U.S. ENVIRONMENTAL PROTECTION AGENCY

DRAFT GUIDELINES FOR MANAGEMENT OF ONSITE/DECENTRALIZED WASTEWATER SYSTEMS

DRAFT GUIDANCE MANUAL OUTLINE

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I. INTRODUCTION

A. Purpose

1. The use of decentralized treatment is currently increasing.

a) Twenty-five percent of the U.S. population uses decentralized systems for wastewater treatment (1990 Census).

b) Approximately 37% of new development is served by decentralized systems (1996 CWNS).

2. Failing onsite systems are reported by the States to constitute the third most common source of ground water contamination and, therefore, improved management of these systems is essential to achieving water quality goals (EPA, National Water Quality 305(b)).

a) Types of Failures.

b) Frequency of performance problems in the U.S.

B. Scope

1. Presents effective management programs based on a comprehensive management approach.

a) Describes current management programs' strengths and weaknesses.

b) Describes the essential functions and activities of management programs.

c) Describes management programs for different levels of management.

d) Provides guidelines for evaluating the effectiveness of existing management programs.

e) Provides guidance for the establishment of effective management programs.

2. Promotes the use of effective management programs that integrate the use of decentralized and conventional treatment.

3. Includes new and existing systems; onsite and cluster; and residential and light commercial.

C. Background

1. *"Response to Congress on Use of Decentralized Wastewater Treatment Systems"*

a) "Management" of decentralized wastewater systems consists of a comprehensive set of procedures and practices that encompass the planning, siting, design, installation, operation, maintenance, and monitoring of each onsite and cluster system.

b) Benefits of decentralized systems under central management.

(1) Often provides more cost effective options for wastewater treatment than centralized collection and treatment in unsewered areas.

(2) Increases the service life of onsite and cluster treatment systems.

(3) Achieves better watershed management through treatment and reuse or disposal near the point of use.

(4) Conserves groundwater resources through groundwater recharge.

(5) Protects property values by effective management of decentralized treatment systems.

c) Barriers to implementation of decentralized facilities.

(1) Lack of knowledge and public misperception.

(2) Legislative and Regulatory Constraints.

(3) Lack of Management Programs.

(4) Liability and Engineering Fees.

(5) Financial Barriers.

d) Overcoming the barriers to decentralized systems.

(1) Education and training of the public and service providers.

(2) Adoption of performance based codes.

(3) Development of effective management programs.

(4) Establishment of financing programs.

2. The 1998 “Clean Water Action Plan: Restoring and Protecting America’s Waters”

a) USEPA will develop national programs for onsite management that address siting, performance, design and maintenance of “decentralized” systems.

b) This commitment is based on reports from States that onsite systems have failed due to inappropriate siting, design, or inadequate long-term maintenance (EPA).

3. Critical factors to success in forming decentralized wastewater treatment management programs (Ciotoli and Wiswall, 1982) include:

a) Funding availability.

b) Early and continuous public involvement.

(1) Public acceptance.

(2) Local political support.

(3) Continuous public feedback.

c) Visibility and accountability of local leaders.

d) Capability and skills of technical/field staff.

e) Availability of creative, professional advisors.

f) Clear and concise legal authority, regulations, and enforcement mechanisms.

g) Cooperation between funding agencies and organizations at the Federal, State, and local level.

h) Cooperation between management districts and local planning commissioners.

II. MODEL MANAGEMENT PROGRAMS

A. Description [Excerpts from the Guidelines]

B. How to Use the Model Programs

III. COMPREHENSIVE MANAGEMENT APPROACH

A. Overview

1. Onsite/decentralized wastewater treatment systems are necessary compliments to conventional sewerage in areas where it is not cost effective to provide regional treatment.

2. Until recently, onsite/decentralized systems were not considered a permanent part of wastewater infrastructure, since they were thought of only as interim facilities, they were not required to meet strict performance requirements nor were effective management programs established to ensure long-term performance.

3. With the recognition that onsite/decentralized systems are an integral and necessary part of our wastewater infrastructure has come the realization that these systems must be managed to meet the same public health and environmental goals as central sewerage.

