ANJEC
Local Environment Matters

An ANJEC Resource Paper

Information for local boards and officials working to protect the environment in New Jersey communities

Septic Systems, Clean Water and Your Municipality

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Illustrated by A.S. Rade

One in every four households in the United States relies on an individual onsite or small cluster system to treat wastewater. In far too many cases, these systems are installed and largely forgotten – until problems arise. On the other hand, EPA concluded in its 1997 Report to Congress that "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. **The difference between failure and success is the implementation of an effective wastewater management program.**"[1]

– **Handbook for Managing Onsite and Clustered (Decentralized) Wastewater Treatment Systems** – USEPA, 2005

INSIDE

The Role of Septic Systems and Why Municipalities Should Care about Them

Septic systems treat and dispose of household wastewater (water from sinks, tubs, toilets, washers, etc.) on individual lots where sewers are not practical or available. These onsite wastewater treatment systems (OWTS) include:

- a watertight septic tank into which wastewater is piped from the building. In the septic tank, solids separate out and settle to the bottom, forming a sludge layer, and the liquid effluent flows out of the septic tank into a drain field.
- a distribution box and drain field (also called an absorption or leach field). Effluent flows through a network of perforated pipes (laterals) into the soil. Bacteria in the soil break down the organic matter and purify the water before it reaches underground water sources, known as the water table or aquifer (often used for drinking water). Drainage capacity of soil is critical to proper functioning of a septic system, and not all soils are suitable for septic systems.

Septic systems are common in more rural areas where lots are large, and in remote areas.

Some municipalities are wholly dependent on septic systems while others are only partially dependent and have portions of the town served by central sewer collection systems. To determine the extent and location of septic served areas within your municipality, go to the New Jersey Department of Environmental Protection (NJDEP) GeoWeb site (*www.nj.gov/dep/gis/geowebsplash.htm*), search for your municipality and, under the "Planning Areas" tab, view "Sewer Service Areas." The areas of the municipality, shown in white outside the colored sewer service areas, are served by individual onsite septic systems. Some septic service areas currently serviced by septic systems may be slated for future installation of sewers.

When properly designed, installed, operated, and maintained, septic systems can provide environmentally sound and cost-effective wastewater treatment. Onsite disposal systems such as seepage pits or cesspools cannot legally be constructed today. Often these "temporary" systems were merely seepage pits that are prohibited today. In some cases, anticipated sewers never arrived, leaving substandard systems in place.

Municipal governments have an important role in ensuring that septic systems work effectively to help protect and maintain public resources such as ground and surface water. Safeguarding public health from waterborne contaminants (e.g. toxics, nitrates, nutrients like phosphorous and nitrogen) as well as disease pathogens that can occur from failing septic systems is a responsibility of local government, and protecting the "public health, safety and welfare" is the fundamental provision underlying the doctrine of "police powers."[2]

Recognizing the Warning Signs of Septic System Failure

Underground septic systems are hidden from view, but there are clear signs of septic system failure.

Complaints About "Sewer Smell"

Sometimes residents will call their municipality to report what they describe as the smell of sewage or rotten eggs. Often these complaints are made in spring when groundwater tables are high or during hot weather in the summer when the air is very still.

Odors often occur when untreated septic effluent seeps to the surface. This is referred to as "breaking out." Sometimes the effluent runs down to a stream or a storm drain and pollutes surface water. While these smells can come from a variety of sources, the municipalities should investigate each complaint and identify the origin.

Contaminated Drinking Water Reports

The State requires that new wells be tested for compliance with drinking water standards. These records are maintained by your local or county health department. A list of health departments may be found at: *www.state.nj.us/health/lh/documents/munidirectory.pdf*. Under the *Private Well Testing Act*, wells must be tested upon changing of title. If a test shows a violation of drinking water standards the results are sent to the local health department and the NJDEP. Local health depart-

ments then notify adjoining property owners. Over time, these data help form a picture of overall drinking water in your municipality. If the violation is due to bacterial contamination or nitrates, the onsite septic system should be investigated and possibly those on adjoining properties as well. This is usually done by the local health department. The *Private Well Testing Act* can be found at: *www.njleg.state.nj.us/2000/Bills/PL01/40_.PDF* and the regulations may be found at: *www.nj.gov/dep/watersupply/pwta/pdf/pwtafinal.pdf*. Local environmental commissions can take a leadership role in establishing a voluntary well testing program by assisting with distribution of test kits, collection, transport to a certified laboratory and communication with residents. Local nonprofit watershed associations sometimes operate such programs and can provide assistance and advice. For example, the Raritan Headwaters Association *www.raritanheadwaters.org/protect/well-testing/* and the Great Swamp Watershed Association *http://greatswamp.org/what-we-do/water-quality/well-water-testing-2/* have provided this support.[3] Mapping of contaminated wells could also become an important part of an environmental resource inventory (ERI).

Nitrogen & Phosphorus from failing septic systems and over fertilizing cause algae blooms and fish kills. Photo by Alexeys

If your municipality does not offer a voluntary testing program, the environmental commission may want to establish one. Municipalities, their boards of health and/or environmental commissions can coordinate with watershed groups to offer and encourage testing. The Watershed Institute maintains a list of New Jersey watershed associations throughout the state at *http://thewatershedinstitute.org/group-locator.*

Fish Kills

Discharge of raw, untreated sewage from malfunctioning septic systems can also cause fish kills in rivers and streams. Large die-offs of fish in New Jersey waters may, however, have several causes and often occur in summer when high water temperatures cause oxygen depletion in surface waters. Malfunctioning septic systems may contribute to the problem by increasing biological oxygen demand (BOD) that depletes oxygen levels. In the absence of an obvious cause like a toxic spill, septic systems in the affected area and upstream should be suspected when there is a fish kill.

