systems. The state public service or public utility commission may regulate the private entity.

10.4 Management Program Functions

A good management program consists of many functions that may be performed by one entity only or shared among several entities. The user of this manual is urged to review the range of functions discussed here, and to select entities that are best able to perform those functions. For a more complete discussion of the various functions, see References (2) and (3).

10.4.1 Site Evaluation and System Design

In developing a management program, a choice can be made between performing the site evaluation and system design functions within the entity itself or reviewing work done in the private sector. Table 10-1 summarizes the suggested activities that should be performed for both options.

TABLE 10-1
SITE EVALUATION AND SYSTEM DESIGN FUNCTIONS

<u>Scope of Activities</u>	<u>Administrative/Technical Activities</u>	<u>Regulatory/Enforcement Activities</u>
<u>Perform</u> all site evaluations and provide system designs	<ul style="list-style-type: none"> a. Conduct site evaluations for each lot to be developed b. Identify and evaluate feasible (or permitted) system designs c. Design selected system 	<ul style="list-style-type: none"> a. Establish guidelines and procedures for identifying sites suitable for development b. Develop cost-effective-ness guidelines and evaluation procedures c. Establish design standards, construction specifications, and performance standards and Issue construction permit
<u>Review</u> all site evaluations and system designs	<ul style="list-style-type: none"> a. Verify site evaluation procedures and data collected for each lot b. Review and approve or disapprove plans 	<ul style="list-style-type: none"> a. Develop guidelines and procedures for identifying sites suitable for development and Develop training, certification, or licensing program for site evaluators b. Establish design standards, construction specifications, and performance standards and/or Develop training certification or licensing program for system designers and Issue construction permit

10.4.1.1 Standards for Site Suitability, System Design, and Performance

A state agency with appropriate authority may establish minimum standards for site suitability, system design, and performance. This may be preferred over each management entity establishing its own standards. The advantages are (1) more uniformity of regulations throughout the state (although the local management entity may choose to be more stringent if it has the power to do so), and (2) more resources and experienced personnel at the state level to develop appropriate standards.

10.4.1.2 Site Evaluation and System Design

It may be desirable to include site evaluation and system design activities as part of the management program. These activities could be performed by any of the entities making up the management program. However, if the local management entity proposes to own and operate systems within its jurisdiction, this would be the preferred entity to perform these activities. Legal advice should be sought regarding liability which may result from undertaking this activity.

As an alternative to performing site evaluations and system designs as part of the management program, these activities could be performed by site evaluators and system designers licensed or registered by the management entity. Licensure or registration is suggested to assure quality. However, such assurances can only be obtained if the license or registration is subject to suspension or revocation. Random or preapproved site inspections by the management entity are suggested to check compliance with established procedures and standards, particularly where site limitations are anticipated.

10.4.1.3 Plan Approval and Construction Permits

The management process should be initiated either by submission of plans for review and approval or by application for a permit to construct a system. Either requirement for plan approval or permit issuance for construction of a system provides the management entity with a convenient method of obtaining information about the site evaluation and system design. Site suitability and design standards may be easily enforced by refusing to approve plans or issue permits.

Plan approval or permit programs at the state level may be more desirable than at the local level because of greater technical resources and isolation from local political pressures to allow development on poorly

suited sites. As an alternative to the review of all applications, the state agency could review a random sample of the plans approved or permits issued by the local management entity. The state agency would have the authority to countermand local approval. However, it would be necessary to limit the period of time that the state agency has to act on the local action.

10.4.2 Installation

As with site evaluation and system design, the management entities could choose to install all new systems themselves. This would be particularly desirable if ownership were to be retained by the entity. If not, the entity may choose to control installation through inspections. Table 10-2 summarizes the suggested activities that should be performed for both options.

10.4.2.1 Construction Inspections

A program to inspect the onsite system at each critical stage during construction is very desirable to prevent improper construction and premature failure of the system. The inspection may be performed by any entity involved in the total management program, but it would be most appropriate for the entity that has responsibility for the rehabilitation or abandonment of improperly functioning systems.

If the management entity does not perform the inspections, they could be performed by licensed or registered inspectors. A state agency would be the most likely entity to develop a program to train inspectors in proper design and construction techniques for all acceptable types of systems. This would assure more uniform quality of inspections statewide.

To further assure uniformity and thoroughness of inspections, checklists of specific items to be inspected for each type of permitted design could be developed. The inspectors would be required to certify that the checklist was completed after the inspector's personal inspection of the installation, and that all entries contained on the checklist are correct. To insure that inspections are timely, the management entity may require the system installer to give notice as to when the construction of the system is to commence.

TABLE 10-2
INSTALLATION FUNCTIONS

<u>Scope of Activities</u>	<u>Administrative/Technical Activities</u>	<u>Regulatory/Enforcement Activities</u>
<u>Perform inspection/supervision of construction</u>	a. Perform construction inspection and/or supervision during various phases of construction	a. Develop guidelines and specifications for construction
	b. Prepare as-built drawing	b. Record as-built drawing and issue system use permit
<u>Review construction inspection/supervision</u>	a. Review certified inspection by licensed/registered inspectors	a. Develop specifications for construction and checklists for inspection and Develop training, certification or licensing program for inspectors
	b. Require as-built drawing	b. Record as-built drawing and issue system use permit

10.4.2.2 As-Built Drawings

It is not unusual for the system installed to be quite different from the drawings originally approved because of changes necessary during construction. As-built drawings become very valuable when inspection or servicing of the system is required. Therefore, a requirement for as-built drawings is a good practice. These plans could be indexed by street, address, name of original owner, installer, and legal description.