4. Evaluating sites, tailoring designs to accommodate site conditions and to meet specific performance requirements, and designing operating and maintaining systems that will sustain performance necessitates the development and implementation of management programs and practices to ensure successful

performance within acceptable levels of risk to public health and the environment.

5. Comprehensive management programs that define and delineate the interdependent roles and responsibilities of the regulatory agencies, owners, and service providers are critical.

B. Objectives

1. The management program should ensure that performance requirements for protecting the public health and the environment are established and achieved through the use of appropriate policies and administrative procedures.

2. The management program should define and integrate the roles and responsibilities of the regulatory agency, system owner, and service providers (site evaluators, designers, contractors, and operators) to ensure that treatment systems are appropriately selected and managed throughout their life cycle to achieve the program's stated performance goals.

C. Potential Entities in a Comprehensive Management Program

1. Federal agencies mandate water quality criteria to protect public health and the environment.

2. State agencies develop procedures for establishing specific water quality goals and standards and promulgate requirements to protect the public health and the environment.

3. Local governments that are delegated to do so by the State may set environmental and public health goals and requirements within their jurisdiction that comply with State requirements.

4. The general public and special interest groups participate in policy development and watershed-level decision-making at the federal, State, and local levels.

5. Management entities/owners adopt actions consistent with federal, State, and local requirements.

D. Management and Financing Issues

1. Permitting: State and local jurisdictions issue the permits required for onsite and decentralized wastewater systems. Historically, these permits were considered an indication that a site was deemed suitable for the designated onsite wastewater system and, once installed and a final inspection accomplished, a completion permit was issued. Little inspection or follow-up occurred after the final permit was issued. Little financial support was afforded to individuals who were required to install a sophisticated onsite wastewater alternative.

a) Permit holder (responsible party)/liability

b) Permit Types

(1) Site approval permit/Improvement permit (ideally followed by Construction permit/Authorization to construct) - State health or environmental agencies generally empower local health jurisdictions with the responsibility to issue permits for

construction of an onsite wastewater system. These local permits are often referred to as improvement permits, construction authorizations, etc. These permits are specific to a site and a particular technology. Once issued, a construction permit generally requires a final inspection from the local permitting entity and the final completion permit is issued. No follow-up is required until a repair or replacement is necessary. Construction permits, without some periodic requirement to assess system performance, are weak permits.

(2) Operating permit - Systems requiring some mechanical components often require an operating permit. These permits establish some performance levels or requirements for specific components or unit processes involved with a site specific onsite wastewater system. Operations permits are both renewable and revocable. These permits offer local agencies some measure of assurance that system performance will be monitored.

(3) Waste disposal permit (e.g., wastewater residuals) - Septage and other residuals are generated through the operation of an onsite wastewater treatment system. These residuals must be managed in accordance with provisions contained in federal guidance (40 C.F.R. part 503). Presently, local jurisdictions establish tracking and reporting requirements for septage and other residuals generated through the treatment of wastewater in an onsite system.

2. Property Issues: Onsite wastewater treatment systems are viewed as individual systems on private property. There has been considerable reluctance to provide management oversight because of this private property rights issue. Onsite wastewater treatment systems employed to address environmental, health, and consumer protection issues must be considered to be an essential component of the wastewater management infrastructure and, where these issues are paramount, private property issues must be secondary to health issues.

a) Access to private property/notification

b) Repairs/reconstruction/upgrades

c) Enforcement and compliance authority for corrective actions

d) Security issues/liability

3. Financing Issues: Several States/commonwealths now utilize some form of grant program, often incorporating components of the State Revolving Fund (SRF) program with local support. Pennsylvania's PennVest Program and the Massachusetts Investment Bank program both incorporate elements of the SRF program with local funding to provide funds for onsite and small, decentralized infrastructure. Note: A more comprehensive listing of financing options will be developed once the manual preparation begins.

a) User fees, assessments, taxes

b) Public grants and revolving loans (federal, State, and local)

c) Ownership of systems

E. Education and Public Participation

1. A comprehensive onsite wastewater management program must involve the public from the outset. Public and regulatory agency misperceptions must be overcome. A public education/involvement effort is essential to address these issues.