Algae Blooms and Aquatic Weed Growth

Malfunctioning septic systems can contribute large quantities of nutrients, particularly nitrogen and phosphorus, to surface waters. One pound of phosphorous in septic effluent can support the growth of 1,100 pounds of algae. These nutrients can increase aquatic plant growth resulting in loss of traditional uses like boating, swimming and fishing, and may also contribute to fish kills, particularly in warm weather. If there are algae blooms and excessive rooted aquatic plant growth, municipalities should investigate the septic systems in the contributing watershed and, in particular, those within 200 feet of the water's edge.

Violation of Surface Water Standards

The NJDEP monitors surface water quality on a rotating basis and compiles the data into a summary report.[4] Municipalities should routinely

inquire about the test results with attention to nutrients (nitrogen and phosphorous) and pathogens that septic systems may be contributing. If there are septic system-related pathogens, nutrients or low dissolved oxygen, municipalities should investigate potential septic impacts. Towns can also consult with their local watershed organization(s), many of which have approved monitoring plans and trained volunteers who regularly test local waterways. Towns may want to consider conducting their own monitoring in the absence of a local monitoring program, particularly if they suspect problems. The NJDEP Volunteer Monitoring Program requires that certain protocols, including analysis by a NJ certified lab, be followed in order for that data to be considered scientifically valid and actionable.

Flowing and Sudsy Storm Drains

If storm sewer systems continue to flow long after an extended period of no rainfall, they may be draining groundwater or flow from other sources, such as septic systems. Illicit connections of septic systems or subsurface drains contaminated by septic waste water may be conveying untreated wastewater to storm drains.

Toxic water running from storm drains. Photo by Narin Nonthamand

Floods Are a Special Concern

Floods can seriously damage septic systems and wells through inundation, erosion and release of untreated wastewater. The Board of Health should investigate flood-prone areas immediately after flood waters recede.

If your municipality is at risk of flooding that could compromise septic systems and wells, educating the affected homeowners is important. The US Environmental Protection Agency (EPA) offers guidance for owners of wells and septic systems after a flood event at: *http://epa.gov/privatewells*. Advice on what to do with flooded wells is also available from the EPA at *http://water.epa.gov*.

Hackensack River flooding. Courtesy of U.S. Geological Survey

Municipalities can provide homeowners with information on how to get their wells tested after a flood. For example, the Musconetcong Watershed Association has offered well testing after flood events. (*www.musconetcong.org*).

The *Private Well Testing Act* and its accompanying regulations require well testing when properties change hands (*www.state.nj.us/dep/watersupply/pw_pwta.html*). Landlords are also required to test and notify tenants of the results. These test results are sent to the NJDEP and when any drinking water standard is violated, and to the local and county and health departments. Your municipality may want to examine these data for areas with high failure rates for bacterial and nitrate contamination and investigate the causes.

Septic effluent should never be allowed to enter storm drains. The presence of foam is almost always an indicator of septic contamination as is the presence of pathogens, high levels of copper and/or optical brighteners[5] contained in laundry detergents, toothpaste and other household cleaning products.

Municipalities should test the water for pathogens, copper and optical brighteners whenever flowing storm drains are noticed during a period of no rain. Testing for optical brighteners is relatively simple and inexpensive and a good step to determining if human wastewater is flowing through the storm sewers. Pathogens from animal sources can often be found in storm drains due to outdoor pet waste and bird droppings; RNA and DNA testing can determine whether the sources of pathogens are human or animal. However, this kind of testing can be expensive.

Likely Problem Areas

Environmental and planning data are available to help identify potential septic problem risk areas. Your municipal ERI may already have enough data to identify areas vulnerable to septic system failure. Poorly draining soil conditions, high seasonal water tables, wetlands, restrictive soil layers and shallow depths to bedrock can also contribute to problems. Areas with relatively small lot sizes in combination with any of these conditions can be special focus areas for onsite investigation.

Patterns in "Permits to Alter" Applications

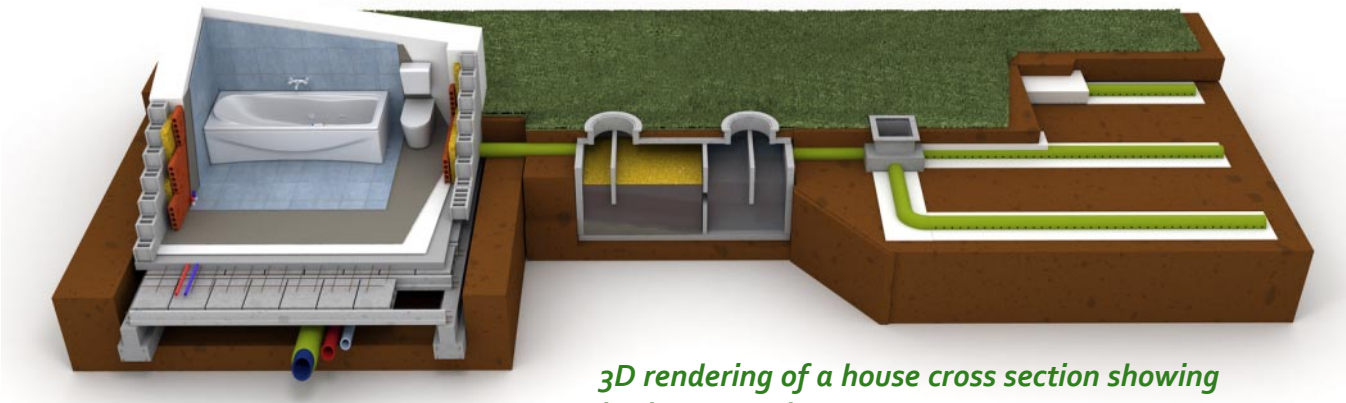
Failures are usually accompanied by an application to the board of health to alter an existing septic system. Keeping track of the locations of these applications over time may help identify areas of high failure rates.