10.4.2.3 Training and Licensing of Installers

To reduce the reliance on good construction supervision and inspections, a program to train and license or register installers could be established. Training would include presentation of design and construction techniques of all approved system types. To be effective, this program would have to be coupled with a strong enforcement program in which the license to install systems could be suspended or revoked.

10.4.3 Operation and Maintenance

Traditionally, the responsibility for operation and maintenance of on-site systems has been left to the owner. This has been less than satisfactory. As an alternative, management entities are beginning to assume this responsibility. The program adopted may either be compulsory or voluntary. If voluntary, the management entities perform the maintenance or issue operating permits on receipt of an assurance that the proper maintenance was performed. Table 10-3 summarizes the suggested activities that should be performed for both options.

10.4.3.1 Standards for Operation and Maintenance

A standard for the operation and maintenance of each type of system used, stating the procedures to be used and the frequency with which they are to be performed, is desirable. These standards would include those necessary to regulate the hauling and disposal of residuals generated by onsite systems as well. The state agency would be the preferred entity to set these standards. The advantages of having the state set the standards include more uniformity in the regulations and more resources and experienced personnel to develop appropriate standards.

10.4.3.2 Operating Permits

Rather than the management entities providing services, compliance with operation and maintenance standards could be assured through an operating permit program. The type and frequency of maintenance required for each type of system would be established by the entity. An operating permit allowing the owner to use the system would be renewed only if the required maintenance is performed. The system owner would be notified when the permit is about to expire, and told what maintenance must be performed to obtain a renewal. The owner would be required to have the necessary maintenance performed by an individual licensed or registered to perform such services within a specified period of time (e.g., 60 days). This individual would sign and date one portion of the owner's permit, thereby certifying that the service was performed.

The enabling ordinance or statutory language establishing this permit program must indicate that it is unlawful to occupy a home served by an onsite system unless the owner holds a valid operating permit. Thus, if the permit were not renewed, the owner would be in violation of the ordinance or statute. From a legal viewpoint, enforcement of this type of violation is straightforward.

TABLE 10-3
OPERATION AND MAINTENANCE FUNCTIONS

<u>Scope of Activities</u>	<u>Administrative/Technical Activities</u>	<u>Regulatory/Enforcement Activities</u>
<u>Perform</u> necessary operation/maintenance	<ul style="list-style-type: none"> a. Provide routine and emergency operation/maintenance of each system b. Determine if operation/maintenance program is voluntary or compulsory 	<ul style="list-style-type: none"> a. Develop guidelines and schedules for routine operation/maintenance b. Establish operation/maintenance program and Obtain legal authority for right of access to private property
<u>Administer</u> operation/maintenance program	<ul style="list-style-type: none"> a. Establish an operation and maintenance program b. Determine if operation/maintenance program is voluntary or compulsory c. Develop policies for regulating operation/maintenance activities 	<ul style="list-style-type: none"> a. Develop guidelines and schedules for routine operation/maintenance and Impose standards for hauling and disposal of residuals b. Develop system for notifying owner of required operation/maintenance and Issue a regularly renewed operating permit after certification that proper operation/maintenance has been performed c. Develop training, certification, or licensing program for those contracting to perform operation/maintenance activities

10.4.3.3 Licensure/Registration

To provide assurance that onsite systems are properly operated and maintained, licensing or registering of qualified individuals is desirable. This could be done at the state level. If licensure/registration programs for individuals, such as plumbers, residual waste haulers, sanitarians, etc., already exist, and if these individuals have sufficient knowledge of onsite systems, an additional program may not be necessary.

10.4.4 Rehabilitation

Because onsite systems are usually located on private property and below ground, system failures are difficult to detect. If a management program is to effectively prevent public health hazards, environmental degradation, and nuisances, identification and correction of failures are a necessary part of the management program. Table 10-4 summarizes the suggested activities that should be performed.

TABLE 10-4
REHABILITATION FUNCTIONS

<u>Scope of Activities</u>	<u>Administrative/Technical Activities</u>	<u>Regulatory/Enforcement Activities</u>
Detect and correct improperly functioning systems	a. Develop procedures for identifying improperly functioning systems (Sanitary surveys, presale inspections, etc.)	a. Develop performance standards and Obtain legal authority for right of access to private property
	b. Rehabilitate system	b. Issue order requiring rehabilitation or Rehabilitate system as part of operation/maintenance program

10.4.4.1 Inspections

Inspections could be performed as part of a sanitary survey of the area or through presale inspections during real estate transactions. The latter option may require enabling legislation. Constitutional restraints regarding the inspection of private property and the limitations on the sale of property have to be considered prior to enacting such legislation.

10.4.4.2 Orders and Violations

The management entity needs the authority to issue orders requiring the repair, replacement, or abandonment of improperly functioning systems if the systems are not owned by the entity. Various state agencies have this authority. If the owner does not comply with the order to repair or rehabilitate the system, the management entity could require that copies of all violations be filed with the registrar of deeds or a similar official. The effect of such a filing requirement would be to give notice of the violation in the chain of title whenever an abstract or a title insurance policy is prepared. Any potential mortgagee or buyer would thereby be alerted to the violation.

10.5 References

1. Plews, G. D. The Adequacy and Uniformity of Regulations for On-Site Wastewater Disposal - A State Viewpoint. In: National Conference on Less Costly Wastewater Treatment Systems for Small Communities. EPA 600/9-79-010, NTIS Report No. PB 293 254, April 1977. pp. 20-28.
2. Small Scale Waste Management Project, University of Wisconsin, Madison, Management of Small Waste Flows. EPA 600/2-78-173, NTIS Report No. PB 286 560, September 1978.
3. Interim Study Report, Management of On-Site and Small Community Wastewater Systems. M687, U.S. Environmental Protection Agency, Municipal Environmental Research Laboratory, Cincinnati, Ohio, 1979.