2. The public must be educated concerning the operational requirements associated with specific onsite and decentralized systems and the regulatory agency personnel must be educated concerning proper operation, maintenance, monitoring and management requirements associated with making an onsite or decentralized wastewater program a permanent part of the utility infrastructure.

IV. Program Elements of Life Cycle Management of Decentralized Treatment Systems

A. Overview

1. A comprehensive management program for decentralized treatment systems must include the program elements described in this section. The extent to which each program element is implemented is dependent on the management objectives (see Table 1: *Summary of EPA Guidelines for Management of Onsite/Decentralized Wastewater Systems*). The minimum requirements for the program elements in each management model are presented in tables (Model Programs 1-5).

2. Requirements of lower level program models can be used in higher program models to accommodate a range of management approaches in a single jurisdiction.

3. Responsibilities for establishing and administering each of the program element requirements can vary. Where system ownership is retained by the individual property owner (Model Programs 1-3), the regulatory agency(ies) will be responsible for most program elements except where professional or trade organizations agree to take responsibility for licensing and certification of service providers. Where third parties, such as utility districts, are permit holders (Model Programs 4-5), the districts themselves may take on some additional responsibilities such as education/training and inspection/monitoring with regulatory oversight.

B. Planning

The Planning program element ensures that onsite system regulations and practices are coordinated with land use policies and zoning ordinances.

1. Integrates prescriptive or performance requirements for implementing onsite systems into a comprehensive land use planning process that is consistent with State/Tribal and local requirements (all Model Programs).

2. Coordinates onsite system performance requirements and land area requirements with land use planning and zoning ordinances, in a manner consistent with the community's goals (all Model Programs).

a) Anticipates growth and development

b) Natural resources are to be protected or preserved

c) Uses permitted treatment technologies

3. Integrates management of decentralized and centralized facilities, where appropriate (Model Program 5).

4. Evaluates the appropriateness of individual systems versus cluster systems at times of new development, repairs, and replacements (Model Program 5).

C. Performance Requirements

The Performance Requirements program element establishes specific and measurable standards for performance of onsite systems to ensure that human health and the environment are adequately protected and that compliance with the requirements can be monitored effectively.

1. Prevent direct and indirect contact with inadequately treated wastewater.

a) Require subsurface discharges without surface seepages or plumbing backups (Model Program 1-2).

b) Require water quality goals be met by the treatment system beyond a specified compliance boundary (Model Program 3-5).

2. Establish measurable requirements for system operation and performance.

a) Establish routine maintenance requirements that must be performed according to a defined schedule for systems that have well documented performance under the conditions used (Model Program 2).

b) Establish treatment performance requirements based on water quality goals for the area (Model Programs 3-5).

D. Site Evaluation

The Site Evaluation program element ensures that the treatment site is evaluated in a manner that results in consistent selection of suitable treatment technologies.

1. Establish procedures for site evaluations that identify site compliance criteria specified for prescriptive applications (Model Programs 1-2).

2. Establish site evaluation procedures that are necessary to estimate site capacities for wastewater discharges (Model Programs 3-5).

E. Design

The Design program element ensures that onsite systems designs are developed to meet the established performance requirements based on utilization of credible treatment processes and methodologies.

1. Provide prescribed system designs that are suitable for use under specific site conditions (Model Programs 1-2).

2. Establish suitable design parameters that system designs should meet to achieve the specified performance requirements (Model Programs 3-5).

3. Establish requirements for contingency plans that can be successfully implemented when performance problems occur (All Model Programs).

4. Address water conservation measures and water reuse in designs, where appropriate, to meet the established environmental goals (All Model Programs).

5. Establish design review and permitting procedures.

    a) Prescriptive designs (Model Programs 1-2).

    b) Engineered designs meet specific performance requirements and use generally accepted design parameters (Model Programs 3-5).

    c) Engineered designs employ innovative/alternative processes or applications that are outside generally accepted design parameters (Model Programs 3-5).