Why Properly Functioning Septic Systems Are Important for Your Municipality

Maintaining properly functioning septic systems in your community has several important advantages.

1. COST – Property owners are responsible for the construction, operation and maintenance costs of septic wastewater treatment, with little or no public cost incurred. The cost of providing central sewers to areas with densities of less than one unit per acre may be unacceptable. Capital, operation and maintenance costs can lead to high sewer fees to compensate for the few users being served.

2. MAINTAINING "WATER BALANCE" – Septic systems, when paired with individual onsite wells, allow water withdrawn through the wells to be recharged into the local aquifer. This helps foster a natural water balance in local watersheds and helps maintain groundwater levels, wetlands water levels and stream flows. Central sewers, particularly when paired with individual onsite wells, often export local groundwater to a distant discharge point, depleting the local groundwater and



3D rendering of a house cross section showing bathroom and sewage system Illustrated by Franck Boston

lowering the water table. Maintaining local water balance is important for ensuring that there is enough clean water available to meet everyone's needs.

3. LAND USE PLANNING, DENSITY CONTROL – Reliance on development patterns featuring individual well and septic systems can help control overall development density, protect natural resources, and preserve the rural character of communities.

For planning purposes, most of New Jersey requires a nitrate threshold of 2 mg/l, while more stringent levels apply in the New Jersey Highlands based on exceptionally clean local water quality. These higher standards can result in significantly larger minimum lot sizes than those calculated using the 10 mg/l drinking water standard, and are more protective of groundwater resources.[6]

4. ENERGY EFFICIENCY – Septic systems generally operate by gravity flow so they consume little or no energy as compared to central sewer systems that involve energy intensive operations such as pumping and filtration.

5. FEWER "ROAD OPENINGS" – Unlike central sewer systems, repair, alteration and maintenance activities for onsite septic systems take place outside of the road network and rarely if ever require disturbance of public roads.

6. COMPATIBILITY WITH TOPOGRAPHY – Central sewer systems require excavation to install sewer mains. In areas with steep topography, massive bedrock or high groundwater conditions, these excavations can be costly and disruptive. Septic systems require no off-lot construction disturbance.

The Municipal Role

Ensuring properly functioning septic systems requires a structured commitment by the municipality and the participation of landowners. Protecting the quality of groundwater and surface waters is an important function of municipal government. An established legal and regulatory framework can assist in these efforts. Obtaining the best results will require an understanding of NJDEP's Standards for Individual Subsurface Sewage Disposal Systems (NJAC 7:9A).[7] Local controls and practices must be at least as comprehensive as these rules. However, a local ordinance can be more protective, provided it is justified by local conditions, and has been approved by NJDEP.

Steep rugged topography poses severe constraints to the construction of central sewer systems. Shallow bedrock, high excavation costs, hydraulic problems and complex engineering argue for septic systems rather than conventional sewers.

The Kittatinnies in northern NJ
Photo by Rick Radis

What Is Septic Failure and What Problems Does It Cause the Community?

Like all technologies, the septic system approach to wastewater treatment has limitations. Systems must be properly sited, designed, installed, operated and maintained to adequately protect water quality, sustain property values, prevent neighborhood conflicts and protect public health. While a septic failure can have serious consequences for a homeowner, municipalities may also experience community-scale consequences from unaddressed septic failures.

According to the NJDEP regulations (NJAC 7:9A-3.4), there are two types of failure that could render a septic system noncompliant:

- ***Systems that do not perform as approved, or that malfunction (known as "failure");***
- ***Systems that are not constructed, operated or maintained in accordance with NJDEP requirements or as specified in an approval issued by either NJDEP or the [local] administrative authority.*** "Administrative authority" means the board of health having jurisdiction or its authorized agent acting on its behalf.

The regulations define a septic failure as including but not limited to:

1. Contamination of nearby wells or surface water bodies by sewage or effluent as indicated by the presence of fecal bacteria where the ratio of fecal coliform to fecal streptococci is 4:1 or greater;

2. Ponding or breakout of sewage or effluent onto the surface of the ground;

3. Seepage of sanitary sewage or effluent into portions of buildings below ground;

4. Backup of sanitary sewage into the building served which is not caused by a physical blockage, of the internal plumbing;

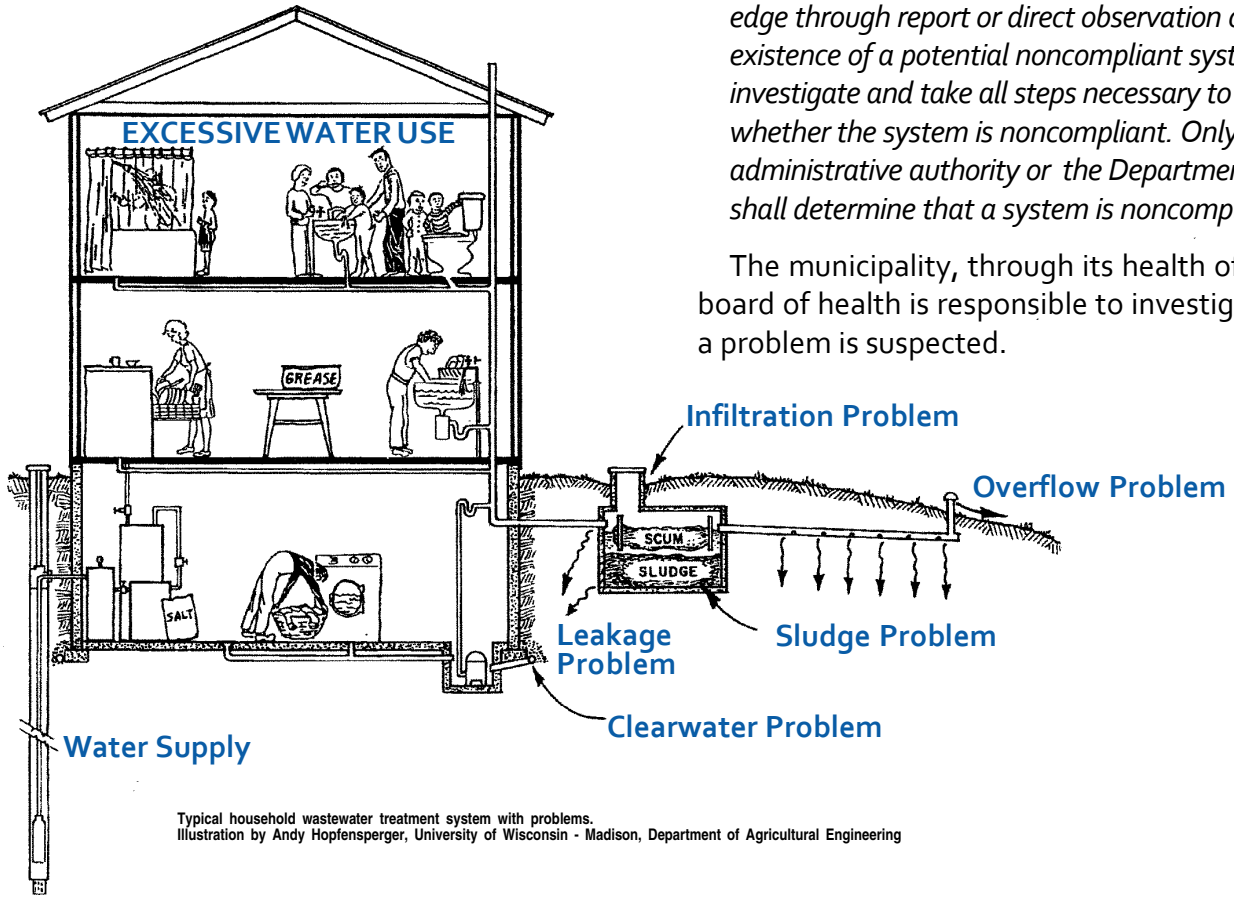
5. Any leakage from or into septic tanks, connecting pipes, distribution boxes and other components that are not designed to discharge sanitary sewage or effluent; or

6. Any discharge of sanitary sewage without a zone of treatment.

Municipalities should be concerned with septic failure for public health, environmental and economic reasons. Additionally, municipalities have an affirmative duty to make sure that systems are properly constructed and operated. Section 3.4 (d) states:

> *Whenever the administrative authority has knowledge through report or direct observation of the existence of a potential noncompliant system, it shall investigate and take all steps necessary to determine whether the system is noncompliant. Only the administrative authority or the Department (NJDEP) shall determine that a system is noncompliant.*

The municipality, through its health officer and board of health is responsible to investigate when a problem is suspected.



Typical household wastewater treatment system with problems.
Illustration by Andy Hopfensperger, University of Wisconsin - Madison, Department of Agricultural Engineering

Why Do Septic System Failures Occur?

While a septic system is a simple engineered structure, it is a sophisticated biological treatment system that depends on multiple factors to adequately treat wastewater. **Anaerobic** (low oxygen) decomposition and settlement of solid residues takes place within the septic tank itself while **aerobic** (with oxygen) treatment takes place in the drain field, close to and beneath the lateral lines, which drain liquid waste from the tank to the field.[8]

Common Causes of Septic System Failure

The onsite system is not a septic system and may be noncompliant.

Wastewater may be treated by structures that are not actually septic systems as defined by state regulations. They may have been constructed prior to current regulations on proper septic design. Abandoned wells, cesspools and seepage pits or pit toilets may be in use, particularly in older neighborhoods, lake communities, former summer colonies converted to permanent residences, former summer camps, farmsteads and rural villages.

Owners may have no idea where the facility is located on their property, and have never maintained it.

These situations may be complicated by very small lots, proximity to drinking water wells, other septic systems, building foundations and the presence of critical resources such as streams, lakes, ponds, high ground water tables, restrictive soils and massive bedrock. The NJDEP regulations (NJAC 7:9A-1.6) strictly control or prohibit use of these types of facilities:

(a) The discharge of sanitary sewage or the effluent from any individual subsurface sewage disposal system into any abandoned well or any well constructed for the purpose of sanitary sewage disposal is prohibited. The administrative authority shall not approve the discharge of sanitary sewage or septic tank effluent into an existing well or the construction of a new well for the purpose of waste disposal.

(b) The construction, installation, alteration or repair of cesspools, privies, outhouses, latrines and/or pit toilets is prohibited.

(c) The administrative authority shall not approve the construction or installation of seepage pits except as provided by NJAC 7:9A-7.6.

Seepage pits may be allowed only under narrow circumstances, such as a gray-water system as provided in NJAC 7:9A-7.5 (gray-water means sanitary sewage that does not include discharges from toilets or urinals), or an alteration for an existing noncompliant malfunctioning system subject to the requirements of NJAC 7:9A-3.3(d).

The system is improperly designed, deteriorated, or improperly altered.