F. Construction

The Construction program element ensures that onsite system construction conforms to the approved plans and follows accepted practices.

1. Establish procedures to ensure that systems are constructed in conformance with approved plans and specifications (All Model Programs).

    a) Agency inspections

    b) Designer certifications

2. Establish procedures to ensure that appropriate construction practices, methods, and procedures are employed (All Model Programs).

    a) Agency inspections

    b) Designer certifications

    c) Contractor certifications

3. Establish procedures to document, accept, and issue use permit after successful system startup (All Model Programs).

G. Operation and Maintenance

The Operation and Maintenance program element ensures that onsite systems continuously perform in accordance to the established performance requirements.

1. Establish procedures to ensure that owners adequately maintain their treatment systems (Model Program 1).

    a) Provide information and education to system owners about the care and maintenance of their systems.

    b) Establish a program to remind owners of scheduled preventative maintenance (Model Program 1).

c) Require automatic controls that alert owner of needed maintenance (Model Program 1).

2. Require that contracts be maintained by owner with operation and maintenance contractors (Model Program 2).

3. Establish a program of operating permits that may be issued to system owners (Model Programs 3 & 5) or to operation and maintenance entities (Model Program 4). These operating permits should be renewable upon submission of documentation by the permittee demonstrating that the system has been operated and maintained within the conditions specified in the permit.

H. Residuals Management

The Residuals Management program element ensures that onsite system residuals are treated and disposed in accordance with established rules.

1. Establish and administer a program for evaluating and approving residual treatment and disposal facilities (All Model Programs).

2. Establish and administer a tracking system for residuals hauling and disposal in compliance with federal biosolids rules (All Model Programs).

I. Certification/Licensing

The Certification/Licensing program element ensures that service providers are properly trained and practice their services in accordance with established rules.

1. Establish a training and licensing/certification program for site evaluators, contractors, and residual haulers (Model Programs 1-2).

2. Establish a training and licensing/certification program for designers and inspectors (Model Programs 3-5).

3. Establish a training and licensing/certification program to ensure conduct consistent with the intent of the rules.

J. Education/Training

The Education/Training program element ensures that owners and service providers understand their roles, responsibilities, requirements, and procedures for managing onsite treatment systems.

1. Educate owners on purpose, use, and care of their systems (all Model Programs).

2. Publish technical guidelines for service providers (all Model Programs).

3. Provide technical training for service providers (all Model Programs).

K. Inspections/Monitoring

The Inspections/Monitoring program element ensures that construction, operation, and maintenance of onsite systems continuously meet regulatory requirements.

1. Establish point-of-sale and change-in-use inspections program to identify and correct performance problems with existing systems (Model Programs 1-2).

2. Establish a performance monitoring program that includes procedures for issuing compliance schedules for necessary corrective actions on systems with performance problems (Model Programs 3-5).

L. Corrective Actions

The Corrective Actions program element ensures that onsite systems with performance problems are corrected in an appropriate manner and within an acceptable time period.

1. Require contingency plans be established by the owner to manage onsite system failures immediately until corrective action(s) can be taken (Model Programs 1-5).

2. Negotiate compliance schedules for correcting documented failures (Model Programs 1-5).

3. Establish an enforcement program with fines and/or penalties for failure to comply with regulatory requirements in a timely manner (Model Programs 1-5).

M. Recordkeeping and Reporting

The Recordkeeping and Reporting program element ensures that up to date records of location, ownership, site evaluation, design, and compliance reports are maintained and performance of systems is monitored.

1. Establish a recordkeeping system that is tied to deed recording system so accurate ownership records are maintained (all Model Programs).

2. Establish a tracking system for owner/maintenance contracts and completed maintenance reports (Model Program 2).

3. Administer an operating permit program and tracking system to alert agency and owners of periodic compliance status reports or inspections (Model Programs 3-5).

4. Maintain compliance status reports (all Model Programs).

5. Establish and administer a financial, management, and technical auditing program of management entities to ensure viability.