Prior to the current septic regulations, systems were often informally designed and even installed by homeowners without review or advice of a professional engineer. Owners may have altered systems on their own in attempting repair, adding laterals to the drain field or ditching around an area of breakout to direct effluent to a stream, storm drain or wetland.

Age and changes in operation may have rendered the initial design inadequate. Impacts of age may include collapse of lines, leaks in the septic tank, a deteriorated or settled (no longer level) distribution box and inadequate tank size or disposal field area.

Distribution box: a container used to receive effluent from tank and redistribute into a network of attached drain field or soakaway bed absorption trenches and pipes

With Permission from ADAMPEASE.ORG

Improper operation

Changes in operation can render the initial design of a septic system inadequate, particularly if alterations were made without benefit of building or construction permits. Installation of garbage disposal units can increase the load of solid waste beyond the capacity of the original septic tank. Introduction of large quantities of grease, inert materials (like cat litter) or other indigestible solids can increase the buildup of solids and lead to drain field clogging. Leaks or the addition of bedrooms, bathrooms, water using appliances, hot tubs, or increased occupancy can increase the flows of wastewater beyond the system's capacity. Connection of sump pumps and downspouts to the septic system can overwhelm even a properly designed system.

Very large, sudden releases of wastewater that churn up the solids settled into the bottom of the tank may allow the suspended solids to enter the distribution box and the laterals. This can rapidly clog the laterals, leading to backups and breakout on the surface. Compaction of the drain field or directing stormwater to it can saturate the soils, leading to a failure.

Introduction of toxic chemicals can severely compromise the effectiveness of a system's complex biological processes, especially if industrial discharges or even those from some small businesses are allowed to enter septic systems.

What Municipalities Must Do

Under NJAC 7.9A:3.14, municipalities are required to educate owners of septic systems (approved since 1990) on proper operation and maintenance practices. This education/notice must occur at the time of approval and at least every three years thereafter. A mass mailing to all owners of septic systems is an acceptable way to satisfy this obligation.

The notice shall include, at a minimum:

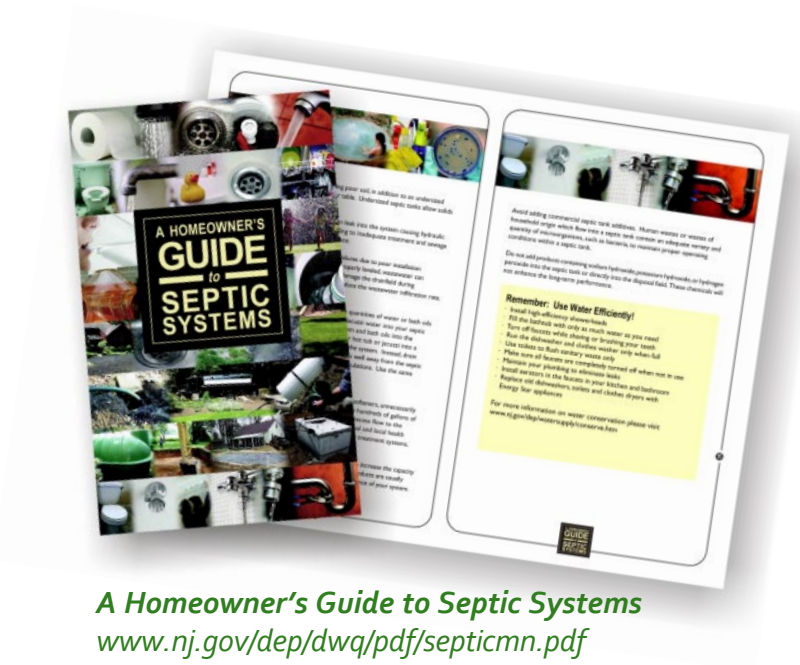
1. A general outline of how a septic system works and the potential impact of improper operation and maintenance on system performance, ground and surface water quality, and public health;

Septic Tank pumping Stock Photo

2. The recommended frequency of septic tank and grease trap pumping to prevent over-accumulation of solids, and methodology for inspection to determine whether pumping is necessary;
3. A list of materials containing toxic substances that are prohibited from being disposed of into an individual subsurface sewage disposal system;
4. A list of inert or non-biodegradable substances which should not be disposed of within an individual subsurface sewage disposal system;
5. Proper practices for maintaining the area reserved for sewage disposal;
6. Impacts upon system performance resulting from excessive water use; and
7. Warning signs of poor system performance or malfunction and recommended or required corrective measures.

To satisfy their obligation to educate property owners, municipalities, boards of health and/or environmental commissions can develop customized notification/educational materials, or distribute copies of guidance materials provided by NJDEP, such as the Homeowners Guide to Septic Systems[9] (*www.nj.gov/dep/dwq/pdf/septicmn.pdf*). There are many opportunities to reinforce this education, such as:

- Displays for community fairs or events
- Local public service announcements or videos
- Website postings
- Press releases
- Door hangers
- Newsletter articles



A Homeowner's Guide to Septic Systems
www.nj.gov/dep/dwq/pdf/septicmn.pdf

Taking Action: The Five Levels of Protection

Municipalities can take an active role in improving septic system functions. The USEPA and Rutgers Cooperative Extension published guidance for municipalities that describes five different approaches to managing OWTS in the community.[10] The five levels, in order of increasing complexity are:

Level I: Homeowner Awareness

This level is appropriate for areas where conventional septic systems function properly and there are no critical environmental issues of concern. The municipality, through issuing permits for septic system construction, can maintain a comprehensive database of septic systems, and can send out regular educational information and pump-out reminders to owners of septic systems. The Homeowner Awareness model represents the minimum that a municipality should be doing and is required by NJDEP regulations.

Level 2: Maintenance Contract

This level requires owner/operators of onsite disposal systems to have maintenance and inspection contracts with licensed septic technicians. Rutgers University/Cooperative Extension recommends this approach for systems with unique features or those designed to provide more advanced treatment. These types of systems may be found where there are soil limitations, topographic constraints or sensitive environmental resources. Examples include systems that use pumps to lift wastewater to a disposal bed at a higher elevation, aerobic systems that pump air into the septic effluent, peat filters, or pressure dosing systems that distribute effluent under pumped pressure.

If a municipality opts for Level 2, their ordinance may specify the applicability and qualification for maintenance contractors. ANJEC is not aware of any NJ municipality that has adopted this option.

For information on alternative designs see:

Peat Systems Guidance – *http://nj-septic.com/new/pdf/Guidance_Document.pdf*
Drip Dispersal Guidance – *www.nj.gov/dep/dwq/pdf/NJ_Drip_Guide_01_08.pdf*
Aerobic System Guidance Document – *www.nj.gov/dep/dwq/pdf/NJ_Aerobic_Guidance_01_08.pdf.*

Level 3: Operating Permits

In this approach, a municipality adopts a local ordinance requiring owners of septic systems to obtain operating permits. The permits generally require owners to provide proof of pump-outs on a specified interval, usually three years, to maintain the permit. The idea is that regular pumping by a licensed service provider will result in fewer instances of malfunctioning systems. An additional positive impact for owners can be fewer costly problems and repairs over time.

This is a proactive approach everywhere, particularly in areas where maintaining high levels of treatment is important, such as communities surrounding lakes with excess nutrient loads and recreational uses. It is also helpful where systems may have been previously installed in soils with high water tables, low permeability or close to surface water.

Some municipalities have established a septic permit system for sensitive areas only (such as lake communities), but others have established the requirement for all septic systems. Whatever the extent of the program, it is critical to begin with owner outreach, to develop support for the ordinance and goal of protecting water, before it is adopted. See page 12 for sample ordinances from municipalities in New Jersey.

Level 4: Responsible Management Entity (RME) Operation and Maintenance

This option is suggested for areas with moderately high environmental sensitivity or with high concentrations of onsite systems, especially for developments using clustered onsite waste water treatment system technology (package plants, communal septic systems). Under this option, municipalities grant an operating permit to a professional Responsible Management Entity (RME). The RME does not own the system, but is responsible for its operation and maintenance.

In New Jersey, onsite systems with a flow greater than 2,000 gallons per day (gpd) are not governed by 7:9A and require NJ Pollution Discharge Elimination System permits from the NJDEP. Systems with 2,000+ gpd flow are known as package treatment plants or communal septic systems and are often designed to discharge through drain fields that resemble large septic disposal beds. Such an option might be considered if there is a substantial cluster of failing systems, restrictive conditions or greater environmental sensitivity where no central sewer system is available.

Level 5: Responsible Management Entity Ownership of Onsite Systems

This approach places ownership of the onsite system in the hands of the RME. The RME is then responsible for all aspects of operation, maintenance, repair and replacement of failing systems. It is, in effect, a decentralized analog to public sewerage treatment, and homeowners are, in effect, users rather than owners. This approach requires more management than any of the others, but allows for the use of more advanced systems resulting in higher treatment levels.

Which Level Is Appropriate and What Should the Ordinance Say?

Every municipality must, at a minimum, conform to the NJDEP septic regulations (NJAC 7:9A). A review of the municipality's present practices and ordinances may prove beneficial in identifying successful behavior, areas for improvement , or needed changes.

Municipalities should consider the environmental and health conditions present in the community when deciding which of the five levels to implement, giving consideration to political realities and institutional preparedness. A public education effort should precede any contemplated change. By referring to the EPA's decision-making guidance,[11] municipalities can chart an appropriate course for improving septic performance.

Keeping homeowners informed includes explaining the critical need for septic system maintenance and stressing the importance of protecting the groundwater aquifer and surface water. Pointing out how these resources contribute to property value, recreation and quality of life is a good beginning. Municipal environmental commissions can provide information on existing impacts, potential problems and appropriate remedies.

Lake Hopatcong, New Jersey's largest freshwater lake, is heavily used for recreation, including swimming, fishing and boating. The lake is surrounded by residential and commercial development on small lots, leading to concerns about water quality. Several adjoining municipalities have passed septic maintenance ordinances.

Courtesy of LAKEHOPATCONG.ORG

Sample Ordinances from New Jersey for Municipalities

Many municipalities have adopted ordinances to achieve a Level 3 result. Some ordinances are applicable only to high value resource areas, such as a particular sub watershed (Byram Twp., Jefferson Twp., Sparta Twp.). There are also ordinances that grandfather existing systems, applying the requirement for an operating license only to new or altered systems (Montville Twp., Mt. Olive Twp., Montgomery Twp., Frankford Twp.). While this approach may be politically easier than blanket applicability, it may not adequately address all of the identified needs. However, it may be useful as an interim step to familiarize the public with the issues and create a feeling of confidence on the part of the public.

Finally, some municipalities have expanded the requirement to include both new and existing septic systems (Chatham Twp., Byram Twp., Hopatcong Borough).

Links to these ordinances are provided below.