N. Financial Assistance

The Financial Assistance program element achieves high compliance rates by providing financial assistance to owners for onsite system construction and upgrades where appropriate.

1. Provide information to owners regarding available financial assistance programs for constructing or upgrading onsite systems (all Model Programs).

2. Provide private/public financing of onsite systems (Model Programs 4-5).

V. Status of Current Model Management Programs

A. Overview

Few States or tribal entities have developed comprehensive management program requirements for onsite/decentralized wastewater systems. North Carolina, Washington, Massachusetts, Rhode Island, Virginia and Pennsylvania do have in code requirements for management of onsite systems.

B. Existing Regulatory Codes - The majority of existing management programs are limited to implementing regulatory codes of practice, and consist of the following:

1. Rudimentary performance requirements

   a) No plumbing back-ups and/or surface seepage;

   b) Maintenance of a minimum unsaturated soil thickness;

   c) Maintenance of setback requirements;

   d) General requirement that treatment systems be maintained (complaint driven enforcement); and

   e) Periodic pumpout requirement (very few).

2. Prescriptive siting, sizing, design, and construction requirements

   a) Conventional;

   b) Alternative; and

   c) Variance and demonstration/experimental system requirements.

3. Regulatory review and approval

   a) Design review and construction permit; and

   b) Pre-cover up inspection and approval.

4. State level licensing of service providers (in some cases certification is required)

5. Compliance, monitoring, and enforcement requirements

   a) Programs typically lack these provisions

   b) Systems are assumed to be performing adequately if no complaints are received.

   c) Enforcement typically limited to investigations of reported surface discharges, odors, or well contamination

   d) Inspections/remediation at time of property transfer (very few require)

C. Strengths and weaknesses - The following identifies some of the strengths and weaknesses of current onsite regulatory programs:

1. Strengths

   a) Simple, effective, and low cost prescriptive systems can be used for sites meeting the prescriptive design criteria, e.g., conventional septic systems with suitable soil conditions and adequate maintenance are appropriate and low cost.

   b) In general, “highly skilled” personnel are not necessary for conventional or traditional system design and construction.

   c) Compliance reviews of systems simplified by confirming conformance to prescribed codes or regulations.

   d) Generally adequate with traditional systems located on suitable sites with adequate soils, and which treat domestic sewage.

2. Weaknesses

   a) Interpretation and implementation of requirements differ by State and local county jurisdiction based on local experience, knowledge, established practice, and environmental limitations (This is a weakness/strength of both prescriptive and performance based programs).

   b) Satisfactory treatment is typically presumptive and not a performance requirement.

   c) Inflexibility in selecting appropriate technologies/alternatives for sites unsuitable for prescriptive technologies.

   d) Lack of requirements for continuous oversight and compliance enforcement by frequently understaffed regulatory agency.

   e) Little experience with performance based programs.

   f) Site evaluations may be inadequate.

   g) Complex systems require the following: skilled personnel (but who are often unavailable); training (but which may not be sufficient); and technology transfer (but which poses its own problems).

   h) Operation and maintenance are most commonly the responsibility of the property owner and not a qualified service provider (may or may not be a weakness).

   i) Conventional or traditional system design and construction is not performed by “highly skilled” personnel.

   j) Lack of cost benefit analysis with prescriptive designs.

VI. Needs of Model Management Programs

A. Procedures for establishing performance requirements based on risk assessment.

B. Comprehensive planning, regulations and guidance for planning, siting, design and construction.

C. Perpetual operation and maintenance.

D. Perpetual compliance monitoring and corrective action procedures.

E. Procedures to identify and upgrade existing systems to meet current or future environmental goals.

F. Funding for management program development and implementation.

G. Enforcement strategy.

H. Coordination between State, tribal and local regulatory agencies.

I. Ongoing public education and involvement program.

VII. How to Evaluate Your Existing Management Program

Appendices

1. Model Management Programs

2. Case Studies

3. Model Regulatory Codes

4. Funding Options

5. Risk Assessment Tools

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