Municipal Ordinances Using Level 3 without Grandfathering:

Chatham Twp.: *http://clerkshq.com/default.ashx?clientsite=Chatham-nj* (chapter XVII)
Byram Twp.: (partial "program area": Lake Lackawanna) *http://ecode360.com/6656513*
Sparta Twp: (partial program area: Lake Mohawk watershed only)
http://clerkshq.com/default.ashx?clientsite=Sparta-nj (chapter XX)
Hopatcong Borough: *http://ecode360.com/9573814*
West Milford Twp.: *http://ecode360.com/13904620*
Jefferson Twp.: *http://ecode360.com/10284515*

Municipal Ordinances Using Level 3 with Grandfathering:

Montville Twp.: *http://ecode360.com/12155890*
Mt. Olive Twp.: *https://law.resource.org/pub/us/code/city/nj/Mount%20Olive.html#8588076*
Montgomery Twp.: *http://clerkshq.com/default.ashx?clientsite=Montgomery-nj* (chapter XII)
Frankford Twp. (Sussex): *http://clerkshq.com/default.ashx?clientsite=Frankford-nj* (chapter XVIII)

The NJDEP Model Septic Management Ordinance[12] generally tracks the Level 3 approach. The model includes additions for record keeping, registration, licensing and maintenance including qualifications for service providers. *www.nj.gov/dep/wqmp/docs/septic_ordinance20091014.pdf*

Conclusion

Managing septic systems is a municipal responsibility that, when done properly, results in the protection of public health, surface and groundwater quality, and enhanced property values. Municipalities can follow guidance provided by NJDEP and may adopt ordinances that allow for an appropriate level of septic management activity.

Septic System Owner Education References

Various government agencies provide outreach information about septic system maintenance, suitable for distribution to owners or users of septic systems. USEPA and NJDEP each have publications that municipalities and environmental commissions can download and reproduce, or post or link to on websites:

USEPA – "Do Your Part, Be Septic Smart: The Do's and Don'ts of Your Septic System" series: (*www.epa.gov/septic*)

NJDEP – "A Homeowner's Guide to Septic Systems" *(www.nj.gov/dep/dwq/pdf/septicmn.pdf)*

Courtesy of U.S. Environmental Protection Agency

Below are some "Do's and Don'ts" for septic users:

Do:

Have the system inspected and pumped every three years (or as needed, as indicated by the inspection), and immediately if you suspect a problem;

Check with local regulatory agency or inspector before installing a garbage disposal unit to make sure your system can handle the waste;

Plant only grass, not trees or shrubs, over or adjacent to the septic system/field;

Minimize water use by using high-efficiency/low-flow fixtures (washer, toilet), installing faucet aerators, and fixing leaks promptly;

Learn the location of your septic system, sketch it and keep records of pumpings, inspections, permits and maintenance;

Avoid additives that promise improved septic performance; they are not needed and may cause problems.

Don't:

Flush or put down the drain non-biodegradable products or chemicals such as feminine hygiene products, condoms, dental floss, diapers, cigarette butts, cat litter, paper towels or pharmaceuticals;

Overload your system by using many water appliances at the same time;

Dispose of cooking grease, oil or coffee grounds down sinks or toilets.

Park or drive over the septic drainfield.

Glossary of Terms

Aerobic Treatment System: An aerobic treatment system or ATS, often called (incorrectly) anaerobic septic system, is a small scale sewage treatment system similar to a septic tank system, but which uses an aerobic process for digestion rather than just the anaerobic process used in septic systems.

Aerobic Treatment: The type of wastewater treatment that takes place in the septic system's drainfield primarily by the actions of soil bacteria in the presence of oxygen.

Anaerobic Treatment: The type of treatment that takes place in the septic tank itself due to bacterial action in a low oxygen environment prior to discharge to a drainfield.

Blue Baby Syndrome: A condition in infants in which the blood's ability to carry oxygen is greatly reduced. It is widely believed to be caused by nitrate contamination in groundwater. To protect infants from this possibility, a drinking water standard of 10 milligrams/litre (10 parts per million) has been established.

BOD: The acronym used to describe biological oxygen demand, a measure of the quantity of oxygen used by microorganisms (e.g., aerobic bacteria) in the oxidation of organic matter.

Breakout: A condition that results from the discharge of untreated septic effluent to the ground surface.

Cesspool: An obsolete onsite disposal system into which untreated wastewater flows and drains or "percolates" into the soil through perforated walls.

Decentralized Wastewater Treatment: A wastewater treatment strategy that relies on individual onsite systems or small treatment facilities not connected to a central collection.

Distribution Box: An essential part of a properly designed septic system located downstream of the septic tank. Its function is to evenly distribute partially treated wastewater to the laterals in the drain field for final treatment by soil bacteria and other microbes

Drain field: Sometimes referred to as a leach field or leach bed. The drain field is composed of laterals that receive partially treated wastewater from the distribution box.

GeoWeb: An interactive online computer based system operated and maintained by the NJDEP at *www.nj.gov/dep/gis/geowebsplash.htm.*

Hydraulic Failure: Septic system failure to drain into the soils as designed. Other causes of hydraulic failure include surface or groundwater entering the septic tank, distribution box, underground lines. Hydraulic failure is often noticed when plumbing fixtures such a floor drains, basement sinks and toilets refuse to flush and flow upward bringing untreated wastewater into the home.

Laterals: Perforated pipes located in the drain field bedded in clean gravel that are designed to both dispose of and treat wastewater by aerobic processes.

Leach Bed/Leach Field: See Drain field

NJDEP "Septic Rule": The Department of Environmental Protection's rules governing septic systems. The rules are found at NJAC 7:9A, at *www.state.nj.us/dep/dwq/pdf/njac79a.pdf*

NJPDES Permit: New Jersey Pollution Discharging Elimination System Permits issued for the discharge of pollutants to surface waters in New Jersey. Septic systems under 2000 gallons per day capacity do not require NJPDES permits and are approved by the local authority. However larger systems that flow over 2000 gallons per day cannot be approved by the local authority but require a NJDEP issued NJPDES permit

Nitrate: Nitrate is an oxide of nitrogen (NO_3-) formed as part of the nitrogen cycle. Domestic wastewater contains about 43 mg/l (parts per million) of nitrate that is actually formed in the septic tank as nitrogen compounds present in wastewater pass through the septic system.

Nitrogen Cycle (ecology): The series of processes by which nitrogen and its compounds are interconverted in the environment and in living organisms, including nitrogen fixation and decomposition.

Noncompliant System: An onsite wastewater treatment system that does not comply with the requirements of the NJ DEP's Standards for Individual Subsurface Sewage Disposal Systems at NJAC 7:9A-3.4: Noncompliant systems.

Optical Brighteners: Fluorescent substances added to detergents in order to produce a whitening effect on laundry.

OWTS: Acronym for Onsite Wastewater Treatment System

Pathogens: Bacteria, protozoa, and viruses that may be present in wastewater, groundwater and surface water. Not all pathogens are disease-causing but many, such as e-coli bacteria are of concern.

Peat Filter: Peat biofilter treatment units use sphagnum peat moss or peat fiber for removing and retaining contaminants until they are broken down.

Pressure Dosing System: A septic system that relies on a pump rather than gravity to periodically distribute wastewater to a drainfield or several drainfields.

Scum Layer: A floating layer composed primarily of oils and greases that forms in the septic tank.

Seepage Pit: A hole in the ground with permeable sides and bottom that allows partially treated wastewater from a septic tank to percolate into the soil in lieu of a drain field. Generally considered obsolete, seepage pits may be used for gray-water and in certain circumstances where construction of a drain field is not feasible.

Septic System: An onsite wastewater treatment system with a capacity of less than 2000 gallons per day that conforms with NJDEP's Standards for Individual Subsurface Systems (NJAC 7:9A).

Septic Tank: A watertight tank that receives the wastewater from the building. Septic tanks are usually made of precast concrete and contain a number of design features that allow separation of solids and prevent the discharge of scum or sludges to the drain field.

Sewer Service Area: The land area of a municipality that is currently or planned to be served by central sewer systems. Areas outside the sewer service area will be served by onsite wastewater treatment systems.

Zone of Treatment: An area around and below the laterals in a septic drainfield that provides the final treatment of wastewater by aerobic action. Unsaturated soils of 4-6 feet in depth should be present below the bottom of the drainfield. The local water table should not intrude into this vital treatment zone.

RESOURCES

[1] Handbook for Managing Onsite and Clustered (Decentralized) Wastewater Treatment Systems USEPA Publication No. 832-B-05001, Dec. 2005, *https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=20017K2G.txt*

[2] Discussion of police powers and public health – *www.ncbi.nlm.nih.gov/pmc/articles/PMC2569983*

[3] Well testing program information for the Raritan Headwaters Association – *www.raritanheadwaters.org/protect/well-testing/community-well-testing* well testing in the Great Swamp Watershed – *http://greatswamp.org/GSWA/wp-content/uploads/2016/02/2016Brochure.pdf*

[4] New Jersey Integrated Water Quality Monitoring and Assessment Report – *www.nj.gov/dep/wms/bears/generalinfo.htm*

[5] Information on optical brighteners - *www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/3414.pdf*

[6] Nitrate Dilution Model Frequently Asked Questions – *www.state.nj.us/dep/njgs/enviroed/infocirc/nitratedilutionFAQ.pdf*

[7] NJDEP Standards for Individual Subsurface Sewage Disposal Systems (NJAC 7:9A) – *www.state.nj.us/dep/dwq/pdf/njac79a.pdf*

[8] To learn about the complex processes that take place in septic systems see: *www.maine.gov/dhhs/mecdc/environmental-health/plumb/documents/training/2013/Microbiology-of-Septic-Systems.pdf*

[9] NJDEP Homeowners Guide to Septic Systems – *www.state.nj.us/dep/dwq/pdf/septicmn.pdf*

[10] Rutgers: Five Levels of Protection – *http://njaes.rutgers.edu/pubs/publication.asp?pid=FS531* USEPA Voluntary National Guidelines for Onsite and Clustered (Decentralized) Wastewater Treatment Systems, *https://epa.gov/sites/production/files/2015-06/documents/septic_guidelines.pdf*

[11] EPA Handbook for Managing On-Site and Clustered Wastewater Treatment Systems – *www.epa.gov/sites/production/files/2015-06/documents/onsite_handbook.pdf*

[12] NJDEP Septic Management Model Ordinance – *www.nj.gov/dep/wqmp/docs/septic_ordinance20091014.pdf*

USEPA SepticSmart Outreach Toolkit – *www.epa.gov/septicsmart* (select the Resources tab under "SepticSmart Homeowners") Outreach material files including downloadable door hanger in English and Spanish, postcards, rack card, Fact Sheet for Homeowners, Homeowner's Guide and the SepticSmart graphic file

Definitions of Septic System Components & Terms: An Online Dictionary: *http://inspectapedia.com/septic/Septic_System_Definitions.php#A*

The Watershed Institute maintains a list of resources of New Jersey watershed associations throughout the state at *http://thewatershedinstitute.org/resources/web-resources*

Information on contaminants in drinking water – *www.epa.gov/dwstandardsregulations*

NJDEP Technical Guidance for Inspections of Onsite Wastewater Treatment and Disposal Systems – *www.state.nj.us/dep/dwq/pdf/inspection_guidance.pdf*

This publication was made possible through the generous support of the William Penn Foundation.

ANJEC is a statewide nonprofit organization that informs and assists environmental commissioners and interested citizens in preserving and protecting New Jersey's environment.

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5C022017